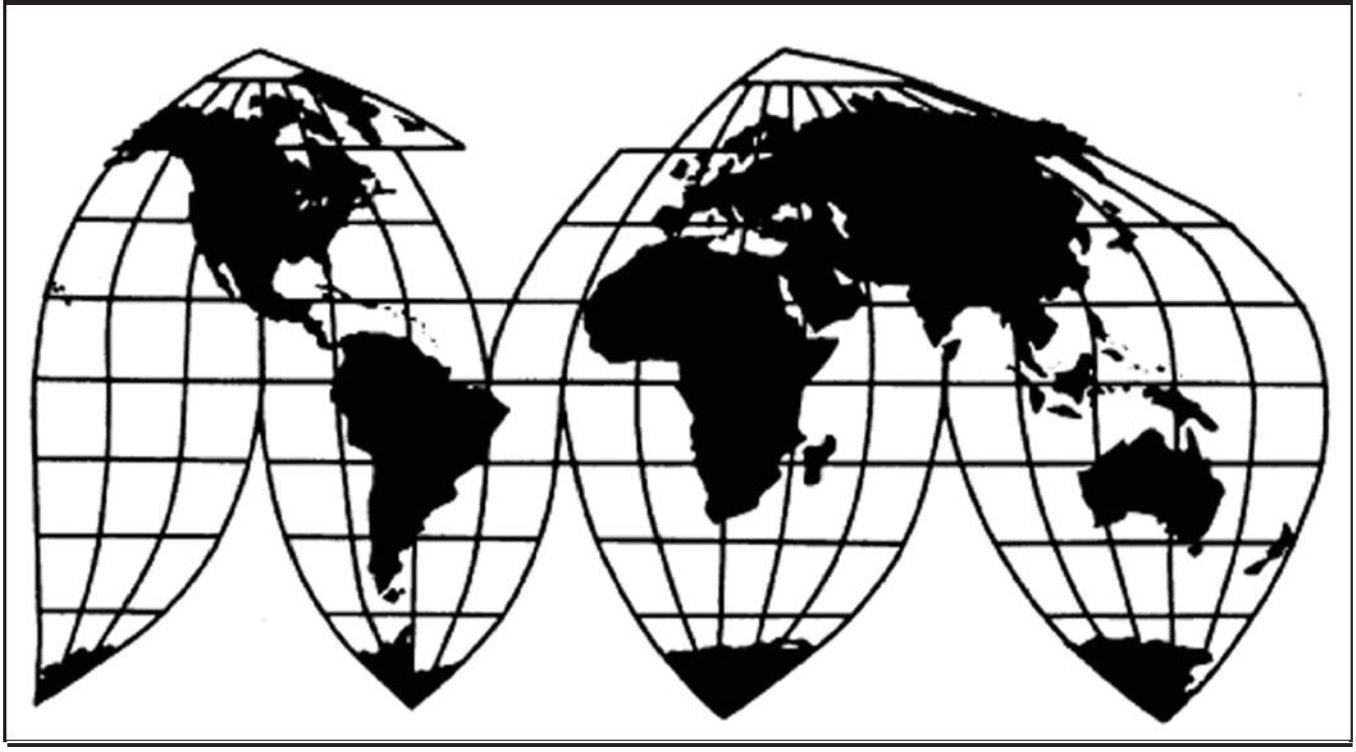
In the Matter of

Certain Polyimide Films, Products Containing Same, and Related Methods

Investigation No. 337-TA-772

Publication 4402 **July 2013**

U.S. International Trade Commission



Washington, DC 20436

U.S. International Trade Commission

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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS**	**Investigation No. 337-TA-772**

NOTICE OF COMMISSION DETERMINATION TO AFFIRM THE FINAL INITIAL DETERMINATION WITH RESPECT TO THE ISSUES ON REVIEW AND TO TERMINATE THE INVESTIGATION

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to affirm, as modified, the final initial determination ("final ID" or "ID") of the presiding administrative law judge ("ALJ") in the above-captioned investigation under section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("section 337"), and has terminated the investigation.

FOR FURTHER INFORMATION CONTACT: James A. Worth, Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-3065. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2000. General information concerning the Commission may also be obtained by accessing its Internet server (*http://www.usitc.gov*). The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov*. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION: The Commission instituted this investigation on May 4, 2011, based on a complaint filed on behalf of Kaneka Corporation of Osaka, Japan ("Kaneka"). 76 *Fed. Reg.* 25373 (May 4, 2011). The complaint alleges violations of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the sale for importation, importation, or sale after importation of certain polyimide films, products containing same, and related methods by reason of infringement of one or more of claims 1-3 and 9-10 of U.S. Patent No. 6,264,866 ("the '866 patent"); claims 1-6 of U.S. Patent No. 6,746,639 ("the '639 patent"); claims 1-5 of U.S. Patent No. 7,018,704 ("the '704 patent"); and claims 1-20 of U.S. Patent No. 7,691,961 ("the '961 patent"). The Commission's notice of investigation named as respondents SKC Kolon PI, Inc. of Gyeonggi-do, South Korea and SKC Corporation of Covington, Georgia ("collectively, "SKC").

On February 23, 2012, the Commission issued notice of its determination not to review an ID (Order No. 26) that Kaneka has satisfied the importation requirement with respect to all versions of the following SKC products: IN30 (75 um), IN70 (19um), IN 70 (25um), IN70 (50um), IF30 (7.5um), IF70 (12.5um), LV100, LV200, and LV300.

On February 27, 2012, the Commission issued notice of its determination not to review an ID (Order No. 25) terminating the investigation with respect to claims 4-5 of the '704 patent and claims 4, 11, 16, 17, and 20 of the '961 patent.

An evidentiary hearing was held from March 12, 2012, to March 16, 2012.

On May 10, 2012, the ALJ issued a final ID finding no violation of section 337 in the above-identified investigation. Specifically, the ALJ found that there was no violation with respect to the '866 patent, the '639 patent, the '704 patent, or the '961 patent by SKC. The ALJ also issued a recommended determination on remedy and bonding.

On May 22, 2012, Kaneka filed a petition for review of the final ID and on May 23, 2012, SKC filed a contingent petition for review. On May 30, 2012, SKC filed a response to Kaneka's petition, and on May 31, 2012, Kaneka filed a response to SKC's contingent petition.

On August 1, 2012, the Commission issued notice of its determination to partially review the final ID. 77 *Fed. Reg.* 47092 (August 7, 2012). With respect to the '866 patent, the Commission determined to review the finding that Kaneka does not satisfy the technical prong of the domestic industry requirement. *Id.* With respect to the '961 patent, the Commission determined to review the ALJ's finding that certain of the accused products infringe and certain of the accused products do not infringe claim 9. *Id.* With respect to the '704 patent, the Commission determined not to review the ALJ's conclusion that the asserted claims of the '704 patent are invalid for indefiniteness. *Id.* The Commission further determined to review and vacate as moot the ID's remaining findings with respect to the '704 patent. The Commission determined not to review the remainder of the ID. *Id.*

On August 15, 2012, Kaneka and SKC each filed submissions on review. On August 22, 2012, each filed reply submissions.

On review, having examined the final ID, the submissions of the parties, and the relevant portions of the record in this investigation, the Commission has determined to affirm the ID with respect to the issues on review. With respect to the '866 patent, the Commission has determined to affirm the ALJ's determination that Kaneka has failed to satisfy the technical prong of the domestic industry requirement on modified grounds. With respect to the '961 patent, the Commission has determined to affirm the ALJ's finding that the IN70 (50μm) product infringes claim 9 and the other accused products do not. The investigation is terminated.

This action is taken under the authority of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337), and under Part 210 of the Commission's Rules of Practice and Procedure (19 C.F.R. Part 210).

By order of the Commission.

Lisa R. Barton
Acting Secretary to the Commission

Issued: October 5, 2012

CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS **337-TA-772**

CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached has been served upon the Office of Unfair Import Investigations and the following parties as indicated on **October 9, 2012.**

Lisa R. Barton, Acting Secretary
U.S. International Trade Commission
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Washington, DC 20436

On Behalf of Complainant Kaneka Corporation:

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On Behalf of Respondents SKC Kolon PI, Inc. and SKC Inc.:

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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of	
CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS	**Inv. No. 337-TA-772**

COMMISSION OPINION

On May 10, 2012, the presiding administrative law judge ("ALJ") (Judge Rogers) issued a final initial determination ("final ID" or "ID") finding no violation of section 337 in the above-identified investigation. Specifically, the ALJ found that there was no violation with respect to U.S. Patent No. 6,264,866 ("the '866 patent"), U.S. Patent No. 6,746,639 ("the '639 patent), U.S. Patent No. 7,018,704 ("the '704 patent"), or U.S. Patent No. 7,691,961 ("the '961 patent) by respondents SKC Kolon PI, Inc. and SKC Corporation ("collectively, "SKC"). The ALJ also issued a recommended determination ("RD") on remedy and bonding.

On August 1, 2012, the Commission issued notice of its determination to review-in-part and vacate-in-part the ID and not to review the remainder of the ID. The Commission solicited briefing focused on the questions on review. Specifically, the Commission sought briefing on the technical prong of the domestic industry requirement with respect to the '866 patent and infringement of claim 9 of the '961 patent. Because the Commission determined not to review the ALJ's finding of no violation of section 337 with respect to the asserted patents, the Commission did not request briefing on remedy, the public interest, and bonding.

Having considered the ID, the various submissions of the parties, and the relevant portions of the record, the Commission has determined to affirm the ALJ's determination that

PUBLIC VERSION

Kaneka Corporation of Osaka, Japan ("Kaneka") failed to satisfy the technical prong of the domestic industry requirement with respect to the '866 patent on modified grounds, and has determined to affirm the ALJ's finding that the IN70 (50μm) product infringes claim 9 of the '961 patent and the other accused products do not. This opinion sets forth the reasons for the Commission's determinations.

I. BACKGROUND

A. Procedural History

The Commission instituted this investigation on May 4, 2011, based on a complaint filed on behalf of Kaneka. 76 *Fed. Reg.* 25373 (May 4, 2011). The complaint alleged violations of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the sale for importation, importation, or sale after importation of certain polyimide films, products containing same, and related methods by reason of infringement of one or more of claims 1-14 of the '866 patent; claims 1-6 of the '639 patent; claims 1-5 of the '704 patent; and claims 1-20 of the '961 patent. The Commission's notice of investigation named as respondents SKC Kolon PI, Inc. of Gyeonggi-do, South Korea and SKC Corporation of Covington, Georgia ("collectively, "SKC").

On February 23, 2012, the Commission issued notice of its determination not to review an ID (Order No. 26) that Kaneka has satisfied the importation requirement with respect to all versions of the following SKC products: IN30 (75 μm), IN70 (19 μm), IN 70 (25 μm), IN70 (50 μm), IF30 (7.5 μm), IF70 (7.5μm), IF70 (12.5 μm), LV100, LV200, and LV300.

On February 27, 2012, the Commission issued notice of its determination not to review an ID (Order No. 25) terminating the investigation with respect to claims 4-5 of the '704 patent and claims 4, 11, 16, 17, and 20 of the '961 patent.

At the prehearing conference, the ALJ granted Motion in Limine 1, limiting the claims at issue to claims 1-3 of the '866 patent, claim 1 of the '639 patent, claim 1 of the '639 patent, claim 1 of the '704 patent, and claims 1 and 9 of the '961 patent. Tr. at 6-7.

An evidentiary hearing was held from March 12, 2012, to March 16, 2012.

On May 10, 2012, the presiding administrative law judge ("ALJ") (Judge Rogers) issued a final initial determination ("final ID" or "ID") finding no violation of section 337 in the above-identified investigation. Specifically, the ALJ found that there was no violation with respect to the '866 patent, the '639 patent, the '704 patent, or the '961 patent by SKC. The ALJ also issued a recommended determination ("RD") on remedy and bonding.

With respect to the '866 patent, the ALJ determined that Kaneka failed to prove that it satisfies the technical prong and the economic prong of the domestic industry requirement; the accused products do not infringe claims 1-3 of the '866 patent; and claims 1-3 of the '866 patent are not invalid by reason of anticipation or obviousness.

With respect to the '639 patent, the ALJ determined that Kaneka failed to prove that it satisfies the technical prong and the economic prong of the domestic industry requirement; the accused products do not infringe claim 1 of the '639 patent; claim 1 of the '639 patent is not invalid by reason of anticipation or obviousness; and claim 1 is not unenforceable by reason of inequitable conduct.

With respect to the '704 patent, the ALJ determined that Kaneka failed to prove that it satisfies the economic prong of the domestic industry requirement and that claim 1 is indefinite.

Although the ALJ held that claim 1 of the '704 patent is indefinite, he made alternative findings under Kaneka's proposed claim construction (which he rejected), *i.e.*, that Kaneka failed to satisfy the technical prong of the domestic industry requirement, that the accused products do not infringe claim 1 of the '704 patent, and that claim 1 of the '704 patent is not invalid by reason of anticipation or obviousness.

With respect to the '961 patent, the ALJ determined that Kaneka failed to prove that it satisfies the technical prong and the economic prong of the domestic industry requirement; the accused products do not infringe claim 1 of the '961 patent; the accused SKC IN70 (50 μm) product infringes claim 9 of the '961 patent but no other accused product infringes claim 9 of the '961 patent; claim 1 of the '961 patent is invalid for lack of enablement but claim 9 is not invalid for lack of enablement; claims 1 and 9 are not invalid by reason of an on-sale bar under 35 U.S.C. § 102(b); and claims 1 and 9 are not invalid for failure to satisfy the best mode requirement.

On August 1, 2012, the Commission issued notice of its determination to partially review the final ID. 77 *Fed. Reg.* 47092 (August 7, 2012). With respect to the '866 patent, the Commission determined to review the finding that Kaneka does not satisfy the technical prong of the domestic industry requirement. *Id.* With respect to the '961 patent, the Commission determined to review the ALJ's finding that certain of the accused products infringe and certain of the accused products do not infringe claim 9. *Id.* With respect to the '704 patent, the Commission determined not to review the ALJ's conclusion that the asserted claims of the '704 patent are invalid for indefiniteness. *Id.* The Commission further determined to review and vacate as moot the ALJ's alternative findings under Kaneka's proposed claim construction that the accused products do not infringe, that claim 1 is not invalid for anticipation or obviousness,

and that Kaneka does not satisfy the technical prong or the economic prong of the domestic industry requirement. *Id.* The Commission determined not to review the remainder of the ID. *Id.*

On August 15, 2012, Kaneka and SKC each filed submissions on review. On August 22, 2012, each filed reply submissions.

B. The Remaining Patents at Issue

The '866 patent, entitled[1] "Method for Producing Polyimide Film," assigned to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha,[2] was issued on July 24, 2001 based on application number 09/095,129[3] filed on June 10, 1998 by Hirofumi Yamada, Manabu Fukudome, Naoki Egawa, Yuzuru Kondo, and Haruhiko Maki. The '866 patent is directed to a method for producing polyimide film in which the imidation ratio, the amount of volatile constituent, and the temperature increases are controlled. Claims 1-3 are at issue in this investigation.

The '961 patent, entitled[4] "Polyimide Film and Use Thereof," assigned to Kaneka Corp., was issued on April 6, 2010 based on application number 11/513,353[5] filed on August 31, 2006 by Kan Fujihara, Kazuhiro Ono, and Takaaki Matsuwaki. The '961 patent is directed to a

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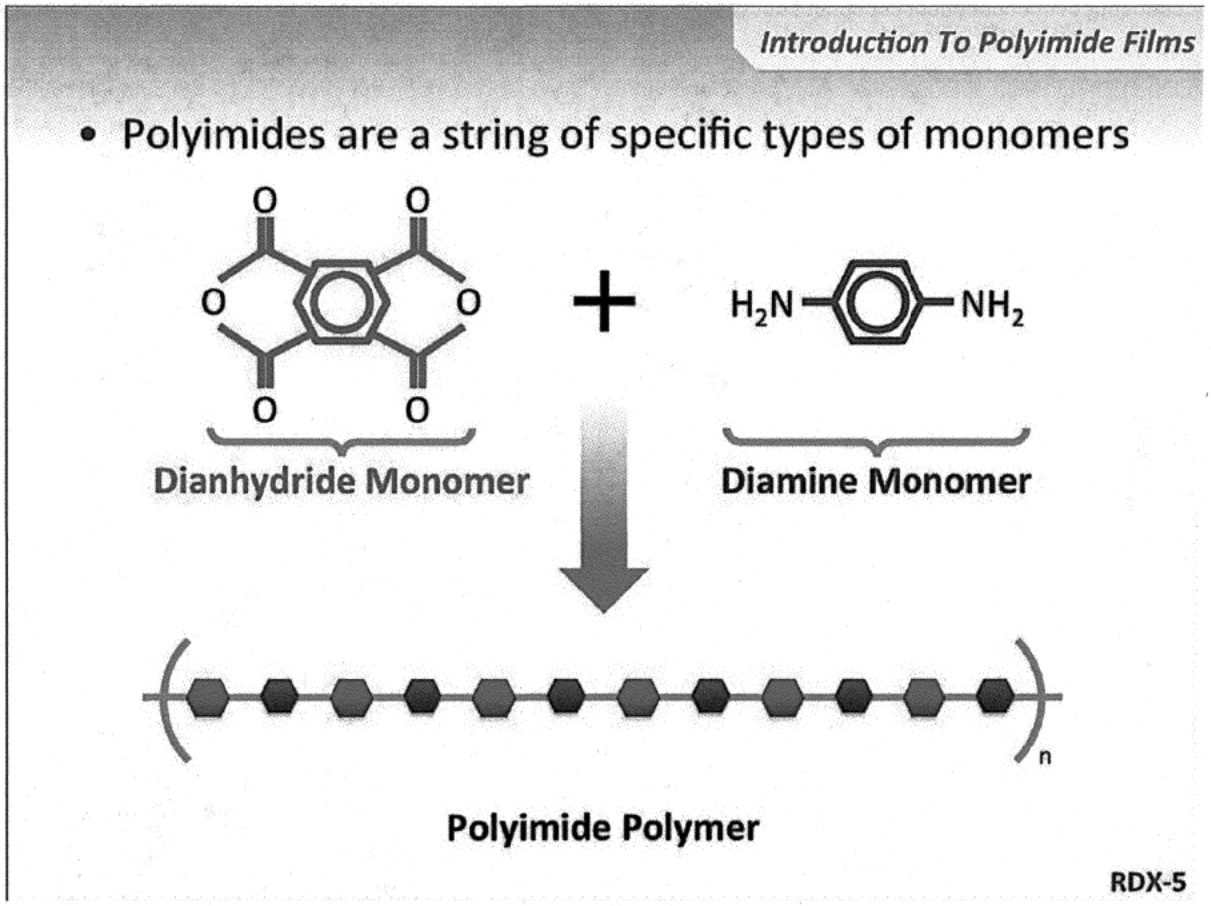
[1] JX-1.
[2] Kanegafuchi Kagaku Kogyo Kabushiki Kaisha changed its name to Kabushiki Kaisha Kaneka (English name: Kaneka Corporation) in September, 2004. http://www.kaneka.co.jp/kaneka-e/ir/pdf/2005_r.pdf
[3] JX-5.
[4] JX-5.
[5] JX-9.

polyimide film produced by a continuous process having a certain ratio of directional linear expansion (a linear expansion ratio) and a certain ratio of directional tear propagation (a tear propagation ratio). Claims 1 and 9 are at issue in this investigation.

C. The Technology: Polyimide Film's Formation, Composition, and Uses

Polyimide film is a polymer (*i.e.*, a plastic), which is formed by cross-linking a double-sided acid anhydride with a double-sided amine to form imide linkages for repeating units of the polymer.



The patents further describe the relative amounts of anhydride to amine, dehydrating agent, and catalyst used, and the proper temperature of the reaction mixture.

Polyimide films are used to mount and insulate circuits, and as a surface for the printing of circuit boards. *See* RX-584C at 20.

D. The Parties

Complainant Kaneka is based in Japan. Kaneka has a wholly-owned subsidiary, KTC, which has a plant in Texas related to the manufacture of polyimide film, or the finishing of film made in Japan. CX-621C, at Q.18. Kaneka has licensed its patents to its subsidiary, KTC. ID at 282. Kaneka alleges that it manufactures its AV line of products at KTC in the United States pursuant to the '866 patent, and that it manufactures its NP and NPI line of products pursuant to the '639, '704, and '961 patents in Japan but that it performs post-processing of these products in the United States, *i.e.*, slitting and coating. ID at 281.

Respondent SKC Kolon PI, Inc. ("SKPI") is a Korean corporation and respondent SKC, Inc. is a U.S. corporation based in Georgia. We collectively refer to the respondents as SKC. SKC imports polyimide film from Korea. *See* Notice (February 23, 2012).

II. STANDARD OF REVIEW

Once the Commission has decided to review the decision of the ALJ, then according to statute, the agency has all of the powers which it would have in making the initial decision except as it may limit the issues on notice or by rule. 5 U.S.C. § 557(b) (*quoted in Certain Acid-Washed Garments and Accessories*, Inv. No. 337-TA-324, USITC Pub. 2576, Comm'n Op. at 3 (Nov. 1992)). Commission Rule 210.45(c) implements 5 U.S.C. § 557(b). In other words, once the Commission decides to review the decision of the ALJ, the Commission may conduct a review of the findings of fact and conclusions of law presented by the record under a *de novo* standard.

III. DISCUSSION

A. The '866 Patent

1. The Claims

Kaneka asserts claims 1-3 of the '866 patent. The claims read as follows:

1. A method for producing an adhesive polyimide film comprising:
casting a composition into a film shape, wherein said composition consists substantially of an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines;
heating the film shaped composition at an initial temperature of 200° C. or less, and thereafter increasing the temperature in a step-wise fashion such that solvent is evaporated to form a chemically cured prefilm while adjusting an imidation ratio represented by the formula:

$$\frac{\left(\frac{\text{imido group infrared absorbance at } 1374\ \text{cm}^{-1}}{\text{benzene ring infrared absorbance at } 1498\ \text{cm}^{-1}}\right)_{\text{prefilm}}}{\left(\frac{\text{imido group infrared absorbance at } 1374\ \text{cm}^{-1}}{\text{benzene ring infrared absorbance at } 1498\ \text{cm}^{-1}}\right)_{100\%\ \text{imidated film}}}$$

and further heating said prefilm to obtain an adhesive polyimide film.

2. A method for producing an adhesive polyimide film comprising:
casting a composition into a film shape, wherein said composition consists substantially of an organic solvent solution of polyamide acid and one or more chemical curing agents selected from the group consisting of a dehydrating agent and a tertiary amine;
heating the film shaped composition at an initial temperature of 200° C. or less, and thereafter increasing the temperature in a step-wise fashion such that solvent is evaporated to form a chemically cured prefilm while adjusting amounts of volatile constituent; and
further heating said prefilm to obtain an adhesive polyimide film.

3. A method for producing an adhesive polyimide film comprising:
casting a composition into a film shape, wherein said composition consists substantially of an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines;
heating the film shaped composition at an initial temperature of 200° C. or less, and thereafter increasing the temperature in a step-wise fashion such that solvent

is evaporated to form a chemically cured prefilm while adjusting amounts of organic solvent and an imidation ratio represented by the formula:

$$\frac{\left(\frac{\text{imido group infrared absorbance at } 1374\ \text{cm}^{-1}}{\text{benzene ring infrared absorbance at } 1498\ \text{cm}^{-1}}\right)_{\text{prefilm}}}{\left(\frac{\text{imido group infrared absorbance at } 1374\ \text{cm}^{-1}}{\text{benzene ring infrared absorbance at } 1498\ \text{cm}^{-1}}\right)_{100\%\ \text{imidated film}}}$$

and further heating said prefilm to obtain an adhesive polyimide film.

The Commission determined to review the issue of whether Kaneka satisfied the technical prong of the domestic industry requirement with respect to the '866 patent.

2. Domestic Industry -- Technical Prong

The Commission determined to review the ALJ's technical prong analysis on the '866 patent, and in particular whether this analysis properly found that the "increasing the temperature in a step-wise fashion" limitation was not satisfied by the evidence adduced at trial. In this regard, the ALJ found that although Kaneka relied on the [[

]] products, it only provided detailed evidence regarding [[ ]]. ID at 298. The ALJ noted Dr. Harris' expert report and Mr. Yamaguchi's testimony regarding KTC's domestic production, but found that Mr. Haussler admitted that [[

]] ID at 302. The ALJ similarly found [[

]] The ALJ thus found that the "increasing the temperature in a step-wise fashion" limitation was not met. *Id.* at 302-03.

The Commission solicited briefing with respect to the '866 patent as follows:

(1) With respect to the '866 patent, would a complainant satisfy the technical prong of the domestic industry requirement if the products offered to satisfy the requirement met the elements of the asserted claims only intermittently or occasionally? *See* ID at 302.

a. Kaneka

Kaneka argues that a complainant would satisfy the technical prong of the domestic industry requirement if the products offered to satisfy the requirement met the elements of the asserted claims only intermittently or occasionally. Complainant Kaneka Corporation's Brief in Response to Commission Request for a Written Submission ("Kaneka Submission") at 2. Kaneka asserts that the test for satisfying the technical prong of the domestic industry requirement is the same as that for infringement. *Id.* (citing *Alloc v. ITC*, 342 F.3d 1361, 1376 (Fed. Cir. 2003) ("The test for satisfying the technical prong of the domestic industry requirement is essentially the same as that for infringement, i.e., a comparison of domestic products to the asserted claims."); *Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, ID at 109 (May 21, 1990)). Kaneka argues that it is well settled that "an accused product that sometimes, but not always, embodies a claimed method nonetheless infringes." *Id.* at 2-3 (citing *Bell Comms. Research Inc. v. Vitalink Comms. Corp.*, 55 F.3d 615, 623 (Fed. Cir. 1995)). Kaneka further argues that the Federal Circuit has held that "'a finding of infringement can rest on as little as one instance of the claimed method being performed during the pertinent time period.'" *Id.* at 3 (quoting *Lucent Techs. Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1317 (Fed. Cir. 2009)).

Kaneka argues that [[

]] *Id.* at 3. Kaneka admits that [[

]]

Kaneka argues that the technical prong of the domestic industry requirement should be analyzed in the context of the nature of the process used to manufacture and the realities of the marketplace. *Id.* at 4 (relying on *Certain Diltiazem Hydrochloride and Diltiazem Preparations*, Inv. No. 337-TA-349, ID at 138 (February 1, 1995) (unreviewed in relevant part)). [[

]]

Kaneka argues that SKC is attempting to confuse the issue by conflating the economic and technical prongs of domestic industry. Complainant Kaneka Corporation's Reply Brief in Response to Commission Request for a Written Submission ("Kaneka Reply Submission") at 1. Kaneka states that whether there are "substantial and significant domestic investments in the asserted patented technologies" is relevant only to the separate inquiry of the economic prong requirement. *Id.* (citing *Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm'n Op. at 8 (Jan. 16, 1996)).

Kaneka argues that SKC's reliance on *Certain Variable Speed Wind Turbines and Components Thereof,* Inv. No. 337-TA-376, Comm'n Op. at 18 (Nov. 1996), is misplaced because *Wind Turbines* addressed the situation where domestic industry ceased, rather than here where there [[ ]] *Id.* at 2. Kaneka states that its practice does resemble the domestic industry in *Wind Turbines* to the extent that it was found to exist before it ceased. *Id.* at 3-4.

Kaneka asserts that SKC attempts to improperly limit Kaneka's domestic industry products to the [[ ]] stating that SKC acknowledged that Kaneka alleged that 45 products practice the '866 patent. *Id.* at 2 (citing ID at 290; Kaneka's Petition at 13).

Kaneka further asserts that SKC attempts to improperly limit the relevant time period to three months before and three months after the filing of the complaint. *Id.* Kaneka responds to SKC's argument that a complainant must practice the patent on the filing date of the complaint, stating that ID is correct that the domestic industry must exist as of the date of the complaint but there is no requirement that the patent is practiced on the date of the complaint. *Id.* at 3. Kaneka explains that in *Bally/Midway Mfg. Co. v. ITC*, 714 F.2d 1117, 1121-22 (Fed. Cir. 1983), it was appropriate for the Commission to measure domestic industry at the time the complaint was filed because the domestic industry had been destroyed by the investigation's target date. *Id.* Kaneka distinguishes *Bally/Midway* and further distinguishes the investigation in *Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, on the same basis, *i.e.*, that the domestic industry was destroyed in those cases. *Id.*

b. SKC

SKC argues that Kaneka has, at best, [[

]] and that this is not "good enough" either conceptually or on the current record. Respondent SKC Kolon PI, Inc. and SKC, Inc.'s Response to the Commission's Notice to Partially Review and Partially Vacate the Final Determination of the Administrative Law Judge ("SKC Submission") at 2. SKC asserts that [[ ]] practice of a patent in the United States should not satisfy the domestic industry requirement or else the requirement will become almost non-existent. *Id.* SKC argues that the Commission's mandate is to protect significant or substantial domestic investments in the asserted patented technologies. *Id.* at 2. SKC further argues that the Commission should "decline to issue a remedy" if the patentee has not consistently invested in the domestic practice of its patented technology because to do so would "protect an essentially non-existent domestic industry." *Id.* at 2-3. SKC observes that only sustained practice of a patented technology warrants a remedy, and that where a domestic industry no longer exists, the Commission will stop enforcing an order. *Id.* at 3 (citing *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, Comm'n at 18 (November 1996)). SKC reasons that, likewise, the Commission should not issue a remedy in the first place if the domestic industry only practices the asserted patent [[

]]

SKC argues that the ID correctly limits the relevant time period of the domestic industry inquiry to the Complaint's April 1, 2011, filing date because Kaneka only asserted an industry that exists, not an industry in the process of being established. *Id.* at 4 & n.4. SKC remarked that the ID even expanded the time period that it examined by three months before and after the filing date. *Id.* SKC states that in this "expansive" six-month window, *i.e.*, three months before and three months after the filing date of the Complaint, [[

]]

SKC argues that it is not aware of any authority which would allow complainant to rely [[

]] *Id.* SKC argues that in order to determine whether the investment is "substantial," the existence of domestic industry must be assessed in the context of the nature of the marketplace and industry in question. *Id.* at 7 (citing *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm'n Op. on Remedy, the Public Interest, and Bonding at 31 (February 17, 2011)).

Further, SKC argues that the Commission has already found that a domestic industry does not exist because Kaneka has not proven that it satisfies the economic prong of the requirement. *Id.* at 7. Moreover, SKC argues that Kaneka has not proven that it satisfies the various aspects of the "while adjusting" limitation of the '866 patent, *i.e.*, the imidation ratio, volatile constituents, or organic solvent measurements. *Id.* at 6.

SKC asserts that Kaneka relies on products not received into evidence and that only [[

]] qualify as domestic industry products.

SKC argues that there are important policy distinctions between the domestic industry requirement and infringement. Respondent SKC Kolon PI, Inc. and SKC, Inc.'s Reply to Complainant Kaneka Corporation's Brief in Response to Commission Question for a Written Submission ("SKC Reply Submission") at 2. SKC argues that the Federal Circuit in *Alloc* stated that the test for technical prong was "essentially the same" as for infringement, but did not say that it was "the same." *Id.* (referring to *Alloc v. ITC*, 342 F.3d 1361, 1375 (Fed. Cir. 2003)). SKC states that the ITC differs from a district court because in a district court, there is a cause of

action for infringement and no need to demonstrate the existence of a domestic industry, whereas the ITC offers an "extraordinary" remedy which requires domestic industry as "gatekeeper to prevent abuse." *Id.* at 3. SKC argues that while the procedural analysis of whether a complainant satisfies the technical prong of the domestic industry requirement is similar to an infringement analysis, it serves a different purpose. *Id.* at 4. [[

]]

SKC states that Kaneka ignores the evidentiary record and attempts to substitute attorney argument for evidence. SKC Reply Submission at 4. SKC asserts that Kaneka avoids identification of exactly which of its products are the domestic industry products, and that it cites to temperature profiles from products for which it offered no evidence during discovery or the evidentiary hearing, and for which the ALJ determined are not relevant to the domestic industry inquiry. *Id.* at 5. SKC submits that Kaneka only presented evidence to support its domestic industry contentions for [[ ]] and offered nothing more than a conclusory statement in support of its claim that 45 other products are manufactured using identical methods, and that this conclusory statement is refuted by the evidence of record. *Id.* (citing *Certain Integrated Circuits, Chipsets, and Products Containing Same Including Televisions, Media Players, and Cameras*, Inv. No. 337-TA-709, ID at 17-19 (April 4, 2011); CX-503-C; Tr. at 123:5-125:3)). SKC submits that Kaneka only supplied evidence on the [[ ]] *Id.* at 6 (citing CX-471-C at 2-4; CX-207C at ¶¶ 68-73; CX-619 at Q.58-77).

SKC argues that the ALJ properly limited the time period relevant to domestic industry to three months before and three months after the filing of the complaint, and argues that CX-646 shows, and Kaneka does not dispute, that [[

]] *Id.* [[

]] *Id.* at 6-7 (citing CX-646C). Moreover, SKC points to KTC's Technical Operating Standard, CX-619C at 61-63, which shows that [[

]]

c. Analysis

The parties' dispute centers on whether "intermittent or occasional" infringement is a "substantial investment" in the articles covered by the patent. 19 U.S.C. § 1337(a)(3). The Commission considers the issue presented by SKC as relating to the domestic industry *economic* prong, not the domestic industry *technical* prong. Thus, the question of how often a claim (here a method claim) is practiced is analyzed with the other factors relating to the size of -- or "substantial investment" or "significant investment" in-- the domestic industry. In this investigation, the Commission has already determined not to review the ALJ's finding that Kaneka has not satisfied the economic prong of the domestic industry requirement, and the fact that there is at most "intermittent or occasional" practice of the patent supports the finding that Kaneka has not satisfied the economic prong of the domestic industry requirement.

With respect to the technical prong, this inquiry is limited to a comparison of the claim language and the product offered to satisfy the domestic industry requirement. *See Alloc v. ITC*, 342 F.3d 1361, 1375 (Fed. Cir. 2003) (technical prong analysis is analogous to an infringement

analysis and compares the product offered to satisfy the domestic industry requirement with the claim relied on).

Under this standard, the Commission has determined to reverse the ALJ's finding that Kaneka has not satisfied the "step-wise" heating limitation. The ALJ was correct to find that there was [[

]] Kaneka asserted a domestic industry in its complaint, and throughout the investigation, based on exploitation of the '866 patent through engineering, research and development, licensing, and litigation. Complaint at ¶44, ID at 274-75. Thus, even if SKC is correct that this was [[

]] Therefore, the ALJ erred in concluding that Kaneka does not practice the "step-wise" heating limitation. ID at 297-303. Because we reverse the ALJ's analysis as to this limitation, we do not adopt the ALJ's finding of no domestic industry on this basis.

Nevertheless, the Commission affirms the ID's ultimate finding of no domestic industry based on the ALJ's interpretation of the "while adjusting" limitation, which requires heating while adjusting the imidation ratio. Specifically, Kaneka's argument that it practices the "while adjusting" limitation rested on its claim construction argument that "the claim does not require routine sample-taking or measurements of imidation ratio." Complainant Kaneka Corporation's Post-Trial Brief ("Kaneka Post-hearing Brief") at 38; ID at 287 ("Kaneka argues that the claim does not require routine sample-taking or measurements of imidation ratio; [[

]] While the ALJ did not consider this claim construction argument in the specific context of a technical prong analysis, he effectively rejected it as part of

an analogous infringement analysis that the Commission declined to review. ID at 208. Because Kaneka's technical prong arguments regarding the "while adjusting" limitation were based on a claim construction that the ALJ correctly rejected, the Commission finds that Kaneka has failed to show that its products practice the "while adjusting" limitation of the '866 patent. We therefore affirm on modified grounds the ALJ's conclusion that Kaneka failed to satisfy the technical prong of the domestic industry requirement with respect to the '866 patent.

B. The '961 Patent

1. The Claims

Kaneka asserts claims 1 and 9 of the '961 patent, which reads as follows:

> 1. A polyimide film produced by a continuous process, wherein when a coefficient of linear expansion a in a direction of the molecular orientation axis and a coefficient of linear expansion b in a direction perpendicular to the molecular orientation axis are measured in the temperature range of 100° C. to 200° C., a coefficient of linear expansion ratio A represented by equation (1):
>
> $$A=1+\{(b-a)/(b+a)\}x2 \quad (1)$$
>
> is in the range of 1.13 to 3.00 across the entire width.
>
> 9. A polyimide film produced by a continuous process, wherein when a tear propagation resistance c in a direction of the molecular orientation axis and a tear propagation resistance d in a direction perpendicular to the molecular orientation axis are measured, the tear propagation resistance ratio d/c is in the range of 1.01 to 1.20 and the difference between the maximum and the minimum of the tear propagation resistance ratio d/c is 0.10 or less across the entire width.

2. Infringement of Claim 9

The ALJ determined that Kaneka demonstrated that IN70 (50μm) infringes claim 9 of the '961 patent, but had not demonstrated that the other accused products infringe claim 9. ID at 262.[6]

The ALJ found that limitations on claim 9 require that "across the entire part in the direction perpendicular to the transferring direction in which the film is continuously produced": (1) the TPR ratio d/c of the accused film is in the range of 1.01 to 1.20 and (2) the difference between the maximum and minimum of the TPR ratio d/c is 0.10 or less. *Id.* at 264. The ALJ held that Kaneka has carried its burden to show the above two elements are present with respect to only two SKC products: IN 70 (50 μm) (Kaneka reference S8) and IN 70 (75 μm) (Kaneka reference S9). *Id.* The ALJ determined that Kaneka could only show that both of the above elements are met for these film samples by averaging the test results from the five replicates; the ALJ found this to be insufficient to meet Kaneka's burden to prove infringement. *Id.* Additionally, the ALJ held that Kaneka failed to meet its burden of proof for the IF70 (50 μm), IF30 (75 μm), IF70 (75 μm), IF70 (75 μm), IF70 (50 μm), LN100, IF70 (12.5 μm), IF70 (25 μm), and LV75, LV100 films because of Kaneka's small sample sizes that all contained at least one replicate showing non-infringement and because of Dr. Harris' testimony that values within the standard deviation of the test results for a number of SKC films would not meet the claim limitations. *Id.* at 265-66.

The Commission solicited briefing with respect to the '961 patent as follows:

> (2) With respect to claim 9 of the '961 patent, would a person of ordinary skill in the art require all replicates to be within the claimed range? Is there any evidence of record to indicate how a person of ordinary skill in the art

[6] The ALJ noted that Kaneka does not need to prove the accused products have molecular orientation angles within the range of $0 \pm 20°$ across the entire width to prove infringement by a preponderance of the evidence; however, the ALJ also determined that if claims 1 and 9 were limited to polyimide films with molecular orientation angles within that range, Kaneka would have failed to meet its burden of proof. *Id.* at 263.

would use confidence intervals or other statistical methods of working with variance to compare replicates with a claimed range?

a. Kaneka

Kaneka asserts that a person of ordinary skill in the art would not require all replicates to be within the claimed range in order to find that the product meets the specifications set forth in the claims. Kaneka Submission at 5. Kaneka argues that as long as the average value is within the claimed range and the relative standard deviation is low, the product meets the claim even if one of the replicates falls outside the claimed range. *Id.* at 5-6. Kaneka relies on the testimony of Dr. Harris who stated that "those are very low relative standard deviations which means that those are very good data." *Id.* at 6 (citing Tr. at 461:9-17). Kaneka asserts that Dr. Harris stated that this is "the way we normally use it." *Id.* (citing Tr. at 462:6-11). Kaneka states that SKC's proposed method of using the percent relative standard deviation is unsupported by any expert or scientific basis. *Id.* Kaneka argues that a person of ordinary skill in this industry would not use relative standard deviation to calculate a tolerance factor or confidence interval around the average, as suggested by SKC, but would merely examine the relative standard deviation to see whether it was sufficiently small. *Id.* (citing Tr. at 462:25-462:5). Kaneka asserts that Dr. Harris explained that data with percent relative standard deviation lower than about 10 percent is trustworthy. Kaneka submits that Dr. Harris testified that even less than 10 percent relative standard deviation is considered "good data" because one expects scattered data and that 0.8 percent relative standard deviation is considered exceptionally good. *Id.* at 8 (citing Tr. at 539:14-25). Kaneka states that Dr. Harris's methodology is further supported by the American Society for Testing and Materials D1938 protocol, which was not offered into evidence, but which Kaneka has attached as an appendix to its submission. *Id.* at 9-10. Kaneka argues that

"there is no indication that any other type of statistical analysis of data is appropriate for the data presented." *Id.* at 10.

Kaneka responds to SKC's citation to "bad data," stating that just because the bad data had points outside the claimed range does not mean that all data sets with points outside the claimed range are "bad data." Kaneka Reply Submission at 5-7. Kaneka argues that the only important criterion for determining whether the data is good is whether there is a low relative standard deviation. *See id.* at 5. Kaneka argues that SKC omitted citation to testimony that S4 (on the left) and S7 (in the middle) are reliable data and instead relied on S4 (left), S7 (right), S22 (middle), S38 (left), S40, S41 (right), and S42 (middle). *Id.* at 5-6.

b. SKC

SKC argues that the only evidence of record directed to this issue suggests that, where there is only a small number of replicates resulting from a test that has inherent variability, one skilled in the art would require, among other things, that all replicates must be within the claimed range to establish sufficient reliability of the test results. SKC Submission at 8. SKC states that Dr. Harris, Kaneka's witness, is a person of ordinary skill, at least according to Kaneka. *Id.* SKC asserts that Dr. Harris testified that his tear propagation resistance ("TPR") tests are unreliable for proving infringement. *Id.* at 9 (citing Tr. at 459:25-460:25, 462:25-464:2, 464:8-469:3). Specifically, SKC points to testimony in which Dr. Harris agreed with the statement that certain data sets had values outside the claimed range and were "a bad set of data, and that doesn't show infringement." *Id.* at 10 (citing Tr. at 468:1-11).

SKC argues that Dr. Harris's trial testimony indicates that a person of ordinary skill in the art would (1) determine confidence intervals from the replicates and other data in Dr. Harris's test results and then (2) compare the confidence intervals to the claimed range to determine whether the replicates are reliable enough to determine infringement of claim 9. *Id.* at 11-12 (citing Tr. at 453:11-15, 458:4-8, 459:25-460:25, 462:3-11). SKC asserts that one would calculate a confidence interval (with upper and lower boundaries) by taking the average value, plus or minus the standard deviation percent of that value. *Id.* at 13 (citing Tr. at 457:22-458:8, 458:19-459:1, 459:10-460:25). SKC further asserts that if the lower or upper boundary of the confidence interval falls outside of the claimed range, then the whole of the test data is deemed unreliable and indeterminate to prove infringement. *Id.* at 13 (citing Tr. at 459:25-460:25, 462:25-463:4, 463:23-464:2, 464:8-469:3). SKC asserts that Dr. Harris failed to apply the calculated standard deviations to any of the actual test results Kaneka offered for proving infringement of claim 9. *Id.* at 13-14 (citing Tr. at 461:4-7, 464:14-16).

SKC argues that the credibility of the "less than 10%" testimony, *i.e.*, that data is "good" if the relative standard deviation is less than 10%, lacks support in the record and does not negate Dr. Harris's admission that the data is unreliable to prove infringement. SKC Reply Submission at 9. SKC asserts that the only evidence of record on point is Dr. Harris's testimony that, when the calculated confidence range is applied to the TPR ratio, the test results are shown to be unreliable. *Id.* (citing Tr. at 459:25-460:25, 462:25-463:4, 463:23-464:2, 464:8-469:3). SKC explains that whether a particular level of relative standard deviation is "good" for mechanical testing is not relevant to the question of whether there is infringement of a narrow claim range. *Id.* SKC further argues that Dr. Harris's opinion that data with less than 10% relative standard deviation is "good" is not supported by substantial evidence, and that Dr. Harris himself

previously relied on data with relative standard deviation greater than 10%, and found data unreliable having a standard deviation less than 10%. *Id.* at 10-11 (citing CX-619C at Q.237-38; Tr. at 462:25-463:23-464:2, 464:8-469:3).

SKC argues that Kaneka cannot ignore or diminish its own expert testimony merely because it was elicited by SKC's counsel on cross-examination. *Id.* at 11. SKC further points to testimony in which Dr. Harris refused on redirect to comment on whether the cross-examination was "trying to throw [him] off." *Id.* at 12 (citing Tr. at 526:24-527:2).

SKC argues that Kaneka's arguments fail to overcome its expert's admission that the data is insufficient to prove infringement. SKC asserts that Kaneka's own expert validated the process of using the relative standard deviation to create a confidence interval or tolerance (*i.e.*, average +/- the relative standard deviation). *Id.* at 13 (citing Tr. at 459:25-460:25). SKC remarks that Kaneka relies on a withdrawn or unadmitted exhibit, CX-209. *Id.* at 14.

SKC further maintains that Kaneka failed in its proof of infringement because Kaneka did not establish the reliability of the TPR test data prior to the hearing. *Id.* at 14. SKC states that Dr. Harris rendered his previous opinion of infringement without applying percentage relative standard deviation at all, and that this is a defect which constitutes a failure to establish reliability for proving infringement because Kaneka carries the burden of proving infringement. *Id.* at 15.

c. Analysis

SKC's challenge of Kaneka's infringement allegations appears to be limited to those products for which some of the test results for a given product were in the claimed range and some of the test results for the same product were outside the claimed range. SKC does not appear to dispute the ALJ's finding that the IN70 (50μm) product (for which all of the test results

are in the claimed range) infringes claim 9 of the '961 patent. ID at 264.[7] This discussion is therefore limited to the other products, for which some of the test results were within the claimed range and some of the test results were outside the claimed range. *See id.*

SKC is correct that Kaneka bears the burden of proving infringement, which includes the burden of laying a foundation for the use of test data. *See* Wright & Miller, FEDERAL PRACTICE AND PROCEDURE § 6275 ("The trial judge evaluates the adequacy of this foundation under Rule 104(a), which means the proponent of the expert opinion testimony must establish the existence of the preliminary facts by a preponderance of the evidence."). In our view, although the Commission (and the ALJ) is not bound by the Federal Rules of Evidence, Kaneka bears the burden of establishing the facts on which the expert relies. In this case, the data itself are not disputed, but the facts of how to interpret the data are in dispute, and specifically whether a person of ordinary skill in the art would find infringement merely because the relative standard deviation is less than 10%.

Dr. Harris appears to be testifying on how to interpret the data based on first-hand knowledge but contradicts himself. Dr. Harris conceded that certain data sets with less than 10% standard deviation were unreliable, agreeing with the questioner on cross-examination who pointed out that the confidence interval (*i.e.*, the range of the test average +/- the standard deviation) extended outside the claimed range. Tr. at 466, 468. Thus, Dr. Harris himself agreed that the data was unreliable. Kaneka's argument that this means only certain data are unreliable is unpersuasive. The transcript indicates that Dr. Harris agreed with the assertion that the data

[7] Although the ALJ found that all of the test results for the IN70 (75μm) product fall within the claimed range for the ratio and differences of the tear propagation resistance values, the ALJ apparently found that the IN70 (75μm) product does not infringe claim 9 because it does not satisfy the "continuous process" limitation. *See* ID at 262-63. Because Kaneka has not argued with specificity or provided evidence that the IN70 (75μm) product satisfies the "continuous process" limitation, the Commission affirms the ALJ's finding that the IN70 (75μm) product does not infringe claim 9.

were unreliable because part of the confidence interval fell outside the claimed range. Dr. Harris' initial assertion that a low relative standard deviation was "good" is thus contradicted by this statement. *See* Tr. at 466, 468. Kaneka admits that it put no other evidence into the record as to how a person of ordinary skill in the art would use statistics to compare the data sets with the claimed range. Kaneka Submission at 2. The Commission therefore agrees with the ALJ that Kaneka has failed to prove infringement for the accused products except for the IN70 (50 μm) product described above.

IV. CONCLUSION

For the foregoing reasons, Commission has determined to affirm the ALJ's determination that Kaneka has not satisfied the technical prong of the domestic industry requirement with respect to the '866 patent based upon modified grounds, and that the IN70 (50μm) product infringes claim 9 of the '961 patent while the other accused products do not.

By order of the Commission.

Lisa R. Barton
Acting Secretary to the Commission

Issued: November 21, 2012

CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS **337-TA-772**

CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **COMMISSION OPINION** has been served upon the Office of Unfair Import Investigations and the following parties as indicated on **November 21, 2012**

Lisa R. Barton, Acting Secretary
U.S. International Trade Commission
500 E Street, SW
Washington, DC 20436

On Behalf of Complainant Kaneka Corporation:

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On Behalf of Respondents SKC Kolon PI, Inc. and SKC Inc.:

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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS**	**Investigation No. 337-TA-772**

NOTICE OF COMMISSION DETERMINATION TO PARTIALLY REVIEW AND PARTIALLY VACATE THE FINAL INITIAL DETERMINATION OF THE ADMINISTRATIVE LAW JUDGE

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to partially review and partially vacate the final initial determination ("final ID" or "ID") of the presiding administrative law judge ("ALJ") in the above-captioned investigation under section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("section 337"). The ALJ found no violation of section 337.

FOR FURTHER INFORMATION CONTACT: James A. Worth, Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-3065. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2000. General information concerning the Commission may also be obtained by accessing its Internet server (*http://www.usitc.gov*). The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov*. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION: The Commission instituted this investigation on May 4, 2011, based on a complaint filed on behalf of Kaneka Corporation of Osaka, Japan ("Kaneka"). 76 *Fed. Reg.* 25373 (May 4, 2011). The complaint alleges violations of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the sale for importation, importation, or sale after importation of certain polyimide films, products containing same, and related methods by reason of infringement of one or more of claims 1-3 and 9-10 of U.S. Patent No. 6,264,866 ("the '866 patent"); claims 1-6 of U.S. Patent No. 6,746,639 ("the '639 patent"); claims 1-5 of U.S. Patent No. 7,018,704 ("the '704 patent"); and claims 1-20 of U.S. Patent No. 7,691,961 ("the '961 patent"). The Commission's notice of investigation named as respondents SKC Kolon PI, Inc. of Gyeonggi-do, South Korea and SKC Corporation of Covington, Georgia ("collectively, "SKC").

On February 23, 2012, the Commission issued notice of its determination not to review an ID (Order No. 26) that Kaneka has satisfied the importation requirement with respect to all versions of the following SKC products: IN30 (75 um), IN70 (19um), IN 70 (25um), IN70 (50um), IF30 (7.5um), IF70 (12.5um), LV100, LV200, and LV300.

On February 27, 2012, the Commission issued notice of its determination not to review an ID (Order No. 25) terminating the investigation with respect to claims 4-5 of the '704 patent and claims 4, 11, 16, 17, and 20 of the '961 patent.

An evidentiary hearing was held from March 12, 2012, to March 16, 2012.

On May 10, 2012, the ALJ issued a final ID finding no violation of section 337 in the above-identified investigation. Specifically, the ALJ found that there was no violation with respect to the '866 patent, the '639 patent, the '704 patent, or the '961 patent by SKC. The ALJ also issued a recommended determination on remedy and bonding.

On May 22, 2012, Kaneka filed a petition for review of the final ID and on May 23, 2012, SKC filed a contingent petition for review. On May 30, 2012, SKC filed a response to Kaneka's petition, and on May 31, 2012, Kaneka filed a response to SKC's contingent petition.

Having examined the final ID, the petitions for review, the responses thereto, and the relevant portions of the record in this investigation, the Commission has determined to partially review the final ID as follows. With respect to the '866 patent, the Commission has determined to review the finding that Kaneka does not satisfy the technical prong of the domestic industry requirement. With respect to the '704 patent, the Commission has determined to review and vacate as moot the ALJ's alternative findings that the accused products do not infringe, that claim 1 is not invalid for anticipation or obviousness, and that Kaneka does not satisfy the technical prong or the economic prong of the domestic industry requirement. The Commission has determined not to review the ALJ's conclusion that the asserted claims of the '704 patent are invalid for indefiniteness. With respect to the '961 patent, the Commission has determined to review the ALJ's finding that certain of the accused products infringe and certain of the accused products do not infringe claim 9. The Commission has determined not to review the remainder of the ID.

The parties are requested to brief their positions on only the following questions, with reference to the applicable law and the evidentiary record:

(1) With respect to the '866 patent, would a complainant satisfy the technical prong of the domestic industry requirement if the products offered to satisfy the requirement met the elements of the asserted claims only intermittently or occasionally? *See* ID at 302.
(2) With respect to claim 9 of the '961 patent, would a person of ordinary skill in the art require all replicates to be within the claimed range? Is there any evidence of record to indicate how a person of ordinary skill in the art would use confidence intervals or

other statistical methods of working with variance to compare replicates with a claimed range?

The Commission does not request briefing on remedy, the public interest, and bonding at this time.

WRITTEN SUBMISSIONS: The parties to the investigation are requested to file written submissions on the issues under review. The submissions should be concise and thoroughly referenced to the record in this investigation, including references to exhibits and testimony. The written submissions must be filed no later than the close of business on August 15, 2012. Reply submissions must be filed no later than the close of business on August 22, 2012. No further submissions will be permitted unless otherwise ordered by the Commission.

Persons filing written submissions must do so in accordance with Commission rule 210.4(f), 19 C.F.R. § 210.4(f), which requires electronic filing. The original document and eight true copies thereof must also be filed on or before the deadlines stated above with the Office of the Secretary. Any person desiring to submit a document (or portion thereof) to the Commission in confidence must request confidential treatment unless the information has already been granted such treatment during the proceedings. All such requests should be directed to the Secretary of the Commission and must include a full statement of the reasons why the Commission should grant such treatment. See 19 C.F.R § 201.6. Documents for which confidential treatment is granted by the Commission will be treated accordingly. All nonconfidential written submissions will be available for public inspection at the Office of the Secretary.

This action is taken under the authority of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337), and under Part 210 of the Commission's Rules of Practice and Procedure (19 C.F.R. Part 210).

By order of the Commission.

William R. Bishop

William R. Bishop
Hearings and Meetings Coordinator

Issued: August 1, 2012

CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS **337-TA-772**

CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached has been served upon the Office of Unfair Import Investigations and the following parties as indicated on **August 1, 2012**

Lisa R. Barton, Acting Secretary
U.S. International Trade Commission
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On Behalf of Respondents SKC Kolon PI, Inc. and SKC Inc.:

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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of	
CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS	**Inv. No. 337-TA-772**

INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND RECOMMENDED DETERMINATION ON REMEDY AND BOND

Administrative Law Judge Robert K. Rogers, Jr.

(May 10, 2012)

Appearances:

For Complainant Kaneka Corporation:

Dariush G. Adli, Esq.; Raymond Chan, Esq.; Dave Deonarine, Esq.; Ali Shalchi, Esq. of Adli Law Group P.C., Los Angeles, California

For Respondents SKC Kolon PI, Inc. & SKC, Inc.:

Smith Brittingham IV, Esq.; Parmanand K. Sharma, Esq.; Anthony A. Hartmann, Esq. of Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Washington, DC

Charles H. Suh, Esq. of Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Reston, Virginia

Gary C. Ma, Esq. of Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Palo Alto, California

TABLE OF CONTENTS

Pursuant to the Notice of Investigation and Rule 210.42 of the Rules of Practice and Procedure of the United States International Trade Commission, this is the Administrative Law Judge's Final Initial Determination in the matter of Certain Polyimide Films, Products Containing Same, and Related Methods, Investigation No. 337-TA-772.

The Administrative Law Judge hereby determines that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain polyimide films, products containing same, and related methods, in connection with U.S. Patent No. 6,264,866 ("the '866 patent").

The Administrative Law Judge hereby determines that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain polyimide films, products containing same, and related methods, in connection with U.S. Patent No. 6,746,639 ("the '639 patent").

The Administrative Law Judge hereby determines that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain polyimide films, products containing same, and related methods, in connection with U.S. Patent No. 7,018,704 ("the '704 patent").

The Administrative Law Judge hereby determines that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain polyimide films, products containing same, and related methods, in connection with U.S. Patent No.

7,691,961 ("the '961 patent").

The following abbreviations may be used in this Initial Determination:

CPX	Complainant's physical exhibit
CDX	Complainant's demonstrative exhibit
CX	Complainant's exhibit
CIB	Complainant's initial post-hearing brief
CRB	Complainant's reply post-hearing brief
RPX	Respondents' physical exhibit
RDX	Respondents' demonstrative exhibit
RX	Respondents' exhibit
RIB	Respondents' initial post-hearing brief
RRB	Respondents' reply post-hearing brief
Dep.	Deposition
JSRCC	Joint Statement Regarding Claim Construction
JSCI	Joint Stipulation of Contested Issues
JX	Joint Exhibit
Tr.	Transcript
CPHB	Complainant's pre-hearing brief
RPHB	Respondents' pre-hearing brief

I. BACKGROUND

A. Procedural History

On April 28, 2011, the Commission issued a Notice of Investigation in this matter to determine:

> [W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain polyimide films, products containing same, and related methods that infringe one or more of claims 1-14 of the '866 patent; claims 1-6 of the '639 patent; claims 1-5 of the '704 patent; and claims 1-20 of the '961 patent, and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

(*See* Notice of Investigation.) The investigation was instituted upon publication of the Notice of Investigation in the *Federal Register* on May 4, 2011. *See* 76 Fed. Reg. 25373-74 (2011). 19 CFR § 210.10(b).

The complainant is Kaneka Corporation ("Kaneka"), 3-2-4 Nakanoshima, Kita-ku, Osaka 530-8288, Japan. The respondents are SKC Kolon PI, Inc., 9th Fl. Daego Building, 1591-10, Gwangyang-dong, Dongan-gu, Anyang-si, Gyeonggi-do, 431-060, Korea; and SKC Inc., 1000 SKC Drive, Covington, GA 30014 (collectively "SKC"). The Commission Investigative Staff did not participate in this investigation.

On January 26, 2012, I issued an Initial Determination terminating the investigation in part with respect claims 4-5 of the '704 patent and claims 4, 11, 16, 17, and 20 of the '961 patent. On February 27, 2012, the Commission issued a notice stating that it would not review this Initial Determination.

On January 30, 2012, I issued an Initial Determination that Kaneka has satisfied the importation requirement with regard to all versions of the following SKC products: IN30 (75μm); IN70 (19μm); IN70 (25μm); IN70 (50μm); IF30 (7.5μm); IF70 (7.5μm); IF70

(12.5μm); LV100; LV200; LV300. On February 23, 2012, the Commission issued a notice stating that it would not review this Initial Determination.

All other motions for summary determination were denied.

An evidentiary hearing was conducted before me from March 12, 2012 through March 16, 2012. Kaneka and SKC participated in the hearing. After the hearing, post-hearing briefs and reply briefs were filed on March 30, 2012 and April 6, 2012, respectively.

B. The Private Parties

1. Kaneka

Complainant Kaneka Corporation is a corporation organized and existing under the laws of Japan, with its principal place of business in Osaka, Japan. (Complaint at ¶ 1.)

2. SKC

Respondent SKC Kolon PI, Inc. is a Korean corporation with its principal place of business in Gyeonggi-do, South Korea. (RIB at 2.) Respondent SKC, Inc. is a Georgia corporation with its principal place of business in Covington, Georgia. (*Id.*)

C. Overview Of The Patents At Issue

1. The '866 patent

The '866 patent is entitled "Method for Producing Polyimide Film." (CX-1.) It was filed on June 10, 1998 and claims priority to a foreign application from June 11, 1997. (*Id.*) It issued on July 24, 2001. (*Id.*) The '866 patent identifies the following individuals as the inventors: Hirofumi Yamada, Manabu Fukudome, Naoki Egawa, Yuzuru Kondo, and Haruhiko Maki. (*Id.*) The Abstract states:

> A method for producing a polyimide film in which the imidation ratio and/or the amount of volatile constituent are controlled to improve the adhesive strength of the polyimide film. The method may also comprise controlling the highest

> temperature of heating the prefilm to improve the adhesive strength of the polyimide film.

(*Id.*)

2. The '639 Patent

The '639 patent is entitled "Process for Preparing Polyimide Film." (CX-2.) It was filed on September 11, 2001 and claims priority to a foreign application from September 11, 2000. (*Id.*) It issued on June 8, 2004. (*Id.*) The '639 patent identifies the following individuals as the inventors: Katsunori Yabuta and Kiyokazu Akahori. (*Id.*) The Abstract states:

> There is provided a process for preparing a polyimide film by a method of casting a film, wherein bubble inclusion and unevenness in thickness are prevented without decrease in mechanical strength at the same time. It is an object of the present invention to provided a process for preparing a polyimide film characterized by extruding, casting and forming into a film a composition of a resin solution obtained by adding, to low viscosity varnish obtained by polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05, or 1:0.95 to 1:0.99, a dehydrating agent in a molar ratio of at least one time and a chemically-imidizing catalyst in a molar ratio of at least half time based on 1 mole of the amic acid of the poly(amic acid) varnish.

(*Id.*)

3. The '704 Patent

The '704 patent is entitled "Polyimide Film for Flexible Printed Circuit Board and Flexible Printed Board Using the Same." (JX-3.) It was filed on September 27, 2002 and claims priority to a foreign application from September 28, 2001. (*Id.*) It issued on March 28, 2006. (*Id.*) The '704 patent identifies the following individuals as the inventors: Hisayasu Kaneshiro and Kiyokazu Akahori. (*Id.*) The Abstract states:

> The present invention provides a flexible printed circuit which is free from curl, torsion and warpage due to temperature change and excellent flexural endurance. By using polyimide film having an average coefficient of thermal expansion of 1.0×10^{-5} to 2.5×10^{-5} cm/cm/°C in a temperature range of 100°C to 200°C and a stiffness value of 0.4 to 1.2 g/cm as the base film for the flexible printed circuit, a

> flexible printed circuit having excellent thermal dimensional stability and flexural endurance can be prepared.

(*Id.*)

4. The '961 Patent

The '961 patent is entitled "Polyimide Film and Use Thereof." (JX-4.) It was filed on August 31, 2006 and claims priority to foreign applications from March 15, 2004 and March 29, 2004. (*Id.*) It issued on April 6, 2010. (*Id.*) The '961 patent identifies the following individuals as the inventors: Kan Fujihara, Kazuhiro Ono, and Takaaki Matsuwaki. (*Id.*) The Abstract states:

> A polyimide film in which the dimensional change is reduced when it has undergone a step of laminating a metal on the polyimide film or a step of etching the metal layer to form wiring, and the rate of dimensional change can be stabilized across the entire width is provided. The object can be solved by a polyimide film produced by a continuous process, wherein when a coefficient of linear expansion a in a direction of the molecular orientation axis and a coefficient of linear expansion b in a direction perpendicular to the molecular orientation axis are measured in the temperature range of 100°C to 200°C, a and b satisfy a particular relationship across the entire width, or a polyimide film produced by a continuous process, wherein when a tear propagation resistance c in the direction of the molecular orientation axis and a tear propagation resistance d in the direction perpendicular to the molecular orientation axis are measured, c and d satisfy a particular relationship across the entire width.

(*Id.*)

D. Products At Issue

Kaneka accuses certain SKC polyimide film products and processes of infringement. Specifically, Kaneka's infringement contentions focus on the following lines of SKC polyimide film products: IF, IN, LN, and LV. (CIB at 15-16.) Kaneka relies on polyimide film products made by Kaneka Corp. in Japan and Kaneka Texas Corporation ("KTC"), a U.S. subsidiary, for the domestic industry requirement. Specifically, Kaneka's domestic industry contentions focus on the following lines of products: AV, AF, and NP. (*Id.* at 10-11.)

II. JURISDICTION

A. Subject Matter Jurisdiction

The complaint alleges that SKC has violated Subsection 337(a)(1)(B) by the importation and sale of products that infringe the asserted patents. I find that SKC imports into the United States, sell for importation, or sell within the United States after importation products that Kaneka has accused of infringement in this investigation. (*See* Order No. 26.) Thus, I find that the Commission has subject matter jurisdiction over this investigation under Section 337 of the Tariff Act of 1930. *See Amgen, Inc. v. United States Int'l Trade Comm'n*, 902 F.2d 1532, 1536 (Fed. Cir. 1990).

B. Personal Jurisdiction

SKC responded to the complaint and notice of investigation, participated in the investigation, made an appearance at the hearing, and submitted post-hearing briefs. Thus, I find that SKC submitted to the personal jurisdiction of the Commission. *See Certain Miniature Hacksaws*, Inv. No. 337-TA-237, Initial Determination, 1986 WL 379287 (October 15, 1986).

C. In Rem Jurisdiction

The Commission has *in rem* jurisdiction over the products at issue by virtue of the finding that accused products have been imported into the United States. *See Sealed Air Corp. v. United States Int'l Trade Comm'n*, 645 F.2d 976, 985 (C.C.P.A. 1981).

III. CLAIM CONSTRUCTION

A. Applicable Law

1. Generally

"An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the

properly construed claims to the device accused of infringing." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996) (citation omitted). Claim construction "is a matter of law exclusively for the court." *Id.* at 970-71. "The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000). "[O]nly those [claim] terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy." *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See generally Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). The Federal Circuit in *Phillips* explained that in construing terms, courts must analyze each of these components to determine the "ordinary and customary meaning of a claim term," which is "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention." *Id.* at 1313.

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Id.* at 1312 (citations omitted). "Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claim terms." *Id.* at 1314. For example, "the context in which a term is used in the asserted claim can be highly instructive," and "[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the meaning of a claim term." *Id.*

"[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id.*

(citation omitted). "The longstanding difficulty is the contrasting nature of the axioms that (a) a claim must be read in view of the specification and (b) a court may not read a limitation into a claim from the specification." *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1117 (Fed. Cir. 2004). The Federal Circuit has explained that there are certain instances when the specification may limit the meaning of the claim language:

> [O]ur cases recognize that the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs. In other cases, the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor. In that instance as well, the inventor has dictated the correct claim scope, and the inventor's intention, as expressed in the specification, is regarded as dispositive.

Phillips, 415 F.3d at 1316.

In addition to the claims and the specification, the prosecution history should be examined if in evidence. "The prosecution history…consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent. Like the specification, the prosecution history provides evidence of how the PTO and the inventor understood the patent." *Id.* at 1317 (citation omitted). "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

If the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence may be considered. Extrinsic evidence consists of all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony and learned treatises. *Id.* at 1317. Extrinsic evidence is generally viewed "as less reliable than the patent and its prosecution history in determining how to read claim terms[.]" *Id.* at 1318. "The court may

receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence." *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

2. Indefiniteness

SKC raises a number of indefiniteness arguments in this investigation. "Indefiniteness under 35 U.S.C. § 112 ¶ 2 is an issue of claim construction and a question of law[.]" *Cordis Corp. v. Boston Scientific Corp.*, 561 F.3d 1319, 1331 (Fed. Cir. 2009). The second paragraph of 35 U.S.C. § 112 states that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." As explained by the Federal Circuit, "[t]his requirement serves a public notice function, ensuring that the patent specification adequately notifies the public of the scope of the patentee's right to exclude." *Praxair, Inc. v. ATMI, Inc.*, 543 F.3d 1306, 1319 (Fed. Cir. 2008). "If one skilled in the art would understand the bounds of the claim when read in light of the specification, then the claim satisfies section 112 paragraph 2." *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001). The Federal Circuit has provided the following guidance in determining whether a claim is indefinite:

> If a claim is insolubly ambiguous, and no narrowing construction can properly be adopted, we have held the claim indefinite. If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds.

Id.; *see also Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) ("Only claims 'not amenable to construction' or 'insolubly ambiguous' are indefinite."); *Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1342 (Fed. Cir. 2003) (characterizing the

indefiniteness standard as "somewhat high.")

B. The '866 patent

1. Level of Ordinary Skill in the Art

Kaneka's expert, Frank W. Harris, says that the level of ordinary skill in the art would be the same for each of the four patents in suit in this case. He opined that a person of ordinary skill in the art would have a Bachelor's degree in chemistry (or equivalent) and 2 to 5 years of experience working in the field of polyimides. (CX-619C at Q. 29.) Immediately prior to expressing his opinion, Dr. Harris testified about the general fields encompassed by the four patents-in-suit. All of the patents-in-suit teach methods of manufacturing polyimide films that will result in improved characteristics and performance by the polyimide films. (CX-619C at Q. 16-27.)

In its reply brief, Kaneka says that the experts for both sides have stated that the level of skill in the art requires a Bachelor's degree in the relevant field "and five years of experience in the technologies relevant to the '866 patent, ("e.g., manufacturing, use, and properties of polyimide films)." (Citing RIB at 10; CX-619C at Q. 29; CX-207C at ¶ 31; RX-584C at Q. 77-79.) Referring to SKC's position that, alternatively, the person of ordinary skill could have "the equivalent education regarding the manufacture and use of polyimide films, or the equivalent work experience or knowledge of such technology," Kaneka expresses the view that in this complex and highly specialized area of technology, "there is no substitute for actual hands-on experience in the manufacture and use of polyimide films in order to properly understand and appreciate the nuances of the technology relating to the Asserted Patents." (Citing RIB at 10.)

SKC's expert, Edwin Thomas, says that except for the '961 patent, all of the patents at issue have the same level of education and experience required to be a person of ordinary skill in

the art, *i.e.* a bachelor's degree in chemical engineering or polymer engineering and five years of experience in the technologies relevant to the patents, for example, manufacturing, use and properties of polyimide films, the equivalent education regarding the manufacture and use of polyimide films, or equivalent work experience or knowledge, i.e. lesser education with more relevant experience or more education with less relevant experience. (RX-584C at Q. 78, 79.)

Dr. Thomas suggests that one having ordinary skill in the art related to the '866 patent should have a combination of a bachelor's degree in chemical engineering or polymer engineering and five years of experience in relevant fields. He also would consider one having less education but more relevant experience. In describing the field of the invention of the '866 patent, Dr. Thomas notes that the "patents in suit" relate to the manufacture of polymer films, and he includes a description of uses for the polymer films and the characteristics those films need in order to perform the functions desired. He notes that the patents describe polyimide film which has some of the characteristics he described as needed by the polymer films. (RX-584C at Q. 81-84)

Reviewing the opinions of both experts, I find that Dr. Harris's description of one having ordinary skill in the art is more closely related to the subject matter covered by the patent-in-suit. Using Dr. Harris's opinion, I find that a person having ordinary skill in the art (PHOSITA) for the '866 patent would have at least a bachelor's degree in chemistry or a related field and from two to five years of experience in the field of polyimides.

2. "Thereafter Increasing the Temperature in a Step-Wise Fashion"

The term "thereafter increasing the temperature in a step-wise fashion" appears in asserted claims 1, 2 and 3.

Kaneka's Position: Prior to the hearing, Kaneka's construction for "thereafter increasing the temperature in a step-wise fashion" was "temperature is increased in a step-by-step manner, *i.e.*, stepped increase(s) as opposed to continuous slope rise in temperature." Kaneka contended that this construction applies the "ordinary and customary meaning" of the terms "step-wise" and "increasing," which is the preferred method of claim construction following the *Phillips* case. *Phillips*, 415 F.3d 1303. Kaneka said the term "step-wise" refers to two or more discrete levels, as if viewed on a graph in the shape of steps. The distinct zones of the dryer are separate steps in the heating of the film.

Following the hearing, Kaneka argues that the '866 patent specification teaches that the "film shaped composition is heated by one or several stages." (Citing CX-1 at 14:44-56.) Kaneka states that the '866 patent teaches that it is preferable to "gradually raise the temperature of the atmosphere in the belt chamber step by step." (Citing CX-1 at 14:9-11.) Kaneka asserts that, because its proposed claim interpretation encompasses the preferred embodiment, it is in compliance with the rule of claim construction that an interpretation of claim language that is at odds with the preferred embodiment "is rarely, if ever, correct." (Citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F. 3d 1576, 1583 (Fed. Cir. 1996).)

Kaneka contends that in paragraph 43 of his expert report, Dr. Frank Harris refers to the same passages cited immediately above as support for adopting Kaneka's proposal. Dr. Harris testified, "[t]he specification describes a preferred embodiment of the patented process where a film-shaped composition of polyimide precursor or 'pre-film' is conveyed to the rooms, in which the film-shaped composition is heated by one or several stages. That is found at column 14, lines 44-56 of the '866 patent. Here, the specification demonstrates that the process of increasing the temperature may occur as either one stage or several stages. Given that the pre-

film may be heated by one stage, one of ordinary skill in the art would understand a claim element specifying 'increasing the temperature in a step-wise fashion' to include the potential application of a singular stepped increase in temperature." (Citing CX-619C at Q. 43-45.)

Kaneka says that SKC's expert, Dr. Thomas, concludes that the patent claims require multiple increases in temperature despite the fact that "multiple" steps does not appear anywhere in the claim language. Kaneka says that Dr. Thomas bases this opinion on the premise that if there were only one increase in temperature, there would be no need for the "step-wise" modifier. (Citing RX-676C at Q. 104.) Kaneka argues that at the hearing Dr. Thomas clearly demonstrated his confusion about the meaning of step-wise increase and was unable to distinguish a step change in temperature from a gradual or sloped change. (Citing Tr. at 946:1-950:6, 948:10-949:17.)

Kaneka argues that SKC's interpretation ignores the specific language in the specification in which one or more stages of heating is described. Kaneka reiterates the language from the specification that says, the "film-shaped composition is then conveyed to the rooms 12, in which the film-shaped composition is heated by one ***or several stages***..." Kaneka then avers that in the paragraph preceding, the specification states that the belt dryer heating "room 12 consists of one ***or more*** sections." (Citing CX-1 at 14:54-56, 14:39-40.)

Kaneka argues that this language in the specification makes clear that the heating can take place in as little as one stage or step. Kaneka concludes, "[i]n light of the teachings of the specification and the understanding of a person skilled in the art (as evidenced by Dr. Harris), it would be improper to require that the 'step-wise' increase in temperature happen more than once. Kaneka concludes that the proper interpretation of the phrase 'thereafter increasing the

temperature in a step-wise fashion' is that the temperature increases one or more times in a step-by-step manner."

In its reply brief, Kaneka argues that SKC's proposed construction of this term would mean that the invention's preferred embodiment of including only one stage of heating would not fall within the claims of the '866 patent. Kaneka argues that this violates a fundamental rule of claim construction; namely, that any construction in which "a preferred... embodiment in the specification would not fall within the scope of the patent claim... is rarely, if ever, correct." (Citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F. 3d 1576, 1583 (Fed. Cir. 1996).)

Kaneka contends that there is simply no way to have a gradual increase in temperature in practice, and the '866 patent makes this clear in reference to the "one or more" heating rooms, each with a distinct temperature. (Citing CX-1 at 14:39-40, 14:54-56.) Kaneka says while it is possible to have two or more increases in temperature, there is nothing in the '866 patent that requires this. Kaneka says the patent simply requires an initial temperature of 200°C or less, followed by a stepped (i.e., not linear) increase over that temperature. Kaneka alleges that SKC concedes that the specification discloses a belt chamber that is separated into "several rooms to differentiate the temperatures between rooms." Kaneka asserts that this reading is consistent with Kaneka's interpretation in which there is an initial temperature of 200°C or less (the first room) followed by one or more increases (in the second room, *etc.*).

Kaneka contends that SKC mischaracterizes and misrepresents the prosecution history regarding the addition of "step-wise" to the claims. Kaneka says according to SKC, the "step-wise" limitation was added on its own, when in fact, the amendment was broader and thus directed to other aspects of the claim. Kaneka recites the entire claim limitation (as amended) to read:

> heating the film shaped composition at an initial temperature of 200°C or less, and thereafter increasing the temperature in a step-wise fashion such that solvent is evaporated to form a chemically cured prefilm while adjusting....

(Citing JX-005 at 173-174) Kaneka states that the underlining appears in the original and indicates claim language added by the amendment. (CRB at 4)

Kaneka states that "in several places, SKC erroneously states that "Kaneka affirmatively amended the claim language from 'increasing the temperature' to 'increasing the temperature in a step-wise fashion.'" (Citing RPHB at 13, 14.) Kaneka says this is untrue, and that prior to this amendment, "increasing the temperature" was not part of the claim language at all in any form.

Kaneka alleges that the amendment that included "step wise" was intended to overcome two particular teachings in the prior art that were not part of the '866 patent invention. (Citing JX-5 at 151-152.) Kaneka says the cited prior art (Asakura, U.S. Patent No. 4,470,944), taught lowering the solvent content by "removing solvent from a cast film by extraction in an aqueous medium... prior to heating." (Citing JX-5 at 179.) Kaneka avers that it distinguished this reference by pointing out that the '866 patent does not include the step of "extraction in an aqueous medium." (Citing JX-5 at 179.) Kaneka continues that Asakura expressly required that after completion of the wet process, the film should be heating at temperatures of **at least** 200°C. (Citing JX-5 at 152.) Kaneka says it distinguished its invention based on these two points by claiming that the solvent is removed by heating (not aqueous extraction) beginning at an initial temperature of 200°C or less (not "at least 200°C"), in contrast to the teachings of Asakura. (Citing JX-5 at 179.) Kaneka reasons that one of ordinary skill in the art would appreciate that the amendment clarifies that, in contrast to Asakura, there is no aqueous extraction and the heating starts at less than 200°C and then increases in the amended claim. Kaneka states that there is nothing in the amendment that requires two or more increases *after* the initial

temperature.

SKC's Position: SKC's expert Edwin Thomas testified that the term is indefinite; but he disagreed with Kaneka's construction which allows for one or several steps. He believes that multiple steps are required for a step-wise fashion of heating. (Citing RX-584C at Q. 102, 114, 136-138, 147.)

SKC argues that the term should be construed to mean *at least two* purposeful temperature increases, after the claimed initial "heating" step. SKC asserts that this is the ordinary and grammatically correct meaning of the entire term, which is supported by the intrinsic evidence. SKC contends that Kaneka's proposed construction contradicts the term's ordinary meaning, renders language in the claim superfluous, and ignores the entirety of the intrinsic evidence.

SKC says that grammatically, the phrase "increasing the temperature" by itself may encompass one or more temperature increases; but the claim language does not call for simply "increasing the temperature." SKC states that Kaneka amended the claims during prosecution to recite the entire phrase "increasing the temperature *in a step-wise fashion*." (Citing JX-5 at 173-180.) SKC reasons that the phrase "step-wise" is more explicit, requiring a step-by-step process. (Citing CPHB at 21.) SKC argues that this claim term cannot include a single increase in temperature because such an interpretation would render the language "in a step-wise fashion" superfluous. SKC says that the Federal Circuit has repeatedly rejected claim constructions that render claim terms superfluous or meaningless. (Citing *August Tech. Corp. v. Camtek, Ltd.*, 655 F.3d 1278, 1284 (Fed. Cir. 2011); *Merck & Co. v. Teva Pharms. USA Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005).)

SKC continues that the specification, as a whole, repeatedly teaches *against* a single increase in temperature. SKC refers to the "Objects and Summary of the Invention," and notes that the specification summarizes the invention as, *inter alia,* "heating the film-shaped composition to obtain a pre-film." (Citing CX-1 at 2:5.) SKC says the "pre-film" is further defined as a film "obtained after the chemical-curing process but before the heat-curing process." (*Id.* at 12:26-28.) SKC avers that the specification then states that "to exclusively promote chemical-curing rather than heat-curing, the temperature is maintained at 200 °C or less." (*Id.* at 14:7-9.) SKC adds that the next statement reveals the importance of increasing the temperature step-by-step: "[i]t is preferable to *gradually raise* the temperature . . . in the belt chamber *step by step*, so that solvent and reaction product are evaporated." (*Id.* at 14:9-11) (emphases added by SKC). SKC argues that one could hardly "gradually raise" the temperature "step-by-step" with a single increase in temperature. SKC concludes that only "at least two purposeful temperature increases" would permit a gradual raise in temperature step-by-step, in accordance with the teachings of the specification.

SKC asserts that the specification also provides two explicit reasons why a single increase in temperature is *not* desirable. First, "[a] sudden rise of the temperature causes wrinkles on the film surface due to the difference of the drying speed between the surface and the inside of the film." (Citing CX-1 at 14:11-14.) Second, a sudden rise of the temperature "causes undesired exfoliation due to partial hardening of the edge." (*Id.* at 14:14-15.) SKC argues that both rationales are in line with the specification's teaching "to gradually raise the temperature . . . in the belt chamber step by step," and the specification's emphasis on separating the belt chamber "into *several* rooms to differentiate the temperatures between the rooms." (*Id.* at 14:9-10, 14:31-33) (emphasis added by SKC).

SKC contends that the examples provided in the specification further underscore the importance of stepped increases in temperature. SKC says that the specification presents examples that include chemical curing both with and without step-wise increases in temperature; but to obtain the patent, Kaneka narrowed the claimed invention to one requiring step-wise increases. SKC says each of the examples in the specification that feature chemical curing with step-wise increases in temperature includes *two* increases after the initial "heating" temperature at 200 °C or less. (Citing CX-1 at 17:44-18:19, 20:39-21:23; RDX-321.) SKC avers that none of the examples that include chemical curing with increases in temperature points to just a single increase in temperature. (*Id.*)

SKC argues that the prosecution history of the '866 patent is particularly informative to the claim construction dispute - notably, the original language merely called for "heating the film shaped composition to obtain a prefilm." (Citing JX-5 at 46.) SKC says it was not until after a series of rejections and amendments that the disputed claim term was finally added by amendment, in response to a rejection based on U.S. Patent No. 4,470,944. (Citing JX-5 at 173-180.) SKC avers in that amendment, the claim term was narrowed from simply ". . . increasing the temperature" to ". . . increasing the temperature *in a step-wise fashion*." (*Id.*) (emphasis added by SKC). SKC says it was only after this amendment that the PTO allowed the claims. (Citing JX-5 at 191-194.) SKC argues that such an affirmative act to include a narrowing claim term relinquishes any later-broadening of the claim to include a single increase in temperature. (Citing *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 730-31 (2002).) SKC concludes that its construction of "at least two purposeful temperature increases" not only agrees with the ordinary meaning of the term, but also is

supported by the intrinsic evidence found in the specification and in the prosecution history. (Citing *Phillips*, 415 F.3d at 1317.)

SKC contends that despite the term's ordinary meaning and its confirmation in the intrinsic evidence, Kaneka points to an ambiguous and isolated instance in the specification, which it takes out-of-context, to support its proposed inclusion of a single temperature increase. (Citing CX-619 at Q. 44.) SKC argues, first, the plain language of the asserted claims, which issued as a result of adding "in a step-wise fashion," covers only a "step-by-step" increase in temperature. (Citing CX-619 at Q. 43.) SKC says, second, Kaneka's attempt to encompass a single increase in temperature contradicts representations it made before the PTO to obtain the patent. SKC avers that Kaneka affirmatively amended the claim language from "increasing the temperature" to "increasing the temperature *in a step-wise fashion*." (Citing JX-5 at 173-180.) SKC argues that Kaneka cannot now ignore its prior actions to secure a broader claim interpretation that recaptures what it gave up to obtain the patent. SKC continues that, third, Kaneka's proposed construction improperly ignores the *entire* context of the specification. SKC says although "claims . . . are to be given their broadest, reasonable interpretation," the interpretation must be "consistent with the specification" and "read in light of the specification." (Citing *In re NTP, Inc.*, 654 F.3d 1278, 1287 (Fed. Cir. 2011).)

In its reply, SKC asserts that, as explained in SKC's Post-Trial Brief, to obtain the '866 patent, Kaneka narrowed its invention by amending the claims and arguing that the added language distinguished the invention over the prior art. (Citing RIB at 3-4, 10-20.) Yet when asserting infringement, Kaneka now ignores the prosecution history and proposes that each of the added limitations has no meaning or effect. According to SKC, this gamesmanship violates the controlling law.

Construction to be applied: "temperature is increased in a step-by-step manner, *i.e.* stepped increases in temperature"

The parties' proposals for construction of this term are similar. The material difference between them is that SKC believes that the step-wise increase language refers to two or more increases in temperature, while Kaneka contends that the term allows for one or more increases in temperature.

The use of the term at issue here is consistent in each of the three asserted independent claims and occurs during the chemical curing process. Each of the three asserted independent claims describes:[1]

> heating the film shaped composition at an initial temperature of 200° C. or less, and thereafter increasing the temperature in a step-wise fashion such that solvent is evaporated to form a chemically cured prefilm ..."

(CX-1 at 21:37-40, 22:1-4, 22:16-20.)

The '866 patent addresses the problem of producing a polyimide film while controlling its adhesive property. Describing the pre-invention state of the industry, the '866 patent states that polyimide could be obtained by a chemical-curing method, in which polyamic acid, a precursor of polyimide, is imidated by being heat-treated under the presence of both dehydrating agent and tertiary amine, or, alternatively, by a heat-curing method in which imidating reaction proceeds without dehydrating agent and tertiary amine. The '866 patent continues that it is preferable to produce polyimide film by the combined use of the chemical-curing method and the heat-curing method. The '866 patent claims that "[i]n the present invention, said combined use is introduced to the process of imidation." (CX-1 at 12:1-22.)

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[1] In fact, the same language is used in every independent claim in the '866 patent.

In the Description of Preferred Embodiments, the '866 patent notes that the chemical-curing method is used in the first half of the process and the heat-curing method in the latter half of the process, in which imidation completes. The inventors state, "'a prefilm' of the present invention is defined as a film obtained after the chemical-curing process but before the heat-curing process." (CX-1 at 12:26-28.) The former process occurs in the belt chamber or its equivalent, and the latter occurs in the tenter chamber or its equivalent. (CX-1 at 12:33-37.)

In describing the preferred embodiments of the invention, the '866 patent states:

> ***The amount of the volatile constituent and the imidation ratio can be adjusted by controlling the temperature and the heating time in the belt chamber.*** Normally in the chemical-curing process, heating is executed to promote a reaction. However, in order to exclusively promote chemical-curing rather than heat-curing, the temperature is maintained 200° C. or less. *It is preferable to gradually raise the temperature of the atmosphere in the belt chamber* ***step by step,*** *so that solvent and reaction product are evaporated.* A sudden rise in the temperature causes wrinkles on the film surface due to the difference of the drying speed between the surface and the inside of the film. Also, it causes undesired exfoliation due to partial hardening of the edge.

(CX-1 at 14:3-25) (Emphasis added).

Referring to Figure 2, the '866 patent describes the chemical-curing process in the belt chamber, saying "[t]he ***preferable*** belt chamber is separated into several rooms to differentiate the temperatures between the rooms." The description says the belt chamber consists of "a parallel stream solidifying room 10, jet stream solidifying rooms 12, [and] an exfoliation room 14." The description of the preferred embodiment provides details about the chemical curing process and the related heating that occurs within that process. First, it describes, "[t]he room 12 consists of ***one or more sections***, in which the film treated in the room 10 is exposed to gas blowing against it to be solidified to such an extent that it can support itself." There follows a more specific description of the process: "[t]he so obtained film-shaped composition is then conveyed ***to the rooms*** 12, in which the film-shaped composition is heated by ***one or several***

stages, while the jets of gas is blown against the film-shaped composition from nozzles resulting in transpiring volatile constituent and organic solvents. The so treated film-shaped composition, or a prefilm, which is solidified and dried to such an extent that it can support itself is exfoliated from the endless belt 20 in the room 14." (CX-1 at 14:32-43, 14:54-62) (Emphasis added).

The '866 patent then instructs that the "present invention will be more clearly understood by referring to the Examples below. However, the Examples should not be construed to limit the invention in any way." (CX-1 at 16:28-30.) A total of 26[2] examples are given. The examples all include in their chemical curing process a step-by-step heating of the composition to arrive at a chemically cured prefilm, and each example uses more than one temperature increase. (*See, e.g.*, CX-1 at 17:2-5, 17:58-63, 18:35-40, 18:56-61, 19:34-39, 19:56-61, 20:54-56.)

The tension here is between the claims' use of "step-wise fashion" and the reference in the preferred embodiment to "one or several stages" for heating the film-shaped composition in the belt chamber(s). At first look, it appears that the preferred embodiment is merely providing a broader meaning to "step-wise fashion." This impression is shown to be incorrect by the prosecution history.

It is settled that claims that have been narrowed in order to obtain issuance over the prior art cannot later be interpreted to cover that which was previously disclaimed during prosecution. *Elekta Instruments, S.A. v. O.U.R. Scientific International, Inc.*, 214 F.3d 1302, 1308 (Fed. Cir. 2000). In my view, this is specifically what Kaneka attempts to do by first narrowing the claims to include a "step-wise fashion" to overcome Asakura, and then pointing to a phrase extant in the

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[2] Although 28 examples are shown in the '866 patent, examples 24 and 25 are limited to the heat-curing of examples 22 and 23 and are not part of the chemical-curing process that produces the "chemically cured prefilm." Thus, there are actually only 26 examples of chemically curing that involve a step-by-step increase in temperature.

specification at the time of the amendment[3] as broadening the claims by returning the process to a single increase in temperature.

A detailed examination of the prosecution history provides insight into Kaneka's actions here. In a May 10, 2000 Amendment, the applicant attempted to overcome a rejection stating, *inter alia*:

> The Examiner states Kunimoto '307 teaches making a polyimide film using a solution containing polyamic acid. The process of Kunimoto '307 teaches a polyimide prepolymer is cast to form a prefilm. The film is heated to evaporate a solvent and then further heated to imidize the prefilm to form a polyimide film. See June 18, 1999 Office Action at page 3.
>
> Accordingly Kunimoto '307 discloses a method for producing an adhesive solid film by heat-curing polyimide acid, applying heat-resistant liquid sulfactant evenly on the surface of the solid film, and heat-treating the solid film ... The adhesiveness of the polyimide film is acquired by the sulfactant.
>
> By contrast, the claimed invention uses a chemical-curing process followed by a heat-treating process to enhance imidation during polyimide film production, and thus enhance adhesiveness of the final polyimide film. ... Adjusting the imidation ratio and/or adjusting the amount of organic solvent within preferred ranges during chemical curing enhances the adhesive properties of the finished polyimide film prepared by the claimed method. ... Claim 1 embodies a method for producing polyimide film entailing the following:
>
> 1. casting a composition into a film shape, wherein said composition consists substantially of organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines;
> 2. heating the film shaped composition to form a chemically cured prefilm while adjusting an imidation ratio of specified formula relating imide group infrared absorbance at 1374 cm^{-1} to benzene ring infrared absorbance at 1498 cm^{-1}; and
> 3. further heating said prefilm to obtain a polyimide film.

(JX-5 at 132-133.)

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[3]The description related to Figure 2 at 14:54-59, of the '866 patent, remained the same in the application prior to and following the final amendment of the claims. (CX-1 at 14:54-59; JX-5 at 29.)

Because the proposed amendment raised new issues for consideration, the applicant was notified on May 15, 2000, that they would be rejected, and the applicant withdrew the amendment. (JX-5 at 140.)

On June 13, 2000, the applicant filed a preliminary amendment in response to the May 15, 2000 Office Action, and on July 31, 2000, the examiner rejected the claims under 35 U.S.C. §§ 102(b) and 103(a) and citing U.S. Patent No. 4,470,944 (Asakura) and U.S. Patent No. 5,324,475 (Okahashi) as the relevant prior art. (JX-5 at 150-154, 156.)

Finally, on November 30, 2000, the applicant responded to the July 31, 2000 rejection with a further amendment which added the language at issue herein, as follows:

> 1. A method for producing an adhesive polyimide film comprising:
>
> * * * *
>
> heating the film shaped composition at an initial temperature of 200° C. or less, and thereafter increasing the temperature in a step-wise fashion such that solvent is evaporated to form a chemically cured prefilm ...

(JX-5 at 173, 174) (Underlining in original to highlight added language.)

In support of the amendments, the applicant stated, *inter alia*:

> Claims 1, 6 and 7, directed to a method for producing an adhesive polyimide film, have been amended to better define the heating aspect of the invention.
>
> * * * *
>
> Claims 1, 6, 7 ... were rejected ... as being anticipated ... or in the alternative, as being obvious over ... Asakura '944. The Examiner states that Asakura '944 teaches a process for making an aromatic polyimide film. The Examiner asserts that the process of Asakura '944 discloses all of the features of the claimed process. Alternatively, the Examiner states that it would have been obvious for a skilled artisan to modify the process of Asakura '944 to obtain the claimed invention. Applicants respectfully traverse this rejection for at least the following reasons.
>
> The process of Asakura '944 requires a step of removing solvent from a cast film by extraction in an aqueous medium so as to lower the solvent content of the film

> below 10% prior to heating the film to a temperature above 200° C. See Asakura '944 at column 1, line 65 through column 2, line 13.
>
> By contrast, embodiments of the claimed invention are a method for producing an adhesive polyimide film and a method for controlling adhesiveness of a polyimide film. ***The claimed invention requires heating a film shaped composition, the composition consisting substantially of an organic solvent solution of polyamide acid and chemical curing agents, at an initial temperature of 200° C. or less. Thereafter the temperature is increased in a step-wise fashion such that solvent is evaporated to form a chemically cured prefilm. Asakura '944 neither teaches nor suggests removal of solvent by increasing the temperature of a cast film in a step-wise fashion to effect evaporation. Therefore, Asakura '944 does not anticipate or render obvious the claimed invention.*** Applicants respectfully submit that the rejections in view of Asakura '944 should be withdrawn and the claims allowed.

(JX-5 at 178-179) (Emphasis added).

On February 26, 2001, the PTO issued a Notice of Allowance and Issue Fee Due. (JX-5 at 192-194.) While the patent examiner listed several passages that demonstrated that Asakura anticipated, or in the alternative rendered obvious, the claims of the application prior to its final amendment,[4] the following passages are illustrative of a process in which heat is gradually applied during the curing process, albeit in one step as opposed to multiple "steps:"

> ***The dope of the polyimide precursor (polyamic acid) so prepared is cast (or coated) in film-like layer over a support such as a glass or metal plate and then heated typically to a temperature between 40° C. and 250° C., preferably between 50° C. and 200° C., for drying and imidization to proceed.*** In order to make a self-supportable film and to impart improved mechanical properties to the final film, the polymer concentration of the film after the casting and drying process must be higher than the concentration of the initial dope preferably 50-80 weight percent, and the imide ring closure ratio of the polymer must be more than 30% preferably 35-90%.
>
> That is if the polymer concentration is less than the concentration of the initial dope, it is then difficult to obtain a self-supportable film even if the ring closure ratio is raised, and the handling of the film becomes difficult for the subsequent process. Also if the imide ring closure ratio is less than 30%, the polymer is subject to hydrolysis in the subsequent wet process and heating causing the final

[4] *See* JX-5 at 151-152.

> film to become embrittled and having poor mechanical properties. ***To ensure against these problems, it is usually preferable to control the heating temperature for the cast film in the range of 40° C. - 250° C., preferably 50 ° C. - 200° C. If this heating temperature is below 40° C., the time required to raise the imidization ratio above 30% becomes too long and the process becomes commercially undesirable. When this temperature is above 250° C., bubble formation takes place due to rapid evaporation of the solvent. Moreover rapid rise of the imidization rate and rapid hydrolysis are likely to result and it then becomes extremely difficult to control the physical properties of the final film.*** Needless to say the imide ring closure reaction may be performed by heating as aforesaid, or by one of the known alternatives of ring closure reaction such as …

(Asakura, at 4:34-68 (JX-5 at 159)) (Emphasis added).

> ***After completion of the wet processing the film is heat-treated for removal by vaporization of the aqueous medium as well as of the residual amounts of amide-type solvent and also for completion of imidization of the polymer*** by raising the ring closure ratio to more than 90% if necessary. ***The temperature during this heating stage should be at least 200° C., preferably between 230° C. and 700° C.*** If the temperature is lower than 200° C., such inconveniences result in insufficient ring closure and too long a time required for removal of the volatiles of the film. Considering the final hygroscopic property and mechanical properties of the film the imide ring closure ratio should be raised to more than 90% in the process if it is found to be less. ***Hence, the heating temperature in this stage is required to be more than 200° C.***

(Asakura at 5:53-67 (JX-5 at 160)) (Emphasis added).

The difference between Asakura and the amended application that resulted in issuance of the '866 patent is precisely the term at issue here. Notwithstanding Kaneka's reply argument, *supra*, that omits much of the discussion and amendments that actually took place, the application was changed to eliminate a single gradual increase in temperature and to substitute instead a step-by-step process[5] that involved at least one interim temperature "step" at which the composite was held for a period of time to allow it to be evenly heated enroute to its target temperature. Inserting the "step" into the process requires an increase in temperature to an

[5]The term "step-by-step" is included in both parties' proposed construction.

interim "step" and a further increase in temperature from the interim "step" to the ultimate target temperature. Hence the need for multiple "increases."

Based upon the foregoing, I find that the term "thereafter increasing the temperature in a step-wise fashion" as used in asserted claims 1, 2 and 3, is clearly to be construed as "temperature is increased in a step-by-step manner, *i.e.* stepped increases in temperature." I find that examination of the extrinsic evidence (such as expert testimony) offered by the parties is unnecessary because the intrinsic evidence is sufficient to understand the meaning of "memory device." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) ("In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence.")

Because the term lends itself to construction, it is not indefinite as argued by SKC. *Energizer Holdings, Inc. v. Int'l Trade Comm'n,* 435 F.3d 1366, 1368-1370 (Fed. Cir. 2006).

3. "Further Heating Said Prefilm to Obtain an Adhesive Polyimide Film

The term "further heating said prefilm to obtain an adhesive polyimide film" appears in asserted claims 1, 2 and 3.

Kaneka's Position: Kaneka's proposed construction for this term was simply "plain meaning." (CX-616 at 3.)

Kaneka says that the parties' disagreement over the construction of "further heating said prefilm to obtain an adhesive polyimide film" centers on the meaning of the term "adhesive."

Kaneka's expert Dr. Harris testified that the "dictionary definition" of "adhesive" is "tending to adhere or cause adherence." He said in the context of the polyimide industry, this definition "meaningfully describes the resultant adhesive property of the obtained film." (CX-619C at Q. 46.)

Harris went on to opine that a person of ordinary skill in the art would understand the term in question according to its plain and ordinary meaning to mean that "any polyimide film prepared utilizing any or all of the processes claimed in the '866 patent would have adhesive properties, subject to fluctuation dependent upon the chosen route of synthesis." Harris continued, "[in] the laboratory setting, one of ordinary skill in the art would understand that a polyimide film 'tending to adhere or to cause adherence' will produce some measurable, detectable level of adhesive strength when subjected to an adhesive test of the variety described in the '866 patent." (Citing CX-619C at Q. 46.) Kaneka avers that one test for determining adhesive strength is described in the '866 patent at column 16, lines 33-48.

Kaneka says that SKC argues, through its expert Dr. Thomas, that the phrase is indefinite because "a person of ordinary skill in the art would not have understood what is meant by 'adhesive' and would not be able to determine when a particular film is 'adhesive,' or not." (Citing RX-584C at Q. 131.) Kaneka counters that this interpretation of the claims ignores the examples set forth in the '866 patent specification that provide sufficient guidance on how to carry out the process to obtain an adhesive polyimide film and subsequently determine its adhesive properties. (Citing CX-1 at 16:27-48; CX-644C at Q. 283-285.)

In its reply brief, Kaneka argues that SKC "seeks to confuse the Commission by taking the term out of context." Kaneka says it is irrational for SKC to attempt to analyze the claim term "adhesive" without reference to the context in which it is found. Kaneka charges that SKC solicited Kaneka's engineers and its expert for their understanding of "adhesive" without context and now seeks to apply the response(s) to support its construction of "adhesive" as used in the patent claims.

Kaneka argues that the difficulty in describing any term when divorced from context is

precisely why the Federal Circuit has repeatedly ruled that those of skill in the art are "deemed to read the claim term in context of the particular claim and in the context of the entire patent," and not in a vacuum. (Citing *Phillips*, 415 F. 3d at 1313; *Medrad, Inc. v. MRI Devices Corp.*, 401 F. 3d 1313, 1319 (Fed. Cir. 2005); *DeMarini Sports, Inc. v. Worth, Inc.*, 239 F. 3d 1314, 1324 (Fed. Cir. 2001).) Kaneka adds that, put in the proper context of the patented process used by Kaneka, its witness Mr. Kaneshiro had no difficulty explaining that the film is adhesive. (Citing CX-620C at Q. 37.)

Kaneka distinguishes *Datamize, LLC v. Plumtree Software, Inc.*, 417 F. 3d 1342, 1348 (Fed. Cir. 2005), cited by SKC, saying that the court was considering the subjective claim term "aesthetically pleasing" in the context of an "interface screen on kiosks." Kaneka argues there, the user was to "assign values" to attributes associated with "selected elements" selected by the user, which elements were to be arranged to be "in conformity with a [user's] desired uniform and aesthetically pleasing look and feel" for the screens. Kaneka says in fact, the patentee argued that the term "involves the intent, purpose, wish, or goal of a person practicing the invention." Kaneka concludes the meaning of that term was entirely dependent on the wish of the person reading the term.

Kaneka contrasts, the '866 patent's use of the term "adhesive" to describe the final result when the specific steps of the patent claims are followed. Kaneka says that Dr. Harris testified that "the term 'adhesive' bookends Claims 1-3 of the '866 patent," indicating that by following the steps in the claims, one will obtain an adhesive film. (Citing CX-644C at Q. 16-17, 23.) Kaneka argues that this is "clearly different than the subjective 'aesthetically pleasing look and feel' of *Datamize*, which is necessarily a nebulous concept dictated by the whims of the user."

Kaneka contends that SKC also errs in arguing that the '866 patent specification provides

no guidance for determining whether a film is adhesive. Kaneka says that Dr. Thomas explained that the specification teaches how to obtain an adhesive film, even going as far as to provide a test for "evaluating the adhesive strength of the polyimide film." (Citing CX-644C at Q. 23; CX-1 at 16:33-47.)

Regarding figures and tables cited by SKC, Kaneka asserts that they were not intended to illustrate every aspect of the claims, as SKC argues. Kaneka says instead the tables and figures illustrate the relationship between adhesive strength and two important aspects of the invention – the amount of volatile constituents and imidation ratio, and illustrate that aspects of the claimed invention provide enhanced adhesiveness over the prior art methods alone, a fact that is not altered because the examples do not explicitly address every aspect of the claimed invention. (Citing *Honeywell Inc. v. Victor Co. of Japan, Ltd.*, 298 F. 3d 1317, 1325-26 (Fed. Cir. 2002).)

Kaneka says that SKC erroneously argues that because the term "adhesive" was added during prosecution, it must therefore equate to "prosecution estoppels", and that Kaneka therefore seeks to remove a claim term that was added by amendment to overcome prior art. Kaneka affirms that it does not seek to remove the claim term; rather Kaneka asserts that it seeks to have the claim term read in context of the claim, which contains explicit direction for creating an adhesive film. Kaneka alleges "there is nothing in the record that states that 'adhesive' was added to overcome prior art." Kaneka adds that the remarks accompanying the amendments state only that the claims "have been amended to better define the heating aspect of the invention." (Citing JX-5 at 178.) Kaneka distinguishes its situation from *August Tech. Corp. v. Camtek, Ltd.*, 655 F. 3d 1278, 1287-88 (Fed. Cir. 2011), cited by SKC, in which the inventor and patent examiner engaged in multiple recorded exchanges regarding why the amendment under scrutiny did or did not overcome the prior art. Kaneka avers that despite the multiple writings in

the file history concerning the amendment, the court in *August Tech.* found that there was "no clear disavowal" of a position by the patentee. Kaneka argues that this is even more true here, "where there is not even a word anywhere in the file history explaining the addition of the claim term 'adhesive.'" (CRB at 7)

SKC's Position: SKC contends that this claim language renders the claims indefinite. (CX-616 at 3.)

SKC's expert, Dr. Thomas, does not appear to have offered an opinion regarding the construction of this term.

SKC submits that the term is indefinite, rendering claims 1–3 invalid, because one of ordinary skill in the art cannot discern what level of adhesiveness falls within the scope of the claims. SKC argues that Kaneka's own Mr. Kaneshiro, who has a Master's degree in polymers and over 17 years of experience in the research and development of polyimides agreed that "adhesive" is vague. (Citing RX-575C at 28:25-29:8; Tr. at 206:12-1.) SKC says that Kaneka's proposed construction, that one of ordinary skill in the art "would understand that any polyimide film prepared utilizing *any or all* of the processes claimed in the '866 patent would have adhesive properties, *subject to fluctuation* dependent upon the chosen route of synthesis," simply adds to the term's indefiniteness, by rendering "adhesive" superfluous. (Citing CX-619C at Q. 46) (emphases added by SKC). SKC concludes that Kaneka fails to identify any intrinsic evidence in support of its construction and instead relies entirely on extrinsic evidence.

SKC says while the claims recite a method to produce "an adhesive polyimide film," they provide no guidance as to what level of adhesiveness is considered the invention versus not the invention. SKC contends that "[t]his latent ambiguity prevents any reasonable construction of the claim term." (Citing *Datamize LLC v. Plumtree Software Inc.*, 417 F.3d 1342, 1348-49,

(Fed. Cir. 2005).) SKC continues that Kaneka failed to cite any intrinsic support for the term it added to obtain the patent, pointing instead to a dictionary definition of "adhesive." (Citing CX-619C at Q. 46.) SKC argues that the dictionary cannot provide the missing clarity since the question remains: How adhesive is an "adhesive" polyimide film of the '866 patent?

SKC argues that the specification of the '866 patent also provides no guidance on the meaning of the phrase "adhesive polyimide film." SKC states that in the "Objects and Summary of the Invention," the specification explicitly distinguishes the "present invention" from conventional methods of improving adhesiveness. (Citing CX-1 at 1:7-10, 1:23-26, 1:39-45, 1:61-65.) SKC says the specification clearly differentiates improving adhesiveness by using conventional post-production treatments – like the corona-discharge treatment, a surface treatment applied after the formation of the film – versus using the process disclosed in the '866 patent, which purportedly obviates the need for post-treatments. (Citing CX-1 at 1:27-2:28.) SKC contends that despite these repeated distinctions, the specification does not explain how one determines whether a film manufactured according to the '866 patent alone, without a conventional post-production treatment, is "adhesive" as recited by the claims.

SKC argues that in the examples in the specification that were prepared by an initial heating at 200 °C or less, followed a step-wise increase in temperature, and then a further heating to complete the heat treating, all measurements of adhesiveness include the *conventional* corona-discharge treatment. (Citing CX-1 at 17:44-18:19, 20:39-21:23.) SKC concludes that the only portions of the specification that reference quantitative measurements of an "adhesive" polyimide film fail to provide a single example of a film produced in accordance with the '866 patent alone, without a post-production treatment. SKC says that one of ordinary skill in the art therefore remains at a loss as to what degree of "adhesiveness" comes within the scope of the

claims. SKC adds that nowhere in the specification can one discern a reference to what degree of adhesiveness falls within the scope of the claims. (Citing *Datamize*, 417 F.3d at 1348-49.)

SKC asserts that while the prosecution history is silent on how to construe this claim term, it does reveal that "adhesive" was added by the inventors to limit the scope of their invention in response to a rejection based on prior art. SKC reasons that "it is a term that should not be rendered meaningless, as Kaneka suggests." (Citing *August Technology, Corp. v. Camtek, Ltd.*, 655 F.3d 1278, 1284 (Fed. Cir. 2011) SKC continues that the original claim language merely called for "further heating said prefilm to obtain a polyimide film." (Citing JX-5 at 46.) SKC says that after a series of rejections and amendments, the disputed claim term was added by amendment in response to a rejection based on prior art. (Citing JX-5 at 173-80.) SKC says in that amendment, the claim was narrowed to recite "further heating said prefilm to obtain *an adhesive* polyimide film." (*Id.*) (emphasis added by SKC). SKC contends there is no guidance or discussion provided in the prosecution history as to what this added claim language means and how it should be applied and interpreted by the public.

SKC asserts that the inventors magnified the ambiguity when they added two figures in a supplemental amendment on December 15, 2000. (Citing JX-5 at 183-88.) SKC says the inventors represented these additional figures as showing "the relationship between the adhesive property of a film and the amount of volatile constituent of a prefilm." (*Id.*) SKC contends that the additional figures only add confusion rather than providing clarity, because they illustrate data from film not produced in accordance with the issued claims of the '866 patent. (Citing CX-1 at 16:51-17:40.) SKC says, instead the data originating from Table 1 in the patent describe examples of film produced without any increases in temperature, and that received the conventional, post-production, corona-discharge treatment. (*Id.*) SKC argues that these

references cannot and do not provide any insight as to what "an adhesive polyimide film" is in the context of claims 1 through 3.

SKC says that Kaneka's proposed construction, which is that one of ordinary skill in the art "would understand that any polyimide film prepared utilizing any or all of the processes claimed in the '866 patent would have adhesive properties, subject to fluctuation dependent upon the chosen route of synthesis," does not explain how to determine whether a polyimide film is "adhesive" within the meaning of the claims. SKC asserts that Kaneka's proposal essentially deletes "adhesive" from the claim phrase altogether, without affecting the claim's scope and meaning. SKC contends that this is impermissible since it seeks to remove a claim term that was added by amendment to overcome prior art. (Citing *August Tech.*, 655 F.3d at 1284.) SKC adds that Kaneka's construction fails to distinguish the adhesiveness obtained through its invention from the methods the patent admits as conventional, for example, the corona-discharge treatment. SKC states that further confusing the term's meaning is Dr. Harris's assertion that every polyimide film has some degree of adhesiveness that can be detected or measured in the laboratory. (Citing CX-619C at Q. 46.) Finally, SKC asserts that Kaneka's reliance on a dictionary definition provides no clarity, and it provides no guidance to one of ordinary skill in determining the boundaries of the claimed invention. SKC argues that extrinsic evidence is secondary to intrinsic evidence, and that here, the intrinsic evidence overwhelmingly shows the indefiniteness of the claim term.

In its reply brief, SKC says Kaneka's own interpretation of "adhesive" demonstrates that the claim term is indefinite. SKC says that relying on Dr. Harris, Kaneka asserts that "adhesive" would be interpreted by one of ordinary skill in the art to mean a film with "some measurable, detectable level of adhesive strength." (Citing CIB at 29.) SKC asserts that this construction is

vague and ambiguous because the actual level that is the "some measurable, detectable level of adhesive strength," remains an unknown. SKC argues that the construction hardly fits with the specification, which discloses that the object and summary of the invention is "to stably provide a film with a high adhesive strength." (Citing CX-1 at 1:57-58.) SKC contends that before the PTO, Kaneka did not argue that the term "adhesive" had no distinguishing and limiting meaning; but to assert infringement, Kaneka does just that, relying only on the extrinsic evidence of Dr. Harris's opinions.

SKC argues that Kaneka's position that the '866 patent examples provide "sufficient guidance" on the claimed level of adhesiveness is also wrong, because the examples relied upon to obtain allowance received conventional, corona-discharge treatment, the very conventional treatment over which the '866 patent distinguishes.

Construction to be applied: "applying sufficient heat for a sufficient amount of time to produce a polyimide film with a measurable and detectable level of adhesive strength"

In *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*) the Federal Circuit explained that in construing terms, courts must analyze the claims, the specification, and the prosecution history if in evidence to determine the "ordinary and customary meaning of a claim term," which is "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention."

Rather than offer a proposed construction for this term, SKC has devoted its argument to a theory that the term is indefinite. SKC argues that the term is indefinite, rendering claims 1–3 invalid, because one of ordinary skill in the art cannot discern what level of adhesiveness falls within the scope of the claims. SKC argues that Kaneka's proposed construction does not provide guidance as to the standards that determine whether a polyimide film is "adhesive"

within the meaning of the claims. SKC asserts that Kaneka's proposal essentially deletes "adhesive" from the claim phrase altogether, without affecting the claim's scope and meaning. SKC contends that this is impermissible since it seeks to remove a claim term that was added by amendment to overcome prior art.

The '866 patent describes in detail one test for determining the adhesive strength of polyimide films, as follows:

> using acrylic adhesive agent "Pyralux" (a product and trade name of E.I. du Pont de Nemours & Col, Inc.), the polyimide film was laminated with a copper foil having 35μm of thickness "3EC" (an electrolyzed copper foil, a product of Mitui Metal & Mining Co., Ltd.), and then the above adhesive agent was allowed to react at 185° C. for an hour to be hardened to produce FCCL (flexible copper-clad laminate); a test sample was cut out of the FCCL so that width of copper pattern of the FCCL could become 3mm, and then the sample was subject to a tension test via 90° of exfoliation at 50mm/min. of peeling speed by applying a tension tester "S-100'C", a product of Shimazu Seisakusho, Co., Ltd. The results of the average of five measurements are shown in Table 1.

(CX-1 at 16:35-47.) While SKC is correct that the examples involved corona discharge treatments, SKC did not demonstrate that the ***test*** to determine adhesive strength was rendered ineffective by those treatments. Contrary to SKC's assertion that "the data originating from Table 1 in the patent describe examples of film produced without any increases in temperature," the description of the examples clearly discloses that the prefilms "were heat treated at the temperature of 300° C. for 30 seconds and then at the temperature of 500° C., for a minute. Thus the imidation of the prefilms was completed and the finished films were subjected to corona discharge treatment to obtain PI film products." (CX-1 at 17:2-7.) Table 1 lists a specific "adhesive strength" for each of the 12 examples shown.

Kaneka's expert Dr. Harris testified that the "dictionary definition" of "adhesive" is "tending to adhere or cause adherence." He said in the context of the polyimide industry, this

definition "meaningfully describes the resultant adhesive property of the obtained film." (CX-619C at Q. 46.)

Harris testified credibly that one of ordinary skill in the art would understand the term in question according to its plain and ordinary meaning to mean that "any polyimide film prepared utilizing any or all of the processes claimed in the '866 patent would have adhesive properties, subject to fluctuation dependent upon the chosen route of synthesis." He said, "[in] the laboratory setting, one of ordinary skill in the art would understand that a polyimide film 'tending to adhere or to cause adherence' will produce some measurable, detectable level of adhesive strength when subjected to an adhesive test of the variety described in the '866 patent." (CX-619C at Q. 46.)

Based upon a thorough review of the intrinsic evidence of record and the credible testimony of Dr. Harris, I find that one of ordinary skill in the art would understand that the term "further heating said prefilm to obtain an adhesive polyimide film" as used in the'866 patent is "applying sufficient heat for a sufficient amount of time to produce a polyimide film with a measurable and detectable level of adhesive strength." I find too, that the specification teaches one means for determining the level(s) of strength one could expect to produce using the invention of the '866 patent and methods for obtaining those levels of strength.

Because the term lends itself to construction, it is not indefinite as argued by SKC. *Energizer Holdings, Inc. v. Int'l Trade Comm'n,* 435 F.3d 1366, 1368-1370 (Fed. Cir. 2006).

4. "Consists Substantially Of"

The term "consists substantially of" appears in asserted claims 1, 2 and 3.

Kaneka's Position: Kaneka alleges that on January 25, 2012, when the parties filed their Joint Stipulation of Contested Issues, SKC proposed for the first time that the phrase

"consists substantially of" is a disputed claim term that should be construed by me. Kaneka argues that the timing of SKC's inclusion of this term as a disputed claim term came months after the cutoff imposed in the procedural schedule for submitting a list of disputed claim terms, weeks after initial and rebuttal expert reports were exchanged, and more than one week after the experts were deposed.

Kaneka avers that, because the term was clearly not in dispute until January 25, 2012, Kaneka was unaware of the need to obtain an expert opinion as to the claim term. Kaneka adds that SKC did not address this claim term in its own expert's opening report on December 23, 2011. Kaneka alleges that instead, SKC chose to include a discussion of the term in its rebuttal expert report dated January 11, 2012, while there was no position to rebut. Kaneka concludes that Dr. Thomas's "rebuttal" was directed to a discussion that was absent from Dr. Harris's report.

Kaneka states that it did not address the claim term at any time prior to its post-hearing brief because SKC did not assert that the claim was at issue in the parties July 25, 2011 joint list of proposed constructions of disputed claim terms or in the amended joint list filed on September 27, 2011, nor at any time during fact or expert discovery. (Citing CX-616.) Kaneka argues that it is improper for SKC to now assert that the claim term must be construed, while at the same time faulting Dr. Harris for not having the prescience to include it in his report before it had been revealed as a disputed term.

Addressing the substance, Kaneka submits that the term "consists substantially of..." as that term is used in the claims of the '866 patent need not be construed. To the extent a construction is necessary, Kaneka asserts that "the commonly understood meaning used throughout the patent literature should be applied." Kaneka says the term "substantially" as a

modifier implies approximate or "largely but not wholly that which is specified." (Citing *Playtex Prod., Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 907 (Fed. Cir. 2005) (quoting *Liquid Dynamics Corp. v. Vaughan Co., Inc.*, 355 F.3d 1361 (Fed.Cir.2004)); *Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358 (Fed.Cir.2001).) Kaneka concludes that in the context of the '866 patent, this means that the claimed composition consists of the ingredients listed in the claims, but also allows for the possibility of other ingredients or substances to be present in the composition.

Kaneka criticizes "the lack of any clear opinion by [SKC's] own expert, Dr. Thomas, on the matter." Kaneka says that although Dr. Thomas notes that Dr. Harris has not given an opinion on the term in his report, Dr. Thomas fails to give a concise opinion on the construction of the term in "rebuttal." Kaneka counters that instead, Dr. Thomas testified that "a person of ordinary skill in the art would understand the above quoted phrase to mean that the composition cannot contain any other ingredients that significantly affect the practice of the claimed method." (Citing RX-676C at Q. 12.) Kaneka contends that this construction does nothing to clarify the term, instead introducing more questions such as the meaning of "significantly affect" in the proposed construction.

Kaneka adds that Dr. Thomas "further muddies his opinion by stating that SKC's proposed construction would exclude all ingredients except those explicitly listed in the claims. In other words, instead of consisting 'substantially' of the ingredients listed, Dr. Thomas opines that it must consist 'only' of the ingredients listed." (Citing RX-676C at Q. 140-141.) Kaneka argues that "this extreme position attributes an exactly contrary meaning to the term "consisting ***substantially*** of..."".

Kaneka continues that, in support of its proposed construction of the phrase "consists substantially of" SKC cites, in its pre-trial brief, *AK Steel Corp. v. Sollac and Ugine*, 344 F.3d 1234, 1239 (Fed. Cir. 2003) (quoting *PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1354 (Fed. Cir. 1998)). Kaneka counters that *AK Steel* did not consider the phrase "consists substantially of" – it discussed a different phrase: "consists *essentially* of." Kaneka argues that the phrase "consists *substantially* of" does not equate to "consists *essentially* of." (Citing *Corning, Inc. v. Virginia Tech Intellectual Properties*, 2011 WL 2293143 (BPAI June 8, 2011).) Kaneka notes that SKC also cites *Bethell v. Koch*, 427 F.2d 1372, 1373 (CCPA 1970). Kaneka contends that this case also did not consider the phrase "consists substantially of" – it discussed the phrase: "consisting of," which Kaneka urges is entirely different from the phrase in dispute here, since it does not include the key qualifier "substantially." Kaneka reasons that by equating phrase "consists substantially of" with "consisting of," SKC is attempting to read out the "substantially" modifier, which is improper. (Citing *Maxwell v. J. Baker, Inc.,* 86 F.3d 1098, 1105 (Fed. Cir. 1996).)

SKC's Position: SKC argues that "consists substantially of" should be construed to exclude addition of any ingredient that would significantly affect practice of the claimed method. SKC says that Kaneka proposes that "consists substantially of" essentially has no meaning, placing no limit on the ingredients or substances that can be included. (Citing CPHB at 25)

SKC contends that the phrase "consisting essentially of" when used as a transitional phrase in a claim has "long been understood to permit inclusion of components not listed in the claim, *provided that they do not 'materially affect* the basic and novel properties of the invention.'" (Citing *AK Steel Corp. v. Sollac and Ugine*, 344 F.3d 1234, 1239 (Fed. Cir. 2003) (quoting *PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1354 (Fed. Cir. 1998) (emphasis

added by SKC)); *Bethell v. Koch*, 427 F.2d 1372, 1373 (CCPA 1970).) SKC argues that based on "the accepted meaning of 'consisting essentially of,' a person of ordinary skill in the art would understand 'consists substantially of' to mean that 'the composition cannot contain any other ingredients that significantly affect the practice of the claimed method.'" (Citing RX-676C at Q.139-141) SKC concludes that this construction is consistent with the intrinsic evidence and that nowhere within the claim terms, the specification, or the prosecution history is there reference to or description of any other ingredient besides polyamide acid solvent and chemical curing agents.

In its reply brief, SKC says that Kaneka seeks to construe the disputed term "consists substantially of" so that it has no limiting effect on the scope of the claim. SKC says according to Kaneka, "in the context of the '866 patent," this phrase "means that the claimed composition consists of the ingredients listed in the claims, but also allows for the possibility of other ingredients or substances to be present in the composition." (Citing CIB at 30.)

SKC says that Kaneka's argument that this phrase should not be construed, was rejected at the hearing. (Citing Tr. at 18:1-17.) SKC dismisses Kaneka's arguments and says "it has always been SKC's position that 'consists substantially of' should be construed to exclude only the addition of an ingredient that would significantly affect practice of the claimed method." SKC argues that its construction gives meaning to the phrase and is consistent with the specification, prosecution history, and the law.

Construction to be applied: "the composition necessarily includes the listed ingredients and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention."

First, regarding Kaneka's assertion that SKC improperly raised this term for construction, I note that the matter was briefed in the motions *in limine*, and I denied Kaneka's motion and ruled at the prehearing conference that the parties may argue their proposed construction for this term. (Tr. at 18:1-17.)

Construction of this term is clear based upon the language of the claims read in context and in light of the relevant precedent of the Federal Circuit.

In construing the meaning of the term "substantially" one begins with the ordinary meaning of the claim terms to a person of ordinary skill in the art. *Deering Precision Instruments, L.L.C., v. Vector Distribution Systems, Inc.*, 347 F.3d 1314, 1322 (Fed. Cir. 2003).

In *Deering,* the Federal Circuit found that the term "substantially" has numerous ordinary meanings and noted that the district court had stated, "substantially" can mean "significantly" or "considerably." The Court said that the term "substantially" can also mean "largely" or "essentially." The court added, "[i]ndeed, our cases recognize the dual ordinary meaning of this term as connoting a term of approximation or a term of magnitude." *Deering*, at 347 F.3d 1323. Since the term "substantially" is capable of multiple interpretations, one looks to the intrinsic evidence to determine which interpretation should be adopted. *Ecolab*, 264 F.3d at 1366; *Gart v. Logitech*, 254 F.3d 1334, 1339-1340 (Fed. Cir. 2001).

In the '866 patent, the term appears in the same context in all of the asserted claims. Claim 1 is illustrative:

> A method for producing an adhesive polyimide film comprising:
>
> casting a composition into a film shape, wherein said composition ***consists substantially of*** an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines.

(CX-1 at 21:30-36; *see also id.* at 21:57-63, 22:9-15) (Emphasis added).

The asserted claims use the term "consists substantially of" in connection with the chemical content of the "composition" being created. In this context, the term is used as an expression of magnitude, and among the choices outlined by the Federal Circuit in *Deering*, the term most synonymous with "substantially" is "essentially." The case of *AK Steel Corp. v. Sollac and Ugine*, 344 F.3d 1234, 1239 (Fed. Cir. 2003) is instructive. In *AK Steel*, the Federal Circuit reviewed construction of a patent that prescribed, *inter alia*, the content of an improved aluminum coating for stainless steel. The court said "[t]he phrase 'consisting essentially of' in a patent claim represents a middle ground between the open-ended term 'comprising' and the closed-ended phrase 'consisting of.' In view of the ambiguous nature of the phrase, it has long been understood to permit inclusion of components not listed in the claim, provided that they do not 'materially affect the basic and novel properties of the invention.'" *Id.* (Citations omitted)

Further enlightenment can be obtained by a review of *PPG Indus. v. Guardian Indus. Corp.,* 156 F.3d 1351, 1354 (Fed.Cir.1998), in which the Federal Circuit described the term "consisting essentially of" as a transition phrase commonly used to signal a partially open claim in a patent. In that case, the invention was a form of green tinted solar control glass, and the claims listed the composition of the product. The court said, "[t]ypically 'consisting essentially of' precedes a list of ingredients in a composition claim or a series of steps in a process claim. By using the term 'consisting essentially of,' the drafter signals that the invention necessarily includes the listed ingredients and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention. A 'consisting essentially of' claim occupies a middle ground between closed claims that are written in a 'consisting of' format and fully open claims that are drafted in a 'comprising" format.'" *Id.* (Citations omitted.)

In the asserted claims of the '866 patent, the language "consists substantially of" precedes a list of ingredients in the composition being cast into a film shape that that will be processed to form a chemically cured prefilm. The use of this term is clearly and squarely on all fours with the use in *AK Steel* and *PPG* of the term "consisting essentially of" in describing the ingredients used in the patents at suit in those cases.

Following the logic of the Federal Circuit, I find that the term "consists substantially of" as used in the asserted claims of the '866 patent means "the composition necessarily includes the listed ingredients and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention." I find that examination of the extrinsic evidence (such as expert testimony) offered by the parties is unnecessary because the intrinsic evidence is sufficient to understand the meaning of "consists substantially of." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) ("In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence.")

The cases cited by Kaneka are not persuasive. While the cases discuss meanings of the term "substantially," they do not reflect contexts that approximate the case at bar. In *Playtex* the claim uses only the term "substantially flattened surfaces" without the limiting term "consisting" or "consists." As used in *Playtex*, and *Liquid Dynamics*, the term "substantially" is one of approximation describing the physical characteristics of a portion of the product, and it follows the open ended term "comprising." *Playtex,* 400 F.3d at 903; *Liquid Dynamics,* 355 F.3d at 1364.

In the third case cited by Kaneka, *Ecolab*, the claims also lacked the reference "consisting" or "consists." To construe the term "substantially uniform," the Federal Circuit

considered the claim language, written description, and prosecution history, and found that the term, as related to the term "alkaline detergent cast" meant "largely, but not wholly the same in form." The Federal Circuit found that the district court had erred in, among other things, adding a functional limitation to the phrase. *Ecolab*, 264 F.3d at 1366-1369. Based on the facts of the case and the Federal Circuit's treatment of the issues, *Ecolab* is clearly inapposite.[6]

C. The '639 Patent

1. Level of Ordinary Skill in the Art

The parties agree that the level of ordinary skill in the art for the '639 patent is the same as the level of ordinary skill in the art for the '866 patent. Therefore, based on my analysis in Section III.B.1 *supra*, I find that the level of ordinary skill in the art for the '639 patent is at least a bachelor's degree in chemistry or a related field and from two to five years of experience in the field of polyimides.

2. "Low Viscosity"

The claim term "low viscosity" appears in asserted claim 1.

Kaneka's Position: Kaneka contends that "low viscosity" means "viscosity obtained by polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99."

Kaneka claims that "low viscosity" is a term that is well-known to a person of ordinary skill in the art, particularly in light of the teachings of the '639 patent. Kaneka asserts that Dr. Harris explained that a person of ordinary skill in the art would understand that the ratio of dianhydride to diamine molar amounts influences the relative viscosity of the resulting

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[6] Ironically, *Ecolab* does contain the term "consisting essentially of" related to an ingredient of the product found in another element of the claim; but the term was not at issue and was not discussed. *Ecolab* 264 F.3d at 1361.

poly(amic) varnish. (Citing CX-619C at Q. 48; CX-207C at ¶ 47.) Kaneka claims that when the molar ratio is altered, the viscosity is also altered. (*Id.*)

Kaneka states that this relationship between viscosity and the ratio of materials is made clear in the '639 patent specification. (Citing CX-2 at 3:29-34, 4:10-14, 7:3-6.) According to Kaneka, the specification explains that it is the ratio of the ingredients used that determines low viscosity, and not the other way around.

Kaneka argues that SKC's analysis errs by divorcing the claim term from the rest of the claim and the specification. Kaneka states that SKC attempts to construe "low viscosity" without looking at how the term is used in the context of the patent. Kaneka offers the example of a claim limitation "a thick book having between 800 and 1,000 pages." Kaneka states that the term "thick book" on its own has no definite meaning; but, when read in context of the claim as a whole, it becomes clear that "thick book" means a book having between 800 and 1,000 pages.

SKC's Position: SKC contends that the term "low viscosity" is indefinite, rendering claim 1 of the '639 invalid. SKC states that should I find that term is not indefinite, the correct construction is "a poly(amic acid) varnish with a viscosity equal to or less than 2,000 poise measured at 20°C."

SKC argues that one of ordinary skill in the art would not understand the threshold for determining what is "low." SKC states that dependent claims 2-5 provide a specific range of viscosity at a specific temperature, in recognition that viscosity is a numerical value that can change depending on temperature and other variables. SKC states that claim 1 provides no range or temperature, rendering the term "low viscosity" a moving target. SKC claims that while the specification and prosecution history discuss viscosity, nothing in the intrinsic record provides

the boundary of what separates "low" viscosity from medium or high viscosity. (Citing CX-2 at 1:52-54, 7:8-13; JX-6 at 122.)

SKC asserts that testimony from Kaneka's own employees demonstrates that viscosity values vary depending on a number of factors, one of which is temperature. (Citing RX-574C at 48:20-49:9; RX-582C at 55:8-17, 56:8-12; Tr. at 155:16-156:2.) SKC argues that at least the poise and temperature values must be given to determine the viscosity of a varnish. (Citing CX-2 at 14:19-25.)

SKC states that the term "low" is a comparative term that can only be understood in context. SKC claims that the inventors of the '639 patent acknowledged that the term "low viscosity" can only be understood in relationship to something else. (Citing RX-580C at 114:6-8, 114:15-115:2; RX-572C at 107:3-4, 107:6-8.)

SKC argues that Kaneka's proposed construction reads out the term "low viscosity" from the claim. SKC argues that Federal Circuit law makes clear that constructions that render claim terms superfluous are disfavored. SKC notes that, contrary to Kaneka's construction, the '639 patent recognizes that the claimed molar ratio alone does not determine viscosity. (Citing CX-2 at 7:25-29; Tr. at 155:8-15.) SKC claims that molar ratio is but one of several factors that influence viscosity, and that varnishes with the same molar ratio can have different viscosities. (Citing RX-676C at Q. 219.)

SKC states that if "low viscosity" is found to be subject to a construction, the only possible construction would be "a poly(amic acid) varnish with a viscosity equal to or less than 2,000 poise measured at 20°C." SKC cites a portion of the specification that states that the viscosity of the poly(amic acid) varnish "is preferable at most 2,000 poise, more preferably at most 1,500 poise, and most preferably 100 to 1,500 poise at 20°C." (Citing CX-2 at 7:8-13.)

SKC notes that during prosecution, the applicants made clear that the "present invention" relates to a process for preparing polyimide films in which undesirable bubble formation and unevenness of film thickness are prevented. (Citing JX-6 at 119.) SKC states that the specification explains that when the viscosity is higher than 2,000 poise, film unevenness and bubbling occurs. (Citing CX-2 at 7:15-19.) SKC asserts that this demonstrates that viscosities higher than 2,000 poise are not part of the invention.

Construction to be applied: "a viscosity that is sufficiently low to prevent the formation of bubbles and unevenness in film thickness of the resulting polyimide film."

The term "low viscosity" appears in the following context in claim 1: "preparing the poly(amic acid) varnish having low viscosity by polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99..." The parties dispute whether or not "low viscosity" is indefinite. If the term is found not to be indefinite, the parties also dispute the proper construction for "low viscosity."

SKC argues that "low viscosity" is indefinite. SKC's indefiniteness argument is that the term "low viscosity" is a relative term, and that the intrinsic evidence does not provide a sufficient reference to understand what constitutes "low" viscosity versus, for example, medium or high viscosity. A number of courts, addressing similar claim language, have rejected indefiniteness arguments. In *CardioFocus, Inc. v. Cardiogenesis Corp.*, --- F. Supp. 2d ----, 2011 WL 5357892, at *5 (D. Mass. Nov. 3, 2011), the court was called on to construe the term "low hydroxyl ion content." The court explained that "[a] patent claim with an undefined relative term such as 'low' is not indefinite unless the specification provides no standard against which to measure it." *Id.* at *6. The court found that because "the specification provides an express standard against which to measure 'low'," the claim term was not indefinite. *Id.* In

Applera Corp. v. Micromass UK Ltd., 186 F. Supp. 2d 487, 524-25 (D. Del. 2002), the court had to construe "relatively low level" and "relatively low value." The court found that the terms were not indefinite based on statements in the intrinsic record that provided a guideline for what the patentee meant by "relatively low." *Id.* In *NexMed Holdings, Inc. v. Beta Techs., Inc.*, 2008 WL 2783522, at *4 (D. Utah July 16, 2008), the court had to construe "low DC voltage" and "low DC electrical voltage." In rejecting an indefiniteness argument, the court was able to use a disclosure in the specification to set a definite value for the claim terms. *Id.*

Here, I find that there is sufficient guidance provided in the specification to determine the meaning of the term "low viscosity" such that the claim is not indefinite. In the Background of the Invention, it is explained that a prior art reference, Japanese Unexamined Patent Publication 198157/1999 "discloses a process for casting a film in which viscosity of a composition of a resin solution in a die is lowered." (CX-2 at 2:43-45.) The prior art process "aims at preventing bubble inclusion at casting a resin film, improving uneven thickness and promoting production efficiency of the film even in a process for casting a film at high speed." (*Id.* at 2:45-48.) The Background of the Invention notes that the problem with Japanese Unexamined Patent Publication 198157/1999 is that it creates a polyimide film with significantly reduced mechanical properties. (*Id.* at 2:54-67.)

The specification states that the "present invention" seeks to maintain the benefits of the process disclosed in Japanese Unexamined Patent Publication 198157/1999 while improving the mechanical properties of the film:

> The present invention is to provide a process for preparing a polyimide film wherein inclusion of bubbles are prevented at resin film casting, and uneven thickness is improved especially in such a cast film forming process for preparing polyimide film at high speed as the above without the lowering of mechanical properties as seen in the process for casting a film disclosed in Japanese Unexamined Patent Publication 198157/1999 at the same time.

(CX-2 at 3:16-23.)

The prosecution history echoes this statement from the specification:

> The present invention, as claimed in independent claim 1, relates to processes for preparing polyimide films in which undesirable bubble formation and enevenness of film thickness are prevented. These advantages are obtained without simultaneously compromising mechanical properties (e.g., tensile strength) of the polyimide films produced, such as is typically the case with conventional methodologies (e.g., specification, page 5, lines 17-23).

(JX-6 at 119.) The reference to "specification, page 5, lines 17-23" in the above-quoted passage is a reference to the portion of the specification quoted *supra*. (*See* JX-6 at 9.)

The prosecution history further makes clear that the "specific ratio of tetracarboxylic dianhydride component to diamine component, and the specific amounts of dehydrating agent and catalyst are critical to achieving" the superior mechanical properties of the claimed invention. (JX-6 at 121; *see also* JX-6 at 119-120, 122-123.)

Thus, from the intrinsic record cited *supra*, it becomes clear that the process claimed in claim 1 results in a polyimide film that lacks the undesirable bubble formation and unevenness of film thickness, while also improving the mechanical properties of the film over the prior art. The statements from the prosecution history establish that it is the claimed ratio of tetracarboxylic dianhydride component to diamine component, and the claimed amounts of dehydrating agent and catalyst that ensure the improved mechanical properties. (JX-6 at 119-123.)

The intrinsic record further establishes that it is the use of a low viscosity poly(amic acid) varnish that results in the prevention of bubbles and unevenness. (CX-2 at 2:42-53, 4:30-41, 7:9-20; JX-6 at 120.) Thus, I find that the intrinsic evidence demonstrates that the reference to "low viscosity" poly(amic acid) varnish in claim 1 is a reference to a poly(amic acid) varnish that has

a viscosity that is sufficiently low to prevent the formation of bubbles and unevenness in film thickness of the resulting polyimide film.

Kaneka's proposed construction merely associates the low viscosity with the claimed ratio of the tetracarboxylic dianhydride component to the diamine component. This construction renders the language "low viscosity" superfluous and meaningless. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.")

Kaneka tries to analogize the claim language to a hypothetical claim reciting "a thick book having between 800 and 1,000 pages," whereby the claim language describing the amount of pages defines the meaning of "a thick book." Kaneka offers no support in the intrinsic evidence for this position, and I find that the specification is contrary to this assertion, as it makes clear that the viscosity can be dependent on factors beyond the claimed molar ratio. (*See, e.g.,* CX-2 at 5:34-51, 7:3-29 (noting that factors such as temperature and the concentration of solid content can affect viscosity).) Therefore, Kaneka's position that "low viscosity" can be defined by the claimed molar ratio, and nothing else, lacks intrinsic support.

SKC's proposed construction, on the other hand, seeks to improperly limit the claim to a preferred embodiment from the specification and violates the doctrine of claim differentiation. SKC seeks to limit "low viscosity" to "a viscosity equal to or less than 2,000 poise measured at 20°C." The '639 patent specification provides that "viscosity of the poly(amic acid) varnish obtained by polymerizing a tetracarboxylic dianhydride component and a diamine component in a molar ratio adjusted to 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99 is ***preferably*** at most 2,000 poise, more preferably at most 1,500 poise, most preferably 100 to 1,500 poise at 20°C." (CX-2 at 7:9-14) (emphasis added). Such a statement does not serve to limit the meaning of "low viscosity."

Cordis Corp. v. Medtronic AVE, Inc., 339 F.3d 1352, 1357 (Fed. Cir. 2003) (explaining that "the use of the term 'preferably' makes clear that the language describes a preferred embodiment, not the invention as a whole.")

Under the doctrine of claim differentiation, "the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Phillips*, 415 F.3d at 1315. Claim 2 of the '639 patent recites "[t]he process of claim 1, wherein viscosity of said poly(amic acid) varnish is at most 2,000 poise at 20°C." Adoption of SKC's proposed construction would violate the doctrine of claim differentiation as it would result in the limitation from claim 2 being read into claim 1.

While claim differentiation only creates a rebuttable presumption, *Regents of the Univ. of Cal. v. Dakocytomation Cal., Inc.*, 517 F.3d 1364, 1375 (Fed. Cir. 2008), I find that SKC has not rebutted the presumption. SKC's apparent basis for believing that the presumption has been overcome is that its proposed construction is the "only definition arguably supported by the intrinsic evidence[.]" (RIB at 48.) As described *supra*, I do not concur with that assertion. Contrary to SKC's position, I have found that the term "low viscosity" is subject to construction without the need to render claim 2 superfluous.

Based on the foregoing, I find that "low viscosity" means "a viscosity that is sufficiently low to prevent the formation of bubbles and unevenness in film thickness of the resulting polyimide film." I find that examination of the extrinsic evidence offered by the parties is unnecessary because the intrinsic evidence is sufficient to understand the meaning of the terms construed in this section. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) ("In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence.")

D. The '704 Patent

1. Level of Ordinary Skill in the Art

The parties agree that the level of ordinary skill in the art for the '704 patent is the same as the level of ordinary skill in the art for the '866 patent. Therefore, based on my analysis in Section III.B.1 *supra*, I find that the level of ordinary skill in the art for the '704 patent is at least a bachelor's degree in chemistry or a related field and from two to five years of experience in the field of polyimides.

2. "Average Coefficient of Thermal Expansion"

The phrase "average coefficient of thermal expansion" appears in asserted claim 1.

Kaneka's Position: Kaneka contends that "average coefficient of thermal expansion" is readily understood by one of ordinary skill in the art, and therefore no construction is needed.

Kaneka states that the testimony of Dr. Harris establishes that a person of ordinary skill in the art would readily understand what an "average coefficient of thermal expansion" is in view of the recited temperature range, and would further understand how to determine whether the average coefficient of thermal expansion falls within the claimed range of $1.0x10^{-5}$ to $2.5x10^{-5}$ cm/cm/°C. (Citing CX-619C at Q. 51-52; CX-207C at ¶¶ 49-50.) Kaneka notes that Dr. Harris also testified that a person of ordinary skill in the art would measure the coefficient of thermal expansion of a commercial polyimide film at the center of the film in both its machine direction and transverse direction. (Citing CX-644C at Q. 167-180.)

Kaneka states that SKC argues that the term is indefinite because the '704 patent does not teach where and how to measure the average coefficient of thermal expansion. Kaneka states that testimony from SKC's witnesses confirms that it is a general practice in the industry to measure the average coefficient of thermal expansion in the center for both the machine direction

and transverse direction. (Citing Tr. at 308:18-23, 368:7-13.) Kaneka claims that this is further confirmed by SKC's own product specifications. (Citing CX-546C.) Kaneka argues that the reference relied upon by Dr. Thomas to argue that the term is indefinite provides a formula for determining average coefficient of thermal expansion, which undercuts SKC's indefiniteness argument. (Citing RX-676C at Q. 295-298; RX-273.)

SKC's Position: SKC contends that "average coefficient of thermal expansion" is indefinite because the intrinsic evidence does not define hot to determine the average coefficient of thermal expansion ("average CTE").

SKC states that there is no disclosure of the locale and direction of the CTE measurement required to determine an average CTE, meaning that one cannot determine whether or not a particular product falls inside or outside of the claim scope. SKC states that, for example, Kapton HN can have a CTE value of 25 in one direction or 117 in another direction, even in the same location. (Citing RX-273 at 6.)

SKC argues that in commercially produced polyimide films, CTE values are strongly dependent on molecular alignment such that films will likely display different CTE values in different directions and different locations, as expressly taught in the '961 patent. (Citing JX-4 at 9:48-10:3; Tr. at 480:9-13; RX-676C at Q. 291.)

SKC states that Kaneka witnesses admitted that the average CTE value would depend on where the CTEs are measured and the direction in which the CTEs are measured. (Citing Tr. at 212:2-213:8, 480:9-13, 488:8-13; JX-4 at 5:58-65, 37:37-40; RX-676C at Q. 291-293; RX-584C at Q. 1211-1212.) SKC notes that this is described in numerous prior art journal articles. (Citing RX-263; RX-465; RX-273.)

SKC asserts that the specification and prosecution history of the '704 patent do nothing to clarify the location and direction of the CTE measurements necessary to calculate the average CTE. SKC states that in contrast to the '704 patent, the '961 patent provides sufficient detail on how to take CTE measurements. (Citing Tr. at 482:14-483:8, 483:13-16, 486:19-24.)

SKC notes that Dr. Harris takes the position that when determining average CTE, it is industry practice to measure the CTE in the machine and transverse directions at the middle of the film samples and then average the two values. (Citing CX-619C at Q, 186.) SKC states that Dr. Harris admitted that when dealing with commercially available film that is slit from a bulk roll, CTE measurements may vary depending on where on the bulk roll the "middle" happens to be. (Citing Tr. at 487:5-8, 487:20-488:13.)

Construction to be applied: I find that the term "average coefficient of thermal expansion" is indefinite.

Claim 1 of the '704 patent requires, *inter alia*, "[a] polyimide film for flexible printed circuit, having an average coefficient of thermal expansion of $1.0x10^{-5}$ to $2.5x10^{-5}$ cm/cm/°C in temperature range of 100°C to 200°C." Therefore, to infringe claim 1, one must be able to determine the accused polyimide film's average coefficient of thermal expansion ("average CTE") in the claimed temperature range.

SKC argues that the claim is indefinite, because nothing in the intrinsic evidence provides any guidance to one of ordinary skill in the art regarding how to calculate the average CTE. The location and direction of the measurements are material to the calculation of average CTE, as the parties' experts have acknowledged that the CTE measurements will vary depending on location and direction. Dr. Harris, Kaneka's expert witness, agreed that "[d]epending on which direction you measure the CTE value, whether it's along the molecular orientation axis or some other

direction, the result of the CTE measurement could be different[.]" (Tr. at 480:9-12.) Dr. Thomas, SKC's expert, testified that "[p]ersons of ordinary skill in the art would know that the CTE is strongly dependent on molecular alignment such that anisotropic films will display different CTE values in different directions and different locations[.]" (RX-676C at Q. 291; *see also id.* at Q. 292, 295; RX-584C at Q. 1212.)

In reviewing the specification of the '704 patent, I find that it provides no guidance regarding how to calculate average CTE. The specification discloses an apparatus used to measure CTE:

> Properties were measured in the following manner.
>
> <Coefficient of Thermal Expansion>
>
> Apparatus: TMA8140 made by Rigaku Electronic Corporation
>
> Temperature profile: 20° to 400° C.
>
> Heating rate: 10°C/min
>
> Sample size: 5x20 mm
>
> In order to remove the influence of shrinkage by heat, measurements were repeated twice at the above-mentioned temperature profile and then the average coefficient of thermal expansion at 100.degree. to 200.degree. C. was calculated from the second chart.

(JX-3 at 5:54-67.) Still, the specification provides no indication of how many measurements to make, where on the polyimide film to make each measurement, and in what direction the measurements should be made. (*See generally* JX-3.) The specification provides a number of examples and comparative examples, but none of these examples includes an explanation regarding how the average CTE was calculated. (*Id.* at 6:50-8:42.)

The prosecution history does not reveal the method used to calculate average CTE. During prosecution, the examiner rejected the claims as anticipated by the Edman reference.

(JX-7 at 82.) The examiner stated that while the average CTE limitation was not expressly disclosed in Edman, it was inherently present. (*Id.*) The applicants disagreed, and argued that Edman does not inherently disclose the average CTE limitation of claim 1. (*Id.* at 88-90.)

When the examiner maintained the objection based on Edman, the applicants submitted a declaration from Hisayasu Kaneshiro, one of the named inventors. (JX-7 at 99-101.) In Mr. Kaneshiro's declaration, he described how he made the polyimide film disclosed in Edman, and how that film does not satisfy the average CTE limitation of claim 1. (*Id.* at 102-107.) While Mr. Kaneshiro's declaration describes the same testing equipment disclosed in the specification, he does not explain how he calculated the average CTE value for the film made according the teachings of Edman. (*Id.*)

After a review of the intrinsic record, it is clear that there is no information provided regarding how to determine average CTE. As Dr. Thomas explained:

> The '704 patent and its claims provide no explanation of which different coefficients of thermal expansion should be measured, in other words, it does not specify where and in which direction CTE is to be measured. Also, to the extent that multiple measurements should be made, it does not teach what measured coefficients should then be "averaged."

(RX-676C at Q. 295.)

Kaneka agrees that the intrinsic evidence does not provide any guidance, as it relies exclusively on extrinsic evidence in an attempt to establish that one of ordinary skill in the art would know to measure the CTE of a commercial polyimide film at the center of the film in both its machine direction ("MD") and its transverse direction ("TD"). (CIB at 70-72.) Dr. Harris testified that "[t]he CTE is determined in two directions, the MD direction and the TD direction. Both the MD and TD values have to satisfy the range claimed for the CTE." (CX-644C at Q. 168.) Dr. Harris opined that the "average" in "average CTE" refers to the averaging of the CTE

values measured over the claimed temperature range of 100°C to 200°C. (*Id.* at Q. 166-167.) Dr. Harris believes that it is "the standard" to test the film in the MD and TD directions in the center of the film. (*Id.* at Q. 169.) Dr. Harris's unsupported testimony that one of ordinary skill in the art would know how to determine the average CTE fails rebut SKC's argument and cannot substitute for the inadequate disclosure in the intrinsic evidence.

Kaneka relies on additional evidence that it claims confirms Dr. Harris's testimony. Kaneka points to the testimony of Mr. Won, an SKC employee, who testified that {

} (Tr. at 368:7-13.) This does not support Kaneka's claim that one of ordinary skill in the art, at the time of filing of the '704 patent, would know to take CTE measurements from the center, as Mr. Won testified that {

} In addition, the testimony does not support Dr. Harris's opinion that it is an industry standard to take measurements only from the center.

Kaneka points to the following testimony from another SKC employee:

> Q. Do you know if there's a general practice in the industry to measure the coefficient of thermal expansion in the direction of MD or TD?
>
> A. Yes, I do.
>
> Q. Is that a yes to my question?
>
> A. Yes.
>
> {
>
> }

{ }

(Tr. at 307:18-308:6.) This testimony is less than clear, as counsel asks the witness if there is a general practice in the industry to measure CTE "in the direction of MD ***or*** TD." (*Id.* at 307:18-20) (emphasis added). While the witness answers in the affirmative, it does not establish that there is a general practice in the industry to measure in both the MD ***and*** TD. Further, even if the testimony established that there is a general practice in the industry to measure both the MD and TD, the testimony does nothing to establish that there is a general practice to measure in the center of the film only.

Kaneka points to SKC's documents, claiming that the CTE for { }

(CX-536C[7] at 21-25.) { } it does not establish that there is a generally accepted method, known to one of ordinary skill in the art at the relevant time period, for calculating average CTE.

Kaneka cites to the testimony of Mr. Kaneshiro, a named inventor on the '704 patent. Mr. Kaneshiro testified that with commercial polyimide film, it is "normal" to measure CTE in the MD and TD at the center of the film. (Tr. at 209:1-210:24.) I find that this unsupported testimony is insufficient to establish that one of ordinary skill in the art during the relevant time period would know how to calculate average CTE as claimed in claim 1. Further, "inventor testimony is of little probative value for purposes of claim construction." *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 n. 5 (Fed. Cir. 2003).

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[7] Kaneka's brief mistakenly identifies this exhibit as CX-546C. (CIB at 71 n. 392.)

Kaneka cites to *Wellman, Inc. v. Eastman Chemical Co.*, 642 F.3d 1355, 1367 (Fed. Cir. 2011), a case in which a finding of indefiniteness was overturned because "the record shows that a person of ordinary skill in the art in this field would follow standard industry guidance" for conditioning plastics. The court made clear that "[w]ell known industry standards need not be repeated in a patent." *Id.* The court found that the record showed that the 1997 International Standard for Differential Scanning Calorimetry of Plastics filled in the details missing from the asserted patent. *Id.* The current situation is much different than *Wellman*, in that Kaneka has not offered evidence of any recognized industry standard that would support its position. Absent that evidence, I cannot find that Kaneka's proposed construction constitutes the industry standard method for calculating average CTE.[8]

The Federal Circuit's decision in *Honeywell Int'l, Inc. v. Int'l Trade Comm'n*, 341 F.3d 1332 (Fed. Cir. 2003) is instructive. There, the claim recited a process for production of a drawn polyethylene terephthalate yarn where the yarn had a melting point elevation within a specified range. The specification provided a description of how to measure melting point elevation using a specimen of the yarn. What the specification did not disclose was the method that must be used to prepare the yarn specimen for analysis. The court noted that there were at least three different specimen preparation methods known in the art as of the earliest priority date of the patent, and a fourth method that was known to those of ordinary skill in the art, but was not published. The court further explained that the calculated melting point elevation varied depending on the method used to prepare the specimen.

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[8] Both Kaneka and SKC rely on the Pottiger article to support their respective positions. (RX-273.) After a thorough review of Pottiger, I find that the article does not disclose evidence of any industry standard method for calculating average CTE. (*Id.*)

The court was faced with three different proposed constructions. The first proposed construction would limit the claims to the "ball method," which was the specimen preparation method that was known in the art but not yet public as of the priority date of the patent. The second proposed construction was labeled as the "any one method" construction, as it would allow the claim to be satisfied if the melting point elevation limitation was met using any one of the known preparation methods. Finally, the third proposed construction was labeled as the "all methods" construction, as it would allow the claim to be satisfied only if the melting point elevation limitation was met using each of the known preparation methods. The court rejected all of these proposed constructions, finding the claims indefinite due to a lack of guidance in the intrinsic evidence regarding how to prepare the yarn specimen:

> After reviewing the entire record regarding claim construction, we agree with the Commission and hold that the claims are insolubly ambiguous, and hence indefinite, with respect to a required sample preparation method. As we discuss below with respect to each proffered construction, the claims, the written description, and the prosecution history fail to give us, as the interpreter of the claim term, any guidance as to what one of ordinary skill in the art would interpret the claim to require. Moreover, because the sample preparation method is critical to discerning whether a PET yarn has been produced by the claimed process, knowing the proper sample preparation method is necessary to practice the invention.

Honeywell, 341 F.3d at 1340; *see also Morton Int'l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470 (Fed. Cir. 1993) (explaining that claims are invalid for failing to satisfy the definiteness requirement if they "are not sufficiently precise to permit a potential competitor to determine whether or not he is infringing[.]")

The facts of this case align with those in *Honeywell*. The '704 patent requires a film with an average CTE within a specified range. There is no dispute that the intrinsic evidence provides an incomplete description regarding how to calculate the average CTE. Further, there is no dispute between the parties that CTE values will vary depending on the location and direction of

the measurements. Because I find that none of the extrinsic evidence offered by Kaneka provides a persuasive indication that, as of the priority date of the '704 patent, one of ordinary skill in the art would have known how to calculate average CTE as claimed in claim 1, I must conclude that claim 1 of the '704 patent is insolubly ambiguous and fails to meet the definiteness requirement of 35 U.S.C. § 112, ¶ 2.

E. The '961 Patent

1. Level of Ordinary Skill in the Art

Kaneka contends in its opening brief that a person of ordinary skill in the art for the '961 patent is the same as for the other patents-in-suit, which is a person with a Bachelor's degree in chemistry (or equivalent) and two to five years of experience working in the field of polyimides. Kaneka asserts that there is no basis to suggest that the level of ordinary skill in the art for the '961 patent is higher than that for the other asserted patents. In its reply brief, Kaneka asserts that a person of skill in the '961 patent would have a bachelor's degree in the relevant field "'and five years of experience in the technologies relevant to the '866 [sic] Patent, ('e.g., manufacturing, use, and properties of polyimide films).'" (Citing RIB at 10; CX-619C at Q.29; CX-207C at ¶ 31; RX-584C at Q.77-79.)

SKC contends that a person of ordinary skill in the art would have a greater level of skill than for the other patents-in-suit—at least a Master's degree in chemical engineering or polymer engineering and five years of experience in the technologies relevant to the '961 patent (e.g., manufacturing, use, and properties of polyimide films), the equivalent education regarding the manufacture and use of polyimide films, or the equivalent work experience or knowledge of such technology.

The parties disagree on both the field of education and the level of education required. Both require experience with polyimides, but disagree on the number of years of experience required. Kaneka offered different positions in its initial post-hearing brief and its post-hearing reply brief. Kaneka's inconsistency notwithstanding, the level of skill articulated by SKC goes beyond the level of ordinary skill in the art. SKC has not offered a sufficient justification regarding why a person of ordinary skill in the art would need both a master's degree and five years of highly specialized experience. *Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985) ("A person of ordinary skill in the art is...presumed to be one who thinks along the line of conventional wisdom in the art and is not one who undertakes to innovate, whether by patient, and often expensive, systematic research or by extraordinary insights, it makes no difference which."). The '961 patent is directed to a polyimide film and use thereof where the polyimide film has certain properties. (JX-4 at Abstract.) The claims of the '961 patent are directed to polyimide films and the properties of those polyimide films. (JX-4 at 37:1–38:38.) There is no discussion in the '961 patent suggesting that the types of properties being addressed by the '961 patent are special or otherwise non-conventional, or would require the level of education or experience suggested by SKC. (*See* JX-4.) Because the claims are directed to polyimide films and the conventional properties of those films, I find that a person of ordinary skill in the art is a person would not need more than a Bachelor's degree in chemistry or chemical or polymer engineering (or equivalent) and two (2) to five (5) years of experience working in the field of polyimides to understand the claims of the '961 patent. .

2. "A Polyimide Film Produced by a Continuous Process"

The phrase "a polyimide film produced by a continuous process" appears in each of the asserted claims. Specifically, the phrase is found in independent claims 1 and 9.

Kaneka's Position: Kaneka contends that "a polyimide film produced by a continuous process" appears in the claim preamble of claims 1 and 9 and means "a process that continuously casts, e.g., by using an endless belt or a drum."

Kaneka asserts that the parties' dispute centers on whether or not this phrase requires "sag" and "tension" limitations. Kaneka claims that SKC's construction improperly imports these limitations.

Kaneka asserts that the specification supports its construction, asserting that the '961 patent discloses: "[t]he polyamic acid solution prepared as described above **is continuously cast or applied on a support . . . . In particular, an endless belt or a metal drum**, which is produced by joining metal plates together, is preferred for drying the coated solution." (Citing JX-4 at 19:14-21 (emphasis added by Kaneka).) Kaneka also asserts that the testimony of Dr. Harris supports its construction. (Citing CX-207C at ¶ 62.)

Kaneka states that SKC's construction incorporates "sag" and "tension" limitations that are not found in the claims or specification. Kaneka also criticizes SKC's construction as failing to address the "continuous" aspect of "continuous process" and importing portions of the specification that discuss step D into the claims. Specifically, Kaneka argues that step D is only a preferred embodiment (Citing JX-4 at 21:19-26) and is discussed within the "Best Mode for Carrying Out the Invention" section of the '961 patent. (Citing JX-4 at 6:14-15.) Kaneka contends that SKC's expert agreed that the plain meaning of "continuous process" does not require "no tension" (Citing Tr. at 887:2-7) and Mr. Won, a senior engineer at SKC's R&D Center, testified that he does not think the existence of sag has any effect on whether or not a process is continuous. (Citing Tr. at 241:7-9.)

Kaneka contends that the construction of "continuous process" should not require "substantially no tension applied to the TD direction." Kaneka argues that during prosecution it distinguished the Fujihara reference based on the anisotropic properties of the claimed film and disagreed with the Examiner's product-by-process inherent disclosure argument, instead of acquiescing that the "continuous process" of the claimed invention requires no tension in the TD direction. Kaneka asserts that during prosecution, it argued that the Fujihara reference disclosed an isotropic film with a ratio "A" outside of the claimed range, in contrast to a film produced by a continuous process such that the coefficient of linear expansion "a" in the molecular orientation direction can be different than the coefficient of linear expansion "b" in the perpendicular direction (i.e., an anisotropic film), within the claimed range of ratio "A." (Citing RX-0557 at 300, 316-17.)

Kaneka asserts that it was responding to the Examiner's remarks that a product-by-process claim may be invalid in view of a prior art product even though the prior art product was made by a different process when it argued "Fujihara et al. does not provide any teaching with respect to applying substantially no tension in the TD direction. This is why the so-called process limitation of claim 1 results in a materially different product." (Citing RX-0557 at 0320.) Kaneka asserts that this statement was clarified in the prosecution history on the same page, which provides that "the step D described in specification . . . does not appear in Fujihara *et al.* Accordingly, Fujihara *et al.* does not ***inherently*** disclose the polyimide film of the present invention as the Examiner seems to understand. It should be emphasized, however, ***that the claimed invention does not relate to the process, but the polyimide film itself which enables a reduced rate of dimensional change.***" (Citing RX-0557 at 0320 (emphasis added by Kaneka).)

SKC's Position: In the joint list of proposed constructions of disputed claim terms, SKC contended that "a polyimide film produced by a continuous process" means "a polyimide film produced by a continuous process that includes transferring a gel film in a heating furnace while being fixed so that substantially no tension is applied in the film width direction and so that the film sags. Substantially no tension is applied in the film width direction means that tensile tension due to mechanical handling is not applied in the film width direction except for the tension due to the weight of the film itself." In its pre-hearing and post-hearing briefs, SKC contends that "a polyimide film produced by a continuous process" means "a continuous process that includes continuously transferring a film into a furnace with substantially no tension applied in the film width direction, that is, transferring a film into a furnace with a sag in the middle."

SKC asserts that this phrase is not in the preamble of claims 1 and 9, and Kaneka has not argued this phrase was in the preamble of claims 1 and 9 until its post-hearing brief. SKC contends that because there is no transitional phrase following the limitation (Citing *Biovail Labs. Int'l SRL v. Impax Labs. Inc.*, 433 F.Supp2d 501, 507 (E.D. Penn. 2006)) and because Kaneka waived the argument that this phrase is in the preamble by failing to raise the issue in its pre-hearing brief, the phrase "a polyimide film produced by a continuous process" is not in the preamble. Alternatively, SKC asserts that because this limitation was relied upon to distinguish the claims during prosecution, this phrase is a limitation on the claims. (Citing *Computer Docketing Station Corp. v. Dell, Inc.*, 519 F.3d 1366, 1375 (Fed. Cir. 2008).)

SKC asserts that Kaneka's pre-hearing briefing on this term was limited to arguments that one portion of the '961 patent disclosed that the "no tension" aspect is described as preferred and should not be a limitation. (Citing CPHB at 93.) As a result, SKC contends that Kaneka's post-hearing brief violates Ground Rule 8.2.

SKC also asserts that Kaneka's post-hearing brief mischaracterizes testimony provided by Dr. Thomas by alleging that Dr. Thomas agreed at trial that the plain meaning of continuous process does not require "no tension." According to SKC, Dr. Thomas' testimony is directed to the plain meaning of the term "continuous process" in the abstract, not what it means when read in the context of the intrinsic record.

SKC asserts that the dispute on construction focuses on the meaning of "a continuous process." SKC contends that the construction proposed in its pre-hearing and post-hearing briefs is supported by the specification, prosecution history, and testimony from a prosecuting attorney for the '961 patent. In contrast, SKC argues that Kaneka's construction is based on selected portions of the specification, taken out of context, and completely ignores the prosecution history.

SKC asserts that the claim language itself does not, on its face, require the construction proposed by either party. SKC contends that Kaneka's reliance on the testimony of Dr. Thomas regarding the plain meaning of "continuous process" is misplaced because the issue being addressed is what the term "continuous process" means when read in the context of the intrinsic record. According to SKC, the specification and prosecution history supports SKC's construction. SKC asserts the specification makes clear that the continuous process disclosed in the '961 patent requires transferring a film into a furnace, also commonly referred to as a tenter, with sagging in the film-width direction. SKC cites a section of the specification entitled "Method of Producing a Polyimide Film of the Present Invention" (JX-4 at 13:46-47, 13:64-14:4), which describes four steps referred to as steps A-D. According to SKC, step D is for transferring the film in a heating furnace with substantially no tension applied in the film width direction. (Citing JX-4 at 13:64-14:4, 20:43-49.) SKC asserts that the specification repeatedly

indicates that the claimed "continuous process" must include "Step D." (Citing JX-4 at 20:50-21:2, 21:55-58, 20:64-67, 21:19-25.) SKC contends that the specification's emphasis on the importance of Step D to "the present invention" indicates Step D is not merely a preferred embodiment, but is an inseparable part of the invention. SKC further cites the testimony of Kaneka's employee, Mr. Kaneshiro, who testified that one focus of the '961 patent is to cause sagging or stretching in the tenter. (Citing CX-620C at Q.22.)

SKC asserts the prosecution history of the '961 patent also supports SKC's construction. According to SKC, Kaneka consistently urged the significance of step D to the claim term "continuous process" through several years of prosecution, by which Kaneka limited its invention to one that requires the presence of step D, i.e., wherein the film sags because substantially no tension is applied in the TD (film width) direction.

SKC contends that the July 7, 2008 response relied on step D as the distinguishing feature over a prior art patent, Fujihara et al., arguing that "step D described in the specification . . . does not appear in Fujihara et al. Accordingly, Fujihara et al. does not inherently disclose the polyimide film of the present invention . . . ." (Citing JX-9 at 301; RDX-330.) SKC further contends that the November 3, 2008 appeal brief argued that Step D distinguished the '961 patent from Fujihara et al. Specifically, SKC cites arguments by Kaneka that the prior art reference "does not provide any teaching with respect to applying substantially no tension in the TD direction," and that "this is why the so-called ***process limitation*** of claim 1 results in a materially different product . . . ." (Citing JX-9 at 319-20 (emphasis added by SKC).) SKC also cites testimony by the prosecuting attorney for the '961 patent, alleging that he admitted to arguing step D of the continuous process before the PTO in order to differentiate the '961 patent from the cited prior art. (Citing RX-583C at 60:20-61:8; 61:15-62:3; RDX-331C.) SKC

contends that in addition to issues of claim construction, the prosecution-disclaimer doctrine precludes Kaneka from recapturing the broad scope it purports to give to "continuous process" that it clearly disclaimed in its arguments to the PTO.

SKC contends that Kaneka's reliance on the sentence that "the claimed invention does not relate to the process, but the polyimide film itself which enables a reduced rate of dimensional change" is improper. According to SKC, this quotation is taken out of context and does not change the fact that the asserted claims are product-by-process claims because they recite "a continuous process." (Citing *Abbott Labs. v. Sandoz, Inc.*, 566 F.3d 1282, 1293-95 (Fed. Cir. 2009).) SKC asserts that regardless of whether or not the claims are product-by-process claims, Kaneka relied on the phrase "a continuous process" to distinguish the claims during prosecution and the "continuous process" is a limitation.

SKC argues that the construction proposed by Kaneka finds no support in the intrinsic record.

Construction to be applied: "a polyimide film produced by continuously casting or applying solution resin to a support"

The term "a polyimide film produced by a continuous process" appears in both claims 1 and 9, and is not followed by a transitional phrase in either claim. (*See* JX-4 at 37:2-11, 37:35-38:2.) Rather, the term "a polyimide film produced by a continuous process" is followed by a "wherein" clause. (JX-4 at 37:2-11, 37:35-38:2.) Read in the context of the claim, the term "a polyimide film produced by a continuous process" is not a preamble. *Biovail Labs. Int'l. SRL v. Impax Labs. Inc.*, 433 F.Supp.2d 501, 507 (E.D. Penn. 2006).

Even if the term "a polyimide film produced by a continuous process" were a preamble, Kaneka did not assert that the phrase is not a limitation as a result of being in the preamble in its

pre-hearing brief. (CPHB at 106 ("The claim term 'a polyimide film produced by a continuous process[']' appears in independent claims 1 and 9."); CIB at 93 ("Claims 1 and 9 both recite 'A polyimide film produced by a continuous process …' in the claim preamble.").) As a result, Kaneka cannot now argue that this phrase is not a limitation. (*See* Ground Rule 8.2.) Moreover, because "a polyimide film produced by a continuous process" is the only structural limitation before the "wherein" clause (JX-4 at 37:2-11, 37:35-38:2) and the focus of the patent specification is "a polyimide film produced by a continuous process" (*See, e.g.,* JX-4 at Abstract), the phrase "a polyimide film produced by a continuous process" is "necessary to give life, meaning, and vitality to the claim." *Poly-America, L.P. v. GSE lining Technology, Inc.*, 383 F.3d 1303, 1309-10 (Fed. Cir. 2004). As a result, even if the phrase "a polyimide film produced by a continuous process" were in the preamble, it is a limitation on the claim.

Although SKC previously asserted that claims 1 and 9 were product-by-process claims for purposes of invalidity, SKC's reply brief is the first time SKC addresses the ***claim construction*** issue of whether claims 1 and 9 are product-by-process claims (*see* RPHB at 372-79). As a result, this argument is waived. Even if SKC had properly raised this issue, SKC's conclusory argument does not overcome the numerous instances during prosecution where Kaneka argued that "[i]t should be emphasized, however, that the claimed invention does not relate to the process, but the polyimide film itself which enables a reduced rate of dimensional change." (JX-9 at 301, 320.) As a result, claims 1 and 9 are not "product-by-process" claims.

With respect to the meaning of the actual claim language, the '961 patent uses the terms continuous or continuously approximately 10 times in the specification and claims. However, the only use in the specification that provides clear guidance as to what is meant by "continuous process" is col. 19, ll. 14-30, which provides, in part, "[t]he polyamic acid solution prepared as

described above is continuously cast or applied on a support and is then dried to form gel film. As the support any support can be used as long as the support is not dissolved by the solution resin and can resist heating that is necessary for removing the organic solvent from the polyimide solution." (JX-4 at 19:14-19.) This use is consistent with the remainder of the specification and the figures. In view of this disclosure, "a polyimide film produced by a continuous process" means "a polyimide film produced by continuously casting or applying solution resin to a support."

Kaneka's proposed construction includes unnecessary examples for the "support." Kaneka's proposed examples of an endless belt or drum are not required to understand the proper meaning of the claim term and do not need to be included in the construction. *See Certain Mobile Devices and Related Software*, Inv. No. 337-TA-750, Initial Determination, 2012 WL 250320 (Jan. 13, 2012).

SKC's arguments that Kaneka's post-hearing brief violates Ground Rule 8.2 are unconvincing. Kaneka's pre-hearing brief adequately set forth its claim construction position regarding the phrase "a polyimide film produced by a continuous process," including its position that including "no tension" in the construction of "a polyimide film produced by a continuous process" improperly imports a limitation into the claims. (*See* CPHB at 106-108.) Kaneka's pre-hearing brief provides adequate notice and therefore, Kaneka has not waived this argument.

In its briefing, SKC improperly offered a construction of this term as "a continuous process that includes continuously transferring a film into a furnace with substantially no tension applied in the film width direction, that is, transferring a film into a furnace with a sag in the middle" that was different from the construction SKC offered in the joint list of proposed constructions of disputed claim terms, where it asserted this term should be construed as means

"a polyimide film produced by a continuous process that includes transferring a gel film in a heating furnace while being fixed so that substantially no tension is applied in the film width direction and so that the film sags. Substantially no tension is applied in the film width direction means that tensile tension due to mechanical handling is not applied in the film width direction except for the tension due to the weight of the film itself." I will not consider arguments offered by parties in briefing for a construction of a term that is different from the construction the party offered for that term in the joint list of proposed constructions of disputed claim terms. However, even assuming, *arguendo*, that SKC had disclosed its construction in the joint list of proposed constructions of disputed claim terms, the proposed construction addressed in SKC's briefing is flawed.

SKC's proposed construction for "continuous process" improperly incorporates limitations from step D disclosed in the specification. A construction requiring elements from step D would improperly import a limitation from a preferred embodiment in the specification into the claims. "[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005).

SKC unconvincingly cites the specification, prosecution history, and prosecuting attorney testimony to argue that the step D limitations are required by the phrase "continuous process." The cited support does not require that "continuous process" be construed to include the step D limitations. Although the use of the phrase "present invention" in the specification can act as a limitation on the scope of the claims, "use of the phrase 'present invention' or 'this invention' is not always so limiting, such as where the references to a certain limitation as being the 'invention' are not uniform, or where other portions of the intrinsic evidence do not support

applying the limitation to the entire patent." *Absolute Software Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1136 (Fed. Cir. 2011).

Even if "Step D" is referred to as the "present invention," other portions of the intrinsic evidence do not support applying the step D limitation to the entire patent. Each of the passages cited by SKC discloses a preferred embodiment or an example. Col. 13 ll. 46-47 and col. 13 l. 64 – col. 14 l. 4 disclose four steps that can be used in a method of producing a polyimide film of the "present invention," including "Step D." (JX-4 at 13:46-47 and 13:64-14:4.) However, when step D is first described, the specification explains that "a step of transferring the film in a heating furnace with both ends of the film being fixed ***can*** be employed." (JX-4 at 14:3-4(emphasis added).) The specification does not provide that step (D) ***must*** be used. (*See* JX-4 at 14:3-4.) Moreover, the sentences immediately following the passages cited by SKC make clear the cited passages, including Step D, are merely examples: "[t]he above polyimide film ***can*** be produced by ***appropriately selecting each of these conditions or adding other steps***. Examples of the variable production conditions and production examples will be described below." (JX-4 at 14:4-8 (emphasis added).)

SKC's citations to JX-4 at col. 20 l. 50 col. 21 l. 2, col. 21 ll. 19-25 and col. 21 ll. 55-58 are likewise unpersuasive. As provided in JX-4 at col. 14 ll. 7-8, these cited portions of the specification are "[e]xamples of the variable production conditions and production examples . . . ." Moreover, one of the cited passages (JX-4 at 21:19-25) actually provides that "the film is ***preferably*** fixed so that substantially no tension is applied . . . ." (Emphasis added). As noted by SKC, an inventor can limit the scope of claims through the specification in certain circumstances. *See, e.g., Gaus v. Conair Corp.*, 363 F.3d 1284, 1290 (Fed. Cir. 2004). This is not such a circumstance in view of the language specifically identifying these cited portions of

the specification as mere examples or preferred embodiments. *See Phillips* 415 F.3d at 1323; *Kara Tech. Inc. v. Stamps.com Inc.*, 582 F.3d 1341, 1348 (Fed. Cir. 2009) ("The patentee is entitled to the full scope of his claims, and we will not limit him to his preferred embodiment or import a limitation from the specification into the claims.").

SKC's arguments based on the prosecution history for the '961 patent are also unpersuasive. SKC's selective quotations and placement of ellipses takes Kaneka's prosecution history arguments out of context and changes the meaning of Kaneka's prosecution arguments. The sentence immediately following SKC's quotation from Kaneka's July 7, 2008 response explains that "[i]t should be emphasized, however, that the claimed invention does not relate to the process, but the polyimide film itself which enables a reduced rate of dimensional change." (JX-9 at 301.) SKC's quotations from Kaneka's appeal brief likewise are taken out of context. SKC asserts that Kaneka argued that the prior art reference "does not provide any teaching with respect to applying substantially no tension in the TD direction," with the implication that Kaneka was referring to the "continuous process" limitations of claims 1 and 10. However, the previous sentence of the appeal brief actually provides "[t]he method disclosed in paragraph [0145] of Fujihara et al. does not correspond to the step D disclosed in the present ***specification*** beginning on page 54." (JX-9 at 318 (emphasis added).)

SKC also selectively quotes a later passage, which provides "this is why the so-called ***process limitation*** of claim 1 results in a materially different product . . .," with the implication that claim 1 includes the step D limitations. However, in the previous paragraph, Kaneka explained that "[t]he disclosed production method of Fujihara et al. would result in a ratio A equal to 1 . . . . [T]he ratio A in the present invention is defined to distinguish from such film." (JX-9 at 319.) Moreover, in the paragraph following SKC's quoted section, Kaneka explained

that "[i]t should be emphasized, however, that the claimed invention does not relate to the process, but the polyimide film itself which enables a reduced rate of dimensional change." (JX-9 at 320.)

Ultimately, Kaneka's statements during prosecution are insufficient to qualify as a disavowal of claim scope. "To balance the importance of public notice and the right of patentees to seek broad patent coverage, [the Federal Circuit has] [] thus consistently rejected prosecution statements too vague or ambiguous to qualify as a disavowal of claim scope." *Omega Engineering, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1326 (Fed. Cir. 2003). There is no clear statement by Kaneka in either the July 7, 2008 response or the appeal brief that claim 1 requires the step D limitations. Rather, both the July 7, 2008 response and the appeal brief include language to the contrary—"[i]t should be emphasized, however, that the claimed invention does not relate to the process, but the polyimide film itself which enables a reduced rate of dimensional change." The statements cited by SKC are too ambiguous to qualify as a disavowal of claim scope, especially in view of the context and explicit statements discussed above.

SKC's allegations that the prosecuting attorney for the '961 patent admits arguing to the PTO that step D of the continuous process differentiates the '961 patent from the cited prior art are unconvincing. "[W]hile extrinsic evidence can shed useful light on the relevant art, [the Federal Circuit] ha[s] explained that it is less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips*, 415 F.3d at 1317. The Federal Circuit has "viewed extrinsic evidence in general as less reliable than the patent and its prosecution history in determining how to read claim terms . . . ." *Id.* at 1318. The testimony by the prosecuting attorney for the '961 patent is undoubtedly extrinsic evidence, and should be discounted to the extent it is at odds with the intrinsic record, which, as discussed above, does

not require step D as part of the "continuous process." *See id.* at 1318 (discounting expert witness testimony on claim construction that conflicted with intrinsic record); *see also Howmedica Osteonics Corp. v. Wright Medical Tech., Inc.* 540 F.3d 1337, 1346-47 (Fed. Cir. 2008) (holding that a letter between a prosecuting attorney and a patent applicant regarding an Examiner interview was of no value to the construction of the disputed claim term and that inventor testimony cannot be relied on to change the meaning of the claims).

Questions of weight aside, the prosecuting attorney's testimony is not a sufficiently clear disavowal of claim scope to justify adopting SKC's proposed construction. Rather, like the July 7, 2008 response and the appeal brief, the actual testimony provided that "the method that is disclosed in Paragraph 145 of Fujihara does not correspond to Step (D) disclosed in the ***specification***" and "I think I was pointing out a difference between Step (D) and what . . .was being done in the present invention of Fujihara." (RX-583C at 60:20-62:3 (emphasis added).) Thus, the prosecuting attorney testified that Paragraph 145 of the cited reference does not correspond to Step (D) in the ***specification***. The prosecuting attorney did not testify that the Paragraph 145 of the cited reference does not correspond to Step (D) in the ***claims***. Although the prosecuting attorney used the phrase "Step D of the present invention," such a comment (assuming *arguendo* that extrinsic evidence testimony of a prosecuting attorney can act as a disclaimer) is not sufficiently clear and unambiguous to disclaim claim scope. *See Omega Engineering, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1326 (Fed. Cir. 2003); *see also Absolute Software Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1136 (Fed. Cir. 2011).

3. "Across the Entire Width"

The phrase "across the entire width" appears in each of the asserted claims. Specifically, the phrase is found in independent claims 1 and 9.

Kaneka's Position: Kaneka contends that "across the entire width" means "the entire part in the direction perpendicular to the transferring direction."

Kaneka contends that the inventor acted as his own lexicographer and defined the term "entire width" in the specification. Kaneka cites JX-4 at col. 7 ll. 49-53, which provides: "In the polyimide film of the present invention, the term 'entire width' means the entire part in the direction (width direction, TD direction) perpendicular to the transferring direction (MD direction) in which the film is continuously produced." Kaneka further cites JX-4 at col. 7 ll. 56-59 as making clear that for "across the entire width," the physical property values are measured "at [the] three points of both end portions and the central portions along the TD direction of the polyimide film." According to Kaneka, Dr. Harris concurs with this interpretation. (Citing CX-619C at 54-55; CX-207C at ¶ 63.)

Kaneka asserts that SKC's construction adds on an additional phrase "the entire part being measured from the fixed ends of the film as it is transferred in the tenter furnace" to the inventor's definition. Kaneka contends this finds no support in the specification or prosecution history. (Citing RX-584C; RX-676C.) Moreover, Kaneka contends that SKC's construction conflicts with the specification's disclosure that the polyimide film has a length of 200mm or more in the width direction (Citing JX-4 at 8:1-5) in view of the fact that 200mm in the width direction is much narrower than the 1,028mm wide film produced from the tenter furnace by SKC. (Citing Tr. at 421:7-19).

SKC's Position: SKC contends that "across the entire width" means "across the entire part in the direction (width direction, TD direction) perpendicular to the transferring direction (D direction) in which the film is continuously produced, the entire part being measured from the fixed ends of the film as it is transferred in the tenter furnace." SKC did not address the

construction of the phrase "across the entire width" in its initial post-hearing brief. In its reply post-hearing brief, SKC asserts that, although it does not necessarily agree with Kaneka's proposed construction, the term "across the entire width" no longer needs construction given the disputed issues defined by the parties' pretrial briefs.

Construction to be applied: "across the entire part in the direction perpendicular to the transferring direction in which the film is continuously produced."

The specification for the '961 patent explicitly defines the term "the entire width." For a patentee to serve as his own lexicographer and define a term in the specification, the definition must be clear. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) ("[T]he claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history."). Here, the patentee clearly set forth a definition for the term entire width. The '961 patent provides: "In the polyimide film of the present invention, the term 'entire width' means the entire part in the direction (width direction, TD direction) perpendicular to the transferring direction (MD direction) in which the film is continuously produced." (JX-4 at 7:49-53.)

SKC did not address this term in its post-hearing brief and therefore provided no support for its construction. (*See* RIB; RRB.) The phrase that SKC's construction adds to the definition provided in the specification—"the entire part being measured from the fixed ends of the film as it is transferred in the tenter furnace"—does not appear in the specification. (*See* JX-4.) Because SKC does not identify any support for this construction, and the specification includes a clear definition of the term "entire width," the proper construction for "across the entire width" is

"across the entire part in the direction perpendicular to the transferring direction in which the film is continuously produced."[9]

4. "Molecular Orientation Angle"

Kaneka's Position: Kaneka contends that the claims should not be limited to a film with a molecular orientation within a range of ± 20° of the MD direction of the film. Kaneka asserts that the '961 patent states that this feature is a preferred embodiment (citing JX-4 at 11:55-12:10) and the claims should not be limited to this preferred embodiment. Kaneka also asserts that dependent claims 16 and 17, and dependent claim 20 which depend from claims 1 and 9, respectively, contain the limitation "the molecular orientation angle is within 0 ± 20°." According to Kaneka, under the doctrine of claim differentiation, the presence of a dependent claim that adds a particular limitation raises a strong presumption that the limitation in question is not found in the independent claim.

SKC's Position: SKC asserts that Kaneka has waived this issue by failing to address this issue in its pre-hearing brief despite being aware of SKC's position since January 11, 2012. SKC asserts this issue was addressed in Dr. Thomas' rebuttal expert report and rebuttal witness statement.

SKC contends that the principle of prosecution disclaimer applies to the molecular orientation angle limitation recited in the '961 patent. According to SKC, the '961 patent expressly teaches that films with a molecular orientation angle outside the range 0 ± 20° are not within the disclosed and claimed invention. SKC cites JX-4 at col. 11 ll. 52-55, which provides: "Furthermore, in the present invention, the variation in the molecular orientation angle is

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[9] The examples "width direction," "TD direction" and "MD direction" included in the definition in the specification are not required to understand the proper meaning of the claim term and do not need to be included in the construction. *See Certain Mobile Devices and Related Software*, Inv. No. 337-TA-750, Initial Determination, 2012 WL 250320 (Jan. 13, 2012).

specified. Namely, the molecular orientation angle is specified so as to be within 0 ± 20° across the entire width of the polyimide film."

SKC further relies on documents written by Dr. Fujihara. SKC cites an email from Dr. Fujihara, a named inventor of the '961 patent. SKC contends this email reflects Dr. Fujihara's belief that the invention of the '961 patent is limited to MD-oriented films, i.e., smaller molecular orientation angles, and further reflects Dr. Fujihara's concerns that a competitor's product likely will not infringe the '961 patent because it has TD orientation. (Citing RX-532C at 2.) SKC also cites a technical report on the "MD orientation film," which discloses the molecular orientation of the film is within ± 20° of the MD direction. (Citing RX533C at 0055.)

Discussion and Conclusions: SKC has waived this issue because it was not addressed in the Joint Stipulation of Contested Issues. Ground Rule 8.3 requires that "[o]n or before the date set forth in the procedural schedule, the parties shall file a Joint Stipulation of Contested Issues. The issues to be tried are limited to those included in the Joint Statement and any amendments thereto permitted by the Presiding Judge." This issue was not raised in the Amended Joint Stipulation of Contested Issues filed on February 6, 2012[10] (*See* JSCI) even though SKC admits that it was aware no later than January 11, 2012 that it could take this position, which predates the original January 25, 2012 deadline for the Joint Stipulation of Contested Issues. SKC has no excuse for failing to raise this issue in the Joint Stipulation of Contested Issues. As a result, this issue was not properly raised by SKC and for that reason alone, SKC's arguments fail.[11]

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[10] Notably, SKC addressed this issue as one of "claim construction" in its post hearing brief (see RIB at 90-91) yet it also was not raised in the Amended Joint List of Proposed Constructions of Disputed Claim Terms filed on September 27, 2011.

[11] Normally, failure to address an issue in the pre-hearing brief would result in waiver. However, because this issue was not identified by SKC in the Joint Stipulation of Contested Issues, Kaneka had not received sufficient notice of this issue and there would be no basis to penalize Kaneka for failing to address this issue in its pre-hearing brief.

Assuming *arguendo* that this issue had been properly raised by SKC, the claims are not properly limited to a film with a molecular orientation within a range of 0 ± 20°. First, the doctrine of claim differentiation weighs against limiting claims 1 and 9 to a film with a molecular orientation within a range of 0 ± 20°. The doctrine of claim differentiation creates a presumption that each claim in a patent has a different scope. *SunRace Roots Enterprise Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1302-03 (Fed. Cir. 2003). "That presumption is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim." *Id.* Here, claims 16 and 17, and claim 20 depend from claims 1 and 9, respectively, and require "the molecular orientation angle [] is within 0 ± 20° []." Since this is the limitation that SKC is proposing be added to claims 1 and 9, the presumption is particularly strong that SKC's proposal is incorrect. As is clear from the discussion below, this is not a situation where the presumption of claim differentiation is overcome by the written description. *See, e.g., Eon-Net LP v. Flagstar Bancorp*, 653 F.3d 1314, 1321-22 (Fed. Cir. 2011).

SKC's citation to col. 11 ll. 52-55 of the '961 patent as disclaiming any orientation angles outside of the range of 0 ± 20° is not persuasive. "To balance the importance of public notice and the right of patentees to seek broad patent coverage, [the Federal Circuit] ha[s] thus consistently rejected prosecution statements too vague or ambiguous to qualify as a disavowal of claim scope." *Omega Engineering, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1326 (Fed. Cir. 2003). No such clear and unambiguous disavowal was made in the specification. Immediately following the portion of the '961 patent cited by SKC, the specification explains that the range of 0 ± 20° is a preferred range, *i.e.*, a preferred embodiment: "[t]hat is the molecular orientation

angle of 0 ± 20° which is ***preferred*** in the present invention . . . ." (JX-4 at 12:5-10 (emphasis added).) The value of 0 ± 20° merely being a preferred embodiment is consistent with the rest of the specification, which provides, in pertinent part: "[t]he direction of the molecular orientation angle ***may be any direction*** as long as the difference in the molecular orientation angle is 40° or less." (JX-4 at 11:44-46 (emphasis added).)

The use of the term "present invention" is not controlling here. Although the use of the phrase "present invention" in the specification can act as a limitation on the scope of the claims, "use of the phrase 'present invention' or 'this invention' is not always so limiting, such as where the references to a certain limitation as being the 'invention' are not uniform, or where other portions of the intrinsic evidence do not support applying the limitation to the entire patent." *Absolute Software Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1136 (Fed. Cir. 2011). As discussed above, the intrinsic evidence does not support limiting the molecular orientation angle to 0 ± 20°. Rather, a molecular orientation angle of 0 ± 20° is identified as being a preferred embodiment. As a result, the use of the term "present invention" is not controlling.

SKC's citation to documents drafted by Dr. Fujihara, a named inventor on the '961 patent, as evidence that the claims should be limited to a film with a molecular orientation within a range of 0 ± 20°, is unpersuasive. As discussed above, "while extrinsic evidence can shed useful light on the relevant art, [the Federal Circuit] ha[s] explained that it is less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005). Internal documents drafted by the named inventor of the '961 patent are undoubtedly extrinsic evidence, and should be discounted to the extent they are at odds with the intrinsic record. *See id.* at 1318; *see also Howmedica Osteonics Corp. v. Wright Medical Tech., Inc.* 540 F.3d 1337, 1346-47 (Fed. Cir. 2008) ("inventor

testimony as to the inventor's subjective intent is irrelevant to the issue of claim construction"). As noted above, the intrinsic record imposes no such limitation on the claims. As a result, the claims of the '961 patent are not properly limited to a film with a molecular orientation within a range of $0 \pm 20°$.

IV. INVALIDITY

A. Applicable Law

It is the respondent's burden to prove invalidity, and the burden of proof never shifts to the patentee to prove validity. *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1380 (Fed. Cir. 2008). "Under the patent statutes, a patent enjoys a presumption of validity, *see* 35 U.S.C. § 282, which can be overcome only through facts supported by clear and convincing evidence[.]" *SRAM Corp. v. AD-II Eng'g, Inc.*, 465 F.3d 1351, 1357 (Fed. Cir. 2006). The clear and convincing standard was recently reaffirmed by the Supreme Court. *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S.Ct. 2238 (2011) (upholding the Federal Circuit's interpretation of 35 U.S.C. § 282).

The clear and convincing evidence standard placed on the party asserting the invalidity defense requires a level of proof beyond the preponderance of the evidence. Although not susceptible to precise definition, "clear and convincing" evidence has been described as evidence which produces in the mind of the trier of fact "an abiding conviction that the truth of a factual contention is 'highly probable.'" *Price v. Symsek*, 988 F.2d 1187, 1191 (Fed. Cir. 1993) (citing *Buildex, Inc. v. Kason Indus., Inc.*, 849 F.2d 1461, 1463 (Fed.Cir.1988).)

1. Anticipation

"A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention. Moreover, a prior art reference may anticipate without

disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference." *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted).

"When no prior art other than that which was considered by the PTO examiner is relied on by the attacker, he has the added burden of overcoming the deference that is due to a qualified government agency presumed to have properly done its job[.]" *Am. Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1359 (Fed. Cir. 1984). Therefore, the challenger's "burden is especially difficult when the prior art was before the PTO examiner during prosecution of the application." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1467 (Fed.Cir.1990).

2. Obviousness

Section 103 of the Patent Act states:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

35 U.S.C. § 103(a) (2008).

"Obviousness is a question of law based on underlying questions of fact." *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008). The underlying factual determinations include: "(1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness." *Id.* (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966)). These factual determinations are often referred to as the "*Graham* factors."

"When no prior art other than that which was considered by the PTO examiner is relied

on by the attacker, he has the added burden of overcoming the deference that is due to a qualified government agency presumed to have properly done its job[.]" *Am. Hoist & Derrick Co.*, 725 F.2d at 1359. Therefore, the challenger's "burden is especially difficult when the prior art was before the PTO examiner during prosecution of the application." *Hewlett-Packard Co.*, 909 F.2d at 1467.

The critical inquiry in determining the differences between the claimed invention and the prior art is whether there is a reason to combine the prior art references. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417-418 (2007). In *KSR*, the Supreme Court rejected the Federal Circuit's rigid application of the teaching-suggestion-motivation test. The Court stated that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *Id.* at 418. The Court described a more flexible analysis:

> Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue...As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Id.

Since *KSR* was decided, the Federal Circuit has announced that, where a patent challenger contends that a patent is invalid for obviousness based on a combination of prior art references, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, . . . and would have had a reasonable expectation of success in doing so."

PharmaStem Therapeutics, Inc. v. Viacell, Inc., 491 F.3d 1342, 1360 (Fed. Cir. 2007).

In addition to demonstrating that a reason exists to combine prior art references, the challenger must demonstrate that the combination of prior art references discloses all of the limitations of the claims. *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1373-1374 (Fed. Cir. 2010) (upholding finding of non-obviousness based on the fact that there was substantial evidence that the asserted combination of references failed to disclose a claim limitation); *Velander v. Garner*, 348 F.3d 1359, 1363 (Fed. Cir. 2003) (explaining that a requirement for a finding of obviousness is that "all the elements of an invention are found in a combination of prior art references").

B. The '866 patent

1. Kohno

SKC's Position: SKC argues that U.S. Patent No. 5,849,397 ("Kohno"), which issued on December 15, 2008 from an application filed October 3, 1996, is Section 102(e)(2) prior art to the '866 patent. SKC contends that claims 1 to 3 are either anticipated by or at a minimum, rendered obvious over Kohno, "particularly in view of either Hamamoto[12] or Haller.[13]" (Citing RX-584C at Q. 222-258.) SKC says that in its pre-trial brief (at pages 44-45), Kaneka raises only one challenge to Kohno; that it did not disclose "chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines."

In its detailed argument, SKC has assigned numbers to various elements of the asserted claims, as follows: (1) "method for producing an adhesive polyimide film;" (2) "casting a composition into a film shape;" (3) "consists substantially of an organic solvent solution...;" (4)

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[12] U.S. Patent No. 5,308,569
[13] U.S. Patent No. 3,502,762

"heating the film shaped composition...;" (5) "increasing the temperature in a step-wise fashion...;" (6) "while adjusting ...;" and (7) "further heating said prefilm...; and (8) "chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines."[14]

SKC alleges that Kaneka does not dispute, that Kohno discloses the preamble (1) and claim elements (2) to (7), above. (Citing RX-584C at Q. 222-258.) SKC continues that with respect to the preamble (1), Kohno discloses a "polyimide film in the form of a continuous tape" and a method for preparing that film. (Citing RX-98 at 3:46-48; 3:49-4:45.) SKC says that for element (2), Kohno discloses casting a composition: a "dope solution is coated or spread on a plain surface of a temporary support (or substrate) such as a surface of a metallic drum or a metallic belt, to give a coated solution layer." (*Id.* at 4:9-12.) SKC states that Kohno's Example 1 discloses "[t]he dope solution . . . was continuously extruded onto a support having a smooth surface in a casting/drying oven . . . ." (*Id.* at 8:26-28; *see also* 4:9-12.) SKC concludes that Kohno discloses regarding element (3) that this composition includes an organic solvent solution of polyamic acid, explaining that its "dope solution" is derived from a "polyamide acid" prepared in an "organic polar solvent." (*Id.* at 3:50-65.)

Regarding elements (4) and (5), SKC avers that Kohno teaches that "[t]he solution layer is dried for 1 to 60 minutes in a drying zone comprising a plurality of zones having different drying temperatures within a range of 100 ° to 160 °C, to form a solidified continuous film." (Citing RX-98 at 4:12-15.) SKC says Kohno Example 1 heats a film shaped composition in a series of temperatures with an average temperature of 138 °C and a final temperature of 142 °C. *Id.* at 8:29-35. SKC asserts that consistent with the '866 patent, a "chemically cured prefilm,"

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[14] SKC alleges in a note that claim 2's use of "one or more" before "chemical curing agents" and of "a dehydrating agent" instead of "dehydrating agents" has been deemed a non-substantive difference by the parties throughout this investigation and, hence, this limitation is taught by the prior art for the same reasons provided for claim 1.

i.e., a self-supporting film that has not yet been heated above 200 °C, is formed. (Citing CX-1 at 12:26-28, 14:7-9.)

Regarding element (6) for claim 1, SKC says that Kohno teaches measuring the polyimide film's imidization ratio at different stages of the manufacturing process, including after the first heating between 110 and 160 °C, to obtain an imidization ratio of 10 to 60%, which is exemplified in Example 1's imidization ratio of 29%. (Citing RX-98 at 4:15-18 & 8:33-35.) For claim 2, SKC asserts that Kohno teaches measuring the polyimide film's volatile content at different stages of the manufacturing process, including after the first heating between 110 and 160 °C, to obtain a volatile content of 36 to 41%, which is exemplified in Example 1's volatile content of 39%. (Citing RX-98 at 4:15-18, 8:33-35, 6:13-18.) Similarly for claim 3, SKC states that Kohno teaches adjusting the amount of volatile content (as in claim 2), which Kohno explains includes the amount of solvent, and adjusting the imidation ratio (as in claim 1).

For element (7), SKC says that Kohno discloses further heating "in a curing apparatus for a period of 1 to 50 minutes under the conditions that the temperature elevates from approximately 100 °C. to the highest temperature of 350 ° to 500 °C. . . ," with Example 1 describing further heating to a highest temperature of 480 °C. (Citing RX-98 at 4:30-37, 8:36-49.) SKC says that while respondents maintain that the phrase "adhesive polyimide film" is indefinite, the resulting film of Kohno will have adhesive properties, at least under Kaneka's proposed construction and application of the '866 patent;[15] a conclusion that, according to SKC, Kaneka has never contested.

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[15] SKC says in a note that the '866 patent provides that "when the amount of volatile constituent of a prefilm is less than 40 weight %, the adhesive strength of a finished polyimide film is improved." (Citing CX-01 13: 25-27) SKC continues that Kohno Example 1 discloses a prefilm after a first heating with an amount of volatile constituent of 39%. (Citing RX-98 at 8:33-34) SKC adds that the '866 patent also provides that the highest temperature reached during heating influences adhesiveness, with an emphasis upon a highest temperature between 450 and 630 °C.

Focusing on element (8), SKC contends that, at page 45 of its pre-trial brief, Kaneka alleges, without evidence, that Kohno does not teach a chemical curing agent selected from the group consisting of dehydrating agents and tertiary amines. SKC counters that to anticipate, a prior art reference need only disclose one element in a Markush group. (Citing *Fresenius USA Inc. v. Baxter International Inc.*, 582 F.3d 1288, 1298 (Fed. Cir. 2009).) SKC elaborates that a "Markush group" is defined by the phrase "selected from the group consisting of A, B and C." (Citing *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1372 (Fed. Cir. 2005).)

SKC asserts that when describing its film shaped composition, Kohno explains that the composition may also include a dehydrating agent (one of the agents provided for in the claimed "Markush" group). SKC says that Kohno discloses "preferably add[ing]" a phosphorous-containing compound to the composition. (Citing RX-98 at 3:66-4:7.) SKC contends that when present, such as in the Examples, this phosphorous-containing compound serves as a dehydrating agent. (Citing RX-584C at Q. 230.) SKC asserts this is consistent with Kohno's express teaching that "the imidization reaction can be performed in the presence of a chemical imidizing agent at a lower temperature." (Citing RX-98 at 4:46-48.) SKC concludes that Kohno anticipates this limitation by disclosing the use of a dehydrating agent.

SKC adds that, even if the chemical curing agent is missing, the inclusion of this limitation in Kohno's process would be obvious in view of the teachings of either U.S. Haller or Hamamoto), respectively. SKC contends that Haller, discloses "treatment with acid anhydride [*i.e.*, dehydrating agent], preferably in the presence of a tertiary amine catalyst," characterizing the process in 1970 as "conventional." (Citing RX-78 at 1:64-2:5.) SKC states that Hamamoto

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(Citing CX-01 at 14:22-26, 15: 26-36) SKC concludes that Kohno Example 1 discloses heating to a highest temperature of 480 °C. (Citing RX-98 at 8:41-42)

similarly discloses using chemical imidization agents such as tertiary amines, which may be used in combination with lower carboxylic acid anhydrides (dehydrating agents) to "avoid such problems as . . . deterioration of physical properties." (Citing RX-90 at 1:44-62.) SKC reasons that since the use of dehydrating agents and tertiary amines as chemical curing (imidizing) agents with polyamide acids, such as those of Kohno, to form polyimides is both conventional and advantageous, it would be obvious to a person of ordinary skill in the art to do so. (Citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).)

SKC says that Kaneka alleges a lack of motivation to add chemical curing agents when Kohno supposedly achieved its intended results without them. (Citing CPHB at 45.) SKC argues that Kaneka fails to address Kohno's express suggestion to use chemical imidizing agents (citing RX-98 at 4:46-48) and Haller's and Hamamoto's teachings that such chemical imidizing agents are conventional and provide known advantages over simple heat curing.

In its reply brief, SKC says Kaneka's sole argument against Kohno (alone or in combination with Haller and Hamamoto) is whether it discloses "chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines." (Citing CIB at 41, 45.)

SKC alleges that Kaneka does not dispute that Kohno teaches "preferably add[ing]" a phosphorous-containing compound to its polyamide acid. (Citing RX-98 at 3:66-4:7.) SKC asserts that when present, such as in the Kohno Examples, this phosphorous-containing compound serves as a dehydrating agent. (Citing RX-584C at Q. 230.) SKC avers that Dr. Harris does not say that SKC is wrong; but that the results of the Examples could have been achieved by heat curing alone. (Citing CX-644C at Q.48.) SKC argues that its position is consistent with Kohno's express teaching that "the imidization reaction can be performed in the presence of a chemical imidizing agent." (Citing RX-98 at 4:46-48; CX-2 at 14:31-32.)

SKC contends that the inclusion of a chemical curing agent in Kohno's process would, nevertheless, be obvious to one of ordinary skill in the art in view of the teachings of either Haller or Hamamoto. SKC alleges that Kaneka does not deny that Haller and Hamamoto disclose the use of dehydrating agents and tertiary amines. (Citing CIB at 45.) SKC says that Kaneka alleges, without support, that there is no motivation to combine these teachings. (*Id.*) SKC counters that Kaneka ignores Kohno's insistence that its "imidization reaction can be performed in the presence of a chemical imidizing agent . . . ." (Citing RX-98 at 4:46-48.) SKC adds that Kaneka ignores Haller's teaching that it has been "conventional" to use these agents in polyimide manufacturing processes since 1970 (citing RX-78 at 1:64-2:5) and Hamamoto's teaching that such agents provide a benefit of "avoid[ing] such problems as . . . deterioration of physical properties." (Citing RX-90 at 1:44-62.) SKC concludes that where the use of dehydrating agents and tertiary amines as chemical curing agents with polyamide acids, such as those of Kohno, to form polyimides is both conventional and advantageous, it would be obvious to a person of ordinary skill in the art to do so. (Citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).)

Kaneka's Position: Kaneka argues that Kohno lacks key elements of Claims 1-3 of the '866 patent. (Citing CX-644C at Q. 46.)

Kaneka asserts that every claim of the '866 patent requires the presence of "chemical curing agents" and the production of a "chemically cured prefilm" after step-wise heating. (Citing CX-644C at Q. 47.) Kaneka says that Dr. Thomas concedes that Kohno is silent as to the curing process, but speculates that, based on the Examples of Kohno, a phosphorous-containing compound (such as (poly)phosphoric acid ester or an amine salt of phosphoric acid ester) is apparently used as a chemical curing agent. (Citing RX-584C at Q. 230.) Kaneka asserts that as

Dr. Harris testified, Kohno does not disclose the use of chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines. (Citing CX-644C at Q. 48.)

Kaneka adds there is nothing in Kohno that suggests chemical curing was used since all of the results in Kohno, including the obtained imidization ratio and percentage of volatile constituents could have been achieved with heat curing alone. (Citing CX-644C at Q. 48.)

In its reply brief, Kaneka says that SKC asserts that Kaneka raised only one challenge to Kohno in its pre-trial brief: that it did not disclose chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines. Kaneka says this is incorrect, because in its pre-trial brief, Kaneka also argued that there is nothing in Kohno that suggests chemical curing was used. (Citing CPHB at 44-45.) Kaneka argues that for both of these reasons, Kohno does not anticipate the '866 patent.

Kaneka argues that claims 1-3 of the '866 patent each require the presence of "chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines." (Citing CX-644C at Q. 47; CX-1.) Kaneka contends that this claim element is not present in Kohno, and that Dr. Thomas, has conceded that Kohno is silent as to the curing process. (Citing RX-584C at Q. 230.) Kaneka adds that "it is undisputed" that Kohno does not disclose the use of tertiary amines. (Citing Tr. at 869:11-869:22.) Kaneka notes that SKC contends that Kohno discloses the use of a dehydrating agent; but says that SKC fails to bring forth any credible evidence in support. Kaneka asserts that Kohno "only discloses 'preferably add[ing]' a phosphorous-containing compound to the composition." (Citing RX-98 at 3:66-4:7.) Kaneka contends that Kohno does not in any way indicate that this "phosphorous-containing compound" is a dehydrating agent. Kaneka adds that "Dr. Thomas's speculation regarding this reference" does not provide the necessary proof to meet SKC's burden. Kaneka says, "[d]espite conceding

that [Kohno] lacks a clear statement, Dr. Thomas speculates that it '***appears*** that the phosphorous-containing compound is a chemical curing agent.'" (Citing RX-584C at Q.230.) Kaneka concludes that "Dr. Thomas's conjecture does not address whether the phosphorous-containing compound is a 'dehydrating agent.'"

Kaneka asserts that claims 1-3 of the '866 patent each require the formation of a chemically cured prefilm. (Citing CX-1; CX- 644C at Q. 47.) Kaneka says that SKC's own expert Dr. Thomas conceded that the '397 patent is silent as to the curing process. (Citing RX-584C at Q. 230; CX-644C at Q. 47.) Kaneka adds that there is nothing to suggest that the '397 patent teaches the chemical curing of the '866 patent and, in fact, all of the results in the '397 patent, including the obtained imidization ratio and percentage of volatile constituents, could have been achieved with heat curing alone. (Citing CX-644C at Q. 48.)

Kaneka contends that Dr. Thomas's analysis again demonstrates his lack of experience and understanding of commercial manufacturing of polyimide films. Kaneka says that the process disclosed in the '397 patent does not discuss chemical curing and includes a heating period of up to 30 hours. Kaneka reasons, not only would this be impractical in any commercial manufacturing setting; but Dr. Thomas admitted that he does not know of anyone in the industry that would use a method that required up to 30 hours of heating. (Citing Tr. at 869:23-871:7.)

Discussion and Conclusions: Based on the evidence in the record, I find that SKC failed to offer clear and convincing evidence that Kohno anticipates any of claims 1-3 of the '866 patent.

Kaneka challenges SKC's assertion that Kohno anticipates asserted claims 1-3 of the '866 patent and bases its challenge on the absence of disclosure of two elements, to wit: (1)

chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines; and (2) creation of a "chemically cured prefilm" after step-wise heating.[16]

SKC's response is not convincing when it refers to the testimony of its expert, Dr. Thomas, who conceded that Kohno does not expressly recite the inclusion of "chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines;" but suggested that "based upon the examples it appears that the phosphorous-containing compound is a chemical curing agent." (RX-584C at Q. 230.) SKC argues that to anticipate, a prior art reference need only disclose one element in a Markush group; but here there is no clear showing that even one element of the recited group is present[17]. Dr. Thomas's reference generally to "the Examples" in Kohno and the brief mention of a chemical imidizing agent without further detail at column 4, lines 46-48 in Kohno lacks the detail needed to clearly establish that Kohno discloses this element. I note that Dr. Thomas conceded that Kohno does not disclose the use of tertiary amines. (Tr. at 869:11-869:22.) I find that SKC has failed to demonstrate by clear and convincing evidence that Kohno teaches or discloses the inclusion of "chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines."

I find, too that there is no showing that the required term is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherent anticipation requires that the missing descriptive material is "necessarily present," not merely probably or possibly present, in the prior art. *Rosco Inc., v. Mirror Lite Co.,* 304 F.3d

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[16] While claims 1, 2 and 3 do not repeat these elements verbatim, they each contain nearly identical elements requiring both of the elements discussed herein. They are, therefore, treated together here. (*See* CX-1 at 21:34-36, 21:38-40, 21:61-64, 22:2-4, 22:13-15, 22:17-19.)

[17] While SKC contends that CX-2 at 14:31-32 reveals that "chemically imidizing catalyst is a tertiary amine," the reference cited is incorrectly taken out of context. That passage of the '639 patent is a dependent claim which merely states, "[t]he process of claim 1, wherein said chemically imidizing catalyst is a tertiary amine." Requiring this additional language to further limit claim 1 of the '639 patent demonstrates that a chemically imidizing catalyst, to which reference is made in claim 1, is not necessarily a tertiary amine. Otherwise the further limitation of claim 6 would be unnecessary. (CX-2 at 14:16-18, 14:31-32.)

1373, 1380 (Fed. Cir. 2002). Lacking this single element, Kohno does not anticipate asserted claims 1-3 of the '866 patent.

In addition, Kaneka argues that Kohno fails to disclose the additional element that requires creation of a "chemically cured prefilm" after step-wise heating. This issue was fairly raised in Kaneka's prehearing brief at page 45 and again in its initial post-hearing brief. Yet, SKC fails to address the issue in its treatment of alleged anticipation of the '866 patent by Kohno.

Kaneka's expert, Dr. Harris, testified that there is nothing in Kohno that suggests chemical curing was used, since all of the results in Kohno, including the obtained imidization ratio and percentage of volatile constituents, could have been achieved with heat curing alone. (CX-644C at Q. 48.) This testimony is unanswered and undisputed by SKC. I find that SKC has failed to meet its burden to demonstrate by clear and convincing evidence that Kohno discloses the formation of a chemically cured prefilm after step-wise heating.

Based upon all of the foregoing, I find that SKC has failed to prove by clear and convincing evidence that Kohno anticipates any of claims 1, 2 or 3 of the '866 patent.

2. Haller

SKC's Position: SKC contends that U.S. Patent No. 3,502,762 ("Haller"), which issued in 1970, is Section 102(b) prior art to the '866 patent, and claims 1 to 3 are either anticipated by or at a minimum, rendered obvious over Haller, "particularly as evidenced by or in view of Hamamoto." (Citing RX-584C at Q. 158-192.) SKC, using a numbering system similar to that in the previous section of its brief, says that Kaneka's pre-trial brief (pages 42-44) raises two challenges to Haller, to wit: that it discloses neither "increasing temperature in a step-wise fashion . . ." nor "while adjusting . . . ."

The numbers that SKC has assigned various elements of the asserted claims for purposes of this discussion are, as follows: (1) "method for producing an adhesive polyimide film;" (2) "casting a composition into a film shape;" (3) "consists substantially of an organic solvent solution…;" (4) "consists substantially of … chemical curing agents;" (5) "heating the film shaped composition…;" (6) "further heating said prefilm…; (7) "increasing the temperature in a step-wise fashion…" and (8) "while adjusting …"

SKC alleges that the record establishes, and Kaneka does not dispute, that Haller discloses the preamble (1) and claim elements (2) to (6), above. SKC says that regarding the preamble (1), Haller states that Example 3 "describes a continuous process for producing polyimide film in accordance with this invention." (Citing RX-78 at 4:19-20.) With respect to elements (2), (3), and (4), SKC says that Haller Example 3 discloses that its "thoroughly mixed solution was pumped into a sheeting die, from which it emerges as a fluid film. . . and was extruded on a rotating steel casting roll . . . ." (*Id.* at 4:36-40.) SKC adds that Haller Example 3 further discloses the mixed solution is formed by mixing a polyamide-acid solution with dimethyl acetamide, an organic solvent; acetic anhydride, which is a dehydrating agent; and pyridine, which is a tertiary amine. (Citing RX-78 at 4:28-35; RX-584C at Q. 161.) For element (5), SKC asserts that Haller Example 3 teaches heating a film shaped composition initially on "a steel casting roll heated to approximately 150 °F." (Citing RX-78 at 4:40.) SKC says that is equal to about 66 °C. (Citing RX-584C at Q.162.) Finally, for element (6), SKC avers that Haller Example 3 teaches that the film is wound on a winder roll, transferred to a forced air oven, and then further heated at 600 °F, which is about 315 °C, on a tentering frame. (Citing RX-78 at 4:49-59; RX-584C at Q. 176.) SKC contends that while it maintains that the phrase "adhesive polyimide film" is indefinite, the resulting film of Haller will have adhesive properties, at least

under Kaneka's proposed construction and application of the '866 patent;[18] a conclusion never contested by Kaneka.

Regarding element (7), SKC argues that Haller discloses that after the initial heating, the film of Example 3 is stripped from the casting roll, and then "passed around a stack of 7 hot cans" with the first can at 150 °F and "the temperature of succeeding cans being increasingly higher until the last can, which was maintained at 215 °F," which is equivalent to about 102 °C. (Citing RX-78 at 4:43-49; RX-584C at Q.163-166.) SKC says that Kaneka criticizes this disclosure, arguing that "[t]he '866 patent does not disclose step-wise heating of a chemically cured prefilm." (Citing CPHB at 42-43.) SKC argues that the question is not what the '866 patent discloses, but what it claims. SKC concludes that nothing in the language of claim 1 precludes a stripping step at any point in the claimed method, much less between the initial heating and the subsequent step-wise heating. (Citing *iLOR, LLC v. Google, Inc.*, 631 F.3d 1372, 1378 (Fed. Cir. 2011).)

SKC continues that the result of this step-wise heating is a chemically cured prefilm, *i.e.*, a self-supporting film that has not yet been heated above 200 °C. (Citing CX-1 at 12:26-28, 14:7-9.) SKC says it is understood that the properties of prefilms change during stepwise heating, resulting in the formation of successive, chemically cured prefilms, as the heating process proceeds. (Citing RX-584C at Q.164-166.) SKC concludes that as long as the stripped film is heated at successive temperatures below 200 °C, which Haller does, then a chemically cured prefilm is obtained at each stage of the step-wise heating. (*Id.*)

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[18] SKC says that the '866 patent provides that "when the amount of volatile constituent of a prefilm is less than 40 weight %, the adhesive strength of a finished polyimide film is improved." (Citing CX-1 at 13:25-27.) SKC adds, Haller Example 3 discloses that the process reduced the total weight percentage of all of the volatile constituents down to 16.2% in the prefilm. (Citing RX-78 at 4:55.)

SKC contends that Haller also anticipates step (8), the "while adjusting..." step, of claims 1, 2, and 3. SKC alleges that Haller, like the '866 patent, discloses heating a film shaped composition at different temperatures. (Citing RX-78 at 4:43-49.) SKC says for claim 1, it was well known to persons of ordinary skill in the art at the time the '866 patent was filed that adjusting, *i.e.*, changing, the degree of imidation and, therefore, the imidation ratio, is a necessary result of the conversion from poly(amic acid) to polyimide, upon such heating of the film. (Citing RX-584C at Q. 167-170.) SKC says that Hamamoto confirms this phenomenon, explaining that heating a prefilm below 200 °C will result in imidation of that film, and that the degree of this imidation can be quantified in a ratio by using infrared spectroscopy. (Citing RX-90 at 6:3-44, 7:12; RX-584C at Q. 171-173.)

SKC argues that since Haller teaches heating the polyimide film, the patent anticipates the claim step of adjusting an imidation ratio by heating. (Citing *Toro Co. v. Deere & Co.*, 355 F.3d 1313, 1321 (Fed. Cir. 2004).) SKC contends that it is not necessary for Haller to explicitly disclose adjusting the imidation ratio of the prefilm since Hamamoto makes clear that the missing feature is necessarily present, as would be recognized by persons of ordinary skill in the art. (Citing *Schering Corp. v. Geneva Pharm.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003).) SKC argues that even if not inherent, it would have been obvious to adjust Haller's process in Example 3 in view of Hamamoto's teaching that such heating will result in a measureable change in imidation ratio. (Citing RX-584C at Q. 174-175.) SKC says that the ordinarily skilled artisan would consider the teachings of the patents together because both are directed to the same art, and Hamamoto simply teaches how to apply a known analytical technique to a known chemical process to evaluate the degree of imidation. (Citing *KSR Int'l Co.*, 550 U.S. at 416.)

SKC says that Kaneka tries to avoid Haller's inherent disclosure by arguing that "'adjusting an imidation ratio' means something more than simply 'changing' the imidation ratio, it requires changing the imidation ratio so it corresponds or conforms to a desired value." (Citing CPHB at 44.) SKC asserts that Kaneka cites to no supporting intrinsic evidence or law, because none exists. SKC argues even if correct, the same conclusion of invalidity still applies. SKC says that Hamamoto expressly teaches adjusting to a desired value, namely "25-80% (particularly 25-60%)." (Citing RX-90 at 6:9-10.)

Addressing the claim 2 "while adjusting...." limitation, SKC asserts that Example 3 of Haller discloses heating the prefilm to adjust its solvent content to 16.2%. (Citing RX-78 at 4:55.) SKC offers that such an adjustment in volatile content, of which solvent is included, is necessarily expected. (Citing RX-584C at Q. 183-184; RX-574C at 65:7-14; RX-580C at 40:11-13, 15.) SKC contends that this is also evident from Hamamoto's teaching of a "loss in weight on heating" test that is nearly identical to the '866 patent's measurement of volatile constituents, aiming to conform to a value of 25-45%. (Citing RX-90 at 6:2-19; CX-1 at 13:13-22.) SKC concludes if not an inherent result, it would have been obvious to combine the teachings of Haller and Hamamoto, for the same reasons provided for claim 1.

Regarding claim 3, SKC argues that following the same rationale addressed for claims 1 and 2, Haller with or without Hamamoto teaches adjusting the imidation ratio and the amount of volatile content, which necessarily includes adjusting the amount of solvent to conform to a value.

In its reply brief, SKC argues Kaneka limits its criticism of Haller (alone or in combination with Hamamoto, the '569 patent) to whether it discloses "increasing temperature in a step-wise fashion . . ." and "while adjusting . . . ." (Citing CIB at 39-41, 44-45.)

SKC alleges that regarding "increasing temperature in a step-wise fashion," Kaneka does not deny that Haller's Example 3 constitutes step-wise heating. (Citing CIB at 40.) SKC says rather it criticizes the stripping of the film from the casting roll before the step-wise heating to fabricate a distinction between heating *of* and heating *to form*, when none exists. (*Id.*) SKC avers that nothing in the claims precludes a stripping step at any point in the claimed method, much less between the initial heating and the subsequent step-wise heating. (Citing *iLOR*, 631 F.3d at 1378.) SKC asserts that the result of Haller Example 3's step-wise heating is *to form* a chemically cured prefilm. (Citing RX-584C at Q. 164-166.)

With respect to the "while adjusting…" step, SKC contends that it is not necessary for Haller to explicitly disclose adjusting the imidation ratio and volatile constituent/organic solvent amounts. SKC asserts that Hamamoto establishes that these features are necessarily present in Haller's teachings, and would be recognized by persons of ordinary skill in the art. (Citing *Schering.*, 339 F.3d at 1377.) SKC charges that Kaneka tries to evade Haller's inherent disclosure by arguing that "adjusting" means more than simply "changing;" requiring the element to "correspond or conform to a desired value." (Citing CIB at 40.) SKC criticizes the argument as vague. SKC alleges that Kaneka cites to no supporting intrinsic evidence or law, and says that none exists.

Kaneka's Position: Kaneka says as its expert testified, Haller does not anticipate because it is missing several key limitations found in claims 1-3 of the '866 patent. (Citing CX-644C at Q. 35.) Kaneka alleges that Dr. Thomas admitted at the evidentiary hearing that the '866 patent issued because it was different from Haller, thus undermining his own conclusions. (Citing Tr. at 668:22-24.)

Kaneka argues that Haller lacks the "step-wise heating of the film shaped composition to

form a chemically cured prefilm" that is required in asserted claims 1-3. (Citing Tr. at 667:25-668:24; RX-78.) Kaneka avers that Haller simply describes formation of a chemically cured prelim after heating at only *one* temperature, 66°C, while on the casting roll. (Citing CX-644C at Q. 37.)

Kaneka says it was only after the "gelled prefilm" was formed, that it was stripped from the casting roll and heated by passing over "hot cans" with increasingly higher temperatures. (Citing CX-644C at Q. 37.) Kaneka asserts that the '866 patent does not disclose step-wise heating ***of*** a chemically cured prefilm; it discloses "step-wise [heating] such that solvent is evaporated ***to form*** a chemically cured prefilm." (Citing CX-644C at Q. 37.) Kaneka adds that Dr. Thomas's limited understanding of Haller and other references was made apparent under questioning at the hearing.

Kaneka argues that Haller is also missing the "while adjusting an imidation ratio" limitation of the '866 patent. Kaneka states that Dr. Harris testified that, while it is true that it is well known in the art that heating a prefilm will inherently change its imidation ratio, this is not the same as "adjust" as claimed in the '866 patent. (Citing CX-644C at Q. 41-44.)

Kaneka asserts that Dr. Thomas conceded on cross-examination that Haller was, in fact, different from the '866 patent, and testified that "if it was the same, the '866 wouldn't be granted by the Patent Office." (Citing Tr. at 668:22-24.)

Kaneka says that Dr. Thomas also believed that Haller anticipates the '866 patent, as evidenced by Hamamoto; but nothing in Hamamoto addresses this missing "step-wise heating of the film-shaped composition to form a chemically cured prefilm" element. (Citing CX-644C at Q. 40.) Kaneka adds that neither Haller nor Hamamoto disclose the limitation "while adjusting" either imidation ratio, amounts of volatile constituent, or imidation ratio and amount of organic

solvent. (Citing CX-644C at Q. 41-44.)

Kaneka asserts that Dr. Thomas provides similar arguments with respect to the adjustment of volatile constituents/organic solvents in claim 2, and claims that Haller discloses that heating the prefilm "adjusts" volatile constituents/organic solvents. Kaneka argues that Dr. Thomas is equating "adjust" with "change." Kaneka says while Haller discloses that heating the prefilm changed its solvent level, it did not "adjust" the solvent level to correspond or conform to a desired value, as is required by the '866 patent. (Citing CX-644C at Q. 44.) Kaneka concludes that neither Haller nor Hamamoto disclose such adjustment of volatile constituents/organic solvents. (Citing CX-644C at Q. 44.)

In its reply brief, Kaneka argues that Haller does not disclose the "increasing the temperature in a step-wise fashion such that solvent is evaporated to form a chemically cured prefilm" and "while adjusting" limitations of claims 1-3 of the '866 patent. Kaneka reasons that accordingly, Haller cannot anticipate the '866 patent.

Kaneka says that SKC contends that Example 3 of Haller discloses the step-wise heating of the '866 patent; but counters that this is not correct. Kaneka argues that nothing in Haller, including Example 3, discloses step-wise heating *to form* a chemically cured prefilm, as disclosed in the '866 patent. Kaneka says Haller only discloses step-wise heating *of* a chemically cured prefilm after the prefilm has already been formed.

Kaneka says that SKC argues that this distinction is not significant; but, as SKC argued in its Initial Post-trial Brief, "[t]he question, however, is not what the '866 patent discloses, but what it claims." Kaneka contends that following this line, the '866 patent specifically claims "increasing the temperature in a step-wise fashion such that solvent is evaporated *to form* a chemically cured prefilm." (Citing CX-1 at 31:38-40.)

Kaneka adds that the process disclosed in Haller is analogous to that disclosed in Hamamoto, above, which Dr. Thomas admitted was not the same as the '866 patent. Kaneka states that in Hamamoto, a cast solution was also heated at a single temperature (140° C) to obtain a prefilm. Kaneka says the already-formed prefilm was then heated in a step-wise fashion. Kaneka reiterates that this step-wise heating *of* a formed prefilm is distinct from "increasing the temperature in a step-wise fashion such that solvent is evaporated *to form* a chemically cured prefilm," as claimed in the '866 patent. Kaneka concludes that, because Dr. Thomas conceded that Hamamoto did not disclose the step-wise heating of the '866 patent, it is disingenuous for SKC to now argue that the analogous process in Haller does disclose this very limitation.

Kaneka argues that the "while adjusting ..." limitation is not disclosed or taught by Haller. Kaneka asserts that SKC assumes that this limitation is disclosed in Haller, because it was well known in the art that heating adjusts imidation ratio and level of volatile constituents; but this is not accurate. Kaneka concedes it is true that it was well known that heating *changes* imidation ratio and level of volatile constituents; but Kaneka argues this is not the same thing as "*adjusting*." (Citing CX-644C at Q. 41-44.) Kaneka argues that SKC "seeks to confuse the Commission" by arguing that the terms "change" and "adjust" are interchangeable; but the ordinary meaning of adjust is not simply "change." Kaneka posits that the term "adjust" means to make correspondent or conformable, as Dr. Harris confirms. (Citing CX-644C at Q. 43.)

Kaneka argues that, in the context of the '866 patent, the phrase "adjusting an imidation ratio" means something more than simply "changing" the imidation ratio: one must modify the imidation ratio so that it corresponds or conforms to a desired value. (Citing CX-644C at Q. 43.) Kaneka says this is consistent with the teachings of the '866 patent, which explicitly discloses

how to *adjust* the imidation ratio: "[t]he...imidation ratio can be adjusted by controlling the temperature and heating time in the belt chamber." (Citing CX-1 at 14:3-5.) Kaneka adds that the specification also discloses the desired imidation ratio ranges to achieve a film with an excellent adhesive property. (Citing CX-1 at 13:62-64.)

Kaneka alleges that the same applies to adjusting the level of volatile constituents. (Citing CX-644C at Q. 17, 44.) Kaneka argues that SKC cannot point to anything in Haller that even suggests that imidation ratio was changed to correspond or conform to a desired value. With respect to level of volatile constituents, Kaneka says SKC notes that Haller discloses heating the prefilm to adjust its solvent content to 16.2%; but this does not disclose *adjusting* – it only represents that a particular value was achieved.

Discussion and Conclusions: Based on the evidence in the record, I find that SKC failed to offer clear and convincing evidence that Haller anticipates any of claims 1-3 of the '866 patent.

Kaneka challenges SKC's assertion that Haller anticipates asserted claims 1-3 of the '866 patent and bases its challenge on the absence of disclosure of two elements, to wit: (1) the "step-wise heating of the film shaped composition to form a chemically cured prefilm" that is required in asserted claims 1-3; and (2) the "while adjusting an imidation ratio" limitation of claims 1 and 3, and the "adjustment of volatile constituents/organic solvents" of claim 2.

Regarding the "step-wise heating" element, SKC concedes that Haller discloses that after the initial heating, "the film of Example 3 is stripped from the casting roll, and then 'passed around a stack of 7 hot cans' with the first can at 150° F and 'the temperature of succeeding cans being increasingly higher until the last can, which was maintained at 215° F,' which SKC alleges is equivalent to 'about 102° C.'" (RX-78 at 4:43-49; RX-584C at Q.163-166.) SKC argues

incorrectly that "the result of this step-wise heating is a chemically cured prefilm, *i.e.*, a self-supporting film that has not yet been heated above 200 °C." (CX-1 at 12:26-28, 14:7-9.) In fact, Haller makes clear that what occurs is that the "gelled film was then stripped from the casting roll and passed around a stack of 7 hot cans." (RX-78 at 4:43-45.)

While it is true, as SKC argues, that use of the term "comprising" in a claim allows for elements in addition to those required by the claim,[19] it does not provide a vehicle for completely changing the nature of the process or product contemplated in the invention. The Federal Circuit has devised a two-part test for determining if the steps of a method claim that do not otherwise recite an order must nonetheless be performed in the order in which they are written. *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369 (Fed. Cir. 2003). The first step is to look to the claim language to determine if, as a matter of logic or grammar, they must be performed in the order written. *Id.* If not, the second step requires looking at the rest of the specification to determine whether it directly or implicitly requires such a narrow construction. *Id.* at 1370.

Regarding the first step of the test, if the language of the steps of a method claim refer to the completed results of the prior step, it can be concluded that the claimed steps must be performed in order. *E-Pass Techs., Inc., v. 3 COM Corp,* 473 F.3d 1213, 1222 (Fed. Cir. 2007); *Mantech Envtl. Corp. v. Hudson Envtl. Servs., Inc.,* 152 F.3d 1368, 1375-1376 (Fed. Cir. 1998).

The claims of the '866 patent teach a specific process, in which each step of the method refers to the completed results of the prior step, to wit:

> ***casting a composition into a film shape ...***
>
> heating ***the film shaped composition*** at an initial temperature of 200° C. or less, and thereafter increasing the temperature in a step-wise fashion such that solvent is evaporated ***to form a chemically cured prefilm*** ...

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[19]See *iLOR, LLC v. Google, Inc.*, 631 F.3d 1372, 1378 (Fed. Cir. 2011), cited by SKC.

* * * * *

and

further heating ***said prefilm*** to obtain an adhesive polyimide film.

(CX-1 at 21:37-56, 22:1-7, 22:16-37) (Emphasis added). Thus, because Haller does not teach heating the film shaped composition at an initial temperature and then increasing the temperature in a step-wise fashion to form a chemically cured prefilm and ***then*** further heating said prefilm to obtain an adhesive polyimide film, it does not disclose the process described in the '866 patent.

Regarding the second of the two elements that Kaneka claims are not disclosed by Haller, Dr. Harris testified credibly that the phrase "adjusting an imidation ratio" means something more than simply "changing" the imidation ratio. Rather, one must modify the imidation ratio so that it corresponds or conforms to a desired value. (CX-644C at Q. 43.) Kaneka argues convincingly that this is consistent with the teachings of the '866 patent, which explicitly discloses how to *adjust* the imidation ratio: "[t]he ... imidation ratio can be adjusted by controlling the temperature and heating time in the belt chamber." (CX-1 at 14:3-5.) Kaneka is correct, too, that the specification also discloses the desired imidation ratio ranges to achieve a film with an excellent adhesive property. (CX-1 at 13:62-64.) Dr. Harris testified similarly that the same logic applies to adjusting the level of volatile constituents. (CX-644C at Q. 17, 44.) Kaneka is correct that Haller does not suggest that an imidation ratio was changed to correspond or conform to a desired value.[20]

The intrinsic record supports Dr. Harris's testimony and Kaneka's position. The original filing at the PTO included the adjusting language, and the claims were rejected in a June 13,

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[20]SKC's only attempt to show otherwise refers to Hamamoto rather than Haller. (RIB at 41.)

1999 Office action as indefinite because, *inter alia*, no specific "imidization ratio"[21] was identified in the specification. (JX-5 at 102.) In response to this office action, the application was amended to clearly indicate that an imidization "ratio" was intended and traversed the rejection. The application included specific adjusted imidization ratio of 70% or more and an adjusted amount of volatile constituent of 40% or less. (JX-5 at 116-118.)

The applicants explained that the adhesive properties of the film is controlled by adjusting imidation ratio and volatile constituent of a prefilm obtained only by a chemical curing and by adjusting the temperature in a heating treatment of the prefilm in course of producing a film. (JX-5 at 119.) The applicants provided a detailed description of the method of adjusting both the imidation ratio and the amount of volatile constituent, including specific formulae for measuring/calculating the results. (*Id.* at 119-120)

The applicants stated:

> It is clear from the Examples of the present application that the adhesiveness of polyimide film can be controlled by adjusting imidation ratio and/or volatile constituent of a prefilm and/or the highest temperature of heating the prefilm. A prefilm of high imidation ratio and low volatile constituent and/or high temperature of heating the prefilm can lead an excellent adhesiveness of a polyimide film as clearly shown in table 1 in page 31 of the specification.
>
> See Examples 11 and 12 in which imidation ration (sic) of a prefilm is more than 90% and volatile constituent of a prefilm is less than 20% and the adhesiveness of obtained polyimide film is no less than 1.63 or 1.7. ***Such a method for improving adhesiveness of a resultant polyimide film by controlling parameters of a prefilm in a course of producing the film is completely novel and unobvious in view of the prior art.*** Moreover, the method of the present invention is simple and results in the same or higher adhesiveness of a polyimide film compared to the film treated by conventional methods, such as liquid treatment and discharge treatment. The present invention would not be conceived by those ordinary skilled in the art.

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[21] The examiner noted that the word "rate" appeared and expressed the opinion that the applicants meant to say "ratio."

(JX-5 at 120) (Emphasis added).

The examiner continued to reject the claims on other grounds (*See* discussion in Section III.B.2, *supra.*), and the applicant, in distinguishing the invention from the prior art reference of Kunimoto '307, said:

> the claimed invention uses a chemical-curing process followed by a heat-treating process to enhance imidation during polyimide film production, and thus enhance adhesiveness of the final polyimide film. ... ***Adjusting the imidation ratio and/or adjusting the amount of organic solvent within preferred ranges during chemical curing enhances the adhesive properties of the finished polyimide film prepared by the claimed method.***

(JX-5 at 132-133) (Emphasis added).

The applicants' entire focus on this one issue was to ***control*** the imidation ratio and the level of volatile constituent within preferred ranges. Use of the word "adjusting" in this context denotes something more than an uncontrolled "change" in the imidation ratio and level of volatile constituent. Change, on the other hand, is what is illustrated in Haller. SKC mischaracterizes the language of Haller, when it argues that Haller "discloses heating the prefilm to adjust its solvent content to 16.2%." (RRB at 41) Haller does nothing of the kind; it merely states that "[a]s wound up the film contained 16.2% solvent." (Rx-78, 4:56) Nowhere in Haller does the inventor make an attempt to "adjust" or "control" the level of the solvent within any specific tolerances.

In its reply brief, SKC counters that it is not necessary for Haller to explicitly disclose adjusting the imidation ratio and volatile constituent/organic solvent amounts; but that argument is based upon a separate reference to Hamamoto and cannot serve to establish anticipation by Haller. (RIB at 19.)

I find, too that there is no showing that the required term is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.

Inherent anticipation requires that the missing descriptive material is "necessarily present," not merely probably or possibly present, in the prior art. *Rosco,* 304 F.3d at 1380.

Based upon all of the foregoing, I find that SKC has failed to prove by clear and convincing evidence that Haller anticipates any of claims 1, 2 or 3 of the '866 patent.

3. Kaneka & KTC Manufacturing Processes

SKC's Position: SKC argues that at least one year before the earliest effective filing date of the '866 patent, both Kaneka and KTC made and sold polyimide film products manufactured using the methods described in claims 1 to 3 of the '866 patent. {

} SKC reasons, therefore, that Kaneka's pre-critical date manufacturing processes apply equally to KTC's pre-critical date manufacturing processes in the United States.

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In its reply brief, SKC argues Kaneka feigns ignorance to the pre-1998 sale of its own products despite its earlier representation to the Commission. (Citing Complaint at ¶ 47; Complaint at ¶ 6 of Ex. 14.) SKC says that Kaneka raises "two incredible arguments on Kaneka's and KTC's pre-1998 manufacturing process: an alleged lack of evidence for the 'step-wise heating' and 'while adjusting' limitations." (Citing CIB at 50.) SKC asserts that the evidence supporting these limitations is detailed at RIB in Section III(D)(1)(c).

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}

SKC adds that Kaneka's rebuttal only applies to KTC. {

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SKC says that Kaneka next urges that there is no evidence that its prior processes practice the "while adjusting..." limitations (*i.e.*, adjusted imidation ratios and amounts of organic solvent and volatile constituents). (Citing CIB at 50.) SKC says this assertion ignores repeated

admissions by its own inventors. {

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Kaneka's Position: Kaneka contends that SKC has presented no evidence to demonstrate that Kaneka, KTC or any other entity even practiced the invention of the '866 patent prior to the critical date, let alone sold or offered for sale in the United States any products manufactured using the patented process.

Kaneka says that SKC asserts that Kaneka practiced the invention of the '866 patent in Japan prior to the critical date; but, SKC's evidence in support of this argument is lacking. Kaneka asserts that first, SKC has not shown that Kaneka practiced the "while adjusting" limitation in the '866 patent prior to the critical date. Kaneka says that SKC can only show that the imidation ratio and level of volatile constituents *changed* upon step-wise heating; but that SKC is conflating "change" and "adjust" as explained above. {

} Kaneka argues that it is, at best, disingenuous for SKC to rely on a declaration describing Kaneka's current process in support of its argument relating to the process used by Kaneka more than 15 years ago.

Kaneka continues that SKC contends that Kaneka used a "step-wise" increase in temperature in its manufacturing process prior to the critical date; but SKC "fails to even identify the product that it guesses was manufactured" using a "step-wise" increase in temperature, and as described below, SKC provides no evidence that *any* products manufactured by this process

were sold in the United States prior to the critical date.

Kaneka alleges that SKC also contends without evidentiary support that KTC practiced the invention of the '866 patent prior to the critical date, because Kaneka indicated that KTC employed the same manufacturing processes as Kaneka. Kaneka argues that, as described above, the same lack of evidence that applies to Kaneka's prior processes also applies to KTC's prior processes. Kaneka offers as one example, that SKC has offered no evidence to show that KTC practiced the "while adjusting" limitation prior to the critical date.

Kaneka adds that SKC cannot show that KTC practiced the "step-wise" increase in temperature limitation of the '866 patent prior to the critical date. {

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Kaneka argues, even if SKC was somehow able to establish that Kaneka or KTC practiced the invention of the '866 patent prior to the critical date, SKC would still fall short in prevailing on this defense, because it has not established that any products manufactured using this process were ever actually sold or offered for sale in the United States prior to the critical date. Kaneka alleges that SKC's only "evidence" for a "sale" or "offer for sale" prior to the critical date is a very general statement from Mr. Tsunemi that Kaneka and KTC "were marketing, offering for sale, and selling their polyimide film products in the U.S. as early as 1990." Kaneka says this general statement does not provide any information regarding whether the patented products were sold (or offered) or to whom these products were sold, etc. Kaneka urges that such gaps in SKC's arguments compel a finding that SKC has not met its heavy

burden of establishing these key elements of this defense. (Citing *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1378 (Fed. Cir. 2005).)

Discussion and Conclusions: Based on the evidence in the record, I find that SKC failed to offer clear and convincing evidence that Kaneka's or KTC's prior manufacturing processes anticipate any of claims 1-3 of the '866 patent.

Kaneka argues that SKC cannot show that KTC practiced the "step-wise" increase in temperature limitation of the '866 patent prior to the critical date. Kaneka criticizes SKC's "evidence" on this point, which comes from a KTC database that Kaneka alleges was created in 1998. {

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Assuming arguendo that the recorded temperatures for the 1997 dates were not contemporaneously entered into the database; but were entered when the database was created in 1998, that does not render them inherently unreliable. I note that there is no evidence that any errors were recorded in that data, and Mr. Haussler did not testify otherwise. {

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[22] Contrary to SKC's assertion, this data is identical in both CX-646C and CX-681C, and I find that it reflects production at KTC and not Kaneka's Shiga plant.

Kaneka has not asserted the runs reflected in CX-646C were not commercially released. Inasmuch as the 4 April 1997 run was listed amongst other commercial runs and was assigned a lot number, it is logical to conclude that the films reflected in CX-646C were commercially released. I find that as early as 4 April 1997, KTC produced for commercial purposes polyimide film that practiced this element of the asserted claims of the '866 patent.

As SKC argued *D.L. Auld Co. v. Chroma Graphics Corp.*, 714 F.2d 1144, 1147-48 (Fed. Cir. 1983) establishes that a sale by a patentee of a product made by a claimed method before the critical date results in a "forfeiture" of any right to a patent to that method, even though the sale of the product did not reveal anything about the method to the public. While I conclude that it is more likely than not that this product was released to the public for commercial purposes, there is no direct evidence that this conclusion is fact. Because the standard of proof that must be met by SKC is "clear and convincing evidence" rather than "a preponderance of evidence," I find that SKC has not met its burden to prove that a "sale" of the product that practices this element was made in 1997 or any other date prior to the effective date of the '866 patent. This is not a situation in which a product was produced over a period of time and commercial sales during that period were established. Rather the evidence only establishes that the product produced on a single date practiced this element, and on these facts SKC's burden includes establishing that this particular polyimide film was, in fact, sold commercially.

Kaneka argues persuasively that SKC lacks evidence to support its contention that Kaneka practiced the "while adjusting" limitation in the '866 patent prior to the critical date. Kaneka contends that SKC can only show that the imidation ratio and level of volatile constituents *changed* upon step-wise heating; but that SKC is conflating "change" and "adjust" as explained in Section IV.B.2, *supra*.

{

} This does not, however, establish that Kaneka was practicing the "while adjusting…" limitations (*i.e.*, adjusted imidation ratios and amounts of organic solvent and volatile constituents) during that timeframe. The testimony to which SKC makes reference – that of inventors Fukudome, Yabuta and Yamaguchi, does not support SKC's position.

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The second reference provided by SKC is the testimony of Mr. Yubata, who was asked if the amount of volatile constituent would "adjust" if the film being casted was heated. He responded in the affirmative. This does not, however, establish that the process practiced the element of "adjusting" either the imidation ratio or the volatile constituents as contemplated in the asserted claims of the '866 patent. In fact, Mr. Yubata was not asked if any effort was made to "adjust" those factors to any standards at all. (*See* RX-580C at 40:11-13, 15.) As I found in Section IV.B.2, *supra*, the element of the asserted claims that is at issue here is modifying the imidation ratio and the volatile constituent so that they correspond or conform to a desired value.

Use of the word "adjust" in the question asked of Mr. Yubata does not suffice to make this point.

Finally, SKC points to the declaration of Mr. Yamaguchi to support its position; but here the discussion is about the current process for manufacture of adhesive polyimide film and does not establish what the process might have been prior to the filing date of the '866 patent. (*See* CX-250 at 0010)

I find that SKC has failed in its burden to prove by clear and convincing evidence that Kaneka's and KTC's prior processes used the methods described in claims 1 to 3 of the '866 patent.

4. Obviousness

SKC's Position: SKC's position regarding obviousness is stated in Sections IV.B.1-2, *supra*.

Kaneka's Position: Kaneka contends that SKC's argument that the '866 patent would be rendered obvious by Kohno in view of either Haller or Hamamoto also fails. Kaneka states that Kohno does not disclose the "chemical curing" of the '866 patent, and Haller and Hamamoto are missing the step-wise heating and "while adjusting" limitations of the '866 patent. (Citing CX-644C at Q. 37, 41-44, 48, 57, 61.)

Kaneka adds that there would be no motivation for one of ordinary skill in the art to combine the teachings of Hamamoto and Haller, or any other references disclosing chemical curing, with Kohno, since the inventors of Kohno achieved their desired result by heat curing alone. (Citing CX-644C at Q. 49.)

Kaneka reasons it would be impractical to look to chemical curing when heat curing achieves the desired result. Kaneka continues that chemical curing would simply add additional steps, components, and cost to the process, and Dr. Thomas does not even speculate that extra

steps, components, or cost would make sense to one of ordinary skill in the art. (Citing CX-644C at Q. 49.)

In its reply brief, Kaneka says SKC's argument that the '866 patent would be rendered obvious by Haller and Hamamoto fails for several reasons. Kaneka begins that Dr. Harris testified that both of these references are missing critical elements that are claimed in the '866 patent, including the step-wise heating and "while adjusting" limitations. (Citing CX-644C at Q. 37, 41-44, 57, 61.)

Kaneka continues that SKC has not provided any credible reason why one of ordinary skill in the art would be motivated to combine these references. (Citing CX-644C at Q. 45.)

Kaneka concludes that, even if one of skill in the art would have combined these references, Hamamoto does not cure the deficiencies of Haller, because Hamamoto does not disclose step-wise heating, as "SKC's expert conceded" or the "while adjusting" limitation.

Discussion and Conclusions: Based on the evidence in the record, I find that SKC has failed to offer clear and convincing evidence that any of claims 1-3 of the '866 patent are obvious in view of the cited prior art.

In order to prevail on its claim that the'866 patent is invalid as obvious, SKC must demonstrate that the combination of prior art references discloses all of the limitations of asserted claims 1 through 3. *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1373-1374 (Fed. Cir. 2010) (upholding finding of non-obviousness based on the fact that there was substantial evidence that the asserted combination of references failed to disclose a claim limitation); *Velander v. Garner*, 348 F.3d 1359, 1363 (Fed. Cir. 2003) (explaining that a requirement for a finding of obviousness is that "all the elements of an invention are found in a combination of prior art references"). I find that SKC has failed to demonstrate that all of the

limitations of asserted claims 1, 2 or 3 are present by either the combination of Kohno in view of Haller or Hamamoto or by Haller in combination with Hamamoto.

First, Kaneka has successfully challenged SKC's assertion that Kohno anticipates asserted claims 1-3 of the '866 patent based on the absence of disclosure of two elements, to wit: (1) chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines; and (2) creation of a "chemically cured prefilm" after step-wise heating.

SKC correctly contends that Haller, discloses "treatment with acid anhydride [*i.e.*, dehydrating agent], preferably in the presence of a tertiary amine catalyst," characterizing the process in 1970 as "conventional." (*See* RX-78 at 1:64-2:5.) SKC also correctly points out that Hamamoto similarly discloses using chemical imidization agents such as tertiary amines, which may be used in combination with lower carboxylic acid anhydrides (dehydrating agents) to "avoid such problems as . . . deterioration of physical properties." (*See* RX-90 at 1:44-62.) SKC reasons persuasively that since the use of dehydrating agents and tertiary amines as chemical curing (imidizing) agents with polyamide acids, such as those of Kohno, to form polyimides is both conventional and advantageous, it would be obvious to a person of ordinary skill in the art to do so. *KSR*, 550 U.S. at 416.

Kaneka has also successfully challenged SKC's assertion that Haller anticipates asserted claims 1-3 of the '866 patent based on the absence of disclosure of two elements, to wit: (1) the "step-wise heating of the film shaped composition to form a chemically cured prefilm" that is required in asserted claims 1-3; and (2) the "while adjusting an imidation ratio" limitation of claims 1 and 3, and the "adjustment of volatile constituents/organic solvents" of claim 2.

SKC was unsuccessful in its attempt to show that Haller discloses heating the prefilm to adjust its solvent content to 16.2%. (*See* Section IV.B.2, *supra.*) SKC now contends that this is

also evident from Hamamoto's teaching of a "loss in weight on heating" test that is nearly identical to the '866 patent's measurement of volatile constituents, aiming to conform to a value of 25-45%. (RX-90 at 6:2-19; CX-1 at 13:13-22.) While it is true that the process described in Hamamoto results in predictable reductions in weight and a predictable change in imidization ratio (i.e. "a polymer having an imidization ratio of 25-80% (particularly, 25-60%) is obtained."), that change results from an obvious heat curing process rather than the chemical curing process of the '866 patent that requires "increasing the temperature in a step-wise fashion."[23] The relevant language of Hamamoto reads:

> Thereafter, the filmy cast solution on the support is heated at a temperature of 80° to 200° C. in a heating apparatus which utilizes a hot air, infrared rays or the like, to obtain a self-supportable film. By this heating, the self-supportable film shows a loss in weight on heating of 25-45% by weight, and some imidization reaction takes place. Thus, a polymer having an imidization ratio of 25-80% (particularly, 25-60%) is obtained. The loss in weight on heating means a weight loss after the self-supportable film is heated at 420° C. for 20 minutes, and is a value obtained by the following formula:
>
> Loss in weight on heating (wt. %) = 100 x {(Sample weight before heating – Sample weight after heating)/(Sample weight before heating)}

(RX-90 at 6:3-19.) Thus, Hamamoto does not disclose "while adjusting an imidation ratio" limitation of claims 1 and 3, or the "adjustment of volatile constituents/organic solvents" of Claim 2.

Even assuming *arguendo* that Haller in combination with Hamamoto did teach the "adjusting" elements, SKC is still required to show that Hamamoto discloses the element missing

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[23] *See* CX-1 at 21:34-36, 21:38-40, 21:61-64, 22:2-4, 22:13-15, 22:17-19.

in both Kohno and Haller, which is the requirement that the process include "step-wise heating of the film shaped composition to form a chemically cured prefilm." SKC does not allege that Hamamoto discloses it.

Based upon the foregoing, I find that SKC has failed to meet its burden to prove by clear and convincing evidence that the asserted claims of the '866 patent are rendered obvious by either Kohno in view of Haller or Hamamoto or by Haller in combination with Hamamoto.

Because SKC has not demonstrated that the cited references render the asserted claims of the '866 patent obvious, it is not necessary for me to treat the issue of whether or not a reason exists to combine prior art references. Nevertheless, assuming *arguendo* that one were to find that the combinations offered by SKC do, in fact, disclose all of the elements of the asserted claims of the '866 patent,

SKC contends that the ordinarily skilled artisan would consider the teachings of the patents together because both are directed to the same art, and Hamamoto simply teaches how to apply a known analytical technique to a known chemical process to evaluate the degree of imidation. SKC cites to the testimony of its expert, Dr. Thomas, found at RX-584C at Q. 158-192, 222-258.

The Federal Circuit has explained that "it remains appropriate for a post-*KSR* court considering obviousness 'to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.'" *Fresenius USA, Inc. v. Baxter Int'l, Inc.*, 582 F.3d 1288, 1300-1301 (Fed. Cir. 2009) (quoting KSR, 550 U.S. at 418).) Here, the combination of "known elements" claimed by the patent require one to chemically cure a film shaped composition by heating to a temperature of 200° C. or less and thereafter increasing the temperature in step-wise fashion such that the solvent is evaporated to form a chemically

cured prefilm. While Dr. Thomas opines in several places in his testimony that a person of ordinary skill in the art would be moved to combine Kohno, Haller and or Hamamoto to create the invention of the '866 patent, he does not address the issue of combining the chemical composition and increasing the heat in a step-wise fashion to arrive at a chemically cured prefilm. Rather he merely points out that the references teach how to apply a known technique to a known process to evaluate the degree of imidation. Dr. Thomas's testimony taken in context, speaks to heat curing, which was known at the time of the '866 invention, and not to the new process of using a combination of the stated chemicals and the step-wise heating to achieve a chemically cured prefilm. (*See, e.g.,* RX-584C at Q. 174, 175.)

Regarding Dr. Thomas's reference to the testimony of Mr. Yabuta as "admitting" that "adjusting the amount of volatile constituents necessarily occurs when heating a prefilm," I note that both the question and answer, taken in context, do not shed any light on the issue of "adjusting" the amount of volatile constituents as contemplated in the '866 patent. (RX-580C at 40:10-15.)

Dr. Harris testified credibly that there would be no motivation for one of ordinary skill in the art to combine the teachings of Hamamoto and Haller, or any other references disclosing chemical curing, with Kohno, since the inventors of Kohno achieved their desired result by heat curing alone. He said it would be impractical to look to chemical curing when heat curing achieves the desired result. Dr. Harris reasoned that chemical curing would simply add additional steps to the process, such as the removal of additional solvent, chemical catalyst, etc. (CX-644C at Q. 49.) Dr. Harris testified, too, that Dr. Thomas has not provided any reason why one of ordinary skill in the art would be motivated to combine these references. (CX-644C at Q. 45.)

Based upon the foregoing, I find that the evidence does not support a finding that a person of ordinary skill in the art would be moved to combine the known elements of Hamamoto with either Haller or Kohno, in the fashion claimed by the patent at issue to create the process described in the asserted claims of the '866 patent to chemically cure a film shaped composition by heating to a temperature of 200° C. or less and thereafter increasing the temperature in step-wise fashion such that the solvent is evaporated to form a chemically cured prefilm.

5. Secondary Considerations

Kaneka's Position: Kaneka argues there is strong evidence as to secondary considerations that support a finding of non-obviousness. Kaneka contends that it is well settled that "secondary considerations" of nonobviousness are often the "most probative and determinative" factors, and can be "decisive." (Citing *Pro-Mold and Tool Co., Inc. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996))

Kaneka says that at the time of the invention of the '866 patent, the methods of providing adhesive strength to films were primarily limited to flame treatment, corona discharge treatment, ultraviolet treatment, alkaline treatment, primer treatment, sand blast treatment and plasma treatment. Kaneka states that each of these treatments are "after treatments" which remove a boundary layer created during the casting process. Kaneka adds that, because the treatments are applied after casting, the adhesive strength of the treated film is inconsistent. Kaneka concludes these additional treatment steps also increase costs associated with producing the film. (Citing CX-644C at Q. 32)

Kaneka asserts that the methods taught in the '866 patent address the long felt need of providing an adhesive film, providing a polyimide film with improved adhesive uniformity and strength, and maintaining high adhesive strength of a composite film by laminating resin on a

polyimide film. Kaneka adds that the method of the '866 patent overcomes the higher cost associated with conventional means of improving film adhesion via an additional processing step, and it can be incorporated with the conventional corona treatment to get an even higher adhesive strength. Kaneka concludes that the method of the '866 patent reduces wrinkles on the film surface and prevents undesired exfoliation due to partial hardening of the edge by increasing the temperature of the belt chamber in a step by step manner. (Citing CX-644C at Q. 33)

In its reply brief, Kaneka argues that SKC asserts that Kaneka only makes general statements regarding secondary considerations without establishing the requisite nexus with the claims of the '866 patent. Kaneka counters that it did, in fact, set forth how the methods disclosed in the '866 patent specifically addressed the long felt need of providing an adhesive film, providing a polyimide film with improved adhesive uniformity and strength, and maintaining high adhesive strength of a composite film by laminating resin on a polyimide film. Kaneka continues that the method of the '866 patent overcomes the higher cost associated with conventional means of improving film adhesion via an additional processing step. Kaneka says the inventive method of the '866 patent can be incorporated with the conventional corona treatment to get an even higher adhesive strength. (Citing CX-644C at Q. 33)

SKC's Position: SKC contends that Kaneka makes general statements that secondary considerations support a finding of non-obviousness with respect to the '866 patent without establishing the requisite nexus with the claims of the '866 patent. (Citing *Muniauction, Inc. v. Thompson Corp.*, 532 F.3d 1318, 1327 (Fed. Cir. 2008)) SKC argues that these allegations fail to rise to the level of a secondary considerations worthy of consideration in any obviousness analysis, and adds that no amount of secondary considerations can overcome a clear case of

obviousness such as the prior art presents here. (Citing *Leapfrog Enters., Inc. v. Fisher–Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007))

In its reply brief, SKC argues the '866 patent Examples do not compare the alleged invention against conventional, post-treatment processes, so there is no evidentiary link between the claims and any so-called long felt need. (Citing RX-584C at Q. 100, 668)

Discussion and Conclusions: Because I conclude that SKC's obviousness arguments lack merit, it is unnecessary to address Kaneka's contentions regarding secondary considerations. Assuming *arguendo* that it is necessary to address secondary considerations, I find that the evidence cited by Kaneka is not adequate to overcome a showing of obviousness.

SKC contends correctly that Kaneka makes general statements that secondary considerations support a finding of non-obviousness with respect to the '866 patent without establishing the requisite nexus with the claims of the '866 patent. SKC argues persuasively that these allegations fail to rise to the level of evidence worthy of consideration in any obviousness analysis.

Kaneka does not provide adequate evidence of commercial success. "When a patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention." *J.T. Eaton & Co. v. Atlantic Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997). While Kaneka alleges commercial success, I find it does not provide any detail whatsoever regarding the sales of

products covered by the '866 patent, market share or income derived from those sales.[24] Thus Kaneka has failed to show "commercial success" as an indicator of non-obviousness.

Kaneka asserts that the methods taught in the '866 patent address a long-felt but unresolved need. To show a long-felt but unresolved need, Kaneka must offer evidence that "both that a demand existed for the patented invention, and that others tried but failed to satisfy that demand." *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, --- F.3d ----, 2012 WL 1320225, at *17 (Fed. Cir. Apr. 16, 2012.)

Kaneka claims that the '866 patent addressed the long-felt need of providing an adhesive film, providing a polyimide film with improved adhesive uniformity and strength, and maintaining high adhesive strength of a composite film by laminating resin on a polyimide film. Kaneka adds that the method of the '866 patent overcomes the higher cost associated with conventional means of improving film adhesion via an additional processing step, and it can be incorporated with the conventional corona treatment to get an even higher adhesive strength. Kaneka concludes that the method of the '866 patent reduces wrinkles on the film surface and prevents undesired exfoliation due to partial hardening of the edge by increasing the temperature of the belt chamber in a step by step manner. To support this, Kaneka cites to the conclusory and unsupported testimony of Dr. Harris. (CX-644C at Q. 33.) These bare assertions by Kaneka and Dr. Harris, which are no more than a listing of the positive features of the invention, do not approach the showing of facts necessary to prove "long felt but unresolved need" in the industry. In addition, I note that Kaneka offers no evidence of other relevant factors in the analysis of

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[24] This finding is based upon a review of not only the secondary consideration sections of Kaneka's initial and reply briefs. It includes a review of the domestic industry economic prong sections of those briefs, anticipating that the information was somehow included therein.

secondary considerations such as, for example, the failure of others, unexpected results or copying.

6. Indefiniteness

In Section III.B.3 *supra*, I construed the phrase "further heating said prefilm to obtain an adhesive polyimide film." Because that phrase is amenable to construction, I find that SKC has not demonstrated that any of the asserted claims of the 866 patent are indefinite. *Datamize*, 417 F.3d at 1347.

C. The '639 Patent

1. Sutton

SKC's Position: SKC contends that U.S. Patent No. 4,358,581 ("Sutton") anticipates claim 1 of the '639 patent.

SKC argues that Sutton clearly discloses "a process for preparing a polyimide film by extruding and casting..." when it states that "[i]ndustrial manufacture of shaped articles in accordance with this investion permits casting or extruding..." (Citing RX-79 at 8:45-53.)

SKC claims that Sutton discloses several examples of varnish with dianhydrides and diamines in the claimed molar ratio range. SKC asserts that the prepolymer of Sutton is equivalent to the poly(amic acid) of claim 1. (Citing RX-584C at Q. 792-794.) SKC argues that the additional of a finishing component in Sutton just prior to converting the resin into a polyimide does not change Sutton's earlier disclosure of a prepolymer that is the same as the poly(amic acid) of claim 1. (Citing RX-79 at 2:65-3:10.) SKC asserts that the disclosure of Sutton includes mole ratio and viscosity ranges that anticipate the mole ratio and viscosity limitations of claim 1. (Citing RX-79 at 3:4-10, 6:21-26, 7:45-47.)

SKC argues that Sutton discloses the addition of a dehydrating agent and a chemically-imidizing catalyst. (Citing RX-79 at 1:57-2:3, 3:27-29; RX-584C at Q. 744.) SKC further claims that calculations show the amounts of these materials added match up with the requirements of claim 1. (Citing RX-584C at Q. 745, 747, 749-770.) SKC states that the relied-upon example in Sutton are mere comparatives. SKC asserts that Kaneka's position is incorrect. (Citing RX-79 at 7:45-8:5.) SKC further argues that even if the examples are comparative, a reference is good for all it would have taught to a person of ordinary skill in the art, including non-preferred embodiments.

Kaneka's Position: Kaneka contends that Sutton does not anticipate claim 1 of the '639 patent.

Kaneka argues that Sutton does not contain any discussion or disclosure of extrusion of a poly(amic acid) solution where the polymerization of the poly(amic acid) is complete. (Citing CX-644C at Q. 84; CX-192C.) Kaneka therefore claims that Sutton fails to disclose "preparing a polyimide film by extruding and casting a composition of a resin solution containing a poly(amic acid) varnish" as required by claim 1.

Kaneka asserts that Sutton fails to disclose the claimed molar ratio of the tetracarboxylic dianhydride component to the diamine component. (Citing CX-644C at Q. 85; CX-192C.) Kaneka claims that the ratios relied on by SKC are for the prepolymer, which is different than the fully polymerized poly(amic acid) varnish. (Citing CX-644C at Q. 85-86; CX-192C.)

Kaneka claims that Sutton does not first prepare a poly(amic acid) varnish and then add the catalyst and the dehydrating agent, as required by claim 1. (Citing CX-644C at Q. 88; CX-192C.) Instead, Kaneka believes that Sutton adds components together in one step, instead of two steps. (*Id.*) Kaneka further asserts that Dr. Thomas relies only on examples 2, 3A and 3B of

Sutton, but Kaneka argues that those are comparative examples of the prior art. (*Id.*) Kaneka claims that SKC ignores example 1 of Sutton, which is the only example practicing the invention of Sutton. Kaneka states that example 1 does not disclose all of the limitations of claim 1. (*Id.*)

Kaneka claims that Dr. Thomas testified that Sutton must be combined with other references to disclose the limitations of claim 1. (Citing Tr. at 673:2-674:12.) Kaneka asserts that Dr. Thomas' testimony at the hearing shows that he is not sure that Sutton discloses certain elements of claim 1. (Citing Tr. at 672:3-673:1, 679:20-25.) Kaneka claims that this testimony demonstrates that Dr. Thomas' opinions regarding Sutton anticipating claim 1 are not reliable.

Discussion and Conclusions: Based on the evidence in the record, I find that SKC failed to offer clear and convincing evidence that Sutton anticipates claim 1 of the '639 patent.

Claim 1 requires "[a] process for preparing a polyimide film by extruding and casting a composition of a resin solution containing a poly(amic acid) varnish..." To support this limitation, SKC relies on the following passage from Sutton:

> Industrial manufacture of shaped articles in accordance with this invention permits casting or extruding the cold, low viscosity, high concentration, polymerization solution into the desired shape and then heating the shape.

(RX-79 at 8:45-49; *see also* RX-584C at Q. 738.)

Kaneka notes that the claim language requires extruding and casting "a composition...containing a poly(amic acid) varnish..." Dr. Harris testified credibly that Sutton "does not contain any discussion or disclosure of extrusion of a poly(amic acid) solution where the polymerization of the poly(amic acid) is complete." (CX-644C at Q. 84.) Instead, Dr. Harris opined that the poly(amic acid) is not fully formed until subsequent heating completes the polymerization process. (*Id.*) Based on this evidence, I find no clear and convincing disclosure

in Sutton of "[a] process for preparing a polyimide film by extruding and casting a composition of a resin solution containing a poly(amic acid) varnish…"

Claim 1 additionally requires "preparing the poly(amic acid) varnish having low viscosity by polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99." I find that SKC failed to offer clear and convincing evidence that Sutton discloses this limitation. In opining that this limitation is found in Sutton, Dr. Thomas pointed to the molar ratio disclosure for the "prepolymer" in Sutton. (RX-584C at Q. 739-740; RX-79 at 3:6-10, 6:20-26.) Dr. Harris responded by explaining that the molar ratio limitation of claim 1 does not relate to a "prepolymer." (CX-644C at Q. 85.) Instead, the molar ratio limitation relates to "a fully polymerized poly(amic acid) varnish." Dr. Harris explained that in Sutton, a "finishing component" is added to the prepolymer, and that finishing component affects the molar ratio of the diamine and dianhydride. (*Id.*)

SKC argues that claim 1 may be anticipated by Sutton even though it requires the later addition of the finishing component. SKC cites *Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 977 (Fed. Cir. 2010) for the proposition that a prior art reference may anticipate even though it discloses additional function. I find that SKC's argument misses the mark, as the issue is that Sutton lacks a disclosure of "preparing the poly(amic acid) varnish…by polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99." Instead, Sutton only discloses a prepolymer with the claimed ratios.

Dr. Thomas also testified that he calculated the molar ratios of the materials in Sutton after the finishing component was added, and that the calculated molar ratios still met the molar ratios required by claim 1. (RX-584C at 740.) Dr. Thomas offers no explanation behind these calculations, and does not actually show how he arrived at such results. (*Id.*) Such a conclusory

assertion is not sufficient to meet the high clear and convincing evidentiary standard required for invalidity.

Based on the foregoing, I find that SKC failed to offer clear and convincing evidence that Sutton anticipates claim 1 of the '639 patent.

2. Okahashi, Alone or In Combination With Tetsuya, Endrey, or Koichiro

SKC's Position: SKC asserts that U.S. Patent No. 5,460,890 ("Okahashi") anticipates claim 1. SKC further asserts that if Okahashi isn't found to anticipate, Okahashi in combination with Japanese Patent Application H11-198157 ("Tetsuya"), Japanese Patent Application 2000-159887 ("Koichiro"), or U.S. Patent No. 3,179,633 ("Endrey") renders claim 1 obvious.

SKC asserts that there is no dispute that Okahashi discloses the preamble, the "low viscosity" limitation, and the "chemically-imidizing catalyst" limitation of claim 1. (Citing RX-94 at 2:10-12, 3:41-46, 4:16-25, 4:38-40, 5:22-23, 8:34-37.)

With regard to the molar ratio limitation, SKC argues that Okahashi expressly teaches use of non-equimolar ratios during polymerization. (Citing RX-94 at 3:51-56.) In addition, SKC argues that there are significant reasons why one of ordinary skill in the art would be motivated to modify Okahashi to avoid an equimolar ratio. (Citing RX-584C at Q. 820-825.) SKC argues that the secondary references teach the advantages of avoiding a 1:1 molar ratio, primarily because with molar ratios near 1:1, polymerization degree is excessively increased, solution viscosity is excessively increased, and thus it is difficult to treat these compounds. (Citing RX-62 at ¶¶ 8-12, 34; RX-77 at 3:8-18; RX-66 at ¶¶ 48, 56.) SKC asserts that, contrary to Kaneka's claim, one of ordinary skill in the art would know to combine Okahashi and Koichiro. (Citing CX-2 at 5:59-6:23; RX-94 at 3:18-34; RX-66 at ¶¶ 15-16.)

With regard to the "dehydrating agent" limitation, SKC states that Okahashi discloses a dehydrating agent in a range of 0.1 to 4 moles per mole of amic acid. (Citing RX-94 at 4:16-25.) SKC asserts that because this disclosure overlaps the claimed range, Okahashi anticipates and renders obvious claim 1. SKC argues that Kaneka cannot rely on the '639 patent's superior mechanical properties, as this is not a claim limitation, and Okahashi indisputably meets the dehydrating agent element of claim 1. (Citing RX-94 at 8:34-36.)

Kaneka's Position: Kaneka contends that Okahashi does not anticipate claim 1, and that the asserted combination does not render claim 1 obvious.

Kaneka asserts that Okahashi does not disclose the non-equimolar ratios of claim 1. (Citing CX-644C at Q. 91; CX-192C.) Kaneka claims that the portion of Okahashi relied on by SKC covers only equimolar ratios. (*Id.*) Kaneka argues that the secondary references relied on by SKC do not cure this deficiency. (Citing CX-644C at Q. 93, 95; CX-192C.)

Kaneka claims that the range for the amount of dehydrating agent disclosed in Okahashi is not applicable to the '639 patent. (Citing CX-644C at Q. 98; CX-192C.) Kaneka states that Okahashi discloses a range that encompasses 0.1-4 moles of the dehydrating agent. (*Id.*) According to Kaneka, the superior mechanical properties of the '639 patent cannot be obtained from the lower point of this range. (*Id.*)

Discussion and Conclusions: Based on the evidence in the record, I find that SKC has failed to offer clear and convincing evidence that Okahashi anticipates claim 1, or that Okahashi in combination with other references renders claim 1 obvious.

Okahashi was cited during the prosecution of the '639 patent, meaning that SKC's burden to prove invalidity is "especially difficult." *Hewlett-Packard,* 909 F.2d at 1467. The parties dispute whether or not Okahashi discloses the molar ratio requirement of claim 1. Claim 1

requires "preparing the poly(amic acid) varnish having low viscosity by polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99." The claim clearly excludes a situation where the components are mixed in an equimolar ratio, *i.e.* 1:1. The '639 patent specification also explains that an equimolar ratio is undesirable. (CX-2 at 4:30-51.)

Okahashi discloses "[a]ccording to the invention process, at least one aromatic tetracarboxylic acid component and at least one aromatic diamine component are polymerized at an approximately equimolar ratio with one component being not more than 10 mole %, preferably not more than 5 mole %, in excess over the other component." (RX-94 at 3:51-56.) The range allowed by Okahashi includes an equimolar ratio, which is expressly excluded from claim 1 for a specific reason. (CX-2 at 4:30-51.) Therefore, I find that the molar ratio range of Okahashi does not anticipate the molar ratio limitation of claim 1. (CX-644C at Q. 91.)

SKC argues that if Okahashi does not disclose the molar ratio limitation, a number of other secondary references could be combined with Okahashi to meet the molar ratio limitation. I concur. Endrey understood the disadvantage associated with using an equimolar ratio, and found that 5% excess of either substance worked, with a 1-3% excess of dianhydride working best for some purposes:

> The use of equal molar amounts of the reactants under the prescribed conditions provides polyamide-acids of very high molecular weight. The use of either reactant in large excess limits the extent of polymerization. However, the scope of the process encompasses the use of up to 5% excess of either the diamine or the dianhydride. More than 5% excess of either reactant results in an undesirably low molecular weight polyamide-acide. For some purposes, it is desirable to use 1-3% excess of either reactant, preferably the dianhydride.

(RX-77 at 3:8-18.) Dr. Thomas explained that when Endrey stated that an equimolar ratio would result in "polyamide-acids of very high molecular weight," this equates to a very high viscosity,

which is the same problem recognized in the '639 patent. (*Id.*; RX-584C at Q. 823; CX-2 at 4:30-51.)

Claim 1 does not allow for an equimolar ratio, but allows for a 5% excess of either material. This is what is disclosed by Endrey. (RX-77 at 3:8-18.) Therefore, I find that Endrey teaches the molar ratio limitation of claim 1. I find that one of ordinary skill in the art would have a reason to combine the teachings of Okahashi with the teachings of Endrey because both references are directed to producing polyimide films and it was known in the art that adjusting the range of molar ratios was a way to obtain a desired viscosity. (RX-584C at Q. 821, 823.) Therefore, I find that one of ordinary skill in the art would look to both references when attempting to find the optimum molar ratio range for the poly(amic acid) varnish.

Kaneka's expert Dr. Harris testified that one of ordinary skill in the art would not combine the references because they are contradictory due to the fact that Okahashi discloses using an equimolar ratio. (CX-644C at Q. 95.) Dr. Harris mischaracterizes Okahashi, as it does not only disclose use of an equimolar ratio. Okahashi clearly discloses that "one component [may be] not more than 10 mole %, preferably not more than 5 mole %, in excess over the other component." (RX-94 at 3:51-56.) Thus, I find nothing contradictory about the combination of Okahashi and Endrey.

Dr. Harris also makes the conclusory assertion that Endrey "does not teach the surprising and unexpected superior mechanical properties" of the '639 patent. (CX-644C at Q. 95.) Dr. Harris does not make reference to any specific claim language that is not met by Endrey. A generic reference to the "superior mechanical properties" of the '639 patent, without any reference to the claim language, is insufficient to overcome the showing that the molar ratio limitation is disclosed in the prior art.

The parties next dispute whether or not Okahashi discloses the dehydrating agent limitation. Claim 1 requires preparing the composition of the resin solution by adding to the poly(amic acid) varnish "a dehydrating agent in an amount of at least one mole…per 1 mole of amic acid of the poly(amic acid) varnish." To satisfy this claim limitation, SKC points to the following equation from Okahashi:

$$\frac{\text{Concentration of Dehydrating Agent (moles)}}{\text{Concentration of Polyamic Acid (moles)}} = 0.1\text{–}4 \quad \text{[Equation 2]}$$

(RX-94 at 4:24-25.) SKC also points to Example 1 from Okahashi, where 2.5 moles of the dehydrating agent were used per mole of amic acid. (RX-94 at 8:34-37; RX-584C at Q. 829.)

Kaneka argues that the disclosed range in Okahashi is insufficient because the lower portion of the range is outside of the range found in claim 1. (CX-644C at Q. 98.) Dr. Harris testified that the superior mechanical properties of the '639 patent process cannot be obtained from the lower point of Okahashi's range (*Id.*)

Here the claimed range overlaps the range disclosed in the prior art. The claimed range is "at least one," meaning greater than or equal to one. The range disclosed in the prior art goes from 0.1 to 4. Kaneka argues that this is not a sufficient disclosure in the prior art because the alleged "superior mechanical properties" of the '639 patent would not be obtained from a range of 0.1 to less than 1.

The Federal Circuit has addressed overlapping ranges in the context of obviousness. "Where a claimed range overlaps with a range disclosed in the prior art, there is a presumption of obviousness." *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311 (Fed. Cir. 2006). "The presumption can be rebutted if it can be shown that the prior art teaches away from the claimed range, or the claimed range produces new and unexpected results." *Id.* Because the range in claim 1 overlaps with the range in Okahashi, I find that there is a presumption of obviousness.

However, I find that the presumption has been rebutted due to the fact that the '639 patent recognized that the claimed range produced new and unexpected results.

The '639 patent was directed to improving on the prior art such that the mechanical properties of the polyimide film were superior to those of the prior art. (*See generally* CX-2.) In describing the reasoning for requiring the claimed amount of dehydrating agent, the specification states that the mechanical properties of the polyimide film will decrease if the amount of dehydrating agent is below the claimed range:

> **In the present invention, a composition of a resin solution is prepared by adding a dehydrating agent in a molar ratio of at least one time and a chemically-imidizing catalyst in a molar ratio of at least half time based on 1 mole of the amic acid of the poly(amic acid) varnish.** To the poly(amic acid) are added the dehydrating agent of preferably at least 1.2 to 5 times, more preferably 1.0 to 4 times, particularly 1.2 to 3 times and the chemically-imidizing catalyst of preferably at least 0.6 to 2.0 times, more preferably 0.5 to 1.5 times, particularly 0.5 to 1.2 times in molar ratio based on 1 mole of the amic acid of the poly(amic acid) varnish. **If the amount of the dehydrating agent is out of this range, mechanical properties of the film tend to decrease.**

(CX-2 at 7:34-47) (emphasis added). In addition, the applicants recognized that the claimed range of the dehydrating agent produced new and unexpected results when compared to the prior art:

> In addition, the specification teaches that when the dehydrating agent is used in an amount less than one mole per mole of amic acid of poly(amic acid) varnish, there is a tendency for the imidization to proceed insufficiently, thus resulting in a marked decrease in the mechanical properties of the polyimide films produced.
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> ***
>
> The enhanced tensile strength and smoothness observed for films produced in accordance with the claimed invention are surprising and unexpected compared to the tensile strengths and smoothness of films produced by other methods. Moreover, they are deemed to be particularly surprising and unexpected in view of the tendency for bubble incorporation and high temperature-induced reduction in mechanical strength when films are continuously cast at high speeds in mass production.

(JX-6 at 120, 123.) Dr. Harris echoed these statements when he opined that the "superior mechanical properties of the '639 Patent cannot be obtained from the lower point of [Okahashi's] range." (CX-644C at Q. 98.) Thus, while the disclosed range in Okahashi overlaps with the claimed range, Okahashi does not appreciate the new and unexpected results that go along with the claimed range of at least one.

SKC relies on *ClearValue, Inc. v. Pearl River Polymers, Inc.*, 668 F.3d 1340 (Fed. Cir. 2012) to support its argument. In *ClearValue*, the question was whether a prior art reference that disclosed clarifying water with alkalinity of 150 ppm or less anticipated a claim which required clarifying water with alkanlinity of 50 ppm or less. The court found anticipation even though the prior art range contained values outside of the claimed range.

I find this case to be distinguishable. Here, the issue is obviousness, and not anticipation, so the test in *Ormco* governs. Even if *ClearValue* was applicable, the Federal Circuit's decision was partially based on the fact that "ClearValue has not argued that the 50 ppm limitation in claim 1 is 'critical,' or that the claimed method works differently at different points within the prior art range of 150 ppm or less." *ClearValue*, 668 F.3d at 1345. As described *supra*, Kaneka has asserted that the claimed range of at least one is critical, and that the claimed range of at least one is relevant to achieving the superior results of the invention.

Based on the foregoing, I find that SKC failed to offer clear and convincing evidence that Okahashi anticipates claim 1, or that Okahashi in combination with other references renders claim 1 obvious.

3. Tetsuya In Combination With Okahashi

SKC's Position: SKC contends that Tetsuya in view of Okahashi renders claim 1 of the '639 patent obvious.

SKC states that there is no dispute that Tetsuya discloses the preamble of claim 1 and the "dehydrating agent" limitation of claim 1. (Citing RX-584C at Q. 1083-1129.) With regard to the molar ratio limitation, SKC claims that Tetsuya teaches a molar ratio that is preferably 1:1.005 to 1.05. (Citing RX-62 at ¶ 34.) SKC argues that it is not a valid basis to challenge Tetsuya based on the fact that Tetsuya discloses a range that extends outside of the claimed range. SKC notes that Examples 1 and 6 of Tetsuya discloses a molar ratio of 1:1.02, which is within the claimed range. (Citing RX-584C at Q. 1092, 1113-1121, 1126-1129.)

SKC argues that Tetsuya discloses the "low viscosity" limitation under Kaneka's proposed construction given that Tetsuya discloses a molar ratio of 1:1.02. SKC argues that alternatively, it would have been obvious to modify Tetsuya's varnishes to have Okahashi's viscosity of 1,000 to 10,000 poise. (Citing RX-584C at Q. 1094, 1095, 1098; RX-94 at 3:41-46.)

Regarding the "chemically-imidizing catalyst" limitation, SKC states that Examples 1 and 6 disclose using 0.27 moles of catalyst per mole of amic acid. (Citing RX-62 at ¶¶ 46, 56; RX-584C at Q. 1092, 1099, 1100, 1112-1129.) While SKC acknowledges that that amount is lower than the claimed range, SKC asserts that Okahashi discloses using 0.5 to 8 moles of catalyst per mole of amic acid. (Citing RX-94 at 4:16-25.) SKC argues that one of ordinary skill in the art would have known to combine the teaching of Okahashi and Tetsuya to meet the "chemically-imidizing catalyst" limitation because it was known in the art that an increase in the catalyst would accelerate the production process. (Citing RX-584C at Q. 889, 1103, 1105-1107.)

Kaneka's Position: Kaneka contends that the combination of Tetsuya and Okahashi does not render claim 1 obvious.

Kaneka argues that Tetsuya's disclosure of a molar ratio of 1:1.005 to 1.05 cannot meet the molar ratio limitation of claim 1 because a molar ratio of 1:1.005 has been shown in the '639

patent to produce film with lower tensile strength and undesirable R values. (Citing CX-644C at Q. 132; CX-192C.) Kaneka further argues that there is no motivation to combine Tetsuya and Okahashi. (Citing CX-644C at Q. 94; CX-192C.)

Discussion and Conclusions: Based on the evidence in the record, I find that SKC has failed to offer clear and convincing evidence that the combination of Tetsuya and Okahashi renders claim 1 obvious.

Claim 1 requires "preparing the poly(amic acid) varnish having low viscosity by polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99." SKC points to Tetsuya to meet this limitation. Tetsuya discloses that "[t]he mixing ratio of aromatic tetracarboxylic dianhydride and aromatic diamine is preferably 1:1.005 to 1:1.05 (molar ratio)." (RX-62 at ¶ 34; RX-584C at Q. 1092.) SKC notes that Examples 1 and 6 in Tetsuya disclose a molar ratio of 1:1.02. (RX-62 at ¶¶ 46, 56; RX-584C at Q. 1092.) Kaneka argues that the disclosure of Tetsuya is insufficient because the '639 patent states that molar ratios in the range disclosed in Tetsuya are undesirable. (*See* CX-644C at Q. 93.)

In this situation, the claimed range – 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99 – overlaps with the range disclosed in the prior art – 1:1.005 to 1:1.05. "Where a claimed range overlaps with a range disclosed in the prior art, there is a presumption of obviousness." *Ormco*, 463 F.3d at 1311. "The presumption can be rebutted if it can be shown that the prior art teaches away from the claimed range, or the claimed range produces new and unexpected results." *Id.*

I find that Kaneka has rebutted the presumption. The intrinsic evidence makes clear that there is a specific reason that the claimed ranges were chosen. The specification expressly

discloses that molar ratios encompassed by the range disclosed in Tetsuya fail to produce the superior polyimide film of the invention:

> When diamine component is less than 1.01 mole approaching 1.00 mole based on 1 mole of the tetracarboxylic dianhydride component, viscosity of poly(amic acid) varnish to be obtained becomes higher. In this case, it is impossible to obtain an excellent polyimide film because the intact varnish causes to include bubbles at casting a resin film and to generate uneven thickness.

(CX-2 at 4:34-41.) The prosecution history further highlights the importance of the claimed molar ratio ranges, and explains that use of the claimed molar ratio ranges produced surprising and unexpected results:

> **For example the specification teaches that when the molar ratio of tetracarboxylic dianhydride component to diamine component approaches a molar ratio of 1.00 (i.e., equimolar), the poly(amic acid) varnish obtained therefrom becomes highly viscous, resulting in the inclusion of bubbles and uneven thicknesses in the films produced.** Moreover, as further noted in the specification, if attempts are made to reduce this high viscosity through dilution with solvent, the mechanical properties (e.g., tensile strength) of the polyimide film may be reduced by more than 90% (page 8, lines 9-23). This result is surprising and unexpected and directly refutes the assumption that the claimed ranges would have been obvious to one having ordinary skill in the art.
>
> **The specification further teaches that when the molar ratio of diamine component to tetracarboxylic dianhydride component is more than 1.05 or less than 0.95, the degree of polymerization of the poly(amic acid) varnish obtained therefrom is low, resulting in a marked reduction in the mechanical properties (e.g., tensile strength) of the polyimide films produced.** Specifically, tensile strength may be reduced by more than 90% relative to films prepared by conventional methods (page 8, line 24 to page 9, line 8). This result is surprising and unexpected and directly refutes the assumption that the claimed ranges would have been obvious to one having ordinary skill in the art.

(JX-6 at 120) (emphasis added).

Based on the above-quoted disclosures, I find that the claimed molar ratio range in claim 1 produced new and unexpected results, and that the range of molar ratios found in Tetsuya includes molar ratios that would result in the production of polyimide film that are inferior to the claimed polyimide film. Tetsuya fails to appreciate the new and unexpected results that go along

with the claimed molar ratio range of claim 1. Therefore, I find that SKC has failed to offer clear and convincing evidence that the combination of Tetsuya and Okahashi renders claim 1 obvious.

4. Indefiniteness

In Section III.C.2 *supra*, I construed the term "low viscosity." Because that term is amenable to construction, I find that SKC has not demonstrated that claim 1 of the '639 patent is indefinite. *Datamize*, 417 F.3d at 1347.

D. The '704 Patent

1. Akahori

SKC's Position: SKC contends that U.S. Patent No. 5,081,229 ("Akahori") anticipates or renders obvious claim 1 of the '704 patent.

SKC asserts that it is undisputed that Akahori discloses the preamble of claim 1 and the molar ratio limitation. (Citing RX-584C at Q. 1239, 1263-1264; RX-87 at 4:62-68, 7:57-59.) SKC argues that Akahori discloses the average CTE limitation. According to SKC, Akahori teaches that its polyimide films have values of 2.5×10^{-5} cm/cm/°C or less. (Citing RX-87 at 4:18-23, 7:50-54.) SKC states that Akahori Examples 4 and 7 report anticipating values of 0.97, which rounds to 1.0, and 1.9×10^{-5} cm/cm/°C, respectively. (Citing RX-87 at Table 1.) SKC asserts that the CTE measurements in Akahori were taken at 200°C. (Citing RX-87 at 8:31-32.) According to SKC, the CTE values at 200°C are expected to be quite comparable to those within the range of 100°C to 200°C. (Citing RX-584C at Q. 1207.)

SKC claims that Akahori discloses the stiffness limitation in claim 1. SKC asserts that the '704 patent provides an equation that can be used to calculate the stiffness. (Citing JX-3 at 1:60-2:8.) SKC states that using the equation from the '704 patent, Dr. Thomas determined the thickness values for Akahori. (Citing RX-584C at Q. 1242-1262.) Based on Dr. Thomas'

calculations, SKC argues that Akahori discloses the stiffness limitation, or at a minimum renders obvious this claim element. (Citing RX-584C at Q. 1245.)

Kaneka's Position: Kaneka contends that Akahori does not anticipate or render obvious claim 1 of the '704 patent.

Kaneka argues that Akahori fails to disclose a stiffness value. Kaneka claims that even if the stiffness value is calculated using the information in the '704 patent, Akahori discloses a film having a thickness range of 15 to 25 microns. (Citing CX-644C at Q. 197.) Kaneka states that Dr. Thomas has conceded that at least some of these thicknesses would result in a stiffness value outside the claimed range. (*Id.*)

Kaneka asserts that Akahori also fails to disclose the average CTE limitation. Kaneka states that in Akahori, the CTE values were measured at a single temperature – 200°C. Kaneka claims that these CTE values are not comparable to an average temperature of 100°C to 200°C. According to Kaneka, if the CTE values were measured under the same conditions as the '704 patent, none of the relied-upon examples from Akahori would have a CTE in the range required by claim 1. (Citing CX-644C at Q. 201.)

Kaneka claims that Akahori's examples for the most part have a diamine ratio outside of claim 1. (Citing CX-644C at Q. 198.) Kaneka argues that there is no example in Akahori that has the combination of stiffness value, CTE value, and diamine ratio.

Discussion and Conclusions: Based on the evidence in the record, I find that SKC has failed to offer clear and convincing evidence that Akahori anticipates or renders obvious claim 1 of the '704 patent.

As described in Section III.D.2 *supra*, I have found that the phrase "average coefficient of thermal expansion" in claim 1 is indefinite, rendering claim 1 invalid. An indefinite claim "by

definition, cannot be construed," meaning I cannot analyze invalidity of the '704 patent based on prior art. *Honeywell*, 341 F.3d at 1342. Therefore, my analysis of claim 1 for purposes of prior art invalidity will be conducted under the assumption that Kaneka's claim construction position for "average coefficient of thermal expansion" has been adopted, even though I have already rejected Kaneka's claim construction position. According to Kaneka's position, the claim language requires that the polyimide film has an average CTE of $1.0x10^{-5}$ to $2.5x10^{-5}$ cm/cm/°C over the temperature range of 100°C to 200°C in both the MD and TD, whereby the CTE is measured in the center of the film. (CX-644C at Q. 168.)

Under Kaneka's claim construction position, I find that SKC has failed to offer clear and convincing evidence that Akahori discloses the "average coefficient of thermal expansion" of claim 1. To meet this limitation, SKC relies on the following disclosures from Akahori:

> The polyimide of the present invention has an elongation of 20% or more for a linear thermal expansion coefficient of $2.5x10^{-5/o}$C or less (at 50°C to 300preferably [*sic*] 40% or more for $2.0x10^{-5/o}$C or less, and more preferably 50% or more for 1.5 $x10^{-5/o}$C.

(RX-87 at 4:18-23.)

> The copolyimide of the present invention has good thermal dimensional stability as well as good mechanical properties. More specifically, the linear thermal expansion coefficient is 2.5 $x10^{-5}$ or less, and an elongation is 20% or more.

(RX-87 at 7:50-54.) In addition, SKC relies on certain Examples from Akahori where "the linear thermal expansion coefficient was obtained at 200°C." (RX-87 at 8:31-32, Table 1.)

Although the above-described disclosures from Akahori do not disclose average CTE calculations within a temperature range of 100°C to 200°C, SKC still asserts that Akahori meets the claim limitation. SKC points to the following testimony from Dr. Thomas:

> I also note that polyimides are known to be thermally stable, and exhibit approximately a constant rate of thermal expansion below their glass transition point. Hence, linear expansion coefficients measured at different temperature

> ranges below the glass transition point, such as 100-200 °C, 200-300 °C, 50-300 °C, etc., are generally quite comparable.

(RX-685C at Q. 1207.) SKC claims that data from Intertek supports Dr. Thomas' opinion. (RX-9.)

Kaneka argues that because the CTE values in Akahori weren't measured over a temperature range of 100-200°C, Akahori does not disclose the average CTE limitation of claim 1. Kaneka cites to the testimony of Dr. Harris, who offered the following testimony:

> [T]he CTE values of Akahori are higher than they would be in they were determined between 100°C and 200°C. As Dr. Thomas shows in RDX-131, The CTEs reported by Akahori are very low. In example 4, The CTE is only 0.97. Dr. Thomas tries to rely on this value to meet the CTE claim limitation of the '704 of 1 to 2.5. But since the CTEs in Akahori were determined at a higher temperature than that stated in claim 1, the CTE of the polymer in example 4 with a CTE of 0.97 would be even lower and definitely not within the range of claim 1 if the determination was carried out at a lower temperature. The CTE of the polymer in example 7 would also fall outside the claimed range if it were determined between 100°C and 200°C.

(CX-644C at Q. 201 *see also id.* at Q. 151 ("Polyimide films expand at different rates depending on the temperature.").)

It is clear that Akahori does not disclose CTE measurements over the claimed temperature range of 100-200°C. Still, SKC takes the position that the CTE measurements in Akahori would be the same even over the claimed temperature range. I find that SKC has failed to offer clear and convincing evidence to support that assertion. The parties' experts express conflicting views on the issue, and SKC and Dr. Thomas have not clearly shown that Dr. Harris's opinion is incorrect or inaccurate. (*See* RX-685C at Q. 1207; CX-644C at Q. 151, 201.) SKC offers the Intertek data to support Dr. Thomas' opinion, but fails to provide an explanation of what is shown in the Intertek data. (RX-9.) Moreover, there is no indication that the polyimide film tested by Intertek is identical or similar to the polyimide film disclosed in

Akahori. (*Id.*; RX-87.) Therefore, I find that the Intertek data does not provide support for Dr. Thomas' opinion.

SKC also argues that Akahori renders claim 1 obvious. For the average CTE limitation, SKC offers no substantive obviousness argument. Instead, SKC merely states that Akahori "anticipates and/or at a minimum renders obvious" the average CTE limitation of claim 1. SKC fails to provide an explanation regarding why one of ordinary skill in the art would find the average CTE limitation obvious in view of the disclosure in Akahori. I find that SKC's conclusory obviousness argument lacks merit. *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1324-1325 (Fed. Cir. 2005) (finding that conclusory evidence of obviousness was not sufficient to meet the clear and convincing standard).

Based on the foregoing, I find that SKC has failed to offer clear and convincing evidence that Akahori anticipates or renders obvious claim 1 of the '704 patent.

2. Ono

SKC's Position: SKC contends that claim 1 of the '704 patent is either anticipated by U.S. Patent No. 6,350,844 ("Ono") or rendered obvious by Ono in view of U.S. Patent Application Publication No. 2002/0012780 ("Yuyama").

SKC claims that there is no dispute that Ono discloses the preamble of claim 1, the average CTE limitation, and the diamine molar ratio limitation. (Citing RX-584C at Q. 1296, 1298-1299, 1308-1309.)

SKC argues that Ono discloses "a stiffness value of 0.4 to 1.2 g/cm." SKC asserts that using the formula provided in the '704 patent to calculate stiffness, the films in Ono meet the stiffness requirement of claim 1. (Citing RX-584C at Q. 1301; RX-102 at 8:36-38, 30:51-55; JX-3 at 2:15-15, 2:35-42.) Alternatively, SKC argues that the stiffness limitation would have

been obvious based on the combination of Ono and Yuyama. SKC states that Yuyama discloses polyimide films with thicknesses ranging from 10 to 30 μm. (Citing RX-107 at ¶ 8.) SKC claims that a person of ordinary skill in the art would have been motivated to modify Ono's thickness range of 15 to 90 μm to make a polyimide film for a flexible printed circuit with a thickness of less than 30 μm with a reasonable expectation of success. SKC states that applying the "k" value disclosed in the '704 patent, the modulus values disclosed in Ono, and the thickness range taught by Yuyama, one would obtain stiffness values ranging between 0.4 and 1.0, which are within the claimed range. (Citing RX-584C at Q. 1305-1306; RDX-153; RX-35 at 44-45.)

Regarding the claim that Ono and Yuyama cannot be combined because Ono is directed to ester linkages, SKC believes that Kaneka's own patent belie this assertion. SKC asserts that both the '639 and '704 patents suggest that it was well known that methods to manufacture polyimide films were equally applicable to polyimides with or without ester linkages. (Citing RX-584C at Q. 861.) SKC claims that Ono's use of PMDA, a non-ester forming dianhydride, suggests the applicability of Yuyama's broad teachings with respect to aromatic dicarboxylic acid dianhydrides. (Citing RX-102 at 38:24-30, 38:49-54; RX-107 at ¶¶ 10-11.)

Kaneka's Position: Kaneka contends that Ono does not anticipate or render obvious claim 1 of the '704 patent.

Kaneka asserts that Ono fails to disclose a stiffness value. Kaneka states that SKC tries to calculate the stiffness value based on the "k" value calculated from the examples in the '704 patent. Kaneka claims that Dr. Thomas relies on only four examples from Ono picked from 96 examples and 28 comparative examples to perform his stiffness calculation. (Citing CX-644C at Q. 216.) Kaneka argues that Dr. Thomas ignores examples in Ono that would lead to calculated

stiffness values outside of the range in claim 1. (*Id.*) In addition, Kaneka argues that not all of the thickness values in the range disclosed in Yuyama meet the stiffness requirement of claim 1. (Citing RDX-159.)

Kaneka claims that Ono has a CTE range that only partially overlaps with that of claim 1 of the '704 patent. (Citing RDX-147; CX-644C at Q. 218.) According to Kaneka, there can be no anticipation with a range that partially overlaps.

Kaneka argues that one of ordinary skill in the art would not combine the references because Ono uses a completely different chemistry than Yuyama. (Citing CX-644C at Q. 219.) Kaneka asserts that Ono is limited to polyimides with ester linkages, which behave very differently than polyimides not containing these linkages. (*Id.*)

Discussion and Conclusions: Based on the evidence in the record, I find that SKC has failed to offer clear and convincing evidence that Ono anticipates claim 1 of the '704 patent, or that the combination of Ono and Yuyama render claim 1 of the '704 patent obvious.

The parties dispute whether or not Ono alone, or the combination of Ono and Yuyama, disclose the limitation of claim 1 requiring a polyimide film with "a stiffness value of 0.4 to 1.2 g/cm." The '704 patent provides a method to calculate stiffness. It states that "[t]he stiffness value is determined by k x (film thickness)^3 x (elastic modulus of the film) (k is a proportional constant)." (JX-3 at 2: 7-8.)

Dr. Thomas testified that "using the stiffness equation provided [in the '704 patent], I was able to calculate that Ono discloses film stiffness values within the claimed range, as shown in RDX-153." (RX-584C at Q. 1301.) RDX-153 depicts the following:

The '844 Patent:
Ex. 5, 20μm = stiffness of 0.8;
Ex. 6, 15μm = stiffness of 0.4;
Ex. 6, 20μm = stiffness of 1.0;
Ex. 15, 20μm = stiffness of 0.8;
Ex. 16, 15μm = stiffness of 0.4;
Ex. 16, 20μm = stiffness of 1.0.

(RDX-153.)

Ono discloses that the preferable thickness for the polyimide film is 15 to 90 μm. (RX-102 at 30:51-55.) Examples 5 and 6 in Ono disclose that they produce "a polyimide film of about 10 μm in thickness." (RX-102 at 38:45, 39:3.) Examples 15 and 16 in Ono do not disclose any film thicknesses. (*Id.* at 43:19-44:6.) As shown in RDX-153, the thickness values used by Dr. Thomas in making his calculations do not correspond to the thickness values disclosed in the specified examples in Ono. (CX-644C at Q. 216.) Because Dr. Thomas' calculations are not supported by the actual disclosure in Ono, I find that SKC has failed to demonstrate that Ono discloses the stiffness limitation of claim 1.

SKC alternatively argues that the combination of Ono and Yuyama renders the stiffness limitation obvious. SKC notes that Yuyama discloses that polyimide film with a thickness in a range of 10 to 30 μm. (RX-107 at ¶ 8.) SKC asserts that using the calculated "k" value from the '704 patent, the modulus values from Examples 5, 6, 15, and 16 of Ono, and thicknesses of 15 or 20 μm, which are in the range disclosed by Yuyama, the resulting stiffness calculations are within the range disclosed in claim 1 of the '704 patent. This combination of values from Ono and Yuyama is what is shown by Dr. Thomas in RDX-153 *supra*. (RX-584C at Q. 1301, 1305-1306; RDX-153.) According to SKC "a person of ordinary skill in the art would have been motivated to modify Ono's range of 15 to 90 μm to make a polyimide film for a flexible printed

circuit with a thickness less than 30 μm, such as 15 and 20 μm, with a reasonable expectation of success." (RIB at 83; *see also* RX-584C at Q. 1305.)

In *KSR*, the Supreme Court explained that in performing an obviousness analysis:

> Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was **an apparent reason to combine the known elements in the fashion claimed by the patent at issue.**

KSR, 550 U.S. at 418 (emphasis added).

As Kaneka and Dr. Harris note, the combination offered by SKC and Dr. Thomas requires cherry picking thickness and modulus values from Ono and Yuyama to arrive at a stiffness value that is within the claimed range. The specification in Ono discloses 96 examples and 28 comparative examples, yet SKC focuses on the modulus values from four specific examples, Examples 5, 6, 15, and 16. (RX-102; RX-584C at Q. 1301, 1035; RDX-153.) Yuyama discloses a film thickness in the range of 10 to 30 μm, yet SKC further narrows that range to 15 to 20 μm when calculating stiffness values. (RX-107 at ¶ 8; RX-584C at Q. 1301, 1035; RDX-153.) SKC and Dr. Thomas provide no explanation regarding why, with so many examples in Ono and the broad thickness range in Yuyama, one of ordinary skill in the art would know to choose the correct modulus and thickness values from each reference to arrive at a stiffness value within the range required by claim 1. (*See* RIB at 83-84; RRB at 44-45; RX-584C at Q. 1301-1303, 1305-1306; CX-644C at Q. 219.) Therefore, I conclude that SKC has failed to demonstrate that the combination of Ono and Yuyama render claim 1 of the '704 patent obvious.

3. Indefiniteness

In Section III.D.2 *supra*, I concluded that the claim term "average coefficient of thermal expansion" is indefinite. Therefore, I find that claim 1 of the '704 patent is invalid pursuant to 35 U.S.C. § 112, ¶ 2.

E. The '961 Patent

1. Anticipation & Obviousness In View of RPX-2, RPX-3, & RPX-4

SKC's Position: SKC asserts that claims 1 and 9 of the '961 patent are either anticipated or rendered obvious by several prior art references and samples. (Citing RX-584C at Q.1559-94, 1636-49, 1697-1735, 1774-88, 1835-60, 1881-87, 1911-27, 1951-57, 1980-98, 2017-23, 2047-68, 2077-93, 2102-16; RX-59; RX-61; RX-71; RX-72; RX-73; RX-82; RX-89; RX-105; RX-108; RX-109; RX-110; RX-113; RX-114; RPX-2; RPX-3; and RPX-4.) According to SKC, claims 1 and 9 are invalid under either party's proposed claim construction.

SKC asserts that Kaneka has not disputed that the DuPont test results anticipate claims 1 and 9 of the '961 patent. SKC contends that Kaneka challenges authenticity, prior art status, and testing procedures. According to SKC, Kaneka does so despite actual samples of 2002 and 2003 Kapton® film (RPX-2 to RPX-4), trial testimony, supporting DuPont documentation, and professional testing of the samples.

SKC asserts that it explained in Section VI(D)(1) of its post-trial brief that both the DuPont witness, Mr. Miller, and SKC witness Mr. Won, testified repeatedly as to the dates of the samples and their relationship to film sold by DuPont in 2002 and 2003. According to SKC, for RPX-2 and 3, Mr. Miller testified how DuPont stored these samples with identifying specification sheets and in fact designated the physical samples and specification sheets, with the same Bates numbers; DUPONT 2 for RPX-2 and RX-487C, and DUPONT 3 for RPX-3 and RX-

488C. (Citing Tr. 709:10-16, 717:14-719:6, 722:17-723:3; RX-686 to 689.) SKC asserts that DuPont also included paperwork to Kaneka and SKC that provided information on the MD and TD directions for RPX-2 and RPX-3. (Citing *id.* (when asked to produce a sample 1 meter in length in MD direction pre-slitting, DuPont identified the sample as "14" long and 55" wide").) SKC contends that for RPX-4, Mr. Won testified at length as to how SKPI's parent corporation, SKC Corp., purchased a roll of DuPont Kapton® 200FPC from DuPont USA in 2002 and how he was the custodian of RPX-4 and its associated documentation, RX-526. (Citing RX-585C at Q.17-36.) SKC asserts that Mr. Won also explained that RPX-4 was identifiable as Kapton® 200FPC { } and its unique properties. (Citing Tr. at 416:19-417:21, 418:9-420:1, 426:2-6, 429:15-23, 430:4-20.)

Kaneka's Position: Kaneka contends that the documents used for authenticating RPX-2, RPX-3, and RPX-4 for the limited purpose of admission at the evidentiary hearing do not have sufficient corroboration or disclosure to qualify as prior art. (Citing *Washburn & Moen v. Beat 'Em All Barbed-Wire*, 143 U.S. 275 (1892).) According to Kaneka, samples alone will not suffice. (Citing *Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1195-1196 (Fed. Cir. 1999).) Kaneka asserts that SKC has not highlighted any evidence of record that supports a jury finding that a person of ordinary skill in the art, upon receipt of the samples would have any of the requisite information to make the claimed invention, and as a result, there cannot be anticipation by knowledge under § 102(a). (Citing *Minnesota Min. & Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 1306 (Fed. Cir. 2002).) Kaneka asserts that in order to establish invalidity based upon prior use or on-sale, SKC must come forward with witness testimony based upon personal knowledge that the DuPont samples possessed the claimed properties in 2002 and must corroborate that testimony with substantial evidence in the form of

documentation and contemporaneous records. (Citing *Woodland Trust v. Flowertree Nursery*, 148 F.3d 1368, 1369 (Fed. Cir. 1988); *The Barbed Wire Patent*, 143 U.S. 275, 284 (1892); *Finnigan Corp. v. Int'l Trade Commn.*, 180 F.3d 1354, 1367-68, 1370 (Fed. Cir. 1999); *Juicy Whip v. Orange Bang*, 292 F.3d 728, 743 (Fed. Cir. 2002).)

Kaneka asserts that RPX-2 and RPX-3 were provided to SKC by Mr. Bruce Goodwin and were allegedly retrieved from storage by Mr. Goodwin, but Mr. Goodwin did not testify at the hearing and his declaration regarding these exhibits was excluded. According to Kaneka, SKC attempts to substitute the hearing testimony of Mr. Miller in support of RPX-2 and RPX-3, but Mr. Miller did not retrieve the samples from storage, did not see Mr. Goodwin retrieve the samples, and did not confirm the sample retrieval. Kaneka contends that Mr. Miller has no personal information about the samples and his only knowledge was his reliance on the excluded Goodwin declaration, thus Mr. Miller cannot possibly corroborate RPX-2 or RPX-3. (Citing Tr. at 717:25-718:19; 721:7-722:5.) Kaneka asserts that although admissibility for an evidentiary hearing may be satisfied by this "corporate" knowledge, the lack of any witness that can affirmatively testify, based upon personal knowledge, that these particular samples were actually produced in 2002, prevents these samples from being used to invalidate the asserted claims of the '961 patent due to a lack of necessary and proper corroboration.

Kaneka assert that the only other purported DuPont sample, RPX-4, {

} (Citing Tr. at 429:22-23.) {

} (Citing Tr. at 417:6-21; 419:6-18.) Kaneka contends that at trial Mr. Won could not distinguish a DuPont sample from an SKC sample. (Citing Tr. at 423:16-25.) According to

Kaneka, Mr. Won testified that he cannot tell the date of manufacture simply by how a roll looks and feels. (Citing Tr. at 418:17, 23.) Kaneka contends that Mr. Won did not test the sample he believed to be from 2002. (Citing Tr. at 419:2-13.)

Discussion and Conclusions: Based on the evidence in the record, I find that SKC has failed to show by clear and convincing evidence that RPX-2, RPX-3, and RPX-4 are prior art to the '961 patent.

The testimony of Mr. Miller that the films identified as RPX-2 and RPX-3 were films that were sold and offered for sale before March 11, 2004 is insufficient to meet the clear and convincing evidence standard. Mr. Miller testified that his knowledge was based on the sworn statement of another DuPont employee, Mr. Goodwin. (Tr. at 721:3-9.) Mr. Goodwin's declaration was excluded. (Tr. at 16:16-17:1.) Mr. Miller's testimony, therefore, was based on excluded evidence, and has little, if any weight. The sales receipts RX-503C and RX-501C are also insufficient to show that RPX-2 and RPX-3 were sold and offered for sale before March 11, 2004. (RIB at 99, 102.) I would have to rely on the testimony of Mr. Miller to tie the sales receipts (RX-503C and RX-501C) to the RPX-2 and RPX-3 films. (*See* Tr. at 706:17-25; 707:5-13.) As discussed above, Mr. Miller's knowledge (and therefore testimony) was based on an excluded statement of another DuPont employee and has little, if any weight. As a result, SKC has failed to show by clear and convincing evidence that RPX-2 and RPX-3 are prior art to the '961 patent.

SKC has likewise failed to establish by clear and convincing evidence that RPX-4 is prior art to the '961 patent. {

} (RX-585C at Q.27.) {

} During the hearing, Mr. Won explained that the roll of DuPont

Kapton® 200FPC film that was produced as RPX-4 {

} (Tr. at 429:15-429:23.) RX-526, a product label for 200FPC film, {

} (RX-585C at Q.25.) Rather, Mr. Won's testimony is needed to connect the product label RX-526 with the physical sample RPX-4.

On its own, Mr. Won's testimony is insufficient to meet the clear and convincing standard required to show invalidity because of Mr. Won's interest in the outcome of the investigation, {

} A witnesses' interest in the outcome of an investigation and the amount of time that has passed both weigh in favor of requiring corroborating evidence to meet the clear and convincing evidence standard for invalidity. *See Woodland Trust v. Flowertree Nursery, Inc.*, 148 F.3d 1368, 1371 (Fed. Cir. 1998) (identifying, *inter alia*, as criteria to assess corroboration, "the time period between the event and trial" and "the interest of the corroborating witness in the subject matter in suit"). Mr. Won is an employee of SKC Kolon PI Inc. (RX-585C at Q.5.) and as a result has an interest in the outcome of the investigation. {

} Mr. Won provided his testimony in 2012 identifying RPX-4 as the Kapton 200FPC film {

} (See RX-585C at Q.21-25.)

The possibility for error in correctly identifying RPX-4 as Kapton 200FPC film {

} further weighs in favor of requiring corroborating evidence of Mr. Won's testimony. RPX-4 was marked with "Kapton {

} (Tr. at 429:24-430:20.) Mr. Won

testified that to distinguish between the {

} and the film's properties, such as thickness, width, color, and core size. (Tr. at 416:19-417:21, 422:9-423:1.) Although Mr. Won asserted that he made this determination based on SKC's records, SKC did not provide these records:

> {
>
> } And if memory serves, of them, {
> } And the core around which the product was wound was a 6-inch core, and as such, the Kapton product by DuPont, as we talked about, compared to the one from 2002, those could be easily distinguished.
> {
>
> }

(Tr. at 422:9-423:1 (emphasis added).)

Thus, the only evidence that RPX-4 is the Kapton 200FPC film {

} is Mr. Won's uncorroborated testimony. Where a mistaken identification is possible, such uncorroborated testimony from an employee of the respondent when so much time has passed fails to reach the level of clear and convincing evidence. *See Woodland Trust v. Flowertree Nursery, Inc.*, 148 F.3d 1368, 1373 (Fed. Cir. 1998)("With the guidance of precedent, whose cautions stressed the frailty of memory of things long past and the temptation to remember facts favorable to the cause of one's relative or friend, we conclude that this oral evidence, standing alone, [does][] not provide the clear and convincing evidence necessary to invalidate a patent on the ground of prior knowledge and use under § 102(a)."); *See also Washburn & Moen Mfg. Co. v. Beat 'Em All Barbed-Wire Co.*, 143 U.S. 275, 284-85 (1892).

RX-526 does not corroborate Mr. Won's testimony. {

} Evidence that circularly requires Mr. Won's testimony in order to use the evidence to corroborate Mr. Won's testimony does not corroborate Mr. Won's testimony. As a result, SKC has failed to prove by clear and convincing evidence that RPX-4 predates the '961 patent.

2. Enablement of Claim 1

SKC's Position: SKC asserts that claim 1 is not enabled by the '961 patent specification for the full range of recited "A" values and is invalid under 35 U.S.C. § 112, paragraph 1. According to SKC, claim 1 recites a range of 1.13 to 3.00 for the coefficient of linear expansion ratio "A" represented by the formula: $A = 1 + \{(b-a)/(b+a)\} \times 2$. (Citing JX-4 at 37:3-11.) SKC contends that there is no enabling disclosure regarding how to make a film with values near and including the endpoint of 3.00.

SKC contends that in order for "A" to be a value of 3.00, "a" must be zero. (Citing RX-584C-1554-55.) SKC asserts that inventor Fujihara noted that he was unaware of any polyimide film where the CTE value is zero along the molecular orientation axis. (Citing RX-590C at 47:22-48:6.) According to SKC, Kaneka's expert concurred that it is impossible to have a polyimide film with a CTE value of zero. (Citing Tr. at 834:3-12.) SKC asserts that Dr. Harris initially took the position that the upper limit of 3 is an actual, as opposed to a "theoretical," limit of A, opining that "one of ordinary skill in the art can make a film that would give a value of 3." (Citing Tr. 835:15-836:4, 14.) According to SKC, after Dr. Harris realized this was impossible, he changed positions, testifying that the upper limit of 3 is a mere "theoretical" limit and only an indication of increasing anisotropy. (Citing Tr. 832:16-833:17; CX-644C at Q.291.)

SKC asserts that this is entirely inconsistent with Kaneka's understanding when prosecuting the '961 patent. According to SKC, at that time, a Kaneka employee wrote to the manager of the Kaneka IP department (Mr. Yamada), to report a concern that claim 1 had an unenforceable scope because the claimed range includes an "A" value of 3.00, which means that a CTE value has to be 0. (Citing RX-392C at 5-6; Tr. at 839:22-840:25.) SKC contends that Mr. Yamada asked the concerned employee to refrain from discussing "delicate" matters over email. (Citing RX-392C at 5.) According to SKC, the employee subsequently retracted his concern and announced, over email, that a CTE value of zero or even negative is possible. (Citing RX-392C at 5.)

SKC contends that because the upper limit of 3.00 is an actual limit, the claimed range of claim 1 includes an indisputably unattainable value of "A." According to SKC, it would take undue experimentation to determine how close one can even get to the "A" value of 3.00 because of the challenges associated with getting to a CTE value close to 0. (Citing RX-584C at Q.1554-56; Tr. 834:24-835:11.) SKC asserts that within the claimed range of "A", one of ordinary skill in the art would not know exactly how much is attainable and how much is not, which is not addressed by Dr. Harris's trial testimony. SKC contends that the '961 patent does not enable the full scope of the claim, and is therefore invalid. (Citing *EMI Group North America, Inc. v. Cypress Semiconductor Corp.*, 268 F.3d 1342, 1349 (Fed. Cir. 2001) ("When a claim itself recites incorrect science in one limitation, the entire claim is invalid, regardless of combinations of the other limitations recited in the claim.").)

SKC contends that Kaneka does not dispute that at least some portions of the claimed range are unattainable and therefore not enabled. (Citing CIB at 115.) According to SKC, Kaneka now argues that because most or a substantial part of the claimed range is attainable, the

claim is not invalid for lack of enablement. (Citing CIB at 115.) SKC asserts that Kaneka's argument is irrelevant because the question here is whether the specification teaches one of ordinary skill in the art how to make and use the full scope of the claim, not most or a substantial part of it. (Citing *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993); *Warner-Lambert Co. v. Teva Pharmaceuticals USA*, 418 F.3d 1326, 1337 (Fed. Cir. 2005)("[T]he specification must provide sufficient teaching such that one skilled in the art could make and use the full scope of the invention without undue experimentation." (emphasis added)).)

According to SKC, when the claimed range includes unattainable portions, it must be readily obvious to one of skill in the art which portions of the claimed range are unattainable. (Citing *In re Cook*, 439 F.2d 730, 734-35 (C.C.P.A. 1971).) SKC contends that Dr. Harris initially opined that one of ordinary skill in the art can make a film that would give a value of 3.00, until he changed his opinion and testified that the upper limit of 3.00 is unattainable. (Citing Tr. at 835:15-836:4; 836:14; 832:16-833:17; CX-644C at Q.291.) According to SKC, a Kaneka employee (Mr. Nakamura) also initially wrote to the manager of the Kaneka IP department (Mr. Yamada) to report a concern that claim 1 had an unenforceable scope because the claimed range includes "A" value of 3.00 before retracting his concern and announcing that a CTE value of zero (i.e., "A" value of 3.00) is possible. (Citing RX-392C at 5.) SKC asserts that these examples of switching opinions by Dr. Harris and Mr. Nakamura strongly suggest that it is not readily obvious to one of skill in the art whether the claimed range even includes unattainable portions.

According to SKC, one of skill in the art would not readily know how close one can get to the "A" value of 3.00 because of the challenges associated with getting to a CTE value close to zero. (Citing RX-584C at Q. 1554-56; Tr. at 834:24-835:11.) SKC asserts that, within the

claimed range of "A," one of ordinary skill in the art would not know exactly how much is attainable and how much is not. (Citing RX-584C at Q. 1554-56.)

Kaneka's Position: Kaneka asserts that Dr. Thomas opines that Claim 1 of the '961 patent lacks an enabling disclosure because the scope of the claims includes a range that encompasses 3.00, and an "A" value of 3.00 cannot be obtained. According to Kaneka, claim 1 of the '961 patent states a range of 1.13 to 3.00. Kaneka contends that the most important part of this range is the lower limit of 1.13, which distinguishes the films of the '961 patent from those of the prior art. (Citing CX-644C at Q.291.) According to Kaneka, the application that issued as the '961 patent originally claimed a range of 1.01 to 3.00. Kaneka asserts that the claim was amended during prosecution to the claimed range of 1.13 to 3.00 in view of the prior art. (Citing RX-557 at 346.) According to Kaneka, the lower range was used to distinguish over the prior art and the upper portion of the range is only an indication of increasing anisotropy. Thus, Kaneka contends that "A" values of 1.13 to 3.00 are included to indicate that the degree of anisotropy is not critical, and any "A" value 1.13 or above falls within the claim.

According to Kaneka, this interpretation is substantiated by the fact that an "A" value of 3.00 is the upper theoretical limit of A. (Citing RX-557 at 346.) Kaneka asserts that one of ordinary skill of art would appreciate that 3.00 is the theoretical maximum, and would not be deterred in practicing the '961 invention utilizing the instructions given in the specification. According to Kaneka, such work could readily be carried out without undue experimentation. Kaneka asserts that Dr. Thomas has not alleged otherwise. (Citing CX-644C at Q.291.) According to Kaneka, Dr. Thomas has never argued that most or substantially all of the claimed range is not enabled.

In its reply brief, Kaneka contends that SKC argues that Claim 1 of the '961 patent lacks an enabling disclosure because the claimed range of A encompasses 3.00, and an A value of "3 or close to 3" cannot be obtained. (Citing RIB at 105.) According to Kaneka, SKC admits that an A value of 3.00 is an upper limit on any embodiment. (Citing RIB at 106.) Therefore, Kaneka asserts that where claim 1 states a range of 1.13 to 3.00, a person of ordinary skill in the art would understand the claim range to be 1.13 or greater. (Citing CX-644C at Q.291.) According to Kaneka, the critical part of the claimed range is not the upper limit, but the lower limit of 1.13, which was amended from 1.01 to distinguish the prior art. (Citing CX-644C at Q.291; RX-557 at 346.)

Kaneka asserts that SKC relies on a single case from the electrical field (*EMI Group North America, Inc. v. Cypress Semiconductor Corp.*, 268 F.3d 1342, 1349 (Fed. Cir. 2001)) to conclude that the claimed range is not enabled because an A value of 3.00 is not obtained. Kaneka contends that *EMI Group* involves a mechanism that was non-operative, not an end point of a range. According to Kaneka, where the vast majority of a claimed range is enabled, the claim is "sufficiently definite" under section 112. (Citing *In re Kroekel*, 504 F.2d 1143, 1144 (C.C.P.A.1974) ("theoretical composition having a total weight of 101%, is sufficiently definite to satisfy the requirements of 35 U.S.C. 112").) Kaneka asserts that 3.00 is only the theoretical upper limit of A. (Citing Tr. at 832:16-833:17.) Kaneka contends that, as a result, the remainder of the claimed range is operable, and no undue experimentation is needed to practice the invention.

Discussion and Conclusions: Based on the evidence in the record, I find that claim 1 is invalid because it is not enabled for the claimed range. Claim 1 requires, *inter alia*, "a coefficient of linear expansion ratio A represented by equation (1): $A=1+\{(b-a)/(b+a)\}\times 2$ (1) is

in the range of 1.13 to ***3.00*** across the entire width." (JX-4 at 37:7-11) (emphasis added). The first paragraph of section 112 of title 35 sets forth the enablement requirement, which provides:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same . . . .

35 U.S.C. § 112 ¶ 1. When a range is claimed, "there must be reasonable enablement of the scope of the range." *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1244 (Fed. Cir. 2003). Here, the specification fails to reasonably enable the scope of the claimed range.

SKC's expert convincingly testifies why the '961 patent does not explain how to obtain an "A" value of 3.00. (RX-1554-1556.) Moreover, Kaneka's own expert has admitted that obtaining an "A" value of 3.00 is not possible. Mathematically, for "A" to be 3.00, the value of "a" in the claimed equation would have to be zero. According to ***Kaneka's*** expert witness, Dr. Harris, this is not possible for a polyimide film produced by a continuous process. (Tr. at 834:3-23.) Although later withdrawing his concerns, a Kaneka employee also expressed his concern that obtaining an "A" value of 3.00 would be impossible. (RX-392C at 6.) Moreover, Kaneka does not argue that an "A" value of 3.00 is possible. Rather, Kaneka argues that 3.00 is an upper "theoretical limit" that is not significant for patentability and merely signals to one of skill in the art that the claim requires an "A" value greater than 1.13. (CRB at 63.)

Kaneka's argument that one of skill in the art would understand that the claim requires an "A" value greater than 1.13 is not convincing. First, Kaneka's expert, one of ***at least*** ordinary skill in the art, admitted that his rebuttal expert report provided "[i]n my opinion, one of ordinary skill in the art can make a film that would give a value of 3, such as by stretching the film in one direction until obtaining a value of 3." (Tr. at 835:15-836:14.) However, he later argued that 3.00 was a theoretical limit. (Tr. at 833:18-23.) Moving in the exact opposite direction of

Kaneka's expert, an employee of Kaneka initially expressed concern that an "A" value of 3.00 would be impossible. (RX-392C at 6.) The employee later changed his mind, concluding that an "A" value of 3.00 would be possible. (RX-392C at 5.) The fact that Dr. Harris, Kaneka's expert, and an employee of Kaneka, both waffled on this issue, and came to different conclusions, rebuts Kaneka's argument that one of ordinary skill in the art would understand that an "A" value of 3.00 is merely theoretical.

The specification of the '961 patent also acts to rebut Kaneka's argument. The specification does not treat an "A" value of 3.00 as theoretical. Rather, when discussing the range of values for "A," the specification discloses that A is less than or ***equal*** to the value 3.00, and preferably, less than or equal to the value 2.00. (*See, e.g.,* JX-4 at 9:7-11.) By indicating that 2.00 is preferable to 3.00, the specification indicates that the upper limit is important, contradicting Kaneka's argument that the lower limit is all that matters. Because an "A" value of 3.00 is not practically possible, and claim 1 claims a range of "A" of 1.13 to 3.00, claim 1 is invalid for lack of enablement under 35 U.S.C. § 112, first paragraph.

3. Enablement of Claim 9

SKC's Position: SKC asserts that claim 9 is not enabled by the '961 patent specification for the full range of recited "d/c" values and, thus, is invalid under 35 U.S.C. § 112, paragraph 1. According to SKC, claim 9 recites that "d/c" must be in the range of 1.01 to 1.20. SKC contends that there is no enabling disclosure regarding how to make a film with values near and including the endpoint of 1.01. According to SKC, Dr. Harris admitted that he did not know whether he could make such a film after reading the '961 patent. (Citing Tr. at 831:4-832:5.)

SKC asserts that during prosecution of the '961 patent, Kaneka represented to the PTO that "[t]he present invention does not cover such an isotropic film, but instead an *anisotropic*

film" (Citing JX-9 at 284 (emphasis added by SKC)) in order to avoid cited prior art. (Citing Tr. 820:7-821:1.) SKC contends that the claimed d/c range, which is a ratio of TPR in molecular orientation axis and perpendicular axis, includes "1.01," which is only 1% removed from perfect *isotropy*. (Citing RX-584C at Q.1553.) According to SKC, one skilled in the art would consider a film having a TPR ratio of 1.01 to be an isotropic film. SKC asserts that despite Dr. Harris's testimony in his witness statement that "1.01" is still "anisotropic," Dr. Harris himself has referred to prior art DuPont films having "1.01" TPR ratio as "isotropic" films to avoid invalidity, and even stated that film characteristic ratios that are *13%* removed from perfect isotropy to be a "boundary" between isotropic and anisotropic films. (Citing Tr. 821:19-822:21; CX-644C at 290-91.) SKC contends that the question is, does the '961 patent disclose to one skilled in the art how to make an *anisotropic* film that has near-perfect *isotropic* properties? According to SKC, both experts in this case say "no." (Citing Tr. at 831:4-832:5; RX-584C at Q.1553.) SKC contend that without such a disclosure, the '961 patent does not enable the full scope of the claimed invention, and is therefore invalid.

SKC asserts that Kaneka's argument at page 116 of its Post-Trial Brief that claim 9 is not tied to anisotropic film is squarely at odds with its own admission a dozen pages earlier, that "[d]uring prosecution, Kaneka argued the Fujihara reference disclosed an isotropic film . . . in contrast to the claimed film." (Citing CIB at 94, 116.) According to SKC, Kaneka represented to the PTO that "[t]he present invention does not cover such an isotropic film, but instead an anisotropic film" to distinguish over prior art. Yet, SKC contends, the claimed range still includes "1.01," which is only 1% removed from perfect isotropy. (Citing Tr. at 820:7-821:1; RX-584C at Q.1553; *see also* JX-9 at 284.)

SKC asserts that nowhere does the '961 patent explain how you can make a film, 1% removed from perfect isotropy, but still not isotropic. According to SKC, Kaneka answers this question through attorney argument and the conclusion that one of ordinary skill in the art can make a polyimide film with a d/c value of 1.01 without citing to any evidence of record. SKC asserts that Kaneka's own expert, Dr. Harris disagrees. According to SKC, Dr. Harris testified that he would not know whether he could make a polyimide film that has a "d" over "c" ratio of 1.01 to 1.20. (Citing Tr. at 831:4-832:5.) SKC contends that Dr. Thomas provided similar testimony, noting that "the '961 Patent fails to provide any disclosure that would allow one skilled in the art to make a polyimide film that is both anisotropic and has a d/c value of '1.01.'" (Citing RX-584C at Q.1553.)

Kaneka's Position: Kaneka asserts that claim 9 is not invalid for lack of enablement. Kaneka contends that Dr. Thomas opines that claim 9 of the '961 patent is invalid for failure to "provide any disclosure that would allow one skilled in the art to make a polyimide film that is both anisotropic and has a d/c value of 1.01." However, according to Kaneka, the term "anisotropic" appears nowhere in claim 9 of the '961 patent. (Citing CX-644C at Q.290.) Kaneka asserts that SKC is trying to import the term anisotropic in the claim, when the patentee decided to express this term only by a range in the claim. According to Kaneka, Claim 9 recites a range from 1.01 to 1.20. Kaneka contends that one of ordinary skill of art can make a polyimide film with a d/c value of 1.01, which is all the claim asks for. According to Kaneka, Dr. Thomas does not allege that one of ordinary skill of art could not make a film that has a d/c ratio of 1.01 to 1.20. Kaneka contends that the patentee defined an anisotropic film with the range provided in the claim. According to Kaneka, while the claimed film may be only slightly

anisotropic, Dr. Thomas has not alleged that one of ordinary skill of art cannot make the claimed film without undue experimentation. (Citing CX-644C at Q.290.)

Kaneka asserts that SKC argues that claim 9 of the '961 patent is invalid for failure to "provide any disclosure that would allow one skilled in the art to make a polyimide film that is both anisotropic and has a d/c value of 1.01." According to Kaneka, The term "anisotropic" appears nowhere in claim 9 of the '961 patent. (Citing CX-644C at Q.290.) Kaneka contends that claim 9 recites a range from 1.01 to 1.20 and one of ordinary skill of art can make a polyimide film with a d/c value of 1.01, which is all the claim asks for. (Citing CX-644C at Q.290.)

According to Kaneka, SKC argues that "film characteristic ratios that are 13% removed from perfect isotropy to be a 'boundary' between isotropic and anisotropic films." (Citing RIB at 107.) Kaneka asserts that Dr. Harris only testified that Claim 1 requires an A value of 1.13 at the lower range to define an anisotropic film. (Citing Tr. at 828:10-829:4.) According to Kaneka, Dr. Harris was only referring to a specific claim. Kaneka asserts that SKC also argues that Dr. Harris himself has referred to prior art DuPont films having 1.01 tear propagation resistance ratio to be isotropic. (Citing RIB at 107.) According to Kaneka, Dr. Harris testified that the DuPont samples had a tear propagation ratio between 0.99 and 1.01 and are likely isotropic. Kaneka contends that Dr. Harris was discussing the range between these two values and at trial, was directed to only the calculation for the 1.01 border of this range.

Discussion and Conclusions: Based on the evidence in the record, I find that claim 9 is not invalid for lack of enablement. SKC's argument that claim 9 is invalid because it would be impossible to make an anisotropic film with a d/c value of 1.01 is not persuasive. As an initial matter, claim 9 does not explicitly include the phrase "an anisotropic film." (*See* JX-4 at 37:35-

38:2.) Rather, claim 9 defines, *inter alia*, the range of acceptable values for d/c. (*See* JX-4 at 37:39-38:2 ("the tear propagation resistance ratio d/c is in the range of 1.01 to 1.20 and the difference between the maximum and the minimum of the tear propagation resistance ratio d/c is 0.10 or less across the entire width.").)) If SKC believes that claim 9 should have been limited to "an anisotropic film," it should have argued such in claim construction and then argued invalidity for lack of enablement, rather than arguing this issue only in invalidity. Issues of waiver notwithstanding, SKC does not address the fact that one example film in the '961 patent discloses a d/c value of 1.01.[25] (JX-4 at Table 3 (comparative example 1 shows a d/c value of 1.01).) Since SKC does not address this example and does not even allege this example does not enable claim 9, SKC has failed to meet its burden to prove that claim 9 is not enabled by clear and convincing evidence.

4. Best Mode

SKC's Position: SKC asserts that the '961 patent is invalid for failure to disclose the best mode for production of the claimed polyimide film known to the inventors at the time when the '961 patent was filed. (Citing *Eli Lilly & Co. v. Barr Labs. Inc.*, 251 F.3d 955, 963 (Fed. Cir. 2001).) According to SKC, Kaneka admits that the '961 patent seeks to improve dimensional stability of a continuously produced polyimide film by "mak[ing] molecular orientation uniformly anisotropic across the entire width of the film." (Citing CIB at 13.) SKC contends that Dr. Fujihara, a named inventor of the '961 patent, failed to disclose his best mode for mass production of such a film. According to SKC, Dr. Fujihara, a named inventor of the '961 patent, revealed that, around the early- to mid-2000s, he along with the other '961 patent named

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[25] It is noted that this example does not appear to meet another limitation in claim 9: "the difference between the maximum and the minimum of the tear propagation resistance ratio d/c is 0.10 . . . ." (JX-4 at 37:40-38:2.)

inventors investigated methods to control the molecular orientation of a particular Kaneka polyimide film, "HP." (Citing RX-532C at 2; *see also* RX-590C at 102:4-19, 23-24.)

SKC asserts that Dr. Fujihara and the research task force found a method to reduce uneven molecular orientation. (Citing RX-532C at 2.) According to SKC, Dr. Fujihara authored a report entitled "Realization of stable production with actual machine by controlling orientation" in connection with the film research. (Citing RX-590C at 93:10-24; 95:9-15; 102:4-19, 23-24.) SKC contends that the '961 patent contains a nearly identical figure to one that is used in the report. (Citing RDX-255.)

SKC asserts that Dr. Fujihara's report explores at least three different methods, each method employing multiple variables, to control the molecular orientation across the entire width of film in a mass production setting. (Citing RX-533C at 61.) According to SKC, through experiments performed in July 2004, Dr. Fujihara reported that "important orientation control factors" of continuously produced film include scaling manipulation, gel tension, 1st oven hot air temperature, residual volatility, the temperature of belt number 2 chamber, mixer revolution frequency, and film traveling speed. (Citing RX-533C at 61.)

SKC asserts that a month later Dr. Fujihara further manipulated residual volatility, gel tension, and scaling and ascertained a successful method to produce polyimide film with controlled molecular orientation. (Citing RX-533C at 60-61.) According to SKC, Dr. Fujihara stated that the parameters of "Experiment 6," which was conducted between July and August 2004 and reported in Table 11, were necessary to mass produce polyimide film with excellent dimensional stability. (Citing RX-533C at 54-55, 62.) SKC contends that those parameters include "scaling change rates" of -4.0 and 0.0 % in 1st and 3rd ovens, respectively; 170 °C, 300

°C, and 400 °C in the 1st, 2nd, and 3rd third hot-air ovens, respectively; gel tension of 8.4 kg/m; and a residual volatility volatile constituent level of 56%. (Citing RX-533C at 55.)

SKC asserts that Dr. Fujihara explicitly identified residual volatility, gel tension, and scaling as particular factors in achieving continuous production of a polyimide film that is dimensionally stable across the entire width. (Citing RX-533C at 60-61.) According to SKC, Dr. Fujihara also knew that parameters of "Experiment 6" enabled stable mass production of polyimide film with excellent dimensional stability. (Citing RX-533C at 54-55, 62.) SKC contends that these important factors constitute part of the best mode known to Dr. Fujihara for practicing the claimed inventions of the '961 patent, which is directed to improving the dimensional stability across the entire width of a continuously produced polyimide film, but none of these specific factors are included in the '961 patent (JX-4 at 6:17-26:62), which was filed after Dr. Fujihara's discovery. (Citing JX-4 (showing a filing date of August 31, 2006 from a continuation-in-part of application No. PCT/JP2005/004282, filed on March 11, 2005).)

According to SKC, the '961 patent's filing date for the best mode determination is August 31, 2006. SKC asserts that while the face of the patent shows that the '961 patent's foreign priority application has a filing date of March 15, 2004, Kaneka has presented no evidence to show that it should benefit from this filing date, or any other earlier filing date, despite SKC presenting evidence that placed a burden on Kaneka to show entitlement to an earlier filing date. (Citing *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 870-71 (Fed. Cir. 2010); SKC's Opposition to Kaneka's Motion in Limine No. 5.) SKC asserts that because Dr. Fujihara failed to share with the public what he apparently knew to be the best way of making the *continuously produced* polyimide film claimed in the '961 patent, claims 1 and 9 are invalid for violating the best mode requirement under 35 U.S.C. § 112, ¶1.

In its reply brief, SKC asserts that its best mode defense stands un-rebutted. According to SKC, it first detailed this defense in Prof. Thomas's witness statement (Citing RX-584C at Q.2139-52) based on evidence provided for by Order Nos. 18 and 33, and again, in its Pre-Trial Brief at pages 472-76. SKC contends that Kaneka did not address the best mode defense in its Post-Trial Brief, which precludes Kaneka from later doing so in its reply brief. (Citing Tr. at 969:24-970:11.)

Kaneka's Position: Kaneka asserts that SKC does not provide any expert testimony in support of its best mode theory, despite the fact that this theory consists of highly technical arguments that require expert assistance to show that the best mode materially affects the properties of the claimed invention itself. (Citing *Bayer AG v. Schein Pharmaceuticals, Inc.,* 301 F.3d 1306, 1319-20 (Fed. Cir. 2002.).) According to Kaneka, whether the best mode has been appropriately disclosed turns on whether the inventor has disclosed the means to carry out the invention. (Citing *Wahl Instruments, Inc. v. Acvious, Inc.*, 950 F.2d 1575, 1580 (Fed.Cir.1991).) Kaneka contends that whether or not the means are disclosed is appropriate and expected ground for expert testimony.

According to Kaneka, SKC alleges that the inventors of the '961 patent did not update their application after later discovering a better method for practicing the invention. Kaneka asserts that the first date that SKC alleges that this best mode could have been known to the inventors is July 2004—approximately four months after the Japanese priority application was filed. According to Kaneka, there is no requirement to update the best mode in the context of a foreign priority application or a continuation application. (Citing *Transco Products, Inc. v. Performance Contracting Inc.*, 38 F.3d 551 (Fed. Cir. 1994); *Standard Oil Co. v. Montedison, S.p.A.*, 494 F. Supp. 370 (D. Del. 1980).) With respect to a continuation-in-part, Kaneka

contends that the best mode need only be updated if it is related to the new matter in the application. (Citing *Johns-Manville Corp. v. Guardian Industries Corp.*, 586 F. Supp. 1034, 1065 (E.D. Mich. 1983).) Kaneka asserts that SKC has made no showing that the best mode falls within this limited exception to the rule.

Kaneka contends that SKC tries to circumvent the lack of duty to update the best mode by stating that the '961 patent is not entitled to its priority date. According to Kaneka, SKC has taken the position that it has shown evidence to the effect that Kaneka should not be entitled to its priority date. Kaneka asserts that SKC failed to provide any citation to the record (other than generally to one of its motions) as to where this evidence might exist. According to Kaneka, Dr. Thomas provided no such basis. (Citing CX-644C at Q. 285.)

Kaneka asserts that, for a determination of a best mode violation, it must be determined whether, at the time the application was filed, the inventor possessed a best mode for practicing the invention. According to Kaneka, this is a subjective inquiry which focuses on the inventor's state of mind at the time of filing. Kaneka contends that if the inventor did possess a best mode, it must be determined whether the written description disclosed the best mode such that a person skilled in the art could practice it. According to Kaneka, this is an objective inquiry, focusing on the scope of the claimed invention and the level of skill in the art. (Citing *Eli Lilly & Co. v. Barr Laboratories Inc.*, 251 F.3d 955, 963 (Fed. Cir. 2001).) Kaneka asserts that while SKC alleges that the inventor knew about some of the new production methods, it has failed to allege facts to show that the inventor subjectively believed that the production methods were the best mode for carrying out the invention and does not allege sufficient facts to determine whether the inventor objectively failed to disclose any best mode.

Discussion and Conclusions: Based on the evidence in the record, I find that the '961 patent is not invalid for failure to comply with the best mode disclosure obligation. As an initial matter, the issue of whether the '961 patent disclosed the best mode was included in the Amended Joint Stipulation of Contested Issues filed on February 6, 2012. (JSCI at ¶ 76.) It was also addressed in SKC's pre-hearing brief. (RPHB at 472-476.) I cautioned both parties at the hearing that "even if you don't have the burden to prove something, you need to put the arguments you have on that issue in your initial brief. Try to anticipate what's going to come up, or at least what's important to you that you think is going to need to be said." (Tr. at 970:6-11.) Kaneka failed to address the issue of whether the best mode for using the invention of the '961 patent was disclosed in the '961 patent in its initial post-hearing brief. (*See* CIB at 114-16.) As a result, Kaneka's arguments included in its reply brief will not be considered. However, SKC still must meet its burden to show by clear and convincing evidence that the best mode for making or using the invention of the '961 patent was not disclosed. SKC has failed to do so.

A patent's specification must set forth the best mode contemplated by the inventor of carrying out his invention. 35 U.S.C. § 112 ¶ 1 (2006). The version of the Patent Act applicable to this investigation permits an accused infringer to assert failure to comply with the best mode disclosure obligation as a defense. *Eurand, Inc. v. Mylan Pharmaceuticals Inc.*, 2012 WL 1320225 at *18 (Fed. Cir. 2012).

The burden of establishing invalidity for failure to disclose the best mode lies with the party asserting invalidity and must be shown by clear and convincing evidence. *Transco Products Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 560 (Fed. Cir. 1994). The test to determine if a best mode violation exists requires two determinations: (1) "whether, at the time the application was filed, the inventor possessed a best mode for practicing the invention;" and

(2) "whether the specification discloses sufficient information such that one reasonably skilled in the art could practice the best mode." *Eurand, Inc. v. Mylan Pharmaceuticals Inc.*, 2012 WL 1320225 at *19, 20 (Fed. Cir. 2012) (citations and quotations omitted). Whether the inventor possessed a best mode for practicing the invention is a subjective inquiry that focuses on "the inventor's state of mind at the time he filed the patent application, and asks whether the inventor considered a particular mode of practicing the invention to be superior to all other modes at the time of filing." *Eurand, Inc. v. Mylan Pharmaceuticals Inc.*, 2012 WL 1320225 at *19 (Fed. Cir. 2012) (citing *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1330 (Fed. Cir. 2002)). "Because the second prong focuses on what the specification teaches to a person of ordinary skill in the art, the inquiry is objective." *Eurand, Inc. v. Mylan Pharmaceuticals Inc.*, 2012 WL 1320225 at *19 (Fed. Cir. 2012).

SKC's reliance on a research paper written by Dr. Fujihara, a named inventor of the '961 patent, to allege that the inventor was aware of a best mode of practicing the invention of the '961 patent that was not disclosed is not convincing. Notably, the '961 patent is a continuation-in-part of a PCT application, which itself claims priority to two Japanese applications that were filed March 15, 2004 and March 29, 2004. (JX-4 at 1:5-10.) In such a situation, the date for evaluating a best mode disclosure is the date of the earlier application with respect to common subject matter. *Transco Products Inc. v. Performance Contracting, Inc.* 38 F.3d 551, 557-58 (Fed. Cir. 1994).

The party asserting invalidity has the burden of going forward with invalidating prior art and the patentee then has the burden of going forward with evidence to the contrary (such as evidence establishing an earlier priority date). *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 870-71 (Fed. Cir. 2010). SKC's brief does not identify the clear and convincing

evidence upon which it relies to justify shifting the burden to Kaneka. SKC improperly attempts to rely on its Opposition to Kaneka's Motion in Limine No. 5 (which addressed a Japanese patent application that predated the U.S. filing date for the '961 patent) as this evidence. However, SKC has withdrawn its allegations of invalidity based on this Japanese patent application publication. (*See* RIB at 98-105.) Because these allegations are no longer asserted, allegations of invalidity based on the Japanese patent application publication is not clear and convincing evidence of invalidity that justifies shifting the burden to Kaneka.

To the extent that SKC intended to rely on its best mode arguments to shift the burden to Kaneka, SKC's argument that Kaneka failed to comply with the best mode disclosure also do not meet the clear and convincing evidence standard. The evidence relied on by SKC focuses on the first prong of the best mode test—whether the inventor was aware of a best mode—but does not address the second prong of the best mode test—whether the specification discloses sufficient information such that one reasonably skilled in the art could practice the best mode. (*See* RIB at 108-10.) SKC's brief alleges that Dr. Fujihara's paper acknowledged that residual volatility, gel tension, and scaling are particular factors in achieving continuous production of a polyimide film that is dimensionally stable, but these factors were not disclosed in the '961 patent but fails to include any discussion of whether or not one of ordinary skill in the art would be aware of these factors. "[R]outine details apparent to one of ordinary skill in the art need not be disclosed to satisfy the best mode disclosure requirement." *Eurand, Inc. v. Mylan Pharmaceuticals Inc.*, 2012 WL 1320225 at *20 (Fed. Cir. 2012).

Moreover, Dr. Fujihara's paper actually includes some language that implies that one of ordinary skill in the art might already be aware of these factors. Specifically, the paper explains that the experiments conducted "reconfirm" the importance of these factors, and these factors

have been "paid attention to . . . before." (RX-0533C at 53-54; See also RX-0533C at 59-60.) In view of this language, and SKC's failure to address the second prong of the best mode test, SKC has not met its burden to show by clear and convincing evidence that the '961 patent failed to comply with the best mode disclosure obligation. As a result, the asserted claims of the '961 patent are not invalid for failure to comply with the best mode disclosure obligation.

V. INEQUITABLE CONDUCT

SKC's Position: SKC contends that Kaneka committed inequitable conduct when filing and prosecuting the '639 patent by failing to submit and mischaracterizing material prior art with deceptive intent.

SKC explains that as part of the application process, Mr. Yabuta, a named inventor on the '639 patent, submitted a search report to Kaneka's IP Department head. (Citing RX-417C; RX-576C at 224:19-23; RX-581C at 19:4-20:10.) SKC states that in the search report, Mr. Yabuta identified a single prior art reference – Tetsuya – as relevant to the invention. (Citing RX-417C; RX-62.) SKC asserts that neither Mr. Yabuta nor the IP Department disclosed Tetsuya to the Patent Office. Instead, SKC asserts that they only provided a limited, misleading description of Tetsuya in the specification. (Citing CX-2 at 2:42-67.) SKC asserts that the applicants failed to disclose to the Patent Office that Tetsuya taught viscosity control via a dianhydride to diamine ratio of 1:1.005 to 1:1.05, which was information that was highly material to the allowance of the claims. (Citing RX-62 at ¶¶ 24, 26, 34.) SKC asserts that the materiality is further highlighted by the Patent Office's rejection of claims over Tetsuya in reexamination and Dr. Thomas' opinion on the matter. (Citing RX-31 at 217-223; RX-584C at Q. 1156-1160.)

SKC argues that in view of Mr. Yabuta's identification of Tetsuya as the sole relevant reference and the decision of the applicants not to submit the reference and to mischaracterize it,

the only reasonable inference to be derived is that the applicants had an intent to deceive the Patent Office into believing that their process to control viscosity through molar ratios was novel. SKC claims that this is part of a pattern by Kaneka's IP Department to not submit prior art identified by the inventors of the asserted patents. (Citing RX-418C through RX-421C.)

Kaneka's Position: Kaneka contends that SKC has failed to offer evidence sufficient to support a finding of inequitable conduct.

Kaneka asserts that Tetsuya was discussed in the background section of the '639 patent, and therefore it was disclosed to the Patent Office. (Citing CX-2 at 2:42-67.) Kaneka argues that SKC has not offered any evidence of intent to deceive. (Citing Tr. at 746:21-748:2 .)

Discussion and Conclusions: Based on the evidence in the record, I find that SKC failed to offer clear and convincing evidence of inequitable conduct.

Inequitable conduct must be proven by clear and convincing evidence. *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1366 (Fed. Cir. 2008). The Federal Circuit's recent en banc decision in *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276 (Fed. Cir. 2011) (en banc) governs inequitable conduct. An alleged infringer must prove both materiality and intent, which are separate requirements. *Id.* at 1290. "[T]he materiality required to establish inequitable conduct is but-for materiality." *Id.* at 1291. This means that "[w]hen an applicant fails to disclose prior art to the PTO, that prior art is but-for material if the PTO would not have allowed a claim had it been aware of the undisclosed prior art." *Id.*

With regard to intent, it must be shown that "the patentee acted with the specific intent to deceive the PTO." *Therasense*, 649 F.3d at 1290. To be clear, "[a] finding that the misrepresentation or omission amounts to gross negligence or negligence under a 'should have known' standard does not satisfy this intent requirement." *Id.* While intent to deceive may be

inferred from indirect and circumstantial evidence, "intent to deceive must be 'the single most reasonable inference able to be drawn from the evidence.'" *Id.* (quoting *Star*, 537 F.3d at 1366). "[A] court must weigh the evidence of intent to deceive independent of its analysis of materiality." *Id.*

SKC asserts that Kaneka failed to provide a full copy of Tetsuya, or a translation, to the examiner, instead only providing a description of Tetsuya in the Background of the Invention section that SKC believes to be incomplete. Kaneka argues that the discussion of Tetsuya in the Background of the Invention section was sufficient to constitute a full disclosure to the PTO. I concur with SKC that the brief description of Tetsuya in the specification was not a sufficient disclosure to the PTO. Tetsuya is a Japanese reference. (RX-62.) Kaneka did not provide a full copy of the reference, or any sort of translation of the reference, to the PTO. (*See generally* JX-6.) Instead, the only disclosure provided to the examiner was a brief discussion of Tetsuya in the specification that provides little detail about what is actually revealed in the reference. (CX-2 at 2:42-67.) While Kaneka did not completely withhold Tetsuya from the PTO, a less than full disclosure can still constitute an effective failure to disclose a reference. *See Semiconductor Energy Lab. Co. v. Samsung Elecs. Co.*, 204 F.3d 1368, (Fed. Cir. 2000) (finding that an applicant "constructively withheld" a reference from the PTO when the applicant submitted a foreign language reference and a one-page, partial English translation focusing on less material portions of the reference). Here, the discussion of Tetsuya in the specification is limited to two paragraphs in the Background of the Invention section that omit important details about the reference. (RX-62 at ¶ 34.)

Still, I do not find that Tetsuya is material under the "but-for" materiality standard required by *Therasense*. In arguing materiality, SKC relies heavily on the molar ratio disclosure

of Tetsuya. (RIB at 66.) As described in Sections IV.C.2-3 *supra*, I rejected SKC's obviousness argument based on the combination of Tetsuya and Okahashi because I found that Tetsuya's molar ratio disclosure did not render obvious the claimed molar ratio range in claim 1. Given the strong emphasis in the '639 patent's intrinsic record on the importance of the claimed molar ratio range, I concluded that Tetsuya's molar ratio range, while it did overlap the claimed range, was not a sufficient disclosure.

Even though I rejected SKC's invalidity argument based on Tetsuya, it does not foreclose a finding of materiality. *Therasense*, 649 F.3d at 1292 (explaining that "even if a district court does not invalidate a claim based on a deliberately withheld reference, the reference may be material if it would have blocked patent issuance under the PTO's different evidentiary standards.") SKC points to the fact that the '639 patent is in reexamination as evidence of Tetsuya's materiality. (RX-31 at 217-223.) In the reexamination, the examiner has issued a first Office action rejecting the claims of the '639 patent. (*Id.*) The examiner has rejected claim 1 as obvious based on a number of different obviousness combinations involving Tetsuya. (*Id.*) The only obviousness rejection of relevance is the rejection based on the combination of Tetsuya and Okahashi, as Okahashi was before the examiner during the original prosecution of the '639 patent. (CX-2.) The remaining obviousness rejections are based on the combination of Tetsuya with references that were not before the examiner during the original prosecution, meaning that those obviousness combinations are not relevant in analyzing materiality under the but-for standard. *Therasense*, 649 F.3d at 1291.

Even though the examiner has issued an initial rejection of claim 1 in the reexamination based on the combination of Tetsuya and Okahashi, I do not find that this is conclusive evidence of materiality. This was only an initial rejection, and is in no way a final determination from the

PTO. (RX-31 at 211-220.) There is still a possibility that claim 1, as currently written, will be allowed over the combination of Tetsuya and Okahashi. Therefore, the initial rejection in reexamination is not sufficient evidence to demonstrate that the PTO would not have allowed the claims had it been aware of Tetsuya. *Therasense*, 649 F.3d at 1291.

SKC also relies on the opinion of Dr. Thomas. Dr. Thomas' cursory opinion regarding the materiality of Tetsuya does nothing to demonstrate that Tetsuya is a material reference. (RX-584C at Q. 1156-1160.)

In addition, I find that SKC failed to prove the intent prong. To succeed in proving that Kaneka intended to deceive the PTO by withholding the full Tetsuya disclosure, SKC must offer "clear and convincing evidence...that [Kaneka] *made a deliberate decision* to withhold a *known* material reference." *Therasense*, 649 F.3d at 1290 (quoting *Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1181 (Fed. Cir. 1995)) (emphasis in original).

SKC offers no evidence of intent to deceive. Instead, SKC offers a single sentence of attorney argument in an attempt to meet the intent requirement: "[i]n view of Mr. Yabuta's identification of Tetsuya as the sole relevant reference and the decisions of the IP Department head and Mr. Yabuta to not submit the reference and to mischaracterize it, the only reasonable inference to be derived is their intent to deceive the PTO into believing that their process to control viscosity through molar ratios was novel." (RIB at 66.) SKC cites to no documentary evidence or testimony that would a support a finding of intent.

Mr. Yabuta, an inventor on the '639 patent, disclosed Tetsuya to the Kaneka IP Department in a search report. (RX-417C.) The '639 patent briefly discusses Tetsuya the Background of the Invention section; but Tetsuya was never fully disclosed to the PTO. (CX-2 at 2:42-67; JX-6.) Based on these facts, I do not find that the single most reasonable inference

able to be drawn is that Kaneka made a deliberate decision to withhold the full reference from the PTO.

Based on the foregoing, I conclude that SKC has not offered clear and convincing evidence of inequitable conduct with regard to the '639 patent.

VI. PATENT MISUSE

SKC's Position: SKC contends that Kaneka's conduct leading up to and throughout this investigation constitutes patent misuse.

SKC claims that from at least 2007, Kaneka was plotting to use its U.S. patents to put pressure on competitors by way of litigation in order to decelerate or halt SKC's entry into the polyimide market. (Citing RX-370C at 3.) According to SKC, Kaneka began to panic when it started to lose market share to SKC in the polyimide film market. (Citing RX-579C at 132:5-9, 132:16-20; RX-370C at 3.) SKC believes that Kaneka attempted to force SKC out of the market or reduce SKC's market share by initiating this ITC investigation. (Citing RX-579C at 23-25; RX-581C at 133:24-134:2.)

SKC argues that Kaneka has pursued this litigation, and the related district court litigation, in bad faith. SKC claims that Kaneka brought the litigation knowing that it procured the asserted patents by withholding material prior art. SKC claims that Kaneka asserted all of the asserted patents' claims against SKC in the Complaint, even though Kaneka knew that it had no basis for asserting infringement of certain claims. (Citing RX-532C at 2.)

SKC claims that Kaneka has sent letters to over 30 SKC customers and potential customers, warning them not to purchase any of SKC's products. (Citing RX-408C; RX-411C through RX-414C; RX-394C.) SKC asserts that at least two companies that received Kaneka's threatening letters on a regular basis felt harassed. (Citing RX-394C.) SKC argues that there is

evidence that it lost business due to Kaneka's threatening letters. (Citing RX-394C; RX-584C at Q. 24.)

Finally, SKC claims that Kaneka has consistently disregarded both the Ground Rules and Procedural Schedule in this investigation, imparting both inconvenience and significant cost to SKC. (Citing Order No. 15; Order No. 22; Order No. 29.) SKC asserts that despite repeated requests that Kaneka withdraw claims for which Kaneka provided no evidence of infringement, Kaneka nevertheless remained evasive on the issue, requiring SKC to file a motion *in limine* to limit Kaneka's infringement case. (Citing Tr. at 6:20-7:3.)

Kaneka's Position: Kaneka contends that SKC failed to demonstrate patent misuse.

According to Kaneka, SKC has offered no evidence of any anticompetitive activity by Kaneka. Kaneka states that the only evidence that SKC relies upon are a series of patent notice letters sent by Kaneka's counsel to potential infringers. (Citing RX-407 through RX-414.) Kaneka claims that 35 U.S.C. § 271(d)(3) specifically sets forth that enforcement activities cannot be found to constitute patent misuse.

Kaneka notes that SKC argues that Kaneka's attempt to seek a global resolution of its U.S. and foreign counterpart patents during settlement negotiations attempted to improperly broaden the scope of the asserted U.S. patents. Kaneka argues that it has made no effort to broaden the scope of the U.S. patents. According to Kaneka, the suggestion of a global settlement was a good faith attempt to resolve all issues between the parties without the need to engage in litigation in numerous countries regarding polyimide film.

Discussion and Conclusions: Based on the evidence in the record, I find that SKC has failed to prove the affirmative defense of patent misuse.

The Federal Circuit has "characterized patent misuse as the patentee's act of 'impermissibly broaden [ing] the 'physical or temporal scope' of the patent grant with anticompetitive effect.'" *Princo Corp. v. Int'l Trade Comm'n*, 616 F.3d 1318, 1328 (Fed. Cir. 2010) (en banc) (citations omitted). The Federal Circuit further explained patent misuse in the following manner:

> The doctrine of patent misuse is...grounded in the policy-based desire to "prevent a patentee from using the patent to obtain market benefit beyond that which inheres in the statutory patent right." It follows that the key inquiry under the patent misuse doctrine is whether, by imposing the condition in question, the patentee has impermissibly broadened the physical or temporal scope of the patent grant and has done so in a manner that has anticompetitive effects. Where the patentee has not leveraged its patent beyond the scope of rights granted by the Patent Act, misuse has not been found.

Id. (citations omitted). The Federal Circuit made clear that "the defense of patent misuse is not available to a presumptive infringer simply because a patentee engages in some kind of wrongful commercial conduct, even conduct that may have anticompetitive effects." *Id.* at 1329.

SKC argues that Kaneka sought to use patent litigation to remove SKC from the market or reduce SKC's market share. As support for this assertion, SKC cites to an internal Kaneka document describing Kaneka's strategy of asserting its U.S. patents against competitors that have entered the polyimide film marketplace. (RX-370C.) The fact that Kaneka had the strategy of asserting its patents against SKC to try to either eliminate SKC from the market or reduce SKC's market share does not equate to patent misuse. SKC has not shown that Kaneka's strategy in any way involved impermissibly broadening the scope of the asserted patents.

SKC next argues that Kaneka committed patent misuse by bringing the current litigation to harass SKC. SKC states that Kaneka asserted every claim of its asserted patents in the original Complaint against SKC, even though Kaneka had an understanding that SKC did not infringe every claim of the asserted patents. (RX-532C.) Even if this is true, this does not

amount to patent misuse, as there is no impermissible broadening of Kaneka's patent right. SKC's allegation that Kaneka filed its Complaint to harass SKC is more properly addressed in the context of Commission Rule 210.4. Because SKC did not assert that SKC has violated Commission Rule 210.4(c), I decline to address that issue.

SKC also argues that Kaneka has committed patent misuse by harassing SKC's customers and potential customers. SKC cites to a number of notice letters that Kaneka sent to SKC's customers and potential customers. (RX-408C; RX-411C through RX-414C.) SKC cites to evidence that one recipient of numerous letters from Kaneka's counsel felt harassed by the repeated letters. (RX-394C at 4.)

The notice letters disclose Kaneka's litigation against SKC, and advise the recipient to "take necessary measures to avoid participating in the expansion of the infringing products in the U.S. that are manufactured or distributed by [SKC] and included in your products." (*See, e.g.*, RX-411C.) The "infringing products" are defined as "certain products of [SKC] that fall within the scope of Kaneka's Asserted Patents." (*Id.*) Kaneka goes on to explain that "[s]uch products include, but are not limited to, IN, IF, LV, and LN polyimide films, and other related products, which [SKC is] not authorized to manufacture, import, distribute or sell in the U.S." (*Id.*)

I find Kaneka has not committed patent misuse by sending these letters, regardless of the fact that there is evidence that a recipient felt harassed after receiving repeated letters from Kaneka. SKC does not offer any explanation regarding how these letters impermissibly expand Kaneka's patent rights in any way. In rejecting a similar patent misuse argument, the Federal Circuit explained:

> VP's practices did not constitute patent misuse because they did not broaden the scope of its patent, either in terms of covered subject matter or temporally. That VP sent infringement notices to various government contractors, even notices that threatened suit and injunctions, did not indicate that VP attempted to broaden its

> patent monopoly. As we stated in *Mallinckrodt,* 976 F.2d at 709, 24 USPQ2d at 1180: "A patentee that has a good faith belief that its patents are being infringed violates no protected right when it so notifies infringers." Accordingly, a patentee must be allowed to make its rights known to a potential infringer so that the latter can determine whether to cease its allegedly infringing activities, negotiate a license if one is offered, or decide to run the risk of liability and/or the imposition of an injunction.

Virginia Panel Corp. v. MAC Panel Co., 133 F.3d 860, 869 (Fed. Cir. 1997). I find that Kaneka had a right to inform potential infringers of its allegations against SKC polyimide films, and that the sending of notice letters by Kaneka does not constitute patent misuse.

Finally, SKC complains of Kaneka's alleged pattern of disregard for the litigation process, which SKC believes is evidenced by Kaneka's repeated failure to follow the Ground Rules and Commission Rules. SKC does not explain how Kaneka's alleged litigation misconduct gives rise to a claim of patent misuse. I find that the allegation that Kaneka has repeatedly violated the Ground Rules and Commission Rules, even if proven true, does not demonstrate that Kaneka has impermissibly broadened the scope of its patent rights. As explained *supra*, if SKC believed that Kaneka was pursuing this litigation for an improper purpose, then seeking relief pursuant to Commission Rule 210.4 was the proper course of action. Because SKC failed to assert Kaneka that violated Commission Rule 210.4(c) by filing its Complaint and fully litigating this case, I decline to address the issue.

Based on the foregoing, I find that SKC has failed to offer any evidence that Kaneka committed patent misuse with regard to any of the asserted patents.

VII. INFRINGEMENT

A. Applicable Law

A complainant must prove either literal infringement or infringement under the doctrine of equivalents. Infringement must be proven by a preponderance of the evidence. *SmithKline*

Diagnostics, Inc. v. Helena Labs. Corp., 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard "requires proving that infringement was more likely than not to have occurred." *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n. 15 (Fed. Cir. 2005).

Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). Literal infringement requires the patentee to prove that the accused device contains each and every limitation of the asserted claim(s). *Frank's Casing Crew & Rental Tools, Inc. v. Weatherford Int'l, Inc.*, 389 F.3d 1370, 1378 (Fed. Cir. 2004).

As for the doctrine of equivalents:

> Infringement under the doctrine of equivalents may be found when the accused device contains an "insubstantial" change from the claimed invention. Whether equivalency exists may be determined based on the "insubstantial differences" test or based on the "triple identity" test, namely, whether the element of the accused device "performs substantially the same function in substantially the same way to obtain the same result." The essential inquiry is whether "the accused product or process contain elements identical or equivalent to each claimed element of the patented invention[.]"

TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc., 529 F.3d 1364, 1376-77 (Fed. Cir. 2008) (citations omitted).

Thus, if an element is missing or not satisfied, infringement cannot be found under the doctrine of equivalents as a matter of law. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538-39 (Fed. Cir. 1991). Determining infringement under the doctrine of equivalents "requires an intensely factual inquiry." *Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 1381 (Fed. Cir. 2000).

B. The '866 patent

Kaneka's Position: Kaneka asserts that SKPI's process for making its LN50, IF70, LV75, IN70, LV100, IN30, LV200, LV300, LN100, LV50, LV100 polyimide film products ("SKC's Process") infringes claims 1-3 of the '866 patent.

Kaneka alleges that SKC does not dispute that SKC's Process practices the "casting the composition into a film shape" limitation. Kaneka says SKC's own witnesses testified that SKC's Process includes casting a composition onto a belt, and Dr. Harris's testimony supports this conclusion. (Citing CX-619C at Q. 152; Tr. at 315:3-316:10, 320:15-320:18, 328:12-328:19, 570:4-570:11, 611:16-612:3; RX-677C at Q. 14; RX-678C at Q. 33.)

Kaneka alleges that SKC does not dispute that the composition used in SKC's Process consists "of an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines," and the testimony of SKC's own witnesses confirms that SKC's Process meets this claim limitation. (Citing RX-677C at Q. 14, 22-24, 26; RX-678C at Q. 33; Tr. at 315:3-316:10, 316:21-317:12, 317:13-318:9, 570:4-570:11, 611:16-612:10.)

Kaneka says that SKC attempts to argue that SKC's Process does not use a composition that "consists substantially of an organic solvent solution of polyamide acid and chemical curing agents" because { } Kaneka counters that SKC's argument relies on an erroneous construction of the phrase "consists substantially of." Kaneka says that SKC asserts that phrase should be construed to mean "the composition cannot contain any other ingredients that significantly affect the practice of the claimed method." Kaneka asserts that SKC's proposed construction would exclude all ingredients except those explicitly listed in the specification, thus substituting the absolute term "only" for the relative term "substantially."

(Citing RX-676C at Q. 140-141.) Kaneka argues that, as described in CIB Section **Error! Reference source not found.**, there is no support for SKC's proposed construction. Kaneka argues that the term "substantially," as a modifier, implies approximate or "largely but not wholly that which is specified." Kaneka concludes in the '866 patent, this means that the claimed composition consists of the ingredients listed in the claims, but also allows for the possibility of other ingredients or substances to be present in the composition.

Kaneka adds even under SKC's construction, SKC's Process still meets this claim limitation, and says SKC's argument that {

} (Citing Tr. at 613:22-614:2.)

Kaneka alleges that SKC also does not dispute that SKC's Process heats the film shaped composition at an initial temperature of 200° or less. Kaneka avers that the testimony of SKC's witnesses, SKC's film making standard sheets, and SKC's screen shots of the DCS confirm that SKC's Process meets this claim limitation. (Citing Tr. at 320:23-321:9; RX-610C; RX-616C; RX-620C; RX-624C; RX-628C; RX-632C; RX-636C; RX-640C; RX-644C; RX-648C; RX-655C; RX-656C; RX-660C through RX-664C; RX-677C at Q. 79-80; RX-678C at Q. 66.)

With respect to the "increasing the temperature in a step-wise fashion" limitation, Kaneka alleges that SKC does not dispute that SKC's Process for its so-called "prior products" meet this limitation. (Citing Tr. at 320:23-321:9, 322:13-322:21, 323:10-323:18, 323:22-323:25, 355:17-355:23; CX-619C at Q. 155; RX-677C at Q. 45-47; RX-678C at Q. 38, 43.) Kaneka adds that SKC's film making standard sheets confirm that SKC's Process for its so-called "prior products" includes a step-wise increase in temperature. (Citing RX-610C; RX-616C; RX-620C;

RX-624C; RX-628C.) Kaneka says for example, a film making standard, dated February 7, 2010, shows that the process used to make SKC's LV100 polyimide film product included a step-wise increase in temperature. (Citing RX-620C; RX-677C at Q. 73-74.)

Kaneka asserts that SKC only argues that {

} (Citing Tr. at 320:23-321:9, 322:13-322:21, 323:10-323:18, 323:22-323:25, 355:17-355:23; CX-619C at Q. 155; RX-677C at Q. 45-47; RX-678C at Q. 38, 43.) Kaneka argues that SKC's evidence of this "design around" does not establish that the temperatures in all three belt dryer zones are either constant or decrease. Kaneka says the {

} (Citing RX-632C; RX-636C; RX-640C; CX-644C; RX-648C; RX-665C; RX-666C.)

Kaneka contends that taking into account this acceptable margin of error, the actual temperature settings could reasonably fall within the claimed limitation. Kaneka says for example, {

}

Kaneka argues that rather than demonstrating non-infringement as SKC suggests, these records actually support the opposite conclusion. Kaneka continues while SKC might argue that the testimony of Mr. Lee establishes that {

}

Kaneka reasons it would not be logical { }

{ } Kaneka concludes there would also not be any logical reason {

}

Kaneka says it is important to note that the {

} (Citing RX-677C at Q. 43-44.) Kaneka reasons even {

}

Kaneka argues that, with respect to SKC's "design around" for its IF products, {

} and testimony from SKC's employees demonstrate that this "design around" still meets the "increasing the temperature in a step-wise fashion" limitation. (Citing Tr. at 602:10-602:15; RX-661C; RX-678C at Q. 50-51, 58-59; RX-660C.)

Kaneka alleges that SKC does not dispute that the heating is "such that solvent is evaporated to form a chemically cured prefilm." Kaneka avers that SKC's own witnesses testified that SKC's Process includes heating such that solvent is evaporated to form a chemically cured prefilm, and Dr. Harris's testimony supports this conclusion and the evidence confirms that this limitation is met. (Citing CX-619C at Q. 155; RX-677C at Q. 14; RX-678C at Q. 33; Tr. at 612:17–612:22, 315:3-316:10, 326:10-326:17.)

Kaneka says that SKC argues that SKC's Process does not practice the element of the claim that teaches "while adjusting an imidation ratio," because there is no measurement or evaluation of imidation ratio and therefore no "active" adjustment step. Kaneka argues that claims 1-3 of the '866 Patent do not require such an active adjustment step. Kaneka says this claim term only requires that the adjustment of imidation ratio, for example, occur

contemporaneously with the belt dryer heating. Kaneka asserts that, according to SKC's witness, Mr. Ahn, this is what, in fact, occurs in SKC's Process. Kaneka says {

} (Citing Tr. at 657:18 - 658:1.)

Kaneka argues if there is a desired ratio to be achieved and the process is adjusted to meet this ratio, then the claim limitation would be met. (Citing CX-644C at Q. 43.) Kaneka asserts that this is what SKC's Process entails – {

}

(Citing Tr. at 604:11-605:10, 607:22-608:24.) Kaneka says that SKC's assertion that Dr. Harris testified this claim term requires an active step of "sampling" in the manufacturing process is simply incorrect. Kaneka counters that the testimony cited by SKC does not support its position and does not even include any discussion of "sampling." (Citing CX-644C at Q. 15-17, 42-44, 53.) Kaneka concludes that {

} (Citing Tr. at 591:17-591:23, 604:11-605:10, 607:22-608:24.)

Kaneka alleges that SKC does not dispute that the "further heating said prefilm" step is practiced by SKC's Process, and this was confirmed by SKC's documents, witnesses, and expert, Dr. Thomas. (Citing RX-677C at Q. 14; RX-678C at Q. 33; Tr. at 951:6-951:14.)

Kaneka contends that the films produced by SKC's Process are adhesive polyimide films. Kaneka cites the testimony of its expert, Dr. Harris, to say he tested SKC's LN50, IF70, LV75, IN70, LV100, IN30, LV200, LV300, LN100, LV50, LV100 polyimide films and determined that

they are further heated to obtain an adhesive polyimide film, as required by claim 1 of the '866 patent. (Citing CX-619C at Q. 151, 156; CX-467C; CX-469C.)

Kaneka alleges that SKC's expert did not conduct any adhesiveness testing of SKC's products manufactured using SKC's Process. Kaneka argues that SKC's criticism of Dr. Harris's test results have no merit. Kaneka concedes that it is true that some replicates of a few samples experienced "popping;" but Kaneka asserts that "the vast majority of the samples had no problems." (Citing CX-469C at 18.)

Kaneka asserts that claim 2 is identical to claim 1, except claim 2 includes the limitation "while adjusting amounts of volatile constituents" rather than "while adjusting an imidation ratio." Kaneka argues that, tor the reasons described above, all of the other claim limitations are met. Kaneka says that with respect to the limitation "while adjusting amounts of volatile constituents," SKC's witness Mr. Ahn testified that {

} (Citing Tr. at 593:10-594:8.)

Kaneka contends that claim 3 is identical to claim 1, except claim 3 includes the limitation "while adjusting amounts of organic solvents" in addition to "while adjusting an imidation ratio." Kaneka argues that for the reasons described above, all of the other claim limitations are met. Kaneka concludes, with respect to the limitation "while adjusting amounts of organic solvents" the evidence demonstrates that volatile constituents consist mainly of organic solvents and acetic acid, thus any description of adjustment of organic solvents is also relevant for volatile constituents. (Citing CX-644C at Q. 17.)

SKC's Position: SKC alleges that a short time after Kaneka initiated this investigation, {

}

{ } (Citing RX-677C at Q.41-51; RX-678C at Q. 39.)

SKC says that while Dr. Harris concludes that SKPI products LN 50, IF 70, LV 75, IN 70, LV 100, IN 30, LV 200, LV 300, LN 100, LV 50, and LV 100 infringe the '866 patent, he does not specify whether he is referring to the former or current SKPI products. SKC adds that, regardless of which, the opinions Dr. Harris provides are not supported by evidence. SKC argues that for claims 1 and 2, Dr. Harris provides only conclusory statements of infringement for SKPI products LN 50, IF 70, LV 75, IN 70, LV 100, IN 30, LV 200, LV 300, LN 100, LV 50, and LV 100. Regarding claim 3, SKC contends that Kaneka has failed to provide any evidence or opinion showing that any SKPI product infringes.

SKC notes that claims 1, 2, and 3 of the '866 patent require first heating a composition at an initial temperature of 200 °C or less and "thereafter increasing the temperature in a step-wise fashion." SKC says that while the parties disagree on the proper interpretation for this claim phrase, even under Kaneka's interpretation, at least SKPI's current products do not infringe. SKC asserts that Dr. Harris has failed to offer any opinions or evidence suggesting otherwise.

SKC asserts that the production managers for the Jincheon and Gumi facilities, Messrs. Ahn and Lee, identified specific SKPI documents[26] relating to SKPI's current manufacturing processes. (Citing RX-677C at Q. 55-68; RX-678C at Q. 41, 50-59, 66-73.) SKC says that those documents show {

}

[26] RX-665C, RX-666C, RX-632C, RX-636C, RX-640C, RX-644C, RX-648C, RX-661C, RX-662C, RX-663C, RX-664C, and RX-660C.

{

} (Citing RX-676C at Q.194, 196.) SKC continues that Mr. Ahn and Mr. Lee, in their witness statements, {

} (Citing RX-677C at Q.41-42; RX-678C at Q. 39; Tr. at 606:1-4.) SKC contends there is no evidence that {

} SKC says that "Kaneka's mere speculation that SKPI's IN/LV and LN products *could* have increases in temperature is not enough to establish infringement, particularly in light of the overwhelming evidence to the contrary." (Citing RX-676C at Q. 194, 196; RDX-313C; RIB at 21-22.)

SKC asserts that Dr. Harris disregards the evidence that shows that each of the former versions of IF 70 (25, 50, and 75 μm) were manufactured through processes {

} (Citing RX-654C; RX-655C; RX-656C; RX-678C at Q. 60, 65; RX-676C at Q. 198.) SKC adds that IF 70 (25, 50, and 75 μm) were never imported into the U.S.[27]

SKC argues, regardless of whose proposed claim construction controls, no one can dispute that { } cannot equate to "thereafter *increasing* the temperature in a step-wise fashion," as recited in claims 1–3 of the '866 patent. (Citing CX-1 at 21:38-39, 22:2-3, 17-18) (emphasis added by SKC).

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[27] SKC notes that the parties have stipulated that the only versions of SKPI's accused products (current or former) that have been imported in the U.S. for sales are IN 30 (75 μm), IN 70 (19 μm, 25 μm, 50 μm), IF 30 (7.5 μm), IF 70 (7.5 μm, 12.5 μm), LV 100, LV 200, and LV 300.

In its reply brief, SKC argues that "Kaneka's complete lack of evidence is shown by its attempt to create a new standard for infringement--the 'could reasonably fall' standard." (Citing CIB at 33.) SKC continues according to Kaneka, because SKPI's IN/LV and LN products are alleged to { } this means that the actual temperature settings "could reasonably fall within the claimed limitation" and therefore infringe. (*Id.*) SKC says Kaneka asserts that { } (*Id.*) SKC adds that Kaneka has presented no evidence that this is the case.

With respect to SKPI's IF products, SKC argues that Kaneka mischaracterizes the evidence. SKC says, for example, Kaneka { } (Citing CIB at 34 n.115.) SKC asserts that Kaneka { } SKC avers that as shown in RX-660C and RX-661C, the { } SKC concludes that these documents { } SKC adds that as Mr. Ahn testified, { } SKC asserts that the { }

SKC notes that claims 1–3 of the '866 patent require "increasing the temperature. . . while adjusting an imidation ratio;" "increasing the temperature . . . while adjusting amounts of volatile constituent;" and "increasing the temperature. . .while adjusting amounts of organic solvent and an imidation ratio," respectively. SKC alleges that Kaneka treats these claim

elements as requiring an active adjustment. SKC says for example, in Dr. Harris's rebuttal witness statement, he describes this claim element as requiring sampling of the prefilm to determine its imidation ratio and/or amounts of volatile constituents, and using the data collected from such sampling as feedback to control the temperature and the heating time in the belt dryer in an attempt to distinguish invalidating prior art.[28] (Citing CX-644C at Q. 15-17, 42-44, 53.)

SKC argues that, rather than address SKPI's actual manufacturing process, Kaneka offers pure conjecture, and Kaneka has not presented any actual evidence suggesting that SKPI is actively adjusting anything during its current manufacturing processes. SKC adds that Kaneka has not provided any evidence that SKPI has done so in the past. SKC says in fact, {

}

(Citing RX-676C at Q. 202.) SKC concludes that Kaneka has not addressed this "undisputed fact." SKC reasons if { } SKPI certainly cannot perform the active adjustment step of controllably adjusting the imidation ratio.

SKC recites that claim 3 of the '866 patent requires "heating the film . . .while adjusting amounts of organic solvent and an imidation ratio." SKC avers that Kaneka and its technical expert, Dr. Harris, have not offered any evidence or opinion as to whether any of SKPI's accused products meets this claim limitation of claim 3.

In its reply brief, SKC says Kaneka asserts its most recent construction and related "viewing" infringement argument for the first time in its Post-Trial Brief. (Citing CRB at 35.)

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[28] SKC adds that similarly, in a declaration of Mr. Yamaguchi that accompanies the Complaint, Kaneka describes this claim element as requiring active adjustment. SKC says although the two Yamaguchi Declarations were admitted as exhibits (CX-249C and CX-250), Kaneka represented during the hearing that it would not use them to establish infringement. (Citing Tr. at 272:21-273:2.) SKC adds that I specifically restricted Yamaguchi's testimony to fact testimony and not expert testimony. (Citing Tr. at 272:6-16.)

SKC contends that this position is a new argument that was not raised in the pre-trial brief and should be rejected on that basis alone in view of Ground Rule 8.2.

Regarding the merits of Kaneka's argument, SKC alleges that Kaneka now "proposes that this claim term has no limiting effect, as explained in Section II(A)(3) above." SKC says previously through its expert, Dr. Harris, and its own employees, Kaneka had treated the "while adjusting" limitations as requiring an active adjustment. (Citing CIB 23 & n.5.) SKC argues that the claims clearly state that "while adjusting" occurs while the film is being heated, and while temperature is increased in a step-wise fashion, and therefore, any adjusting must be during the actual process of producing an adhesive polyimide film.

SKC continues that as "evidence" of alleged infringement under its new construction, Kaneka cites to Mr. Ahn's testimony where he explained that {

}

(Citing Tr. at 593:15-594:8.) SKC urges that Kaneka's attempt { } to the claimed step of "while adjusting" is frivolous.

SKC adds, to the extent that Mr. Ahn's testimony has any relevance, {

} (Citing RX-678C at Q. 6-9; Tr. at 592:6-9.) SKC concludes that Kaneka has, therefore, provided no evidence that the processes used to make the LN, LV, and IN products practice the "while adjusting" limitations.

SKC argues that equating an active "while adjusting" limitation with {

} renders meaningless the claim language Kaneka added during the prosecution, to obtain the patent. SKC contends that { } does not constitute adjustment, and that is not how Kaneka applied the language to obtain the patent. SKC says rather, it relied on that language as having meaning. SKC continues that Dr. Harris has described the "while adjusting"

step as requiring sampling of the prefilm to determine its imidation ratio and then using the data collected as feedback to control the temperature and the heating time in the belt dryer. (Citing CX-644C at Q.15-17, 42-44, 53.)

SKC argues that Mr. Ahn's testimony does not prove infringement, it proves noninfringement under any reasonable construction. SKC avers that Mr. Ahn's testimony {

} (Citing Tr. at 586:6-618:17, 604:11-20, 605:4-606:10, 607:15-21.) SKC adds that Mr. Ahn testified that {

} (Citing Tr. at 604:11-20.) SKC contends that {

} (Citing Tr. at 605:17-606:10; 607:14-21.) SKC concludes there is no evidence that during the process of manufacturing polyimide film SKPI actively adjusts anything in its current or former manufacturing processes.

SKC notes that claims 1–3 require "further heating said prefilm to obtain an adhesive polyimide film." SKC reiterates its position that the claim term "adhesive" is indefinite.

SKC argues that Kaneka has not established that any of SKPI's accused products meets the "adhesive" claim limitation. SKC says that Dr. Harris points to lab testing results contained in an exhibit to his expert report (CX-469C), conducted by Akron Polymer Systems, Inc., as confirmation that SKPI products meet this claim limitation. SKC contends that this document, however, cannot support a reasoned opinion that this claim limitation is met, because the data contained in CX-469C is insufficient to properly assess the adhesive nature of the polyimide film samples. SKC says for example, some of the remarks, such as "Popping," "little Popping," and "a few Pops" contained in CX-469C indicate that multiple types of failure occurred contrary to

the protocol on polyimide adhesion strength that was provided. (Citing CX-676C at Q. 206.) SKC argues that these remarks in CX-469C also indicate either poor lamination or lack of adhesion, rendering the data completely unreliable.

SKC contends even if one were to accept the data contained in CX-469C, Kaneka has not established that the reported values are due to the claimed process or are sufficient to meet the claimed "adhesive" requirement in any objective or scientific sense. SKC asserts that all of the SKPI products Kaneka tested { } (Citing RX-676C at Q. 205.) SKC says the '866 patent is directed to a process for improving the adhesive strength of film, without the need for any post-production treatments, such as corona treatment. SKC states that the specification repeatedly distinguishes the alleged invention in the '866 patent from conventional post-production treatments that improve adhesion, like corona treatment. SKC contends that merely detecting some degree of adhesiveness in a polyimide film { } does not render that film "adhesive" in the context of the '866 patent. (*Id.*) SKC adds testing the adhesion of film products that employ { } from which the method disclosed in the '866 patent is explicitly and repeatedly distinguished, has no bearing on infringement.

SKC concludes that Kaneka provides no proof that SKPI's products meet the "adhesive" claim limitation. SKC notes that Kaneka says Dr. Harris "determined that they are heated to obtain an adhesive polyimide film..." (*Id.*) SKC argues that these "conclusory assertions do not represent proof." SKC says that Kaneka fails to define what exactly is "some measureable, detectable level of adhesive strength," and it fails to present scientific proofs that any of the accused SKPI films fall within its definition.

SKC says that claims 1, 2, and 3 require that a composition "consist[] substantially of an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines." Kaneka purposefully chose to include this language in the claims, and for it to have meaning, it must impose some limitation to what may be added to the claimed composition. SKC submits that a proper construction is that the claimed composition cannot contain any other ingredients that would "materially affect the basic and novel properties of the invention," which for the '866 patent, is directed towards a method for producing an adhesive polyimide film. (Citing CX-1 at 1:57-61, 2:19:29, 21:30-31, 2:57-58.)

SKC asserts that SKPI's accused products include other compounds besides the claimed ingredients. (Citing RX-677C at Q. 18-21, 25; RX-678C at Q. 33; RX-676C at Q. 187-189.) SKC states that SKPI {

} (*Id.*) SKC says {

} SKC says Mr. Ahn testified at the hearing that {

} SKC asserts that {

} (Citing RX-677C at Q. 25; Tr. at 609:8-18.) SKC alleges that, in SKPI's manufacturing process, {

} (Citing Tr. at 609:8-18.) SKC concludes through { }

SKC contends that Kaneka has entirely failed to { } in SKPI's composition. SKC says Kaneka's expert, Dr. Harris, testified that the alleged novel aspect of the

'866 patent is a method for producing an adhesive polyimide film. (Citing CX-619C at Q. 17.) SKC says there is no question that { } materially affects the alleged basic and novel properties of the invention of the '866 patent—a method for producing an adhesive polyimide film. SKC adds { } is irrelevant because its addition impacts the entire inventive purpose of the '866 patent, the production of an adhesive polyimide film.

Discussion and Conclusions: Based on the evidence in the record, I find that Kaneka has failed to demonstrate by a preponderance of the evidence that the accused products[29] infringe asserted claims 1, 2 or 3 of the '866 patent.

SKC raises four non-infringement arguments, all of which are equally relevant to all of the asserted claims:[30] (1) the accused products do not practice the element that requires that the casted composition "consist[] substantially of an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines;"[31] (2) the accused products do not practice the element that requires "increasing the temperature in a step-wise fashion;" (3) the accused products do not practice the element that requires "increasing the temperature ... while adjusting an imidation ratio," "increasing the temperature ... while adjusting amounts of volatile constituent," or "increasing the temperature

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[29] The parties have stipulated that the only versions of SKC's accused products (current or former) that have been imported in the U.S. for sales are IN 30 (75 μm), IN 70 (19 μm, 25 μm, 50 μm), IF 30 (7.5 μm), IF 70 (7.5 μm, 12.5 μm), LV 100, LV 200, and LV 300.

[30] The disputed elements of the asserted claims are nearly identical for all three of the asserted claims, and for this discussion they will be treated jointly.

[31] While claims 1, 2 and 3 do not repeat this element verbatim, they each contain nearly identical language requiring the essential feature of the element discussed herein. The asserted claims are, therefore, treated together here. (*See* CX-1 at 21:34-36, 21:61-64, 22:13-15.)

... while adjusting amounts of organic solvent and an imidation ratio;"[32] and (4) the accused products do not practice the element that requires "further heating said prefilm to obtain an adhesive polyimide film."

> **"consist[] substantially of an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines"**
>
> The asserted claims recite:
>
> casting a composition into a film shape, wherein said composition consists substantially of an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines;[33]

(CX-1 at 21:32-36, 21:59-63, 22:11-15.)

In Section III.B.4, *supra*, I construed the term "consists substantially of" to mean "the composition necessarily includes the listed ingredients and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention." For purposes of this issue, SKC asserts that the "basic and novel properties of the invention" of the '866 patent amounts to "a method for producing an adhesive polyimide film."

The dispute focuses specifically on the inclusion in the SKPI products of an { } which SKC's Mr. Ahn and Mr. Lee both testified is a component of the polyimide film.

Mr. Ahn is the manager of the PI film production department at SKPI's Jincheon plant. Mr. Ahn admitted that { } (Tr. at 609:8-18, 611:16-24; RX-678C at Q. 3, 33.)

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[32] While claims 1, 2 and 3 do not repeat this element verbatim, they each contain nearly identical language requiring the essential feature of the element discussed herein. The asserted claims are, therefore, treated together here. (*See* CX-1 at 21:38-40, 22:2-4, 22:17-19.)

[33] The language is identical for claims 1 and 3, while claim 2 refers to "one or more chemical curing agents selected from ..." The difference is not material to the dispute regarding this element.

Similarly, Mr. Ik Sang Lee, the manager of PI film production at SKPI's Gumi facility, testified that the { }[34] Mr. Lee said that the process involves {

} Mr. Lee admitted that {

}

Mr. Lee averred that {

} He said the {

} (RX-677C at Q. 3, 8, 10, 11, 14, 21-34; Tr. at 316:21-317:20, 318:2-9.)

Mr. Ahn testified at the hearing that {

} (Tr. at 609:8-18.) SKC argues that through the { } SKPI's film has less, rather than more, adhesiveness.

CX-467C is a document produced by Chemir, a company engaged to perform testing and to prepare laminates of polyimide films for testing by others, at the direction of Kaneka's expert, Dr. Harris. The exhibit describes Chemir's preparation of certain laminates from polyimide film products for, *inter alia*, "adhesive tests." (CX-467C at 0002.) It specifically states that it prepared SKPI products, including all of the products that the parties have stipulated are imported into the United States. The imported products identified in the list include, *inter alia*, samples S6, S7, S8, S9, S25N, S28N, S40, S43, S51 and S52. (CX-467C at 0019-0021.)

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[34] {

}

The samples prepared by Chemir correspond to ten of the imported accused products as follows:

Sample No.	Imported Accused Product(s)
S6	LV100 (A+C2)/IN70 (25 μm)
S7	IN 30 (75 μm)
S8	LV200/IN70
S9	LV300/IN70
S25N	LV100
S28N	IF70 (12.5 μm)
S40	IF70 (12.5 μm)
S43	LV100 (A+C2)/IN70 (25 μm)
S51	LV75/IN 70 (19 μm)
S52	LV200/IN 70 (50 μm)

(CX-467C at 0019-0021.)

CX-469C is a report of test results from Akron Polymer Systems, Inc. (APS), that includes testing on, *inter alia*, SKPI polyimide films. One of the tests performed by APS on the Kaneka SKPI films is shown to be "Polyimide Film Adhesion Strength," which APS states it performed in accordance with Dr. Harris's protocol. APS performed adhesive strength testing on, *inter alia*, the polyimide films labeled S6, S7, S8, S9, S25N, S28N, S51 and S52.[35] (CX-469C at 0002, 0016, 0018, 0019.)

Of the eight samples tested by APS, five revealed measurable levels of adhesive strength and contained no "remarks" regarding "popping." Those five samples corresponded to imported accused products LV100 (A+C2)/IN70 (25 μm); LV100; IF70 (12.5 μm); LV75/IN 70 (19 μm); and LV200/IN 70 (50 μm). The remaining three samples, which correspond to imported accused products IN 30 (75 μm); LV200/IN70; and LV300/IN70, revealed measurable levels of adhesive strength and contained comments noting "popping," "a little popping," and "a few pops." The

[35] While Chemir prepared laminates of samples marked S40 and S43, APS provides no adhesive strength testing data for those samples.

test results are shown in the chart below:

Adhesion Strength kg/cm by Peel Test						Remark	Person testing
Sample	#1	#2	#3	#4	#5	Average	
{							
}							

(CX-469C at 0018, 0019.)

SKC challenges the results of the APS testing, noting that all samples tested but one, sample S-7, { } and the results do not reflect the adhesive strength of the products as they completed the SKC process. SKC has not shown that inclusion of its { } does, in fact, have a material impact on the adhesive strength of its polyimide film. SKC

does not assert that the addition of { } removes all measurable and detectable adhesive strength; instead, SKC claims that the { } lowers the adhesive strength of the polyimide film. I find that even if this claim is true, it is insufficient to establish that { } materially affects the basic and novel properties of the invention.

Based on the foregoing, I find that Kaneka has demonstrated that the "consist[] substantially of an organic solvent solution of polyamide acid and chemical curing agents selected from the group consisting of dehydrating agents and tertiary amines" limitation is satisfied.

"increasing the temperature in a step-wise fashion"

The asserted claims recite:

> heating the film shaped composition at an initial temperature of 200° C. or less, and thereafter increasing the temperature in a step-wise fashion such that solvent is evaporated to form a chemically cured prefilm …

(CX-1 at 21:37-40, 22:1-4, 22:16-19.)

Kaneka cites {

} (RX-620C.) The cited reference, however, {

} which does not show a "step-wise" increase in temperature as construed herein. {

} In order to demonstrate a "step-wise" increase in temperature it would be necessary to demonstrate a consistent increase in temperature with at least one "step" between the beginning temperature and the ultimate temperature. The testimony cited by Kaneka merely identifies the document in the exhibit; it provides no conflicting testimony regarding the temperatures displayed in the exhibit. (RX-677C at Q. 73-74.)

Similarly, Kaneka cites a string of questions and answers on cross-examination during the hearing to support its hypothesis that the accused products practiced the "step-wise" increase in temperature until a change in process after the filing of the complaint in this matter. The references do not support Kaneka's position, because Dr. Lee testified that { } He testified that this process { } Prior to that, { } (*See* Tr. at 320:23-323.25, 325:23-326:2.) Mr. Lee's testimony is supported by the exhibits cited by Kaneka. RX-620C, RX-624C and RX-628C, which refer to imported accused "prior" products, { } RX-640C, RX-644C, RX-648C, RX-654C and RX-662C which refer to imported accused "redesigned" products, all demonstrate { }[36] This evidence cited by Kaneka does not establish that either the "prior" process or the current process practiced "increasing the temperature in step-wise fashion."

Kaneka next argues that the film making standards offered by SKC to demonstrate its "design around" reveal that the { } Kaneka contends that { } "could" result in a process that practices the "increasing the temperature in step-wise fashion." Kaneka presents no evidence that this was, in fact, the case for either SKPI's prior products or current products. It is Kaneka's burden to provide a

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[36] Other exhibits to which Kaneka makes reference, *e.g.*, RX-610C, RX-616C, RX-632C, RX-636C, RX-655C, RX-656C and RX-660C, RX-661C, and RX-663C through RX-665C, relate to products that are not asserted to be imported into the United States, per the stipulation of the parties. *See fn.26 and 28, supra.* As an aside, SKC is correct when it states that Kaneka read the temperatures in RX-660C and RX-661C backwards from { } I note that the zones in the exhibit are listed from right to left in Japanese tradition.

preponderance of evidence to support a finding that SKPI's accused products ***do*** practice each and every element of at least one claim in the '866 patent. Suggesting that they "could" infringe the asserted claims does not suffice.

Based upon all of the foregoing, I find that Kaneka has failed to prove by a preponderance of evidence that the imported accused products practice the requirement of element 2 of the asserted claims of the '866 patent that teaches "increasing the temperature in a step-wise fashion."

If the Commission disagrees with the construction of this term, set forth in Section III.B.2, *supra,* and finds that a single increase in temperature without an interim "step" such as demonstrated by, for example, { } then I would find that Kaneka has demonstrated by a preponderance of evidence that this element is met by the SKC process for its "prior" imported accused LV and IN products.[37] Based upon the evidence and the rationale set forth above, however, I would continue to hold that Kaneka has failed to demonstrate that SKC's process practices this element in any of its "redesigned" imported accused products. I would also find that Kaneka has failed to prove by a preponderance of evidence that SKC's process practiced this element in its "prior" accused imported IF products, because there is no data submitted regarding the temperatures observed for those products.

"increasing the temperature ... while adjusting an imidation ratio," "increasing the temperature ... while adjusting amounts of volatile constituent," or "increasing the temperature ... while adjusting amounts of organic solvent and an imidation ratio;"

The asserted claims recite:

increasing the temperature in a step-wise fashion ... while adjusting an imidation

---

[37] Mr. Lee has testified that the { } (RX-677C at Q. 10, 12.)

ratio"[38]

(CX-1 at 21:38-41, 22:2-5, 22:17-21.)

First, I note that the disputed element "while adjusting," when taken in context, must occur at the same time that the process practices "increasing the temperature in step-wise fashion," which I have already found does not occur in the production of either the former accused imported products or the redesigned accused imported products. It follows that the SKC process cannot infringe this element of the asserted claims.

To the extent that the Commission finds that SKC's process has at any time practiced said requirement for "increasing the temperature in step-wise fashion," I would find that Kaneka has not met its burden to prove by a preponderance of evidence that SKC's Process, for any of its imported accused products, practices the "while adjusting" element of the asserted claims of the '866 patent.

Dr. Harris, Kaneka's expert, testified that "adjusting" the imidation ratio and the amounts of volatile constituents, is accomplished by "controlling the temperature and heating time in the belt dryer." In countering Dr. Thomas's opinion that heating the prefilm will inherently adjust its imidation ratio, Dr. Harris posited that Dr. Thomas used the terms "change" and "adjust" interchangeably, which is incorrect. Dr. Harris said, "in the context of the '866 patent the phrase 'adjusting an imidation ratio' means something more than merely changing the imidation ratio, it requires changing the imidation ratio so that it corresponds or conforms to a desired value." (CX-644C at Q. 15-17, 42-44.)

Kaneka alleges incorrectly that Dr. Thomas testified that { }

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[38] The recited language is from asserted claim 1. Claim 2 refers to adjusting amounts of volatile constituent, and claim 3 teaches adjusting amounts of organic solvent and an imidation ratio.

{

} In fact, the testimony cited by Kaneka merely repeats Dr. Thomas's opinion that there is an imidation reaction that takes place during the chemical curing. (Tr. at 657:18-658:1.)

Kaneka mischaracterizes the testimony of Mr. Ahn to say that, {

} Mr. Ahn actually testified that {

} Mr. Ahn said that {

} (Tr. at 604:11-605:10, 607:22-608:24.)

Kaneka argues correctly that SKC's assertion that Dr. Harris testified this claim term requires an active step of "sampling" in the manufacturing process is incorrect. (*See* CX-644 at Q. 15-17, 42-44, 53.) Kaneka concludes that the {

} The testimony cited by Kaneka does not support this position. While the testimony indicates that {

} (*See* Tr. at 591:17-591:23, 604:11-605:10, 607:22-608:24.)

Also, SKC notes correctly that Mr. Ahn testified that he knew nothing of the processes at the Gumi plant and could only testify about the Jincheon plant at which he works. The Jincheon plant { } SKC contends persuasively that all of Kaneka's specific

evidence regarding the "while adjusting" limitation is limited to Mr. Ahn's testimony, and there is no similar evidence cited regarding the SKPI LN, LV and IN products, which are produced at the Gumi plant. (RX-678C at Q. 6-9; Tr. at 592:6-9.)

SKC focuses on one specific assertion by Kaneka citing to Mr. Ahn's testimony where he explained that { } Mr. Ahn testified that { } Mr. Ahn said { } (Tr. at 593:15-594:8.) Kaneka's attempt to equate { } to determining an imidization ratio is well wide of the mark. I have found no evidence of record that SKC monitored imidization ratio or levels of volatile constituent during the production process.

Based upon all of the foregoing, I find that Kaneka has failed to prove by a preponderance of evidence that SKC's process, for any of its imported accused products, practices the "while adjusting" limitation of element 2 of the asserted claims of the '866 patent.

"further heating said prefilm to obtain an adhesive polyimide film."

All three of the asserted claims of the '866 patent contain identical language in their 3rd and final element, to wit: "further heating said prefilm to obtain an adhesive polyimide film."

SKC does not dispute that { } SKC persists in its position that the term adhesive is indefinite; but that matter has been decided otherwise. (*See* Section III.B.3, *supra*.)

Treating the substance of this issue, I note that SKC correctly points out that the evidence shows all of the SKPI products Kaneka tested { } (RX-676C at Q. 205). While SKC argues that the '866

patent is "directed to" a process for improving the adhesive strength of film, without the need for any post-production treatments, { } I note that the claims are not so limited. They merely recite heating the prefilm "to obtain an adhesive polyimide film," which in this case means "applying sufficient heat for a sufficient amount of time to produce a polyimide film with a measurable and detectable level of adhesive strength."

Exhibit CX-469C, which details the results of the adhesion strength testing, shows that the samples tested each displayed a "measurable and detectable level of adhesive strength." Sample S-7, which SKC argued was the only sample that did not receive post-process {

}

All of those levels are obviously measurable and detectable. It is true that the other {

} samples in the test results show generally higher levels of adhesive strength than sample S-7. I note, however, that Mr. Lee testified that {

} (CX-469C at 18, 19; RX-677C at Q. 10, 12.) In my view, it is reasonable on this evidence to conclude that, while { } will likely increase the adhesive strength of the polyimide films, lack of that { } will not reduce the adhesive strength of the films to a level that is not detectable and measurable.

Based upon the foregoing, I find that Kaneka has met its burden to show by a preponderance of evidence that the imported accused LV and IN products practice "further heating said prefilm to obtain an adhesive polyimide film." I have found no evidence of testing the imported accused SKPI IF products to determine if they possess a detectable and measurable level of adhesive strength, and I find that Kaneka has not met its burden as to those products.

C. The '639 Patent

Kaneka's Position: Kaneka contends that SKC's LV and IN processes infringes claim 1 of the '639 patent.

Kaneka states that SKC does not dispute that the LV process practices the preamble of claim 1. Kaneka asserts that testimony from an SKC employee and Dr. Harris confirms that the LV process is a process for preparing a polyimide film by extruding and casting a composition of a resin solution containing a poly(amic acid) varnish. (Citing CX-619C at Q. 160; RX-677C at Q. 14; Tr. at 315:3-316:10, 328:12-19; CX-207 at ¶ 104.)

Kaneka argues that the LV process meets the limitation of claim 1 requiring the specific molar ratio of a tetracarboxylic dianhydride component to a diamine component. Kaneka asserts that the evidence shows that the molar ratio for the LV process is 1:1.011, which falls within the claimed range. (Citing CX-619C at Q. 164; CX-207C at ¶¶ 104-107.) Kaneka notes that Dr. Thomas' calculations resulted in a ratio that is { } (Citing CX-619C at Q. 165; CX-207C at ¶ 107.) Kaneka argues that the evidence supports a finding that the poly(amic acid) varnish in the LV process has a low viscosity, { } (Citing CX-619C at Q. 164-165; CX-207C at ¶. 108.)

Kaneka asserts that production data for SKC's LV200 product confirms that the LV process infringes claim 1. Kaneka states that the data from the LV200 product shows that the molar ratio is {1:0.985, which falls within the claimed range} (Citing CX-619C at Q. 173, 174, 177; Tr. at 931:19-932:16.) Kaneka states that Dr. Harris testified that a poly(amic acide) varnish with this molar ratio will have a low viscosity. (Citing CX-619C at Q. 177.)

Kaneka asserts that the LV process meets the chemically-imidizing catalyst and dehydrating agent requirements of claim 1. Kaneka claims that production targets for the LV process show that the respective molar ratios of isoquinoline (i.e. chemical imidizing catalyst) and acetic anhydride (i.e. dehydrating agent) to amic acid of the poly(amic acid) varnish, are { } (Citing CX-619C at Q. 166; CX-207C at ¶¶ 111-113.)

Kaneka contends that the actual production data for the LV200 product confirms Kaneka's assertions. Kaneka states that the production data shows that the respective molar ratios of isoquinoline (i.e. chemical imidizing catalyst) and acetic anhydride (i.e. dehydrating agent) to amic acid of the poly(amic acid) varnish, are { } (Citing CX-619C at Q. 178-179; Tr. at 931:19-932:16.) According to Kaneka, Dr. Thomas agreed that the ratios used in the process to make the LV200 product { } (Citing Tr. at 925:14-18.)

Kaneka argues that because the LV products are the same as the IN products, the IN process also infringes claim 1. (Citing RX-677C at Q. 10-11.)

SKC's Position: SKC contends that Kaneka has failed to prove infringement of claim 1 of the '639 patent.

SKC notes that Kaneka's infringement argument is intended to apply to all of SKC's IN/LV film products. SKC asserts that the various IN/LV products are made using different formulations, different film thicknesses, and different manufacturing conductions. Similarly, SKC argues that Kaneka failed to explain why SKC's current and former IN/LV products can be considered the same for purposes of infringement. SKC argues that Kaneka's broad infringement fails to address each product individually, as was necessary.

SKC contends that Kaneka failed to prove that any SKC process meets the chemically imidizing catalyst limitation of claim 1. SKC states that had Kaneka considered the actual manufacturing documents for the IN/LV products, it would have become clear that the molar ratio of catalyst to amic acid in the poly(amic acid) varnish of SKC's current products are { } (Citing RX-676C at Q. 258-268; RDX-314C.) SKC asserts that Kaneka's failure of proof for the current IN/LV products also extends to SKC's former LV 50, LV 75, LV 100, and LV 300 products and their associated IN products, IN 30, IN 50, and IN 70. (Citing RX-676C at Q. 2781 RDX-315C.)

SKC claims that using SKC's alternative proposed construction for "low viscosity," Kaneka has not shown that any of the IN/LV products meet this limitation. (Citing CX-619C at Q. 164.) SKC states that the varnish viscosities for SKC's current and former IN/LV products remain { } (Citing RDX-314C; RDX-316C.) SKC notes that if the IN/LV viscosity measurements had been taken at 20°C, as required by SKC's alternative claim construction, { .} (Citing Tr. at 155:16-156:2; RX-574C at 49:6-9; RX-676C at Q. 269.)

In its reply brief, SKC makes clear that { } SKC asserts that Kaneka ignores that fact, and focuses only on just one specific product, the former LV 200 product. SKC therefore claims that Kaneka has offered no evidence of infringement with regard to any products outside of the former LV 200 product. According to SKC, Kaneka attempts to prove infringement of the LV 200 product by relying on excluded and/or mischaracterized evidence.

Discussion and Conclusions: Based on the evidence in the record, I find that Kaneka has failed to prove that SKC infringes claim 1 of the '639 patent.

Kaneka asserts that the accused SKC processes are processes "for preparing a polyimide film by extruding and casting a composition of a resin solution containing a poly(amic acid) varnish," as recited in the preamble of claim 1. (CX-619C at Q. 160; RX-677C at Q. 14; Tr. at 315:3-316:10, 328:12-19.) SKC offers no rebuttal to Kaneka's assertion. Therefore, I find that Kaneka has shown that the accused SKC processes are processes "for preparing a polyimide film by extruding and casting a composition of a resin solution containing a poly(amic acid) varnish."

The next limitation requires "preparing the poly(amic acid) varnish having low viscosity." The parties disputed the meaning of "low viscosity." I construed "low viscosity" to mean "a viscosity that is sufficiently low to prevent the formation of bubbles and unevenness in film thickness of the resulting polyimide film."

Kaneka failed to offer any evidence concerning the formation of bubbles or the unevenness in the SKC film. (*See* CIB at 53-54; CRB at 24-25.) Based on the lack of evidence from Kaneka on this issue, I find that Kaneka has failed to demonstrate that any accused SKC process meets the "low viscosity" construction.

Kaneka's proposed construction for "low viscosity" is "viscosity obtained by polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99." Thus, Kaneka ties "low viscosity" directly to the claimed ratio of tetracarboxylic dianhydride to diamine. For the reasons described *infra*, if

Kaneka's proposed construction is adopted, I find that only SKC's prior process[39] used to manufacture the LV200 product meets the "low viscosity" claim limitation.

SKC argued that "low viscosity" was indefinite, an argument which I rejected. Alternatively, SKC proposed the following construction: "a poly(amic acid) varnish with a viscosity equal to or less than 2,000 poise measured at 20°C." If this construction is adopted, I find that Kaneka has failed to demonstrate that any SKC process meets the "low viscosity" limitation.

Dr. Harris testified that the "low viscosity" limitation is met because the target viscosity for the varnish is { } (CX-619C at Q. 164.) This testimony fails to satisfy the SKC's construction for multiple reasons. First, claiming that the target viscosity is equal to { } is not the same as stating that the viscosity is less than or equal to 2,000 poise. Next, Dr. Harris does not provide a temperature at which the viscosity was measured, meaning that there is no way to know if SKC's construction is satisfied. Finally, the testimony is based on evidence that was not admitted at the hearing. The testimony is based on Dr. Harris's expert report, where he cited to an SKC document to support his alleged poise range. (CX-207C at ¶ 108.) In paragraph 108, Dr. Harris relies on data from an SKC document with the Bates number SKPI-ITC-00110238. (*Id.*) This document, identified at the hearing as CX-297C, was excluded during the hearing, as evidenced by Kaneka's Final Trial Exhibit List.

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[39] { } *Certain Rotary Printing Apparatus Using Heated Ink Composition, Components Thereof, & Systems Containing Said Apparatus & Components*, Inv. No. 337-TA-320, Order No. 1 (Jan. 14, 1991) ("Neither importation nor sale during the pendency of the investigation is required to support a Section 337 violation, and discontinuance of an unfair practice is not an adequate defense.")

In addition, SKC offers evidence that when measured at { } the viscosities for the varnish used in the prior and current IN/LV products is { } (*See* RX-676C at Q. 266, 269-275, 279-281.) SKC points to testimony from Kaneka employees agreeing that if the measurements were taken at 20°C instead of { } the viscosities would have been even higher. (Tr. at 155:16-156:2; RX-574C at 49:6-9.)

Based on the foregoing, under the adopted construction of "low viscosity," Kaneka has failed to demonstrate that any accused SKC process creates a "poly(amic acid) varnish having low viscosity."

The parties dispute whether or not Kaneka has shown that the accused SKC processes meet the claim limitation requiring "polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99." To prove that this limitation is met, Kaneka cites to the testimony of Dr. Harris. (CIB at 53.) Dr. Harris's testimony provides no detail regarding how he arrived at the conclusion that the ratio of tetracarboxylic dianhydride to diamine is { } or how the ratio is still within the claimed range using the molecular weights suggested by Dr. Thomas. (CX-619C at Q. 164-165.) Instead, Dr. Harris makes reference to his expert report, CX-207C. (*Id.* at Q. 164.) Dr. Harris's expert report contains more detail concerning how he arrived at his conclusion regarding the molar ratio; but his opinion is based on documents that have been excluded from evidence. (CX-207C at ¶¶ 104-108.) In paragraphs 104-106, Dr. Harris relies on the deposition testimony of Young Don Ahn. (*Id.* at ¶¶ 104-106.) This deposition transcript, identified at the hearing as CX-485C, was not admitted during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. In paragraphs 105-106, Dr. Harris relies on data from an SKC document with the Bates number SKPI-ITC-00110238. (*Id.* at ¶¶ 105-106.) This document, identified at the

hearing as CX-297C, was excluded during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. Therefore, I find that Dr. Harris's opinions in paragraphs 104-108 of his expert report hold no weight because they are based on evidence that was not admitted at the hearing. Kaneka next relies on Dr. Harris's opinion that the tetracarboxylic dianhydride to diamine ratio for the prior LV200 product is { } (CX-619C at Q. 173, 174, 177.) Kaneka also cites to the following testimony from Dr. Thomas:

Q. Question No. 177. Yes, Page 45, yes.

A. Okay.

Q. Do you see where he's calculated a molar ratio?

A. { }

Q. Did you disagree with that calculation?

A. No, I think that's correct.

(Tr. at 930:20-931:1.)

Because both parties' experts are in agreement on the calculated molar ratio, and SKC has not offered any evidence to the contrary, I find that Kaneka has sufficiently demonstrated that SKC's process used to manufacture the prior LV200 product meets the claim limitation requiring "polymerizing a tetracarboxylic dianhydride component with a diamine component in a molar ratio of 1:1.01 to 1:1.05 or 1:0.95 to 1:0.99." Further, I find that Kaneka has failed to offer sufficient evidence to demonstrate that any other SKC processes meet this claim limitation.

The parties dispute whether or not Kaneka has shown that the accused SKC processes meet the claim limitation requiring "preparing the composition of the resin solution by adding to the poly(amic acid) varnish a dehydrating agent in an amount of at least one mole...per 1 mole of amic acid of the poly(amic acid) varnish." I find that Kaneka failed to offer sufficient

evidence to meet its burden with respect to this claim limitation. Kaneka cites to Question 166 of Dr. Harris's witness statement, but this is just an unsupported assertion by Dr. Harris that the IN product meets the dehydrating agent limitation of claim 1. (CX-619C at Q. 166.) Such unsupported assertions by an expert witness are not sufficient evidence to prove infringement. *Kim v. ConAgra Foods, Inc.*, 465 F.3d 1312, 1319-1320 (Fed. Cir. 2006) (finding conclusory testimony of an expert insufficient to demonstrate infringement).

Kaneka next cites to Dr. Harris's expert report on infringement. Specifically, Kaneka cites to paragraphs 109 to 113 to support the assertion that the chemically-imidizing catalyst limitation of claim 1 is satisfied. (CIB at 54.) In these paragraphs, Dr. Harris calculates the molar ratio of the dehydrating agent to be {

} (CX-207C at ¶¶ 109-113.)

As SKC notes, this evidence is problematic because Dr. Harris's calculations are based SKC documents that were excluded during the hearing. In paragraph 109, Dr. Harris relies on a document with Bates number SKPI-ITC-00714465. (CX-207C at ¶ 109.) This document, identified at the hearing as CX-285C, was excluded during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. In paragraphs 110 and 111, Dr. Harris relies on a document with Bates number SKPI-ITC-00110243. (*Id.* at ¶¶ 110-111.) This document, identified at the hearing as CX-298C, was excluded during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. Paragraph 112 of Dr. Harris's expert report refers back to calculations made in paragraphs 106 and 107. (*Id.* at ¶ 112.) In paragraph 106, Dr. Harris relies on data from an SKC document with the Bates number SKPI-ITC-00110238. (*Id.* at ¶ 106.) This document, identified at the hearing as CX-297C, was excluded during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. In addition, in paragraphs 106 and 110, Dr. Harris relies on the deposition

testimony of Young Don Ahn. (*Id.* at ¶¶ 106, 110.) This deposition transcript, identified at the hearing as CX-485C, was not admitted during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. Therefore, I find that Dr. Harris's opinions in paragraphs 109-113 of his expert report hold no weight because they are based on evidence that was not admitted at the hearing.

Kaneka next cites to Dr. Harris's testimony regarding the LV200 product. Dr. Harris claims that he calculated the dehydrating agent ratio to be { } (CX-619C at Q. 178-179.) Dr. Harris fails to provide any detail regarding his calculation. (*Id.*) This testimony is unsupported by any evidence, and such unsupported assertions by an expert witness are not sufficient evidence to prove infringement. *Kim v. ConAgra Foods, Inc.*, 465 F.3d 1312, 1319-1320 (Fed. Cir. 2006) (finding conclusory testimony of an expert insufficient to demonstrate infringement).

Kaneka cites to the hearing transcript in an attempt to show that Dr. Thomas agreed with Dr. Harris's calculation of { } The first citation is testimony from Dr. Thomas merely confirming that the { } recited by Dr. Harris is within the range required by claim 1. (Tr. at 931:19-932:16; CX-619C at Q. 179.) It does not constitute an admission by Dr. Thomas that Dr. Harris's calculations are accurate or correct. (*Id.*) The second citation relates to the chemically-imidizing agent ratio of claim 1, and not the dehydrating agent ratio of claim 1, and is therefore not applicable. (Tr. at 924:22-925:18.)

Based on the foregoing, I find that Kaneka failed to offer sufficient evidence to demonstrate that any SKC process meets the limitation of claim 1 requiring "preparing the composition of the resin solution by adding to the poly(amic acid) varnish a dehydrating agent in an amount of at least one mole…per 1 mole of amic acid of the poly(amic acid) varnish."

The parties dispute whether or not Kaneka has shown that the accused SKC processes meet the claim limitation requiring "preparing the composition of the resin solution by adding to the poly(amic acid) varnish…a chemically-imidizing catalyst in an amount of at least 0.5 mole per 1 mole of amic acid of the poly(amic acid) varnish." I find that, with one exception, Kaneka failed to offer sufficient evidence to meet its burden with respect to this claim limitation. Kaneka cites to Question 166 of Dr. Harris's witness statement, but this is just an unsupported assertion by Dr. Harris that the IN product meets the chemically-imidizing catalyst limitation of claim 1. (CX-619C at Q. 166.) Such unsupported assertions by an expert witness are not sufficient evidence to prove infringement. *Kim v. ConAgra Foods, Inc.*, 465 F.3d 1312, 1319-1320 (Fed. Cir. 2006) (finding conclusory testimony of an expert insufficient to demonstrate infringement).

Kaneka next cites to Dr. Harris's expert report on infringement. Specifically, Kaneka cites to paragraphs 111 to 113 to support the assertion that the chemically-imidizing catalyst limitation of claim 1 is satisfied. (CIB at 54.) In these paragraphs, Dr. Harris calculates the molar ratio of the chemically-imidizing catalyst to be {

} (CX-207C at ¶¶ 111-113.)

As SKC notes, this evidence is problematic because Dr. Harris's calculations are based SKC documents that were excluded during the hearing. In paragraph 111, Dr. Harris relies on a document with Bates number SKPI-ITC-00110243. (*Id.* at ¶ 111.) This document, identified at the hearing as CX-298C, was excluded during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. Paragraph 112 of Dr. Harris's expert report refers back to calculations made in paragraphs 106 and 107. (*Id.* at ¶ 112.) In paragraph 106, Dr. Harris relies on data from an SKC document with the Bates number SKPI-ITC-00110238. (*Id.* at ¶ 106.) This document, identified

at the hearing as CX-297C, was excluded during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. In addition, in paragraph 106, Dr. Harris relies on the deposition testimony of Young Don Ahn. (*Id.*) This deposition transcript, identified at the hearing as CX-485C, was not admitted during the hearing, as evidenced by Kaneka's Final Trial Exhibit List. Therefore, I find that Dr. Harris's opinions in paragraphs 111-113 of his expert report hold no weight because they are based on evidence that was not admitted at the hearing.

Kaneka then offers evidence relating to a specific SKC product, the prior LV200 product. Kaneka cites to the testimony of Dr. Harris. (CX-619C at Q. 178-179.) Dr. Harris testified that the ratio of chemically-imidizing catalyst to amic acid was {

} (*Id.*) On cross examination, Kaneka asked Dr. Thomas about this calculation. (Tr. at 924:22-925:18.) Dr. Thomas acknowledged that the calculation was correct and that the "at least 0.5 mole per 1 mole" claim language for the ratio of chemically-imidizing catalyst to amic acid was satisfied for the former LV200 product. (*Id.*) Based on this admission from Dr. Thomas, I find that Kaneka has demonstrated the process used to manufacture SKC's prior LV200 product meets the "chemically-imidizing catalyst" claim limitation of claim 1.

SKC argues that this testimony was excluded based on the fact that it went beyond the scope of permissible testimony. The testimony at issue was based on Dr. Thomas' expert report, but it was determined, after the testimony was elicited, that Dr. Thomas' expert report was not offered by either party as an exhibit in the hearing. (Tr. at 927:9-928:20.) Therefore, I found that Kaneka's questioning of Dr. Thomas regarding the subject matter of his expert report went beyond the scope of allowable cross examination, and I found that the expert report would not be admitted into evidence. (*Id.*) SKC did not seek to strike the prior testimony, and I made no such

ruling to that effect. (*Id.*) Therefore, there is no basis to find that the above-cited testimony was excluded or stricken from the record.

In addition to Kaneka's failure to offer sufficient evidence, I find that SKC offered credible evidence that many of its products do not meet the chemically-imidizing catalyst limitation. Dr. Thomas' calculations show that the amount of chemically-imidizing catalyst in the current LV50, LV75, LV100, LV200, and LV300 products is less than 0.5 moles per 1 mole of amic acid. (RX-676C at Q. 258-268.) Dr. Thomas also provided calculations showing that the prior LV50, LV75, LV100, and LV300 products do not meet the chemically-imidizing catalyst limitation of claim 1. (*Id.* at Q. 278.)

Based on the foregoing, I find that Kaneka has proven that the process used to manufacture the prior LV200 product meets the chemically-imidizing catalyst limitation of claim 1. Further, I find that Kaneka has failed to offer sufficient evidence to demonstrate that any other SKC processes meet this claim limitation.

In sum, I conclude that Kaneka has not offered sufficient evidence to show that any SKC process, whether it be a current or former process, meets all of the limitations of claim 1. Therefore, Kaneka has failed to demonstrate by a preponderance of the evidence that SKC infringes claim 1 of the '639 patent.

D. The '704 Patent

Kaneka's Position: Kaneka contends that SKC's IF70 and LN100 products infringe claim 1 of the '704 patent.

Kaneka claims that it tested four SKC film samples that each infringe claim 1: S3 (IF70 25 μm)), S11 (LN100), S27 (IF70 (25 μm)), and S21 (LN100). Kaneka explains that S21 and S27 are current SKC products, while S3 and S11 are prior products.

Kaneka asserts that the accused products are polyimide films for flexible printed circuits. Kaneka states that the IF and LN line of films are used for flexible copper clad laminates. (Citing CX-10 at 2; CX-536C at 18; Tr. at 313:3-6.) Kaneka states that the lamination of a polyimide film onto a copper foil to form a flexible copper clad laminate is an intermediate step in the production of a flexible printed circuit. (Citing CX-619C at Q. 26.)

Kaneka states that for each film sample, the CTE from 100 to 200°C was measured in both MD and TD at the center of the film, and the average CTE was calculated. (Citing CX-619C at Q. 184; CX-207C at ¶ 117; CX-456C at ¶ 4.) Kaneka claims that sample S21 was tested twice to confirm the accuracy of the results. (Citing CX-619C at Q. 192.) According to Kaneka, the test results prove that the accused products meet the average CTE limitation of claim 1. Kaneka claims that SKC product specifications confirm that the accused products meet the average CTE limitation of claim 1. (Citing CX-536C at 23-24; CX-619C at Q. 96.)

Kaneka asserts that the accused products meet the stiffness limitation of claim 1. According to Kaneka, stiffness testing was performed by an independent lab according to Dr. Harris's protocol. (Citing CX-619C at Q. 194.) Kaneka states that the testing was performed with the same instrument used in the '704 patent. (Citing CX-619C at Q. 194; JX-3 at 6:1-6.) Kaneka asserts that each of the twenty replicates tested satisfied the stiffness requirement of claim 1. (Citing CX-619C at Q. 195-200; CX-468C at 75-76; CX-207C at ¶ 117; CX-456C at ¶ 4.) Kaneka claims that Dr. Thomas did not challenge these test results.

Kaneka states that the accused SKC products meet the limitation requiring "the polyimide is obtained from diamine containing 4,4'-oxydianiline and paraphenylenediamine in a mole ratio of 9/1 to 4/6." Kaneka states that accused products were analyzed via high performance liquid chromatography (HPLC) to show that this limitation is met. (Citing CX-619C at Q. 203.)

According to Kaneka, all of the tested SKC samples have a ratio of about 3:1, which is within the claimed range. (Citing CX-619C at Q. 202-205; CX-207C at ¶ 117; CX-456C at ¶ 4; CX-467C at 23.)

Kaneka notes that while Dr. Harris's original HPLC protocol called for three replicates, Chemir only tested one replicate per sample. (Citing Tr. at 499:2-500:14.) Kaneka states that Chemir was having trouble following the original protocol, so Dr. Harris changed the protocol after discussion with Chemir to add control samples of polyimide films with known amounts of diamines, which were analyzed to confirm that the HPLC testing was accurate. (Citing Tr. at 496:14-497:14, 503:24-504:17; CX-619C at Q. 113-114.)

Kaneka states that SKC may challenge the testing because the HPLC tests of three control samples did not return the expected results. (Citing Tr. at 507:7-508:12.) Kaneka asserts that Dr. Harris testified that the test results only mattered at the 3 mole range, where the instrument exhibited excellent calibration, because all of the samples were tested at the 3 mole range, not at the 4 or 9 mole range. (Citing Tr. at 508:24-509:13.)

In its reply brief, Kaneka argues that SKC mischaracterizes Dr. Harris's protocol for measuring CTE. (Citing CX-467C at 12.) Kaneka states that the Kaneka S15 product was tested three times and the SKC S21 product was tested two times. According to Kaneka, these tests demonstrate that the CTE testing was highly accurate. (Citing CX-467C at 12; CX-469C at 20-22.)

SKC's Position: SKC contends that Kaneka has failed to meet its burden to show that any SKC product infringes claim 1 of the '704 patent.

SKC asserts that Kaneka has failed to demonstrate that the four accused SKC products meet the average CTE claim limitation. SKC claims that neither Chemir nor Dr. Harris's

laboratory, Akron Polymer Systems, followed the protocol set out by Dr. Harris with regard to the measurement of the CTE values relied on by Dr. Harris. (Citing CX-467C at 12; CX-469C at 11.) SKC states that the protocol clearly requires data from three replicates for the CTE testing. (*Id.*) SKC claims the testing reports show that only a single measurement was obtained for three of the products, while only two replicates were obtained for the fourth product. (Citing CX-467C at 22; CX-469C at 22; CX-482C at 11.)

SKC argues that the failure to follow protocol is significant, as Dr. Harris testified that the replicate testing allows him to determine whether or not the data is valid. (Citing Tr. at 453:1-15, 458:4-8, 462:3-11, CPHB at 86.) SKC claims this problem renders the data unreliable, meaning that Dr. Harris's conclusions are unsubstantiated.

SKC argues that Dr. Harris's opinion is unreliable for additional reasons. SKC notes that Dr. Harris relies on liquid chromatography (HPLC) testing to opine that the accused products are made from "diamine containing 4,4'-oxydianiline and paraphenylenediamine in a mole ratio of 9/1 to 4/6." SKC explains that HPLC testing separates a sample that contains multiple chemical components into single chemical components, thus allowing one to determine the relative amounts of each chemical component in the sample. According to SKC, before conducting HPLC testing on samples containing known chemical components, known standards are tested to verify the accuracy of the procedure. (Citing Tr. at 501:8-11.) SKC states that Dr. Harris testified that at least half of the known standards tested by Chemir came back with "bad" results. (Citing Tr. at 507:21-508:12; CX-467C at Q. 23.) SKC claims that Chemir's failure to return expected results for known samples demonstrates the unreliability of the HPLC testing on the unknown samples.

SKC states that when Chemir's HPLC test results for the LN 100 product are compared to Kaneka's own HPLC test results for the same product, it can be seen that the results are significantly different. (Citing Tr. at 513:23-25, 516:16-18, 516:23-517:3.) SKC claims that the difference in test results "concerned" Dr. Harris. (*Id.*)

Finally, SKC argues that Kaneka has not shown that the accused products are "polyimide film[s] for flexible printed circuit[s]" as recited in claim 1. SKC states that Kaneka has not pointed to any evidence that SKC makes any of the accused polyimide films specifically for flexible printed circuits or that flexible printed circuits made from the accused polyimide films are imported.

In its reply brief, SKC asserts that Kaneka misrepresents the reason for why it only did a single set of CTE tests. SKC states that Kaneka explained that the lab failed to follow Dr. Harris's protocol because one product sample was tested twice to confirm the accuracy of the equipment, eliminating the need for multiple tests. (Citing CIB at 73.) SKC argues that this is wrong because the second test of the specific sample, S21, was not reported until after Dr. Harris reported the single-test data for the other samples. (Citing CX-207C at ¶ 117; CX-456C at ¶ 4; CX-482C at 11.)

In addition, SKC claims that Kaneka misrepresents the reasoning behind the flawed HPLC testing. (Citing CIB at 74-75; Tr. at 497:4-14, 543:12-16, 544:8-15; CX-467C at 13-14.) According to SKC, the facts plainly show that the HPLC testing was flawed, resulting in inaccurate and unreliable data. (RIB at 74-75.)

SKC asserts that Kaneka fails to distinguish between current and former products when discussing CX-536C. (Citing CIB at 73.) SKC states that CX-536C bears a { }

{ } Regarding the former products, SKC claims that Kaneka failed to establish any foundational testimony regarding CX-536C at 23-24.

Discussion and Conclusions: Based on the evidence in the record, I find that Kaneka has failed to demonstrate that any accused SKC product infringes claim 1 of the '704 patent. As described in Section III.D.2 *supra*, I have found that the phrase "average coefficient of thermal expansion" in claim 1 is indefinite, rendering claim 1 invalid. An indefinite claim "by definition, cannot be construed," meaning I cannot analyze infringement of the '704 patent. *Honeywell*, 341 F.3d at 1342. Therefore, my analysis of claim 1 for purposes of infringement will be conducted under the assumption that Kaneka's claim construction position for "average coefficient of thermal expansion" has been adopted, even though I have already rejected Kaneka's claim construction position. According to Kaneka's position, the claim language requires that the polyimide film has an average CTE of $1.0x10^{-5}$ to $2.5x10^{-5}$ cm/cm/°C over the temperature range of 100°C to 200°C in both the MD and TD, whereby the CTE is measured in the center of the film. (CX-644C at Q. 168.)

The parties dispute the accuracy and reliability of the testing that Kaneka had performed to establish that the accused SKC products meet the average CTE limitation. "Although framed in the context of admissibility rather than weight, *Daubert* set-forth a non-exclusive check-list for trial courts to use in assessing the reliability of scientific expert testimony, including: '(1) whether the expert's technique or theory can be tested; (2) whether the technique or theory has been subject to peer review; (3) the known or potential rate of error in the technique; (4) the existence and maintenance of standards and controls; and (5) whether the technique or theory has been generally accepted.'" *Certain Semiconductor Chips With Minimized Chip Package Size and Products Containing Same (III)*, Inv. No. 337-TA-630, Commission Determination at 59-60

(Dec. 2010) (citing *Daubert v. Merrill Dow Pharmaceuticals, Inc.* 509 U.S. 579 (1993); Fed. R. Evid. 702 Advisory Committee's note).

Kaneka enlisted the services two companies, Chemir and Akron Polymer Systems ("APS"), to perform the CTE testing. (CX-467C; CX-469C.) Kaneka relies on Chemir's and APS's testing of four SKC samples, designated as S3, S11, S21, and S27. S3 is SKC's former IF70 (25 μm) product, S11 is SKC's former LN100 product, S21 is SKC's current LN100 product, and S27 is SKC's current IF70 (25 μm) product. (CX-619C at Q. 184; RIB at 72.)

Dr. Harris provided Chemir and APS with a protocol for the CTE testing. The testing protocol provided to both companies states the following:

> Sampling Procedure
>
> 1) Cut a rectangular sample near the center of the film such that the longer dimension is in the MD direction (parallel to the mechanical feeding direction, i.e. film transfer direction). Determine the film CTE in the MD direction.
>
> 2) Cut a rectangular sample near the center of the film such that the longer dimension is in the TD direction (perpendicular to the mechanical feeding direction, i.e. transverse direction). Determine the film CTE in the TD direction.
>
> 3) Repeat one or more of the above sampling procedures using new film samples so that data is obtained for a total of three replicates.

(CX-467C at 12; CX-469C at 11.)

Chemir provided one CTE measurement in the MD direction and one CTE measurement in the TD direction for each of S3 and S11. (CX-467C at 22.) Chemir provided two CTE measurements in the MD direction and two CTE measurements in the TD direction for S21. (CX-482C at 11.) APS provided one CTE measurement in the MD direction and one CTE measurement in the TD direction for S27. (CX-469C at 22.) As quoted *supra*, Dr. Harris's testing protocol clearly requires "[r]epeat[ing] one or more of the above sampling procedures

using new film samples so that data is obtained for a total of three replicates." (CX-467C at 12; CX-469C at 11.) Kaneka offers no evidence that this protocol – namely obtaining data for a total of three replicates – was followed by either of the testing companies.

SKC argues that the average CTE data from Chemir and APS is unreliable because the testing failed to follow the protocol established by Kaneka's own expert. Kaneka claims that it was only necessary to test one sample three times "to calibrate the CTE instrument." (CRB at 36.) Kaneka claims that it tested its own domestic industry product sample, designated S15, three times, thereby satisfying Dr. Harris's testing protocol.[40] I find Kaneka's argument unpersuasive. Kaneka offers no evidence to support the assertion that the reason for testing one sample three times was to calibrate the equipment. Moreover, Kaneka offers no evidence to support the assertion that once Kaneka's S15 sample was tested three times, there was no need to test the remaining products more than once. Kaneka offers only attorney argument, which is no substitute for evidence. *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed. Cir. 1989). Dr. Harris's testing protocol very clearly requires three replicates for each product tested, and there is no evidence that this protocol was met for any of the SKC products accused of infringing the '704 patent.

Even if I accepted Kaneka's position that Dr. Harris's protocol only required testing a single product three times to calibrate the instrument, there is no evidence that the three test results from the S15 product demonstrate the reliability and accuracy of the testing. In the MD direction, the CTE measurements for the S15 product were { } (CX-469C at 20-21.) In the TD direction, the CTE measurements for the S15 product were { }

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[40] Kaneka also notes that the S21 sample was tested two times, but that is still insufficient to meet Dr. Harris's protocol.

{ } (*Id.*) While Kaneka claims that this data shows that the CTE testing is "highly accurate," Kaneka offers no evidence confirming this assertion. I find that the numbers, on their own, do not give an adequate indication of the accuracy of the equipment because Kaneka provides no indication of the acceptable variance between CTE measurements.

Assuming *arguendo* that the testing of the SKC S21 sample two times was sufficient to demonstrate the accuracy of the equipment, there are still problems with the testing of S21. The data for the two sets of tests on the S21 sample was not reported at the same time, strongly implying that the testing was not done at the same time. The first data for a single test of S21 was reported in Dr. Harris's December 30, 2011 first supplemental expert report. (CX-456C at ¶ 4.) The second data for a single test of S21 was reported in Dr. Harris's January 6, 2012 second supplemental expert report. (CX-482C at 11.) The testing for the S3, S11, and S27 samples was reported in Dr. Harris's initial December 23, 2011 report. (CX-207C at ¶ 117.) As SKC explains, "[b]ecause the second replicate testing of S21 occurred after all other samples had been tested and reported to SKC, the labs could not have made a calculated decision to disregard Dr. Harris's protocol based on the second replicate testing of S21." (RRB at 39.)

Additionally, it is not clear why Kaneka is relying on S21 in the first place. As Dr. Harris explained in his second supplemental expert report, samples S21, S24, and S25 "were not in good condition when received." (CX-482C at ¶ 2.) Because of the poor condition of the samples, Kaneka asked for replacement samples, and tested those replacement samples. (*Id.*) Yet, for a reason that Kaneka fails to explain, Dr. Harris still relies on S21 to attempt to prove infringement. (CX-619C at Q. 190, 192.)

In sum, Kaneka's expert clearly laid out a testing protocol for the labs to follow when measuring CTE. The labs failed to follow that protocol for reasons that Kaneka cannot

adequately explain. Based on this failure to follow the testing protocol established by Kaneka's own expert witness, I cannot find that the CTE measurements offered by Kaneka are sufficiently reliable to prove that the accused SKC products meet the average CTE limitation of claim 1.[41] This conclusion is supported by the opinion of Dr. Thomas. (RX-676C at Q. 311.)

Kaneka additionally points to an SKC document to establish that the average CTE limitation is met. (CX-536C.) This document lists the coefficient of thermal expansion for certain products, which was measured { } (*Id.* at 23-24.) The document shows {

} (*Id.*) Dr. Harris offers testimony that the {

} (CX-619C at Q. 96.)

While this document shows {

} there is no indication where on the film the measurements were taken. (CX-536C.) Kaneka offers no evidence regarding where on the film these measurements were taken. An SKC employee testified that {

} (Tr. at 368:10-13.) The SKC document at issue is from 2009, so there is no way of knowing, without further information, where on the film the measurements were taken. (CX-536C.) Because Kaneka's construction of the average CTE limitation requires

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[41] Assuming *arguendo* that Kaneka's CTE measurements are deemed to be sufficiently reliable, I find that they demonstrate that the S3, S11, S21, and S27 samples satisfy the average CTE limitation of claim 1. (CX-467C at 22; CX-469C at 22; CX-482C at 11; CX-619C at Q. 188-191.)

measurement in the center of the film, I find that CX-536C, on its own, is insufficient to demonstrate that this limitation is met.[42]

SKC also questions the reliability of Kaneka's testing used to try to prove the claim limitation requiring that "the polyimide is obtained from diamine containing 4,4'-oxydianiline and paraphenylenediamine in a mole ratio of 9/1 to 4/6." Dr. Harris explained the test that Kaneka used in an attempt to prove this claim limitation:

> Testing was carried out with a technique known as high performance liquid chromatography, or "HPLC." The film samples were dissolved and then run through a chromatophraphy column, which separates the components according to their adhesion to the column. The lab used HPLC for determining the amount of each diamine.

(CX-619C at Q. 203.) Dr. Harris explained that control samples of films with known amounts of diamines were used to test the accuracy of the HPLC testing. (*Id.*; Tr. at 502:14-18.)

Out of the six control samples tested using HPLC, three of the samples provided results that were clearly wrong. (CX-467C at 23.) Sample S55 contained an 80/20 ratio of materials and should have returned a value of 4; but instead returned a value of 2.29. (*Id.*) Sample S53 contained a 90/10 ratio of materials and should have returned a value of 9; but instead returned a value of 12.93. (*Id.*) Sample S56 also contained an 80/20 ratio of materials and should have returned a value of 4; but instead returned a value of 2.34. (*Id.*) Dr. Harris acknowledged that these results were not close to the expected results. (Tr. at 507:8-508:12.) Dr. Harris agreed with counsel's characterization of these as "bad control test results." (*Id.*) SKC additionally points to another sample, S60, which had a 75/25 ratio of materials and should have returned a

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[42] SKC notes that CX-536C is from 2009, and therefore does not apply to the current SKC products, { } (CX-536C; RX-677C at Q. 46-48; RX-678C at Q. 39-45.) I concur with SKC that because CX-536C has a 2009 date, Kaneka has not shown that the measurements found in the document apply to products manufactured { }

value of 3; but instead returned a value of 3.15. (CX-467C at 23.) SKC argues that S60 is another bad test result, even though it did not get Dr. Harris to admit it.

Kaneka argues that the bad test results do not mean that the HPLC testing is an unreliable method to prove infringement. Kaneka notes that when the SKC samples – S3, S11, S21, and S27 – were tested, they all returned results that were { } Specifically, S3 returned a value of { } S11 returned a value of { } S21 returned a value of { } and S27 returned a value of { } (CX-467C at 23.) Kaneka argues that because the 75/25 control sample – which should have returned a value of 3 – returned a value of close to three, it is reasonable to expect that the testing of the SKC samples was accurate. Dr. Harris testified that "the 3-to-1 checked out, and if it's close to that value, then I think it would be pretty reasonable to expect that it would be still good data." (Tr. at 509:6-8; *see also id.* at 509:11-13.)

I find that Kaneka's HPLC test results are not sufficiently accurate to constitute reliable evidence of infringement. There is no dispute between the parties that at least half of the control samples tested by Chemir produced results that were drastically different than the expected results. The point of testing the control samples was to ensure that the testing was accurate. (CX-619C at Q. 203.) If the testing of three of the six control samples cannot produce expected results, then I am not convinced that the testing as a whole can be relied upon as evidence of infringement.

Kaneka attempts to ignore the bad test results, arguing that the testing of the SKC samples is reliable because the results are close in value to the 75/25 control sample that produced a result close to the expected result. I find that the fact that the testing results of the SKC samples are similar to the result from the 75/25 control sample does not impart reliability on the testing. This is not a situation where the control samples with the bad results were vastly

different than the control samples that produced good results. Two control samples that should have both returned a value of 4 failed to produce good results, returning values of 2.29 and 2.34. (CX-467C at 23.) Two testing failures that are so close in range to the results of the SKC samples demonstrate that the HPLC testing cannot be viewed as a reliable measure of whether or not the SKC products satisfy the molar ratio limitation of claim 1.[43]

Finally, SKC argues that Kaneka has not shown that the accused products are "polyimide film[s] for flexible printed circuit[s]," as recited in claim 1 because there is no evidence that SKC makes any of the accused polyimide films specifically for flexible printed circuits or that flexible printed circuits made from SKC polyimide films are imported. I find that SKC's argument lacks merit. The claim language in question is found in the preamble of claim 1, and provides an intended use for the claimed polyimide film. "[W]here a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation." *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997); *see also Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006) ("Preamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of the claim.") Here, I find that the body of claim 1 provides for a structurally complete invention, and that the language "for flexible printed circuit" merely states an intended use. Therefore, I conclude that the claim language "for flexible printed circuit" does not constitute a claim limitation.

Based on the foregoing, I find that Kaneka has failed to demonstrate that any accused SKC product infringes claim 1 of the '704 patent.

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[43] Assuming *arguendo* that the HPLC testing is deemed to be reliable, then I find that Kaneka has demonstrated that the S3, S11, S21, and S27 samples fall within the claimed molar ratio range. (CX-467C at Q. 23; CX-619C at Q. 204.)

E. The '961 Patent

1. Claim 1

Kaneka's Position: Kaneka contends that SKC's polyimide films infringe claim 1 of the '961 patent. Citing the testimony of its expert Dr. Harris, Kaneka asserts that the manufacturing diagram from SKC's website proves that SKC produces polyimide film by a continuous process. (Citing CX-010 at 5; CX-619C at Q. 211-212.) Kaneka contends that Dr. Harris testified that all commercial production of polyimide film is only possible via a continuous process. (Citing CX-619C at Q.215.) According to Kaneka, the production manager at SKC's Gumi factory, Mr. Lee, testified that {

} and testified that {

} (Citing Tr. at 314:1-4, 315:16-316:3.) Kaneka argues that Dr. Thomas, SKC's expert, admitted that SKC's polyimide films are produced via a continuous process under either party's claim construction. (Citing Tr. at 907:15-21.)

Kaneka asserts that claim 1 should not be limited to polyimide films with molecular orientation angles in the range of $0 \pm 20°$ across the entire width.

Kaneka contends that SKC's polyimide films meet the "wherein when a coefficient of linear expansion a . . . across the entire width" limitation. Kaneka asserts that the terms coefficient of linear expansion ("CLE") and coefficient of thermal expansion ("CTE") are used interchangeably within the industry. (Citing CX-619C at Q.224.) Kaneka asserts that claim 1 defines a coefficient of linear expansion ratio "A" as a function of the coefficients of linear expansion "a" in the direction of the molecular orientation axis and "b" in the perpendicular direction. (Citing JX-4 at 37:2.) According to Kaneka, for each SKC film tested, the molecular

orientation axis is defined as a molecular orientation angle from the MD direction. (Citing CX-619C at Q.217-18; CX-468C at 55-74 (samples S1-S12 and S20-S64).) Kaneka asserts that the '961 patent provides that for "across the entire width . . . the physical property values are measured at [the] three points of both end portions and the central portion along the TD direction of the polyimide film." (Citing JX-4 at 11:55-12:10.)

Kaneka contends that 40mm by 40mm test samples were taken at the left edge, center, and right edge of each film. (Citing CX-619C at Q.218, 220.) According to Kaneka, six samples were taken at each of these three sections of the film and were tested, and the test results show that the molecular angle is not uniform in each section of the film. (Citing CX-619C at Q.219; CX-468C at 55-74.) Kaneka contends that, in accordance with the '961 patent, it cut two smaller samples from each sample in one set of the 40mm by 40mm test samples used to determine molecular orientation axis. (Citing JX-4 at 8:45-52; CX-219C at Q.225.) One sample was cut in the molecular orientation direction and one in the perpendicular direction. (CX-219C at Q.225.) Kaneka contends that the CLE of each of these smaller samples were measured with a thermo mechanical analyzer ("TMA") in the temperature range of 100°C to 200°C, with a heating rate of 10°C/minute, as specified by the '961 patent. (Citing CX-219C at Q.225; JX-4 at 27:9-33; CX-468 at 22; CX-470 at 20-22.) Kaneka contends that these two parameters are sufficient for one of ordinary skill in the art to measure CLE in view of an exemplary DuPont polyimide film patent that specifies only these two parameters for its CTE evaluation method. (Citing RX-099 at 7:16-27.)

Kaneka asserts that it calculated the coefficient of linear expansion ratio "A" after taking the CLE measurements and found that each of the listed SKC films have a coefficient of linear expansion ratio "A" in the range of 1.13 to 3.00 across the entire width. (Citing CX-207C at ¶¶

125-27; CX-459C at ¶ 6.) According to Kaneka, this data is reliable because multiple replicates of two samples (S21 infringement and S15 domestic industry) were tested to calibrate the TMA used to measure CTE for the '704 patent to ensure that the CTE results were consistent and reproducible. Kaneka contends that the same instruments were used to measure CLE for the '961 patent and therefore the results are accurate and reproducible. (Citing CX-619C at Q.137.)

Kaneka asserts that SKC's molecular orientation testing of its own films in accordance with Dr. Thomas' testing protocol is unreliable. (Citing RX-596; RX-598; RX-600.) First, Kaneka criticizes the instrument used by SKC to conduct the testing. According to Kaneka, Dr. Thomas' testing protocol specifies a RETS-100 for determining the molecular orientation axis, which uses a light source in the visible spectrum to measure the molecular orientation axis. (Citing RX-010 at ¶ 3; CX-644C at Q.450-52; CX-193.) According to Kaneka, the product specifications for the instrument indicate that the instrument is optimized for use on optical films. (Citing CX-644C at Q.457; CX-193.) Kaneka asserts that Dr. Harris testified that the polyimide films at issue are highly-colored films that absorb light in the visible spectrum and are not optical films. (Citing CX-644C at Q.457; CX-193.) According to Kaneka, using an instrument optimized for optical films to measure the molecular orientation on the SKC polyimide films cannot obtain accurate results. (Citing CX-644C at Q. 455; Tr. at 807:7-23.) Kaneka contends that a microwave molecular orientation analyzer should have been used, as specified by the '961 patent, and would have been more accurate. (Citing CX-644C at Q.453-455.)

Second, Kaneka criticizes the sample size used by SKC to conduct the testing. According to Kaneka, Dr. Thomas' protocol specified a 40mm by 40mm test sample for measuring the molecular orientation axis, in accordance with the '961 patent. (Citing RX-010 at

¶ 2.2; JX-4 at 12:53-58.) Kaneka contends that SKC ignored this instruction and used a 100mm by 100mm sample size. (Citing RX-596 at 2; RX-598 at 2; RX-600 at 3, 5.) According to Kaneka, the larger the sample, the more likely it would be that variation in molecular orientation within the sample would reduce the accuracy of measuring the molecular orientation axis. (Citing CX-644C at Q.439.)

Third, Kaneka criticizes SKC's testing of three samples to measure CTE, five samples to measure tear propagation resistance, and only a single sample to determine the molecular orientation axis. (Citing RX-596 at 2; RX-598 at 2; RX-600 at 3, 5.) According to Kaneka, testing only a single sample causes the respective molecular orientation axes of the majority of the samples tested to determine CTE and tear propagation resistance to be unknown. As a result, Kaneka contends that the majority of the CTE and tear propagation resistance measurements were taken with the assumption that the molecular orientation axis of each film at its left edge, center, and right edge are uniform along the length (MD direction) of the film. According to Kaneka, its testing shows that this assumption is incorrect. (Citing CX-619C at Q.219; CX-468C at 55-74.)

In its reply brief, Kaneka asserts that Dr. Harris' protocol called only for testing "one or more" samples three times, for calibration of the instrument. (Citing CX-647C[44] [sic] at 9; CX-469C at 21.) According to Kaneka, multiple replicates of two samples—S21 and S15—were tested to calibrate the thermo mechanical analyzer used to measure CTE for the '704 patent, and the CTE measurements for the '961 patent were taken with the same instruments, and therefore are accurate and reproducible. (Citing Cx-619C at Q.137.)

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[44] It is believed that Kaneka intended to cite CX-467C.

According to Kaneka, SKC's position that multiple replicates are necessary for CTE testing directly contradicts its own testing with respect to claim 1 of the '961 patent. (Citing RX-009 at 3.) Kaneka asserts that Intertek did not perform any replicates. According to Kaneka, pursuant to Dr. Thomas' protocol (Citing RX-008 at 3), for each position "across the entire width," Intertek only took one CTE measurement in the molecular orientation direction and one in the perpendicular direction, for a total of six measurements. (Citing RX-9 at 3.) Kaneka asserts that Dr. Harris relies on the same six CTE measurements to show infringement. (Citing CX-647C at 22; CX-649 at 20-23.)

SKC's Position: SKC asserts that claim 1 is not infringed by SKC's film products. SKC asserts that its films do not meet the "continuous process" limitation because every accused SKC product has been manufactured and is currently manufactured with purposeful tension applied in the film width direction as it enters the tenter. (Citing RX-677C at Q.15-16; RX-678C at Q.34.) SKC further asserts that it has never operated its processes in a manner where there is substantially no tension in the film width direction as it enters the furnace. (Citing RX-676C at Q.370.)

SKC asserts that neither Kaneka nor Dr. Harris assert infringement under SKC's construction of the term "continuous process." According to SKC, Kaneka and Dr. Harris failed to analyze SKC's actual manufacturing process, relying instead on Kaneka's construction and a generalized schematic that SKC's own employees describe as "a very cursory type of an overview," lacking any real detail. (Citing Tr. at 314:3-4.)

SKC asserts that both Mr. Lee and Dr. Thomas have testified that {

} of the '961 patent. (Citing RX-677C at 15-16; RX-676C at 368-371, 406-407.) According to SKC, Mr. Lee did not testify that the diagram show on CX-

536C at 15 represents SKC's process of making polyimide films. Rather, Mr. Lee testified that { } (Citing Tr. at 314:1-7.) SKC asserts that the portions of Mr. Lee's testimony cited by Kaneka were in response to questions to "generally describe . . . the process that is shown on this diagram" (Citing Tr. at 315:3-9; 314:1-7) rather than SKC's actual production process for any specific product. According to SKC, Mr. Lee repeatedly testified that { } (Citing Tr. at 316:11-17.)

Likewise, SKC asserts that Kaneka's characterization of Dr. Thomas' trial testimony to allege that Dr. Thomas agrees that SKC's process is continuous fails. According to SKC, Dr. Thomas testified that { } They are, in fact, { } And therefore they do not practice the ['961] patent." (Citing Tr. at 957:9-17.) Moreover, SKC asserts that Dr. Thomas testified that these opinions are reflected in his rebuttal witness statement and he stands by the testimony. (Citing Tr. at 957:18-22; RX-676C at 368-71.)

SKC asserts that Kaneka has disclaimed polyimide films with molecular orientation angles beyond 0 ± 20° across the entire width. According to SKC, Kaneka's test results show that SKC's accused products all have molecular orientation angles { } (Citing CX-467C at 55-66 (showing a molecular orientation angle for all SKC samples well outside of ± 20°); CX-469C at 20-22; RX-676C at Q.367.) SKC asserts that for this reason alone, Kaneka has failed to carry its burden on infringement. SKC further asserts that Kaneka cannot dispute that the molecular orientation angle of SKC's films fall { } of ± 20° of the MD direction, and should not be permitted to create rebuttal positions in its reply brief.

SKC asserts that Kaneka has failed to establish that SKC's accused products meet the "wherein a coefficient of linear expansion a . . . across the entire width" claim limitation. According to SKC, contrary to Kaneka's technical expert's protocols, neither Chemir nor Akron Polymer Systems conducted the necessary replicates for these CTE tests that Kaneka relies on for this limitation. Rather, SKC asserts that the test results clearly show that only a single CTE measurement was obtained. (Citing CX-467C at 22; CX-469C at 20-22.)

SKC contends that the omission of replicate testing is significant. According to SKC, Dr. Harris testified that his lab "normally" uses data from replicate testing to calculate a standard deviation value, from which the lab can gain "some indication on the validity of the test" and infer whether "the data is good data." (Citing Tr. at 458:4-8; 462:3-11.) SKC asserts that Dr. Harris has no basis on which to confirm the accuracy of the test or the resulting data without replicate test data. (Citing CPHB at 86; RX-676C at Q.374.) According to SKC, its own replicate testing shows non-infringement, further highlighting shortcomings of Kaneka's testing. (Citing RX-676C at Q.375, 384; RX-600; RX-596; RDX-319; RDX-318.) According to SKC, Dr. Harris' testing protocol does not specify the cooling rate, equilibration time, or details regarding the load selection, all of which SKC alleges can affect the CTE value measured. As a result, SKC contends that the data Dr. Harris relied upon in providing his CTE testimony is unreliable, resulting in unsubstantiated testimony that cannot support Kaneka's infringement assertions.

SKC asserts in its reply brief that Kaneka has not disputed that the testing labs failed to follow Dr. Harris' protocol for testing CLE. (Citing CIB at 98.) According to SKC, Kaneka tried to address this failure by arguing that the labs made a calculated decision not to follow Dr. Harris' protocol because a single sample "was tested twice to confirm the accuracy of the

results." (Citing CIB at 73, 98.) However, SKC asserts that Kaneka offers no evidence or testimony that would support the accuracy of the test results for all samples based on the mere twice testing of a single sample. SKC also criticizes Kaneka's argument that the decision not to follow Dr. Harris' protocol was calculated. SKC asserts that the decision could not have been calculated, since the one sample that was tested twice and allegedly confirmed the accuracy of the results was not tested a second time until weeks after all other samples had been tested and the data had been reported to SKC. (Citing CX-456C at ¶ 4; CX-482C at 11.) According to SKC, even if the decision to do less than what the original protocol required were calculated, it still does not cure the fact that the results are less reliable than what Dr. Harris originally required for rendering an infringement opinion.

Discussion and Conclusions: Based on the evidence in the record, I find that Kaneka has failed to prove that any SKC polyimide films meet all limitations of claim 1 of the '961 patent.

The products accused of infringing claims 1 and/or 9 of the '961 patent are:

Sample	SKPI serial number	Product Name
S3, S41	SKPI-ITC-02000009	IF70 (25 μm)
S2, S40	SKPI-ITC-02000008	IF70 (12.5 μm)
S4,	SKPI-ITC-02000010	IF70 (50 μm)
S22	SKPI-ITC-02000021	IF70 (50 μm)
S10	SKPI-ITC-02000011	IF70 (75 μm)
S20	SKPI-ITC-02000019	IF70 (75 μm)
S26, S44	SKPI-ITC-02000013	LN50
S11, S38,	SKPI-ITC-02000002	LN 100

Sample	SKPI serial number	Product Name
S21, S45	SKPI-ITC-02000014	LN 100
S1, S37	SKPI 2000001	LN50
S5, S42	SKPI-ITC-0200004	LV75
S51	SKPI 2000022	LV75/IN70
S6, S43	SKPI-ITC-02000005	LV100
S25, S50	SKPI-ITC-02000016	LV100
S7	SKPI-ITC-02000012	IN30
S52	SKPI 2000023	LV200/IN70
S8	SKPI-ITC-02000006	LV200/IN70
S9	SKPI-ITC-02000007	LV300/IN70
S24, S46	SKPI-ITC-02000015	LV50
S12, S39	SKPI 2000003	LV50

(*See* CIB at 15-16.) However, the parties entered into a stipulation as to the SKC products that are actually imported. Those products are: IN30 (75μm); IN70 (19μm); IN70 (25μm); IN70 (50μm); IF30 (7.5μm); IF70 (7.5μm); IF70 (12.5μm); LV100; LV200; LV300. (Order No. 26.) Kaneka has made no other arguments regarding importation. As a result, the following products are the only SKC products relevant for purposes of infringement: IF70 (12.5 μm), IN70 (19um),[45] LV100, IN30 (75um),[46] LV200 / IN70 (50um),[47] LV200 / IN70 (50um),[48] and LV300.[49]

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[45] *See* CX-468C at 21 for thickness identification.
[46] *See* CX-468C at 19 for thickness identification.
[47] *See* CX-468C at 21 for thickness identification.
[48] *See* CX-468C at 19 for thickness identification.
[49] *See* CX-468C at 19 for thickness identification.

The SKC film designated S9 by Kaneka warrants further attention. S9 is identified as IN 70 (75um) in the table in CX-468C on which Kaneka relies to show claim 9 is infringed by S9, but is identified as LV-300/IN-70 (75um) in another portion of CX-468C. (CX-468C at 52, 19.) LV-300, but not IN-70 (75um), is included in the parties' stipulation of imported products. (See Order No. 26.) Because it is not clear whether S9 is a sample of IN-70 (75um) or LV-300, or both, and there is no evidence that IN-70 (75um) is imported, Kaneka has not met its burden to show S9 is imported.

With respect to the imported products, Kaneka sets forth three unpersuasive arguments that SKC's film products meet the "a polyimide film produced by a continuous process" limitation under Kaneka's construction. First, Dr. Harris' testimony that all commercial production of polyimide film is only possible via a continuous process is not sufficient to meet Kaneka's burden. (Citing CX-619C at Q.215.) Dr. Harris' witness statement provides:

> 215. Is it possible to make commercial film without using continuous process?
> a. No. The production of commercial films is only possible with continuous process where raw materials are continuously added to make varnish which is cast on belt or other moving production line and the final film constantly wound.

(CX-619C at Q. 215.) However, Dr. Harris provided no citations or underlying evidence for this opinion. (*See* CX-619C at Q. 215.) This conclusory, unsupported statement by a party's expert has little, if any, weight and cannot meet Kaneka's burden to prove infringement by a preponderance of the evidence. *See Kim v. ConAgra Foods, Inc.*, 465 F.3d 1312, 1319-20 (Fed. Cir. 2006).

Second, Kaneka contends that a figure available on SKC's website (CX-10 at 5) and in SKC documentation (CX-536C at 15) shows that SKC products are "a polyimide film produced by a continuous process" under Kaneka's construction, but fails to tie this figure to all but one

SKC film. Mr. Lee, on whose testimony Kaneka relies, expressly stated that {

}

(Tr. at 314:1-4.) When Kaneka pressed Mr. Lee regarding SKC's actual production of films, Mr. Lee testified that {

}

(Tr. at 316:4-17 (emphasis added).) Kaneka has not introduced any other evidence that this figure is tied to SKC's actual production of the other accused lines of polyimide films. Thus, Kaneka has failed to introduce sufficient evidence that the figure it relies on to show that SKC uses a "continuous process" actually represents the process used by SKC to produce any films other than LN-grade films.

Third, Kaneka's reliance on Dr. Thomas' testimony is likewise unpersuasive. Dr. Thomas testified that:

> Q. Turning to the '961 patent, which I believe is JX-4; again looking at claim 1. Is SKPI's process of film manufacture continuous?
> A. Yes, sir.
> Q. And that's under either interpretation of that term?
> A. I think it's a continuous process, yeah.

(Tr. at 952:15-21 (cited by Kaneka as 907:15-21).)

This purported admission alone is insufficient to meet Kaneka's burden to show infringement by a preponderance of the evidence. First, the statement by Dr. Thomas was not a clear admission that SKC's products are a "polyimide film produced by a continuous process." The first question did not ask whether SKC's products are a "polyimide film produced by a continuous process," the actual claim limitation included in claims 1 and 9. The question also did not identify which products were being addressed—it merely addressed "SKC's process" generally. This statement may have been referring to all films, or may have been referring to just certain films. As a result, Dr. Thomas' response did not clearly admit the claim limitation itself was met for all SKC products.

The second question posed to Dr. Thomas was whether his conclusion was the same under either interpretation of "that term." Although it could be inferred that "either interpretation of that term" referred to Kaneka's and SKC's competing proposed constructions for "polyimide film produced by a continuous process," it is not necessarily the case. His response, that "I think it's a continuous process, yeah" did not specifically address either party's construction, and in view of other testimony provided by Dr. Thomas discussed *infra*, it is not a clear admission of infringement.

Additional testimony provided by Dr. Thomas regarding this limitation provides evidence that Dr. Thomas was not admitting infringement under either party's construction. On redirect, Dr. Thomas provided some additional explanation regarding his cross-examination testimony, clarifying that he did not believe SKC's film was produced by a continuous process under ***SKC's*** construction:

> Q. In looking at both claim 1 and claim 9 of the '961 patent, both include the phrase in the first line, quote, "produced by a continuous process," close quote. Do you see that, sir?
> A. Yes.

Q. Are you aware of a dispute between the parties as to whether that, quote, "continuous process" should be interpreted to require that there be a sag or not sag -- there is a difference between the parties relative to that?
A. Yes.
Q. Do you have -- is your opinion on whether that -- under both interpretations the result is the same as to whether the accused SKPI M films infringe claims 1 or 8 -- 1 or 9, or do you have different opinions based upon the different interpretations?
A. No, the SKPI films, {

}
Q. Is that reflected in your rebuttal witness statement?
A. Yes, it is.
Q. Do you stand by it?
A. I do.

(Tr. at 956:23-957:22.) The rebuttal witness statement itself appears to challenge that SKC's film was produced by a continuous process under ***Kaneka's*** construction. It provides:

405. Q. In your opinion has Dr. Harris established that any of the accused SKPI films infringe the continuous process limitation of claim even under Dr. Harris's new bases?
A. No. It is my opinion that he has not.

(RX-0676C at Q. 405.)

These "new bases" included Dr. Harris' responses to question 211 in his opening witness statement. (RX-0676C at Q. 404.) In response to question 211, Dr. Harris stated that:

211. Q. What is your opinion regarding whether SKPIs products use a continuous process as stated in claim 1?
A: It is my opinion that SKPI uses continuous process based on information in SKPI's documents. For example there is a diagram from SKPI's website which shows that SKPI manufactures polyimide films using a continuous process.

(CX-619C at Q. 211.) The diagram to which Dr. Harris makes reference, is the same as that shown in CX-010 at 5. (CX-619C at Q. 212.) As a result, there is conflicting testimony on this issue. As discussed above, Dr. Thomas testified on re-cross that he does not agree that SKC's films infringe under SKC's construction, and in Dr. Thomas' rebuttal witness statement he disagreed with Dr. Harris' analysis of the figure included in CX-010 at 5 (an analysis made using

Kaneka's construction). Also as discussed above, the answers given on cross-examination by Dr. Thomas upon which Kaneka relies were not clear admissions of infringement. Therefore, the cross-examination testimony of Dr. Thomas alone is insufficient to meet Kaneka's burden of showing infringement of claims 1 and 9 by a preponderance of the evidence.

Dr. Thomas' testimony notwithstanding, Mr. Lee did provide sufficient evidence to find that the limitation "a polyimide film produced by a continuous process" under the adopted interpretation is met by SKC's LN, IN, and LV grade films. As construed, the phrase "a polyimide film produced by a continuous process" requires "a polyimide film produced by continuously casting or applying solution resin to a support." As discussed above, the testimony of Mr. Lee, SKC's production manager at its Gumi factory, { } that appears on page 15 of CX-536C to { } (Tr. at 313:22-314:4; 316:4-10.) { } on page 15 of CX-536C {

} (*See* CX-536C at 15.)

In addition to the figure itself, which Mr. Lee tied to the production of SKC's LN-grade films, Mr. Lee testified that {

} (Tr. at 315:7-25, 316:4-10.)

With respect to IN, LV and LN films, Mr. Lee also testified that {

} (RX-677C at Q.14.) Dr. Harris testified that another document, containing the same figure that Mr. Lee tied

to the LN-grade films, proves that SKC produces polyimide film by a continuous process. (CX-619C at Q. 211-212 (Citing CX-10 at 5).) This testimony and documentation shows, by a preponderance of the evidence, that the following SKC films[50] are "a polyimide film produced by continuously casting or applying solution resin to a support":

Sample	SKPI serial number	Product Name
S51	SKPI 2000022	IN70 (19um)[51]
S6, S43	SKPI-ITC-02000005	LV100
S25, S50	SKPI-ITC-02000016	LV100
S7	SKPI-ITC-02000012	IN30 (75um)[52]
S52	SKPI 2000023	LV200 / IN70 (50um)[53]
S8	SKPI-ITC-02000006	LV200 / IN70 (50um)[54]

Had SKC's proposed construction for this term been adopted, Kaneka would have failed to meet its burden to prove infringement for all product lines. The only evidence of infringement under SKC's construction of this term cited by Kaneka is the alleged admissions by Dr. Thomas that SKC's polyimide films are produced via a continuous process under either party's claim construction. (CIB at 96 (Citing Tr. at 907:15-21).) However, as discussed above, on redirect Dr. Thomas provided additional explanation regarding his cross-examination testimony in which he clarified that he did not believe SKC's films were produced by a continuous process under SKC's construction. In view of the conflicting evidence, the cross-examination testimony of Dr.

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[50] These are a subset of the products for which importation has been established (as addressed in Order No. 26).
[51] *See* CX-468C at 21 for thickness identification.
[52] *See* CX-468C at 19 for thickness identification.
[53] *See* CX-468C at 21 for thickness identification.
[54] *See* CX-468C at 19 for thickness identification.

Thomas alone is insufficient to meet Kaneka's burden of showing infringement by a preponderance of the evidence under SKC's construction.

As discussed in Section III.E.4 *supra*, claim 1 is not properly limited solely to polyimide films with molecular orientation angles in the range of 0 ± 20° across the entire width. As a result, Kaneka does not need to prove the accused products have molecular orientation angles within that range to prove infringement by a preponderance of the evidence.

However, if claim 1 were limited to polyimide films with molecular orientation angles in the range of 0 (MD direction) ± 20° across the entire width, Kaneka would have failed to meet its burden to prove infringement of any SKC products by a preponderance of the evidence. Kaneka's measurements for SKC's films { } (CX-468C at 55-73.) The smallest value measured in Kaneka's evidence for the molecular orientation angle appears to be { } (CX-468C at 73.) SKC's measurements of its own films { } (*See*, RX-596, RX-600 (showing measured values for molecular orientation angle that exceed 0 ± 20°).) Kaneka's initial post-hearing brief and reply brief fail to rebut this evidence, and do not address SKC's allegation that Kaneka's own evidence fails to show this requirement would be met if it were a limitation. (CIB at 49-50; CRB at 96-97.) As a result, if claims 1 and 9 were limited to polyimide films with molecular orientation angles in the range of 0 (MD direction) ± 20° across the entire width, Kaneka would have failed to meet its burden to prove infringement of any SKC products by a preponderance of the evidence.

Claim 1 requires, *inter alia*, "wherein when a coefficient of linear expansion a in a direction of the molecular orientation axis and a coefficient of linear expansion b in a direction perpendicular to the molecular orientation axis are measured in the temperature range of 100° C to 200° C, a coefficient of linear expansion ratio A represented by equation (1):

$A=1+\{(b-a)/(b+a)\}\times 2$ (1) is in the range of 1.13 to 3.00 across the entire width." "Across the entire width" means "across the entire part in the direction perpendicular to the transferring direction in which the film is continuously produced." Kaneka has conducted testing that it contends proves that SKC film products meet this limitation, but, as explained below, Kaneka's testing is unreliable.

Kaneka has the burden to prove infringement by a preponderance of the evidence. Here, it has failed to meet that burden because the testing conducted by Kaneka has questionable reliability. "Although framed in the context of admissibility rather than weight, *Daubert* set-forth a non-exclusive check-list for trial courts to use in assessing the reliability of scientific expert testimony, including: '(1) whether the expert's technique or theory can be tested; (2) whether the technique or theory has been subject to peer review; (3) the known or potential rate of error in the technique; (4) the existence and maintenance of standards and controls; and (5) whether the technique or theory has been generally accepted.'" *Certain Semiconductor Chips With Minimized Chip Package Size and Products Containing Same (III)*, Inv. No. 337-TA-630, Commission Determination at 59-60 (Dec. 2010) (Citing *Daubert v. Merrill Dow Pharmaceuticals, Inc.* 509 U.S. 579 (1993); Fed. R. Evid. 702 Advisory Committee's note).

Kaneka's evidence of infringement is unreliable because it failed to conduct replicate testing. Kaneka's expert drafted a testing protocol to be used for testing to show infringement of the "wherein when a coefficient of linear expansion . . . across the entire width" limitation. Without question, the testing protocol called for replicate testing to be conducted. (CX-468C at 9-10; CX-470C at 8-9.) The question is what kind of replicate testing was required by the testing protocol.

I find that the testing protocol required thrice replicate testing to be conducted for at least one of the three 40x40 mm samples cut from each film sample. Kaneka asserts that the testing protocol required only testing "one or more" samples three times, for calibration of the instrument. However, the testing protocols do not specify that the replicate testing is to be used for "calibration of the instrument," as Kaneka appears to contend. (CX-468C at 9; CX-470C at 8.) Rather, the testing protocols require that the lab "[r]epeat one or more of the CTE determinations two additional times using new film samples so that data is obtained for a total of three replicates." (CX-468C at 10; CX-470C at 9.) As explained below, this instruction to repeat CTE determinations three times was given with respect to each set of three 40x40 mm samples cut from an individual film sample.

The testing protocol required that three 40x40 mm samples be cut from each overall film sample—one at the left edge, one in the middle, and one at the right edge. (CX-468C at 5; CX-470C at 4.) The testing protocol then addressed how testing was to be conducted for ***each set*** of these 40x40mm samples. (CX-468C at 9; CX-470C at 8.) The protocol instructs that, from each of these 40x40mm samples, two smaller samples were to be cut, one in the direction of the molecular orientation angle, and one perpendicular to the molecular orientation angle. (CX-468C at 9; CX-470C at 8.) This resulted in a total of 6 smaller samples for each overall film sample, three in the direction of the molecular orientation angle and three in the direction perpendicular to the molecular orientation angle. (CX-468C at 9; CX-470C at 8.)

The testing protocol then required that the film CTE be determined in the direction of the molecular orientation angle for the three smaller samples cut in the direction of the molecular orientation angle. (CX-468C at 9; CX-470C at 8.) The testing protocol also required that the film CTE be determined in the direction perpendicular to the molecular orientation angle for the

three samples cut in the direction perpendicular to the molecular orientation angle. (CX-468C at 9; CX-470C at 8.) This would result in a total of six CTE determinations. (*See* CX-468C at 9; CX-470C at 8.) Finally, the testing protocol required that the lab "[r]epeat one or more of the CTE determinations two additional times using new film samples so that data is obtained for a total of three replicates." (CX-468C at 10; CX-470C at 9.) The "one or more of the CTE determinations" appears to be referring to one or more of the six CTE determinations made for each set of the 40x40mm samples. As a result, this instruction would require that the CTE measurement in either the direction of the molecular orientation angle or the direction perpendicular to the molecular orientation angle be replicated three times for at least one 40x40 mm sample in each set of three 40x40 mm samples. The testing data does not show this required replicate testing was conducted. (CX-468C at 22 CX-470C at 20-22.) Failure to comply with the testing protocol calls into question the reliability of Kaneka's test data. *See San Huan New Materials High Tech, Inc. v. Int'l Trade Comm'n*, 161 F.3d 1347, 1359 (Fed. Cir. 1998) (approving the Commission's reliance on the complainant's testing where the ALJ had found the respondent's testing was unreliable due to, *inter alia*, the testing lab's failure to follow its own standard testing protocol).

The testimony of Dr. Harris regarding the importance of replicate testing confirms this interpretation of the testing protocol, and further calls into question the reliability of Kaneka's data. Dr. Harris testified that his lab "normally" uses data from replicate testing to calculate a standard deviation value from which the lab can gain "some indication on the validity of the test" and infer whether "the data is good data." (Tr. at 458:4-8; 462:3-11.) This testimony tracks the principle that understanding the errata of a particular methodology is key to assessing its reliability. *Certain Semiconductor Chips With Minimized Chip Package Size and Products*

Containing Same (III), Inv. No. 337-TA-630, Commission Determination at 59-60 (Dec. 2010) (Citing *Daubert v. Merrill Dow Pharmaceuticals, Inc.* 509 U.S. 579, 594 (1993)). Each set of three 40x40 mm samples was from a separate film sample. (*See* CX-468C at 5; CX-470C at 4.) To verify that the testing of each film sample was accurate, it would make sense to have replicate testing data for at least one of the three 40x40 mm samples from each separate film sample to assess the errata of the test methodology as applied to the individual film sample.

Kaneka's arguments that the test data is accurate because replicate testing was conducted for calibration purposes on two samples (S21—an SKC film—and S15—a Kaneka film) does not address the Kaneka's failure to comply with Dr. Harris' standard procedures or the actual testing protocol written by Dr. Harris for the samples used to allege infringement. Although Kaneka asserts that "[t]he data from the S15 and S21 replicates show that the CTE testing is highly accurate" and "[t]he CTE value only varied in the one hundredth position," an absolute comparison such as this, without any context, does not verify the data is accurate. Indeed, a review of the cited data for S15 and S 21 shows that the replicates actually varied by as much as 2.5% in the MD direction and 3.5% in the TD direction. (*See* CX-470C at 20-22; CX-482C at Ex. 1.) Kaneka does not provide any evidence or argument that variability of 2.5% in the MD direction and 3.5% in the TD direction is small enough to be considered accurate.

Kaneka's argument that the decision not to follow Dr. Harris' protocol was calculated is not convincing. Only one set of test data for sample S21 was provided in Dr. Harris' first supplemental expert report of December 30, 2011. (CX-456C at ¶ 4.) At this time, Dr. Harris had already relied on the data obtained for the other samples. (*See* CX-456C.) Moreover, the supplemental expert report itself provided that, at the time of the supplemental expert report, "testing of SKPI sample S21N is ongoing . . . ." (CX-456C at ¶ 8.) The second set of test data

for sample S21 was not provided by Dr. Harris until January 6, 2012. (CX-482C at Ex. 1.) Because this testing was not completed until after the other testing was already completed and the results of that testing were already relied upon by Dr. Harris, this duplicative testing of S21 could not have formed the basis for a "calculated" decision to test the other samples only once. As a result, Kaneka has not provided a reasonable basis for failing to comply with Dr. Harris' testing protocols.[55]

Moreover, as Dr. Harris testified, his lab "normally" uses data from replicate testing to calculate a standard deviation value from which the lab can gain "some indication on the validity of the test" and infer whether "the data is good data." (Tr. at 458:4-8, 462:3-11.) No such standard deviation values were calculated here to determine if the data was "good data." As explained above, the testing protocol drafted by Dr. Harris required replicate testing data for at least one of the three 40x40 mm samples from each separate film sample. No such replicate testing was conducted. Although Kaneka has questioned the accuracy of the testing conducted by SKC, SKC's thrice-replicated testing showed that SKC's LN-50 and IF-70 50um films (S26/44 and S22 respectively) do not meet the "wherein when a coefficient of linear expansion . . . across the entire width" limitation. (*See* RX-676C at Q.375, 379, 383, 384; RX-600; RX-601; RX-596; RX-597.) These tests conflict with Kaneka's test data showing LN-50 and IF-70 products meet this claim limitation, and further evidence the need for confirmation that Kaneka's test data is reliable—confirmation that replicate testing may have provided had it been done. (*See* CX-470C at 21.) Dr. Harris' conclusory testimony that the testing is accurate because the same instruments were used for all CTE and CLE testing and were calibrated and gave

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[55] It is not clear whether the test data for sample S21 is accurate at all, since the sample designated S21, by Kaneka's own admission was "not in good condition when received," and a replacement sample, designated S45 was provided. (CX-482C at ¶ 2.)

reproducible results, without data to back up the testimony (*see* CX-619C at Q. 226), is not convincing. *See Kim v. ConAgra Foods, Inc.*, 465 F.3d 1312, 1319-20 (Fed. Cir. 2006).

Kaneka's argument that it did not need to conduct replicate testing because SKC did not conduct replicate testing for the purposes of invalidity is not convincing. Kaneka incorrectly argues that SKC's position that multiple replicates are necessary for CTE testing directly contradicts its own testing with respect to claim 1 of the '961 patent. (Citing RX-9 at 3.) Although Kaneka contends that, pursuant to Dr. Thomas' protocol (Citing RX-8 at 3) Intertek only took one CTE measurement in the molecular orientation direction and one in the perpendicular direction, for a total of six measurements, a review of Dr. Thomas' testing protocol reveals that Dr. Thomas actually instructed Intertek to conduct replicate testing. (*see* RX-8 at 3-4 (requiring 3 replicate samples in each orientation direction for each of left, center, and right samples).) Intertek's alleged failure to do so does not make Kaneka's test data any more reliable, and does not give me any way to confirm the reliability of Kaneka's test data.

Kaneka has not provided evidence in the form of replicate testing data that would permit me to determine the reliability of Kaneka's test data. The conflicting test data from SKC that calls into question the accuracy of Kaneka's test data and the testimony from Kaneka's expert that replicates are usually used to confirm accuracy confirms the importance of such replicate test data. Because there are questions as to the reliability of Kaneka's test data that Kaneka has failed to address, Kaneka has failed to show that it is more likely than not that the accused SKC polyimide films meet this claim limitation.

2. Claim 9

Kaneka's Position: Kaneka contends that SKC films infringe claim 9 of the '961 patent. Kaneka asserts that, as with claim 1 of the '961 patent, SKC polyimide films are produced

through a continuous process. Kaneka asserts that the molecular orientation axis of each SKC film tested is described with respect to claim 1 of the '961 patent and falls within the limitations of claim 9.

With respect to the "Tear Propagation Resistance C . . . across the entire width" limitation, Kaneka asserts that in accordance with the '961 patent, two smaller 10mm by 20mm samples were cut from each sample in the other five sets (one set: left edge, center, right edge) of the 40mm by 40mm test samples used to determine molecular orientation axis, one in the molecular orientation direction and the other in the perpendicular direction. (Citing CX-619C at Q.222.) According to Kaneka, the tear propagation resistance of each smaller 10mm by 20mm sample was then measured according to ASTM standard D1938 as specified in the '961 patent. (Citing CX-619C at Q.222; JX-4 at 12:59-67.) Kaneka asserts that although the standard specifies a larger sample size, the smaller 10mm by 20mm sample size specified in the '961 patent allowed Chemir to minimize the effect of any variation in molecular orientation on the tear propagation tests. (Citing CX-219C at Q.222.) According to Kaneka, by preparing the smaller 10mm by 20mm samples for tear propagation testing from the five sets of the 40mm by 40mm test samples used to determine molecular orientation axis, Chemir was able to perform the tear propagation tests on five replicates for each SKC film sample. (Citing CX-219C at Q.222.)

Kaneka asserts that the tear propagation resistance ratio "d/c" was calculated according to the formula in claim 9 based on the test data. According to Kaneka, the table included in Dr. Harris' report shows that the tested SKC products meet this element of claim 9 because the d/c ratio of each product falls within the claimed range of 1.01 to 1.20 across the entire width (left edge, center, and right edge), and the difference between the maximum and minimum tear

propagation resistance ratio d/c is 0.10 or less across the entire width. (Citing CX-207C at ¶¶ 147-48; CX-459C at ¶¶ 24-25; CX-482 at ¶¶ 24-25; CX-468 at 52-54.)

Kaneka contends that the %RSD values of certain tear propagation resistance measurements do not render the measurements unreliable. Rather, Kaneka contends that Dr. Harris testified that considering the tear propagation resistance test is a mechanical test, the %RSD values are relatively low and demonstrate that the measurements yielded very good data. (Citing Tr. at 461:4-17.) Kaneka further argues that Dr. Harris testified that the overwhelming majority of the actual tear propagation resistance measurements fall within the claimed range in Claim 9. (Citing Tr. at 532:4-533:1.) Kaneka asserts that under the preponderance of the evidence standard, Kaneka must only establish that infringement was "more likely than not to have occurred." (Citing *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1641 n.15 (Fed. Cir. 2005).) According to Kaneka, it is not required to show that every measurement of these SKC film samples yielded d/c values within the claimed range or that all possible values within the standard deviation of the average d/c fall within the claimed range. Rather, Kaneka contends that it only needs to prove the d/c values of the SKC film samples are more likely than not to be within the claimed range, which Kaneka asserts is shown by the evidence.

In its reply brief, Kaneka asserts that Dr. Harris did apply statistical measures of reliability to his tear propagation data because he provided %RSD (relative standard deviation) values for each set of tear propagation measurements. (Citing CX-468C at 52-54.) According to Kaneka, Dr. Thomas provided no such statistical values for his data. (Citing RX-11; RX-12; RX-596; RX-598; RX-600; Tr. at 887:8-19.) Kaneka contends that Exhibit CX-467C contains the results of 360 sample tests and 180 values for d/c. According to Kaneka, of the 180 values measured, only seven fall outside the claimed range and of the 36 values calculated for average

TPR, none fall outside the claimed range. Kaneka asserts that testing conclusively demonstrated that the TPR of the accused films fall within the claimed range.

Kaneka contends that the "%RSD" included in the test results is an indication of the percentage of relative standard deviation of the sample set, which has nothing to do with "a particular range . . . you can calculate off of percent RSD?" as represented by SKC's counsel at the hearing. (Citing Tr. at 458:20-21.) According to Kaneka, %RSD cannot be used to calculate { } SKC's counsel. (Citing 458:23-25.) Kaneka asserts that %RSD cannot be used to find values that fall outside the range of claim 9 as suggested by SKC's counsel.

Kaneka asserts that Dr. Harris is not a statistical expert and responded with "I think that is correct" and "I don't know if that is correct" and "I don't usually use it that way, but that's probably correct." (Citing Tr. at 458:23-25.) According to Kaneka, uncertainty is not testimony and SKC did not offer any evidence or testimony to support its positions. Kaneka contends that SKC improperly cites counsel's questions in its initial post-trial brief as if they were the answers of Dr. Harris. (Citing RIB at 94-95.) According to Kaneka, Dr. Harris' actual answer was "when I looked at those numbers for mechanical tests, those are very low relative standard deviations, which means those are very good data." (Citing Tr. at 461:15-17.) Kaneka asserts that Dr. Harris never agreed that the test data was unreliable and the confusion was cleared during my examination of Dr. Harris, when Dr. Harris confirmed his confidence in the test data. (Citing Tr. at 539-542.)

Kaneka asserts that under the preponderance of the evidence standard, it must only establish that infringement was more likely than not to have occurred. (Citing *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).) According to

Kaneka, it is not required to show that every measurement of these SKC film samples yield d/c values within the claimed range, or that all possible values within the standard deviation of the average d/c fall within the claimed range; rather, Kaneka only needs to prove the d/c values of the SKC film samples are more likely than not to be within the claimed range. Kaneka notes that Dr. Thomas failed to do a single RSD calculation for its testing, and failed to challenge the data for claim 9 on any basis. According to Kaneka, if the data were not reliable, Dr. Thomas would have surely addressed it in his witness statement.

As discussed with respect to claim 1, Kaneka criticized SKC's method for determining the molecular orientation angle. Moreover, Kaneka criticizes the sample sizes used by Dr. Thomas for tear propagation testing. Kaneka contends that Dr. Thomas used a 10mm by 50mm test sample for the tear propagation test rather than the 10mm by 20mm sample size specified by the '961 patent. (Citing RX-010 at ¶ 2.2; JX-4 at 12:62-67.) According to Kaneka, using larger sample sizes for tear propagation resistance measurements and for molecular axis measurements means there is less correlation between the actual respective molecular orientation axis of the samples used for tear propagation resistance measurements and for molecular axis measurements, reducing the likelihood that the tear would be propagated along the actual direction of the molecular orientation axis of the sample tested. (Citing CX-644C at Q.439.)

SKC's Position: SKC asserts that claim 9 is not infringed by SKC's film products. SKC addressed the "polyimide film produced by a continuous process" limitation once for both claim 1 and claim 9. SKC addressed the "molecular orientation axis" once for both claim 1 and claim 9.

SKC argues that Kaneka has failed to provide reliable data to prove infringement of the "Tear Propagation Resistance C . . . across the entire width" limitation and Kaneka's expert has

failed to apply appropriate statistical measures of reliability to his data. According to SKC, without the statistical measures of reliability, one cannot assess whether or the data is reliable, and as such, Kaneka has failed to meet its burden of proving infringement. SKC contends that when Dr. Harris was forced to apply assessments of reliability at the evidentiary hearing, Dr. Harris made clear that the tear propagation resistance test results he relied upon for his infringement conclusions cannot establish infringement. SKC asserts that Dr. Harris testified that his laboratory's routine practice is to use data from replicate testing to calculate a standard deviation value, from which the lab can gain some indication on the validity of the test and infer whether the data is good data. (Citing Tr. at 458:4-8, 462:3-11.) SKC asserts that Dr. Harris testified that the standard deviation calculated based on test values provides an indication of how accurate the values are. (Citing Tr. at 467:15-25, 539:6-541:24.)

SKC contends that Dr. Harris admitted that if one applies the standard deviation values from his test data to his tear propagation resistance test results and obtains any value that falls outside of the claimed scope, it would bring the entire data set into question for purposes of determining infringement. (Citing Tr. at 459:25-460:22.) SKC argues that Dr. Harris admitted that he did not previously evaluate the relative standard deviation values obtained from the tear propagation resistance test data. (Citing Tr. at 461:4-7.) According to SKC, upon calling Dr. Harris' attention to the relative standard deviation values obtained from the tear propagation resistance test data, Dr. Harris confirmed that many of the tear propagation resistance test results were, in fact, unreliable data for determining infringement. (Citing Tr. 463:25-464:2, 465:19-21, 466:14-16, 467:1-3, 467:11-25, 468:1-6, 468:23-25 (addressing the tear propagation resistance test results for S4, S7, S20, S22, S38, S40, S41, and S42).)

SKC contends that Kaneka's attempts to mitigate Dr. Harris admissions by arguing the ratios are "actual measured values" that show infringement are flawed because the ratios are not actual measured values, as Dr. Harris admits. (Citing Tr. at 532:4-7, 545:1-14.) Rather, SKC asserts that the ratios are based on two separate measurements that include their own respective standard deviations. (Citing Tr. at 546:1-5.) According to SKC, Kaneka's reliance on faulty and unreliable test data cannot meet its burden of proving infringement.

In its reply brief, SKC asserts that Kaneka has failed to cite any authority or supporting evidence for its position that it does not need to show that every measurement of the SKC film samples yielded d/c values within the claimed ranges or that all possible values within the standard deviation of the average d/c need not fall within the claimed range. SKC contends that to prove infringement, Kaneka must show that the "average d/c" value for all three locations fall within the claimed range of 1.01-1.20. SKC asserts that Kaneka's arguments do not change Dr. Harris' admissions at trial that the data is unreliable and cannot support Kaneka's burden of proving infringement.

SKC contends that Dr. Harris admitted to using multiple replicate measurements of tear propagation resistance for each "d" and "c" value for reliability reasons. (Citing Tr. at 453:1-15.) According to SKC, Dr. Harris admits he calculated "%RSD," which indicates the confidence range of the "average d/c" value derived from multiple measurements, because the replicates provided varying results. (Citing Tr. at 457:19-458:8.) SKC asserts that Dr. Harris did not apply the %RSD to the "average d/c" value. (Citing Tr. at 461:4-7.) According to SKC, this failure means that Dr. Harris did not show whether his calculated "average d/c" value can be relied upon to render a credible opinion concerning whether the value falls within the claimed range of 1.01 to 1.20.

SKC asserts that had Dr. Harris determined the confidence ranges of the "average d/c" values he relied on using the corresponding %RSD values, it would have revealed the deficiencies and the unreliability of the test data for determining infringement. According to SKC, Dr. Harris admitted that if the confidence range of "average d/c" calculated using %RSD included values outside of the claimed scope of 1.01 to 1.20, it would "bring [the validity of the entire data set] into question" for purposes of determining infringement." (Citing Tr. at 459:25-460:25.) SKC asserts that, upon calculating the lower or upper bounds of the confidence range, Dr. Harris admitted that many of the TPR test results were unreliable data for determining infringement. (Citing Tr. at 463:25-464:2, 465:19-21, 466:14-16, 467:1-3, 11-25, 468:1-6, 23-25.)

SKC asserts that during his redirect, Dr. Harris agreed with most of his counsel's leading questions (Citing Tr. at 548:3-549:16), including his counsel's statement that d/c ratios are "actual measured values" that show infringement. (Citing Tr. at 532:4-7.) SKC contends that Dr. Harris recanted when forced to reconsider this question on re-cross. (Citing TR. at 545:1-14; 546:1-5.)

Discussion and Conclusions: Based on the foregoing, I find that Kaneka has demonstrated by a preponderance of the evidence that IN 70 (50um) infringes claim 9 of the '961 patent. I find that Kaneka has failed to prove by a preponderance of the evidence that each and every limitation of claim 9 is met by any other accused and imported SKC product.

As discussed in Section VII.E.1 *supra*, Kaneka has met its burden to prove that the limitation "a polyimide film produced by a continuous process" under the adopted interpretation is met by the following accused imported products:

Sample	SKPI serial number	Product Name
S2, S40	SKPI-ITC-02000008	IF70 (12.5 μm)
S51	SKPI 2000022	IN70 (19um)
S6, S43	SKPI-ITC-02000005	LV100
S25, S50	SKPI-ITC-02000016	LV100
S7	SKPI-ITC-02000012	IN30 (75um)
S52	SKPI 2000023	LV200 / IN70 (50um)
S8	SKPI-ITC-02000006	LV200 / IN70 (50um)

As discussed in Section III.E.4 *supra*, claim 9 is not properly limited solely to polyimide films with molecular orientation angles in the range of 0 ± 20° across the entire width. As a result, Kaneka does not need to prove the accused products have molecular orientation angles within that range to prove infringement by a preponderance of the evidence. However, were claims 1 and 9 limited to polyimide films with molecular orientation angles in the range of 0 (MD direction) ± 20° across the entire width, Kaneka would have failed to meet its burden to prove infringement of any SKC products by a preponderance of the evidence, as explained in Section VII.E.1 *supra*.

Claim 9 requires, *inter alia*, "wherein when a tear propagation resistance c in a direction of the molecular orientation axis and a tear propagation resistance d in a direction perpendicular to the molecular orientation axis are measured, the tear propagation resistance ratio d/c is in the range of 1.01 to 1.20 and the difference between the maximum and the minimum of the tear propagation resistance ratio d/c is 0.10 or less across the entire width." As discussed above in Section III.E.3 *supra*, "across the entire width" means "across the entire part in the direction perpendicular to the transferring direction in which the film is continuously produced." This

limitation therefore requires that "across the entire part in the direction perpendicular to the transferring direction in which the film is continuously produced": (1) the tear propagation resistance ratio d/c of the accused film is in the range of 1.01 to 1.20 and (2) the difference between the maximum and the minimum of the tear propagation resistance ratio d/c is 0.10 or less.[56] Kaneka has carried its burden to show these elements are present with respect to only two SKC products: IN 70 50um (Kaneka reference S8) and IN 70 75um (Kaneka reference S9).[57]

Upon review of Kaneka's testing data, it is clear that many of the individual replicate testing results obtained by Kaneka for SKC products fail to prove that the two elements of this claim 9 limitation are met. Kaneka conducted 5 replicate tests for each film sample at left, middle, and right positions (*See* CX-468C at 52-54), but the data shows that the two elements of this claim 9 limitation are met for all replicates of only two products: IN 70 50um and IN 70 75um. The test data obtained for a number of the individual replicates do not meet both elements. Indeed, several of the film samples have two, three, four, or even five replicates that do not individually meet both elements. Only by averaging the test results from the five replicates has Kaneka been able to show both elements one and two are met for these film samples. This is insufficient to meet Kaneka's burden to prove infringement.

The burden to prove infringement is on Kaneka and Kaneka must prove "that infringement was more likely than not to have occurred." *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n. 15 (Fed. Cir. 2005). As a result, Kaneka must show by a preponderance of the evidence that a particular SKC ***film*** meets every limitation of claim 9. Kaneka chose the relatively small sample size of five replicates. Because of the relatively small

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[56] For efficiency, these elements will be referred to as element one and element two, respectively.
[57] As discussed *infra*, it is unclear whether S9 is a sample from an imported product, and therefore, Kaneka has not shown IN-70 (75um) infringes claim 9 and is imported.

sample size, even one replicate showing non-infringement calls into question the accuracy of Kaneka's testing. Moreover, Dr. Harris testified that when the standard deviation range for test data is calculated, if the range goes outside of the range claimed in the patent, it would call into question whether the data proved infringement. (Tr. at 461:15-17.) Dr. Harris calculated the standard deviation range for a number of the SKC films tested by Kaneka and found that the standard deviation range went outside of the range claimed in claim 9. (Tr. at 462:17-469:3.) Dr. Harris' testimony that the standard deviation shows the data is very good for mechanical data (Tr. at 461:15-17) or that individual replicate tests showed values within the claimed range (Tr. at 524:16-533:1), does not address whether or not the test data as a whole shows infringement. As a result of the fact that at least one (and often more than one) replicate shows non-infringement and the fact that Dr. Harris testified that values within the standard deviation of the test results for a number of the SKC films would not meet the claim limitations, Kaneka failed to meet its burden for the following films:

IF-70 (50um): As discussed above, Kaneka has not shown that IF-70 (50um) is imported into the United States. Assuming *arguendo* that Kaneka had done so, Kaneka failed to meet its burden to show element one and element two of claim 9 are met. Two replicates from Kaneka's test data for IF-70 50um (Kaneka reference S4) fail to meet element one. Replicate 1 shows a Middle d/c value of { } (CX-468C at 52.) Replicate 2 shows a Left d/c value of { } (CX-468C at 52.) Because these values fall outside of the range claimed in element 1, replicates 1 and 2 do not show infringement. Dr. Harris testified that the standard deviation range for testing conducted on this test sample includes values that fall outside of the range required by claim 9. (Tr. at 462:25-464:13.)

IN-30 (75um): Two replicates from Kaneka's test data for IN-30 75um (Kaneka reference S7) fail to meet element one. One also fails to meet element two. Replicate 3 shows a left d/c value of { } (CX-468C at 52.) Replicate 4 shows right and middle d/c values of { } (CX-468C at 52.) Moreover, the right d/c value is { } than the left d/c value, which fails to meet element two. (CX-468C at 52.) As a result, replicates 3 and 4 do not show infringement. Dr. Harris testified that the standard deviation range for testing conducted on this test sample includes values that fall outside of the range required by claim 9. (Tr. at 464:17-465:21.)

IF-70 (75um): As discussed above, Kaneka has not shown that IF-70 (75um) is imported into the United States. Assuming *arguendo* that Kaneka had done so, Kaneka failed to meet its burden to show element one and element two of claim 9 are met. One replicate from Kaneka's test data for IF-70 75um (Kaneka reference S10) fails to meet element one. Replicate 3 shows a right d/c value of { } (CX-468C at 53.) As a result, replicate 3 does not show infringement.

IF-70 (75um): As discussed above, Kaneka has not shown that IF-70 (75um) is imported into the United States. Assuming *arguendo* that Kaneka had done so, Kaneka failed to meet its burden to show element one and element two of claim 9 are met. Two replicates from Kaneka's test data for IF-70 75um (Kaneka reference S20) fails to meet element one. Replicate 1 shows a right d/c value of { } (CX-468C at 53.) Replicate 3 shows a left d/c value of { } (CX-468C at 53.) As a result, replicates 1 and 3 do not show infringement. Dr.

Harris testified that the standard deviation range for testing conducted on this test sample includes values that fall outside of the range required by claim 9. (Tr. at 465:22-466:16.)

IF-70 (50um): As discussed above, Kaneka has not shown that IF-70 (50um) is imported into the United States. Assuming *arguendo* that Kaneka had done so, Kaneka failed to meet its burden to show element one and element two of claim 9 are met. One replicate from Kaneka's test data for IF-70 50um (Kaneka reference S22) fails to meet element one or element two. Replicate 5 shows a middle d/c value of { } (CX-468C at 53.) Moreover, the right and left d/c values for replicate 5 are { } than the middle d/c value, which fails to meet element two. (CX-468C at 53.) As a result, replicate 5 does not show infringement. Dr. Harris testified that the standard deviation range for testing conducted on this test sample include values that fall outside of the range required by claim 9. (Tr. at 466:17-467:3.)

LN-100: As discussed above, Kaneka has not shown that LN-100 is imported into the United States. Assuming *arguendo* that Kaneka had done so, Kaneka failed to meet its burden to show element one and element two of claim 9 are met. Three replicates from Kaneka's test data for LN-100 (Kaneka reference S38) fail to meet element one or two, and one replicate fails to meet element two. Replicate 1 shows a right d/c value of { } (CX-468C at 53.) The right d/c value for replicate 1 is { } than the middle d/c value, which fails to meet element two. (CX-468C at 53.) Replicate 2 shows a middle d/c value of { } (CX-468C at 53.) The right and left d/c values for replicate 2 are { } than the middle d/c value, which fails to meet element two. (CX-468C at 53.) Replicate 3 shows a left d/c value of { } (CX-468C at 53.) The

left and middle d/c values for replicate 3 are { } than the right d/c value, which fails to meet element two. (CX-468C at 53.) The left d/c value for replicate 4 is { } than the middle d/c value, which fails to meet element two. (CX-468C at 53.) As a result, replicates 1, 2, 3, and 4 do not show infringement. Dr. Harris testified that the standard deviation range for testing conducted on this test sample include values that fall outside of the range required by claim 9. (Tr. at 467:4-14.)

IF-70 (12.5um): All five replicates from Kaneka's test data for IF-70 12.5um (Kaneka reference S40) fail to meet element two, and three fail to meet element 1. Replicate 1 shows a right d/c value of { } (CX-468C at 54.) The right d/c value for replicate 1 is { } than the left and middle d/c values. (CX-468C at 54.) As a result, replicate 1 fails to meet element two. The left d/c value for replicate 2 is { } than the right and middle d/c values. (CX-468C at 54.) As a result, replicate 2 fails to meet element two. The left and right d/c values for replicate 3 are { } than the middle d/c value. (CX-468C at 54.) As a result, replicate 3 fails to meet element two. Replicate 4 shows a middle d/c value of { } (CX-468C at 54.) The right and left d/c values for replicate 4 are { } than the middle d/c value. (CX-468C at 54.) Replicate 5 shows a middle d/c value of { } (CX-468C at 54.) The right and left d/c values for replicate 4 are { } the middle d/c value. (CX-468C at 54.) As a result, replicates 1, 2, 3, 4, and 5 do not show infringement. In addition to the individual replicates failing to show any infringement, Dr. Harris admitted that the test data for S40 was "obviously a bad set of data." (Tr. at 467:15-25.)

IF-70 (25um): As discussed above, Kaneka has not shown that IF-70 (25um) is imported into the United States. Assuming *arguendo* that Kaneka had done so, Kaneka failed to meet its burden to show element one and element two of claim 9 are met. Four replicates from Kaneka's test data for IF-70 25um (Kaneka reference S41) fail to meet element one, and three fail to meet element two. Replicate 2 shows a middle d/c value of { } (CX-468C at 54.) The left and right d/c values for replicate 2 are { } the middle d/c value. (CX-468C at 54.) Replicate 3 shows a right d/c value of { } (CX-468C at 54.) The middle d/c value for replicate 3 is { } the left and right d/c values. (CX-468C at 54.) Replicate 4 shows a right d/c value { } (CX-468C at 54.) The right d/c value for replicate 4 is { } middle d/c value. (CX-468C at 54.) Replicate 5 shows a left d/c value of { } (CX-468C at 54.) As a result, replicates 2, 3, 4, and 5 do not show infringement. Dr. Harris testified that the standard deviation range for testing conducted on this test sample includes values that fall outside of the range required by claim 9. (Tr. at 468:1-468:11.)

LV-75: As discussed above, Kaneka has not shown that LV-75 is imported into the United States. Assuming *arguendo* that Kaneka had done so, Kaneka failed to meet its burden to show element one and element two of claim 9 are met. Four replicates from Kaneka's test data for LV-75 (Kaneka reference S42) fail to meet element one, and three fail to meet element two. Replicate 1 shows a middle d/c value of { } (CX-468C at 54.) The middle d/c value for replicate 1 is { } the left and right d/c values. (CX-468C at 54.) The left and middle d/c values for replicate 2 are { }

{ } the right d/c value. (CX-468C at 54.) Replicate 2 shows a right d/c value { } (CX-468C at 54.) Replicate 3 shows a right d/c value of { } (CX-468C at 54.) Replicate 4 shows a middle d/c value of { } (CX-468C at 54.) The left and right d/c values for replicate 4 are { } the middle d/c value. (CX-468C at 54.) As a result, replicates 1, 2, 3, and 4 do not show infringement. Dr. Harris testified that the standard deviation range for testing conducted on this test sample includes values that fall outside of the range required by claim 9. (Tr. at 468:12-469:3.)

LV-100: One replicate from Kaneka's test data for LV-100 (Kaneka reference S43) fails to meet element one and one replicate fails to meet element two. The middle d/c value for replicate 4 is { } the left d/c value. (CX-468C at 54.) Replicate 5 shows a middle d/c value { } As a result, replicates 1 and 5 do not show infringement.

Kaneka has shown that the following films meet both elements because SKC elicited no admissions from Dr. Harris regarding the standard deviation range, and no replicates fail to meet the two elements:

IN 70 (50um): Kaneka's test data from IN-70 50um (Kaneka reference S8) show that all replicates meet both element one and element two. First, The three d/c values for each of replicates one through five are { } (*See* CX-468C at 52.) Second, the difference between the three d/c values for each replicate is { } (*See* CX-468C at 52.) As a result, Kaneka has established that IN 70 (50um) meets this limitation of claim 9.

IN 70 (75um): As discussed above, Kaneka has not proven that IN-70 (75um) is imported. Assuming *arguendo* that Kaneka had done so, Kaneka failed to meet its burden to show element one and element two of claim 9 are met. Kaneka's test data from IN-70 75um (Kaneka reference S9) show that all replicates meet both element one and element two. First, The three d/c values for each of replicates one through five are { } (*See* CX-468C at 52.) Second, the difference between the three d/c values for each replicate is { } (*See* CX-468C at 52.) As a result, Kaneka has established that IN 70 (75um) meets this limitation of claim 9.

Based on the foregoing, I find that Kaneka has demonstrated by a preponderance of the evidence that IN 70 (50um) infringes claim 9 of the '961 patent. I find that Kaneka has failed to demonstrate that any other accused SKC product infringes claims 1 or 9 of the '961 patent.

VIII. DOMESTIC INDUSTRY

A. Applicable Law

In patent-based proceedings under section 337, a complainant must establish that an industry "relating to the articles protected by the patent...exists or is in the process of being established" in the United States. 19 U.S.C. § 1337(a)(2) (2008). Under Commission precedent, the domestic industry requirement of Section 337 consists of an "economic prong" and a "technical prong." *Certain Data Storage Systems and Components Thereof*, Inv. No. 337-TA-471, Initial Determination Granting EMC's Motion No. 471-8 Relating to the Domestic Industry Requirement's Economic Prong (unreviewed) at 3 (Public Version, October 25, 2002).

The "economic prong" of the domestic industry requirement is satisfied when it is determined that the economic activities set forth in subsections (A), (B), and/or (C) of subsection 337(a)(3) have taken place or are taking place. *Certain Variable Speed Wind Turbines and*

Components Thereof, Inv. No. 337-TA-376, USITC Pub. No. 3003, 1996 ITC LEXIS 556, Comm'n Op. at 21 (Nov. 1996). With respect to the "economic prong," 19 U.S.C. § 1337(a)(2) and (3) provide, in full:

> (2) Subparagraphs (B), (C), (D), and (E) of paragraph (1) apply only if an industry in the United States, relating to the articles protected by the patent, copyright, trademark, mask work, or design concerned, exists or is in the process of being established.
>
> (3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned-
>
> (A) significant investment in plant and equipment;
>
> (B) significant employment of labor or capital; or
>
> (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

Given that these criteria are listed in the disjunctive, satisfaction of any one of them will be sufficient to meet the domestic industry requirement. *Certain Integrated Circuit Chipsets and Products Containing Same*, Inv. No. 337-TA-428, Order No 10, Initial Determination (Unreviewed) (May 4, 2000), citing *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, Commission Op. at 15, USITC Pub. 3003 (Nov. 1996).

To meet the technical prong, the complainant must establish that it practices at least one claim of the asserted patent. *Certain Point of Sale Terminals and Components Thereof*, Inv. No. 337-TA-524, Order No. 40 (April 11, 2005). "The test for satisfying the 'technical prong' of the industry requirement is essentially same as that for infringement, i.e., a comparison of domestic products to the asserted claims." *Alloc v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). The technical prong of the domestic industry can be satisfied either literally or under the doctrine of equivalents. *Certain Excimer Laser Systems for Vision Correction Surgery and*

Components Thereof and Methods for Performing Such Surgery, Inv. No. 337-TA-419, Order No. 43 (July 30, 1999). The economic prong and technical prong showings must be made for the same product or products.

B. Economic Prong

Kaneka's Position: Kaneka contends that it has satisfied the economic prong of the domestic industry requirement for each of the four asserted patents. Kaneka argues that it has made significant investments on plant and equipment, significant employment of labor and capital, and significant investment in the exploitation of the asserted patents.

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SKC's Position: SKC contends that Kaneka has failed to satisfy the economic prong of the domestic industry requirement.

SKC argues that Kaneka has not offered evidence to determine how much of Kaneka's domestic investments are tied to the products or processes alleged to practice the asserted patents. SKC claims that this is a problem because most of the so-called "domestic industry

products" are actually manufactured by Kaneka in Japan. SKC states that Kaneka must focus its proofs only on U.S. activities related to the products asserted to practice the patents.

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With respect to the '866 patent, SKC states that Kaneka relies on, *inter alia*, production of films made at the KTC plant in Texas. SKC argues that, even if the identified products made in the U.S. practice the '866 patent, Kaneka has made no effort to isolate and identify the specific investments tied to specific alleged domestic industry products for the '866 patent.
SKC claims that in addition to failing to provide evidence of the investments tied to the specific domestic industry products, Kaneka also failed to provide evidence to demonstrate that the domestic investments are significant. SKC states that for the products manufactured in Japan, there is no evidence of how much value is added by the post-production processes performed by KTC in the United States. Even for the AV100/200 films made in the U.S., SKC argues that Kaneka has offered no information from which it can be determined whether the investment is significant compared to Kaneka's overseas production of those and many more films.

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SKC argues that Kaneka's licensing arguments fail. SKC states that for Kaneka to establish a domestic industry based on licensing, Kaneka must show that there are domestic activities designed to license the patents at issue, not foreign licensing activities granting a license to a domestic company.

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Discussion and Conclusions: Based on the evidence in the record, I find that Kaneka has failed to satisfy the economic prong of the domestic industry requirement for any of the asserted patents in this investigation.

Kaneka filed its complaint on April 1, 2011. Kaneka only asserts that a domestic industry exists, and it does not assert that a domestic industry is in the process of being established. Therefore, the domestic industry analysis is limited to determining whether or not Kaneka's domestic industry existed as of April 1, 2011. *Certain Video Game Systems & Controllers*, Inv. No. 337-TA-743, Comm'n Op. at 5 (Jan. 20, 2012).

To determine whether or not Kaneka satisfies the economic prong, I must examine Kaneka's domestic investments "with respect to the articles protected by the patent[s]." 19 U.S.C. § 1337(a)(3). The analysis is therefore focused on the investments related to the products that Kaneka claims practice each of the asserted patents. { }

{

}

Kaneka asserts that it satisfies the economic prong under each of the three subsections of Section 337. I address each separately.

Plant & Equipment

Kaneka may satisfy the economic prong by demonstrating "significant investment in plant and equipment" related to the articles protected by the asserted patents. 19 U.S.C. § 1337(a)(3)(A).

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I find that the evidence concerning Kaneka's investments into what has become the KTC facility is insufficient to demonstrate a domestic industry based on plant and equipment. Kaneka

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[58] In Section VIII.B.4 *supra*, I have found that Kaneka waived any argument that the 50AV product practices the '961 patent. Therefore, I will not consider the 50AV product a domestic industry product with regard to the '961 patent.

does not even attempt to tie any of its investments to the specific products alleged to practice the patents. Instead, Kaneka provides only generalized figures regarding the amount of overall investment made at the KTC facility. In order to demonstrate that the economic prong is met, it was necessary for Kaneka to provide detail regarding the investments made related specifically to the products alleged to practice the patents. *See Certain Printing & Imaging Devices & Components Thereof*, Inv. No. 337-TA-690, Order No. 24 (Apr. 21, 2010) (instructing the parties that "domestic industry allegations must be specifically tied to the product(s) asserted to practice the patents, rather than generally referencing the investments related to all" products); *Certain Digital Televisions & Certain Products Containing Same & Methods of Using Same*, Inv. No. 337-TA-617, Order No. 54 (July 1, 2008) (finding that "the lack of information concerning the allocation of expenditures and activities prevents the granting of summary determination.") Such a lack of specificity with regard to the products alleged to practice the patents dooms Kaneka's argument.[59]

Labor or Capital

Kaneka may satisfy the economic prong by demonstrating "significant employment of labor or capital" related to the articles protected by the asserted patents. 19 U.S.C. § 1337(a)(3)(B).

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[59] In addition, I note that the investments relied on by Kaneka were made long before the filing of the Complaint in this investigation. Kaneka has not explained why such distant investments should be considered relevant to the domestic industry analysis.

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Again, I find that Kaneka's lack of specificity precludes a finding that it satisfies the economic prong. {

}

Finally, Kaneka provides labor costs and administrative and selling expenses for the KTC facility for a period between April 2009 and March 2010, yet Kaneka does not allocate those costs with respect to the products and processes alleged to practice the asserted patents. Therefore, the financial figures cited by Kaneka cover both products alleged to practice the patents and products wholly unrelated to this investigation. This lack of detail demonstrates that Kaneka has not offered sufficient evidence to meet the economic prong.

Exploitation of the Asserted Patents

Kaneka may satisfy the economic prong by demonstrating "substantial investment in…exploitation [of the patents], including engineering, research and development, or licensing." 19 U.S.C. § 1337(a)(3)(C).

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While these facts do not *per se* preclude a finding of domestic industry, I find that Kaneka has offered insufficient evidence to meet its burden. The Commission has explained that when the investment related to a product is partially made abroad and partially made in the United States, there needs to be evidence offered to show, *inter alia*, the value added to the article in the U.S. by the domestic industry activities and the relative domestic contribution as compared to the foreign contribution. *See Certain Printing & Imaging Devices & Components Thereof*, Inv. No. 337-TA-690, Comm'n Op. at 27-34 (Feb. 17, 2011). Because Kaneka failed to offered any evidence regarding the substantially of its domestic investment as it relates to the investments made in the foreign manufacturing of the polyimide films, I find that Kaneka has failed to satisfy the domestic industry requirement for any films that are manufactured in Japan and then further processed at KTC in Texas. *Id.*

{

} Without evidence that

Kaneka has made a substantial investment in the U.S. related to licensing of the asserted patents, Kaneka cannot rely on its licensing activities to meet the domestic industry requirement.

{

} The Federal Circuit has held that "expenditures on patent litigation do not automatically constitute evidence of the existence of an industry in the United States established by substantial investment in the exploitation of a patent." *John Mezzalingua Assocs., Inc. v. Int'l Trade Comm'n*, 660 F.3d 1322, 1328 (Fed. Cir. 2011). Therefore, the existence of this litigation does not automatically demonstrate that Kaneka has satisfied the domestic industry requirement. Kaneka fails to tie this litigation to any exploitation of the patents pursuant to 19 U.S.C. § 1337(a)(3)(C). Thus, the litigation expenses, without more, are insufficient to support a finding that Kaneka has satisfied the domestic industry requirement.

Based on the foregoing, I find that Kaneka has failed to demonstrate that it satisfies the economic prong of the domestic industry requirement for the '866 patent, the '639 patent, the '704 patent, and the '961 patent.[61]

C. Technical Prong

1. The '866 patent

Kaneka's Position: Kaneka argues that Kaneka and KTC practice the '866 patent in the U.S., and SKC has presented no witnesses to rebut this fact. In its reply brief, Kaneka notes that

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[61] Domestic industry is an issue where all of the necessary evidence is in Kaneka's possession, custody, or control. As described *supra*, the majority of my findings with regard to the economic prong concern Kaneka's lack of evidentiary support for its claims, or Kaneka's failure to provide sufficiently detailed evidence. Many of the evidentiary deficiencies noted in my analysis above were already known to Kaneka by virtue of my denial of Kaneka's motion for summary determination on the economic prong. (*See* Order No. 26.) Kaneka and its counsel have no one to blame but themselves for failing to put on a sufficient case on the issue of economic prong.

SKC argues at one point in its brief that KTC does not practice the '866 patent, then, to support its invalidity case, SKC argues in the same brief that KTC has practiced the '866 patent since 1997. Kaneka argues that these inconsistent positions demonstrate the inherent weaknesses in SKC's arguments.

Kaneka contends that SKC first attacks the quality and quantity of the evidence relied upon by Kaneka in support of Kaneka's domestic industry; but then SKC makes the incredible statement that Kaneka "only presents conclusory statements from its expert, Dr. Harris, and its employees, all unsupported by any documents." (Citing RIB at p. 27) Kaneka says this is untrue and it relied on substantial, reliable, and probative evidence, including Dr. Harris's personal inspection of the manufacturing process at KTC, Dr. Harris's inspection of Kaneka's manufacturing process (via video), testimony from Kaneka's and KTC's polyimide film production managers, and numerous documents, including technical operating standards, and daily log sheets showing the actual production data for each production run at KTC going back to 1998. (Citing CX-623C; CX-619C; CX-646C; CX-503; CX-207; CX-469; CX-474C; CX-620C.)

Kaneka says that SKC makes the incorrect assertion that Dr. Harris admitted that: "he never personally compared the manufacturing process he saw at Kaneka Texas Corporation (KTC) with the requirements of the '866 patent." (Citing RIB at 30.) Kaneka asserts this is clearly misleading. Kaneka says, when asked whether he compared the manufacturing process for each of KTC's products with the claims of the '866 patent, Dr. Harris replied "[n]ot each and every one." (Citing Tr. at 445:18-446:5.) Kaneka concludes in fact, Dr. Harris prepared a claim chart comparing each and every element of Claims 1-3 of the '866 patent to KTC's process. (Citing CX-619C at Q. 70.)

Kaneka notes that claim 1 of the '866 patent claims a particular method for producing an adhesive polyimide film. (Citing CX-1 at 21:30-56.) {

}

{

} Kaneka alleges that SKC does not dispute that KTC's Process practices this claim limitation.

{

} Kaneka alleges that SKC does not dispute that KTC's Process practices this claim limitation.

Kaneka says SKC asserts that Kaneka presents "no proof" that KTC's Process meets the "consisting substantially of" limitation of the '866 patent. (Citing RIB at 29.) Kaneka responds that SKC completely disregards the testimony of Dr. Harris and Mr. Haussler establishing that KTC's Process meets the "consisting substantially of" limitation. (Citing CX-469C; CX-619C, Q. 62; CX-623C, Qs. 18, 23.)

{

} Kaneka alleges that SKC does not dispute that KTC's Process practices this claim limitation.

{

}

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}

Kaneka asserts that claim 2 is identical to claim 1, except claim 2 includes the limitation "while adjusting amounts of volatile constituents" rather than "while adjusting an imidation ratio." Kaneka argues that for the reasons described above, all of the other claim limitations are met. {

}

Kaneka states that claim 3 is identical to claim 1, except claim 3 includes the limitation "while adjusting amounts of organic solvents" in addition to "while adjusting an imidation ratio." Kaneka says for the reasons described above, all of the other claim limitations are met.

{

}

{

}

SKC's Position: SKC argues that Kaneka must establish that it practices each and every claim limitation of at least one claim of the asserted '866 patent, in order to meet the technical prong. SKC contends that Kaneka neglects to present any evidence on how the manufacturing process for any of its products meets the "consists substantially of," "increasing the temperature in a step-wise fashion . . . while adjusting [an imidation ratio/volatile constituent]" and "adhesive polyimide film" limitations of claims 1 and 2 of the '866 patent, let alone practices claim 3. SKC says that Kaneka only presents conclusory statements from its expert, Dr. Harris, and its employees, all unsupported by any documents, and that Kaneka has, therefore, failed to meet its burden of proof.

In its reply brief, SKC asserts that, contrary to Kaneka's statement that SKC "presented no witnesses to rebut" Kaneka's assertion that it practices the '866 patent, Dr. Thomas provided extensive testimony explaining why Kaneka failed to prove that it practices the patent. (Citing CIB at 36; RX-676C at Q. 142-177.) SKC adds that Kaneka no longer asserts that any of its products, made in Japan, support the '866 technical prong. (Citing CIB at 36.)

SKC contends that there is insufficient evidence that Kaneka practices the '866 patent, because instead of presenting evidence of how the manufacturing process of each domestic industry product meets each element of the '866 patent claims, Kaneka relies upon a disjointed collection of testimony and documents related to different products and manufacturing lines, including manufacturing lines in Japan and Texas. {

}

{

}

SKC complains that Kaneka and its expert, Dr. Harris, provide few details about the manufacturing processes for Kaneka's products in either Japan or Texas. SKC asserts that except for making conclusory statements, they never point to any evidence showing that the manufacturing process for any specific product meets all elements of either claim 1 or 2 of the '866 patent.

Focusing on specifics, SKC argues in its reply brief that Kaneka's arguments regarding how its manufacturing processes meet the "increasing the temperature in a step-wise fashion" limitation also lacks evidence. {

}

{

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}

SKC alleges that Kaneka provided "no competent proof" that any of its other alleged "domestic" products meet this limitation. SKC says Kaneka "has no proof that even one product line meets this claim limitation over any given period of time."[64]

SKC says for example Kaneka offers no proof that it adjusts imidation ratios or amounts of volatile constituents, whether by controlling temperature and the heating time in the belt or otherwise. SKC adds Kaneka has presented no measurements of imidation ratios or volatile constituents, or evidence suggesting if, when, or how the temperature and/or heating time in the

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[63] SKC alleges that respondents were never provided a copy of CX-646C; but that allegation is untrue. In fact, on March 12, 2012, at the hearing, Mr. Haussler was questioned at length on this exhibit by Mr. Sharma. At the time, Mr. Sharma stated that he had a copy of CX-646C, and when Mr. Zito moved that exhibit into evidence, Mr. Sharma indicated there was no objection. Thus, exhibit CX-646C was admitted. (Tr. at 134:9-25, 136:20-137:6, 140:10-149:16.)

{

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belt dryer is controlled to adjust those values. SKC says under Kaneka's claim construction, this limitation "requires changing the imidation ratio [or amount of volatile constituent] so it corresponds or conforms to a desired value." (Citing CX-644C at Q. 43-44.)

In its reply brief, SKC argues that, with respect to the "while adjusting amounts of volatile constituents" limitation, Kaneka presents a new argument for the first time in its Post-Trial Brief. {

} SKC argues that the Kaneka's argument should be rejected, because it violates Ground Rule 8.2, and because it "completely lacks evidentiary support."

SKC contends that Kaneka presents no proof that any of its products meet the "adhesive film" or the "consists substantially of" limitations for claims 1 and 2. SKC avers there is no evidence or analysis of how any product is "adhesive," as that term is used in the claims. SKC

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[65] SKC argues that this position was also not presented in Kaneka's Pre-Trial Brief, and in view of Ground Rule 8.2, Kaneka should be precluded from relying upon it. I concur and find that it is waived by Kaneka.

adds that there is no evidence of whether Kaneka includes ingredients other than an organic solvent solution of polyamide acid and chemical curing agents in its products, such that it meets the "consists substantially of" limitation.

{

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Regarding claim 3, SKC says that Kaneka fails to assert or articulate any theory of how its manufacturing processes meet that claim. SKC says while the language of claim 3 is similar to that found in claim 1, claim 3 requires "adjusting amounts of *organic solvent* and an imidation ratio… ," not just an "imidation ratio" (claim 1). SKC asserts that Kaneka fails to address how any of its manufacturing processes heat a film shaped composition while adjusting the amounts of organic solvent and imidation ratio.

In its reply brief, SKC alleges that Kaneka discusses claim 3 for the first time in its Post-Trial Brief. SKC says that prior to this, Kaneka never provided any discussion or analysis of

how any of its manufacturing processes allegedly practice Claim 3. SKC avers that this claim was not substantively addressed in Kaneka's Pre-Trial Brief. (Citing CPHB at 37-38.) SKC adds that it did not appear in Dr. Harris's witness statement. (Citing CX-619C at Q. 58-77.) SKC argues that for this reason, Kaneka's arguments on this claim should be rejected in view of Ground Rule 8.2.

Addressing the merits, SKC contends that if Kaneka is allowed to now argue that it practices claim 3, those arguments fail because there is insufficient evidence. SKC avers that Kaneka relies solely on its analysis for claims 1 and 2 to show that claim 3 is practiced. (Citing CIB at 39.) SKC reiterates that Kaneka has not met its evidentiary burden of establishing that it practices claims 1 and 2, and for those same reasons, it has not established that it practices claim 3. {

}

SKC posits that where Kaneka identifies alleged support for some, limited claim elements, what it presents is flawed and insufficient. {

}

{

}

SKC concludes Dr. Harris's testimony and opinions lack any credible foundation.

{

} SKC urges that his "newly found recollection in the form of trial testimony, divorced from any corroborating documentation, should not be accepted and in any event does not meet Kaneka's burden."

{

}

SKC argues that it is insufficient, as a matter of law, for Kaneka to rely on an unsubstantiated assumption that each of the 45 products it lists as domestic industry products is manufactured in the same way. SKC says there is simply no basis to assume that all of the 45 products are manufactured the same way. {

}

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}

Discussion and Conclusions: Based upon the evidence in the record, I find that Kaneka has failed to satisfy the technical prong of the domestic industry requirement for the '866 patent.

{

{

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[67] Dr. Harris's expert report, CX-207C, was admitted as an exhibit, and the parties were afforded an opportunity to cross-examine him on that exhibit.}

{

} Dr. Harris did not describe the facts that support this conclusion.

{

}

[68] Mr. Yamaguchi was a witness at the hearing and was cross-examined on this declaration before it was admitted as an exhibit.

{

}

{

}

[69] S-13 and S-16 are not identified as either 100AV or 200AV, which are the only two Kaneka products for which any detailed evidence was provided.

{

}

SKC is correct when it argues that the evidence is lacking that as of the date of filing the complaint, KTC practiced the element that requires increasing the temperature in a "step-wise fashion" as construed herein.[70] {

}

{

}

[70] SKC attempts to argue in its reply brief that with respect to "heating the film shaped composition at an initial temperature of 200°C or less," Kaneka's Post-Trial Brief cites to Mr. Haussler's testimony and a KTC process document about certain AV products; but Kaneka has not established that manufacturing processes for any other alleged domestic industry products meet this limitation. This appears to be a new issue raised by SKC for the first time in its reply brief, and is deemed waived.

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}

2. The '639 Patent

Kaneka's Position: Kaneka contends that the process for making its 75NPI product practices claim 1 of the '639 patent.

{

}

{

}

{

}

SKC's Position: SKC contends that Kaneka has failed to meet its burden to demonstrate that it practices any claim from the '639 patent.

{

} SKC asserts that the testimony offered by Kaneka employees is not supported by any documents or evidence. SKC claims that the uncorroborated testimony of Kaneka employees is insufficient to satisfy the technical prong.

SKC further argues that Kaneka failed to demonstrate that the "low viscosity" claim limitation is satisfied. {

}

In its reply brief, SKC notes that Kaneka is relying on excluded evidence to support its domestic industry claim. {

} SKC argues that Kaneka may not rely on excluded documents to support its domestic industry assertions.

Discussion and Conclusions: Based on the evidence in the record, I find that Kaneka has failed to offer sufficient evidence to meet the technical prong of the domestic industry requirement.

{

}

To the extent that Kaneka relies on products manufactured in Japan and then transferred to the United States for slitting and/or coating, I find that such products are insufficient to demonstrate a domestic industry for reasons described in the economic prong analysis found in Section VIII.B *supra*. Assuming *arguendo* that Kaneka can properly rely on the products manufactured in Japan, Kaneka has still failed to meet its burden.

{

.} I find that such conclusory testimony is insufficient to meet Kaneka's burden.

Kaneka cites to Dr. Harris's expert report as well. {

} While Dr. Harris's expert report does in fact cite to documentary evidence to support his conclusions, the documents cited by Dr. Harris were not admitted into evidence. In paragraphs 76, 78, 79, and 80, Dr. Harris relies on a document labeled KANJP000654862-65.

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[71] Kaneka additionally cites to CX-471C, which is a claim chart that references portions of Dr. Harris's expert report.

(*Id.* at ¶¶ 76, 78, 79, 80.) This document, identified as exhibit CX-212C, was excluded at the hearing, as evidenced by Kaneka's Final Exhibit List. In paragraph 85, Dr. Harris relies on a document labeled KANJP000654902. (*Id.* at ¶ 85.) This document, identified as exhibit CX-217C, was excluded at the hearing, as evidenced by Kaneka's Final Exhibit List. In paragraph 87, Dr. Harris relies on a document labeled KANJP000654859. (*Id.* at ¶ 85.) This document, identified as exhibit CX-211C, was excluded at the hearing, as evidenced by Kaneka's Final Exhibit List. I give no weight to Dr. Harris's expert report because it relies solely on excluded evidence to support the opinions therein.

{

} I find that a declaration from a Kaneka employee created for this litigation that cites to no supporting evidence and fails to provide any explanation regarding the calculations made to determine the claimed ratios is insufficient to establish the technical prong. (*Id.*)

{

} Just like Mr. Yamaguchi, Mr. Kaneshiro fails to cite to any

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[72] Kaneka additionally cites to CX-250C, which is identical to CX-30C.

supporting evidence or provide any explanation regarding how he calculated the stated ratios. (*Id.*) Again, I find that testimony from a Kaneka employee created for this litigation that cites to no supporting evidence and fails to provide any explanation regarding the calculations made to determine the claimed ratios is insufficient to establish the technical prong. (*Id.*)

In view of the fact that Kaneka has not offered sufficient evidence to support a finding that its NPI process practices claim 1 of the '639 patent, I conclude that Kaneka has not established that it satisfied the technical prong of the domestic industry requirement for the '639 patent.

3. The '704 Patent

Kaneka's Position: Kaneka contends that the KTC 100NP and Kaneka 25NPI films practice claim 1 of the '704 patent.

{

}

{

}

In its reply brief, Kaneka notes that SKC raises the same issues with Kaneka's testing as were addressed in the infringement section. Kaneka asserts that, for the same reasons as offered when discussing infringement, the testing used to demonstrate the technical prong was accurate and produced reliable results.

SKC's Position: {

}

SKC argues that the testing relied on by Kaneka to establish the average CTE limitation is flawed and unreliable because the testing failed to include replicates, as required by Dr. Harris's protocol. (Citing CX-467C at 12.) SKC states that the testing relied on by Dr. Harris includes on a single measurement of each product. (Citing CX-469C at 20.) According to SKC, a single measurement is insufficient to reliably prove that the average CTE limitation is met. (Citing RX-676C at Q. 302.)

SKC notes that the failure to follow the testing protocol is particularly important because Kaneka tested two samples of the 25NPI product, and only reported results for one of the samples for purposes of the '704 patent. (Citing CX-467C at 20.) Further, SKC claims that Kaneka failed to provide the tested samples to SKC so that SKC could try to verify Kaneka's results. (Citing RX-594; RX-676C at Q. 300.)

With regard to Kaneka's HPLC testing to prove the diamine molar ratio limitation, SKC offers the same argument as raised in the infringement section. Specifically, SKC argues that the

testing is not reliable due to the fact that at least half of the control samples failure to provide accurate results. (Citing Tr. at 506:16-508:12; CX-467C at 23.) SKC argues that the unreliable HPLC testing cannot be used to show that the domestic industry products meet the diamine molar ratio limitation of claim 1.

Discussion and Conclusions: {

}

To the extent that Kaneka relies on products manufactured in Japan and then transferred to the United States for slitting and/or coating, I find that such products are insufficient to demonstrate a domestic industry for reasons described in the economic prong analysis found in Section VIII.B *supra*. Assuming *arguendo* that Kaneka can properly rely on the products manufactured in Japan, Kaneka has still failed to meet its burden.

As described in Section III.D.2 *supra*, I have found that the phrase "average coefficient of thermal expansion" in claim 1 is indefinite, rendering claim 1 invalid. An indefinite claim "by definition, cannot be construed," meaning I cannot analyze technical prong of the '704 patent. *Honeywell*, 341 F.3d at 1342. Therefore, my analysis of claim 1 for purposes of the technical prong will be conducted under the assumption that Kaneka's claim construction position for "average coefficient of thermal expansion" has been adopted, even though I have already rejected Kaneka's claim construction position. According to Kaneka's position, the claim language requires that the polyimide film has an average CTE of $1.0x10^{-5}$ to $2.5x10^{-5}$ cm/cm/°C over the temperature range of 100°C to 200°C in both the MD and TD, whereby the CTE is measured in the center of the film. (CX-644C at Q. 168.)

In an attempt to prove that the domestic industry products meet the diamine molar ratio limitation of claim 1, Kaneka relies on the HPLC test results of two product samples, S13 and

S15. (CIB at 76.) {

}

This is the same HPLC testing that was addressed in Section VII.D *supra*, regarding Kaneka's infringement claims. In deciding infringement, I determined that the HPLC test results were unreliable because the testing did not return accurate results for at least three of the six control samples, a fact that is undisputed. For the same reasons as explained in Section VII.D *supra*, I find that Kaneka's HPLC test results for its domestic industry products are unreliable.[73]

Because this is the only evidence that Kaneka offers to prove the diamine molar ratio limitation of claim 1, I find that Kaneka has failed to offer sufficient evidence that either of its domestic industry products practice claim 1.

4. The '961 Patent

Kaneka's Position: {

}

[73] Assuming *arguendo* that the HPLC testing is deemed to be reliable, then I find that Kaneka has demonstrated that the S13 and S15 samples fall within the claimed molar ratio range. (CX-467C at Q. 23; CX-619C at Q. 115-118.)

{

.}

In its reply brief, Kaneka asserts that SKC's challenge to Dr. Harris' CTE data is limited to a statistical argument based on the number of replicates tested. Kaneka refers to its response to these challenges with respect to its infringement testing. {

}

With respect to whether Kaneka uses a continuous process, Kaneka asserts that SKC's expert agreed that a continuous process with tension would still be a continuous process. (Citing Tr. at 887:2-7.) Kaneka also asserts that Mr. Won, a senior engineer at SKPI's R&D center, testified that he does not think that the existence of sag has any effect on whether or not the process is continuous, so whether Mr. Haussler has "personally seen a sag at that stage of the process" is irrelevant. According to Kaneka, the fact that Dr. Harris did not address sag is irrelevant. Kaneka asserts that Dr. Harris visited KTC in Texas and watched a video of the Japanese plant, and concluded that both production processes are continuous based on his

observations. (Citing CX619C at Q.132-33) Kaneka contends that Dr. Harris testified that "[t]he production of commercial films is only possible with a continuous process." (Citing CX-619C at Q. 215.)

SKC's Position: {

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{

}

SKC asserts that Kaneka has failed to show that Kaneka's films sag in the middle as the film is transferred to the furnace, as required by SKC's construction for continuous process.

{

}

SKC contends that, to the extent Kaneka asserts it meets the "continuous process" limitation based on Kaneka's construction, Kaneka has no evidentiary support. According to SKC, Dr. Harris' witness statement only offers a conclusory statement that it is impossible to make a commercial film without using a continuous process. (Citing CX-619C at Q. 134) {

} SKC contends that such an unsubstantiated opinion is not sufficient to meet Kaneka's burden.

In its reply brief, SKC asserts that Kaneka presents an analysis on the technical prong for claim 9 for the first time in its post-trial brief. According to SKC, Kaneka provided a conclusory statement about practicing claim 9 in Kaneka's pre-trial brief, but provided no analysis. SKC contends that Dr. Harris failed to address claim 9 in his witness statement, no testimony was given about Kaneka's alleged practice of claim 9 at trial, and neither of the exhibits cited in the small portion of Kaneka's pre-trial-brief regarding claim 9 are even in evidence. (Citing CX-029

and CX-031C.) SKC asserts that I should not consider Kaneka's late analysis for claim 9, particularly because SKC never had an opportunity to cross-examine a witness on this issue, since it was never addressed in any witness statement.

SKC asserts that even if Kaneka's arguments with respect to claim 9 are considered, Kaneka still fails to establish that it practices claim 9. SKC contends that Kaneka should be limited to arguing that the two products identified in Kaneka's pretrial-brief (25NPI and 25NP) practice claim 9 and should not be allowed to argue that the 100NP and 50AV products also practice this claim. (Citing CPHB at 116; CIB at 102)

SKC contends that the tear propagation resistance values relied on by Kaneka in its post-trial brief lack evidentiary support. {

} SKC asserts that given the lack of evidentiary support, there is no way for SKC or anyone else to verify the test results, and as a result, Kaneka has not satisfied its burden of proof.

Discussion and Conclusions: {

} These are the only films that Kaneka has addressed.

To the extent that Kaneka relies on products manufactured in Japan and then transferred to the United States for slitting and/or coating, I find that such products are insufficient to demonstrate a domestic industry for reasons described in the economic prong analysis found in Section VIII.B *supra*. {

} Assuming *arguendo* that Kaneka can properly rely on the products manufactured in Japan, Kaneka has still failed to meet its burden.

{

}

{ }

{

}

SKC's arguments regarding sag are unpersuasive in view of the adopted construction for "polyimide film produced by a continuous process." {

}

{

}

{

} As a result, had SKC's proposed construction been adopted, Kaneka would have failed to carry its burden to show the "technical prong" of domestic industry was met for claim 1 of the '961 patent.

{

}

{

}

As above, had SKC's construction been adopted, Kaneka would have failed to meet its burden.

SKC's arguments regarding the molecular orientation axis are unpersuasive in view of the discussion above regarding molecular orientation axis. {

} As a result, had SKC's proposed

construction been adopted, Kaneka would have failed to carry its burden to show the "technical prong" of domestic industry was met for the '961 patent.

{

} Because Kaneka has provided no evidence or foundation regarding the collection of this testing data or the data itself, and in view of the problems with Kaneka's data discussed in Section VII.E.2 *supra*, Kaneka has failed to carry its burden to show the "technical prong" of domestic industry was met for this claim limitation of claim 9 of the '961 patent.

IX. REMEDY & BONDING

A. General Exclusion Order

Kaneka's Position: Kaneka contends that the Commission should issue a general exclusion order in this investigation.

According to Kaneka, a general exclusion order should be granted in this case because the vast majority of SKC films enter into the U.S. via downstream products. Kaneka claims that polyimide films are used in a wide range of consumer products such as cell phones and televisions. Kaneka asserts that SKC polyimide films are found in LG and Samsung cell phones

imported into the United States. Kaneka argues that a general exclusion order is necessary to prevent the importation of these downstream products.

SKC's Position: SKC contends that Kaneka is not entitled to a general exclusion order. SKC claims that Kaneka failed to meet the requirements necessary for the issuance of a general exclusion order.

Discussion and Conclusions: I have found that, in this case, there is no violation of Section 337. Should the Commission find a violation of Section 337, however, I do not recommend that the Commission issue a general exclusion order.

Pursuant to 19 U.S.C. § 1337(d), the Commission may issue either a limited or a general exclusion order. A limited exclusion order instructs the U.S. Customs and Border Protection ("CBP") to exclude from entry all articles that are covered by the patent at issue and that originate from a named respondent in the investigation. A general exclusion order instructs the CBP to exclude from entry all articles that are covered by the patent at issue, without regard to source.

A general exclusion order is permitted in certain limited situations. Specifically, the statute provides:

> (2) The authority of the Commission to order an exclusion from entry of articles shall be limited to persons determined by the Commission to be violating this section unless the Commission determines that—
>
> (A) a general exclusion from entry of articles is necessary to prevent circumvention of an exclusion order limited to products of named persons; or
>
> (B) there is a pattern of violation of this section and it is difficult to identify the source of infringing products.

19 U.S.C. § 1337(d)(2); *see also Certain Hydraulic Excavators*, Inv. No. 337-TA-582, Comm'n Op. (Feb. 3, 2009) (describing the standard for general exclusion orders).

Kaneka does not address either of these requirements for a general exclusion order, merely arguing that "[t]o allow downstream products to enter the U.S. in this case would not effectuate the purpose of an exclusion order, which aims to eliminate unfair competition." (CIB at 123.) But Kaneka has not argued a general exclusion order is necessary to prevent circumvention of a limited exclusion order, or that there is a pattern of violation and that it is difficult to identify the source of the infringing products. Nor has Kaneka offered any evidence on those points. Thus, Kaneka has not met its burden to demonstrate that the issuance of a general exclusion order is proper in this investigation, should the Commission find a violation of Section 337.

B. Limited Exclusion Order

Kaneka's Position: Kaneka contends that, if a general exclusion order does not issue, the Commission should issue a limited exclusion order against SKC. Kaneka claims that it has satisfied the requirements of Section 337 and established that it is entitled to a limited exclusion order against SKC.

SKC's Position: SKC contends that if a limited exclusion order issues, it should be limited to imports by, or on behalf of the two named respondents in this investigation. According to SKC, the products subject to any exclusion order should be infringing polyimide films and should not include downstream products incorporating those films.

Discussion and Conclusions: I have found that, in this case, there is no violation of Section 337. Should the Commission find a violation of Section 337, however, I recommend that the Commission issue a limited exclusion order that applies to SKC Kolon PI, Inc. and SKC, Inc., as well as all of their affiliated companies, parents, subsidiaries, or other related business

entities, or their successors or assigns, and covers the polyimide films, products containing same, and related methods found to infringe the asserted patents.

C. Cease & Desist Order

Kaneka's Position: Kaneka contends that the Commission should issue a cease and desist order against SKC to prevent the exploitation by SKC of any inventories of infringing products that exist or may exist in the United States.

SKC's Position: SKC contends that a cease and desist order is not warranted because there is no evidence that SKC maintains a commercially significant inventory of infringing articles in the United States. SKC explains asserts that there is unrebutted testimony that SKC does not maintain a domestic inventory. (Citing RX-586C at Q. 32.)

Discussion and Conclusions: I have found that, in this case, there is no violation of Section 337. Should the Commission find a violation of Section 337, however, I do not recommend the issuance of a cease and desist order.

Section 337 provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order as a remedy for violation of section 337. *See* 19 U.S.C. § 1337(f)(1). The Commission generally issues a cease and desist order directed to a domestic respondent when there is a "commercially significant" amount of infringing, imported product in the United States that could be sold so as to undercut the remedy provided by an exclusion order. *See Certain Crystalline Cefadroxil Monohydrate*, Inv. No. 337-TA-293, USITC Pub. 2391, Comm'n Op. on Remedy, the Public Interest and Bonding at 37-42 (June 1991); *Certain Condensers, Parts Thereof and Products Containing Same, Including Air Conditioners for Automobiles*, Inv. No. 337-TA-334, Comm'n Op. at 26-28 (Aug. 27, 1997). The complainant bears the burden of proving that a respondent has a commercially significant inventory in the

United States. *Certain Integrated Repeaters, Switches, Transceivers & Products Containing Same*, Inv. No. 337-TA-435, Comm'n Op., 2002 WL 31359028 (Aug. 16, 2002).

Kaneka offers no evidence that SKC maintains a commercially significant inventory of infringing products in the United States. SKC offers unrebutted testimony that the domestic respondent in this investigation, SKC, Inc., does not have any domestic inventory of the accused prior or redesigned polyimide films. (RX-586C at Q. 32.) In view of this, I find that Kaneka has not met its burden to show that it is entitled to a cease and desist order.

D. Bonding

Kaneka's Position: Kaneka contends that a bond in the amount of 100% of the entered value of any infringing imports should be imposed to offset SKC's competitive advantage from the continued infringement.

SKC's Position: SKC contends that the bond should be set at no more than 3%.

SKC asserts that Kaneka failed to offer any evidence regarding a reliable price comparison between domestically-manufactured products made by KTC and products imported by SKC. SKC notes that Kaneka has licensed KTC under the asserted patents, and that the license calls for a running royalty of 3%. (Citing JX-30C at 51-52.) Therefore, SKC believes that the bond should be set at no more than 3%.

Discussion and Conclusions: I have found that, in this case, there is no violation of Section 337. Should the Commission find a violation of Section 337, however, I do not recommend the imposition of a bond.

The administrative law judge and the Commission must determine the amount of bond to be required of a respondent, pursuant to section 337(j)(3), during the 60-day Presidential review period following the issuance of permanent relief, in the event that the Commission determines

to order a remedy. The purpose of the bond is to protect the complainant from any injury. 19 CFR §§ 210.42(a)(1)(ii), 210.50(a)(3). The complainant has the burden of supporting any bond amount it proposes. *Certain Rubber Antidegradants, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-533, Comm'n Op., 2006 ITC LEXIS 591 (Jul. 21, 2006).

When reliable price information is available, the Commission has often set the bond by eliminating the differential between the domestic product and the imported, infringing product. *See Certain Microsphere Adhesives, Processes for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm'n Op. a 24 (1995). In other cases, the Commission has turned to alternative approaches, especially when the level of a reasonable royalty rate could be ascertained. *See, e.g., Certain Integrated Circuit Telecommunication Chips and Products Containing Same, Including Dialing Apparatus*, Inv. No. 337-TA-337, Comm'n Op. at 41 (1995).

The Commission has set a bond of 100% when the evidence supported a finding that it would be difficult or impossible to calculate a bond based on price differentials. *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, Comm'n Op., 1996 WL 1056209 (Sept. 23, 1996) (finding that a bond of 100% was appropriate "because of the difficulty in quantifying the cost advantages of respondents' imported Enercon E-40 wind turbines and because of price fluctuations due to exchange rates and market conditions."); *Certain Systems For Detecting and Removing Viruses or Worms, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-510, Comm'n Op., 2007 WL 4473083 (Aug. 2007) (imposing a bond of 100% based on a finding that the parties had numerous models and products lines, and that a price comparison would be difficult because respondent's products were a combination of hardware and software while the complainant's products were software only);

Certain Flash Memory Circuits and Products Containing Same, Inv. No. 337-TA-382, USITC Pub. No. 3046, Comm'n Op. at 26-27 (July 1997) (a 100% bond imposed when price comparison was not practical because the parties sold products at different levels of commerce, and the proposed royalty rate appeared to be *de minimis* and without adequate support in the record).

In *Certain Rubber Antidegradants*, the Commission did not require a bond. The presiding administrative law judge had set no bond, finding, "no evidence in the record to support any bond to offset any competitive advantage resulting from the unfair acts of [respondents] from their importations." *Certain Rubber Antidegradants*, 2006 ITC LEXIS 591, at *59.

The respondent argued that the lack of pricing information was due to the complainant's failure to adduce such evidence during the hearing and complainant should not be able to benefit from that failure. (*Id.* at 60.) In response, the complainant argued that it had no burden of proof with respect to bonding, and that the existence of a violation is sufficient to support a 100% bond. (*Id.*) In deciding the issue, the Commission stated:

> We find the ALJ's recommendation appropriate in the circumstances here and have determined not to require that a bond be posted for temporary importation. In our view, the complainant has the burden of supporting any proposition it advances, including the amount of the bond. [The complainant] did not meet that burden.

(*Id.*)

Kaneka requests a bond of 100%, yet offers no justification to support that amount. (CIB at 124.) Kaneka does not assert that calculating a bond would be difficult or impossible. (*Id.*) I decline to recommend a bond of 100% based on nothing more than Kaneka's unsupported

assertion that such a bond "should be imposed to offset SKC's competitive advantage from the continued infringement." (*Id.*)

SKC asserts that the bond should be set at no more than 3%, as that is the royalty rate in the license agreement between Kaneka and KTC. (JX-30C.) Kaneka criticizes this approach, claiming that the 3% rate represents "a royalty rate in a license agreement between a parent company and a wholly-owned subsidiary." (CRB at 75.) Kaneka argues that the 3% amount is not evidence of a reasonable royalty because the license was not an arm's-length transaction between two unrelated entities. (*Id.*) I concur with Kaneka, and find that a royalty rate in a license agreement between a parent company and a wholly-owned subsidiary does not provide sufficient evidence of a reasonable royalty. Because Kaneka failed in its burden to demonstrate the appropriate bond amount, I recommend that the Commission not impose a bond if a violation of Section 337 is found.

X. MATTERS NOT DISCUSSED

This Initial Determination's failure to discuss any matter raised by the parties, or any portion of the record, does not indicate that it has not been considered. Rather, any such matter(s) or portion(s) of the record has/have been determined to be irrelevant, immaterial or meritless. Arguments made on brief which were otherwise unsupported by record evidence or legal precedent have been accorded no weight.

XI. CONCLUSIONS OF LAW

1. The Commission has subject matter jurisdiction, *in rem* jurisdiction, and *in personam* jurisdiction.

2. There has been an importation into the United States, sale for importation, or sale within the United States after importation of the accused polyimide films or products containing

same, which are the subject of the alleged unfair trade allegations.

3. SKC has failed to offer evidence of patent misuse by Kaneka.

U.S. Patent No. 6,264,866

4. An industry does not exist in the United States that exploits U.S. Pat. No. 6,264,866, as required by 19 U.S.C. § 1337(a)(2).

5. Claims 1-3 of U.S. Pat. No. 6,264,866 are not invalid.

6. The accused SKC processes do not infringe claims 1-3 of U.S. Pat. No. 6,264,866.

7. There is no violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Pat. No. 6,264,866.

U.S. Patent No. 6,746,639

8. An industry does not exist in the United States that exploits U.S. Pat. No. 6,746,639, as required by 19 U.S.C. § 1337(a)(2).

9. Claim 1 of U.S. Pat. No. 6,746,639 is not invalid.

10. U.S. Pat. No. 6,746,639 is not unenforceable due to inequitable conduct.

11. The accused SKC processes do not infringe claim 1 of U.S. Pat. No. 6,746,639.

12. There is no violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Pat. No. U.S. Pat. No. 6,746,639.

U.S. Patent No. 7,018,704

13. An industry does not exist in the United States that exploits U.S. Pat. No. 7,018,704, as required by 19 U.S.C. § 1337(a)(2).

14. Claim 1 of U.S. Pat. No. 7,018,704 is invalid due to indefiniteness pursuant to 35 U.S.C. § 112, ¶ 2.

15. The accused SKC products do not infringe claim 1 of U.S. Pat. No. 7,018,704.

16. There is no violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Pat. No. U.S. Pat. No. 7,018,704.

U.S. Patent No. 7,691,961

17. An industry does not exist in the United States that exploits U.S. Pat. No. 7,691,961, as required by 19 U.S.C. § 1337(a)(2).

18. Claim 1 of U.S. Pat. No. 7,691,961 is invalid due to lack of enablement pursuant to 35 U.S.C. § 112, ¶ 1.

19. Claim 9 of U.S. Pat. No. 7,691,961 is not invalid.

20. The accused SKC IN-70 (50um) product infringes claim 9 of U.S. Pat. No. 7,691,961. No other accused SKC products infringe claims 1 and/or 9 of U.S. Pat. No. 7,691,961.

21. There is no violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Pat. No. U.S. Pat. No. 7,691,961.

XI. ORDER

Based on the foregoing, and the record as a whole, it is my Final Initial Determination that there is no violation of 19 U.S.C. § 1337(a)(1) in the importation into the United States, sale for importation, and the sale within the United States after importation of certain polyimide films, products containing same, and related methods.

I hereby **CERTIFY** to the Commission my Final Initial and Recommended Determinations together with the record consisting of the exhibits admitted into evidence. The pleadings of the parties filed with the Secretary, and the transcript of the pre-hearing conference and the hearing, as well as other exhibits, are not certified, since they are already in the Commission's possession in accordance with Commission rules.

It is further **ORDERED** that:

In accordance with Commission Rule 210.39, all material heretofore marked *in camera* because of business, financial and marketing data found by the administrative law judge to be cognizable as confidential business information under Commission Rule 201.6(a), is to be given *in camera* treatment continuing after the date this investigation is terminated.

The initial determination portion of the Final Initial and Recommended Determination, issued pursuant to Commission Rule 210.42(a)(1)(i), shall become the determination of the Commission sixty (60) days after the service thereof, unless the Commission, within that period, shall have ordered its review of certain issues therein, or by order, has changed the effective date of the initial determination portion. If the Commission determines that there is a violation of 19 U.S.C. § 1337(a)(1), the recommended determination portion, issued pursuant to Commission Rule 210.42(a)(1)(ii), will be considered by the Commission in reaching a determination on remedy and bonding pursuant to Commission Rule 210.50(a).

Within ten days of the date of this document, each party shall submit to the Office of the Administrative Law Judge a statement as to whether or not it seeks to have any portion of this document deleted from the public version. The parties' submissions must be made by hard copy by the aforementioned date and must include a copy of this document with red brackets indicating any portion asserted to contain confidential business information to be deleted from the public version. The parties' submission concerning the public version of this document need

not be filed with the Commission Secretary.

SO ORDERED.

Issued: 5/10/2012
DATE

Robert K. Rogers, Jr.
Administrative Law Judge

CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS

Inv. No. 337-TA-772

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **INITIAL DETERMINATION** was served upon the following parties via overnight mail delivery on June 11, 2012

Lisa R. Barton, Acting Secretary
U.S. International Trade Commission
500 E Street SW, Room 112A
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FOR RESPONDENTS SKC KOLON PI, INC. and SKC INC.:

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CERTAIN POLYIMIDE FILMS, PRODUCTS CONTAINING SAME, AND RELATED METHODS

Inv. No. 337-TA-772

PUBLIC CERTIFICATE OF SERVICE PAGE 2

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