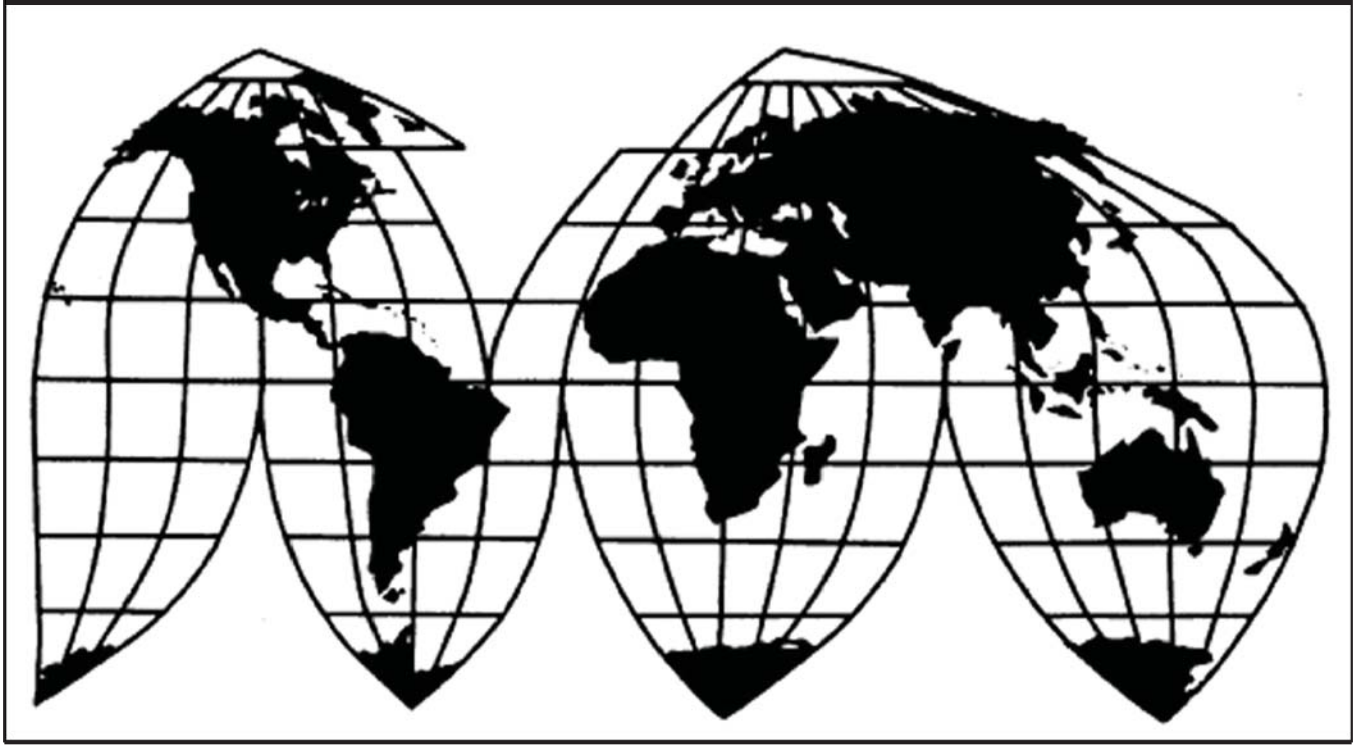
1,1,1,2 - Tetrafluoroethane (R-134a) from China

Investigation No. 731-TA-1313 (Preliminary)

Publication 4606 **April 2016**

U.S. International Trade Commission



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Note.—Information that would reveal confidential operations of individual concerns may not be published and therefore has been deleted. Such deletions are indicated by asterisks.

UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-1313 (Preliminary)

1,1,1,2 - Tetrafluoroethane (R-134a) from China

DETERMINATION

On the basis of the record[1] developed in the subject investigation, the United States International Trade Commission ("Commission") determines, pursuant to the Tariff Act of 1930 ("the Act"), that there is a reasonable indication that an industry in the United States is materially injured by reason of imports of 1,1,1,2 - Tetrafluoroethane (R-134a) from China, provided for in subheading 2903.39.20 of the Harmonized Tariff Schedule of the United States, that are alleged to be sold in the United States at less than fair value ("LTFV").

COMMENCEMENT OF FINAL PHASE INVESTIGATION

Pursuant to section 207.18 of the Commission's rules, the Commission also gives notice of the commencement of the final phase of its investigation. The Commission will issue a final phase notice of scheduling, which will be published in the *Federal Register* as provided in section 207.21 of the Commission's rules, upon notice from the Department of Commerce ('Commerce") of an affirmative preliminary determination in the investigation under section 733(b) of the Act, or, if the preliminary determination is negative, upon notice of an affirmative final determination in that investigation under section 735(a) of the Act. Parties that filed entries of appearance in the preliminary phase of the investigation need not enter a separate appearance for the final phase of the investigation. Industrial users, and, if the merchandise under investigation is sold at the retail level, representative consumer organizations have the right to appear as parties in Commission antidumping and countervailing duty investigations. The Secretary will prepare a public service list containing the names and addresses of all persons, or their representatives, who are parties to the investigation.

BACKGROUND

On March 3, 2016, the American HFC Coalition and its individual members (Amtrol, Inc., West Warwick, Rhode Island; Arkema, Inc., King of Prussia, Pennsylvania; The Chemours Company FC LLC, Wilmington, Delaware; Honeywell International Inc., Morristown, New Jersey; Hudson Technologies, Pearl River, New York; Mexichem Fluor Inc., St. Gabriel, Louisiana; and Worthington Industries, Inc., Columbus, Ohio) and District Lodge 154 of the International Association of Machinists and Aerospace Workers filed a petition with the Commission and

[1] The record is defined in sec. 207.2(f) of the Commission's Rules of Practice and Procedure (19 CFR § 207.2(f)).

Commerce, alleging that an industry in the United States is materially injured and threatened with material injury by reason of LTFV imports of 1,1,1,2 - Tetrafluoroethane (R-134a) from China. Accordingly, effective March 3, 2016, the Commission, pursuant to section 733(a) of the Tariff Act of 1930 (19 U.S.C. §§ 1673b(a)), instituted antidumping duty investigation No. 731-TA-1313 (Preliminary).

Notice of the institution of the Commission's investigation and of a public conference to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the *Federal Register* of March 9, 2016 (81 FR 12523). The conference was held in Washington, DC, on March 24, 2016, and all persons who requested the opportunity were permitted to appear in person or by counsel.

Views of the Commission

Based on the record in the preliminary phase of this investigation, we find that there is a reasonable indication that an industry in the United States is materially injured by reason of imports of 1,1,1,2 – Tetrafluoroethane ("R-134a") from China that are allegedly sold in the United States at less than fair value.

I. The Legal Standard for Preliminary Determinations

The legal standard for preliminary antidumping and countervailing duty determinations requires the Commission to determine, based upon the information available at the time of the preliminary determinations, whether there is a reasonable indication that a domestic industry is materially injured or threatened with material injury, or that the establishment of an industry is materially retarded, by reason of the allegedly unfairly traded imports.[1] In applying this standard, the Commission weighs the evidence before it and determines whether "(1) the record as a whole contains clear and convincing evidence that there is no material injury or threat of such injury; and (2) no likelihood exists that contrary evidence will arise in a final investigation."[2]

II. Background

The American HFC Coalition, a group of domestic producers, wholesalers, and suppliers of R-134a, and District Lodge 154 of the International Association of Machinists and Aerospace Workers, a labor union, filed the petition on March 3, 2016. Petitioners appeared at the staff conference and submitted a joint postconference brief.

Several respondent entities participated in the preliminary phase of this investigation. Chinese producers Zhejiang Quhua Fluor-Chemistry Co., Ltd.; Sinochem Environmental Protection Chemicals (Taicang) Co., Ltd.; and Zhejiang Sanmei Chemical Industry Co., Ltd. (collectively "respondents"), appeared at the staff conference and submitted a joint postconference brief.

U.S. industry data are based on the questionnaire responses of three domestic producers, accounting for 100 percent of U.S. production of R-134a in 2015. U.S. import data are based on official U.S. Department of Commerce ("Commerce") import statistics for HTS number 2903.39.2020 and on questionnaire responses from 30 U.S. importers that accounted

[1] 19 U.S.C. §§ 1671b(a), 1673b(a) (2000); *see also American Lamb Co. v. United States*, 785 F.2d 994, 1001-04 (Fed. Cir. 1986); *Aristech Chem. Corp. v. United States, 2*0 CIT 353, 354-55 (1996). No party argues that the establishment of an industry in the United States is materially retarded by the allegedly unfairly traded imports.

[2] *American Lamb Co*., 785 F.2d at 1001; *see also Texas Crushed Stone Co. v. United States*, 35 F.3d 1535, 1543 (Fed. Cir. 1994).

for 83.8 percent of total subject imports from China in 2015.[3] The Commission received responses to its questionnaires from six Chinese producers of subject merchandise accounting for approximately 76.7 percent of U.S. imports of R-134a from China and 66.8 percent of production of subject merchandise in China in 2015.[4]

In October, 2013, the Commission initiated antidumping and countervailing duty investigations concerning R-134a from China. The scope of the prior investigations was the same as the scope of this investigation.[5] The Commission and Commerce reached affirmative preliminary determinations, which caused imports of R-134a from China to be subject to preliminary duty deposits. Preliminary countervailing duty deposits were imposed on imports of R-134a from China beginning April 18, 2014,[6] and provisional antidumping duties were imposed on imports of R-134a from China beginning May 29, 2014.[7] On December 9, 2014, the Commission issued negative determinations in its investigations, thereby ending the collection of provisional duties.[8]

III. Domestic Like Product

In determining whether there is a reasonable indication that an industry in the United States is materially injured or threatened with material injury by reason of imports of the subject merchandise, the Commission first defines the "domestic like product" and the "industry."[9] Section 771(4)(A) of the Tariff Act of 1930, as amended ("the Tariff Act"), defines the relevant domestic industry as the "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[10] In turn, the Tariff Act defines

[3] Confidential Report ("CR") at I-5, Public Report ("PR") at I-4.

[4] CR at I-5, PR at I-4.

[5] *See 1, 1, 1, 2-Tetrafluoroethane from China*, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final), USITC Pub. 4503 (Dec. 2014) ("2014 R-134a Determinations").

[6] Countervailing Duty Investigation of 1, 1, 1, 2-Tetrafluoroethane From the People's Republic of China: Preliminary Affirmative Determination and Alignment of Final Determination with Final Antidumping Determination, 79 Fed. Reg. 21895 (April 18, 2014) ("2014 Commerce Preliminary CVD Determination"); 1, 1, 1, 2-Tetrafluoroethane from China, 79 Fed. Reg. 73102 (Dec. 9, 2014) ("2014 ITC Notice of Determination").

[7] 1, 1, 1, 2-Tetrafluoroethane From the People's Republic of China: Antidumping Duty Investigation, Preliminary Determination of Sales at Less Than Fair Value, Affirmative Preliminary Determination of Critical Circumstances, in Part, and Postponement of Final Determination, 79 Fed. Reg. 30817 (May 29, 2014) ("2014 Commerce Preliminary AD Determination"); 2014 ITC Notice of Determination, 79 Fed. Reg. at 73102.

[8] *See* 2014 ITC Notice of Determination, 79 Fed. Reg. at 73102; *see also* 2014 R-134a Determinations, USITC Pub. 4503 at 5-6.

[9] 19 U.S.C. § 1677(4)(A).

[10] 19 U.S.C. § 1677(4)(A).

"domestic like product" as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation."[11]

The decision regarding the appropriate domestic like product(s) in an investigation is a factual determination, and the Commission has applied the statutory standard of "like" or "most similar in characteristics and uses" on a case-by-case basis.[12] No single factor is dispositive, and the Commission may consider other factors it deems relevant based on the facts of a particular investigation.[13] The Commission looks for clear dividing lines among possible like products and disregards minor variations.[14] Although the Commission must accept Commerce's determination as to the scope of the imported merchandise that is subsidized and/or sold at less than fair value,[15] the Commission determines what domestic product is like the imported articles Commerce has identified.[16]

Commerce defined the imported merchandise within the scope of this investigation as follows:

> The product subject to this investigation is 1,1,1,2-Tetrafluoroethane, R-134a, or its chemical equivalent, regardless of form, type, or purity level. The chemical formula for 1,1,1,2-Tetrafluoroethane is CF_3-CH_2F, and the Chemical Abstracts Service registry number is CAS 811-97-2.

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[11] 19 U.S.C. § 1677(10).

[12] *See, e.g., Cleo Inc. v. United States*, 501 F.3d 1291, 1299 (Fed. Cir. 2007); *NEC Corp. v. Department of Commerce*, 36 F. Supp. 2d 380, 383 (Ct. Int'l Trade 1998); *Nippon Steel Corp. v. United States*, 19 CIT 450, 455 (1995); *Torrington Co. v. United States*, 747 F. Supp. 744, 749 n.3 (Ct. Int'l Trade 1990), aff'd, 938 F.2d 1278 (Fed. Cir. 1991) ("every like product determination 'must be made on the particular record at issue' and the 'unique facts of each case'"). The Commission generally considers a number of factors including the following: (1) physical characteristics and uses; (2) interchangeability; (3) channels of distribution; (4) customer and producer perceptions of the products; (5) common manufacturing facilities, production processes, and production employees; and, where appropriate, (6) price. *See Nippon*, 19 CIT at 455 n.4; *Timken Co. v. United States*, 913 F. Supp. 580, 584 (Ct. Int'l Trade 1996).

[13] *See*, *e.g.*, S. Rep. No. 96-249 at 90-91 (1979).

[14] *See*, *e.g.*, *Nippon*, 19 CIT at 455; *Torrington*, 747 F. Supp. at 748-49*; see also* S. Rep. No. 96-249 at 90-91 (Congress has indicated that the like product standard should not be interpreted in "such a narrow fashion as to permit minor differences in physical characteristics or uses to lead to the conclusion that the product and article are not 'like' each other, nor should the definition of 'like product' be interpreted in such a fashion as to prevent consideration of an industry adversely affected by the imports under consideration.").

[15] *See*, *e.g.*, *USEC, Inc. v. United States*, 34 Fed. App'x 725, 730 (Fed. Cir. 2002) ("The ITC may not modify the class or kind of imported merchandise examined by Commerce."); *Algoma Steel Corp. v. United States,* 688 F. Supp. 639, 644 (Ct. Int'l Trade 1988), *aff'd*, 865 F.3d 240 (Fed. Cir.), *cert. denied*, 492 U.S. 919 (1989).

[16] *Hosiden Corp. v. Advanced Display Mfrs.,* 85 F.3d 1561, 1568 (Fed. Cir. 1996) (the Commission may find a single like product corresponding to several different classes or kinds defined by Commerce); *Cleo*, 501 F.3d at 1298 n.1 ("Commerce's {scope} finding does not control the Commission's {like product} determination."); *Torrington*, 747 F. Supp. at 748-52 (affirming the Commission's determination defining six like products in investigations where Commerce found five classes or kinds).

> Merchandise covered by the scope of this investigation is currently classified in the Harmonized Tariff Schedule of the United States ("HTSUS") at subheading 2903.39.2020. Although the HTSUS subheading and CAS registry number are provided for convenience and customs purposes, the written description of the scope is dispositive.[17]

R-134a is used predominantly as a refrigerant in air conditioning systems. It is a clear, colorless liquid or gas that is relatively nontoxic and nonflammable.[18] R-134a is the primary refrigerant used in automotive air conditioning systems and is also used in domestic and commercial refrigeration, as a propellant in aerosol cans, for foam-blowing of building insulation, and in pharmaceutical uses such as asthma inhalers.[19]

Petitioners argue that the Commission should define a single domestic like product consisting of R-134a that is coextensive with Commerce's scope.[20] Respondents state that for the purposes of the preliminary phase investigation, they agree with petitioners' definition of the domestic like product.[21] For the reasons below, we define a single domestic like product consisting of R-134a that is coextensive with Commerce's scope.

Physical Characteristics and Uses. All R-134a has the same chemical composition and is produced to the same specifications.[22] The majority of domestically produced R-134a is used as a refrigerant; less prominent uses are as a propellant and in pharmaceutical applications. Some R-134a is also used in hydrofluorocarbon blends to make other products, including other refrigerants.[23] R-134a that is used in pharmaceutical applications requires greater purification than standard R-134a and requires chain of custody documentation.[24]

Manufacturing Facilities, Production Processes and Employees. There are multiple methods for producing R-134a. All methods of R-134a production involve reacting hydrogen fluoride with a compound containing carbon and chlorine.[25] The primary raw materials used in

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[17] *1, 1, 1, 2-Tetrafluoroethane From the People's Republic of China: Initiation of Less Than Fair Value Investigation*, 81 Fed. Reg. 18830 (April 1, 2016) ("Commerce Notice of Initiation"). A footnote to the scope definition states that "1,1,1,2-Tetrafluoroethane is sold under a number of trade names including Klea 134a and Zephex 134a (Mexichem Fluor); Genetron 134a (Honeywell); Freon™ 134a, Suva 134a, Dymel 134a, and Dymel P134a (Chemours); Solkane 134a (Solvay); and Forane 134a (Arkema). Generically, 1,1,1,2-Tetrafluoroethane has been sold as Fluorocarbon 134a, R-134a, HFC-134a, HF A-134a, Refrigerant 134a, and UN3159."

[18] CR at I-9, PR at I-6.

[19] CR at I-21, PR at I-14.

[20] Petitioners' Postconference Br. at 5.

[21] Tr. at 141 (Schutzman).

[22] CR at I-9 and II-17, PR at I-7 and II-11.

[23] CR at I-21, PR at I-14.

[24] CR at I-21, PR at I-14.

[25] CR at I-9, PR at I-7.

the production of R-134a are hydrogen fluoride, which is made from fluorspar, and trichloroethylene or perchloroethylene.[26]

Channels of Distribution. All domestically produced R-134a is sold through similar channels of distribution in all regions of the United States.[27] Domestic producers sell primarily to end users and distributors and reported sales in all segments of the U.S. market.[28]

Interchangeability. All R-134a is interchangeable for refrigeration purposes. Substitutes for R-134a are limited because refrigeration systems are designed for use with a specific refrigerant and the system must be redesigned and retooled before it can be operated with any other refrigerant.[29] R-134a is preferred as a propellant in aerosol cans, foam blowing of building insulation, and in pharmaceutical uses due to its nontoxicity, nonflammability and other physical characteristics. When used as a propellant for pharmaceutical purposes, standard R-134a must be further purified.[30]

Producer and Customer Perceptions. Petitioners assert that producers and customers perceive all R-134a to be essentially the same product.[31]

Price. Information on the record indicates that prices for the different domestically produced pricing products with the same packaging were similar. Bulk R-134a was generally less expensive on a per-pound basis than R-134a in smaller packages.[32]

Conclusion. Evidence on the record of this preliminary phase investigation indicates that all domestically produced R-134a shares the same physical characteristics and general uses. All R-134a is made from the same raw materials, is produced using similar chemical reactions, and is predominantly used for refrigeration purposes. R-134a is sold through similar channels of distribution. In light of the above and the lack of any contrary argument, we define a single domestic like product that is coextensive with Commerce's scope for purposes of this preliminary determination.

IV. Domestic Industry

The domestic industry is defined as the domestic "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[33] In defining the domestic industry, the Commission's general practice has been to include in the industry producers of all domestic production of the like product, whether toll-produced, captively consumed, or sold in the domestic merchant market.

[26] CR at V-1, PR at V-1.
[27] CR at II-4, PR at II-3.
[28] CR at II-4, PR at II-2.
[29] CR at I-17, PR at II-11.
[30] CR at I-21, PR at II-14.
[31] CR at II-17, PR at II-11.
[32] *See* CR/PR at Tables V-3-7.
[33] 19 U.S.C. § 1677(4)(A).

Petitioners argue that there is a single domestic industry consisting of all producers of R-134a.[34] Respondents state that they agree with petitioners' definition of the domestic industry for the purposes of the preliminary phase investigation.[35] There are three domestic producers of R-134a: The Chemours Company FC LLC ("Chemours"), Mexichem Fluor Inc. ("Mexichem"), and Arkema Inc. ("Arkema"). There are no related party issues in this investigation. Therefore, and in light of our domestic like product definition, we define the domestic industry to include all domestic producers of R-134a.

V. Negligible Imports

Pursuant to Section 771(24) of the Tariff Act, imports from a subject country of merchandise corresponding to a domestic like product that account for less than 3 percent of all such merchandise imported into the United States during the most recent 12 months for which data are available preceding the filing of the petition shall be deemed negligible.[36]

Available data, based on adjusted import statistics, indicate that subject imports from China exceed the requisite 3 percent statutory negligibility threshold. During calendar year 2015, which is the most recent 12-month period prior to the filing of the petition for which data are available, imports from China accounted for *** percent of total imports of R-134a by quantity.[37] We consequently find that imports from China are not negligible.

VI. Reasonable Indication of Material Injury by Reason of Subject Imports

A. Legal Standard

In the preliminary phase of antidumping and countervailing duty investigations, the Commission determines whether there is a reasonable indication that an industry in the United States is materially injured or threatened with material injury by reason of the imports under investigation.[38] In making this determination, the Commission must consider the volume of subject imports, their effect on prices for the domestic like product, and their impact on domestic producers of the domestic like product, but only in the context of U.S. production operations.[39] The statute defines "material injury" as "harm which is not inconsequential,

[34] Petitioners' Postconference Br. at 5.

[35] *See* Tr. at 141 (Schutzman).

[36] 19 U.S.C. §§ 1671b(a), 1673b(a), 1677(24)(A)(i), 1677(24)(B); *see also* 15 C.F.R. § 2013.1 (developing countries for purposes of 19 U.S.C. § 1677(36)).

[37] CR at IV-6, PR at IV-4.

[38] 19 U.S.C. §§ 1671b(a), 1673b(a). The Trade Preferences Extension Act of 2015, Pub. L. 114-27, amended the provisions of the Tariff Act pertaining to Commission determinations of reasonable indication of material injury and threat of material injury by reason of subject imports in certain respects. We have applied these amendments here.

[39] 19 U.S.C. § 1677(7)(B). The Commission "may consider such other economic factors as are relevant to the determination" but shall "identify each {such} factor ... {a}nd explain in full its relevance to the determination." 19 U.S.C. § 1677(7)(B).

immaterial, or unimportant."[40] In assessing whether there is a reasonable indication that the domestic industry is materially injured by reason of subject imports, we consider all relevant economic factors that bear on the state of the industry in the United States.[41] No single factor is dispositive, and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[42]

Although the statute requires the Commission to determine whether there is a reasonable indication that the domestic industry is "materially injured by reason of" unfairly traded imports,[43] it does not define the phrase "by reason of," indicating that this aspect of the injury analysis is left to the Commission's reasonable exercise of its discretion.[44] In identifying a causal link, if any, between subject imports and material injury to the domestic industry, the Commission examines the facts of record that relate to the significance of the volume and price effects of the subject imports and any impact of those imports on the condition of the domestic industry. This evaluation under the "by reason of" standard must ensure that subject imports are more than a minimal or tangential cause of injury and that there is a sufficient causal, not merely a temporal, nexus between subject imports and material injury.[45]

In many investigations, there are other economic factors at work, some or all of which may also be having adverse effects on the domestic industry. Such economic factors might include nonsubject imports; changes in technology, demand, or consumer tastes; competition among domestic producers; or management decisions by domestic producers. The legislative history explains that the Commission must examine factors other than subject imports to ensure that it is not attributing injury from other factors to the subject imports, thereby inflating an otherwise tangential cause of injury into one that satisfies the statutory material injury threshold.[46] In performing its examination, however, the Commission need not isolate

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[40] 19 U.S.C. § 1677(7)(A).

[41] 19 U.S.C. § 1677(7)(C)(iii).

[42] 19 U.S.C. § 1677(7)(C)(iii).

[43] 19 U.S.C. §§ 1671b(a), 1673b(a).

[44] *Angus Chemical Co. v. United States*, 140 F.3d 1478, 1484-85 (Fed. Cir. 1998) ("{T}he statute does not 'compel the commissioners' to employ {a particular methodology}."), *aff'g* 944 F. Supp. 943, 951 (Ct. Int'l Trade 1996).

[45] The Federal Circuit, in addressing the causation standard of the statute, has observed that "{a}s long as its effects are not merely incidental, tangential, or trivial, the foreign product sold at less than fair value meets the causation requirement." *Nippon Steel Corp. v. USITC*, 345 F.3d 1379, 1384 (Fed. Cir. 2003). This was re-affirmed in *Mittal Steel Point Lisas Ltd. v. United States*, 542 F.3d 867, 873 (Fed. Cir. 2008), in which the Federal Circuit, quoting *Gerald Metals, Inc. v. United States*, 132 F.3d 716, 722 (Fed. Cir. 1997), stated that "this court requires evidence in the record 'to show that the harm occurred "by reason of" the LTFV imports, not by reason of a minimal or tangential contribution to material harm caused by LTFV goods.'" *See also Nippon Steel Corp. v. United States*, 458 F.3d 1345, 1357 (Fed. Cir. 2006); *Taiwan Semiconductor Industry Ass'n v. USITC*, 266 F.3d 1339, 1345 (Fed. Cir. 2001).

[46] SAA, H.R. Rep. 103-316, Vol. I at 851-52 (1994) ("{T}he Commission must examine other factors to ensure that it is not attributing injury from other sources to the subject imports."); S. Rep. 96-249 at 75 (1979) (the Commission "will consider information which indicates that harm is caused by factors other than less-than-fair-value imports."); H.R. Rep. 96-317 at 47 (1979) ("in examining the overall injury being experienced by a domestic industry, the ITC will take into account evidence presented to it which (Continued…)

the injury caused by other factors from injury caused by unfairly traded imports.[47] Nor does the "by reason of" standard require that unfairly traded imports be the "principal" cause of injury or contemplate that injury from unfairly traded imports be weighed against other factors, such as nonsubject imports, which may be contributing to overall injury to an industry.[48] It is clear that the existence of injury caused by other factors does not compel a negative determination.[49]

Assessment of whether material injury to the domestic industry is "by reason of" subject imports "does not require the Commission to address the causation issue in any particular way" as long as "the injury to the domestic industry can reasonably be attributed to the subject imports" and the Commission "ensure{s} that it is not attributing injury from other sources to the subject imports."[50] [51] Indeed, the Federal Circuit has examined and affirmed various Commission methodologies and has disavowed "rigid adherence to a specific formula."[52]

(…Continued)
demonstrates that the harm attributed by the petitioner to the subsidized or dumped imports is attributable to such other factors;" those factors include "the volume and prices of nonsubsidized imports or imports sold at fair value, contraction in demand or changes in patterns of consumption, trade restrictive practices of and competition between the foreign and domestic producers, developments in technology and the export performance and productivity of the domestic industry"); *accord Mittal Steel*, 542 F.3d at 877.

[47] SAA at 851-52 ("{T}he Commission need not isolate the injury caused by other factors from injury caused by unfair imports."); *Taiwan Semiconductor Industry Ass'n* , 266 F.3d at 1345. ("{T}he Commission need not isolate the injury caused by other factors from injury caused by unfair imports ... . Rather, the Commission must examine other factors to ensure that it is not attributing injury from other sources to the subject imports." (emphasis in original)); *Asociacion de Productores de Salmon y Trucha de Chile AG v. United States*, 180 F. Supp. 2d 1360, 1375 (Ct. Int'l Trade 2002) ("{t}he Commission is not required to isolate the effects of subject imports from other factors contributing to injury" or make "bright-line distinctions" between the effects of subject imports and other causes.); *see also Softwood Lumber from Canada*, Inv. Nos. 701-TA-414 and 731-TA-928 (Remand), USITC Pub. 3658 at 100-01 (Dec. 2003) (Commission recognized that "{i}f an alleged other factor is found not to have or threaten to have injurious effects to the domestic industry, *i.e*., it is not an 'other causal factor,' then there is nothing to further examine regarding attribution to injury"), *citing Gerald Metals,* 132 F.3d at 722 (the statute "does not suggest that an importer of LTFV goods can escape countervailing duties by finding some tangential or minor cause unrelated to the LTFV goods that contributed to the harmful effects on domestic market prices.").

[48] S. Rep. 96-249 at 74-75; H.R. Rep. 96-317 at 47.

[49] *See Nippon*, 345 F.3d at 1381 ("an affirmative material-injury determination under the statute requires no more than a substantial-factor showing. That is, the 'dumping' need not be the sole or principal cause of injury.").

[50] *Mittal Steel*, 542 F.3d at 877-78; *see also id.* at 873 ("While the Commission may not enter an affirmative determination unless it finds that a domestic industry is materially injured 'by reason of' subject imports, the Commission is not required to follow a single methodology for making that determination ... {and has} broad discretion with respect to its choice of methodology.") *citing United States Steel Group v. United States*, 96 F.3d 1352, 1362 (Fed. Cir. 1996) and S. Rep. 96-249 at 75. In its decision in *Swiff-Train v. United States*, 792 F.3d 1355 (Fed. Cir. 2015), the Federal Circuit affirmed the Commission's causation analysis as comporting with the Court's guidance in *Mittal*.

The Federal Circuit's decisions in *Gerald Metals*, *Bratsk,* and *Mittal Steel* all involved cases in which the relevant "other factor" was the presence in the market of significant volumes of price-competitive nonsubject imports. The Commission interpreted the Federal Circuit's guidance in *Bratsk* as requiring it to apply a particular additional methodology following its finding of material injury in cases involving commodity products and a significant market presence of price-competitive nonsubject imports.[53] The additional "replacement/benefit" test looked at whether nonsubject imports might have replaced subject imports without any benefit to the U.S. industry. The Commission applied that specific additional test in subsequent cases, including the *Carbon and Certain Alloy Steel Wire Rod from Trinidad and Tobago* determination that underlies the *Mittal Steel* litigation.

Mittal Steel clarifies that the Commission's interpretation of *Bratsk* was too rigid and makes clear that the Federal Circuit does not require the Commission to apply an additional test nor any one specific methodology; instead, the court requires the Commission to have "evidence in the record 'to show that the harm occurred 'by reason of' the LTFV imports,'" and requires that the Commission not attribute injury from nonsubject imports or other factors to subject imports.[54] Accordingly, we do not consider ourselves required to apply the replacement/benefit test that was included in Commission opinions subsequent to *Bratsk*.

The progression of *Gerald Metals*, *Bratsk*, and *Mittal Steel* clarifies that, in cases involving commodity products where price-competitive nonsubject imports are a significant

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(…Continued)

[51] Vice Chairman Pinkert and Commissioner Kieff do not join this paragraph or the following three paragraphs. They point out that the Federal Circuit, in *Bratsk*, 444 F.3d 1369, and *Mittal Steel*, held that the Commission is *required*, in certain circumstances when analyzing present material injury, to consider a particular issue with respect to the role of nonsubject imports, without reliance upon presumptions or rigid formulas. The Court has not prescribed a specific method of exposition for this consideration. *Mittal Steel* explains as follows:

> What *Bratsk* held is that "where commodity products are at issue and fairly traded, price competitive, non-subject imports are in the market," the Commission would not fulfill its obligation to consider an important aspect of the problem if it failed to consider whether non-subject or non-LTFV imports would have replaced LTFV subject imports during the period of investigation without a continuing benefit to the domestic industry. 444 F.3d at 1369. Under those circumstances, *Bratsk* requires the Commission to consider whether replacement of the LTFV subject imports might have occurred during the period of investigation, and it requires the Commission to provide an explanation of its conclusion with respect to that factor.

542 F.3d at 878.

[52] *Nucor Corp. v. United States*, 414 F.3d 1331, 1336, 1341 (Fed. Cir. 2005); *see also Mittal Steel*, 542 F.3d at 879 ("*Bratsk* did not read into the antidumping statute a Procrustean formula for determining whether a domestic injury was 'by reason' of subject imports.").

[53] *Mittal Steel*, 542 F.3d at 875-79.

[54] *Mittal Steel*, 542 F.3d at 873 (quoting from *Gerald Metals*, 132 F.3d at 722), 875-79 & n.2 (recognizing the Commission's alternative interpretation of *Bratsk* as a reminder to conduct a non-attribution analysis).

factor in the U.S. market, the Court will require the Commission to give full consideration, with adequate explanation, to non-attribution issues when it performs its causation analysis.[55]

The question of whether the material injury threshold for subject imports is satisfied notwithstanding any injury from other factors is factual, subject to review under the substantial evidence standard.[56] Congress has delegated this factual finding to the Commission because of the agency's institutional expertise in resolving injury issues.[57]

B. Conditions of Competition and the Business Cycle

The following conditions of competition inform our analysis of whether there is a reasonable indication of material injury by reason of subject imports.

1. Demand Conditions

Demand for R-134a is derived from demand for its end uses, the largest of which is air conditioning systems, particularly automotive air conditioning systems.[58] Other end uses for R-134a are as a propellant in aerosol cans, as a foam expansion agent, and in pharmaceutical applications such as asthma inhalers.[59] The automotive air conditioning replacement aftermarket comprises approximately 70 to 80 percent of the overall automotive air conditioning refrigerant market.[60] R-134a is also used to a lesser extent by original equipment manufacturers ("OEMs") of both automotive and stationary air conditioning systems.[61] However, U.S. Environmental Protection Agency regulations require that all automobile OEMs shift from R-134a to the next generation of refrigerants by 2021. While this will ultimately lead to a shrinking OEM market for R-134a, the parties agree that the automotive aftermarket for R-

[55] To that end, after the Federal Circuit issued its decision in *Bratsk*, the Commission began to present published information or send out information requests in the final phase of investigations to producers in nonsubject countries that accounted for substantial shares of U.S. imports of subject merchandise (if, in fact, there were large nonsubject import suppliers). In order to provide a more complete record for the Commission's causation analysis, these requests typically seek information on capacity, production, and shipments of the product under investigation in the major source countries that export to the United States. The Commission plans to continue utilizing published or requested information in the final phase of investigations in which there are substantial levels of nonsubject imports.

[56] We provide in the discussions below a full analysis of other factors alleged to have caused any material injury experienced by the domestic industry.

[57] *Mittal Steel*, 542 F.3d at 873; *Nippon Steel Corp*., 458 F.3d at 1350, *citing U.S. Steel Group*, 96 F.3d at 1357; S. Rep. 96-249 at 75 ("The determination of the ITC with respect to causation is ... complex and difficult, and is a matter for the judgment of the ITC.").

[58] CR at II-10, PR at II-6.

[59] CR at II-11, PR at II-6.

[60] CR at II-10, PR at II-7.

[61] CR at II-10, PR at II-7.

134a will not be immediately affected.[62]

Petitioners and respondents agree that U.S. demand for R-134a was *** during the 2013-2015 period of investigation ("POI").[63] They also agree that demand for R-134a is seasonal and highest during the warmer months.[64] Apparent U.S. consumption of R-134a declined from *** short tons in 2013 to *** short tons in 2014 and *** short tons in 2015.[65]

2. Supply Conditions

The domestic industry supplied the majority of R-134a to the U.S. market but lost market share over the POI. Subject imports supplied most of the remainder of the U.S. market and gained market share over the POI. Nonsubject imports had a minimal presence in the U.S. market throughout most of the POI.[66] The main segments of the R-134a market include the automotive OEM and aftermarket, stationary OEM and aftermarket, foam expansion and propellants, and other uses, which include refrigerant blends and miscellaneous applications.[67]

U.S. producers' U.S. shipments accounted for *** percent of apparent U.S. consumption in 2013, *** percent in 2014, and *** percent in 2015.[68] Domestically produced R-134a was sold in all market segments throughout the POI, but the domestic industry lost market share in virtually all segments between 2013 and 2015.[69] All three domestic producers reported that they shut down their production facilities at least once during the POI to conduct scheduled

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[62] CR at II-13, PR at II-9; Respondents' Postconference Br. at 8. In any final phase investigation, we intend to explore further any effects that regulations requiring the shift from R-134a to the next generation of refrigerant have had on U.S. demand for R-134a.

[63] Tr. at 32 (Geosits), 37 and 60-61 (Sassano); Respondents' Postconference Br. at 7.

[64] Petitioners' Postconference Br. at 10; Respondents' Postconference Br. at 8.

[65] CR/PR at Table IV-3. We note that the import data used in our analysis, including in the apparent consumption figures, were calculated using official U.S. import statistics that have been adjusted using questionnaire data for R-134a imported under HTS statistical reporting numbers other than 2903.39.2020. The use of both official import statistics and questionnaire data comports with the request in the petition that the Commission ask importers to report in their questionnaire responses any R-134a that entered the United States under HTS numbers other than 2903.39.2020 (and were therefore misclassified) and use these data when calculating subject import volume. Petition at 18. HTS heading 2903.39.2020 was created in 2009 for R-134a, and Petitioners assert that importers continue to import R-134a under the HTS headings in use prior to 2009.

Petitioners subsequently argued that the data concerning subject import volume, and hence apparent consumption, are still understated, and that ship manifest data and Chinese export statistics indicate that actual subject import volume is greater than that presented in the Commission report. Tr. at 115 (Cannon), Petitioners' Postconference Br. at 16-18. In any final phase investigation, we will attempt to obtain more complete importer data coverage.

[66] CR/PR at Table IV-3.

[67] CR at II-2, PR at II-1.

[68] CR/PR at Table IV-6.

[69] CR/PR at Table IV-6. The only market segment where domestic producers did not lose market share over the POI was in the "other" segment.

routine maintenance ("turnaround").[70] One domestic producer, ***, indicated that it had a scheduled turnaround in ***.[71] The domestic producers indicated that they build up inventory prior to any scheduled turnaround to enable uninterrupted supply,[72] but ***.[73]

As discussed earlier, R-134a from China was subject to antidumping and countervailing duty investigations from 2013 to 2014. As a result of these investigations, imports of R-134a from China were subject to provisional countervailing duties from April 18, 2014 through December 9, 2014,[74] and to provisional antidumping duties from May 29, 2014 through December 9, 2014.[75] The provisional duties were no longer collected after December 9, 2014, when the Commission issued negative determinations in those investigations.[76] Subject imports as a share of apparent U.S. consumption were *** percent in 2013, *** percent in 2014, and *** percent in 2015.[77] As discussed in more detail below, subject imports had some presence in all market segments over the POI as a whole, and were concentrated in the automotive aftermarket, the stationary aftermarket, and the "other" segment.[78]

Nonsubject imports' share of apparent U.S. consumption was *** percent in 2013, *** percent in 2014, and *** percent in 2015.[79] The majority of nonsubject imports were sold in the automotive aftermarket.[80]

3. Substitutability and Other Conditions

We find that there is a high degree of substitutability between subject imports and the domestic like product. The majority of domestic producers and importers reported that U.S.-produced R-134a was "always" or "frequently" interchangeable with R-134a from China.[81] *** responding domestic producers stated that they were "always" interchangeable, and *** responding producer stated that they were "frequently" interchangeable. *** responding importers stated that they were "always" interchangeable, and *** stated they were "frequently" interchangeable.[82]

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[70] Petitioners' Postconference Br. at Exh. 1-1-2; Tr. at 95 (Pacillo), 103 (Sassano).

[71] Petitioners' Postconference Br. at Exh. 1-6.

[72] Tr. at 77 (Sassano).

[73] Petitioners' Postconference Br. at 22; Tr. at 103-104 (Sassano).

[74] 2014 Commerce Preliminary CVD Determination, 79 Fed. Reg. at 21895; 2014 ITC Notice of Determination, 79 Fed. Reg. at 73102.

[75] 2014 Commerce Preliminary AD Determination, 79 Fed. Reg. at 30817; 2014 ITC Notice of Determination, 79 Fed. Reg. at 73102.

[76] *See* 2014 ITC Notice of Determination, 79 Fed. Reg. at 73102; *see also 2014 R-134a Determinations*, USITC Pub. 4503 at 5-6.

[77] CR/PR at Table IV-3.

[78] CR/PR at Table IV-4.

[79] CR/PR at Table IV-3.

[80] CR/PR at Table IV-5. Nonsubject imports were present in all market segments except *** market. The volume of nonsubject imports in the *** market was extremely small (***). *Id*.

[81] CR/PR at Table II-5.

[82] CR/PR at Table II-5.

The record indicates that price is an important factor in purchasing decisions. In responses to the lost sales and lost revenue survey, purchasers most frequently cited price, quality/purity, and availability/supply as the factors affecting their purchasing decisions.[83] They most frequently cited price as the most important purchasing factor.[84] All *** responding purchasers listed price as among the top three purchasing factors in their purchasing decisions.[85]

Domestic producers sold R-134a primarily to end users and distributors, while importers sold primarily to distributors with some sales to retailers.[86] The automotive aftermarket, which is almost twice as large as the automotive OEM market, is primarily served by distributors, some of which also serve the HVAC aftermarket.[87]

The principal raw materials used in the production of R-134a are hydrogen fluoride and trichloroethylene or perchloroethylene. U.S. producers' ratio of raw materials to the total cost of goods sold ("COGS") decreased from *** percent in 2013 to *** percent in 2015.[88] The record contains mixed information regarding raw material costs. Of the three domestic producers, ***. Nine of 23 responding importers reported no change in raw material costs, six reported declining raw material costs, and seven reported fluctuating raw material costs.[89]

C. Volume of Subject Imports

Section 771(7)(C)(i) of the Tariff Act provides that the "Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States, is significant."[90]

Subject import volume declined from *** short tons in 2013 to *** short tons in 2014, and then increased to *** short tons in 2015.[91] As explained above, imports of R-134a from China were subject to provisional duties during a substantial portion of 2014. Subject imports declined in 2014, when provisional duties were in place, and increased sharply in 2015 to virtually the same volume reported in 2013.

Despite the overall slight decrease in the volume of subject imports between 2013 and 2015, the market share held by subject imports increased from *** percent in 2013 to *** percent in 2015 as demand declined.[92] The increase in subject import market share was at the expense of the domestic industry, which lost *** percentage points of market share from 2013 to 2015.[93] The majority of subject imports during this period were shipped to the automotive

[83] CR/PR at Table II-5.
[84] CR/PR at Table II-4.
[85] CR/PR at Table II-4.
[86] CR/PR at Table II-1.
[87] CR/PR at II-1.
[88] CR/PR at V-1.
[89] CR/PR at V-1.
[90] 19 U.S.C. § 1677(7)(C)(i).
[91] CR/PR at Table IV-2.
[92] CR/PR at Table IV-3.
[93] CR/PR at Table IV-3.

refrigerant aftermarket segment. In this segment, as in the U.S. market as a whole, the quantity of subject imports declined from 2013 to 2015 but their market share increased from *** percent to *** percent. The subject imports also gained substantial market share in the stationary aftermarket segment during the POI.[94] Additionally, subject imports entered the foam expansion and propellant market segments *** in 2015.[95] Consequently, the subject imports were present in all segments of the U.S. market in 2015.

While subject imports declined in 2014, when provisional duties were in place, they nonetheless gained market share over the whole POI at the expense of domestic producers. Thus, we find that the volume of subject imports was significant, both in absolute terms and relative to consumption in the United States.

D. Price Effects of the Subject Imports

Section 771(7)(C)(ii) of the Tariff Act provides that, in evaluating the price effects of subject imports, the Commission shall consider whether –

> (I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and
>
> (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.[96]

As discussed above, the record indicates there is a high degree of substitutability between subject imports and domestically produced R-134a and that price is an important factor in purchasing decisions. All three domestic producers and 18 importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters.[97] Reported pricing data accounted for approximately *** percent of U.S. producers' commercial shipments and *** percent of U.S. commercial shipments of subject imports in 2015.[98]

Over the POI, subject imports undersold the domestic like product in 36 of 59 quarterly comparisons at margins ranging from *** percent.[99] By volume, 24.5 million pounds of subject

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[94] Subject imports' share of the stationary aftermarket was *** percent in 2013, *** percent in 2014, and *** percent in 2015, whereas the share of the stationary aftermarket held by the domestic industry was *** percent in 2013, *** percent in 2014, and *** percent in 2015. CR/PR at Table IV-6.

[95] CR/PR at Table IV-4.

[96] 19 U.S.C. § 1677(7)(C)(ii).

[97] CR at V-5, PR at V-4. The pricing products are Product 1 -- R-134a in bulk sold to repackagers and distributors; Product 2 -- R-134a in 30-pound containers with an automotive valve sold to distributors; Product 3 -- R-134a in 30-pound containers with an HVAC valve sold to distributors or wholesalers; Product 4 -- R-134a 30-pound containers with an automotive valve sold to retailers; and Product 5 -- R-134a in 12-ounce containers sold to distributors. *Id.*

[98] CR at V-5-6, PR at V-4.

[99] CR/PR at Table V-9.

imports were involved in underselling comparisons, and 12.3 million pounds of subject imports were involved in overselling comparisons. Underselling was especially prevalent in 2015, after provisional duties were no longer assessed. In 2015, subject imports undersold the domestic like product in *** quarterly comparisons at margins ranging from *** percent.[100] There was underselling for ***.[101] During 2015, *** pounds of subject imports were involved in underselling comparisons,[102] while only *** pounds of subject imports were involved in overselling comparisons for pricing product 3.[103]

We have also examined data on the record pertaining to direct imports. Seven importers reported direct imports of bulk R-134a from China for internal use or repackaging during the POI.[104] Importers also reported the factors that add to the cost of directly importing R-134a.[105] Even taking into account the additional costs the importers assumed with direct importing, the record indicates that the reported prices for direct imports were generally lower than prices charged by U.S. producers.[106]

Consequently, we find that there has been significant underselling by the subject imports.

Prices for the domestically produced pricing products declined overall by 0.3 to 23.0 percent from January 2013 to December 2015, though there were some fluctuations. Prices for subject imports declined by 15.0 to 62.4 percent, with the exception of prices for pricing product 3, which showed an increase of *** percent over the period.[107]

We find that the domestic industry's price trends are related to the presence of low-priced subject imports. Specifically, when subject import volume decreased in 2014, prices for the domestic like product increased. Some market participants reported that prices were highest in the third quarter of 2014. Prices for three of the five pricing products peaked during the fourth quarter of 2014.[108] However, in 2015, when subject import volume increased, prices for the domestic like product declined, in most cases to levels lower than in 2013.[109]

Evidence on the record concerning lost sales and lost revenue allegations further supports a finding that domestic producers cut prices due to competition from low-priced subject imports. Nine of 19 responding purchasers reported that U.S. producers had reduced prices to compete with lower-priced subject imports. These purchasers estimated that the price reductions ranged from *** percent and indicated that prices declined sharply after the Commission's negative injury determinations in the 2014 investigations of R-134a from

[100] Compiled from CR/PR at Tables V-3-7.
[101] CR/PR at Tables V-3-7.
[102] Compiled from CR/PR at Tables V-3-7.
[103] CR/PR at Table V-5.
[104] CR at V-17, PR at V-11.
[105] CR at V-20, PR at V-12.
[106] *See* CR/PR at Table V-10.
[107] CR/PR at Table V-8.
[108] CR/PR at Tables V-3, V-5, V-6.
[109] CR/PR at Tables V-3-7. Market participants reported that within hours after the negative injury determinations in the 2014 R-134a investigations, their customers began to call and cancel orders or demand rebates and that this impacted their sales in 2015. Tr. at 69 (Haun).

China.[110] Eight responding purchasers also reported shifting purchases from domestic product to subject imports, and seven reported that price was the reason.[111]

Consequently, for purposes of this preliminary determination, we find that subject imports had significant price depressing effects. In light of our findings of significant underselling and significant price depression, we conclude for purposes of this preliminary determination that subject imports had significant price effects.

E. Impact of the Subject Imports[112]

Section 771(7)(C)(iii) of the Tariff Act provides that the Commission, in examining the impact of the subject imports on the domestic industry, "shall evaluate all relevant economic factors which have a bearing on the state of the industry." These factors include output, sales, inventories, capacity utilization, market share, employment, wages, productivity, gross profits, net profits, operating profits, cash flow, return on investment, return on capital, ability to raise capital, ability to service debt, research and development, and factors affecting domestic prices. No single factor is dispositive and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[113]

Most indicators of the domestic industry's performance declined over the POI. Declines were most apparent from 2014 to 2015, when subject import volume and market penetration increased sharply.

The domestic industry's capacity declined from *** short tons in 2013 to *** short tons in 2014 and *** short tons in 2015.[114] Production also declined from *** short tons in 2013 to *** short tons in 2014 and *** short tons in 2015. Capacity utilization rose from *** percent in 2013 to *** percent in 2014, then declined to a period low of *** percent in 2015.[115] Commercial U.S. shipments of the domestic like product were *** short tons in 2013, increased to *** short tons in 2014 when subject imports decreased, and declined to a period low of *** short tons in 2015.[116] End of period inventories declined from *** short tons in 2013 to *** short tons in 2014, and then increased to a period high of *** short tons in 2015.[117] The domestic industry's share of apparent consumption was *** percent in 2013 and *** percent in 2014, but then declined to *** percent in 2015.[118]

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[110] CR at V-24-25, PR at V-14; CR/PR at Table V-13.

[111] CR at V-23; PR at V-13.

[112] In its notice initiating the antidumping duty investigation on R-134a from China, Commerce reported estimated antidumping duty margins of 153.68 to 220.87 percent. Commerce Notice of Initiation, 81 Fed. Reg. at 18833.

[113] 19 U.S.C. § 1677(7)(C)(iii). This provision was recently amended by the Trade Preferences Extension Act of 2015, Pub. L. 114-27.

[114] CR/PR at Table III-4.

[115] CR/PR at Table III-4.

[116] CR/PR at Table III-5.

[117] CR/PR at Table III-7.

[118] CR/PR at Table IV-3.

The data concerning domestic industry employment are mixed. The number of production related workers increased from *** in 2013 to *** in 2014 and 2015. Total hours worked increased from *** in 2013 to *** in 2014, and then declined to a period low of *** in 2015. Hours worked per worker decreased from 2013 to 2015 by *** percent, total wages increased by *** percent, and productivity decreased by *** percent.[119]

The domestic industry's overall financial performance declined sharply over the POI. The quantity of net sales declined from *** short tons in 2013 to *** short tons in 2014 and *** short tons in 2015. The value of net sales decreased from $*** in 2013 to $*** in 2014 and $*** in 2015.[120] The domestic industry's costs declined less rapidly than revenues, and its ratio of COGS to net sales increased from *** percent in 2013 to *** percent in 2014 and *** percent in 2015. As a result, the industry's gross profits declined from $*** in 2013 to $*** in 2014 and $*** in 2015.[121] Similarly, the industry's operating income declined from $*** in 2013 to $*** in 2014 and *** in 2015.[122] The domestic industry's ratio of operating income to net sales declined from *** percent in 2013 to *** percent in 2014 and *** in 2015.[123] Its net income declined from $*** in 2013 to *** in 2014 and *** in 2015.[124] Research and development expenses declined each year.[125] However, capital expenditures increased over the POI from $*** in 2013 to $*** in 2014 and $*** in 2015.[126]

Respondents argue that the declines in the domestic industry's capacity and production in 2015 were due to ***, which ***.[127] The record indicates that ***.[128] We acknowledge that ***.[129]

We find that the record of this preliminary phase investigation indicates that the subject imports had negative effects on the domestic industry. As previously discussed, the significant volume of low-priced subject imports undersold the domestic like product and had significant price depressing effects. The underselling and price depression were particularly pronounced during 2015, when subject import volume increased and the subject imports took market share from the domestic industry. As a result of lower prices and lost market share, the domestic industry's revenues were worse than they would have been otherwise, leading to a poor and declining financial performance. We consequently find that the subject imports had a significant impact on the domestic industry.

We have also considered whether there are other factors that may have had an adverse impact on the domestic industry during the POI to ensure that we are not attributing injury from such other factors to the subject imports. Respondents argue that the domestic industry

[119] CR/PR at Table III-9.
[120] CR/PR at Table VI-1.
[121] CR/PR at Table VI-1.
[122] CR/PR at Table VI-1.
[123] CR/PR at Table VI-1.
[124] CR/PR at Table VI-1.
[125] CR/PR at Table VI-3.
[126] CR/PR at Table VI-3.
[127] Respondents' Postconference Br. at 30.
[128] Petitioners' Postconference Br. at Exh. 1-2-4.
[129] CR/PR at Table F-1. In any final investigation, we encourage parties to comment on how ***.

experienced supply constraints during the POI and was subsequently unable to meet customer demands, particularly in 2015.[130] Supply constraints, however, cannot explain the significant underselling and price depression that occurred during the POI. We also observe that reported domestic capacity, which reflects closures due to turnover activity, exceeded apparent U.S. consumption in every year of the POI.[131]

We have also considered the presence of nonsubject imports. As discussed earlier, nonsubject imports had a minimal presence throughout the POI. Nonsubject imports were generally priced higher than the domestic like product and subject imports and gained only a small amount of market share from 2013 to 2015.[132] In light of their limited presence in the U.S. market and the available pricing data, we find that nonsubject imports did not cause the adverse effects we have attributed to subject imports.

For the foregoing reasons, we find that the record of the preliminary phase of this investigation supports a determination that the subject imports had a significant impact on the domestic industry.

VII. Conclusion

For the reasons stated above, we determine that there is a reasonable indication that an industry in the United States is materially injured by reason of subject imports of R-134a from China that are allegedly sold in the United States at less than fair value.

[130] Respondents' Postconference Br. at 17.

[131] CR/PR at Tables III-4 and IV-3. In any final phase investigation, we intend to further explore how any constraints in the domestic industry's production affected purchasers' perception of availability.

[132] CR/PR at Table IV-3 and Appendix E.

PART I: INTRODUCTION

BACKGROUND

This investigation results from a petition filed with the U.S. Department of Commerce ("Commerce") and the U.S. International Trade Commission ("USITC" or "Commission") by the American HFC Coalition and its individual members (Amtrol, Inc., West Warwick, Rhode Island; Arkema, Inc. ("Arkema"), King of Prussia, Pennsylvania; The Chemours Company FC LLC ("Chemours"), Wilmington, Delaware; Honeywell International Inc. ("Honeywell"), Morristown, New Jersey; Hudson Technologies, Pearl River, New York; Mexichem Fluor Inc. ("Mexichem"), St. Gabriel, Louisiana; and Worthington Industries, Inc., Columbus, Ohio), as well as District Lodge 154 of the International Association of Machinists and Aerospace Workers, on March 3, 2016, alleging that an industry in the United States is materially injured and threatened with material injury by reason of less-than-fair-value ("LTFV") imports of 1,1,1,2 - tetrafluoroethane ("R-134a")[1] from China. The following tabulation provides information relating to the background of this investigation.[2] [3]

Effective date	Action
March 3, 2016	Petition filed with Commerce and the Commission; institution of Commission investigation (81 FR 12523, March 9, 2016)
March 24, 2016	Commission's conference
April 1, 2016	Commerce's notice of initiation (81 FR 18830)
April 15, 2016	Commission's vote
April 18, 2016	Commission's determination
April 25, 2016	Commission's views

STATUTORY CRITERIA AND ORGANIZATION OF THE REPORT

Statutory criteria

Section 771(7)(B) of the Tariff Act of 1930 (the "Act") (19 U.S.C. § 1677(7)(B)) provides that in making its determinations of injury to an industry in the United States, the Commission—

[1] See the section entitled "The Subject Merchandise" in *Part I* of this report for a complete description of the merchandise subject to this investigation.

[2] Pertinent *Federal Register* notices are referenced in appendix A, and may be found at the Commission's website (www.usitc.gov).

[3] A list of witnesses appearing at the conference is presented in appendix B of this report.

shall consider (I) the volume of imports of the subject merchandise, (II) the effect of imports of that merchandise on prices in the United States for domestic like products, and (III) the impact of imports of such merchandise on domestic producers of domestic like products, but only in the context of production operations within the United States; and. . . may consider such other economic factors as are relevant to the determination regarding whether there is material injury by reason of imports.

Section 771(7)(C) of the Act (19 U.S.C. § 1677(7)(C)) further provides that-—

In evaluating the volume of imports of merchandise, the Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States is significant.. . .In evaluating the effect of imports of such merchandise on prices, the Commission shall consider whether. . .(I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.. . . In examining the impact required to be considered under subparagraph (B)(i)(III), the Commission shall evaluate (within the context of the business cycle and conditions of competition that are distinctive to the affected industry) all relevant economic factors which have a bearing on the state of the industry in the United States, including, but not limited to. . . (I) actual and potential decline in output, sales, market share, gross profits, operating profits, net profits, ability to service debt, productivity, return on investments, return on assets, and utilization of capacity, (II) factors affecting domestic prices, (III) actual and potential negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment, (IV) actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the domestic like product, and (V) in {an antidumping investigation}, the magnitude of the margin of dumping.

In addition, Section 771(7)(J) of the Act (19 U.S.C. § 1677(7)(J)) provides that—[4]

[4] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.

(J) EFFECT OF PROFITABILITY.—The Commission may not determine that there is no material injury or threat of material injury to an industry in the United States merely because that industry is profitable or because the performance of that industry has recently improved.

Organization of report

Part I of this report presents information on the subject merchandise, alleged dumping margins, and domestic like product. *Part II* of this report presents information on conditions of competition and other relevant economic factors. *Part III* presents information on the condition of the U.S. industry, including data on capacity, production, shipments, inventories, and employment. *Parts IV* and *V* present the volume of subject imports and pricing of domestic and imported products, respectively. *Part VI* presents information on the financial experience of U.S. producers. *Part VII* presents the statutory requirements and information obtained for use in the Commission's consideration of the question of threat of material injury as well as information regarding nonsubject countries.

MARKET SUMMARY

R-134a is a refrigerant gas used in automotive air conditioning systems, stationary commercial air conditioning and refrigeration, as well as various other applications such as foam expansion and propellants. There are three U.S. producers of R-134a: Arkema, Chemours, and Mexichem. Leading producers of R-134a in China include Quhua, Sanmei, and Sinochem (Tiacang), and the leading U.S. importers of R-134a from China are ***. The leading importer of R-134a from nonsubject countries (primarily the United Kingdom) is ***. U.S. purchasers of R-134a are generally distributors in the automotive and stationary aftermarkets, end users in the automotive and stationary OEM markets, and retailers in the automotive aftermarket. Leading purchasers, in order of size, include ***.

Apparent U.S. consumption of R-134a totaled approximately *** short tons ($279.7 million) in 2015. U.S. producers' U.S. shipments of R-134a totaled *** short tons ($220.9 million) in 2015, and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value. U.S. imports from subject sources totaled *** short tons ($***) in 2015 and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value. U.S. imports from nonsubject sources totaled 1,135 short tons ($8.1 million) in 2015 and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value.

SUMMARY DATA AND DATA SOURCES

A summary of data collected in this investigation is presented in appendix C, table C-1. U.S. industry data are based on questionnaire responses of three firms that accounted for all U.S. production of R-134a during 2015. Data for U.S. imports are compiled from both official

Commerce statistics for HTS statistical reporting number 2903.39.2020 and imports of R-134a reported in questionnaire responses under all other HTS categories. Thirty usable U.S. importer responses were received; representing 83.8 percent of U.S. imports from China in 2015.[5] Foreign industry data are based on questionnaire responses of six Chinese firms. These firms' exports to the United States accounted for approximately 76.7 percent of U.S. imports of R-134a from China in 2015.[6] According to estimates requested of the responding Chinese producers, the production of R-134a in China reported in this Part of the report accounts for approximately 66.8 percent of overall production of R-134a in China.

PREVIOUS AND RELATED INVESTIGATIONS

R-134a has been subject to several proceedings before the Commission. On December 31, 2007, the Commission instituted a section 337 investigation on R-134a, based on a complaint filed by INEOS Fluor Holdings Ltd.[7] against Sinochem.[8] The complaint alleged violations of section 337 by reason of infringement of various process patents used in the manufacture of R–134a. On December 1, 2008, the ALJ determined that Sinochem had violated section 337. On June 1, 2009, the Commission determined to review the remand determination and reversed the conclusion of nonobviousness of the patent infringement claims, finding that the claim would have been obvious to one of ordinary skill in the art and was therefore invalid. With its finding of no patent infringement, the Commission terminated its 337 investigation on R-134 in 2009.[9]

In October 2013, Mexichem filed antidumping and countervailing duty petitions with the Commission and Commerce concerning R-134a from China. In October 2014, Commerce found that such imports were being sold at less than fair value, at a margin of 280.67 percent.[10] However, the Commission found that such imports did not cause or threaten to cause material injury to the domestic industry.[11] The Commission's negative determination is currently under appeal.

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[5] Coverage was derived from responding quantity of imports imported under HTS 2903.39.2020 in 2015, 12,921 short tons, versus official import statistics, 15,426 short tons.

[6] Coverage was derived from responding quantity of exports to the United States in 2015, 11,836 short tons, versus official import statistics, 15,426 short tons.

[7] In April 2010, INEOS Fluor Holdings, Ltd. sold its refrigerant business to Mexichem.

[8] *In the Matter of Certain R-134a Coolant (Otherwise Known as 1,1,1,2—Tetrafluoroethane)*, USITC Publication No. 4150 (December 2010).

[9] *In the Matter of Certain R–134a Coolant (Otherwise Known as 1,1,1,2-Tetrafluoroethane); Notice of Commission Determination To Reverse the Remand Determination of the Presiding Administrative Law Judge and To Terminate the Investigation in Its Entirety With a Finding of No Violation*, 74 FR 39968, August 10, 2009.

[10] *1,1,1,2-Tetrafluroethane From the People's Republic of China: Final Determination of Sales at Less Than Fair Value*, 79 FR 62597, October 20, 2014.

[11] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final*), USITC Publication 4503, December 2014.

Additionally, in 2015, the American HFC Coalition filed an antidumping duty petition covering Hydrofluorocarbon Blends and Components Thereof from China ("HFC blends"). Investigations by the Commerce Department and the Commission were initiated and are currently underway.[12] The scope of the HFC blends investigation does not include R-134a when imported as a stand-alone component (*i.e.*, unblended), but it does include R-134a that is incorporated within an HFC blend prior to importation.[13] Thus, imports of R-404A, R-407A, or R-407C that include R-134a in a blend with other single-component HFCs are subject to the scope of the HFC Blends investigation.

NATURE AND EXTENT OF ALLEGED SALES AT LTFV

Alleged sales at LTFV

On April 1, 2016, Commerce published a notice in the *Federal Register* of the initiation of its antidumping duty investigation on R-134a from China.[14] Commerce has initiated an antidumping duty investigation based on estimated dumping margins between 153.68 and 220.87 percent for R-134a from China.

THE SUBJECT MERCHANDISE

Commerce's scope

Commerce has defined the scope of this investigation as follows:[15]

> *The product subject to this investigation is 1,1,1,2-Tetrafluoroethane, R-134a, or its chemical equivalent, regardless of form, type, or purity level. The chemical formula for 1,1,1,2-Tetrafluoroethane is CF_3-CH_2F, and the Chemical Abstracts Service registry number is CAS 811-97-2.*[16]

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[12] *Hydrofluorocarbon Blends and Components Thereof from the People's Republic of China: Initiation of Less-Than-Fair-Value Investigation*, 80 FR (July 22, 2015); *Hydrofluorocarbon Blends and Components From China; Institution of Antidumping Duty Investigation and Scheduling of Preliminary Phase Investigation*, 80 FR 38231 (July 2, 2015).

[13] Ibid.

[14] *1, 1, 1, 2-Tetrafluoroethane From the People's Republic of China: Initiation of Less Than Fair Value Investigation*, 81 FR 18830, April 1, 2016.

[15] Ibid.

[16] 1,1,1,2-Tetrafluoroethane is sold under a number of trade names including Klea 134a and Zephex 134a (Mexichem Fluor); Genetron 134a (Honeywell); Freon™ 134a, Suva 134a, Dymel 134a, and Dymel P134a (Chemours); Solkane 134a (Solvay); and Forane 134a (Arkema). Generically, 1,1,1,2-Tetrafluoroethane has been sold as Fluorocarbon 134a, R-134a, HFC-134a, HF A-134a, Refrigerant 134a, and UN3159.

Merchandise covered by the scope of this investigation is currently classified in the Harmonized Tariff Schedule of the United States ("HTSUS") at subheading 2903.39.2020. Although the HTSUS subheading and CAS registry number are provided for convenience and customs purposes, the written description of the scope is dispositive.

Tariff treatment

Based upon the scope set forth by the Department of Commerce, information available to the Commission indicates that the merchandise subject to this investigation is imported under statistical reporting number 2903.39.2020 of the Harmonized Tariff Schedule of the United States ("HTS"). The 2016 general rate of duty for this subheading is 3.7 percent *ad valorem.*

While this subheading is an *eo nomine* product category created in 2009 that includes only the subject merchandise, petitioners contend that some U.S. imports of R-134a may have entered the United States during the period of investigation misclassified under incorrect HTS subheadings.[17] Respondents note over time, misclassification gets corrected and is occurring less frequently than in the past.[18]

THE PRODUCT

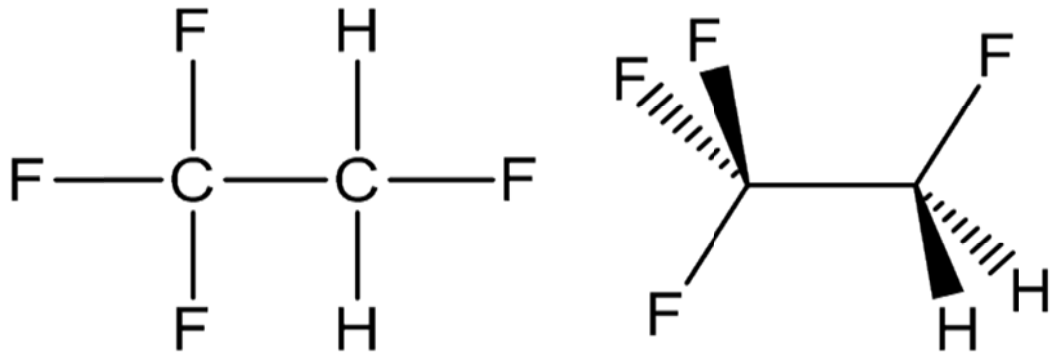
Manufacturing processes

The subject product is 1,1,1,2-tetrafluoroethane (a.k.a. HFC-134a or R-134a). It is a clear, colorless liquid or gas, which is gaseous at normal atmospheric conditions. It has a boiling point of -15 F and a freezing point of -153 F. It is relatively nontoxic and nonflammable. As can be seen in figure I-1 below, it is composed of two carbon atoms, two hydrogen atoms and four fluorine atoms.

[17] Petition, pp. 18-19. Conference transcript, pp. 35 (Sassano) and 98 (Cannon); Petitioner's postconference brief, pp. 13-14.

[18] Conference transcript, p. 140 (Marshak). The current HTS statistical reporting number was created in 2009. Prior to 2009, R-134a was properly classified under HTS 2903.39.2050, which was a broader "other" category that included other fluorinated hydrocarbons.

Figure I-1
R-134a: Structure



Source: http://www.chm.bris.ac.uk/motm/hfc134/hfch.htm.

There are multiple methods used to produce R-134a. Generally, they involve reacting hydrogen fluoride (HF) with a compound containing carbon and chlorine. The fluorine replaces the chlorine. The reaction with hydrogen fluoride may have to be repeated multiple times to reach the desired end product. Generally, a fluorocarbon plant is designed to make one compound and cannot be used to make a different compound in response to changing market conditions.[19]

Mexichem uses a two-stage process. Its first stage involves an exothermic, vapor phase reaction of trichloroethylene (TCE) with hydrogen fluoride (HF) over a chromium-based catalyst to produce 1-chloro-2,2,2-trifluoroethane (R-133a). The second stage is an endothermic, vapor phase reaction of R-133a with HF over a chromium-based catalyst again to produce HFC-134a.[20] HFC-134a is separated out of the recycle stream by distillation. Hydrochloric acid (HCl), the byproduct of the reactions, has to be either disposed of or sold on the market. [21]

Mexichem's production process is expressed by the following series of reaction equations and illustrated in figure I-2 that follows:

$$3\ HF + TCE\ (HC_2Cl_3) \rightarrow R-133a\ (H_2C_2ClF_3) + 2\ HCl$$

$$R-133a\ (H_2C_2ClF_3) + HF \rightarrow R-134a\ (H_2C_2F_4) + HCl$$

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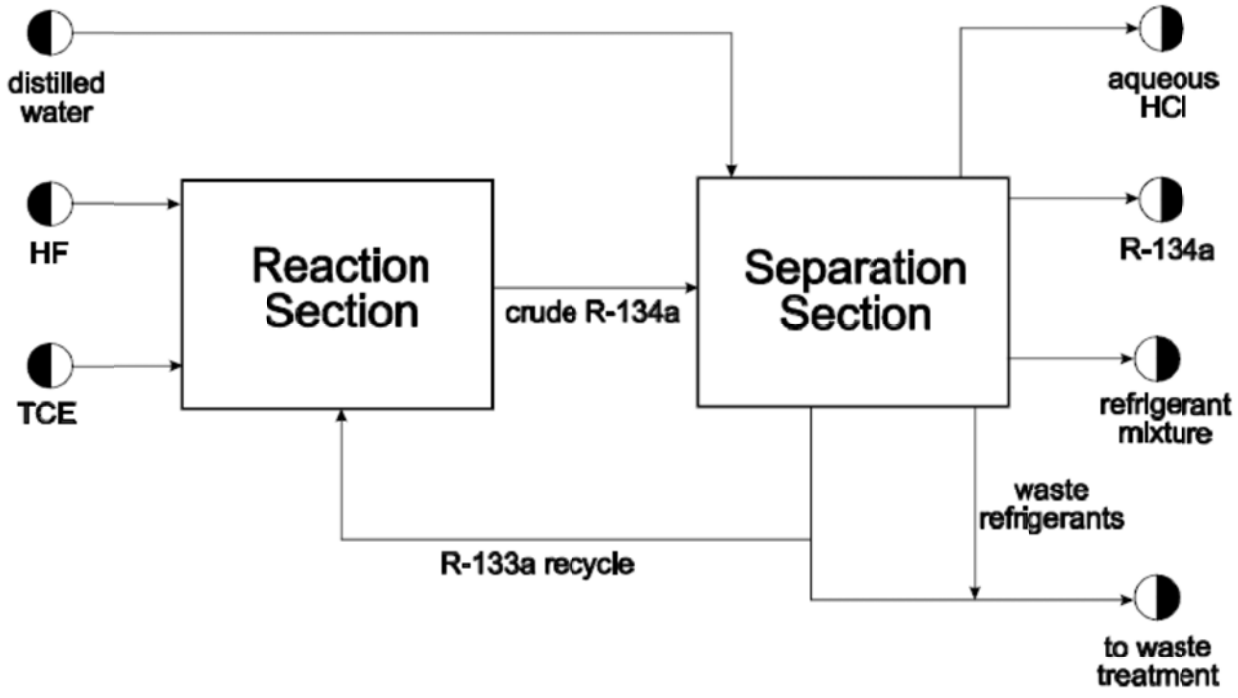
[19] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-8.

[20] In an exothermic reaction, heat is given off when the inputs combine to make the resultant molecule. By contrast, an endothermic reaction requires heat (energy) as an input for the reaction to occur, i.e., the inputs absorb heat (energy) when producing the resultant molecule.

[21] Conference transcript, p. 24 (Pacillo). Chemours uses a *** to manufacture HFC-134a. *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-8.

Figure I-2
R-134a: Production process



Source: 1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final), USITC Publication 4503, December 2014, p. I-9.

Fluorspar, one of the primary inputs to HF (hydrofluoric acid), which is a necessary input to most processes for producing R-134a, is distributed throughout the world. The bulk of the identified reserves are in South Africa (17 percent), Mexico (13 percent), China (10 percent), and Mongolia (9 percent). However, two countries, China and Mexico, combined, account for over 80 percent of global production in 2013 and 2014. China accounted for 65 percent and 64 percent of global production in 2013 and 2014, respectively. Mexico produced 18 percent of global production in each of those years.[22]

[22] U.S. Geological Survey, Mineral Commodity Summaries, Fluorspar, January 2015.

Description and applications

Physical characteristics of refrigerants

Refrigerants need to have a number of specific properties to be used in the various applications. Boiling point and vapor pressure are two such properties essential for their functionality.[23] Any compound used on a mass commercial scale also needs to be noncorrosive to minimize equipment maintenance costs. Safety concerns require other properties such as being nonflammable and nontoxic.

Early refrigeration systems used compounds such as ammonia, methyl chloride or sulfur dioxide. Given that these compounds were either highly flammable or toxic, alternatives were sought for them early in the twentieth century.[24] In 1931, a joint venture between DuPont and General Motors discovered an economical method to produce chlorofluorocarbons (CFCs). These CFCs had good refrigerant properties and were neither flammable nor toxic, in most uses. One of the most commonly used CFCs was R-12 (dichlorodifluoromethane).[25] For half a century these CFCs were used extensively as they were relatively cheap to produce, were effective in refrigeration and other applications, and were relatively safe. As environmental concerns became more important, CFCs such as R-12 have been replaced by hydrofluorocarbons (HFCs), including R-134a.[26]

Fluorinated, organic (i.e., carbon-containing) compounds that are related to R-134a are classified into three groups: chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs). Almost all of these compounds are man-made as fewer than a dozen fluorinated, organic compounds occur in nature.[27]

CFCs, which contain only chlorine, fluorine, and carbon atoms, have an excellent combination of physical properties such as a low boiling point and a low vapor pressure to make them ideal for many refrigerant applications. These compounds are nonreactive, nontoxic, and nonflammable. The lack of reactivity means that the compound is stable and noncorrosive. While these characteristics are desirable when the compound is being used as a refrigerant or a propellant, the stability contributes to the compound's effect on the ozone

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[23] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-9.

[24] Ammonia is still used in many food industry applications because it is a very efficient refrigerant. It is also being developed further because it is a naturally occurring compound that has no negative effect on the environment.

[25] Many people used to refer to this product with the generic term "freon" but that is the trade name for DuPont's line of CFC refrigerants. *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-10.

[26] "In roughly 1994, R12 refrigerant was phased out due to the environmental regulations, and then all vehicles began using 134a." *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-10.

[27] *Fluorine Compounds, Organic*. Kirk-Othmer Encyclopedia of Chemical Technology (2004), vol. 11, p. 858.

layer. The CFC has a sufficiently long lifecycle that much of it is eventually carried up into the stratosphere, where it damages the ozone.

HCFCs contain hydrogen atoms in addition to the chlorine, fluorine, and carbon atoms. Hydrogen atoms may be introduced into the CFC structure to lower the chlorine content (to reduce the impact on the ozone layer). The HCFCs (and HFCs) have shorter lifecycles in the lower atmosphere so they are less likely to reach the stratosphere and damage the ozone. However, introducing a hydrogen atom into a one-carbon CFC lowers the boiling point, which is too low for some applications. Therefore, two- and three-carbon HCFCs are more attractive substitutes. Another drawback of replacing chlorine with hydrogen is that flammability increases as the hydrogen content increases.[28]

HFCs have completely replaced the chlorine atoms with either fluorine or hydrogen. These compounds still retain enough of the desirable properties (nontoxic, nonflammable, nonreactive, low boiling point, and low vapor pressure) while eliminating the effect on the ozone layer.

Flammability

Flammability is a significant safety concern for a refrigerant. Potential fires, whether inside a closed system (which might then explode) or outside the system when the refrigerant leaks, would require the system and the area around it to be modified substantially. Systems made strong enough to contain any pressure build up from an internal fire would be more expensive. Systems that ensure zero refrigerant leakage are also more expensive and would still require significant fire suppression gear in case of failure.[29]

Toxicity

The problems caused by toxicity are similar to those for flammability. The cost of designing and installing a system that has zero leakage would be prohibitive. Additional monitors would be required to check for any incidental leakage. Also, the cost of health monitoring or potential liability would have to be added to the cost of the system.

Vapor pressure

An ideal refrigerant would have a low vapor pressure. The higher the vapor pressure, the stronger the equipment required to contain it. The stronger, heavier equipment would cost more initially and, for portable A/C systems like those on automobiles, would increase the operating costs, too. Installing a heavier A/C system would be counter to numerous recent moves to improve vehicle fuel efficiency.[30]

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[28] *Fluorine Compounds, Organic*. Kirk-Othmer Encyclopedia of Chemical Technology (2004), vol. 11, p. 859.

[29] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-11.

[30] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-11.

Form (liquid vs. gas)

The physical form of the refrigerant determines the design and operation of the system. Many systems combine liquid and gas components to take advantage of the phase transformation to transfer a significant amount of energy without requiring a large temperature swing in the refrigerant.

Nomenclature and classification conventions

The designation R-134a follows the naming convention for refrigerants: the "R" implies that it is a refrigerant and the numbers and their positions identify the chemical composition. In this case, the "4" indicates that there are four fluorine atoms; the "3" shows that the compound contains two hydrogen atoms; and the "1" means that there are two carbon atoms. The hydrogen digit is one more than the number of hydrogen atoms in the compound; the carbon digit is one less than the number of carbon atoms.[31] The "a" specifies a certain isomer of this compound. All 400 and 500 series refrigerants (R-4xx and R-5xx) are blends.

The safety classification of compounds follows a convention prescribed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the International Institute of Refrigeration (IIFIIR). Under this convention the toxicity of the compound is designated by the letter "A" or "B." "A" compounds are less toxic; "B" compounds are more toxic.[32]

Flammability of refrigerants follows a similar designation, this time using the numbers 1 through 3. The refrigerants increase in flammability as the number increases.[33] R-134a has a safety classification of "A1," which means that it is relatively nontoxic and nonflammable.[34]

Environmental concerns have caused a transition away from the CFCs and their collection of excellent properties to alternatives with less ideal properties. As more of the halogens (chlorine and fluorine) have been replaced in these refrigerants, it has become more difficult for producers to find the right collection of properties in a single compound. Thus, the industry has combined different compounds into blends to get the essential or desired properties for the given application. For example, one refrigerant might have the ideal vapor pressure while another has the ideal boiling point. When combined, their performance might suffer some, but the blend is able to meet the overall performance requirements for the

[31] International Institute for Refrigeration, "Classification of Refrigerants," pp. 1-2.

[32] Class "A" refrigerants have no or unidentified toxicity at concentrations at or below 400ppm. Class "B" refrigerants have been identified as toxic at concentrations below 400ppm. International Institute for Refrigeration, "Classification of Refrigerants," p. 2.

[33] Class 1 refrigerants do not "propagate flame" at standard room temperature and pressure. Class 2 refrigerants have a flammability limit of at least 0.10 kg/cubic meter at standard room temperature and pressure and have a heat of combustion of less than 19 kJ/kg. Class 3 refrigerants are even more flammable. International Institute for Refrigeration, "Classification of Refrigerants," p. 3.

[34] International Institute for Refrigeration, "Classification of Refrigerants," Annex.

specific application.[35] In some cases the blend may have superior properties to either of the component refrigerants.

Refrigerant end use market segments

There are numerous applications for refrigerants including automotive air conditioning, appliances, small stationary equipment, medium temperature supermarket cases, and industrial and commercial chillers.[36] Multiple refrigerants could potentially be used for each of these applications; however, cost effectiveness appears to be the primary factor in determining the refrigerant used in each application.[37]

Generally, the refrigerant and system are chosen together. Using a different refrigerant than what the system is designed for will either reduce the unit's efficiency or render it non-functional. In general, it is not possible to put a different refrigerant into a machine and have that machine work effectively. Any number of components would have to be changed to accommodate the new refrigerant in order to make the system as effective as with the intended refrigerant.[38]

Automotive air conditioning

Automotive A/C is the primary use for R-134a. Within the automotive A/C sector there are two sub-categories of end users: (1) the original equipment manufacturers ("OEMs") (automobile manufacturers) and (2) the automotive aftermarket which includes automobile repair shops, dealerships, and auto retail stores.

Almost all vehicles on the road now use R-134a and their systems cannot use another refrigerant. The cost of replacing the entire A/C system on existing vehicles would be prohibitively expensive.[39] Therefore, some demand for R-134a in the aftermarket will continue after another refrigerant becomes the standard in new automotive A/C units. The United States is scheduled to transition to the next generation of refrigerants by 2021 and the EU expects to phase out R-134a for new light duty vehicles by year end 2016. [40]

Figure I-2 illustrates how a car A/C unit works. The diagram lists the relative temperature and phase of the refrigerant as it travels through the system. A refrigeration

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[35] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, pp. I-12-13.

[36] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-13. DuPont, Technical Information Brochure, "DuPont HFC-134a: Properties, Uses, Storage, and Handling."

[37] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-13.

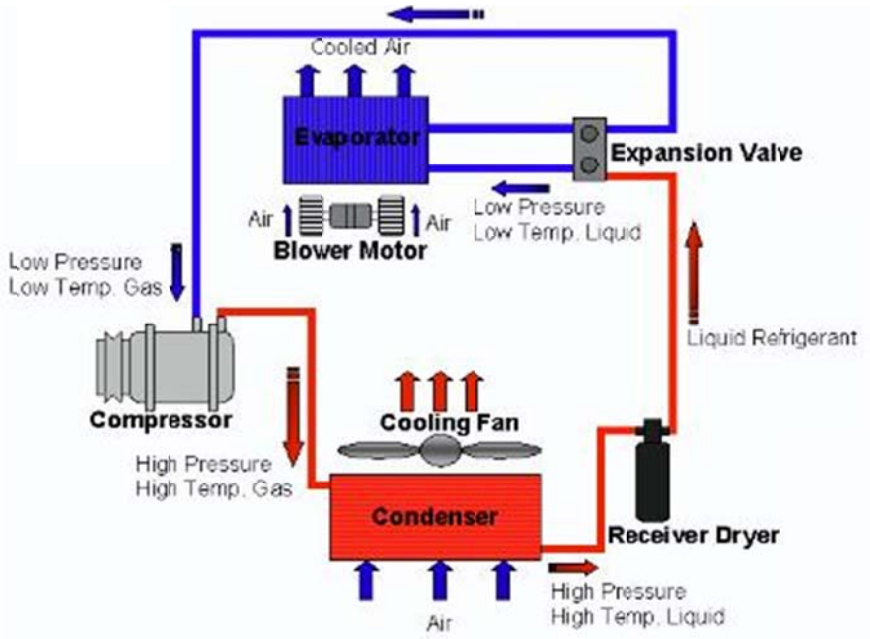
[38] Conference transcript, pp. 73-74 (Geosits and Sassano).

[39] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-13.

[40] Petition, pp. 13-14. Conference transcript, pp. 36, 53-54 (Sassano).

system will generally have four main components: a compressor, a condenser, an expansion valve, and an evaporator.

Figure I-2
R-134a: Car air conditioning system



Source: *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final)*, USITC Publication 4503, December 2014, p. I-14.

The compressor is a pump that draws the refrigerant gas from the evaporator to maintain the desired low temperature and pressure in the evaporator. The compressor increases not only the pressure but also the temperature of the refrigerant gas. The increased pressure drives the refrigerant flow through the system. The increased temperature ensures that the refrigerant is at a higher temperature than the air passing over the condenser to allow energy to be removed from the system.

The condenser is generally a set of many small, thin-walled pipes where the A/C unit transfers energy (heat) from the system to the heat sink (the outside air). The cooler outside air takes away enough energy for the refrigerant gas to condense into a liquid. The phase transformation allows a large amount of energy to be transferred even though the temperature change of the refrigerant may not be that great.

The expansion valve reduces the refrigerant pressure and regulates the liquid–refrigerant flow to the evaporator. The lower pressure allows the refrigerant to boil at a lower temperature. The valve is designed to adjust the amount of refrigerant flowing into the evaporator to correspond to the amount of heat being removed from the refrigerated space.

The evaporator captures or absorbs heat from the car interior. A fan blows air from inside the car over a set of thin-walled coils, which have cool refrigerant liquid entering them. The hotter air boils the low-pressure refrigerant inside the coils, transferring heat from inside

the car to the refrigerant. Again, the phase transformation allows a considerable amount of energy to be transferred even though the refrigerant temperature may change only slightly.[41]

Domestic refrigeration

R-134a may also be used in household appliances such as refrigerators, freezers, and dehumidifiers.[42] Residential central A/C systems, however, generally do not use R-134a. Older residential A/C systems, both central and wall units, generally use R-22 and newer systems use R410A.[43]

Commercial refrigeration

R-134a may also be used in large, self-contained commercial refrigeration systems such as supermarket display cases and freezers as well as large A/C systems in office buildings, stores, and airports. [44] R-134a may also be used in refrigeration systems for commercial food storage as well as in transport refrigeration systems in trucks, trains, or ships.

Propellant and pharmaceutical applications

In addition to its primary use as a refrigerant, R-134a is used as a propellant in various applications such as aerosol cans, foam-blowing of building insulation, and pharmaceutical uses like asthma inhalers.[45] The nontoxicity, nonflammability, or other physical properties of the subject product make it preferable to alternatives in these applications.[46] The product needs to be nontoxic when it is being used as a blowing agent in an open environment and nonflammable if it is being used near, or to clean, energized electronic circuits. R-134a is used to deliver pharmaceuticals into the lungs via metered dose inhalers in order to treat chronic obstructive pulmonary disease (COPD) and asthma.[47] R-134a for use in pharmaceutical products has to be further purified than standard R-134a and requires chain of custody documentation.

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[41] *Refrigeration*. Kirk-Othmer Encyclopedia of Chemical Technology (2006), vol. 21, pp. 11-15.

[42] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-15.

[43] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-15.

[44] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-15. Blends such as R-404A are also frequently used in supermarket refrigeration. *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-15.

[45] Petition, p. 14.

[46] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-15.

[47] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-15.

U.S. shipment data of R-134a by end use market segment

Table I-1 presents the major end use applications of fluorocarbons including R-134a and similar refrigerants.[48]

Table I-1
R-134a: Major applications of fluorocarbons or refrigerants, by segment

Major applications	Major fluorocarbons or refrigerants
Refrigeration:	**HFC-134a**
	Recycled HCFC-22
Automobile A/C	HFC-32
Home/commercial A/C	HFC-125
Industrial plant cooling and processing	HFC-143a
Retail store chilled and frozen foods	Recycled CFCs
Home refrigerators and freezers	Refrigerant Blends (e.g., R-410A, R-404A)
Refrigerated transport	HFO-1234yf
	Ammonia
	Carbon dioxide (R-744)
Foam blowing:	**HFC-134a**
	HFC-245fa
Insulation for appliances and buildings	HFC-365mfc
Packaging foams, thermal containers	HFO-1234ze
Electronics:	HFC-116
	HFC-14
Gases, etching, solvent cleaning	HFC-23
	Carbon dioxide (R-744)
Chemical inputs:	HCFC-22
	HCFC-142b
For fluoropolymers/fluoroelastomers	HFC-152a
Propellants:	HFC-227ea
	HFC-152a
Personal care and commercial products	**HFC-134a**
Metered-dose inhalers	Carbon dioxide (R-744)
Fire extinguishing:	HFC-227ea
	HFC-23
	HFC-236fa

Source: Aida Jebens, et al., "CEH Marketing Research Report: Fluorocarbons," 543.7000, February 2014.

[48] Data provided by U.S. producers and U.S. importers which shows reported U.S. shipments categorized by end use market segment is presented in parts III and IV.

The regulatory history of automotive refrigerants

R-12 "FREON"

Prior to the 1930's, refrigeration systems commonly used ammonia and sulfur dioxide as refrigerants, both of which are toxic and flammable. Chloroflurocarbons (CFC's) were developed as a safer alternative and widely used in all refrigeration systems. The most common CFC was R-12 and was marketed under the DuPont trademark, "Freon™." R-12 was used for decades as the refrigerant in home and automobile air conditioning systems and in aerosol can production.

Montreal Protocol

In 1985, the discovery of a hole in the Earth's ozone layer led to an international environmental agreement to reduce substances with high ozone depleting potential ("ODP").[49] This international agreement, the Montreal Protocol on Substances that Deplete the Ozone Layer ("Montreal Protocol"), entered into force in 1989 and has been ratified by 197 states, including the United States, Japan, China, and the European Union.[50] Among those substances deemed with a high ODP was all CFC's, including R-12 refrigerants. The Montreal Protocol began to schedule the worldwide phase-out of the production and use of ozone-depleting CFCs. A later amendment to the Montreal Protocol accelerated the phase-out of Class I substances, which included CFCs (including R-12), to the end of 1995.[51] The Montreal Protocol is incorporated into U.S. statutory law through Title VI of the Clean Air Act, which is implemented by U.S. Environmental Protection Agency ("EPA") regulations.

The EPA, pursuant to Section 612(c) of the Clean Air Act, is authorized to identify and publish lists of acceptable and unacceptable substitutes for class I or class II ozone-depleting substances.[52] This program, known as the Significant New Alternatives Policy ("SNAP")

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[49] The ODP of a chemical compound is the relative amount of degradation to the ozone layer it can cause, with trichlorofluoromethane (R-11 or CFC-11) being fixed at an ODP of 1.0, which is the maximum ODP of Class I and II substances with the exception of halons. R-12 has an ODP of 1.0 whereas R-134a has an ODP of 0.

[50] The list of signatories may be found at: http://ozone.unep.org/new_site/en/treaty_ratification_status.php retrieved on November 20, 2013.

[51] The Montreal Protocol included two phase-out deadlines, one for Class I substances and the other for Class II substances. Class I substances are defined as chemicals with an ozone-depletion potential of 0.2 or higher and include: CFCs, halons, carbon tetrachloride, and methyl chloroform, HBFCs, and methyl bromide. Class II substances are chemicals with an ozone-depletion potential of less than 0.2 and include all HCFCs, which includes R-22 a popular refrigerant for home air conditioning units. By January 1, 2020, the U.S. is required to reduce its consumption of Class II substances by 99.5% below the U.S. baseline and chemical manufacturers will no longer be able to produce R-22 to service existing air conditioners and heat pumps.

[52] EPA evaluates the refrigerants using the following factors: (1) atmospheric effects (the ODP and GWP); (2) exposure assessments (estimate concentration levels to which people may be exposed);

(*continued*...)

Program, regulates substitutes for the ozone-depleting chemicals that are being phased out pursuant to the Montreal Protocol.[53]

Recently, parties to the Montreal Protocol have turned their attention to curbing the use of HFCs, which initially replaced ozone-depleting CFCs, because of their high global warming potential. In November 2015, all 197 parties of the Montreal Protocol agreed to the "Dubai Pathway" to prepare an amendment in 2016 that will call for the reduction of HFC production and consumption.[54]

Transition from R-12 to R-134a

Under the EPA's SNAP program in 1995, R-134a was deemed an acceptable substitute for CFC–12 in retrofitted and new motor vehicle air conditioners in the United States.[55] Since its approval by the EPA, R-134a has become the most used refrigerant for automotive air conditioning in the United States and globally. By 2004, all automobiles produced or sold in North America, Japan, and the Europe used R-134a as a refrigerant.[56]

Kyoto Protocol

Signed by 183 nations in 1997, the Kyoto Protocol to the United Nations Framework Convention on Climate Change ("Kyoto Protocol") is an international treaty that sets binding obligations on industrialized countries to reduce emissions of greenhouse gases.[57] The protocol set national reduction targets for a number of gases with high Global Warming Potential ("GWP"),[58] among those were hydrofluorocarbons (HFCs). Developed nations that ratified the Kyoto Protocol agreed to phase-out the manufacture and use of HFCs with a GWP of greater than 150. R-134a has a GWP of 1,430.

(…*continued*)
(3) Toxicity; (4) Flammability; and (5) Other environmental impact.
http://www.epa.gov/ozone/snap/about.html, retrieved on November 20, 2013.

[53] In order for a refrigerant to be used in the U.S. marketplace it must be on the EPA's list of approved refrigerant for the end use specified. Section 612(d) of the Clean Air Act grants the right to any person to petition EPA to add a substance to or delete a substance from the lists. The Agency has 90 days to grant or deny a petition. *See* 59 FR 13044, March 18, 1994 (EPA promulgation of SNAP regulations).

[54] "Statement from EPA Administrator Gina McCarthy on Decision Reached at the 27th Meeting of the Parties to the Montreal Protocol / Decision Puts World on Path to 2016 Amendment to Phase Down HFCs," EPA news release, https://www.epa.gov/newsroom retrieved April 4, 2016.

[55] 60 FR 31092, June 13, 1995 (SNAP list of acceptable substitutes for R-12 in 1995).

[56] *"Refrigerants for Light-Duty Passenger Vehicle Air Conditioning Systems,"* Working paper 2011-3, International Council on Clean Transportation, July 2011, p. 1.

[57] Although 103 nations have signed the Kyoto Protocol only 83 nations have ratified it and are therefore bound to its requirements. The United States has signed, but not ratified the Kyoto Protocol. http://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-a&chapter=27&lang=en retrieved on November 20, 2013.

[58] GWP is defined as the ratio of the warming caused by a substance to the warming caused by a similar mass of carbon dioxide. Thus, the GWP of CO_2 is defined to be 1.0. CFC-12 has a GWP of 10,900.

Corporate Average Fuel Economy ("CAFE") standards[59] in the United States

Although the United States has not ratified the Kyoto Protocol, the NHTSA and EPA announced proposed CAFE standards in 2009 that would regulate greenhouse gas emissions of automobiles, among which were HFC refrigerants.[60] The agencies described the two mechanisms by which mobile air conditioning ("MAC") systems contribute to the emissions of greenhouse gases: (1) through leakage of refrigerant into the atmosphere and (2) through the consumption of fuel to provide mechanical power to the MAC system. The regulation did not provide a ban or a phase-out schedule, but rather gave CAFE credits[61] to any automobile manufacturer that produced automobiles that used a refrigerant with a GWP less than 150. The EPA, pursuant to its SNAP program, approved a number of refrigerants with a GWP less than 150, including R-152a (GWP=124), R-744 (GWP=1), and HFO-1234yf (GWP=4). [62] General Motors announced that it would produce automobiles for model year 2013 that would use the HFO-1234yf refrigerant. Presently, General Motors is the only U.S. automobile manufacturer currently installing R-1234yf.[63] Over 99 percent of the new vehicle production in the United States installs and uses R-134a as its refrigerant.[64]

EU regulations on R-134a

Subsequent to the European Union's ratification of the Kyoto Protocol, the EU promulgated regulations relating to emissions from air conditioning systems in motor vehicles in May 2006.[65] The EU regulation provided for a total ban on air conditioning systems and refrigerants designed to use HFCs with a GWP higher than 150, which includes R-134a

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[59] CAFE are regulations in the United States, first enacted in 1975 and now promulgated by the National Highway Traffic Safety Administration ("NHTSA"), intended to reduce energy consumption by improving the average fuel economy of cars and light trucks sold in the United States. In 2010, the NHTSA, jointly with the EPA, issued greenhouse gas ("GHG") emissions standards. For the first time, these GHG standards were part of the CAFE regulation.

[60] *Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule*, 75 FR 25324, May 7, 2010. (CAFE standards for model years 2012 to 2016); *2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards*, 77 FR 62624, October 15, 2012 (CAFE standards for model years 2017 to 2025).

[61] CAFE provides for a credit trading and transferring system that allows manufacturers to transfer credits between automobile categories, as well as, sell them to other manufacturers.

[62] 73 FR 33304, June 12, 2008 (R-152a); 76 FR 17488, March 29, 2011 (HFO-1234fy); 77 FR 33315, June 6, 2012 (R-744 or CO_2).

[63] *"GM First to Market Greenhouse Gas-Friendly Air Conditioning Refrigerant,"* RP News Wires, http://www.reliableplant.com/Articles/Print/25709, retrieved on October 22, 2013.

[64] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-19.

[65] EU Directive 2006/40/EC; Also referred to as the "MAC Directive" or "F-gas Regulation." http://europa.eu/legislation_summaries/internal_market/single_market_for_goods/motor_vehicles/interactions_industry_policies/l24280_en.htm, retrieved on November 20, 2013.

(GWP=1,430). The ban covers all new automobile types from January 1, 2011 and applies to all vehicles as of January 1, 2017. In order to comply with the EU F-gas regulation, manufacturers attempted to develop a refrigerant that would have a GWP of less than 150, but keep the positive physical characteristics of R-134a with regard to toxicity and flammability. In 2007, the product HFO-1234yf was developed through a joint venture of DuPont and Honeywell.[66] HFO-1234yf has a GWP of 4 and appeared to have favorable toxicity and flammability characteristics.

EU transition from R-134a to HFO-1234fy

In September 2012, Mercedes-Benz announced that testing of HFO-1234yf showed safety issues such as flammability and recalled 3500 automobiles in which it had installed air conditioning systems that used the new refrigerant. It also notified regulators that it intended to continue the use of R-134a subsequent to the January 1, 2011 deadline for new vehicle production.[67] Shortly thereafter, BMW and Volkswagen joined Mercedes-Benz and citing safety concerns called for a return to R-134a as the automotive refrigerant.[68] Honeywell and the EU have disputed the safety claims and provided their own safety tests to refute the Mercedes-Benz safety test results.[69] The effect of the directive under the current deadline remains in question because manufacturers have introduced uncertainty over what constitutes a new automobile platform.[70]

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[66] China is expected to be the largest producer of HFO-1234yf as DuPont, Honeywell, Arkema, and DAIKIN have announced that they are building manufacturing facilities in China. *"Arkema to build production capacity for the novel refrigerant gas HFO-1234yf,"* Chemical Week, September 4, 2013; *"China expected to be largest production base of HFO-1234yf worldwide,"* PRLOG, December 28, 2012.

Mexichem stated that it is also developing a HFO-1234yf product. *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-20.

[67] *"Mercedes-Benz wishes to continue using the tried-and-tested R134a refrigerant in passenger cars,"* Mercedes-Benz Press Release, September 25, 2012. Mercedes-Benz specifically announced that "the refrigerant is dynamically dispersed at high pressure near to hot components of the test vehicle's exhaust system. This corresponds to a serious head-on collision in which the refrigerant line is severed and the reproducible results demonstrate that refrigerant which is otherwise difficult to ignite under laboratory conditions can indeed prove to be flammable in a hot engine compartment. Similar tests of the current R134a refrigerant did not result in ignition."

[68] *"Debate about air conditioning refrigerant R1234yf heats up,"* Auto Industry Insider, February 18, 2013, http://www.autoindustryinsider.com/?p=5697, retrieved on October 22, 2013.

[69] *"Honeywell and BAM refute risky HFO-1234yf claims,"* ACR-news.com, February 23, 2010.

[70] The EU published a report dismissing safety concerns cited by the industry related to HFO-1234yf on March 3, 2014, and kept the deadlines in place. "JRC technical and scientific support to the research on safety aspects of the use of refrigerant R1234yf on MAC systems," March 7, 2014. *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. I-21.

DOMESTIC LIKE PRODUCT ISSUES

No issues with respect to the definition of the domestic like product have been raised in this investigation. The petitioner proposes that the domestic like product should be defined as co-extensive with the scope definition.[71] Respondents state that for purposes of this preliminary phase investigation, the domestic like product should coordinate with the scope of the investigation.[72]

[71] Petition, p. 19.
[72] Conference transcript, p. 141 (Schutzman).

PART II: CONDITIONS OF COMPETITION IN THE U.S. MARKET

U.S. MARKET CHARACTERISTICS

The primary use for R-134a is as a refrigerant gas in vehicle A/C systems. There are two primary distribution channels for vehicle A/C systems: original equipment manufacturers (OEMs) and the automotive aftermarket. The automotive aftermarket, which is almost twice as large as the automotive OEM market, is primarily served by distributors. R-134a is also used as a refrigerant in large commercial A/C units and in appliances (refrigerators, freezers, and dehumidifiers). There are also a number of non-refrigerant uses for R-134a: the installation of insulating foams, as an aerosol propellant in sprays, in aerosol dusters for electronics, and in pharmaceuticals (for inhalers).[1] Petitioners report that some distributors sell R-134a to both the automotive aftermarket and the HVAC aftermarket.[2]

R-134a is sold in various bulk sizes as well as packaged in smaller size containers. For bulk sales, U.S. producers can supply R-134a in large truckloads while importers sell the product in ISO containers. Typical smaller size containers are 30-pound containers and 12-ounce cans. The 12-ounce cans are sold at retail for do-it-yourself customers while 30-pound containers typically go to repair shops.[3]

Some distributors (repackagers) repackage bulk product into 30-pound cylinders and 12-ounce containers for resale to auto dealerships, service centers, service stations, and auto parts retailers. Distributors also import 30-pound cylinders and 12-ounce containers from China.[4] U.S. producer Arkema, for example, generally sells R-134a to large distributors who typically buy in bulk and repackage into smaller cylinders or cans for sale in various market segments, or sells directly to OEMs, including air-conditioning or refrigeration equipment manufacturers and chemical companies that produce aerosol products. Petitioners argue that many firms switched from repackaging bulk R-134a to purchasing prepackaged Chinese R-134a.[5]

In 2015, 28.0 percent of combined U.S. shipments of R-134a (domestic and imported) were to the automotive aftermarket, 19.3 percent to the foam expansion and propellant market, 12.8 percent to automotive OEMs, 5.6 percent to the stationary aftermarket, 2.9 percent to the stationary OEM market, and 31.4 percent to "other" uses.[6] U.S. producers reported sales to variety of markets whereas subject importers' sales were much more

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[1] *Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final)*, USITC Publication 4503, December 2014, p. II-1; Conference transcript, pp. 29-30 (Geosits); respondents' postconference brief, pp. 5-6.

[2] Conference transcript, p. 29 (Geosits).

[3] *Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final)*, USITC Publication 4503, December 2014, p. II-1; Conference transcript, p. 35 (Sassano).

[4] *Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final)*, USITC Publication 4503, December 2014, p. II-1; Conference transcript, pp. 28-9 (Geosits).

[5] Conference transcript, pp. 18-19 (Haun).

[6] "Other" includes stationary refrigerators/air conditioners, non-automotive OEMs, propellants, refrigerant blends, and miscellaneous applications.

concentrated in the automobile aftermarket. Importers of Chinese R-134a reported that in 2015 *** percent of U.S. shipments were to the automotive aftermarket, while *** percent of their shipments to automotive OEMs.[7] [8] U.S. producers, in contrast, sell relatively large shares to other markets including foam expansion (*** percent), and automotive OEMs (*** percent).[9]

Apparent U.S. consumption of R-134a fluctuated slightly during 2013-15. Overall, apparent U.S. consumption in 2015 was *** percent lower than in 2013.

CHANNELS OF DISTRIBUTION

U.S. producers sold mainly to end users and distributors (*** percent and *** percent in 2015, respectively) while importers of R-134a from China sold mainly to distributors and retailers (*** percent and *** percent in 2015, respectively) as shown in table II-1.

Table II-1
R-134a U.S. producers' and importers' U.S. commercial shipments, by sources and channels of distribution, 2013-15

* * * * * * *

GEOGRAPHIC DISTRIBUTION

U.S. producers and importers reported selling R-134a to all regions in the contiguous United States (table II-2). For U.S. producers, *** percent of sales were within 100 miles of their production facility, *** percent were between 101 and 1,000 miles, and *** percent were over 1,000 miles. Importers sold about *** percent within 100 miles of their U.S. point of shipment, *** percent between 101 and 1,000 miles, and *** percent over 1,000 miles.

[7] U.S. importers also shipped *** percent to the foam expansion and propellant market, and *** percent to the stationary OEM market.

[8] Petitioners stated that subject imports are present in all segments of the market, including the automotive aftermarket, the stationary HVAC aftermarket, the stationary OEM market, and the foam and propellant markets. Conference transcript, p. 12 (Cannon); petitioners' postconference brief, p. 3.

[9] U.S. producers' remaining shipments were to the automotive aftermarket (*** percent), the stationary aftermarket (*** percent), stationary OEMs (*** percent) and "other" uses (*** percent).

Table II-2
R-134a: Geographic market areas in the United States served by U.S. producers and importers

Region	U.S. producers	Subject U.S. importers
Northeast	***	17
Midwest	***	21
Southeast	***	22
Central Southwest	***	20
Mountains	***	18
Pacific Coast	***	19
Other[1]	***	9
All regions (except Other)	***	16
Reporting firms	***	24

[1] All other U.S. markets, including AK, HI, PR, and VI.

Source: Compiled from data submitted in response to Commission questionnaires.

SUPPLY AND DEMAND CONSIDERATIONS

U.S. supply

Domestic production

Based on available information, U.S. producers of R-134a have the ability to respond to changes in demand with moderate changes in the quantity of shipments of U.S.-produced R-134a to the U.S. market. The main contributing factors to this degree of responsiveness of supply are the existence of alternate markets and some unused capacity, tempered by a lack of production alternatives.

Industry capacity

U.S. capacity of R-134a decreased from *** short tons in 2013 to *** short tons in 2015. Domestic capacity utilization decreased irregularly from *** percent in 2013 to *** percent in 2015. This level of capacity utilization suggests that U.S. producers may have some capacity to increase production in response to an increase in prices.

Alternative markets

All three U.S. producers export R-134a; principal markets include ***.[10] U.S. producers' exports, as a percentage of total shipments, decreased over the period of investigation, from *** percent in 2013 to *** percent in 2015. This fairly high level of exports indicates that U.S. producers may have the ability to shift shipments between the U.S. market and other markets in response to price changes.

[10] ***.

Inventory levels

U.S. producers' inventories, as a ratio to total shipments, increased irregularly from *** percent in 2013 to *** percent in 2015. These inventory levels suggest that U.S. producers may have some ability to use inventories to respond to changes in demand. U.S. producers schedule outages ("turnarounds") every two to three years for preventative maintenance, inspection, and ***. These outages usually last *** days, and producers build inventory to prepare for the outage.[11]

Production alternatives

All three U.S. producers stated that they could not switch production from R-134a to other products. Additionally, ***.

Supply constraints

None of the U.S. producers reported supply constraints.[12] U.S. importer *** reported that in 2015 Mexichem Fluor and Chemours both declined to provide quotes for 30-pound cylinders of R-134a.[13]

Private label

All three U.S. producers reported that they are able to supply private-labeled product indirectly. Producer *** reported that ***. All four importers that reported an ability to directly supply private label 12-ounce cans supplied private label 12-ounce cans, while the three importers reporting an ability to supply private label indirectly had not supplied private label product since 2013. U.S. importer ***.[14]

Subject imports from China[15]

Based on available information, producers of R-134a from China have the ability to respond to changes in demand with moderate changes in the quantity of shipments of R-134a to the U.S. market. The main contributing factors to the moderate degree of responsiveness of supply are the existence of alternate markets, some ability to produce alternate products, tempered by limited unused capacity, and small inventories.

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[11] Conference transcript, pp. 45 (Sassano), 77-8 (Pacillo, Haun).

[12] Conference transcript, p. 11 (Cannon).

[13] See staff email with *** on March 22, 2016.

[14] Staff email correspondence with *** on March 22, 2016.

[15] For data on the number of responding foreign firms and their share of U.S. imports from China, please refer to Part I, "Summary Data and Data Sources."

Industry capacity

Reported R-134a production capacity in China increased from 129,276 short tons in 2013 to 157,263 short tons in 2015. Production also increased over the same period from 124,136 short tons to 152,298 short tons. Capacity utilization increased from 96.0 percent in 2013 to 96.8 percent in 2015. This level of utilization indicates that Chinese producers may have limited unused capacity with which to increase shipments to the United States.

Petitioners stated that China continues to add capacity to produce R-134a, even though China's current capacity exceeds global demand.[16]

Alternative markets

Most Chinese producers' shipments are to the home and third-country markets. Chinese producers' shipments to the home market increased from 48.1 percent of total shipments (60,121 short tons) in 2013 to 53.5 percent (81,259 short tons) in 2015. The percentage of shipments to other (non-U.S.) markets fluctuated from 41.1 percent in 2013 to 48.0 percent in 2014 and 38.7 percent in 2015. Chinese producers reported shipping to markets throughout the world: Europe, Asia, Latin America, the Middle East, Canada, and South Africa. R-134a producers in China may be able to shift sales from other markets to the U.S. market in response to relative price changes.

Petitioners state that demand in China has been low and shows no signs of improving because of "overcapacity and weak demand from downstream industries."[17] Additionally, petitioners argue that due to regulatory changes in the EU, more Chinese exports are likely headed to the United States.[18] Respondents argue that demand for R-134a in China and third-country export markets will continue to increase due to the increased demand in the automotive industry.[19]

Inventory levels

Chinese producers' R-134a inventories, as a share of total shipments, decreased from 5.3 percent in 2013 to 4.3 percent in 2015. These data indicate that producers in China may have a limited ability to use inventories to increase sales to the United States.

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[16] Petitioners' postconference brief, p. 5.

[17] Petitioners' postconference brief, pp. 40-41.

[18] Petitioners' postconference brief, p. 41. As of January 2017, there will be a ban on the use of fluorinated greenhouse house gases (including R-134a) in all new vehicles on the EU market.

[19] Respondents' postconference brief, p. 34, and Answers to Questions from Commission Staff, no. 1 and 11.

Production alternatives

*** of the five responding Chinese producers reported that they could shift production between R-134a and other products, depending on market demand. These other products include R-32, R-125, R-143a, and R-133a.

Supply constraints

Five Chinese producers reported supply constraints including a governmental environmental protection quota limiting total output of chemical products and R-134a, limited availability of skilled labor, and limited availability of raw materials. Importer *** reported that its supplying factory could not deliver on time due to a shortage in China.

Nonsubject imports

Nonsubject imports fluctuated during 2013-2015, increasing from *** percent of U.S. apparent consumption of R-134a in 2013 to *** percent in 2014, and declining to *** percent in 2015. The largest sources of nonsubject imports during 2013-15 were the UK and Germany. Combined, these countries accounted for *** percent of nonsubject imports in 2015. Importers of nonsubject R-134a reported that *** of their nonsubject shipments in 2015 went to ***.

U.S. demand

Based on available information, the overall demand for R-134a would likely experience small changes in response to changes in price. The main contributing factors are the lack of substitute products for R-134a and the very small cost share of R-134a in most of its final end uses.

End uses

U.S. demand for R-134a depends on the demand for U.S.-produced downstream products and services. As noted above, end uses include automobile A/C (new and repairs), refrigerant blends, refrigerators, stationary A/C units, propellants, industrial aerosol products, foam blowing, and pharmaceuticals. Respondents state that new uses of R-134a have been developed and include use in the heat pump market, alternative aerosols, and magnesium alloy to protect gas.[20]

Automotive OEM demand is based on U.S. new vehicle production. OEM demand is affected more immediately than aftermarket demand by any changes in regulations, car design, or the state of the economy.

[20] Respondents' postconference brief, Answers to Questions from Commission Staff, no. 1 and 11.

The A/C aftermarket is substantially larger than the OEM market, constituting about 70 to 80 percent of the overall automotive A/C refrigerant market. Although R-134a is not consumed by the A/C unit operation, some of the product leaks out of the system over time, degrading cooling performance. Automotive A/C units typically need to be recharged with refrigerant every 5 years. System damage in a vehicle accident also creates demand for R-134a in the aftermarket.[21] Current U.S. regulations require automotive OEMs move away from R-134a in 2021, however there will continue to be a substantial aftermarket.[22]

Cost share

R-134a accounts for a varying share of the cost of most of the end-use products in which it is used, depending on the end use. The typical responses of producers and importers differed, with U.S. producers typically reporting relatively low cost shares and importers typically reporting higher cost shares. One of the reasons for this difference is that U.S. producers typically responded for final products (automobiles and other equipment) while importers typically responded for intermediate products (refrigerant blends and R-134a in cans and cylinders). Reported cost shares for some uses were as follows:[23]

- Automotive or light duty vehicles (0.1 to 0.2 percent)[24]
- Non-automotive refrigerant uses: refrigerators (0.2 percent), chillers (0.9 percent), and HVAC (0.5 percent)[25]
- Refrigerant blends (40 percent)
- Foam (13 percent)
- Aerosol: industrial aerosol products (65 percent), electronic dusters (53 percent), freeze sprays for dusters (57 percent), aerosol cleaners/degreasers (34 percent)
- Medical devices (0.2 percent)
- Repackaging into cans and cylinders: 12 ounce cans (60 to 91 percent), 30 pound cylinders (83 to 91 percent).

Business cycles

All three responding U.S. producers and 24 of 30 importers indicated that the market was subject to business cycles. One U.S. producer and two responding importers reported other

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[21] *Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final)*, USITC Publication 4503, December 2014, p. II-12.

[22] Conference transcript, pp. 54-6 (Sassano).

[23] Producers and importers were requested to report the share of R-134a in downstream products. A number of importers reporting R-134a cost share of 100 percent. These responses are not included since they indicate that responding firms misunderstood the question.

[24] One importer reported that the cost share of R-134a in automotive use was 85 percent.

[25] One importer reported that the cost share of R-134a in stationary air conditioners/refrigerators was 50 percent.

distinctive conditions of competition.[26] Seasonal demand was reported to be the result of weather patterns that affected purchasing patterns (particularly in the aftermarket for replacement of R-134a in automobile air conditioners and refrigerators) and stocking up for the seasonal demand.[27]

All three U.S. producers and 8 of 24 responding importers reported changes in the conditions of competition since 2013.[28] Reported changes included increased R-134a available from China, changes in the availability of R-134a from China caused price changes, reduced demand in Europe leading to the U.S. market to becoming more important, weather, Chemours' plant closure in 2014 and the first half of 2015, and the EPA phase out of R-134a.

Demand trends

Most firms reported that either U.S. demand for R-134a has not changed or has decreased since 2013 (table II-3). *** of three producers reported a decrease in demand and 11 of 28 importers reported no change in demand. Reasons reported for reduced demand included the replacement of R-134a with R-1234yf in new vehicles, decreased use in propellants, and weather.[29] Firms reporting increased demand cited the increase in vehicle age and miles driven, increased use of R-134a in blends, based on weather and temperature, and lower R-134a price increasing the amount purchased.

Table II-3
R-134a: Firms' responses regarding U.S. demand and demand outside the United States

Item	Number of firms reporting			
	Increase	No change	Decrease	Fluctuate
Demand inside the United States:				
U.S. producers	***	***	***	***
Importers	4	11	8	5
Demand outside the United States:				
U.S. producers	***	***	***	***
Importers	1	7	4	1

Source: Compiled from data submitted in response to Commission questionnaires.

[26] Other conditions of competition included global over supply, industry consolidation causing a domestic shortage, and difficulties arising from the previous case on R-134a.

[27] Conference transcript, p. 9 (Cannon); petitioners' postconference brief, p. 10.

[28] Petitioners argued that the preliminary duties on R-134a during 2014 are another condition of competition and respondents argued that these deposit requirements had a significant impact on market forces. Conference transcript, p. 56 (Cannon) and p. 15 (Schutzman).

[29] Respondents stated that R-134a is in the process of being phased out of the market in favor of permissible substitutes such as R-1234yf. Conference transcript, p. 15 (Schutzman).

The EPA requires that all new cars shift from R-134a to R-1234yf by 2021, leading to a shrinking OEM market for R-134a.[30] [31] However, petitioners argue that there will be steady demand for R-134a in the aftermarket for at least 15 years after the phase out, and R-134a will continue to be used in other applications such as the stationary OEM and aftermarkets as well as in foam applications.

Most firms reported that demand outside the United States had not changed, or had decreased. Demand decreases were attributed to a shift from R-134a to 1234yf, European restrictions on use of R-134a, and weather. Demand was reported to be increasing because of economic growth in Asia and Latin America, and increased demand in Mexico including converting older autos from R-12 to R-134a.[32]

Substitute products

Substitutes for R-134a are limited. Two of the three responding U.S. producers and 4 of 29 responding importers reported substitutes for R-134a including: 152A, CO2, hydrocarbons, and 123ze/HFO-1234 for propellants; 152A and hydrocarbons for foam; and HFO-1234/1234YF, R-404A, R437A, and hydrocarbons for refrigerant/air conditioners. These substitutes are limited because replacing R-134a with another refrigerant typically requires retrofitting or changing equipment,[33] the flammability of HFC 152a limits its use, and the delisting of 404A as a substitute for R-134a. Only one firm reported that the price of substitutes affected demand for R-134a; this importer reported that the EPA phase out of R134a had reduced its price.

SUBSTITUTABILITY ISSUES

The degree of substitution between domestic and imported R-134a depends upon such factors as relative prices, quality (e.g., reliability of supply, purity, etc.), and conditions of sale (e.g., price discounts/rebates, lead times between order and delivery dates, payment terms, product services, etc.). Based on available data, staff believes that there is a high degree of substitutability between domestically produced R-134a and R-134a imported from China.

[30] Conference transcript, p. 30 (Geosits). This EPA regulation will affect less than 10 percent of the R-134a market, and the phase out of R-134a is expected to be gradual. Conference transcript, pp. 53, 61 (Sassano).

[31] R-134a will no longer be used in new, light-duty vehicles in Europe by the end of 2016. Conference transcript, p. 36 (Sassano).

[32] Petitioners' postconference brief, pp. 13, 35.

[33] Refrigeration systems using R-134a are designed specifically for R-134a. Respondents' postconference brief, p. 8.

Factors affecting purchasing decisions

Purchasers responding to lost sales lost revenue allegations[34] were asked to identify the main purchasing factors their firm considered in their purchasing decisions for R-134a. The major purchasing factors identified by firms include price/cost (reported by 20 firms), quality/purity (12), and availability/supply (10) (see table II-4).

Table II-4
R-134a: Ranking of factors used in purchasing decisions as reported by U.S. purchasers, by factor

Item	First	Second	Third	Total
	Number of firms (number)			
Price / Cost	7	5	8	20
Quality / Purity	6	2	4	12
Availability / Supply	3	3	4	10
Other factors[1]	3	9	4	16

[1] Other factors include lead times, service, reliability, U.S. reclamation activities, brand or source, U.S. stock, and administration.

Note.-- One firm reported both service and availability for the third factor and both responses are reported in the table and two firms reported price and quality as one factor.

Source: Compiled from data submitted in response to Commission questionnaires.

Petitioners stated that quality, reliability, timeliness, and delivery method are important to purchasers, but that during the period of investigation, U.S. producers were no longer able to charge a premium for service because of low import prices.[35]

Lead times

R-134a is primarily sold from inventory. U.S. producers reported that *** percent of their commercial shipments were sold from inventory, with lead times averaging 11.0 days, and that the remaining *** percent were produced-to-order with an average lead time of *** days. Importers reported that 59.2 percent of their commercial shipments were from U.S inventories, with lead times averaging 8 days, the remaining 40.8 percent was produced-to-order, with lead times averaging of 64 days.[36]

Petitioners report that domestic producers have no competitive advantage as a result of shorter lead times because of the large inventories of Chinese R-134a in the United States.[37]

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[34] This information is compiled from responses by purchasers identified by petitioners to the lost sales lost revenue allegations. See Part V for additional information.

[35] Conference transcript, p. 63 (Haun) and p. 67 (Buterbaugh).

[36] ***.

[37] Petitioners' postconference brief, p. 10.

Comparison of U.S.-produced and imported R-134a

In order to determine whether U.S.-produced R-134a can generally be used in the same applications as imports from China, U.S. producers and importers were asked whether the products can "always," "frequently," "sometimes," or "never" be used interchangeably. As shown in table II-5, most U.S. producers and importers reported that R-134a from all country pairs were "always" interchangeable. Importer *** reported the only difference was that ***.

Table II-5
R-134a: Interchangeability between R-134a produced in the United States and in other countries, by country pairs

Country pair	U.S. producers				U.S. importers			
	A	F	S	N	A	F	S	N
United States vs. China	***	***	***	***	22	4	2	1
United States vs. Germany	***	***	***	***	9	2	0	1
United States vs. Other	***	***	***	***	8	2	0	1
China vs. Germany	***	***	***	***	8	1	0	1
China vs. Other	***	***	***	***	8	1	0	1
Germany vs. Other	***	***	***	***	7	1	0	1

Note.—A=Always, F=Frequently, S=Sometimes, N=Never.

Source: Compiled from data submitted in response to Commission questionnaires.

Petitioners reported that R-134a is essentially interchangeable, and that customers receive certificates of assay verifying that the product meets AHRI700 specifications, regardless of source.[38]

In addition, producers and importers were asked to assess how often differences other than price were significant in sales of R-134a from the United States, China, or nonsubject countries. As seen in table II-6, all U.S. producers and most importers reported that there were either "sometimes" or "never" differences other than price. Differences reported by importers included: U.S. producers will not sell to the importer ***; availability, quality and transportation network; U.S. product had a distinctive and unpleasant odor that limited its applications; availability from U.S. sources is less certain than from Chinese sources; and that it is difficult to deal with U.S. manufacturers who "are arrogant and secretive."

[38] Conference transcript, p. 17-8 (Haun); petitioners' postconference brief, p. 10.

Table II-6
R-134a: Significance of differences other than price between R-134a produced in the United States and in other countries, by country pairs

Country pair	U.S. producers				U.S. importers			
	A	F	S	N	A	F	S	N
United States vs. China	***	***	***	***	4	2	12	10
United States vs. Germany	***	***	***	***	2	1	4	5
United States vs. Other	***	***	***	***	3	0	4	3
China vs. Germany	***	***	***	***	1	0	4	4
China vs. Other	***	***	***	***	2	0	4	2
Germany vs. Other	***	***	***	***	2	0	4	2

Note.--A = Always, F = Frequently, S = Sometimes, N = Never.

Source: Compiled from data submitted in response to Commission questionnaires.

PART III: U.S. PRODUCERS' PRODUCTION, SHIPMENTS, AND EMPLOYMENT

The Commission analyzes a number of factors in making injury determinations (see 19 U.S.C. §§ 1677(7)(B) and 1677(7)(C)). Information on the dumping margins was presented in *Part I* of this report and information on the volume and pricing of imports of the subject merchandise is presented in *Part IV* and *Part V*. Information on the other factors specified is presented in this section and/or *Part VI* and (except as noted) is based on the questionnaire responses of three firms that accounted for the 100 percent of U.S. production of R-134a from 2013 through 2015.

U.S. PRODUCERS

The Commission issued a U.S. producer questionnaire to three firms based on information contained in the petition. All three firms provided useable data on their productive operations.[1] Staff believes that these responses represent 100 percent of U.S. production of R-134a. Table III-1 lists U.S. producers of R-134a, their production locations, positions on the petition, and shares of total production.

Table III-1
R-134a: U.S. producers of R-134a, their positions on the petition, production locations, and share of reported production, 2015

Firm	Position on petition	Production location	Share of production (percent)
Arkema	Petitioner	Calvert City, KY	***
Mexichem	Petitioner	St. Gabriel, LA	***
Chemours	Petitioner	Corpus Cristi, TX	***
Total			100.0

Source: Compiled from data submitted in response to Commission questionnaires.

Table III-2 presents information on U.S. producers' ownership, and related and/or affiliated firms.

Table III-2
R-134a: U.S. producers of R-134a, ownership, related and/or affiliated firms, since January 2013

* * * * * * *

[1] In addition, the Commission received a U.S. producer response from Honeywell International, Inc. ("Honeywell"). Honeywell is ***.

As discussed in greater detail below, *** U.S. producers directly import the R-134a from China and *** U.S. producers directly import R-134a from nonsubject sources.

Producers were asked to report any changes in operations since January 2013. All three firms reported prolonged shutdowns or production curtailments. Table III-3 presents producer responses.

Table III-3
R-134a: U.S. producers' reported changes in operations, since January 1, 2013

* * * * * * *

U.S. PRODUCTION, CAPACITY, AND CAPACITY UTILIZATION

Table III-4 and figure III-1 present U.S. producers' production, capacity, and capacity utilization. Total U.S. producers' capacity decreased by *** percent from 2013 to 2015. Reported production also decreased by *** percent over the period.

Table III-4
R-134a: U.S. producers' production, capacity, and capacity utilization, 2013-15

* * * * * * *

Figure III-1
R-134a: U.S. producers' production, capacity, and capacity utilization, 2013-15

* * * * * * *

Arkema's production capacity is calculated ***. Chemours' capacity is calculated ***. Likewise, Mexichem calculates ***.

Petitioners explain that the capacity decline from 2013 to 2015 is due to reporting U.S. producers' actual experience during the period, rather than average capacity over the period. U.S. producers plan a periodic month-long shutdown, which occurred in late 2014/early 2015, to conduct routine periodic maintenance.[2] Arkema's ***. Chemours ***.[3] ***.[4] Chemours further explained in its questionnaire response that ***. Mexichem replaces its catalyst every three years, resulting in a 45-day shutdown.[5] Its last catalyst change shutdown occurred in the fall of 2015.[6]

[2] Petitioners' postconference brief, pp. 31-32.
[3] Petitioners' postconference brief, Exhibit 1, pp 1-2 and pp. 5-6.
[4] Petitioners' postconference brief, pp. 31-32.
[5] Conference transcript, pp. 75-77 (Pacillo).
[6] Conference transcript, p. 95 (Pacillo).

The Commission asked the domestic producers to report constraints on their capacity to produce R-134a. Arkema stated that ***. Chemours stated that ***. Mexichem Flour added that its capacity ***.

*** U.S. producers reported that they cannot switch production between R-134a and other production using the same equipment and labor. Chemours reported ***.[7]

U.S. PRODUCERS' U.S. SHIPMENTS AND EXPORTS

Table III-5 presents U.S. producers' U.S. shipments, export shipments, and total shipments. The quantity of U.S. producers' U.S. shipments decreased from 2013 to 2015 by *** percent, while the value decreased as by *** percent. The unit values of U.S. shipments also decreased by *** percent from 2013 to 2015. U.S. producers reported exporting to ***. The quantity of export shipments decreased by *** percent from 2013 to 2015.

Table III-5
R-134a: U.S. producers' U.S. shipments, export shipments, and total shipments, 2013-15

* * * * * * *

In addition, Honeywell ***. The tabulation below presents ***.

* * * * * * *

U.S. PRODUCERS' U.S. SHIPMENTS BY SEGMENT

Table III-6 presents U.S. producers' U.S. shipments by industry segment. Producers identified "other segments" as ***.

Table III-6
R-134a: U.S. producers' U.S. shipments by market segment, 2013-15

* * * * * * *

U.S. PRODUCERS' INVENTORIES

Table III-7 presents U.S. producers' end-of-period inventories and the ratio of these inventories to U.S. producers' production, U.S. shipments, and total shipments. U.S. producers' inventories of R-134a increased by *** percent from 2013 to 2015. Inventories relative to U.S. shipments increased by *** percentage points from 2013 to 2015, while inventories relative to total shipments increased by *** percentage points.

[7] ***.

Table III-7
R-134a: U.S. producers' inventories, 2013-15

* * * * * * *

U.S. PRODUCERS' IMPORTS

U.S. producers' direct imports of R-134a are presented in table III-8. *** U.S. producers reported direct imports of R-134a from China. ***. ***.

Table III-8
R-134a: U.S. producers' direct imports, 2013-15

* * * * * * *

U.S. EMPLOYMENT, WAGES, AND PRODUCTIVITY

Table III-9 shows U.S. producers' employment-related data. The level of production-related workers (PRWs) *** from 2013 to 2015. Hours worked per PRW decreased from 2013 to 2015 by *** percent. Total wages paid increased by *** percent, while productivity *** by *** percent.

Table III-9
R-134a: U.S. producers' employment related data, 2013-15

* * * * * * *

PART IV: U.S. IMPORTS, APPARENT U.S. CONSUMPTION, AND MARKET SHARES

U.S. IMPORTERS

The Commission issued importer questionnaires to 72 firms believed to be importers of subject R-134a, as well as to all U.S. producers of R-134a.[1] Usable questionnaire responses were received from 30 companies.[2] [3] Table IV-1 lists all responding U.S. importers of R-134a from China and other sources, their headquarters, and their shares of U.S. imports, in 2015.

U.S. IMPORTS

Table IV-2 and figure IV-1 present data for U.S. imports of R-134a from China and all other sources. U.S. import data is based on official Customs import data, HTS subheading 2903.39.2020, adjusted with imports reported in questionnaire responses that entered the U.S. under HTS numbers *other than* 2903.39.2020.[4] The quantity of imports from China decreased by *** percent from 2013 to 2015, and the value of imports from China decreased by *** percent. The top nonsubject sources of U.S. imports in 2015 were the United Kingdom, India, and France.

[1] The Commission issued questionnaires to those firms identified in the petition, along with firms that, based on a review of data provided by ***, may have accounted for more than one percent of total imports under HTS statistical reporting number 2903.39.2020 in 2013 through 2015.

[2] The Commission received an incomplete response from ***. Responding importers are comprised of 29 distributors, 7 repackagers, 6 retailers, and 7 "other" types of importers. The numbers do not sum to 30 because respondents were allowed to identify as more than one type of importer.

[3] For data on the share of responding U.S. importers' U.S. imports from China, please refer to Part I, "Summary Data and Data Sources."

[4] Petitioners argue that import data collected by the Commission understates total imports because of a poor response rate by importers from China. In addition, due to misclassification Census statistics understate R-134a imports from China. Petitioners' postconference brief, pp. 13-16. Appendix D presents import data and apparent consumption using only official import data.

Table IV-1
R-134a: U.S. importers, their headquarters, and share of total imports by source, 2015

Firm	Headquarters	Share of imports by source (percent)		
		China	All other sources	Total imports
Arkema Inc.	King Of Prussia, PA	***	***	***
Autopart International, Inc.	Norton, MA	***	***	***
AutoZone Parts Inc.	Memphis, TN	***	***	***
BBC Biochemical	Mount Vernon, WA	***	***	***
BMP International Inc.	Tampa, FL	***	***	***
Coolgas, Inc. dba A-Gas Americas	Magnolia, TX	***	***	***
CRC Industries	Warminster, PA	***	***	***
Diversified Pure Chem LLC	Rhome, TX	***	***	***
DYK Automotive, LLC	Medina, MN	***	***	***
Enviro-Safe Refrigerants, Inc.	Pekin, IL	***	***	***
First Continental International (N.J.) Inc.	Glen Rock, NJ	***	***	***
FSD Group D/B/A Saez Distributors	Doral, FL	***	***	***
Galpa Export Corp	Doral, FL	***	***	***
GlaxoSmithKline LLC	Philadelphia, PA	***	***	***
Hudson Technologies Company	Pearl River, NY	***	***	***
ICOR International Inc.	Indianapolis, IN	***	***	***
Kivlan and Company, Inc.	Carlisle, PA	***	***	***
Mexichem Fluor Inc.	St. Gabriel, LA	***	***	***
Mondy Global, Inc.	San Antonio, TX	***	***	***
National Refrigerants, Inc.	Philadelphia, PA	***	***	***
Old World Industries, LLC	Northbrook, IL	***	***	***
Ozark Purchasing, LLC d/b/a O'Reilly Auto Parts	Springfield, MO	***	***	***
Rig Tough, Inc.	San Antonio, TX	***	***	***
Solvay Fluorides, LLC	Houston, TX	***	***	***
Technical Chemical Company	Cleburne, TX	***	***	***
Tulstar Products Inc.	Tulsa, OK	***	***	***
USA United Suppliers of America, Inc.	Sarasota, FL	***	***	***
Vision Global Technology, Inc.	Decatur, AL	***	***	***
Walmart Stores, Inc.	Bentonville, AR	***	***	***
Weitron Inc.	Newark, DE	***	***	***
Total		***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

Table IV-2

R-134a: U.S. imports, by source, 2013-15

Item	Calendar year		
	2013	2014	2015
	Quantity (short tons)		
U.S. imports from.--			
China	***	***	***
All other sources	838	3,820	1,135
Total U.S. imports	***	***	***
	Value (1,000 dollars)		
U.S. imports from.--			
China	***	***	***
All other sources	5,764	17,415	8,071
Total U.S. imports	***	***	***
	Unit value (dollars per short ton)		
U.S. imports from.--			
China	***	***	***
All other sources	6,878	4,559	7,111
Total U.S. imports	***	***	***
	Share of quantity (percent)		
U.S. imports from.--			
China	***	***	***
All other sources	***	***	***
Total U.S. imports	***	***	***
	Share of value (percent)		
U.S. imports from.--			
China	***	***	***
All other sources	***	***	***
Total U.S. imports	***	***	***
	Ratio to U.S. production		
U.S. imports from.--			
China	***	***	***
All other sources	***	***	***
Total U.S. imports	***	***	***

Source: Official U.S. import statistics using HTS statistical reporting number 2903.39.2020, accessed March 9, 2016 and compiled from data submitted in response to Commission questionnaires for imports of R-134a in other HTS statistical reporting numbers.

Figure IV-1

R-134a: U.S. import volumes and prices, 2013-15

* * * * * * *

NEGLIGIBILITY

The statute requires that an investigation be terminated without an injury determination if imports of the subject merchandise are found to be negligible.[5] Negligible imports are generally defined in the Tariff Act of 1930, as amended, as imports from a country of merchandise corresponding to a domestic like product where such imports account for less than 3 percent of the volume of all such merchandise imported into the United States in the most recent 12-month period for which data are available that precedes the filing of the petition or the initiation of the investigation. However, if there are imports of such merchandise from a number of countries subject to investigations initiated on the same day that individually account for less than 3 percent of the total volume of the subject merchandise, and if the imports from those countries collectively account for more than 7 percent of the volume of all such merchandise imported into the United States during the applicable 12-month period, then imports from such countries are deemed not to be negligible.[6] Imports from China accounted for *** percent of total imports of R-134a by quantity during 2015.

APPARENT U.S. CONSUMPTION AND MARKET SHARES

Table IV-3 and figure IV-2 present data on apparent U.S. consumption and U.S. market shares for R-134a. Apparent consumption, based on quantity, decreased by *** percent from 2013 to 2015, while apparent consumption based on value decreased by *** percent. U.S. producers' share of U.S. consumption, based on quantity, decreased from 2013 to 2015 by *** percentage points. The market share of imports of R-134a from China increased from 2013 to 2015 by *** percentage points, and the market share of nonsubject imports increased by *** percent .

[5] Sections 703(a)(1), 705(b)(1), 733(a)(1), and 735(b)(1) of the Act (19 U.S.C. §§ 1671b(a)(1), 1671d(b)(1), 1673b(a)(1), and 1673d(b)(1)).

[6] Section 771 (24) of the Act (19 U.S.C § 1677(24)).

Table IV-3
R-134a: Apparent U.S. consumption, 2013-15

Item	Calendar year		
	2013	2014	2015
	Quantity (short tons)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
China	***	***	***
All other sources	838	3,820	1,135
Total U.S. imports	***	***	***
Apparent U.S. consumption	***	***	***
	Value (1,000 dollars)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
China	***	***	***
All other sources	5,764	17,415	8,071
Total U.S. imports	***	***	***
Apparent U.S. consumption	***	***	***
	Share of quantity (percent)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
China	***	***	***
All other sources	***	***	***
Total U.S. imports	***	***	***
	Share of value (percent)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
China	***	***	***
All other sources	***	***	***
Total U.S. imports	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

Figure IV-2
R-134a: Apparent U.S. consumption, 2013-15

* * * * * * *

U.S. shipments of imports from China by market segment are presented in table IV-4, and U.S. shipments of imports from all other sources by market segment are presented in table IV-5. Table IV-6 presents a comparison of U.S. producers' and U.S. importers' U.S. shipments by market segment.

Table IV-4
R-134a: U.S. importers' U.S. shipments of imports from China by market segment, 2013-15

* * * * * * *

Table IV-5
R-134a: U.S. importers' U.S. shipments of imports from all other sources by market segment, 2013-15

* * * * * * *

Table IV-6
R-134a: U.S. producers' and importers' U.S. shipments of imports by market segment, 2013-15

* * * * * * *

PART V: PRICING DATA

FACTORS AFFECTING PRICES

Raw material costs

The primary raw materials used in the production of R-134a are hydrogen fluoride (HF) which is made from fluorspar, and a chlorocarbon, trichloroethylene (TCE) or perchloroethylene (PCE).[1] U.S. producers' ratio of raw materials to the total cost of goods sold decreased from *** percent in 2013 to *** percent in 2015. Of the three responding U.S. producers, ***. Importers' responses also varied, with 9 of 23 importers reporting no change in raw material costs, 6 reporting declining raw material costs, and 7 reporting fluctuating raw material costs.

U.S. inland transportation costs

*** responding U.S. producers and the vast majority of importers reported that they typically arrange transportation to their customers. U.S. producers reported that their U.S. inland transportation costs ranged from *** percent while importers reported costs ranging between 1 and 20 percent (averaging about 6 percent).[2]

PRICING PRACTICES

Pricing methods

U.S. producers and importers reported using a variety of pricing methods (table V-1). U.S. producers reported using transaction-by-transaction negotiations, contracts, and price lists. Most importers (20 of 29) reported transaction-by-transaction pricing methods, although a smaller number of importers also reported contracts, set price lists, and other methods.

[1] *Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final)*, USITC Publication 4503, December 2014, p. V-1. TCE is used by *** and PCE is used by ***.

[2] Excluding importers *** who reported transportation costs of 38 and 35 percent respectively. Average U.S. inland transportation costs reported by importers including these responses was 9.5 percent.

Table V-1
R-134a: U.S. producers and importers reported price setting methods, by number of responding firms[1]

Method	U.S. producers	U.S. importers
Transaction-by-transaction	***	20
Contract	***	7
Set price list	***	4
Other	***	8

[1] The sum of responses down may not add up to the total number of responding firms as each firm was instructed to check all applicable price setting methods employed.

Source: Compiled from data submitted in response to Commission questionnaires.

Petitioners stated that some distributors of Chinese refrigerants sell under uniform prices to all market segments, often via weekly or monthly price lists.[3] They report that because most customers, including OEMS which have aftermarket service arms, have access to these distributed price lists, these price lists are referenced in the OEM bidding process.[4] According to petitioners, in some cases, the list price offered by distributors of Chinese R-134a is lower than domestic producers' actual selling price.[5]

As shown in table V-2, U.S. producers sell largely in the spot market and under annual contracts (*** percent and *** percent, respectively). Importers reported selling most of their product in the spot market. U.S. importer *** reported that it quotes prices on the spot market ***.

Table V-2
R-134a: U.S. producers' and importers' shares of U.S. commercial shipments by type of sale, 2015

Item	U.S. producers	Subject U.S. importers
	Share (percent)	
Share of commercial U.S. shipments.--		
Long-term contracts	***	0.4
Annual contract	***	15.8
Short-term contracts	***	16.2
Spot sales	***	67.6

Note.--Because of rounding, figures may not add to the totals shown.

Source: Compiled from data submitted in response to Commission questionnaires.

U.S. producers *** also reported short-term contract sales ((ranging from *** months) and long-term contract sales (*** years). *** producers offered annual contracts. *** under

[3] Conference transcript, pp. 20-21 (Haun). Mr. Haun specifically referenced distributors such as South Corp Sales, Jack McAdams, and BMP International, and reported that Chinese prices for R-134a in 30-pound cylinders have affected prices for bulk R-134a.

[4] Conference transcript, p. 50 (Sassano); petitioners' postconference brief, p. 7.

[5] Conference transcript, p. 41 (Cannon).

short-term contracts. U.S. producers *** reported *** and *** producers reported offering meet-or-release provisions under annual or long-term contracts.

Six importers' short term contracts ranged from three to six months. Most of these importers reported that their short-term contract sales did not allow for price renegotiation, fixed quantity and price, and did not have a meet-or-release provision. One importer *** reported long-term contract sales with a duration of *** years with a fixed price and quantity.

Sales terms and discounts

U.S. producers and importers typically quote prices on a delivered basis. U.S. producer *** reported offering ***, but *** reported ***, and *** reported ***.[6] Most importers (17 of 29) reported no discount policy. Nine importers reported offering quantity discounts, four reported total volume discounts, and five reported other types of discounts, including discounts based on pricing terms, total value of the order, and multiple cylinder purchase discounts. Importer *** reported offering some discounts based on total annual volume for its commercial accounts, ***.

*** producers reported offering sales terms of net 30 days, and *** also reported a variety of other sales terms. Sixteen importers reported sales terms of 30 days, one importer each reported offering sales terms of net 60 and 2/10 net 30, and thirteen importers also reported other sales terms (including prepayment, payment at the time of shipment, and "cash on delivery").

Petitioners stated that Chinese producers will occasionally offer U.S. importers 365-day payment terms, or will not require payment from retailers until the importer sells the 30-pound cylinders or 12-ounce cans of R-134a.[7]

PRICE DATA

The Commission requested U.S. producers and importers to provide quarterly data for the total quantity and f.o.b. value of the following R-134a products shipped to unrelated U.S. customers during 2013-15.

Product 1.-- R-134a in bulk sold to repackagers and distributors

Product 2.-- R-134a in 30-pound containers with an automotive valve sold to distributors

[6] Petitioners stated that after the negative determination of the related investigation in 2014, customers approached the U.S. producers requesting rebates on price increases that they had already paid which cost petitioners millions of dollars. Conference transcript, p. 11 (Cannon), pp. 31 and 70 (Geosits), p. 69 (Haun); petitioners' postconference brief, pp. 3, 27.

[7] Petitioners' postconference brief, p. 10.

Product 3.-- R-134a in 30-pound containers with an HVAC valve sold to distributors or wholesalers[8]

Product 4.— R-134a in 30-pound containers with an automotive valve sold to retailers

Product 5.— R-134a in 12-ounce containers sold to distributors

All three U.S. producers and 18 importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters. [9] [10] Pricing data reported by these firms accounted for approximately *** percent of U.S.producers' commercial shipments[11] of R-134a and *** percent of U.S. commercial shipments of subject imports from China in 2015.

Price data for products 1-5 are presented in tables V-3 to V-7 and figures V-1 to V-5. Nonsubject country prices were collected for Germany, and are presented in Appendix E.

[8] Petitioners questioned the accuracy of particular importers reporting prices higher than those presented on the price lists. Specifically, petitioners assert that *** are aberrational. Petitioners' postconference brief, p. 28. U.S. importer ***. (Staff telephone interview with ***, March 31, 2016).

[9] U.S. importer *** provided estimates of the quantities and values based on the ratio of Chinese imports to total purchases by year, because it does not track the country source once the product is brought into its facility.

[10] Per-unit pricing data are calculated from total quantity and total value data provided by U.S. producers and importers. The precision and variation of these figures may be affected by rounding, limited quantities, and producer or importer estimates.

[11] Pricing coverage for U.S. producers is relatively low because pricing product definitions did not include automotive and stationary OEMs which made up *** percent of domestic shipments in 2015.

Table V-3
R-134a: Weighted-average f.o.b. prices and quantities of domestic and imported product 1[1] and margins of underselling/(overselling), by quarters, 2013-15

Period	United States		China		
	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2013:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	---	***	---
2014:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2015:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	1.42	228,741	***

[1] Product 1: R-134a in bulk sold to repackagers and distributors.

Note.--Importer *** reported the only imports of product 1 during the first two quarters of 2013 at relatively high prices and has not imported R-134a since then. Importer *** reported prices for *** of R-134a than other importers throughout the period, and sold in ***. These were the only *** importers reporting prices during the first three quarters of 2013, and these data have been included.

Source: Compiled from data submitted in response to Commission questionnaires.

Table V-4
R-134a: Weighted-average f.o.b. prices and quantities of domestic and imported product 2[1] and margins of underselling/(overselling), by quarters, 2013-15

Period	United States		China		
	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2013:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2014:					
Jan.-Mar.	***	***	2.20	565,336	***
Apr.-Jun.	***	***	2.34	456,293	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2015:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	1.92	1,505,583	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***

[1] Product 2: R-134a in 30-pound containers with an automotive valve sold to distributors.

Source: Compiled from data submitted in response to Commission questionnaires.

Table V-5
R-134a: Weighted-average f.o.b. prices and quantities of domestic and imported product 3[1] and margins of underselling/(overselling), by quarters, 2013-15

Period	United States		China		
	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2013:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	3.20	425,938	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	3.08	214,705	***
2014:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	2.82	122,387	***
Jul.-Sep.	***	***	2.95	69,222	***
Oct.-Dec.	***	***	2.97	56,586	***
2015:					
Jan.-Mar.	***	***	3.15	186,727	***
Apr.-Jun.	***	***	2.97	381,690	***
Jul.-Sep.	***	***	3.11	254,663	***
Oct.-Dec.	***	***	3.41	123,482	***

[1] Product 3: R-134a in 30-pound containers with an HVAC valve sold to distributors or wholesalers.

Source: Compiled from data submitted in response to Commission questionnaires.

Table V-6
R-134a: Weighted-average f.o.b. prices and quantities of domestic and imported product 4[1] and margins of underselling/(overselling), by quarters, 2013-15

Period	United States		China		
	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2013:					
Jan.-Mar.	***	***	2.19	2,586,463	***
Apr.-Jun.	***	***	2.23	1,982,627	***
Jul.-Sep.	***	***	2.21	804,016	***
Oct.-Dec.	***	***	2.12	457,214	***
2014:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2015:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***

[1] Product 4: R-134a in 30-pound containers with an automotive valve sold to retailers.

Source: Compiled from data submitted in response to Commission questionnaires.

Table V-7
R-134a: Weighted-average f.o.b. prices and quantities of domestic and imported product 5[1] and margins of underselling/(overselling), by quarters, 2013-15

Period	United States		China		
	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2013:					
Jan.-Mar.	***	***	3.91	779,112	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2014:					
Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	3.93	320,411	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2015:					
Jan.-Mar.	***	***	3.21	654,755	***
Apr.-Jun.	***	***	3.04	681,157	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	2.69	212,423	***

[1] Product 5: R-134a in 12-ounce containers sold to distributors.

Note.-- These data exclude *** reported pricing data for product from China which included prices for *** dollars per pound during 2013-2015.

Source: Compiled from data submitted in response to Commission questionnaires.

Figure V-1

R-134a: Weighted-average prices and quantities of domestic and imported product 1, by quarters, 2013-15

* * * * * * *

Figure V-2

R-134a: Weighted-average prices and quantities of domestic and imported product 2, by quarters, 2013-15

* * * * * * *

Figure V-3

R-134a: Weighted-average prices and quantities of domestic and imported product 3, by quarters, 2013-15

* * * * * * *

Figure V-4

R-134a: Weighted-average prices and quantities of domestic and imported product 4, by quarters, 2013-15

* * * * * * *

Figure V-5

R-134a: Weighted-average prices and quantities of domestic and imported product 5, by quarters, 2013-15

* * * * * * *

Price trends

Prices decreased overall during 2013-15, but increased during 2014. Table V-8 summarizes the price trends, by country and by product. A number of firms reported high prices for R-134a during the third quarter of 2014. Several firms attributed these high prices to the pending AD/CVD investigations at the time.[12] As shown in the table, domestic price decreases ranged from 0.3 to 23.0 percent during 2013-15 while import price decreases ranged from 15.0 to 62.4 percent.[13] Import prices increased by *** percent for pricing product 3.[14]

[12] U.S. importer *** reported that it ceased all sales of R-134a during June and July of 2014, and when selling R-134a during the third quarter of 2014, it increased prices to help cover the potential expense of any duties. It reported that since the negative determination, prices have returned to normal market conditions. See staff email with *** on March 22, 2016.

[13] The large decrease in Chinese pricing product 1 is largely due to data reported by ***, who was the only reporting firm in the first two quarters of 2013 and who has not imported R-134a since then.

[14] U.S. importer *** (Staff telephone interview with ***, March 31, 2016).

Table V-8
R-134a: Summary of weighted-average f.o.b. prices for products 1-5 from the United States and China

Item	Number of quarters	Low price (dollars per pound)	High price (dollars per pound)	Change in price over period[1] (percent)
Product 1:				
United States	12	***	***	***
China	11	***	***	***
Product 2:				
United States	12	***	***	***
China	12	***	***	***
Product 3:				
United States	12	***	***	***
China	12	***	***	***
Product 4:				
United States	12	***	***	***
China	12	***	***	***
Product 5:				
United States	12	***	***	***
China	12	***	***	***

[1] Percentage change from the first quarter in which data were available to the last quarter in which price data were available.

Source: Compiled from data submitted in response to Commission questionnaires.

Price comparisons

As shown in table V-9, prices for R-134a imported from China were below those for U.S.-produced product in 36 of 59 instances (*** pounds); margins of underselling ranged from 4.1 to 20.8 percent. In the remaining 23 instances (*** pounds), prices for R-134a from China were between 3.2 and 133.8 percent above prices for the domestic product.

Table V-9
R-134a: Instances of underselling/overselling and the range and average of margins, by China, 2013-15

Source	Underselling				
	Number of quarters	Quantity (pounds)	Average margin (percent)	Margin Range (percent)	
				Min	Max
Product 1	7	1,418,947	11.9	4.6	20.8
Product 2	***	***	***	***	***
Product 3	***	***	***	***	***
Product 4	9	13,111,258	10.3	6.1	20.2
Product 5	6	2,530,453	7.1	4.1	12.2
Total, underselling	36	***	7.5	4.1	20.8
Source	(Overselling)				
	Number of quarters	Quantity (pounds)	Average margin (percent)	Margin Range (percent)	
				Min	Max
Product 1	4	1,446,101	(74.4)	(3.2)	(133.8)
Product 2	***	***	***	***	***
Product 3	***	***	***	***	***
Product 4	3	6,415,507	(13.6)	(7.3)	(18.0)
Product 5	6	2,169,470	(20.2)	(4.1)	(57.4)
Total, overselling	23	***	(27.6)	(3.2)	(133.8)

Note.-- These data include only quarters in which there is a comparison between the U.S. and subject product.

Source: Compiled from data submitted in response to Commission questionnaires.

Direct Imports/Purchase Costs

Seven importers reported imports of bulk R-134a from China for internal use or repackaging since January 1, 2013.[15] [16] Import purchase cost data for bulk R-134a and U.S. price data for bulk R-134a sold to repackagers and distributors (pricing product 1) are presented in table V-10 and figure V-6.[17]

[15] These importers include ***. These reported direct imports account for *** percent of total imports of R-134a during 2013-2015.

[16] U.S. importer *** reported importing bulk R-134a for internal use or repackaging ***. Importer ***.

[17] Respondents stated that domestic producers are not willing to sell bulk R-134a in sufficient quantities or at prices that would give their competitors an edge in the downstream markets for 30-pound cylinders or 12-ounce cans. Respondents' postconference brief, p. 27.

Table V-10

R-134a: Weighted average f.o.b. prices and quantities of domestic pricing product 1 and weighted-average landed-duty paid prices and quantities of bulk R-134a for internal consumption/repackaging, by quarter, 2013-2015

* * * * * * *

Figure V-6

R-134a: Weighted average f.o.b. prices and quantities of domestic pricing product 1 and weighted-average landed-duty paid prices and quantities of bulk R-134a for internal consumption/repackaging

* * * * * * *

Importers were asked about factors that add to the cost of directly importing. U.S. importer *** reported port fees of 3.8 percent of landed duty paid value; *** reported that the ***; and *** reported 1 percent of its landed duty paid value went towards insurance costs, such as marine insurance and broker fees. U.S. importer *** reported that about 1 percent each of its landed duty paid value went towards logistical costs/supply chain costs and warehousing costs, and about 0.2 percent of its landed duty paid value went towards insurance costs. U.S. importer *** reported that about 17 percent of its landed duty paid value went towards logical costs or supply chain costs, and about 1 percent went towards insurance costs.[18] Two importers reported comparing costs to U.S. producers' prices when determining additional transaction costs to directly import, five importers reported comparing costs to both importers and U.S. producers' prices, and three importers reported comparing costs to neither U.S. producers' or importers' prices.

When asked about the benefits of directly importing bulk R-134a, three importers reported that it was cost effective, or that they did so to remain competitive. U.S. importer *** imported directly because of the availability of supply and asset utilization, and *** reported that it is ***. U.S. importer *** reported that it directly imports ***, and *** reported that it ***. Two importers estimated margins saved by directly importing ranging from *** percent, and six importers estimated that U.S. inland-transportation costs accounted for *** percent of the total cost of bulk R-134a directly imported from China.

LOST SALES AND LOST REVENUE

The Commission requested U.S. producers of R-134a report purchasers where they experienced instances of lost sales or revenue due to competition from imports of R-134a from China during 2013-15. All three responding U.S. producers reported that they had to either reduce prices or roll back announced price increases, and that they had lost sales. The

[18] Importer *** reported values instead of shares. Staff followed up to gain clarification (see staff email with ***, March 29, 2016).

petitioning firms identified 34 firms where they lost sales or revenue (21 consisting of only lost sales allegations, 2 consisting of only lost revenue allegations, and 11 consisting of both types of allegations).[19] U.S. producers were also asked to provide information regarding the timing, method of sale, and product type related to the lost sales and lost revenue allegations. Allegations spanned the entire period of investigation from 2013 through 2015. Methods of sale varied and included request for quote bids, individual sales, and contract negotiations.

Staff contacted 38 purchasers and received responses from 19 purchasers. Responding purchasers reported purchasing 158.8 million pounds of R-134a during 2013-15 (table V-11). During 2015, responding purchasers purchased 71.9 percent from U.S. producers, 28.0 percent from China, and 0.1 percent from nonsubject countries. Of the responding purchasers, six reported decreasing purchases from domestic producers, two reported increasing purchases, four reported no change, six reported fluctuating purchases, and one did not purchase any domestic product.[20] Explanations for increasing purchases of domestic product included more aggressive pricing because of the previous AD/CVD investigations. Explanations for decreasing purchases of domestic product included difficulty in securing domestic product due to limited availability to meet customer demand and competitive pricing from other distributors; domestic prices could not match Chinese prices; and sales erosion and lower-priced imports were demanded by customers. Explanations for fluctuating domestic purchases included customer demand; sales trends and inventory calculations; pricing and service; and one U.S. producer sold its inventory to another producer whose plant was shut down for a prolonged period.

Table V-11
R-134a: Purchasers' responses to purchasing patterns

* * * * * * *

Of the 19 responding purchasers, eight reported that they had shifted purchases of R-134a from U.S. producers to subject imports since 2013. Seven of these purchasers reported that price was the reason for the shift, and the reported estimated share of purchases shifted ranged from 0.2 percent to 59.5 percent of their total purchases during 2013-2015 (table V-12). Another identified reason for shifting from U.S. producers was lack of availability of U.S. product.

Table V-12
R-134a: Purchasers' responses to shifting supply sources

* * * * * * *

[19] ***.

[20] All purchasers indicated that they knew the source of the R-134a they purchased.

Of the 19 responding purchasers, nine reported that U.S. producers had reduced prices in order to compete with lower-priced imports from subject countries (table V-13). Two purchasers reported that U.S. producers had not reduced prices, and nine reported that they did not know. They reported estimated price reductions ranging from *** to *** percent. In describing the price reductions, purchasers indicated that prices declined sharply after the negative determination in 2014, and that there were annual price reductions to compete with imported R-134a.

In responding to the lost sales lost revenue survey, some purchasers provided additional information on purchases and market dynamics. Purchaser *** reported that "***".

Table V-13
R-134a: Purchasers' responses to U.S. producer price reductions

* * * * * * *

PART VI: FINANCIAL EXPERIENCE OF U.S. PRODUCERS

BACKGROUND

Three U.S. producers, Arkema, Chemours, and Mexichem Fluor, reported usable financial results on their R-134a operations.[1] All three U.S. producers are part of large publically traded multinational businesses.[2] As noted below in the *Cost of goods sold and gross profit* section, U.S. producers vary in terms of the level of input integration.

With respect to notable changes during the period, DuPont's Performance Chemicals segment was spun-off and became a publically traded company (Chemours) in July 2015.[3] While it reportedly did not affect the manufacturing operations of Chemours,[4] some aspects of Chemours' cost structure *** (see footnote 23).

As noted in Part III, the R-134a operations of all three U.S. producers were impacted to some extent *** during the period examined.[5] Arkema noted that ***.[6] With regard to operating issues related to ***.[7] Mexichem Fluor, which reported ***.[8]

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[1] Chemours reported its financial results on the basis of generally accepted accounting principles (GAAP). Arkema and Mexichem Fluor reported their financial results on the basis of International Financial Reporting Standards (IFRS). All three companies reported their financial results for calendar-year periods.

[2] Arkema's R-134a operations are part of the company's fluorogases business which is in turn part of its Industrial Specialties segment. Arkema 2014 Reference Document, p. 17. With regard to its R-134a operations, Arkema stated that they are ***. Petitioners' postconference brief (Exhibit 1), p. 8.

Chemours' R-134a operations are part of its Fluoroproducts segment. Chemours 2015 10-K, p. 3. ***. Petitioners' postconference brief (Exhibit 1), p. 8.

Mexichem Fluor's R-134a operations are part of the company's Fluorine segment. Mexichem 2014 annual report, p. 94. As noted in Petitioners' postconference brief, "Mexichem does not produce other refrigerants or HFC blends in the United States. Its return on investment is therefore evaluated on the basis of the R-134a business." Petitioners' postconference brief (Exhibit 1), p. 8.

[3] In the third quarter of 2013, DuPont made the decision to spin off its performance chemicals business of which R-134a is a part. *Shift in Agricultural Sales Timing, Lower Chemical Prices Weigh On DuPont's Earnings Growth*, http://www.forbes.com/sites/greatspeculations/2014/04/24/shift-in-agricultural-sales-timing-lower-chemical-prices-weigh-on-duponts-earnings-growth/, retrieved July 15, 2015. Chemours was subsequently established as a separate publically-traded company in July 2015. Chemours 2015 10-K, p. 3.

[4] HFC blends and components conference transcript, p. 89 (Buterbaugh).

[5] The R-134a operations of U.S. producers require planned outages for routine maintenance, as well as the replacement of catalyst. ***. Petitioners' postconference brief, Exhibit 1, pp. 1-2. ***. Conference transcript, p. 77 (Sassano). Petitioners' postconference brief, Exhibit 1, pp. 1-2. Mexichem Fluor reported that it plans for a 45-day plant outage approximately every three years which includes catalyst replacement, as well as primary maintenance. The majority of this activity is reportedly capitalized. Conference transcript (Pacillo), pp. 75-76, p. 78.

[6] ***. March 29, 2016 e-mail with attachment from *** to USITC auditor.

[7] March 29, 2016 e-mail with attachment from *** to USITC auditor. ***. *** U.S. producer questionnaire response to II-3c.

OPERATIONS ON R-134A

Income-and-loss data for the U.S. industry's R-134a operations are presented in table VI-1. A variance analysis of these financial results is presented in table VI-2.[9] Selected company-specific financial information is presented in Appendix F.

Table VI-1
R-134a: Results of operations of U.S. producers, 2013-15

* * * * * * *

Table VI-2
R-134a: Variance analysis on the operations of U.S. producers, 2013-15

* * * * * * *

Revenue

The majority of R-134a sales volume was classified as commercial sales (*** percent), followed by transfers (*** percent), swaps (*** percent), and a relatively small amount of internal consumption (*** percent).[10] Company-specific information in table F-1 shows that the U.S. producers varied in terms of the relative importance of these categories. *** U.S. producer reported revenue in all four categories.

(…*continued*)

[8] March 29, 2016 e-mail with attachment from *** to USITC auditor.

[9] The Commission's variance analysis is calculated in three parts: sales variance, cost of goods sold (COGS) variance, and SG&A expenses variance. Each part consists of a price variance (in the case of the sales variance) or a cost or expense variance (in the case of the COGS and SG&A expenses variance), and a volume variance. The sales or cost/expense variance is calculated as the change in unit price or per-unit cost/expense times the new volume, while the volume variance is calculated as the change in volume times the old unit price or per-unit cost/expense. As summarized at the bottom of table VI-2, the price variance is from sales, the cost/expense variance is the sum of those items from the COGS and SG&A variances, respectively, and the volume variance is the sum of the volume components of the net sales, COGS, and SG&A expenses variances. In general, the utility of the Commission's variance analysis is enhanced when product mix remains the same throughout the period.

[10] USITC auditor preliminary-phase notes. ***. Ibid. With respect to HFC components in general, swap transactions appear to be nonmonetary exchanges (specifically exchanges of inventory for similar products) that would be recognized at carrying value, as opposed fair value. Under these circumstances and because the earnings process has not been completed, profit or loss on swap transactions would generally not be recognized. Wiley GAAP 2002, p. 363. Wiley GAAP 2012, pp. 830-831. As presented in this section and analogous to the Commission's treatment of internal consumption, R-134a manufactured *** and given up in a swap exchange has been reported at fair market value and therefore contributes to profit or loss on reported R-134a financial results.

Volume

As shown in table F-1, Mexichem Fluor was the *** U.S. producer to report *** sales volume in 2014 while Arkema and Chemours *** sales volume.[11] In contrast and with respect to the large negative volume variance in 2015, *** U.S. producers contributed to this pattern. Notwithstanding directional ***, the magnitude of company-specific declines in 2015 sales volume ***.[12]

Value

The revenue section of the variance analysis (table VI-2) shows that price variances were negative in 2013-14 and then modestly positive in 2014-15. As shown in table F-1 and while magnitudes varied, company-specific average sales values were directionally the ***. In contrast, the company-specific pattern of change in average sales values in 2014-15 was ***.[13]

Cost of goods sold and gross profit

Raw material

As noted in Part I of this report, primary R-134a raw material inputs are hydrofluoric acid (HF) and a chlorine starting component which is either perchloroethylene (PCE) or trichloroethylene (TCE), depending on the underlying production process.[14] ***. As a share of company-specific variable manufacturing costs, HF and the chlorine starting component ranged from ***. As shown in table VI-1, total raw material cost declined from *** percent of COGS in 2013 to *** percent in 2015.

While the U.S. industry's average raw material cost declined somewhat during the period (see table VI-1), the pattern of company-specific average raw material varied. ***, which consistently reported the lowest average raw material cost, was also the *** company to

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[11] ***. March 29, 2016 e-mail with attachment from *** to USITC auditor.

[12] Changes in the sales volume of underlying categories of R-134a revenue (commercial sales, transfers, swaps, and internal consumption) also did not move in unison. ***. Ibid.

[13] ***. March 30-31, 2016 e-mail correspondence between *** and USITC auditor. ***. March 29, 2016 e-mail with attachment from *** to USITC auditor. ***. April 1, 2016 e-mail from *** to USITC auditor.

***. March 29, 2016 e-mail with attachment from *** to USITC auditor.

[14] Mexichem Fluor is the only U.S. producer that is fully integrated with respect to fluorine-based inputs; i.e., Mexichem Fluor affiliates in Mexico mine fluorine and produce the HF used in Mexichem Fluor's U.S. R-134a production. ***. March 29, 2016 e-mail with attachment from *** to USITC auditor. ***. Petitioners' postconference brief (Exhibit 1), p. 3. With respect to the "chlorine starting component," ***. Ibid.

The Commission's current practice requires that relevant cost information associated with inputs purchased from related suppliers correspond to the manner in which this information is reported in the U.S. producer's own accounting books and records. See 1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final), USITC Publication 4503, December 2014, pp. 23 and 37.

report declines throughout the period (see table F-1).[15] *** reported relatively modest increases in average raw material costs throughout the period, while *** reported an increase in 2014 and then a decrease in 2015. *** indicates that prices for TCE and HF fluctuated somewhat but were generally at their highest level during 2014 and then declined somewhat in 2015.[16]

Conversion costs

Table VI-1 shows that conversion costs (direct labor plus other factory costs) increased as a share of total COGS from *** percent in 2013 to *** percent in 2015.[17] While *** of the U.S. producers reported increases in average conversion costs during 2013-15, the magnitude of company-specific increases varied ***. Table F-1 shows that *** company-specific average conversion costs and overall 2013-15 percentage increases (***) which were also similar.[18] ***.[19] See *Background* section and footnote 7.

Gross profit

As shown in table VI-1, the industry's gross profitability declined on an absolute basis and as a ratio to sales throughout the period. Table F-1 shows that the pattern of company-specific gross profitability was *** for each U.S. producer. ***.[20] ***.[21] ***. ***.[22]

SG&A expenses and operating income or loss

While the U.S. industry reported a modest decline in total SG&A expenses during the period examined (see table VI-1), the positive impact on operating results was minimal and only partially offset corresponding declines in absolute gross profit. As shown in table F-1, *** reported SG&A expense ratios (total SG&A expenses divided by total revenue) which fluctuated

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[15] ***. March 29, 2016 e-mail with attachment from *** to USITC auditor.

[16] Petitioners' postconference brief (Exhibit 19). ***. March 29, 2016 e-mail with attachment from *** to USITC auditor.

[17] ***, direct labor and other factory costs in this case appear to be more meaningfully considered together as conversion costs. In contrast with raw materials, which would generally represent variable costs, conversion costs reflect a combination of fixed, variable, and mixed (fixed and variable) costs. Given what was confirmed by company officials to be a highly capital-intensive manufacturing process (conference transcript, p. 101 (Pacillo, Sassano, Haun)), it appears reasonable to conclude that fixed costs represent a relatively large share of total R-134a conversion costs.

[18] ***. March 29, 2016 e-mail with attachment from *** to USITC auditor.

***. March 29, 2016 e-mail with attachment from *** to USITC auditor.

[19] March 29, 2016 e-mail with attachment from *** to USITC auditor.

[20] ***. March 29, 2016 e-mail with attachment from *** to USITC auditor. ***. Ibid.

[21] ***. March 29, 2016 e-mail with attachment from *** to USITC auditor.

[22] ***. March 29, 2016 e-mail with attachment from *** to USITC auditor. ***. See *Background* section and footnote 7. ***. Ibid.

somewhat but remained within a relatively narrow range. In contrast, *** higher initial SG&A expense ratio which increased throughout the period.[23]

The contraction in the U.S. industry's overall gross profit ratio largely explains the declines in corresponding operating profit during 2013-14 and the operating loss in 2015. In terms of its impact on overall operating results, the *** (see table F-1). The operating results of *** were somewhat more mixed: *** reported an increase in operating income in 2014 followed by a decline in 2015 to about the level reported in 2013; *** reported a sharp decline in operating income in 2014 followed by a modest increase in 2015.

Interest expense, other expenses, and net income or loss

While net income and operating results share the same directional pattern (see table VI-1), the lower level of net income in 2013 and net losses in 2014 and 2015 primarily reflect the inclusion of other expenses reported by ***.[24] Smaller amounts of interest expense and other income were reported by ***.

CAPITAL EXPENDITURES AND RESEARCH AND DEVELOPMENT EXPENSES

Table VI-3 presents U.S. producers' R-134a capital expenditures and research and development (R&D) expenses by firm.

Table VI-3
R-134a: Capital expenditures and research and development (R&D) expenses of U.S. producers, 2013-15

* * * * * * *

*** accounted for the majority of the U.S. industry's capital expenditures. *** reported its highest level of capital expenditures in 2013 followed by declines in 2014 and 2015.[25]

***.[26] ***.[27] See *Background* section and footnote 7.

As shown in table VI-3, *** reported *** of the U.S. industry's R&D expenses. With regard to its R&D expenses, ***.[28]

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[23] ***. USITC auditor preliminary-phase notes.
***. March 29, 2016 e-mail with attachment from *** to USITC auditor.
[24] ***. Ibid.
***. March 29, 2016 e-mail with attachment from *** to USITC auditor.
[25] USITC auditor preliminary-phase notes. ***. March 29, 2016 e-mail with attachment from *** to USITC auditor.
[26] *** U.S. producer questionnaire response to III-13 (note 1).
[27] *** U.S. producer questionnaire response to III-13 (note 1).

ASSETS AND RETURN ON INVESTMENT

Table VI-4 presents data on U.S. producers' R-134a total assets, asset turnover (sales divided by total assets), and return on assets.[29]

Table VI-4
R-134a: U.S. producers' total assets, asset turnover, and return on assets, 2013-15

* * * * * * *

CAPITAL AND INVESTMENT

The Commission requested U.S. producers of R-134a to describe any actual or potential negative effects on their return on investment or their growth, investment, ability to raise capital, existing development and production efforts (including efforts to develop a derivative or more advanced version of the product), or the scale of capital investments as a result of imports of R-134a from China. Table VI-5 tabulates the responses on actual negative effects on investment, growth and development, as well as anticipated negative effects. Table VI-6 presents the narrative responses of U.S. producers regarding actual and anticipated negative effects on investment, growth and development.

(…*continued*)

[28] *** U.S. producer questionnaire response to III-13 (note 2). In its 2015 10-K and with regard to its overall operations, Chemours stated that "{w}e perform research and development activities in all of our segments with the majority of our efforts focused in the Fluoroproducts segment. The Fluoroproducts segment efforts center on developing new sustainable fluorochemicals and new applications and formulations for fluoropolymers that meet customers' technical requirements." Chemours 2015 10-K, p. 14.

[29] With respect to a company's overall operations, staff notes that a total asset value (i.e., the bottom line value on the asset side of a company's balance sheet) reflects an aggregation of a number of assets which in many instances are not product specific. For producers who manufacture products in addition to R-134a, high-level allocation factors were likely necessary to report a total asset value specific to U.S. R-134a operations. In contrast and since its relevant operations are focused on R-134a, it is unlikely that an allocation to report Mexichem Fluor's total R-134a assets was necessary (see also footnote 2).

The ability of U.S. producers to assign total asset values to discrete products lines affects the meaningfulness of calculated asset turnover and corresponding return on investment. For the chemical manufacturing industry in general, average asset turnover ratios ranged from a low of 0.64 in the fourth quarter of 2015 to a high of 0.87 in the third quarter of 2015. Chemical Manufacturing Efficiency Information & Trends http://csimarket.com/Industry/industry_Efficiency.php?ind=101, retrieved March 22, 2016. ***.

Table VI-5
R-134a: Negative effects of imports from subject sources on investment, growth, and development since January 1, 2013

* * * * * * *

Table VI-6
R-134a: Narrative responses of U.S. producers regarding actual and anticipated negative effects of imports from subject sources on investment, growth, and development since January 1, 2013

* * * * * * *

PART VII: THREAT CONSIDERATIONS AND INFORMATION ON NONSUBJECT COUNTRIES

Section 771(7)(F)(i) of the Act (19 U.S.C. § 1677(7)(F)(i)) provides that—

> *In determining whether an industry in the United States is threatened with material injury by reason of imports (or sales for importation) of the subject merchandise, the Commission shall consider, among other relevant economic factors*[1]*--*
>
> *(I) if a countervailable subsidy is involved, such information as may be presented to it by the administering authority as to the nature of the subsidy (particularly as to whether the countervailable subsidy is a subsidy described in Article 3 or 6.1 of the Subsidies Agreement), and whether imports of the subject merchandise are likely to increase,*
>
> *(II) any existing unused production capacity or imminent, substantial increase in production capacity in the exporting country indicating the likelihood of substantially increased imports of the subject merchandise into the United States, taking into account the availability of other export markets to absorb any additional exports,*
>
> *(III) a significant rate of increase of the volume or market penetration of imports of the subject merchandise indicating the likelihood of substantially increased imports,*
>
> *(IV) whether imports of the subject merchandise are entering at prices that are likely to have a significant depressing or suppressing effect on domestic prices, and are likely to increase demand for further imports,*
>
> *(V) inventories of the subject merchandise,*

---

[1] Section 771(7)(F)(ii) of the Act (19 U.S.C. § 1677(7)(F)(ii)) provides that "The Commission shall consider {these factors} . . . as a whole in making a determination of whether further dumped or subsidized imports are imminent and whether material injury by reason of imports would occur unless an order is issued or a suspension agreement is accepted under this title. The presence or absence of any factor which the Commission is required to consider . . . shall not necessarily give decisive guidance with respect to the determination. Such a determination may not be made on the basis of mere conjecture or supposition."

(VI) the potential for product-shifting if production facilities in the foreign country, which can be used to produce the subject merchandise, are currently being used to produce other products,

(VII) in any investigation under this title which involves imports of both a raw agricultural product (within the meaning of paragraph (4)(E)(iv)) and any product processed from such raw agricultural product, the likelihood that there will be increased imports, by reason of product shifting, if there is an affirmative determination by the Commission under section 705(b)(1) or 735(b)(1) with respect to either the raw agricultural product or the processed agricultural product (but not both),

(VIII) the actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the domestic like product, and

(IX) any other demonstrable adverse trends that indicate the probability that there is likely to be material injury by reason of imports (or sale for importation) of the subject merchandise (whether or not it is actually being imported at the time).[2]

Information on the volume and pricing of imports of the subject merchandise is presented in *Parts IV* and *V*; and information on the effects of imports of the subject merchandise on U.S. producers' existing development and production efforts is presented in *Part VI*. Information on inventories of the subject merchandise; foreign producers' operations, including the potential for "product-shifting;" any other threat indicators, if applicable; and any dumping in third-country markets, follows. Also presented in this section of the report is information obtained for consideration by the Commission on nonsubject countries.

THE INDUSTRY IN CHINA

The Commission issued foreign producers' or exporters' questionnaires to 29 firms identified in the petition as possible producers and/or exporters of R-134a from China. Useable responses to the Commission's questionnaire were received from six firms: Jiangsu Bluestar Green Technology Co. Ltd. (formerly Jiangsu Kangtai Fluorine Chemical Co. Ltd.) ("Bluestar");

[2] Section 771(7)(F)(iii) of the Act (19 U.S.C. § 1677(7)(F)(iii)) further provides that, in antidumping investigations, ". . . the Commission shall consider whether dumping in the markets of foreign countries (as evidenced by dumping findings or antidumping remedies in other WTO member markets against the same class or kind of merchandise manufactured or exported by the same party as under investigation) suggests a threat of material injury to the domestic industry."

Sinochem Environmental Protection Chemicals (Taicang) Co., Ltd. (“Sinochem Taicang”); Sinochem Modern Environmental Protection Chemicals (Xi’an) Co. Ltd. (“Sinochem Xi’an”); Weitron International Refrigeration Equipment (Kunshan) Co. Ltd. (“Weitron International”); Zhejiang Quhua Fluor-Chemistry Co., Ltd. (“Quhua”); and Zhejiang Sanmei Chemical Ind. Co.,Ltd. (“Sanmei”). [3]

Weitron International ***. Weitron International exported ***.

Table VII- 1 presents summary data on producers in China by firm in 2015.

Table VII-1

R-134a: Summary data on producers in China, by firm, 2015

Firm	Production (short tons)	Share of reported production (percent)	Exports to the United States (short tons)	Share of reported exports to the United States (percent)	Total shipments (short tons)	Share of firm's total shipments exported to the United States (percent)
Bluestar	***	***	***	***	***	***
Quhua	***	***	***	***	***	***
Sanmei	***	***	***	***	***	***
Sinochem (Tiacang)	***	***	***	***	***	***
Sinochem (Xi'an)	***	***	***	***	***	***
Total	152,298	100.0	11,836	100.0	151,868	7.8

Source: Compiled from data submitted in response to Commission questionnaires.

Producers were asked to report any changes in operations since January 2013. There was one reported plant opening. ***. There were three reported expansions. ***.

No Chinese producer reported production of other products on the same machinery as R-134a. However, *** firms reported that it is able to switch production (capacity) between R-134a and other products, namely R-125, R-32, R-133a, and R-143a, using the same equipment and/or labor. *** stated that the price of each product is the main factor affecting the ability to switch production. *** states that it depends on market demand, and *** states that it will switch production when the price of R- 34a is low, or if demand is high.

Chinese producers were asked to report constraints on their capacity to produce R-134a. Firms reported the plant capacity, maintenance, supply of raw material, access to skilled labor and market demand as the major constraints. In addition, Sanmei stated ***.

Table VII-2 presents information on the R-134a operations of the responding producers and exporters in China.

[3] For data on the number of responding foreign firms and their share of U.S. imports from China, please refer to Part I, “Summary Data and Data Sources.”

Table VII-2
R-134a: Data on industry in China, 2013-15 and projection calendar years 2016 and 2017

Item	Actual experience			Projections	
	Calendar year			Calendar year	
	2013	2014	2015	2016	2017
	Quantity (short tons)				
Capacity	129,276	150,547	157,263	157,263	157,263
Production	124,136	138,297	152,298	154,304	154,304
End-of-period inventories	6,628	6,088	6,518	6,301	6,501
Shipments:					
Home market shipments:					
Internal consumption/ transfers	***	***	***	***	***
Commercial shipments	***	***	***	***	***
Subtotal, home market shipments	60,121	69,301	81,259	80,962	80,962
Export shipments to:					
United States	13,577	2,868	11,836	8,351	8,351
All other markets	51,364	66,669	58,773	64,791	64,791
Total exports	64,941	69,537	70,609	73,142	73,142
Total shipments	125,062	138,838	151,868	154,104	154,104
	Ratios and shares (percent)				
Capacity utilization	96.0	91.9	96.8	98.1	98.1
Inventories/production	5.3	4.4	4.3	4.1	4.2
Inventories/total shipments	5.3	4.4	4.3	4.1	4.2
Share of shipments:					
Home market shipments:					
Internal consumption/ transfers	***	***	***	***	***
Home market shipments	***	***	***	***	***
Subtotal, home market shipments	48.1	49.9	53.5	52.5	52.5
Export shipments to:					
United States	10.9	2.1	7.8	5.4	5.4
All other markets	41.1	48.0	38.7	42.0	42.0
Total exports	51.9	50.1	46.5	47.5	47.5
Total shipments	100.0	100.0	100.0	100.0	100.0

Source: Compiled from data submitted in response to Commission questionnaires.

U.S. INVENTORIES OF IMPORTED MERCHANDISE

Table VII-3 presents data on U.S. importers' reported inventories of R-134a.

Table VII-3
R-134a: U.S. importers' end-of-period inventories of imports by source, 2013-15

* * * * * * *

U.S. IMPORTERS' OUTSTANDING ORDERS

The Commission requested importers to indicate whether they imported or arranged for the importation of R-134a from China after December 31, 2015. Twelve responding importers

reported that they arranged such shipments. Table VII-4 presents data reported by U.S. importers concerning their arranged imports of R-134a.

Table VII-4
R-134a: Arranged imports, January 2016 through December 2016

* * * * * * *

ANTIDUMPING OR COUNTERVAILING DUTY ORDERS IN THIRD-COUNTRY MARKETS

On April 19, 2010, India imposed preliminary antidumping duty orders on producers and exporters of R-134a under subheading 2903.39.19 from China and Japan.[4] On July 15, 2011 final antidumping duty rates were imposed by India on R-134a under subheading 2903.39.19 from China and Japan for a period of five years. The final duty rates included $1.15 per kilogram for producer/exporter Sinochem Environmental Protection (Taicang) Co. Ltd., $1.36 per kilogram for producer Sinochem Environmental Protection (Taicang) Co. Ltd. and exporter Du-Pont Trading (Shanghai) Co. Ltd., and $.1.15 per kilogram on producer/exporter Sinochem Environmental Protection Chemicals (Xian) Co. A duty rate of $1.41 per kilogram was placed on any other Chinese producer/exporter combinations. Finally, imports from any Japanese producer/exporter combinations were assigned a duty rate of $0.69 per kilogram.[5] On April 10, 2015, India initiated a sunset review concerning the antidumping duty order on R-134a from China only.[6]

INFORMATION ON NONSUBJECT COUNTRIES

In assessing whether the domestic industry is materially injured or threatened with material injury "by reason of subject imports," the legislative history states "that the Commission must examine all relevant evidence, including any known factors, other than the dumped or subsidized imports, that may be injuring the domestic industry, and that the Commission must examine those other factors (including non-subject imports) 'to ensure that it is not attributing injury from other sources to the subject imports.'"[7] Table VII-5 presents U.S. imports of R-134a from all sources other than China.

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[4] Government of India CUSTOMS Notification No. 52/2010, April 19, 2010.
[5] Government of India CUSTOMS Notification No. 61/2011, July 15, 2011.
[6] Government of India CUSTOMS Notification No.15/23/2014, April 10, 2015.
[7] *Mittal Steel Point Lisas Ltd. v. United States*, Slip Op. 2007-1552 at 17 (Fed. Cir. Sept. 18, 2008), quoting from Statement of Administrative Action on Uruguay Round Agreements Act, H.R. Rep. 103-316, Vol. I at 851-52; *see also Bratsk Aluminum Smelter v. United States*, 444 F.3d 1369 (Fed. Cir. 2006).

Table VII-5

R-134a: U.S. imports from nonsubject sources, by country, 2013-15

Item	Calendar year		
	2013	2014	2015
	Quantity (short tons)		
U.S. imports from nonsubject sources.--			
United Kingdom	643	604	648
India	20	88	284
France	0	497	85
Germany	80	1,985	71
Belgium	0	195	0
Japan	0	398	0
Russia	44	12	0
All other sources	50	41	47
Total U.S. imports from nonsubject sources	838	3,820	1,135
	Ratio to total U.S. imports (percent)		
U.S. imports from nonsubject sources.--			
United Kingdom	***	***	***
India	***	***	***
France	***	***	***
Germany	***	***	***
Belgium	***	***	***
Japan	***	***	***
Russia	***	***	***
All other sources	***	***	***
Total U.S. imports from nonsubject sources	***	***	***

Source: Official U.S. import statistics using HTS statistical reporting number 2903.39.2020, accessed March 9, 2016 and compiled from data submitted in response to Commission questionnaires for imports of R-134a in other HTS statistical reporting numbers.

The UK was a significant supplier in each of the three years. Germany was the next most significant supplier of R-134a during the period of investigation. In 2014, three other non-subject countries were also significant sources: France, Japan, and Belgium. The increase in imports from non-subject countries in 2014 was most likely due to the temporary imposition of anti-dumping duties on imports from China.

Table VII-6 presents countries' global exports of a basket category of goods, including R-134a, during 2013-2015. The basket category of exports includes all compounds of "other fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons." Further information on production of R-134a in the UK and Germany, the two largest sources of nonsubject imports over the period of investigation is provided below.

Table VII-6

R-134a: Global exports of related products[1], by exporter, 2013-15

Item	Calendar year		
	2013	2014	2015
	Quantity (short tons)		
United States	91,027	90,211	70,067
China	194,932	203,323	236,990
All other major exporters-- Netherlands	23,973	28,977	27,695
France	19,919	16,103	18,347
Japan	11,638	10,036	15,787
United Kingdom	12,369	12,406	15,436
Belgium	9,472	10,417	10,878
Germany	10,440	11,204	7,680
Italy	4,669	5,540	5,427
India	594	1,030	2,823
Singapore	3,342	2,896	2,476
Mexico	1,306	1,860	1,215
All other exporters	18,318	13,241	6,904
Total global exports	401,999	407,243	421,726
	Share of value (percent)		
United States	22.6	22.2	16.6
China	48.5	49.9	56.2
All other major exporters-- Netherlands	6.0	7.1	6.6
France	5.0	4.0	4.4
Japan	2.9	2.5	3.7
United Kingdom	3.1	3.0	3.7
Belgium	2.4	2.6	2.6
Germany	2.6	2.8	1.8
Italy	1.2	1.4	1.3
India	0.1	0.3	0.7
Singapore	0.8	0.7	0.6
Mexico	0.3	0.5	0.3
All other exporters	4.6	3.3	1.6
Total global exports	100.0	100.0	100.0

[1] Includes all compounds under HS 290339: other fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons.

Source: Official exports statistics as reported by various national statistical authorities in the GTIS/GTA database using HTS subheading 2903.39, accessed April 11, 2016.

United Kingdom

There are no production facilities for R-134a in the United Kingdom. Mexichem UK has a fluorocarbon production facility there, but it was converted from production of R-134a to production of R-125 during 2001-06.[8] While the facility no longer produces R-134a, Mexichem UK does purify R-134a. Mexichem stated that it exports standard R-134a to the United Kingdom, where the subject product is purified before imported into the U.S. market.[9] The purified R-134a is used in pharmaceutical applications such as metered dose inhalers (MDIs) to treat lung/breathing issues. Table VII-7 present United Kingdom's exports of related products.

Germany

Solvay Fluor produces the subject product in Germany. While most of the product is intended for refrigerant and foam blowing applications, some of the R-134a is further purified for pharmaceutical uses.[10] Solvay produces its own HF from fluorspar, some of which it sources from its mines in Namibia and Bulgaria.[11] Table VII-8 present Germany's exports of related products.

[8] Mexichem Fluor, manufacturing plants, http://www.mexichemfluor.com/americas/m_plants.html (retrieved November 27, 2013).

[9] *1,1,1,2-Tetrafluoroethane from China, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final),* USITC Publication 4503, December 2014, p. VII-9.

[10] Solvay Chemicals, Fluor Products, http://www.solvaychemicals.com/EN/products/Fluor/Fluor.aspx (retrieved December 2, 2013).

[11] Solvay Chemicals, hydrogen fluoride brochure, October 11, 2011.

Table VII-7

R-134a: United Kingdom exports of related products[1], by country, 2013-15

Item	Calendar year		
	2013	2014	2015
	Quantity (short tons)		
United Kingdom's exports to the United States	1,112	901	915
United Kingdom's exports to other major destination markets.--			
France	2,117	2,161	2,587
Spain	2,256	2,380	2,289
Ireland	663	572	1,672
Netherlands	666	918	1,579
India	1,140	1,135	1,542
Saudi Arabia	278	488	546
United Arab Emirates	572	602	512
Italy	438	286	502
All other destination markets	3,128	2,964	3,292
Total United Kingdom exports	12,369	12,406	15,436
	Share of quantity (percent)		
United Kingdom's exports to the United States	9.0	7.3	5.9
United Kingdom's exports to other major destination markets.--			
France	17.1	17.4	16.8
Spain	18.2	19.2	14.8
Ireland	5.4	4.6	10.8
Netherlands	5.4	7.4	10.2
India	9.2	9.1	10.0
Saudi Arabia	2.2	3.9	3.5
United Arab Emirates	4.6	4.9	3.3
Italy	3.5	2.3	3.3
All other destination markets	25.3	23.9	21.3
Total United Kingdom exports	100.0	100.0	100.0

[1] Includes all compounds under HS 290339: other fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons.

Source: Official exports statistics of the United Kingdom as reported by Eurostat in the GTIS/GTA database using HTS subheading 2903.39, accessed April 11, 2016.

Table VII-8

R-134a: German exports of related products[1], by country, 2013-15

Item	Calendar year		
	2013	2014	2015
	Quantity (short tons)		
Germany's exports to the United States	203	2,396	346
Germany's exports to other major destination markets.--			
France	2,539	1,860	1,382
Netherlands	608	676	842
Belgium	675	604	511
United Kingdom	653	656	438
Italy	554	593	435
Austria	325	337	349
Czech Republic	781	716	347
Spain	604	412	342
All other destination markets	3,500	2,955	2,688
Total Germany exports	10,440	11,204	7,680
	Share of quantity (percent)		
Germany's exports to the United States	1.9	21.4	4.5
Germany's exports to other major destination markets.--			
France	24.3	16.6	18.0
Netherlands	5.8	6.0	11.0
Belgium	6.5	5.4	6.7
United Kingdom	6.3	5.9	5.7
Italy	5.3	5.3	5.7
Austria	3.1	3.0	4.5
Czech Republic	7.5	6.4	4.5
Spain	5.8	3.7	4.5
All other destination markets	33.5	26.4	35.0
Total Germany exports	100.0	100.0	100.0

[1] Includes all compounds under HS 290339: other fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons.

Source: Official exports statistics of the Germany as reported by Eurostat in the GTIS/GTA databas using HTS subheading 2903.39, accessed April 11, 2016.

APPENDIX A

FEDERAL REGISTER NOTICES

The Commission makes available notices relevant to its investigations and reviews on its website, www.usitc.gov. In addition, the following tabulation presents, in chronological order, *Federal Register* notices issued by the Commission and Commerce during the current proceeding.

Citation	Title	Link
81 FR 12523 March 9, 2016	*1,1,1,2-Tetrafluoroethane (R–134a) From China; Institution of Antidumping Duty Investigation and Scheduling of Preliminary Phase Investigation*	https://federalregister.gov/a/2016-05245
81 FR 18830 April 1, 2016	*1, 1, 1, 2-Tetrafluoroethane From the People's Republic of China: Initiation of Less Than Fair Value Investigation*	https://federalregister.gov/a/2016-07316

APPENDIX B

CALENDAR OF THE PUBLIC STAFF CONFERENCE

CALENDAR OF PUBLIC PRELIMINARY CONFERENCE

Those listed below appeared as witnesses at the United States International Trade Commission's preliminary conference:

Subject: 1,1,1,2-Tetrafluoroethane (R-134a) from China

Inv. No.: 731-TA-1313 (Preliminary)

Date and Time: March 24, 2016 - 9:30 a.m.

Sessions were held in connection with this preliminary phase investigation in the Main Hearing Room (room 101), 500 E Street, S.W., Washington, DC.

OPENING REMARKS:

Petitioners (**James R. Cannon, Jr.**, Cassidy Levy Kent (USA) LLP)
Respondents (**Max F. Schutzman**, Grunfeld, Desiderio, Lebowitz, Silverman & Klestadt LLP)

In Support to the Imposition of
Antidumping and Countervailing Duty Order:

Cassidy Levy Kent (USA) LLP
Washington, DC
on behalf of

The American HFC Coalition

Glenn Haun, Director of Sales, Arkema Inc.

Elizabeth Mary Sassano, Global Business and Market Manager, Refrigerants, The Chemours Company, LLC

Magen L. Buterbaugh, Global Business Manager, Fluorochemicals, The Chemours Company, LLC

Deirdre Maloney, Senior Trade Advisor, Cassidy Levy Kent (USA) LLP

James R. Cannon, Jr.)
) – OF COUNSEL
Nazak Nikakhtar)

In Support to the Imposition of
Antidumping and Countervailing Duty Order (continued):

Schagrin Associates
Washington, DC
on behalf of

Mexichem Fluor, Inc.

Peter Geosits, Americas Commercial Director,
Mexichem Fluor, Inc.

John Pacillo, Americas Operations Director,
Mexichem Fluor, Inc.

Roger B. Schagrin)
) – OF COUNSEL
Paul W. Jameson)

In Opposition of the Imposition of
Antidumping and Countervailing Duty Order:

Grunfeld, Desiderio, Lebowitz, Silverman & Klestadt LLP
Washington, DC
on behalf of

Zhejiang Quhua Fluor-Chemistry Co., Ltd. ("Quhua")
Sinochem Environmental Protection Chemicals (Taicang)Co., Ltd. ("Sinochem")
Zhejiang Sanmei Chemical Industry Co., Ltd. ("Sanmei")

Max F. Schutzman)
Ned H. Marshak) – OF COUNSEL
Kavita Mohan)

REBUTTAL/CLOSING REMARKS:

Petitioners (**James R. Cannon, Jr.**, Cassidy Levy Kent (USA) LLP)
Respondents (**Max F. Schutzman**, Grunfeld, Desiderio, Lebowitz, Silverman & Klestadt LLP)

-END-

APPENDIX C

SUMMARY DATA

Table C-1
R-134a: Summary data concerning the U.S. market, 2013-15
(Quantity=short tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per short ton; Period changes=percent--exceptions noted)

	Reported data			Period changes		
	Calendar year			Calendar year		
	2013	2014	2015	2013-15	2013-14	2014-15
U.S. consumption quantity:						
Amount	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***
Importers' share (fn1):						
China	***	***	***	***	***	***
All others sources	***	***	***	***	***	***
Total imports	***	***	***	***	***	***
U.S. consumption value:						
Amount	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***
Importers' share (fn1):						
China	***	***	***	***	***	***
All others sources	***	***	***	***	***	***
Total imports	***	***	***	***	***	***
U.S. imports from:						
China:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
All other sources:						
Quantity	838	3,820	1,135	35.4	355.8	(70.3)
Value	5,764	17,415	8,071	40.0	202.1	(53.7)
Unit value	$6,878	$4,559	$7,111	3.4	(33.7)	56.0
Ending inventory quantity	***	***	***	***	***	***
Total imports:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
U.S. producers':						
Average capacity quantity	***	***	***	***	***	***
Production quantity	***	***	***	***	***	***
Capacity utilization (fn1)	***	***	***	***	***	***
U.S. shipments:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Export shipments:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
Inventories/total shipments (fn1)	***	***	***	***	***	***
Production workers	***	***	***	***	***	***
Hours worked (1,000s)	***	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***	***
Hourly wages (dollars)	***	***	***	***	***	***
Productivity (short tons per 1,000 hours)	***	***	***	***	***	***
Unit labor costs	***	***	***	***	***	***
Net sales:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Cost of goods sold (COGS)	***	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***	***
SG&A expenses	***	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***	***
Net income or (loss)	***	***	***	***	***	***
Capital expenditures	***	***	***	***	***	***
Unit COGS	***	***	***	***	***	***
Unit SG&A expenses	***	***	***	***	***	***
Unit operating income or (loss)	***	***	***	***	***	***
Unit net income or (loss)	***	***	***	***	***	***
COGS/sales (fn1)	***	***	***	***	***	***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	***
Net income or (loss)/sales (fn1)	***	***	***	***	***	***

APPENDIX D

ALTERNATE IMPORT TABLES

Table D-1

R-134a: U.S. imports, by source, 2013-15

Item	Calendar year		
	2013	2014	2015
	Quantity (short tons)		
U.S. imports from.--			
China	11,419	8,753	15,426
All other sources	838	3,820	1,135
Total U.S. imports	12,257	12,573	16,561
	Value (1,000 dollars)		
U.S. imports from.--			
China	40,338	28,531	50,753
All other sources	5,764	17,415	8,071
Total U.S. imports	46,102	45,946	58,824
	Unit value (dollars per short ton)		
U.S. imports from.--			
China	3,532	3,260	3,290
All other sources	6,878	4,559	7,111
Total U.S. imports	3,761	3,654	3,552
	Share of quantity (percent)		
U.S. imports from.--			
China	93.2	69.6	93.1
All other sources	6.8	30.4	6.9
Total U.S. imports	100.0	100.0	100.0
	Share of value (percent)		
U.S. imports from.--			
China	87.5	62.1	86.3
All other sources	12.5	37.9	13.7
Total U.S. imports	100.0	100.0	100.0
	Ratio to U.S. production		
U.S. imports from.--			
China	***	***	***
All other sources	***	***	***
Total U.S. imports	***	***	***

Source: Official U.S. import statistics using HTS statistical reporting number 2903.39.2020, accessed March 9, 2016.

Table D-2

R-134a: Apparent U.S. consumption, 2013-15

Item	Calendar year		
	2013	2014	2015
	Quantity (short tons)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
China	11,419	8,753	15,426
All other sources	838	3,820	1,135
Total U.S. imports	12,257	12,573	16,561
Apparent U.S. consumption	***	***	***
	Value (1,000 dollars)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
China	40,338	28,531	50,753
All other sources	5,764	17,415	8,071
Total U.S. imports	46,102	45,946	58,824
Apparent U.S. consumption	***	***	***
	Share of quantity (percent)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
China	***	***	***
All other sources	***	***	***
Total U.S. imports	***	***	***
	Share of value (percent)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
China	***	***	***
All other sources	***	***	***
Total U.S. imports	***	***	***

Source: Official U.S. import statistics using HTS statistical reporting number 2903.39.2020, accessed March 9, 2016 and compiled from data submitted in response to Commission questionnaires.

APPENDIX E

NONSUBJECT COUNTRY PRICE DATA

*** importers[1] reported price data for Germany for products 1, 2, 3, and 5. Price data reported by these firms accounted for *** percent of commercial shipments of R-134a from all nonsubject sources. These price items and accompanying data are comparable to those presented in tables V-1, V-2, V-3, and V-5. Price and quantity data for Germany are shown in table E-1 and in figures E-1 to E-4 (with domestic and subject sources).

In comparing nonsubject country pricing data with U.S. producer pricing data, prices for product imported from Germany were lower than prices for U.S.-produced product in *** instances and higher in *** instances. In comparing nonsubject country pricing data with subject country pricing data, prices for product imported from Germany were lower than prices for product imported from China in *** instances and higher in *** instances. A summary of margins of underselling and overselling is presented in table E-2.

Table E-1

R-134a: Weighted-average f.o.b. prices and quantities of imported products 1, 2, 3, 4 and 5[1], by quarters, January 2013-December 2015

* * * * * * *

Figure E-1

Product: Weighted-average f.o.b. prices and quantities of domestic and imported product 1[1], by quarters, January 2013-December 2015

* * * * * * *

Figure E-2

R-134a: Weighted-average prices and quantities of domestic and imported product 2, by quarters, 2013-15

* * * * * * *

Figure E-3

R-134a: Weighted-average prices and quantities of domestic and imported product 3, by quarters, 2013-15

* * * * * * *

[1] Importers *** reported pricing data. *** shipped its imports from Germany to the *** and *** shipped to the ***.

Figure E-4

R-134a: Weighted-average prices and quantities of domestic and imported product 5, by quarters, 2013-15

* * * * * * *

Table E-2

R-134a: Summary of underselling/(overselling), by country, January 2013-December 2015

Comparison	Total number of comparisons	Underselling		Overselling	
		Number of quarters	Quantity (pounds)	Number of quarters	Quantity (pounds)
Nonsubject vs United States.--					
Germany vs. United States	33	***	***	***	***
Nonsubject vs Subject.--					
Germany vs. China	32	***	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

APPENDIX F

FINANCIAL DATA OF U.S. PRODUCERS BY FIRM

Table F-1
R-134a: Results of operations of U.S. producers, by firm, 2013-15

* * * * * * *