Difluoromethane (R-32) from China

Investigation No. 731-TA-1472 (Final)

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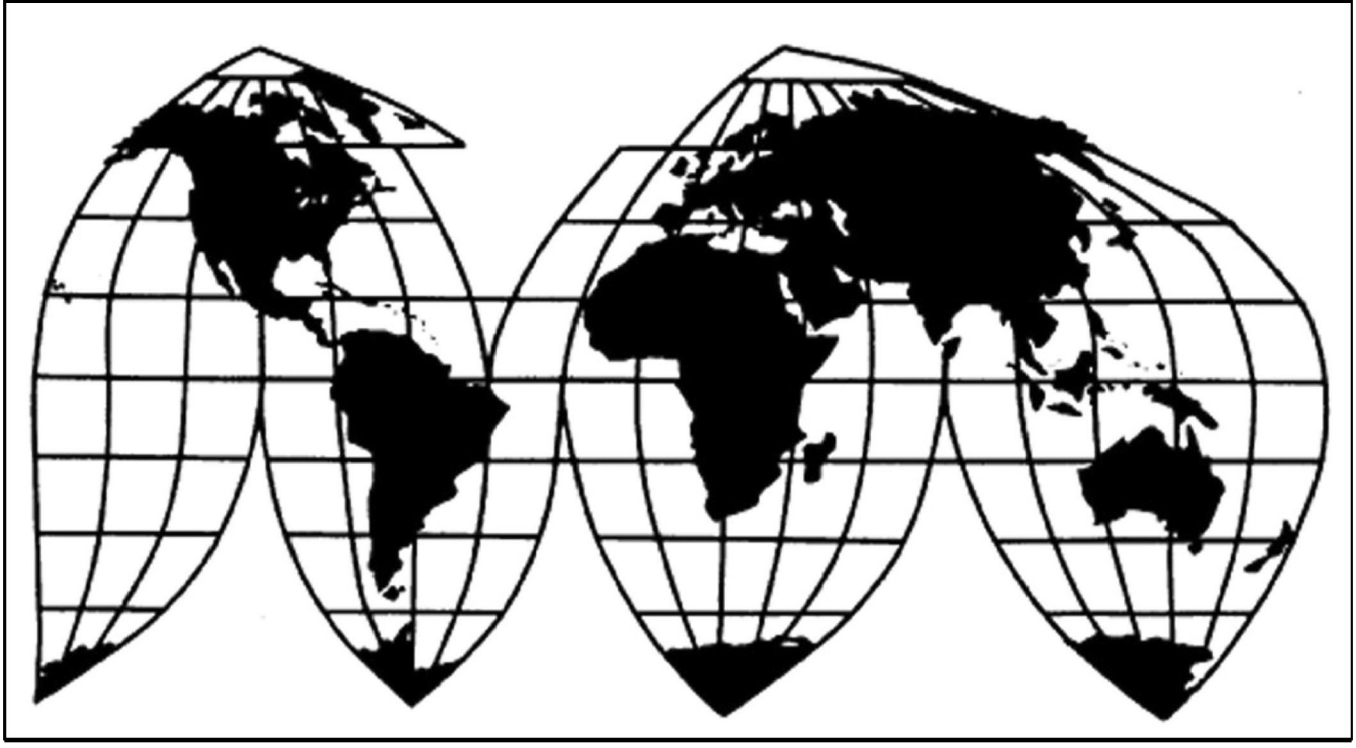
U.S. International Trade Commission



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UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-1472 (Final)

Difluoromethane (R-32) 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 an industry in the United States is materially injured by reason of imports of difluoromethane (R-32) from China, provided for in subheadings 2903.39.20 and 3824.78.00 of the Harmonized Tariff Schedule of the United States, that have been found by the U.S. Department of Commerce ("Commerce") to be sold in the United States at less than fair value ("LTFV").[2]

BACKGROUND

The Commission instituted this investigation effective January 23, 2020, following receipt of a petition filed with the Commission and Commerce by Arkema, Inc., King of Prussia, Pennsylvania. The Commission scheduled the final phase of the investigation following notification of a preliminary determination by Commerce that imports of R-32 from China were being sold at LTFV within the meaning of section 733(b) of the Act (19 U.S.C. 1673b(b)). Notice of the scheduling of the final phase of the Commission's investigation and of a public hearing 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 September 9, 2020 (85 FR 55688). Subsequently, the Commission cancelled its previously scheduled hearing following the withdrawal of petitioners' request to appear at the hearing (86 FR 6670, January 22, 2021).

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

[2] 86 FR 5136 (January 19, 2021).

Views of the Commission

Based on the record in the final phase of this investigation, we determine that an industry in the United States is materially injured by reason of imports of difluoromethane ("R-32") from China found by the U.S. Department of Commerce ("Commerce") to be sold in the United States at less than fair value ("LTFV").

I. Background

Arkema, Inc. ("Petitioner" or "Arkema"), a U.S. producer of R-32, filed the petition in this investigation on January 23, 2020. Petitioner submitted a prehearing brief, witness testimony, responses to Commission questions, and a posthearing brief.[1] No respondent participated in the final phase of this investigation.

U.S. producer data are based on the questionnaire response of one firm (Arkema) believed to account for all U.S. production of R-32 in 2019.[2] U.S. import data are based on official Commerce import statistics and responses to the Commission's importer questionnaires.[3] The Commission received questionnaire responses from 13 importers of R-32, accounting for approximately *** percent of imports by quantity from China in 2019. There were *** U.S. imports from nonsubject sources during the period of investigation ("POI").[4] Foreign industry data are based on questionnaire responses from 10 producers or exporters of

[1] No public hearing was conducted in the final phase of this investigation. The Commission initially scheduled a hearing. While Petitioner filed a request to appear at the hearing, it later withdrew its appearance and requested that the Commission cancel the hearing when no other requests to appear were filed. Subsequently, the Commission cancelled the hearing and submitted written questions to Petitioner.

[2] Public report ("PR") at I-4; Confidential Report ("CR") at I-4.

[3] CR/PR at I-4, IV-1, and Table IV-1.

[4] CR/PR at I-3, IV-1, and Table IV-1.

R-32 from China, accounting for approximately *** percent of U.S. imports of R-32 from China in 2019.[5]

II. Domestic Like Product

A. In General

In determining whether an industry in the United States is materially injured or threatened with material injury by reason of imports of subject merchandise, the Commission first defines the "domestic like product" and the "industry."[6] 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."[7] In turn, the Tariff Act defines "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."[8]

By statute, the Commission's "domestic like product" analysis begins with the "article subject to an investigation," *i.e.*, the subject merchandise as determined by Commerce.[9] Therefore, Commerce's determination as to the scope of the imported merchandise that is subsidized and/or sold at less than fair value is "necessarily the starting point of the

[5] CR/PR at I-4.
[6] 19 U.S.C. § 1677(4)(A).
[7] 19 U.S.C. § 1677(4)(A).
[8] 19 U.S.C. § 1677(10).
[9] 19 U.S.C. § 1677(10). 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. *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).

Commission's like product analysis."[10] The Commission then defines the domestic like product in light of the imported articles Commerce has identified.[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]

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[10] *Cleo Inc. v. United States*, 501 F.3d 1291, 1298 (Fed. Cir. 2007); *see also Hitachi Metals, Ltd. v. United States*, Case No. 19-1289, slip op. at 8-9 (Fed. Cir. Feb. 7, 2020) (the statute requires the Commission to start with Commerce's subject merchandise in reaching its own like product determination).

[11] *Cleo*, 501 F.3d at 1298 n.1 ("Commerce's {scope} finding does not control the Commission's {like product} determination."); *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); *Torrington Co. v. United States*, 747 F. Supp. 744, 748-52 (Ct. Int'l Trade 1990), *aff'd*, 938 F.2d 1278 (Fed. Cir. 1991) (affirming the Commission's determination defining six like products in investigations where Commerce found five classes or kinds).

[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] *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.").

B. Product Description

In its final determination, Commerce defined the imported merchandise within the scope of this investigation as:

> . . . difluoromethane (R–32), or its chemical equivalent, regardless of form, type or purity level. R–32 has the Chemical Abstracts Service (CAS) registry number of 75–10–5 and the chemical formula CH2 F2. R–32 is also referred to as difluoromethane, HFC–32, FC–32, Freon-32, methylene difluoride, methylene fluoride, carbon fluoride hydride, halocarbon R32, fluorocarbon R32, and UN 3252. Subject merchandise also includes R–32 and unpurified R–32 that are processed in a third country or the United States, including, but not limited to, purifying or any other processing that would not otherwise remove the merchandise from the scope of this investigation if performed in the country of manufacture of the in-scope R–32. R–32 that has been blended with products other than pentafluoroethane (R–125) is included within this scope if such blends contain 85% or more by volume on an actual percentage basis of R–32. In addition, R–32 that has been blended with any amount of R–125 is included within this scope if such blends contain more than 52% by volume on an actual percentage basis of R–32. Whether R–32 is blended with R–125 or other products, only the R–32 component of the mixture is covered by the scope of this investigation. The scope also includes R–32 that is commingled with R–32 from sources not subject to this investigation. Only the subject component of such commingled products is covered by the scope of this investigation.
>
> Excluded from the current scope is merchandise covered by the scope of the antidumping order on hydrofluorocarbon blends from the People's Republic of China. *See Hydrofluorocarbon Blends from the People's Republic of China: Antidumping Duty Order,* 81 FR 55436 (August 19, 2016) (the *Blends Order*).
>
> R–32 is classified under Harmonized Tariff Schedule of the United States (HTSUS) subheading 2903.39.2035. Other merchandise subject to the current scope, including the abovementioned blends that are outside the scope of the Blends Order, may be classified under 2903.39.2045 and 3824.78.0020. The HTSUS subheadings and CAS registry number are provided for convenience and customs purposes. The written description of the scope of the investigation is dispositive.[15]

[15] *Difluoromethane (R–32) From the People's Republic of China: Final Affirmative Determination of Sales at Less Than Fair Value*, 86 Fed. Reg. 5136, 5138 (Jan. 19, 2021) ("Commerce Final Determination").

R-32 is a hydrofluorocarbon ("HFC"), a colorless, odorless, gaseous chemical that is primarily used as a component in HFC refrigerant blends. Once blended, the HFC gases containing R-32 are used in residential and commercial refrigerant and cooling applications. Compared to other HFC components, R-32 has a relatively lower global warming effect, no ozone depletion potential, and is a low-to-medium temperature refrigerant. R-32 is a flammable gas and is designated as a hazardous material by Occupational Safety and Health Administration ("OSHA") regulation. It is produced in both the United States and China to industry standards as published by the Air Conditioning, Heating, and Refrigeration Institute ("AHRI"). In both China and the United States, R-32 conforms to AHRI standard 700 and to the same chemical formula (CH_2F_2) and chemical composition, whether produced in the United States, China, or elsewhere.[16]

C. Analysis

In the preliminary determination, the Commission found one domestic like product comprising R-32, coextensive with the Commerce's scope of investigation. The Commission found that all R-32 shared the same physical characteristics, chemical composition, and end uses, and that those physical characteristics, chemical composition, and end uses differed from other HFC components. All R-32 is produced with the same production process, equipment, and employees, and other HFCs cannot be produced in the same production facility without significant investment of time and cost. In addition, the Commission found that market participants perceived R-32 to be a unique product, produced to the same AHRI standards, and

[16] CR/PR at I-9.

that R-32 is not interchangeable with other refrigerant components that lack its physical and chemical characteristics.[17]

The record in this final phase investigation does not contain any new information that would warrant revisiting the definition of the domestic like product. Moreover, no party has argued for a definition of the domestic like product different from the definition adopted by the Commission in the preliminary determination.[18] Therefore, for the reasons set forth in the preliminary determination, we define a single domestic like product consisting of R-32, coextensive with the scope of the investigation.

III. 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."[19] 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.

Arkema was the only domestic producer of R-32 during the POI. There are no related party issues. We consequently define the domestic industry as the sole U.S. producer of R-32, Arkema,[20] in accordance with our definition of domestic like product.

[17] *Difluoromethane (R-32) from China*, Inv. No. 731-TA-1472 (Preliminary), USITC Pub. 5036 (Mar. 2020) at 8-11.

[18] *See* Petitioner Prehearing Brief at 6-8.

[19] 19 U.S.C. § 1677(4)(A).

[20] CR/PR at Table III-1; *see* Petitioner Prehearing Brief at 9.

IV. Material Injury by Reason of Subject Imports

Based on the record in the final phase of this investigation, we find that an industry in the United States is materially injured by reason of imports of dumped R-32 from China.

A. Legal Standards

In the final phase of antidumping and countervailing duty investigations, the Commission determines whether an industry in the United States is materially injured or threatened with material injury by reason of the imports under investigation.[21] 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.[22] The statute defines "material injury" as "harm which is not inconsequential, immaterial, or unimportant."[23] In assessing whether 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.[24] 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."[25]

Although the statute requires the Commission to determine whether the domestic industry is "materially injured or threatened with material injury by reason of" unfairly traded

[21] 19 U.S.C. §§ 1671d(b), 1673d(b).

[22] 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 ... and explain in full its relevance to the determination." 19 U.S.C. § 1677(7)(B).

[23] 19 U.S.C. § 1677(7)(A).

[24] 19 U.S.C. § 1677(7)(C)(iii).

[25] 19 U.S.C. § 1677(7)(C)(iii).

imports,[26] 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.[27] 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.[28]

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

[26] 19 U.S.C. §§ 1671d(b), 1673d(b).

[27] *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).

[28] The Federal Circuit, in addressing the causation standard of the statute, 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 further ratified in *Mittal Steel Point Lisas Ltd. v. United States*, 542 F.3d 867, 873 (Fed. Cir. 2008), where 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).

injury threshold.[29] In performing its examination, however, the Commission need not isolate the injury caused by other factors from injury caused by unfairly traded imports.[30] 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.[31] It is clear that the existence of injury caused by other factors does not compel a negative determination.[32]

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[29] Uruguay Round Agreements Act Statement of Administrative Action (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 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.

[30] 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.").

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

[32] *See Nippon Steel Corp*., 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.").

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."[33] The Commission ensures that it has "evidence in the record" to "show that the harm occurred 'by reason of' the LTFV imports," and that it is "not attributing injury from other sources to the subject imports."[34] The Federal Circuit has examined and affirmed various Commission methodologies and has disavowed "rigid adherence to a specific formula."[35]

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.[36] Congress has delegated this factual finding to the Commission because of the agency's institutional expertise in resolving injury issues.[37]

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[33] *Mittal Steel*, 542 F.3d at 876, 878; *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*, 793 F.3d 1355 (Fed. Cir. 2015), the Federal Circuit affirmed the Commission's causation analysis as comporting with the Court's guidance in *Mittal*.

[34] *Mittal Steel*, 542 F.3d at 873 (*quoting from Gerald Metals*, 132 F.3d at 722), 877-79. We note that one relevant "other factor" may involve the presence of significant volumes of price-competitive nonsubject imports in the U.S. market, particularly when a commodity product is at issue. In appropriate cases, the Commission collects information regarding nonsubject imports and producers in nonsubject countries in order to conduct its analysis.

[35] *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.").

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

[37] *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.").

B. Conditions of Competition and the Business Cycle[38]

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

1. Captive Production Provision

We first consider the applicability of the statutory captive production provision.[39] Petitioner argues that the captive production provision does not apply in this investigation.[40] Arkema states that R-32 represents between *** and *** percent of the raw material costs of the downstream HFC blends on a weighted-average basis, which it argues falls short of the cost share percentages for the "predominant input" requirement to be satisfied.[41] As such, Arkema

[38] 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. 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)). Negligibility is not an issue in this investigation. From January to December 2019, the twelve-month period preceding the filing of the petition, subject imports from China accounted for *** percent of total U.S. imports of R-32 by quantity. CR/PR at Table at IV-3.

[39] The captive production provision, 19 U.S.C. § 1677(7)(C)(iv), as amended by the Trade Preferences Extension Act of 2015, provides:

(iv) CAPTIVE PRODUCTION – If domestic producers internally transfer significant production of the domestic like product for the production of a downstream article and sell significant production of the domestic like product in the merchant market, and the Commission finds that-

> (I) the domestic like product produced that is internally transferred for processing into that downstream article does not enter the merchant market for the domestic like product, and
>
> (II) the domestic like product is the predominant material input in the production of that downstream article,

then the Commission, in determining market share and the factors affecting financial performance set forth in clause (iii), shall focus primarily on the merchant market for the domestic like product.

[40] Arkema provided argument regarding only the second statutory criterion. *See* Petitioner Prehearing Brief at 12-13.

[41] Petitioner Prehearing Brief at 12-13 and n.60.

concludes the "captive production statute" is inapplicable and the Commission should focus on the domestic industry's overall market and financial performance during the POI. [42]

Threshold Criterion. The captive production provision can be applied only if, as a threshold matter, significant production of the domestic like product is internally transferred and significant production is sold in the merchant market. In this investigation, internal consumption accounted for between *** percent and *** percent of the domestic industry's total shipments of R-32 during the POI.[43] Commercial shipments (***) accounted for between *** percent and *** percent of the domestic industry's total shipments in this period.[44] We find that both the internal transfer and merchant market segments (including swaps) constitute significant portions of the market, and that the threshold criterion is therefore satisfied.

First Statutory Criterion. The first criterion focuses on whether any of the domestic like product produced that is internally transferred for processing is in fact sold on the merchant market.[45] Arkema reported internal consumption of R-32 for the production of downstream HFC products and did not report any production of R-32 that were to be internally consumed but were diverted to the merchant market.[46] Therefore, this criterion appears to be satisfied.

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[42] Petitioner Prehearing Brief at 13.

[43] CR/PR at III-10 and Table III-5.

[44] CR/PR at Table III-5. Commercial shipments accounted for between *** percent and *** percent of the domestic industry's total shipments in this period. *Id.* Swaps accounted for *** (between *** and *** percent) of Arkema's U.S. shipments during the period of investigation. *Id.* The record indicates that the swaps, which will be described below, met the criteria for "sales." CR/PR at VI-6 n.5.

[45] *See*, *e.g.*, *Hot-Rolled Steel Products from Argentina and South Africa*, Inv. Nos. 701-TA-404, 731-TA-898, 905 (Final), USITC Pub. 3446 (Aug. 2001) at 15-16; *Certain Cold-Rolled Steel Products from Argentina, Brazil*, *China*, *Indonesia*, *Japan*, *Russia*, *Slovakia*, *South Africa*, *Taiwan*, *Turkey and Venezuela*, Inv. Nos. 701-TA-393 and 731-TA-829-40 (Final) (Remand), USITC Pub. 3691 (May 2004), at 2 & n.19.

[46] CR/PR at III-10.

Second Statutory Criterion. In applying the second criterion, we generally consider whether the domestic like product is the predominant material input into a downstream product by referring to its share of the raw material cost of the downstream product.[47] In this investigation, R-32 reportedly comprised an average of *** percent of the finished cost of material inputs of HFC products produced with R-32.[48] Thus, this criterion does not appear to be satisfied.

Conclusion. Based on the above analysis and absent any contrary arguments, we conclude that the second criterion for application of the captive production provision is not met. Accordingly, we will focus on the overall R-32 market in analyzing the market share and financial performance of the domestic industry. We do, however, consider the industry's significant captive consumption of R-32 as a condition of competition.

2. Other HFC Components Proceedings, Including Alleged Circumvention of the Antidumping Duty Order on HFC Blends from China

On August 5, 2016, the Commission determined that an industry in the United States was materially injured by reason of dumped imports of HFC blends from China. The Commission also determined that an industry in the United States was not materially injured or threatened with material injury by reason of dumped imports of HFC components (specifically,

[47] We have construed "predominant" to mean the main or strongest element, and not necessarily a majority, of the inputs by value. *See Polyvinyl Alcohol from Germany and Japan*, Inv. Nos. 731-TA-1015-16 (Final), USITC Pub. 3604 (June 2003), at 15 n.69.

[48] Calculated from CR/PR at Table III-8. R-32 reportedly comprised *** percent of the finished cost of finished HFC blend R-410a and *** percent of the finished cost of other HFC blends. In the data reported for HFC blends, R-32 did not comprise the predominant raw material input by value for any HFC blend. *Id*.

R-32, R-125, and R-143a) from China.[49] Commerce subsequently issued an antidumping duty order on imports of HFC blends from China on August 15, 2016, but no order on HFC components.[50]

On June 18, 2019, Commerce initiated an anti-circumvention inquiry to determine whether imports of certain HFC components (*i.e.,* R-32, R-125, and R-143a) from China that are further processed into finished HFC blends in the United States were circumventing the antidumping duty order on HFC blends from China within the meaning of section 781(a) of the Act.[51] On April 6, 2020, Commerce preliminarily determined that HFC components from China were circumventing the antidumping duty order on HFC blends from China.[52] As a result of its preliminary determination, Commerce directed U.S. Customs and Border Protection

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[49] *Hydrofluorocarbon Blends and Components From China; Determination*, 81 Fed. Reg. 53157 (Aug. 11, 2016); *Hydrofluorocarbon Blends and Components From China*, Inv. No. 731-TA-1279, USITC Pub. 4629 (August 2016). In the final phase investigation, the Commission found two domestic like products, one consisting of HFC blends and one consisting of HFC components. USITC Pub. 4629 at 10-13. The Commission ultimately made an affirmative present material injury determination with respect to HFC blends, and negative present material injury and threat of material injury determinations with respect to HFC components. USITC Pub. 4629 at 28, 42, 45. Petitioners challenged the Commission's determination that HFC components constituted a separate domestic like product in the U.S. Court of International Trade ("CIT"). *See Arkema, Inc. v. United States*, Ct. No. 16-00179. The CIT subsequently affirmed on second remand the Commission's determination that there were two domestic like products, one consisting of HFC blends and one of HFC components, and the Commission's negative present material injury and threat of material injury determinations with respect to HFC components. *See Arkema, Inc. v. United States*, 81 CIT ____, 393 F.Supp.3d 1177 (Ct. Int'l Trade 2019).

[50] *Hydrofluorocarbon Blends From the People's Republic of China: Antidumping Duty Order*, 81 Fed. Reg. 55436 (Aug. 19, 2016).

[51] *Hydrofluorocarbon Blends from the People's Republic of China: Initiation of Anti-Circumvention Inquiry on Antidumping Duty Order; Components*, 84 Fed. Reg. 28273 (June 18, 2019).

[52] *Hydrofluorocarbon Blends from the People's Republic of China: Affirmative Preliminary Determination of Circumvention of the Antidumping Duty Order for HFC Components; and Extension of Time Limit for Final Determination*, 85 Fed. Reg. 20248 (Apr. 10, 2020) and accompanying *Decision Memorandum* (Apr. 3, 2020); and *Hydrofluorocarbon Blends and Components From China*, Inv. No. 731-TA-1279, USITC Pub. 4629 (August 2016). Commerce's affirmative preliminary determination in its anticircumvention inquiry concerning imports of HFC components from China did not consider as part of its analysis the Commission's 2016 negative final injury determination on HFC components from China. *Id*.

("Customs") to suspend liquidation and to require a cash deposit of estimated duties at the rate applicable for an exporter of the subject imports from China, on all unliquidated entries of HFC components from China that were entered, or withdrawn from warehouse, for consumption on or after June 18, 2019, the date of initiation of Commerce's anticircumvention inquiry.[53]

On August 19, 2020, following notification from the Commission that an affirmative circumvention determination on HFC components would raise a significant injury issue, Commerce determined in a final negative determination that imports of HFC components (R-32, R-125, and R-143a) from China were not circumventing the antidumping duty order on HFC blends from China.[54] Given its negative circumvention finding that the scope of the antidumping duty order on HFC blends should not include HFC components (including R-32), Commerce directed Customs to refund any cash deposits made for these entries and to discontinue the suspension of liquidation of HFC components.[55]

3. Demand Conditions

U.S. demand for R-32 is driven principally by demand for the downstream products that use R-32, principally HFC blends. There is also some limited demand for R-32 for other uses, such as a stand-alone refrigerant and in semiconductor manufacturing.[56]

[53] 85 Fed. Reg. at 20248-49.

[54] *See Anti-Circumvention Inquiry of Antidumping Duty Order on Hydrofluorocarbon Blends From the People's Republic of China—HFC Components: Final Determination Not To Include Within the Scope of the Order*, 85 Fed. Reg. 51018, 51019 (Aug. 19, 2020), and accompanying *Decision Memorandum*. In its negative anticircumvention determination on imports of HFC components (including R-32) from China, Commerce considered the Commission's negative injury determination on HFC components from China as part of its analysis in reaching a negative circumvention decision. *Id*.

[55] 85 Fed. Reg. at 51019.

[56] CR/PR at I-9 to I-10.

Apparent U.S. consumption for R-32 increased steadily from *** short tons in 2017 to *** short tons in 2018 and to *** short tons in 2019, a level *** percent higher than in 2019; it was *** percent higher in January-September ("interim") 2020, at *** short tons, than in interim 2019, at *** short tons.[57] The U.S. producer and a majority of responding importers (7 of 16) reported that U.S. demand for R-32 increased over the POI.[58] Petitioner indicated that the market has shifted towards blends containing R-32 as a replacement or alternative for the refrigerant R-22, the production and importation of which was phased out under U.S. Environmental Protection Agency EPA ("EPA") regulations as of January 1, 2020.[59]

4. Supply Conditions

The domestic industry supplied the largest share of the U.S. R-32 market throughout the POI. As noted above, there was a single domestic producer accounting for *** percent of domestic production in 2019.[60] The domestic industry's share of the quantity of apparent U.S. consumption decreased continuously from *** percent in 2017 to *** percent in 2018 to ***

[57] CR/PR at Table C-1.

[58] CR/PR at II-4 and Table II-4.

[59] CR/PR at I-11 to I-12; Petitioner Posthearing Brief at Exhibit 3 (EPA brochure on phase out deadlines and use restriction schedule under EPA's Clean Air Act of 1990 and its Amendments ("CAAA") enacted in accordance with the Montreal Protocol). As noted above, an antidumping duty order was entered in August 2016 against HFC blends, the primary downstream products for R-32. *See Hydrofluorocarbon Blends from the People's Republic of China*, 81 Fed. Reg. 55436 (Aug. 19, 2016). Petitioner argues that this order affected market conditions during the POI as domestic firms shifted to producing HFC blends that would otherwise be subject to the antidumping duty order on HFC blends if imported. As a result of this shift, Petitioner claims that demand for R-32 increased. *See* Petitioner Prehearing Brief at 20-22.

[60] CR/PR at Table III-1.

percent 2019; its share of apparent U.S. consumption was *** percent in interim 2019 and *** percent in interim 2020.[61]

Subject imports' share of the quantity of apparent U.S. consumption increased continuously over the POI, and was *** percent in 2017, *** percent in 2018, and *** percent in 2019; it was *** percent in interim 2019 and *** percent in interim 2020.[62] Subject imports were *** percent of total imports over the POI and were *** percent in interim 2020.[63]

Nonsubject imports were virtually nonexistent as a source of supply to the U.S. market throughout the POI. Nonsubject imports' share of the quantity of apparent U.S. consumption was *** percent from 2017 to 2019 and was *** percent in interim 2020.[64] India was reported as the source of nonsubject imports in interim 2020.[65]

5. Substitutability and Other Conditions

Based on the record, we find that domestically produced R-32 and subject imports are highly substitutable.[66] As noted above, all R-32 is produced to AHRI standards whether originating in the United States or China.[67] The U.S. producer, all responding importers, and

[61] CR/PR at Table C-1. The domestic industry's share of the value of apparent U.S. consumption was *** percent in 2017, *** percent in 2018, *** percent in 2019, *** percent in interim 2019, and *** percent in interim 2020. *Id*.

[62] CR/PR at Tables IV-4, C-1. Subject imports' share of the value of apparent U.S. consumption increased continuously over the POI, and was *** percent in 2017, *** percent in 2018, and *** percent in 2019, and was *** percent in interim 2019 and *** percent in interim 2020. *Id.*

[63] CR/PR at Table IV-4. Subject imports' by value were *** percent of total imports over the POI and were *** percent in interim 2020. *Id.*

[64] CR/PR at Tables IV-4, C-1. Nonsubject imports' share of the value of apparent U.S. consumption was *** percent in interim 2020. *Id.*

[65] CR/PR at II-8.

[66] CR/PR at II-12. The degree of substitution between domestic and imported R-32 depends upon such factors as relative prices, quality (*e.g.*, grade standards, defect rates, *etc.*), and conditions of sale (*e.g.*, price discounts/rebates, lead times between order and delivery dates, reliability of supply, product services, *etc.*). *Id*.

[67] CR/PR at I-9 to I-10.

virtually all responding purchasers reported that the domestic like product and subject imports from China were always or frequently interchangeable.[68]

The record also indicates that price is an important factor in purchasing decisions for R-32. Purchasers responding to the lost sales and lost revenue survey ranked price, along with availability of supply, among the most important factors in purchasing decisions for R-32.[69] The U.S. producer and a majority of responding importers and purchasers reported for all comparisons that differences other than price were only sometimes or never significant in purchasing decisions for R-32.[70]

The major raw materials used in the production of R-32 are dichloromethane (methylene chloride), chlorine gas, and hydrofluoric acid.[71] Raw materials constituted the largest component of the domestic industry's cost of goods sold ("COGS") and accounted for an increasing share of COGS over the POI.[72] As a share of the domestic industry's COGS, raw material costs ranged from *** percent to *** percent during the POI.[73] Arkema reported that the share of hydrofluoric acid in the cost of goods sold increased from *** percent to *** percent from 2017 to 2019, and the share of methylene chloride in the cost of goods sold increased from *** percent to *** percent over the same period.[74]

[68] CR/PR at II-17 to II-18 and Table II-10. One of 11 U.S. purchasers reported that the domestic like product and subject imports from China were sometimes interchangeable. *Id*.

[69] CR/PR at II-13 and Table II-6.

[70] CR/PR at Table II-12.

[71] CR/PR at V-1.

[72] CR/PR at Table C-1.

[73] CR/PR at Table VI-1. As a share of the domestic industry's COGS, raw material costs were *** percent in 2017, *** percent in 2018, and *** percent in 2019; they were *** percent in interim 2019 and *** percent in interim 2020. *Id*.

[74] CR/PR at V-1 and Table VI-1. Arkema reported that none of its raw materials were imported and therefore were not affected by section 301 tariffs on imports from China. CR/PR at V-1.

Questionnaire data indicate that the large majority of the domestic producer's U.S. commercial shipments of R-32 in 2019 were made through long-term contracts, with some short-term contracts and the small remainder as spot sales.[75] In contrast, importers' U.S. commercial shipments were made *** on the basis of spot sales.[76]

HFC blends are produced domestically by two types of domestic refrigerant producers -- integrated producers and independent refrigerant producers. Integrated producers, such as Arkema,[77] Chemours, and Honeywell, produce HFC blends using HFC components that were obtained via internal transfers, swaps with and purchases from other domestic component producers, and importation.[78] Independent refrigerant blenders, which produce no HFC components, produce HFC blends using HFC components they purchased that are domestically produced or imported from China.[79] Arkema also ***, so that both firms can manufacture an HFC blend from those HFC components.[80] The record indicates that the *** are determined pursuant to arms-length prices negotiated by the parties and reflect fair market value.[81]

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[75] CR/PR at Table V-2. The U.S. producer's U.S. commercial shipments were *** percent long-term contracts, *** percent short-term contracts, and *** percent spot sales. *Id*.

[76] CR/PR at Table V-2.

[77] As noted, Arkema produces R-32 as well as HFC blends of which R-32 is a component. CR/PR at II-2 to II-3.

[78] Integrated producers manufacture one or more of the components necessary to produce HFC blends and other refrigerants. *See, e.g., Hydrofluorocarbon Blends and Components from China*, Inv. No. 731-TA-1279 (Final), USITC Pub. No. 4629 (Aug. 2016), at 11.

[79] *See HFC Blends*, USITC Pub. No. 4629 at 33.

[80] CR/PR at VI-6 n.5.

[81] CR/PR at VI-6 n.5 and VI-10 n.16; Arkema Producer Questionnaire Response, EDIS Doc. 724374 at III-4a. As noted above, an antidumping duty order was entered in August 2016 against HFC blends, the primary downstream product for R-32. *See Hydrofluorocarbon Blends from the People's Republic of China*, 81 Fed. Reg. 55436 (Aug. 19, 2016). Petitioner argues that this order affected market conditions during the POI as domestic firms shifted to producing HFC blends that would otherwise be subject to the antidumping duty order on HFC blends if imported. As a result of this shift, Petitioner claims that demand for R-32 increased. *See* Petitioner Prehearing Brief at 20-22.

C. Volume of Subject Imports[82]

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."[83]

The volume and market share of subject imports from China increased steadily over the POI. The volume of subject imports was *** short tons in 2017, *** short tons in 2018, and *** short tons in 2019, for an overall increase of *** percent; the volume of subject imports was *** short tons in interim 2019 and nearly twice as large at *** short tons in interim 2020.[84] Subject imports' share of the U.S. market was *** percent in 2017, *** percent in 2018, and *** percent in 2019, for an overall increase of *** percentage points; the market share of subject imports was *** percent in interim 2019 and *** percent in interim 2020, *** percentage points higher than in interim 2019.[85]

Therefore, we find that the volume of subject imports and the increase in volume is 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 the 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

[82] Because the subject product is entered under a basket HTS category that includes out-of-scope articles, the Commission used importer questionnaire responses to measure import volume. *See* CR/PR at VI-1.

[83] 19 U.S.C. § 1677(7)(C)(i).

[84] CR/PR at Table C-1.

[85] CR/PR at Table C-1.

> (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.[86]

As discussed above, the record indicates a high degree of substitutability between subject imports from China and the domestic like product, and that price, along with availability of supply, is an important consideration in purchasing decisions.[87]

We have examined several sources of data in our underselling analysis, including price data, import purchase cost data, data derived from lost sales/lost revenue survey responses, and other data on the record. The Commission collected quarterly price data for the total quantity and f.o.b. value of one R-32 product shipped by U.S. producers and importers to unrelated customers between January 2017 and September 2020.[88] The domestic producer (Arkema) and three importers provided usable pricing data for the requested product, although not all firms reported price data for all products for all quarters. Price data reported by these firms accounted for approximately *** percent of the U.S. producer's U.S. shipments of R-32 and *** percent of subject imports in 2019.[89]

The Commission also collected import purchase cost data for the same pricing product for firms that imported R-32 for use in the production of their own downstream products.[90] Nine firms that imported R-32 for internal consumption reported usable import purchase cost data.[91] Purchase cost data reported by these firms accounted for *** percent of subject

[86] 19 U.S.C. § 1677(7)(C)(ii).
[87] CR/PR at II-13 and Table II-6.
[88] The pricing product was **Product 1.** -- R-32, sold in bulk to blenders. CR/PR at V-4.
[89] CR/PR at V-4.
[90] CR/PR at V-4.
[91] CR/PR at V-4.

imports from China in 2019.[92] Given the much greater coverage of subject imports represented by the purchase cost data as compared to the importer pricing data, the Commission has given predominant weight to the purchase cost data in considering the price effects of subject imports.[93] Landed duty-paid costs for subject imports were below the sales prices for U.S. produced R-32 in *** (or *** percent) of quarterly comparisons involving *** short tons, with price-cost differences ranging from *** percent to *** percent, compared to *** short tons of subject imports in quarters with higher costs than U.S. sales prices, with reported price-cost differences ranging from *** percent to *** percent.[94] The average price-cost differential between the import purchase costs and prices for the domestic like product was *** percent when import purchase cost data was lower than U.S. price and *** percent when import purchase cost data was higher than U.S. price.[95]

We recognize that the import purchase cost data may not reflect the total cost of importing. Therefore, we requested that direct importers provide additional information regarding the costs and benefits of directly importing R-32. Six of 11 importers that reported purchase cost data reported that they incurred additional costs beyond landed duty-paid costs

[92] CR/PR at V-4 to V-5.

[93] The limited price comparison data showed subject imports underselling the domestic like product in *** (or *** percent) of quarterly comparisons at an average underselling margin of *** percent. CR/PR at Table V-5. The total quantity of subject imports in quarters with underselling was *** short tons, with margins of underselling ranging from *** to *** percent. The total quantity of subject imports in quarters with overselling was *** short tons, with margins of overselling ranging from *** to *** percent and averaging *** percent. *Id*.

[94] CR/PR at V-12 to V-14, and Table V-6. *See also* Petitioner Prehearing Brief at 32-33, Petitioner Posthearing Brief at 4 (arguing that significant underselling in 2017 and 2018 is masked by ***; Petition at Exhibit I-18 ("Meet or Release" Agreement). Arkema reported that *** accounted for between *** percent to *** percent of Arkema's total shipments over the POI. Arkema's Posthearing Brief, Exhibit 1 at 36.

[95] CR/PR at Table V-6.

associated with importing R-32.[96] These costs ranged from one to 11 percent compared to landed duty-paid value.[97] These additional costs were less than the average price-cost differential of *** percent between landed duty-paid costs for the subject imports and prices for the domestic like product. We also observe that the subject import purchase costs were lower than domestic R-32 prices in all quarters from the second quarter of 2019 through the end of the POI (third quarter 2020).[98] These lower subject import costs correspond to the portion of the POI during which subject imports increased the most and gained the greatest market share (2019 and interim 2020).[99]

U.S. importers were also asked whether the cost of R-32 they imported was lower than the price of purchasing R-32 from a U.S. producer or importer. Four importers reported estimated cost savings, ranging from *** percent to *** percent of landed duty-paid value by importing directly rather than purchasing from a U.S. producer.[100] Four of six responding importers (or 66.7 percent) reported that imports were priced lower when not including the

[96] CR/PR at V-8.

[97] CR/PR at V-8. In determining whether to directly import R-32, 7 of 12 importers (or 58.3 percent) reported that they compare costs of importing directly to the cost of purchasing from a U.S. producer, five importers compare costs to purchasing from a U.S. importer, and five do not compare costs. *Id*.

[98] *See* CR/PR at Table V-3. We also note that purchase cost data do not include data from certain importers that accounted for a significant share of reported imports in 2019 and 2020. *See*, *e.g.*, CR/PR at Table IV-1 (***). The import AUVs reported by these firms were well below AUVs of domestic shipments of R-32 during those periods, suggesting that inclusion of their purchase cost data would, at a minimum, have been consistent with the data the Commission did receive showing subject import costs that were lower than domestic prices. *See* *** Importer Questionnaire Response at II-5a; *** Importer Questionnaire Response at II-5a.

[99] *See* CR/PR at Tables, IV-2, IV-4.

[100] CR/PR at V-9.

additional costs, and five of seven importers (or 71.4 percent) reported that imports were priced lower when including additional costs.[101]

We have also considered purchaser lost sales/lost revenue responses. Seven of 17 (or 41.2 percent) purchasers responding to the Commission's questionnaire reported that they had purchased subject imports instead of the domestic like product. Four of the seven purchasers reported that subject import prices were lower than the domestically produced product, and three purchasers reported that price was the primary reason for purchasing subject imports.[102] Responses to the purchaser questionnaires indicate that lower prices were a primary basis of *** percent of total reported purchases of subject imported R-32 during the period.[103] These data are consistent with the data described above showing purchase costs of subject imports that were lower than domestic prices in 2019 and interim 2020.[104] We also note that a majority of purchasers reported that the domestic like product was inferior to subject imports with respect to price, indicating that prices for domestic products were higher than those for subject imports.[105]

In light of the available information showing that purchase costs for subject imports were substantially lower than prices for the domestic like product, that a substantial share of purchases of subject imports were based primarily on lower prices, that most purchasers

[101] CR/PR at V-9. Several importers reported turning to subject product because they could not obtain R-32 domestically from Arkema. CR/PR at V-8 to V-9.

[102] CR/PR at V-13 to V-14, and Tables V-7 & V-8.

[103] CR/PR at Tables V-7 and V-8. The seven responding purchasers reported purchasing a total of *** short tons of subject imports during the period; three of the seven purchasers reported purchasing *** short tons of subject imports based on the lower price of the subject imports. *Id*.

[104] *See* CR/PR at Table V-5.

[105] CR/PR at Table II-9.

reported that subject imports were lower priced than the domestic like product, and that price is important to purchasing decisions, we find that the underselling by subject imports is significant. Lower-priced imports caused the domestic industry to lose sales and market share to subject imports. Specifically, the domestic industry lost *** percentage points of market share to the subject imports from 2017 to 2019 and an additional *** percentage points between interim 2019 and interim 2020.[106]

We have also considered price trends for the domestic like product and subject imports. The pricing data indicate that the domestic industry's prices decreased from first quarter 2017 through third quarter 2017 and then generally increased throughout 2018 and 2019, resulting in a *** percent increase over the POI.[107] The reported purchase costs of subject imports fluctuated, first generally increasing from 2017 to 2018, then generally decreasing in 2019, ending up *** higher in third quarter 2020 than at the start of the POI.[108]

We have also examined whether subject imports prevented price increases which otherwise would have occurred to a significant degree. The domestic industry's unit COGS increased for its U.S. shipments more than its unit sales values did during the period, resulting in a cost-price squeeze.[109] After declining from 2017 to 2018 from *** percent to *** percent ,

[106] CR/PR at Table IV-4. Petitioner argues that the import purchase cost data masked significant underselling that occurred in 2017 and 2018. It claims that domestic prices *** beginning in the second quarter 2017 because ***. It argues, therefore, that this price competition from subject imports caused price declines at the beginning of the POI and through the end of first quarter 2018. *See* Petitioner Prehearing Brief at 32-33, Petitioner Posthearing Brief at 4, and Petition at Exhibit I-18 ("Meet or Release" Agreement).

[107] CR/PR at V-9 and Figure V-3.

[108] CR/PR at V-9 to V-10.

[109] CR/PR at Tables VI-1 and C-1.

the domestic industry's ratio of COGS to net sales grew by *** points to *** percent in 2019.[110] The domestic industry's unit COGS increased by *** percent from 2017 to 2019; by year, unit COGS increased by *** percent from 2017 to 2018, then by *** from 2018 to 2019.[111] By contrast, the domestic industry's net unit sales AUV increased *** percent ($***) from 2017 to 2019; by year, the industry's net unit sales AUV increased by *** percent from 2017 to 2018, then fell by *** percent from 2018 to 2019.[112]

In light of the fact that the increase in the domestic industry's unit sales value was not enough to cover the increase in unit COGS during a period of significantly increasing apparent U.S. consumption,[113] we find that subject imports prevented price increases, which otherwise would have occurred, to a significant degree.[114] We find particularly noteworthy the industry's inability to cover its rising costs from 2018 to 2019, given the large (***) increase in apparent U.S. consumption in 2019 and the fact that subject imports more than doubled in quantity in that year and were purchased at costs that were lower than domestic prices during three of the

[110] CR/PR at Tables VI-1 and C-1. The domestic industry's COGS/net sales ratio was *** percent in 2017, *** percent in 2018, and *** percent in 2019, *** percent in interim 2019, and *** percent in interim 2020. *Id*.

[111] CR/PR at Table VI-1 and Table VI-2. Unit COGS was $*** in 2017, $*** in 2018, $*** in 2019, $*** in interim 2019, and $*** in interim 2020. CR/PR at Table VI-1. The increase in unit COGS was driven primarily by increases in raw material costs from 2017 to 2019 and by lower raw material costs in interim 2020. CR/PR at Table VI-2.

[112] CR/PR at Table VI-1 and Table VI-2. Net sales AUVs were $ *** in 2017, $*** in 2018, $*** in 2019, $*** in interim 2019, and $*** in interim 2020. CR/PR at Table VI-1. In terms of percentages, the industry's unit COGS increased by *** percent from 2017 to 2019 while the net sales AUV increased by *** percent; unit COGS were *** percent lower in interim 2020 than in interim 2019 while the net sales AUV was *** percent higher. CR/PR at Table VI-2.

[113] As discussed above, apparent U.S. consumption of R-32 increased from *** short tons in 2017 to *** short tons in 2018 and *** short tons in 2019, for an increase of *** percent: it was *** short tons in interim 2019 and *** short tons in interim 2020, for an increase of *** percent. CR/PR at Table C-1.

[114] Moreover, one of Arkema's ***, reported that Arkema ***. CR/PR at Table V-9.

four quarters of that year.[115] Therefore, we find that the subject imports had significant effects on prices for the domestic like product.

E. Impact of the Subject Imports[116]

Section 771(7)(C)(iii) of the Tariff Act provides that examining the impact of subject imports, the Commission "shall evaluate all relevant economic factors which have a bearing on the state of the industry."[117] 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 debts, 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."[118]

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[115] We note that in interim 2020, as compared to interim 2019, the industry was better able to cover its costs through higher sales values as its somewhat lower unit COGS. CR/PR at Table C-1. As described *infra* in the section on Impact, Petitioner supplied information suggesting that Commerce's anticircumvention inquiry may have played a role in the positive cost-price developments in interim 2020.

[116] The statute instructs the Commission to consider the "magnitude of the dumping margin" in an antidumping proceeding as part of its consideration of the impact of imports. 19 U.S.C. § 1677(7)(C)(iii)(V). In its final determination of sales at less than fair value on subject imports from China, Commerce found dumping margins ranging from 161.49 percent to 221.06 for imports of R-32 from China for the companies listed with separate rates and 221.06 percent for the China-wide entity rate. Commerce Final Determination, 86 Fed. Reg. at 5137. We take into account in our analysis the fact that Commerce has made final findings that subject producers in China are selling subject imports in the United States at less than fair value. In addition to this consideration, our impact analysis has considered other factors affecting domestic prices. Our analysis of the significant underselling of subject imports, described in both the price effects discussion and below, is particularly probative to an assessment of the impact of the subject imports.

[117] 19 U.S.C. § 1677(7)(C)(iii); *see also* SAA at 851 and 885 ("In material injury determinations, the Commission considers, in addition to imports, other factors that may be contributing to overall injury. While these factors, in some cases, may account for the injury to the domestic industry, they also may demonstrate that an industry is facing difficulties from a variety of sources and is vulnerable to dumped or subsidized imports.").

[118] 19 U.S.C. § 1677(7)(C)(iii). This provision was amended by the Trade Preferences Extension Act of 2015, Pub. L. 114-27.

The domestic industry's output related indicia generally fluctuated between years and were higher in 2019 than in 2017, although those increases were less than the increases in apparent U.S. consumption. The domestic industry's capacity remained steady during the period at *** short tons.[119] Its production increased by *** percent from 2017 to 2019, increasing from *** short tons in 2017 to *** short tons in 2018, before declining to *** short tons in 2019. Its capacity utilization increased *** percentage points overall from 2017 to 2019, increasing from *** percent in 2017 to *** percent in 2018, before declining to *** percent in 2019.[120]

The domestic industry's U.S. shipments (including internal consumption and swaps) fluctuated between years, but increased overall by *** percent between 2017 and 2019, increasing from *** short tons in 2017 to *** short tons in 2018, before declining to *** short tons in 2019.[121] The industry's end-of-period inventories fluctuated between years but increased overall by *** percent from 2017 to 2019, increasing from *** short tons in 2017 to *** short tons in 2018, before declining to *** short tons in 2019.[122] The domestic industry's share of apparent U.S. consumption declined by *** percentage points from 2017 to 2019, declining steadily from *** percent in 2017 to *** percent in 2018 and *** percent in 2019.[123]

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[119] CR/PR at Table C-1. The domestic industry's production capacity was *** short tons in interim 2019 and interim 2020. *Id*.

[120] CR/PR at Table C-1. The industry's capacity utilization was *** percent in interim 2019 and *** percent in 2020. *Id*.

[121] CR/PR at Table III-5. The industry's U.S. shipments were *** short tons in interim 2019 and *** short tons in interim 2020. The domestic industry's U.S. commercial shipments increased steadily between 2017 and 2019, increasing from *** short tons in 2017 to *** short tons in 2018 and *** short tons in 2019; they were *** short tons in interim 2019 and *** short tons in interim 2020. *Id*.

[122] CR/PR at Tables III-6 and C-1. The industry's end-of-period inventories were *** short tons in interim 2019 and *** short tons in interim 2020. *Id*.

[123] CR/PR at Table C-1. The industry's share of apparent U.S. consumption was *** percent in interim 2019 and *** percent in interim 2020. *Id*.

The domestic industry's employment-related performance indicia were mixed. Employment,[124] total hours worked,[125] and wages paid[126] increased steadily from 2017 to 2019. Hourly wages and productivity between years declined overall from 2017 to 2019.[127]

Despite rising demand, the domestic industry's financial performance deteriorated from 2017 to 2019, owing to significant decreases in profitability from 2018 to 2019 that reflected a growing imbalance between the domestic industry's unit COGS and net sales AUV. The industry's gross profit fluctuated between years, but declined overall by *** percent from 2017 to 2019.[128] The industry's operating income and net income also fluctuated between years, but significantly declined overall from 2017 to 2019.[129] Similarly, as a ratio to net sales, the domestic industry's operating income and net income margins fluctuated between years, but declined overall, for an overall decrease of *** percentage points and *** percentage points

[124] Employment increased by *** percent from 2017 to 2019, increasing from *** production-related workers ("PRWs") in 2017 to *** PRWs in 2018, and *** PRWs in 2019; it was *** PRWs in interim 2019 and interim 2020. CR/PR at Tables III-7 and C-1.

[125] Total hours worked increased by *** percent from 2017 to 2019, increasing from *** hours in 2017 to *** hours in 2018, and *** hours in 2019; they were *** hours in interim 2019 and *** hours in interim 2020. CR/PR at Tables III-7 and C-1.

[126] Wages paid increased by *** percent from 2017 to 2019, increasing from $*** in 2017 to $*** in 2018 and 2019; they were $*** in interim 2019 and interim 2020. CR/PR at Tables III-7 and C-1.

[127] Hourly wages declined overall by *** percent from 2017 to 2019, increasing from $*** per hour in 2017 to $*** per hour in 2018, but then declining to $*** per hour in 2019; they were $*** per hour in interim 2019 and $*** per hour in interim 2020. Productivity declined overall by *** percent from 2017 to 2019, increasing from *** short tons per 1,000 hours in 2017 to *** short tons per 1,000 hours in 2018, but then declining to *** short tons per 1,000 hours in 2019; it was *** short tons per 1,000 hours in interim 2019 and *** short tons per 1,000 hours in interim 2020. CR/PR at Tables III-7 and C-1.

[128] CR/PR at Tables VI-1 and C-1. Gross profit was $*** in 2017, $*** in 2018, and $*** in 2019; it was $*** in interim 2019 and $*** in interim 2020. *Id*.

[129] CR/PR at Tables VI-1 and C-1. The industry's operating income declined *** percent from 2017 to 2019, increasing from $*** in 2017 to $*** in 2018, before declining to $*** in 2019; it was $*** in interim 2019 and $*** in interim 2020. Its net income declined *** percent, increasing from $*** in 2017 to $*** in 2018, and then declining to $*** in 2019; it was $*** in interim 2019 and $*** in interim 2020. *Id*.

respectively.[130] Capital expenditures declined over the period, for an overall decrease of *** percent.[131]

Thus, as apparent U.S. consumption increased steadily over the POI, the domestic industry lost market share to increasing volumes of subject imports that undersold domestic prices to a significant degree, particularly at the end of the POI.[132] The domestic industry lost a total of *** percentage points of market share directly to the subject imports over the POI.[133] As a result, the domestic industry's output and financial indicators necessarily are lower than they otherwise would have been but for significant volumes of low-priced subject imports

[130] CR/PR at Tables VI-1 and C-1. As a ratio to net sales, the industry's operating income margin decreased by *** percentage points from 2017 to 2019, initially increasing from *** percent in 2017 to *** percent in 2018, before declining to *** percent in 2019; it was *** percent in interim 2019 and *** percent in interim 2020. Net income as a percentage of net sales decreased from 2017 to 2019 by *** percentage points, increasing from *** percent in 2017 to *** percent, before declining to *** percent in 2019; it was *** percent in interim 2019 and *** percent in interim 2020. *Id*.

[131] CR/PR at Tables VI-4 and C-1. Capital expenditures fluctuated between years but declined overall, initially increasing from $*** in 2017 to $*** in 2018, before decreasing to $*** in 2019; they were $*** in interim 2019 and $*** in interim 2020. *Id*.

[132] *See* CR/PR at Table V-3. In addition, as noted above, Arkema's ***, reported that Arkema ***. CR/PR at Table V-9; *see also* Petition at Exhibit I-18 ("Meet or Release" Agreement).

In addition, as noted above, Commerce made an affirmative preliminary circumvention determination of the HFC blends order by imports of R-32 from China in April 2020, which it initiated in June 2019, and instructed Customs to begin collecting cash deposits on those entries. Petitioner argues that that its financial performance improved during the interim 2020 period as a result of Commerce's preliminary finding, as well as the anticipated imposition of cash deposits on imports of R-32 from China when Commerce initiated that proceeding. It claims that customers that previously relied on dumped subject imports turned to Arkema for domestic R-32 to avoid the duties on the preliminarily subject HFC components and that, as a result of the inquiry and cash deposits, it was able to raise prices to some customers in the second and third quarters of 2020, which subsequently drove an improvement in its financial position during interim 2020. *See, e.g.*, Petitioner Prehearing Brief at 24. Pricing data show that prices for domestically produced R-32 begin increasing as of January 2020. CR/PR at Tables VI-1, C-1. These data are consistent with purchasers accounting for the imposition of cash deposit requirements in their purchasing decisions, thereby enabling the domestic industry to begin raising prices.

[133] We note that the subject imports' market share increase of *** percentage points during 2017 to 2019 period came entirely at the expense of the domestic industry and did so with steadily increasing domestic U.S. consumption over that time. *See* CR/PR at C-1.

having taken market share from the domestic industry. Further, these significant volumes of subject imports suppressed the industry's prices to a significant degree, resulting in a cost-price squeeze and declining financial performance. The significant deterioration in the domestic industry's financial results in 2019 is directly attributable to the domestic industry's inability to increase its prices sufficiently to cover its increased costs in 2019. We therefore find that subject imports had a significant impact on the domestic industry.

We also have considered the role of other factors so as not to attribute injury from other factors to the subject imports. Nonsubject imports were not present in the U.S. market during 2017 to 2019. They were present in very small volumes in interim 2020 and held *** percent of apparent U.S. consumption during the interim period.[134] Thus, the presence of extremely limited quantities of nonsubject imports in interim 2020 cannot explain the domestic industry's injury during the POI that we have attributed to subject imports from China.

Accordingly, we find that subject imports had a significant impact on the domestic industry.

VI. Conclusion

For the reasons stated above, we determine that an industry in the United States is materially injured by reason of subject imports of difluoromethane (R-32) from China that Commerce has found to be sold in the United States at less than fair value.

[134] CR/PR at Table C-1. U.S. shipments of nonsubject imports were *** short tons in interim 2020 and accounted for *** percent of total U.S. import quantity in that period. CR/PR at II-8 and Table C-1.

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 Arkema, Inc., King of Prussia, Pennsylvania, on January 23, 2020, 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 difluoromethane ("R-32")[1] from China. The following tabulation provides information relating to the background of this investigation.[2] [3]

Effective date	Action
January 23, 2020	Petition filed with Commerce and the Commission; institution of Commission investigations (85 FR 5239, January 29, 2020)
February 24, 2020	Commerce's notice of initiation (85 FR 10406, February 24, 2020)
March 9, 2020	Commission's preliminary determination (85 FR 14703, March 13, 2020)
August 27, 2020	Commerce's preliminary determination (85 FR 52950, August 27, 2020); scheduling of final phase of Commission investigation (85 FR 55688, September 9, 2020)
October 19, 2020	Commission's notice of revised scheduling (85 FR 67566, October 23, 2020)
January 11, 2021	Commerce's final determination (86 FR 5136, January 19, 2021)
January 12, 2021	Commission's hearing - Cancelled (86 FR 6670, January 22, 2021)
February 10, 2021	Scheduled date for the Commission's vote
February 25, 2021	Scheduled date for Commission's views

[1] See the section entitled "The subject merchandise" in Part I of this report for a complete description of the merchandise subject in this proceeding.

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

[3] Appendix B presents the Petitioners' withdrawal of its request to appear and willingness to answer any Commission's questions in lieu of a hearing. On January 8, 2021 counsel for Arkema filed its request to appear at the hearing. No other parties submitted a request to appear at the hearing. On January 12, 2021, counsel withdrew their request to appear at the hearing. Counsel indicated a willingness to submit written responses to any Commission questions in lieu of an actual hearing. Consequently, the public hearing in connection with this investigation was cancelled. 86 FR 6670, January 22, 2021.

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--

> *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--[4]

> *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.*

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

In addition, Section 771(7)(J) of the Act (19 U.S.C. § 1677(7)(J)) provides that—[5]

(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, 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-32 is generally used to produce refrigerant blends such as R407C and R410A. Arkema is the sole known U.S. producer of R-32.[6] Leading producers of R-32 outside the United States in 2019 include *** of China. The leading U.S. importers of R-32 from China in 2019 were ***. There were *** U.S. imports of R-32 from nonsubject countries during January 2017-September 2020. U.S. purchasers of R-32 are firms that blend R-32 into HFC blends for use in air conditioners; leading purchasers include ***.

Apparent U.S. consumption of R-32 totaled approximately *** short tons ($***) in 2019. The sole U.S. producer Arkema's U.S. shipments of R-32 totaled *** short tons ($***) in 2019, and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value. U.S. importers' U.S. shipments from China totaled *** short tons ($***) in 2019 and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value. ***.

[5] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.
[6] Petition, pp. 1 and 3.

Summary data and data sources

A summary of data collected in this investigation is presented in appendix C, tables C-1, C-2 and C-3. Except as noted, U.S. industry data are based on questionnaire responses of one firm, Arkema, Inc. that accounted for all known U.S. production of R-32 during 2019.[7] U.S. imports are based on the questionnaire data of thirteen U.S. importers of R-32 that accounted for *** percent of imports under statistical reporting number 2903.39.2035 of the Harmonized Tariff Schedule ("HTS") in 2019.[8] Data on the subject foreign industry are based on the responses of ten foreign producers whose exports accounted for *** percent of reported U.S. imports of subject merchandise under HTS statistical reporting number 2903.39.2035.

Previous and related investigations

As a result of a petition filed on June 25, 2015, on behalf of the American HFC Coalition, and its 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, NY; Mexichem Fluor, Inc., St. Gabriel, Louisiana; and Worthington Industries, Inc., Columbus, Ohio, the Commission conducted an antidumping investigation concerning HFC blends and components from China.[9] Included in the components subject to investigation was R-32.[10] On July 22, 2016, the Commission determined that an industry in the United States was materially injured by imports of HFC blends from China, but determined that an industry in the United States producing HFC components, including R-32, was neither materially injured nor threatened with material injury.[11] Commerce published the antidumping duty order on HFC blends from China ("Blends Order") on August 19, 2016.[12]

On June 18, 2019, the Department of Commerce initiated an anti-circumvention inquiry of the antidumping duty order on HFC blends from China to address whether imports of partially finished blends of HFC components R-32, R-125, and R-143a from China were

[7] Petitioner's posthearing brief, Exh. 1, p. 5. Petitioner noted that, in general, globally "there are very few producers of R-32 as compared to the number of producers of other {HFC} components." Petitioner's pre-hearing brief, p. 8.

[8] See Part IV for an explanation on coverage calculation.

[9] Hydrofluorocarbon Blends and Components from China, Investigation No. 731-TA-1279 (Final), USITC Publication 4629, August 2016 ("HFC Publication") at p. I-1.

[10] HFC Publication at pp. I-7 and I-8. See also 81 FR 42314, June 29, 2016.

[11] HFC Publication at p. 1.

[12] 81 FR 55436, August 19, 2016.

circumventing the antidumping duty order on HFC blends.[13] On April 10, 2020, Commerce preliminarily determined that imports of unfinished blends of R-32, R-125, and R-143a were circumventing the antidumping duty order on HFC blends from China.[14] On August 19, 2020, following notification from the Commission that an affirmative final determination would raise a significant injury issue, Commerce issued its final determination not to include R-32, R-125, and R-143a from China that are further processed in the United States to produce subject HFC blends within the scope of the HFC order.[15]

On January 12, 2021, Honeywell International Inc. filed petitions alleging that an industry in the United States is materially injured and threatened with material injury by reason of subsidized and LTFV imports of R-125 (Pentafluoroethane) from China.[16] These preliminary investigations have been instituted by the Commission and are pending initiation at Commerce.

[13] 84 FR 28276, June 18, 2019.
[14] 85 FR 20248, April 10, 2020.
[15] 85 FR 51018, August 19, 2020.
[16] 86 FR 5247, January 19, 2021.

Nature and extent of sales at LTFV

Sales at LTFV

Commerce published notices in the Federal Register of its preliminary determination on August 27, 2020, and its final determination on January 19, 2021, of sales at LTFV with respect to imports from China.[17] Table I-1 presents Commerce's dumping margins with respect to imports of product from China.

Table I-1
R-32: Commerce's weighted-average LTFV margins with respect to imports from China

Exporter	Producer	Preliminary dumping margin (percent)	Final dumping margin (percent)
Taizhou Qingsong Refrigerant New Material Co., Ltd.	Taizhou Qingsong Refrigerant New Material Co., Ltd	161.49	161.49
Zibo Feiyuan Chemical Co., Ltd.	Zibo Feiyuan Chemical Co., Ltd	221.06	221.06
T.T. International Co., Ltd.	Zibo Feiyuan Chemical Co., Ltd	221.06	221.06
Non-Individually Examined Exporters (Appendix III of the cited FR Notice)	Producers Supplying the Non-Individually Examined Exporters Receiving Separate Rates (Appendix III of the cited FR Notice)	196.19	196.19
All others		221.06	221.06

Source: 85 FR 52950, August 27, 2020 and 86 FR 5136, January 19, 2021.

[17] 85 FR 52950, August 27, 2020 and 86 FR 5136, January 19, 2021.

The subject merchandise

Commerce's scope

In the current proceeding, Commerce has defined the scope as follows:[18]

> *The merchandise covered by this investigation is difluoromethane (R-32), or its chemical equivalent, regardless of form, type or purity level. R-32 has the Chemical Abstracts Service (CAS) registry number of 75-10-5 and the chemical formula CH_2F_2. R-32 is also referred to as difluoromethane, HFC-32, FC-32, Freon-32, methylene difluoride, methylene fluoride, carbon fluoride hydride, halocarbon R32, fluorocarbon R32, and UN 3252. Subject merchandise also includes R-32 and unpurified R-32 that are processed in a third country or the United States, including, but not limited to, purifying or any other processing that would not otherwise remove the merchandise from the scope of this investigation if performed in the country of manufacture of the in-scope R-32. R-32 that has been blended with products other than pentafluoroethane (R-125) is included within this scope if such blends contain 85% or more by volume on an actual percentage basis of R-32. In addition, R-32 that has been blended with any amount of R-125 is included within this scope if such blends contain more than 52% by volume on an actual percentage basis of R-32. Whether R-32 is blended with R-125 or other products, only the R-32 component of the mixture is covered by the scope of this investigation. The scope also includes R-32 that is commingled with R-32 from sources not subject to this investigation. Only the subject component of such commingled products is covered by the scope of this investigation. Excluded from the current scope is merchandise covered by the scope of the antidumping order on hydrofluorocarbon blends from the People's Republic of China. See Hydrofluorocarbon Blends from the People's Republic of China, 81 Fed. Reg. 55436 (Aug. 19, 2016) (the Blends Order).*

Tariff treatment

Based upon the scope set forth by Commerce, information available to the Commission indicates that the merchandise subject to this investigation is currently imported under statistical reporting number 2903.39.2035 of the Harmonized Tariff Schedule of the United States ("HTS").[19] Merchandise that is an in-scope blend containing R-32 that falls outside of the

[18] 86 FR 5136, January 19, 2021.

[19] Two other products outside the scope of this investigation are imported under this statistical reporting number, which are pentafluoroethane and 1,1,1-trifluoroethane.

scope of the Blends Order may be imported under statistical reporting numbers 2903.39.2045 and 3824.78.0020. The 2020 general rate of duty is 3.7 percent *ad valorem* for both HTS subheadings 2903.39.20 and 3824.78.00.[20]

An additional 15 percent ad valorem duty on imports of R-32 produced in China pursuant to Section 301 of the Trade Act of 1974 were scheduled to go into effect on December 15, 2019; however, negotiations led to a suspension of duties, and there are currently no Section 301 duties in effect for subheading 2903.39.20.[21] Hydrofluorocarbon refrigerant blends[22] produced in China entering under subheading 3824.78.20 are subject to an additional 25 percent *ad valorem* duty.[23] Decisions on the tariff classification and treatment of imported goods are within the authority of U.S. Customs and Border Protection.

[20] Harmonized Tariff Schedule of the United States, Revision 28, Chapters 29 and 38, November 2020, Publication 5143.

[21] Harmonized Tariff Schedule of the United States, Revision 28, Chapter 99, Subchapter III, footnote 20(t) and 20(t), p. 99-III-97, November 2020, Publication 5143. Duties under 9903.88.16 were suspended pursuant to the Federal Register Notice of December 18, 2019 (84 FR 243).

[22] For the purposes of statistical reporting number 3824.78.0020, the term "hydrofluorocarbon refrigerant blends" consists of hydrofluorocarbon mixtures containing at least pentafluoroethane (R-125) or difluoromethane (R-32) or 1,1,1-trifluoroethane (R-143a), mixed, with or without other ingredients. Harmonized Tariff Schedule of the United States, Revision 28, Chapters 38, Statistical note 2, November 2020, Publication 5143.

[23] Harmonized Tariff Schedule of the United States, Revision 28, Chapter 99, Subchapter III, footnote 20(e) and 20(f), p. 99-III-23-24, 34, November 2020, Publication 5143. Exclusions to the additional duty are the following: 1) Mixtures of hydrofluorocarbons, containing 40 to 44 percent by weight of 1,1,1,2-tetrafluoroethane (CAS No. 811-97-2), 56 to 60 percent by weight of pentafluoroethane (CAS No. 354-33-6) and up to 2 percent by weight of lubricating oil (described in statistical reporting number 3824.78.0020) (subchapter III, footnote 20(xx)(12), p. 99-III-157); 2) Refrigerant gas R-421B, comprising mixtures containing at least 83 percent but not more than 87 percent by weight of pentafluoroethane, at least 13 percent but not more than 17 percent by weight of 1,1,2,2-tetrafluoroethane, and at least 0.5 percent but not more than 2 percent by weight of lubricant (described in statistical reporting number 3824.78.0020) (subchapter III, footnote 20(aaa)(32), p. 99-III-172); 3) Mixtures of hydrofluorocarbons, containing 40 to 44 percent by weight of 1,1,1,2-tetrafluoroethane (CAS No. 811-97-2), 56 to 60 percent by weight of pentafluoroethane (CAS No. 354-33-6) and up to 2 percent by weight of lubricating oil (described in statistical reporting number 3824.78.0020) (subchapter III, footnote 20(iii)(55), p. 99-III-189); 4) Refrigerant gas R-421B, comprising mixtures containing at least 83 percent but not more than 87 percent by weight of pentafluoroethane, at least 13 percent but not more than 17 percent by weight of 1,1,2,2-tetrafluoroethane, and at least 0.5 percent but not more than 2 percent by weight of lubricant (described in statistical reporting number 3824.78.0020) (subchapter III, footnote 20(iii)(56), p. 99-III-189).

The product

Description and applications

R-32 is a hydrofluorocarbon ("HFC"), a colorless, odorless, gaseous chemical that is primarily used as a component in HFC blends. Once blended, these gases are used for various residential and commercial refrigerant and cooling applications.[24] Apart from "R-32", difluoromethane can be referred to with many other names including HFC-32, FC-32, Freon-32, methylene difluoride, methylene fluoride, carbon fluoride hydride, halocarbon R32, fluorocarbon R32, and UN 3252.[25] Compared to other HFC components, R-32 has a low global warming potential ("GWP"), no ozone depletion potential, and is a low-to-medium temperature refrigerant.[26] R-32 is classified as a Category 1- Flammable Gas and is considered a hazardous material by the OSHA Hazard Communication Standard.[27] R-32 is produced to the same well-established standards published by the Air Conditioning, Heating, and Refrigeration Institute, known as AHRI.[28] In both the United States and China, R-32 is produced to meet the AHRI standard known as AHRI 700.[29] This standard takes into account general characteristics, vapor phase contaminants, and liquid phase contaminants for single-component fluorocarbon refrigerants (e.g. R-32) as well as blends containing R-32.[30] Similarly, all R-32 conforms to the same chemical formula (CH_2F_2) and chemical composition as defined by the Chemical Abstracts Service (CAS) number 75-10-5.[31]

The principal end use for R-32 is as a component in the production of HFC blends, whether internally consumed or sold to third parties. These HFC blends are used in a variety of residential and commercial refrigerant and cooling applications.[32] Other uses for R-32 include semiconductor silicon wafer manufacturing for etching silicon and as a stand-alone

[24] Petitioner's written testimony, p. 2, January 13, 2021 (O'Donovan).
[25] Petition, p.5.
[26] Conference transcript, p. 10 (O'Donovan); Written testimony, p. 2, January 13, 2021 (O'Donovan).
[27] Airgas, "Safety Data Sheet on Difluoromethane" (accessed January 21, 2021).
[28] Written testimony, p. 2, January 13, 2021 (O'Donovan).
[29] Written testimony, p. 2, January 13, 2021 (O'Donovan).
[30] Air Conditioning, Heating, and Refrigeration Institute, "Standard 700 – Specifications for Refrigerants" p. 7 (accessed January 21, 2021).
[31] Written testimony, p. 2, January 13, 2021 (O'Donovan).
[32] Written testimony, p. 2, January 13, 2021 (O'Donovan).

refrigerant.[33] R-32 in its stand-alone application requires a high-purity R-32 and makes up a limited percentage of the market.[34]

HFCs, which include R-32, have gained favor over time compared to another class of refrigerants known as hydrochlorofluorocarbons ("HCFCs"). HCFCs are known to be ozone depleting and began being phased out of production in accordance with the Montreal Protocol.[35] HFCs, such as R-32, are intended to be a replacement for HCFCs, such as R-22,[36] in residential and commercial refrigerant and cooling applications.[37] Compared to HCFCs, HFC blends, such as those containing R-32, do not cause ozone depletion and present a more environmentally friendly option.[38] In 2019 HFCs represented *** percent of global consumption of fluorocarbons, while HCFCs were *** percent.[39] Reflecting the effort of phase out HCFCs, the global share of HCFCs shrank from *** percent in 2012 to *** percent of total fluorocarbon market in 2019.[40] By 2030, all HCFC production in developed countries will be banned.[41] Although HFCs are not ozone depleting like HCFCs, they emit greenhouse gases and have been slated for phasedown.[42]

[33] Conference transcript, p. 32 (King); Petitioner's posthearing brief, Exhibit 1, pp. 3-4, 14.

[34] Conference transcript, p. 10 (O'Donovan); Petitioner's posthearing brief, Exhibit 1, pp. 3-4, 14.

[35] IHS Markit, Chemical Economics Handbook, Fluorocarbons, June 2020, p. 23 regarding the phase out of HCFCs with the Montreal Protocol and zero ozone depletion potential of HFCs; Montreal Protocol Fact Sheet (accessed January 21, 2021).

[36] The chemical name for R-22 is chlorodifluoromethane. PubChem, "Chlorodifluoromethane" (accessed January 21, 2021).

[37] Petitioner's posthearing brief, pp. 11-12, Exhibit 1, pp. 1-2, 18-19, 260-261.

[38] Petitioner's posthearing brief, Exhibit 1, pp. 1-2.

[39] IHS Markit, Chemical Economics Handbook, Fluorocarbons, June 2020, p. 10.

[40] IHS Markit, Chemical Economics Handbook, Fluorocarbons, June 2020, p. 10.

[41] Developing countries have until 2040. The Montreal Protocol restrictions only refer to newly produced product that is not used as feedstock for other chemicals. IHS Markit, Chemical Economics Handbook, Fluorocarbons, June 2020, pp. 23-24; U.S. Environmental Protection Agency, "Phaseout of Class II Ozone-Depleting Substances" (accessed January 21, 2021).

[42] U.S. Environmental Protection Agency, "Recent International Developments Under the Montreal Protocol" (accessed January 21, 2021); U.S. Environmental Protection Agency, "Reducing HFC Use" (accessed January 21, 2021); IHS Markit, Chemical Economics Handbook, Fluorocarbons, June 2020, p. 27.

On December 27, 2020, the President signed the American Innovation and Manufacturing (AIM) Act, and it will lead to phasedown of HFCs[43] [44] in alignment with the Kigali amendment to the Montreal Protocol.[45] Specifically, the sum of all regulated substances on the list of the AIM Act will decrease in production and consumption by 10 percent by 2023, 40 percent by 2028, 70 percent by 2033, 80 percent by 2035, and 85 percent by 2036 and later.[46]

The AIM Act permits allowances and trading.[47] Each individual chemical substance on the list has a specific GWP value.[48] This value is a common measure that allows for the comparison of different gases, as different gases have different Earth warming effects. The common measure also allows for the comparison of emissions reduction opportunities across sectors and gases. The higher the GWP number, the more the gas warms the Earth.[49] In a

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[43] Doniger, David and Alex Hillbrand, "HFC Phasedown Marks Top Climate Win of 116th Congress," NRDC, December 20, 2020 and updated December 27, 2020 https://www.nrdc.org/experts/david-doniger/hfc-phasedown-marks-top-climate-win-116th-congress; Garry, Michael, "U.S. enacts HFC Phase-down Law as Part of COVID Relief Bill," Hydrocarbon 21, January 4, 2021 https://hydrocarbons21.com/articles/9879/u_s_enacts_hfc_phase_down_law_as_part_of_covid_relief_bill; S. 2754, 116th Congress, §6(b)(3), available at https://www.congress.gov/bill/116th-congress/senate-bill/2754/text.

[44] Petitioner expects that as the other HFCs are being phased down in distinct steps, those products that contain lower global warming potential products for R-32 will have increased consumption and demand before each step down in 2024 and 2029. Petitioner's posthearing brief, p. 32.

[45] The R-32 and R-22 are two of the included substances on the AIM Act and Kigali amendment lists. United Nations Environment Economy Division, "The Kigali Amendment to the Montreal Protocol: HFC Phasedown," retrieved January 31, 2021, https://multimedia.3m.com/mws/media/1365924O/unep-fact-sheet-kigali-amendment-to-mp.pdf; S. 2754, 116th Congress, §6(b)(3), available at https://www.congress.gov/bill/116th-congress/senate-bill/2754/text.

[46] As the Act stipulates that *all* chemical substances on the regulated list will in total be decreased by 85 percent by 2036, the individual chemical substances themselves may have different percentages of decrease. Recycled product is excluded. S. 2754, 116th Congress, §6(b)(3), available at https://www.congress.gov/bill/116th-congress/senate-bill/2754/text.

[47] An allowance is a limited authorization for the production or consumption of a regulated substance under the Act and does not constitute a property right. S. 2754, 116th Congress, §6(b)(3), available at https://www.congress.gov/bill/116th-congress/senate-bill/2754/text; In one example of a trading program, a company may be permitted one ton of sulfur dioxide emissions into the air. It can trade that allowance amount in an allowance market for its benefit. Environmental Protection Agency, "How Do Emissions Trading Programs Work?" retrieved January 31, 2021, https://www.epa.gov/emissions-trading-resources/how-do-emissions-trading-programs-work.

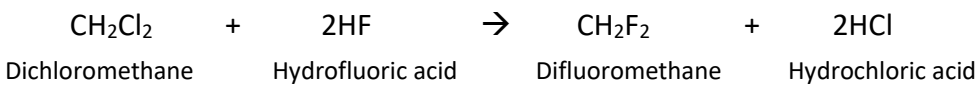
[48] Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO_2). 100 years is usually the time period used. GWP is a common unit of measure across gases can be added to get a national inventory. It allows for the comparison of emissions reduction opportunities across sectors and gases. EPA, "Understanding Global Warming Potentials," (accessed January 31, 2021), https://www.epa.gov/ghgemissions/understanding-global-warming-potentials.

[49] In the AIM Act, the GWP over 100 years is called the exchange value.

trading and allowance system in which all the individual GWPs are added together and the lowering of total GWPs is the goal, those individual chemical substances with a lower GWP number may fare better in the market than those with a higher GWP number.[50] However, the details of allowance and trading programs will be written by the Environmental Protection Agency (EPA) in the future.[51]

Manufacturing processes

The reaction used in the manufacturing process that produces R-32 is known as hydrofluorination. It is the reaction of a chlorinated starting compound with hydrofluoric acid. The yield from this reaction is a carbon-hydrogen-fluorine compound and hydrochloric acid.[52] For the specific production of R-32, dichloromethane (CH_2Cl_2; also known as methylene chloride) reacts with chlorine gas and hydrofluoric acid.[53] This results in crude R-32 and liquid waste. The waste is incinerated, and the crude R-32 is then purified. The purification process results in the production of food grade hydrochloric acid.[54] The purified R-32 then goes through a drying process and is stored in containers for shipping to customers. The chemical formula summarizing the reaction is as follows:



According to AHRI standards, R-32 may have a maximum level of contaminants of 1.5 percent by weight.[55] Contaminants in this system are non-compressible gases such as nitrogen. Other contaminates include moisture and oxygenated air.[56] The downstream effect on an air

[50] The GWP range of all individual chemical substances listed in the Act is 53 to 14,800 GWP (100 years) (AIM Act terms it "exchange rate"). R-32 has a GWP, 100 Years value of 675 and is thus lower than some of the other chemical substances on the list. S. 2754, 116th Congress, §6(b)(3), available at https://www.congress.gov/bill/116th-congress/senate-bill/2754/text.

[51] S. 2754, 116th Congress, §6(b)(3), available at https://www.congress.gov/bill/116th-congress/senate-bill/2754/text.

[52] Petition, p. 7. Petitioner states that since the preliminary phase of this investigation, there are no product or manufacturing changes to report. Petitioner's posthearing brief, Exh. 1, p. 1.

[53] Conference transcript, p. 10 (O'Donovan).

[54] Petition, p. 7.

[55] Air Conditioning, Heating, and Refrigeration Institute, "AHRI Standard 700 – 2019 Standard for Specifications for Refrigerants," 2019, p. 7.

[56] Conference transcript, pp. 61-62 (O'Donovan).

conditioner in a system with contaminants is lack of efficiency, through excessive energy usage or excessive heating of the air conditioner unit.[57]

A common HFC blend that contains R-32 is R-410a, which is a gas that is used in almost all modern air conditioning units.[58] It is comprised by volume of 50 percent R-32 and 50 percent R-125.[59] There is no substitute for R-32 that can be used to produce R-410a. There are many downstream HFC blends used in refrigerants that do not contain any R-32. However, these blends are not as widely used as R-410a. These components also do not share common manufacturing facilities. The equipment at the petitioner's Calvert City plant that is used to manufacture R-32 cannot produce other components, such as R-143a (1,1,1-trifluoroethane), R-125 (pentafluoroethane) and R-134a (1,1,1,2-tetraflurorethane).[60]

Domestic like product issues

No issues with respect to domestic like product have been raised in this investigation, nor did either party request data or other information necessary for analysis of the domestic like product.

[57] Conference transcript, p. 62 (O'Donovan).

[58] Conference transcript, p. 7 (Mintzer); Written testimony, p. 2, January 13, 2021 (O'Donovan).

[59] R-125 is pentafluoroethane. PubChem, "Pentafluoroethane" (accessed January 21, 2021).

[60] Written testimony, p. 2, January 13, 2021 (O'Donovan); chemical names from PubChem. PubChem, "Pentafluoroethane" (accessed January 21, 2021); PubChem, "1,1,1-trifluoroethane" (accessed January 21, 2021); PubChem, "1,1,1,2-tetraflurorethane" (accessed January 21, 2021).

Part II: Conditions of competition in the U.S. market

U.S. market characteristics

Difluoromethane ("R-32") is a hydrofluorocarbon ("HFC") gas primarily used in HFC blends for residential and commercial refrigerant applications, such as air-conditioning.[1] [2] Newer generations of HFCs, such as R-32, were developed to replace the previous generation of hydrochlorofluorocarbon ("HCFC") refrigerants and HFCs that caused ozone depletion.[3]

R-32 must meet standards set by the Air Conditioning, Heating, and Refrigeration Institute ("AHRI"),[4] and Chinese and U.S.-produced product have the same chemical formula.[5] R-32 has no ozone depletion potential and has a lower global warming potential than other HFC compounds.[6] Most R-32 is used to produce HFC blends, including R-410A, R-407A, and R-407C. Modern air conditioning units use HFC blend R-410A, which is composed of 50 percent R-32 and 50 percent R-125.[7] R-32 comprises a varying share of other HFC blends.[8] R-32 is also used as a stand-alone refrigerant in some applications, such as window-unit air conditioners.[9] Respondent Daikin America stated that air-conditioning producer Goodman will use R-32 as a stand-alone refrigerant in its next-generation air conditioners.[10] High-purity R-32 is also used in semiconductor silicon wafer manufacturing to etch silicon, although relatively little R-32 is used in this application.[11]

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[1] Petition, p. 6 and Exh. 1-2, p. 47. Conference transcript, p. 10 (O'Donovan).

[2] R-32 is sold under various names including Solkane 32, Forane 32, and Klea 32. *Hydrofluorocarbon Blends from the People's Republic of China, Inv. No. 731-TA-1279 (Final),* USITC Publication No. 4629, (August 2016), p. I-7.

[3] FluoroFusion and Kivlan and Co.'s postconference brief, p. 9.

[4] Petition, p. 1.

[5] Petition, p. 18. All R-32 has the "same chemical composition as defined by the CAS number and meets the same HRI standard knowns as HRI 700." Conference transcript, p. 10 (O'Donovan).

[6] Conference transcript, p. 10 (O'Donovan).

[7] Conference transcript, p. 11 (O'Donovan).

[8] Petitioner's claimed cost share of R-32 in these blends in 2019 was: ***. Derived from Petition Exh. 1-9.

[9] Conference transcript, pp. 29-30 (Swan).

[10] Daikin America's postconference brief, p. 2.

[11] Conference transcript, p. 32 (O'Donovan).

R-32 is sold in containers of various sizes. Bulk containers include ISO[12] tanks, tank truck trailers containing 15 to 17 tons of R-32, and railcars containing about 60 tons of R-32. R-32 is also sold in half-ton or one-ton packages, standard cylinders of 125 pounds, and 20-pound small cylinders. Chinese-produced R-32 is typically sold in ISO tanks. Other packaging is available for Chinese-produced R-32 but it is not available in railcars.[13]

Arkema is the only known U.S. producer of R-32. China was the only other source of imported R-32 reported during the preliminary phase of this investigation, and an Indian source was reported in final phase of this investigation.[14] Most importers (9 of 13 responding) internally consume R-32 to make HFC blends.[15] [16] The petitioner argued that the antidumping

[12] "ISO" stands for International Organization of Standardization.

[13] Conference transcript, pp. 60-61 (O'Donovan).

[14] Daikin America stated that Arkema does not have enough capacity to supply all the U.S. market for R-32. Daikin America's postconference brief, p. 8.

[15] Importers *** submitted questionnaires in the preliminary phase, but they did not submit questionnaires in the final phase. *** belong to the same parent company, though each firm submitted a separate importer questionnaire in the preliminary phase. Counsel for ***. ***, email correspondence to USITC staff, November 6, 2020. Counsel for ***. ***, email correspondence to USITC staff, November 10, 2020.

[16] *** are related firms and submitted separate importers' questionnaires in the final phase of the investigation. ***. ***. ***. ***. Each firm's responses are reported separately throughout this section, unless otherwise noted.

duty order on HFC blends, effective August 2016,[17] led to an increase in imports of R-32.[18] According to the Petitioner, new entrants, such as importers IGas and BMP USA, established U.S. HFC blending operations in response to the antidumping duty order on HFC blends.[19]

Respondents FluoroFusion and Kivlan and Co. argued that the phasing out of R-22, an older HFC component, has led to large supplies of R-22 "overhang{ing}" the market of HFC blends.[20]

Apparent U.S. consumption of R-32 increased by *** percent during 2017-19. Overall, apparent U.S. consumption was *** percent higher in January-September 2020 than in January-September 2019.

U.S. purchasers

The Commission received 17 usable purchaser questionnaires.[21] [22] Ten responding purchasers are distributors; 11 are blender end users; and three are other.[23] [24] Eight purchasers

[17] The Commission found a separate like product for blends and components in its investigations of HFC Blends from China and found that the U.S. industry was not materially injured or threatened by injury by reason of HFC components from China. The Department of Commerce found dumping margins applicable to blends of 101.82 percent for the investigated producer/exporter combinations and dumping margins of 216.3 percent for the PRC-Wide entity. *Hydrofluorocarbon Blends and Components from China, Inv. No. 731-TA-1279 (Final)*, USITC Publication 4629, August 2016 ("HFC Publication"), pp. 3, 13, and 25.

[18] Conference transcript, p. 14 (Swan). Petitioner's posthearing brief, p. 2 and Exh. 1, p. 22.

[19] Petition, pp. 21-23.

[20] FluoroFusion and Kivlan and Co.'s postconference brief, p. 11. They did not, however, explain how this influences the demand for R-32 or for blends that contain R-32.

[21] The following firms provided purchasers' questionnaire responses: ***.

[22] Of the 17 responding purchasers, 9 purchased the domestic R-32, 10 purchased imports of the subject merchandise from China, and 3 purchased imports of R-32 from other sources.

[23] Purchaser *** reported ***. Purchaser *** reported ***. Purchaser *** reported ***.

[24] Purchaser *** reported ***. Purchasers *** reported ***.

also imported R-32.[25] In general, responding U.S. purchasers were located in the Northeast, the Midwest, the Central Southwest, the Pacific Coast, and the Southeast. The responding purchasers are in a variety of industries, including engineering, OEM, industrial laboratory research, appliances, electronics, semiconductor manufacturers and distributors, reclaiming and blending, field contractors, wholesale blenders, and HVAC wholesalers. Large purchasers of R-32 include ***.[26]

Channels of distribution

*** importers sold mainly to HFC blenders, as shown in table II-1.[27]

[25] *** submitted both purchaser and importer questionnaires.

[26] These firms ***.

[27] Importers *** were the only importers to report that none of their shipments were internally consumed. They shipped all their R-32 imports to HFC blenders.

Table II-1
R-32: U.S. producers' and importers' U.S. shipments, by sources and channels of distribution, 2017-19, January to September 2019, and January to September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Share of U.S. shipments (percent)				
U.S. producers: to Distributors	***	***	***	***	***
to HFC blenders	***	***	***	***	***
to Other end users	***	***	***	***	***
U.S. importers: China to Distributors	***	***	***	***	***
to HFC blenders	***	***	***	***	***
to Other end users	***	***	***	***	***
U.S. importers: Nonsubject to Distributors	***	***	***	***	***
to HFC blenders	***	***	***	***	***
to Other end users	***	***	***	***	***
U.S. importers: All sources: to Distributors	***	***	***	***	***
to HFC blenders	***	***	***	***	***
to Other end users	***	***	***	***	***

Note.-- Importer *** reported that it shipped all its R-32 to end users and reported these shipments were internally consumed during 2017-18. Importer *** reported that less than one percent of its shipments were to end users in 2018.
Note.-- Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

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

Geographic distribution

Arkema reported selling R-32 to *** regions in the contiguous United States (table II-2). Importers reported selling to all regions in the contiguous United States except the Mountain region. Arkema had *** sales within 100 miles of its production facility, *** percent were between 101 and 1,000 miles, and *** percent were over 1,000 miles. Importers sold 99.3 percent within 100 miles of their U.S. point of shipment, 0.6 percent between 101 and 1,000 miles, and less than one percent over 1,000 miles.

Table II-2
R-32: Geographic market areas in the United States served by U.S. producer and subject importers

Region	U.S. producer	Subject U.S. importers
Northeast	***	2
Midwest	***	2
Southeast	***	5
Central Southwest	***	1
Mountain	***	---
Pacific Coast	***	4
Other	***	---
All regions (except Other)	***	---
Reporting firms	1	6

Note.-- 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

Table II-3 provides a summary of the supply factors regarding R-32 from Arkema and from China. Chinese production capacity was nearly *** the size of U.S. production in 2019.

Table II-3
R-32: Supply factors that affect the ability to increase shipments to the U.S. market

	2017	2019	2017	2019	2017	2019	Shipments by market in 2019 (percent)		Able to shift to alternate products
Item	Capacity (short tons)		Capacity utilization (percent)		Inventories as a ratio to total shipments (percent)		Home market shipments	Exports to non-U.S. markets	No. of firms reporting "yes"
United States	***	***	***	***	***	***	***	***	*** of 1
China	***	***	***	***	***	***	***	***	*** of 9

Note.-- Arkema accounted for all U.S. production of R-32 in 2019. Responding foreign producer/exporter firms accounted for *** of U.S. imports of R-32 from China during 2019. For additional data on the number of responding firms and their share of U.S. production and of U.S. imports from each subject country, please refer to Part I, "Summary Data and Data Sources."

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

Domestic production

Based on available information, Arkema has the ability to respond to changes in demand with moderate-to-large changes in the quantity of shipments of U.S.-produced R-32 to the U.S. market. The main contributing factor to this degree of responsiveness of supply is the availability of unused capacity. Factors mitigating responsiveness of supply include limited inventories, limited ability to shift shipments from alternate markets, and no reported ability to shift production to or from alternate products. [28]

From 2017-19, Arkema's capacity *** and production ***, leading to *** capacity utilization. Inventories were *** from 2017-19, and home market shipments comprised the *** of Arkema's shipments.

Subject imports from China

Ten firms provided foreign producer/exporter questionnaires.[29] [30] Based on available information, producers of R-32 from China have the ability to respond to changes in demand with moderate changes in the quantity of shipments of R-32 to the U.S. market. The main contributing factors to this degree of responsiveness of supply are Chinese producers' ability to increase capacity quickly and some ability to shift shipments from alternative markets.[31] Factors mitigating responsiveness of supply include high capacity utilization, no reported ability to shift production to or from alternate products, and limited inventories.

From 2017-19, foreign producers' capacity increased substantially and capacity utilization decreased but remained high. Chinese producers reported shipping the majority of their R-32 to their home market, but also export to other markets including ***. The limited supply of raw materials was reported to be a barrier to increasing production. An *** is a barrier to shifting between markets.

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[28] Conference transcript, p. 11 (O'Donovan).

[29] One of these firms, ***, reported that it ***.

[30] Part VII provides information on Chinese exports of HTS 2903.39, a basket category of chemicals that includes R-32.

[31] China comprised *** percent of global R-32 production capacity in 2019, and the United States comprised *** percent of global production capacity in 2019. IHS Markit, Chemical Economics Handbook, Fluorocarbons, June 2020, p. 7. See Part VII of this report for additional information.

Imports from nonsubject sources

Nonsubject imports only entered in January-September 2020, accounted for *** percent of total U.S. import quantity that period.[32] The largest source of nonsubject imports during this period was India.[33]

Supply constraints

Arkema reported that it has not refused, declined, or been unable to supply R-32 since January 1, 2017. However, multiple U.S. importers/end users reported that Arkema was unable or unwilling to supply them with R-32 since January 1, 2017. Importer/purchaser *** noted that it cannot rely on Arkema to meet all its supply requirements. Since the preliminary investigation, ***.[34] Importer *** also noted that diversity of supply is important as there is only one U.S. producer. Importer/purchaser *** stated that Arkema does not have the capacity to meet its demand. Additionally, importer/purchaser *** noted that Arkema "***."[35]

Two importers reported supply constraints on product from China: *** reported a "significantly reduced" supply in April 2017 that affected R-32 for four months, and *** reported *** "due to lack of availability in other countries."[36] Multiple importers reported that prices of R-32 from China spiked in Q2 2017, discussed above, and Q2 and Q3 2018 due to temporary supply issues in China.

[32] *** reported that Indian manufacturer SRF started producing R-32 in 2020.

[33] Importers and purchasers reported no other nonsubject source.

[34] *** U.S. purchasers' questionnaire, responses to III-14 and IV-2.

[35] Arkema argued that this statement confirmed that Arkema lost significant volumes due to price, not availability. Petitioner's postconference brief, Exh. 2, p 2. Arkema ***. Petitioner's prehearing brief, p. 51. Arkema reported ***. Petitioner's prehearing brief, pp. 51-52.

[36] *** report ***.

New suppliers

Four of 17 responding purchasers indicated that two new suppliers entered the U.S. market since January 1, 2017. Purchasers cited SRF (an Indian producer) and Scales N Stuff (an importer of Chinese R-32).[37]

U.S. demand

Based on available information, the overall demand for R-32 is likely to experience small changes in response to changes in price. The main contributing factors are the lack of substitute products and the moderate cost share of R-32 in its ultimate end-use product of air conditioning systems.

End uses and cost share

U.S. demand for R-32 depends on the demand for U.S.-produced downstream products, such as HFC blends. Importers' reported end uses include various HFC refrigerant blends. R-32 accounts for a varying share of the cost of the HFC blends in which it is used, but is generally a moderate share of the reported end-uses in HFC blends. Reported cost shares for HFC blends were as follows:

- R-410A (8 firms): 26-45 percent
- R-407C (7 firms): 11-23 percent
- R-407A (3 firms): 10-20 percent
- R-407F (1 firm): *** percent
- R-442A (1 firm): *** percent
- R-453A (1 firm): *** percent
- HFC and refrigerant blends, generally (1 firm): *** percent

Petitioner noted that in terms of the ultimate end use, air conditioning systems, R-32 constitutes a very small cost share.[38]

[37] A fifth purchaser, ***, was the only purchaser that reported Arkema as a new supplier. It reported that "Arkema made R-32 components available to distributors in 2020."

[38] Petitioner's prehearing brief, p. 46.

Business cycles

*** 9 of 13 responding importers indicated that the market was subject to business cycles or distinct conditions of competition. *** noted that U.S. demand for R-32 has increased following the antidumping duty order on HFC blends. Eight importers reported that R-32 was subject to business cycles, citing increased demand for air conditioning refrigerants during the summer. Four importers also reported that R-32 is subject to distinct conditions of competition, such as higher prices during supply shortages and increasing volumes of low-priced Chinese product. One importer also noted the R-32 market has changed, reporting that it has lost market share in the refrigerant blends market due to increased imports of blend components, including R-32, from China; additional components from China being blended in the U.S.; and increasing Chinese capacity of R-32. Importers report that the anticircumvention inquiries related to R-32 constitute a change to the conditions of competition; the investigation has led to business uncertainty, supply volatility, and price volatility; the COVID-19 pandemic has reduced demand for, and sales of, HFC blends containing R-32 and this has led to oversupply and lower prices in the third quarter of 2020; and that Arkema began to sell R-32 to independent blenders and reclaimers in 2020, after the initiation of this investigation.

Demand trends

Arkema reported that demand for R-32 is tied to overall growth in the economy, and that it uses GDP as a demand indicator, noting that demand for R-32 grows slightly more rapidly than GDP.[39] From January 2017 through December 2019, real GDP increased in each quarter GDP decreased in the first two quarters of 2020 and then increased in the third quarter of 2020 (figure II-1).[40] [41]

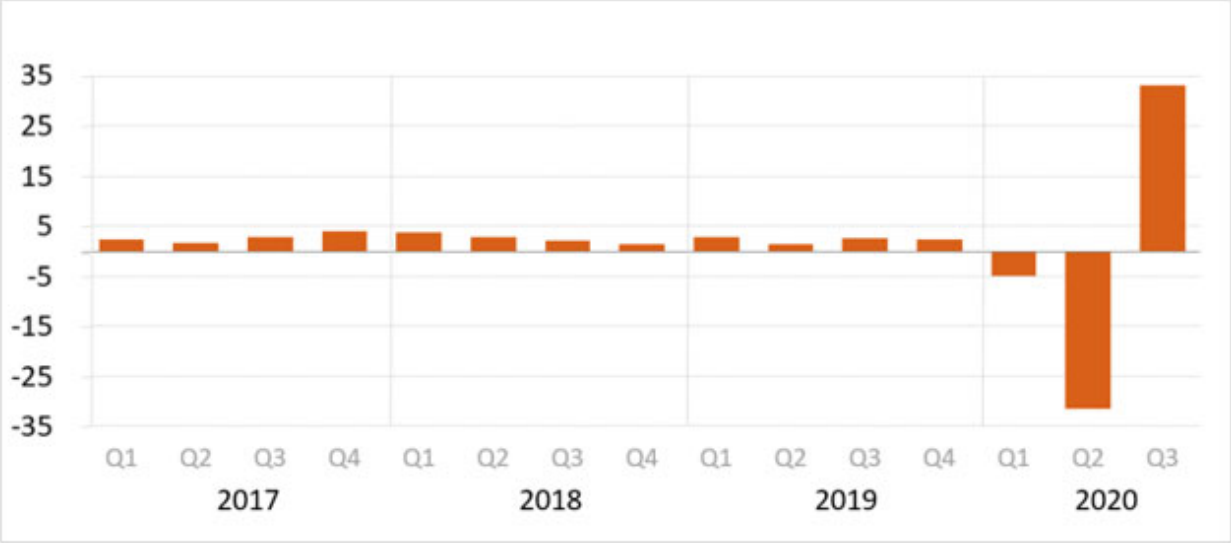
[39] Petitioner's prehearing brief, pp. 21-22.

[40] Data for the third quarter of 2020 is a preliminary estimate. Bureau of Economic Analysis Real Gross Domestic Product (accessed December 21, 2020).

[41] Arkema also reported that the increase in R-32 demand resulted from the antidumping order on blends. Petitioner's prehearing brief, pp. 20-24.

Figure II-1

GDP: Real gross domestic product, percent change from preceding quarter, seasonally adjusted at annual rates, January 2017-September 2020 (preliminary estimate)



Note.-- Data for the third quarter of 2020 is a preliminary estimate.

Source: U.S. Bureau of Economic Analysis. https://www.bea.gov/data/gdp/gross-domestic-product.

*** most importers reported an increase in U.S. demand for R-32 since January 1, 2017 (table II-4). Importer/purchaser *** reported that demand for R-32 increased as air conditioners become more energy efficient. In addition, there has been a shift away from air conditioning systems that use R-22 to systems that use HFC blend R-410A, which contains R-32 (***).

Table II-4
R-32: Firms' perceptions regarding demand in the United States and outside of the United States

Item	Number of firms reporting			
	Increase	No change	Decrease	Fluctuate
Demand inside the United States: U.S. producers	***	***	***	***
Importers	7	1	2	3
Purchasers	9	6	2	---
Demand outside the United States: U.S. producers	***	***	***	***
Importers	5	1	---	3
Purchasers	9	2	---	---
Demand for end use products: Purchasers	5	3	3	2

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

Substitute products

***, all 13 importers, and all 17 purchasers reported that there were no substitutes for R-32. Arkema also noted that there are no substitutes for the HFC blends containing R-32, as air conditioning equipment is designed to work with particular HFC blends.[42]

Substitutability issues

The degree of substitution between domestic and imported R-32 depends upon such factors as relative prices, quality (e.g., grade standards, defect rates, etc.), and conditions of sale (e.g., price discounts/rebates, lead times between order and delivery dates, reliability of supply, product services, etc.). Based on available data, staff believes that there is high degree of substitutability between domestically produced R-32 and R-32 imported from China.

Lead times

R-32 is primarily sold from inventory. *** reported that all of its commercial U.S. shipments came from inventories. Most importers internally consume their R-32. Importers that commercially sold their R-32 reported that 0.2 percent of their commercial U.S. shipments came from U.S. inventories, 99.2 percent of commercial U.S. shipments came from foreign inventories, and 0.6 percent were produced-to-order. Arkema reported an average lead time of *** days. Importer National reported an average lead time of ***. Importer First Continental reported an average lead time of ***.

[42] "Blends have different pressures and efficiencies, so if the equipment is designed for a particular blend, that is the limitation of substitution." Conference transcript, p. 32 (O'Donovan).

Knowledge of country sources

Fifteen purchasers reported that they had marketing/pricing knowledge of domestic product, 11 had marketing/pricing knowledge of Chinese product, and 4 had marketing/pricing knowledge of the product from India.

As shown in table II-5, most purchasers always or usually make purchasing decisions based on the producer and on the country of origin. Most of their customers never make purchasing decisions based on the producer or country of origin.

Of the seven purchasers that reported that they always make decisions based the manufacturer, *** firms cited quality of the product. Other reasons cited include preexisting business relationships and domestic supplier contracts ***.

Table II-5
R32: Purchasing decisions based on producer and country of origin

Purchaser/customer decision	Always	Usually	Sometimes	Never
Purchaser makes decision based on producer	7	4	2	4
Purchaser's customers make decision based on producer	1	1	1	7
Purchaser makes decision based on country	3	6	1	7
Purchaser's customers make decision based on country	---	1	3	8

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

Factors affecting purchasing decisions

The most often cited top-three factors firms consider in their purchasing decisions for R-32 were availability/supply (13 firms), price/cost (12 firms), and quality (7 firms), as shown in table II-6. Availability/supply was the most frequently cited first-most important factor (cited by 6 firms), followed by price/cost (5 firms); availability/supply was the most frequently reported second-most important factor (7 firms); and price/cost was the most frequently reported third-most important factor (6 firms).

Table II-6
R-32: Ranking of factors used in purchasing decisions as reported by U.S. purchasers, by factor

Factor	First	Second	Third	Total
Availability / Supply	6	7	---	13
Price / Cost	5	1	6	12
Quality	4	1	2	7
Established contracts / Established supplier relationship	1	---	1	2
Delivery / Lead time	---	4	---	4
Ability to meet volume requirements / Capacity	---	2	---	2
Product range / Portfolio	---	---	3	3
All other factors	1	---	3	NA

Note.-- Other factors cited included “specifications” (one firm, first-most important factor) and the ability to be set up in a purchasing system (one firm, third-most important factor).

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

The majority of purchasers (11 of 17) reported that they sometimes or never (7 purchasers and 4 purchasers, respectively) purchase the lowest-priced product. Three purchasers reported that they always purchase the lowest-priced product and three purchasers reported that they usually purchase the lowest-priced product.

Importance of specified purchase factors

Purchasers were asked to rate the importance of 15 factors in their purchasing decisions (table II-7). The factors rated as very important by more than half of responding purchasers were availability, quality meeting industry standards, and reliability of supply (16 each); product consistency (15 firms); delivery time (14 firms); price (11 firms); and product range (9 firms). More purchasers reported that a factor was not important than that factor being very important for five factors. Those factors include quality exceeds industry standards (8 reported not important), discounts offered and technical support (7 each), and minimum quantity requirements and packaging (6 each).

Table II-7
R-32: Importance of purchase factors, as reported by U.S. purchasers, by factor

Factor	Very important	Somewhat important	Not important
Availability	16	1	---
Delivery terms	7	7	3
Delivery time	14	3	---
Discounts offered	3	7	7
Minimum quantity requirements	5	6	6
Packaging	5	6	6
Payment terms	5	9	3
Price	11	4	2
Product consistency	15	2	---
Product range	9	1	7
Quality meets industry standards	16	1	---
Quality exceeds industry standards	6	3	8
Reliability of supply	16	1	---
Technical support/service	6	4	7
U.S. transportation costs	4	9	4

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

Supplier certification

Nine of 17 responding purchasers require their suppliers to become certified or qualified to sell R-32 to their firm. Purchasers reported that the time to qualify a new supplier ranged from 14 to 180 days.[43] One importer/purchaser reported that three foreign suppliers failed in their attempts to qualify R-32 or lost their approved status since 2017.[44]

Changes in purchasing patterns

Purchasers were asked about changes in their purchasing patterns from different sources since January 1, 2017 (table II-8).

The reason reported for decreasing purchases of U.S. product was unfavorable pricing in the United States. Reasons reported for increasing purchases of U.S. product included increased demand by OEMs, increased availability from domestic suppliers, in-house leadership changes, potential antidumping duty orders, and railcar availability. Seven of 17 responding purchasers reported that they had changed suppliers since January 1, 2017. Specifically, one firm dropped or reduced purchases from Chinese suppliers because of Commerce's anticircumvention inquiry

[43] *** reported certification time of ***, *** reported certification time of ***, *** reported certification time of ***, *** reported certification time of ***, and *** reported a certification time of ***.

[44] That importer/purchaser, ***, ***. *** said ***.

related to hydrofluorocarbon blends. *** increased purchases from Chinese suppliers, *** due to lower pricing. One firm reported fluctuating purchasing patterns of Chinese product because it divides its R-32 purchases between imports from China and purchases of Chinese product available in the U.S.

Table II-8
R-32: Changes in purchase patterns from U.S., subject, and nonsubject countries

Source of purchases	Did not purchase	Decreased	Increased	Constant	Fluctuated
United States	3	1	5	5	2
China	6	5	2	1	2
All other sources	13	---	2	---	---
Sources unknown	13	1	1	1	---

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

Importance of purchasing domestic product

Thirteen of 17 purchasers reported that most or all of their purchases did not require purchasing U.S.-produced product. No firms reported that domestic product was required by law, three reported it was required by their customers (for 20 to 100 percent of their purchases), and one firm cited a contract commitment with a U.S. supplier.

Comparisons of domestic products, subject imports, and nonsubject imports

Purchasers were asked a number of questions comparing R-32 produced in the United States, China, and a nonsubject country. First, purchasers were asked for a country-by-country comparison on the same 15 factors (table II-9) for which they were asked to rate the importance.

Most purchasers reported that U.S. and Chinese R-32 were comparable on 9 of the 15 factors. The exceptions were delivery terms, delivery time, reliability of supply, technical support/service, and U.S. transportation costs, for which at least half of responding purchasers rated the domestic product as superior. In contrast, most responding purchasers indicated that the Chinese product was lower priced. Most purchasers reported that U.S. and nonsubject R-32 were comparable on 9 of the 15 factors. The exceptions were delivery terms, delivery time, payment terms, technical support/service, and U.S. transportation costs, for which the majority of purchasers rated the domestic product as superior, and product range, which received one purchaser response for each rating of superior, comparable, and inferior. Most purchasers reported that Chinese and nonsubject R-32 were comparable on 8 of the 15 factors. The exceptions were availability, delivery terms, delivery time, payment terms, price, product

range, and reliability of supply, for which the majority of purchasers rated the Chinese product as superior.

In table II-7, 16 of 17 responding purchasers rated availability, quality meets industry standards, and reliability of supply as very important. As illustrated in table II-9, most responding purchasers reported that the U.S. product and the Chinese product were comparable for availability and quality meets industry standards, while 5 of 10 responding firms reported that U.S. product was superior for the reliability of supply.

Table II-9
R-32: Purchasers' comparisons between U.S.-produced and imported product

Factor	United States vs. China			United States vs. Nonsubject sources			China vs. Nonsubject sources		
	S	C	I	S	C	I	S	C	I
Availability	2	6	2	1	2	---	3	---	---
Delivery terms	5	4	1	2	1	---	3	---	---
Delivery time	7	3	---	2	1	---	3	---	---
Discounts offered	---	6	3	---	2	1	1	2	---
Minimum quantity requirements	---	8	1	---	2	1	1	2	---
Packaging	2	9	---	---	3	---	---	3	---
Payment terms	1	7	2	3	---	---	2	1	---
Price	1	2	6	---	2	1	2	1	---
Product consistency	1	9	---	1	2	---	1	2	---
Product range	1	8	1	1	1	1	2	1	---
Quality meets industry standards	---	10	---	---	3	---	---	3	---
Quality exceeds industry standards	---	10	---	1	2	---	---	3	---
Reliability of supply	5	4	1	1	2	---	2	1	---
Technical support/service	6	4	1	2	1	---	1	2	---
U.S. transportation costs	6	3	1	2	---	---	1	2	---

Note.-- S=first listed country's product is superior; C=both countries' products are comparable; I=first list country's product is inferior.
Note.-- A rating of superior means that price/U.S. transportation cost is generally lower. For example, if a firm reported "U.S. superior," it meant that the U.S. product was generally priced lower than the imported product.

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

Comparison of U.S.-produced and imported R-32

In order to determine whether U.S.-produced R-32 can generally be used in the same applications as imports from China, Arkema, importers, and purchasers were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in table II-10, ***, almost all importers, and a majority of responding purchasers reported that U.S.- and Chinese-produced R-32 are always interchangeable.

Table II-10
R-32: Interchangeability between R-32 produced in the United States and in other countries, by country pair

Country pair	U.S. producer				U.S. importers				U.S. purchasers			
	A	F	S	N	A	F	S	N	A	F	S	N
United States vs. China	***	***	***	***	9	1	---	---	8	2	1	---
United States vs. Other	---	---	---	---	8	---	---	---	6	2	1	---
China vs. Other	---	---	---	---	8	---	---	---	6	1	1	---

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

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

As can be seen from table II-11, nearly all responding purchasers reported that domestically produced and Chinese imported R-32 product always met minimum quality specifications.

Table II-11
R-32: Ability to meet minimum quality specifications, by source

Source	Always	Usually	Sometimes	Rarely or never
United States	8	2	---	---
China	10	1	---	---
All other sources	3	---	---	---

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

In addition, the U.S. producer, importers, and purchasers were asked to assess how often differences other than price were significant in sales of R-32 from the U.S., China, or nonsubject countries. As seen in table II-12, Arkema reported that factors other than price are *** important, and a plurality of importers and purchasers reported that non-price differences between U.S. and Chinese product are sometimes important. Importers noted that there is limited availability of R-32 produced in the United States and that the U.S. supplier does not have all three HFC components available. Purchaser *** reported that "{n}o U.S. producer or importer has the breadth of product range that our Chinese suppliers offer," adding, "Prior to the initiation of the R-32 {antidumping} investigation, {we} had never received a quote for R{-}32 from a domestic supplier that could fulfill the requested supply and forward-looking order schedule, nor included payment and shipping terms." Purchaser *** reported that it is "time consuming and costly" to purchase product from China because the Chinese product is transported in ISO containers, and heels[45] in those containers must be consolidated to return the empty ISO containers.

[45] *** explained heel consolidation as the cost to "recover residual R-32 from empty ISO" containers.

Table II-12
R-32: Significance of differences other than price between R-32 produced in the United States and in other countries, by country pair

Country pair	U.S. producers				U.S. importers				U.S. purchasers			
	A	F	S	N	A	F	S	N	A	F	S	N
United States vs. China	***	***	***	***	1	2	3	2	***	***	***	***
United States vs. Other	---	---	---	---	1	---	1	3	***	***	***	***
China vs. Other	---	---	---	---	1	1	1	2	***	***	***	***

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

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

Elasticity estimates

This section discusses elasticity estimates; parties were encouraged to comment on these estimates in their prehearing or posthearing briefs.[46]

U.S. supply elasticity

The domestic supply elasticity for R-32 measures the sensitivity of the quantity supplied by U.S. producers to changes in the U.S. market price of R-32. The elasticity of domestic supply depends on several factors, including the level of excess capacity, the ease with which producers can alter capacity, producers' ability to shift to production of other products, the existence of inventories, and the availability of alternate markets for U.S.-produced R-32. Analysis of these factors above indicates that the U.S. industry has the ability to moderately increase or decrease shipments to the U.S. market; an estimate in the range of 4 to 7 is suggested.

U.S. demand elasticity

The U.S. demand elasticity for R-32 measures the sensitivity of the overall quantity demanded to a change in the U.S. market price of R-32. This estimate depends on factors discussed above, such as the existence, availability, and commercial viability of substitute products, as well as the component share of the R-32 in the production of any downstream products. Based on the available information, the aggregate demand for R-32 is likely to be inelastic; a range of -0.25 to -0.75 is suggested.

[46] Petitioner ***. Petitioner's prehearing brief ***. Petitioner's prehearing brief, Exh. 15, p. 11. Petitioner ***. Petitioner's prehearing brief, p. 9. Petitioner ***. Petitioner's prehearing brief, p. 46.

Substitution elasticity

The elasticity of substitution depends upon the extent of product differentiation between the domestic and imported products.[47] Product differentiation, in turn, depends upon such factors as quality (e.g., chemistry, appearance, etc.) and conditions of sale (e.g., availability, sales terms/discounts/promotions, etc.). Based on available information, the elasticity of substitution between U.S.-produced R-32 and imported R-32 is likely to be in the range of 3 to 5.

[47] The substitution elasticity measures the responsiveness of the relative U.S. consumption levels of the subject imports and the domestic like products to changes in their relative prices. This reflects how easily purchasers switch from the U.S. product to the subject products (or vice versa) when prices change.

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 one firm believed to account for all known U.S. production of R-32 during 2019.

U.S. producers

The Commission issued a U.S. producer questionnaire to one firm, Arkema, believed to account for all known production of R-32 in the United States. Table III-1 lists Arkema's production location, position on the petition, and share of total production.

Table III-1
R-32: U.S. producers of R-32, their positions on the petition, production locations, and shares of reported production, 2019

Firm	Position on petition	Production location	Share of production (percent)
Arkema	Petitioner	Calvert City, KY	100.0
Total			100.0

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

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

Table III-2
R-32: U.S. producer Arkema's ownership, related and/or affiliated firms, 2017-19, January-September 2019, and January-September 2020

Item / Firm	Firm Name	Affiliated/Ownership
Ownership:		
***	***	***

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

Table III-3 presents U.S. producers' reported changes in operations since January 1, 2017.

Table III-3
R-32: U.S. producer Arkema's reported changes in operations, since January 1, 2017

Item / Firm	Reported changes in operations
Prolonged shutdowns or curtailments:	
***	***

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

U.S. production, capacity, and capacity utilization

Table III-4 and figure III-1 present Arkema's production, capacity, and capacity utilization. While capacity remained steady during 2017-19 and in both interim periods (January-September 2019 and January-September 2020), production increased by *** percent between 2017 and 2018, thus increasing capacity utilization by *** percentage points. Arkema's production then fell by *** percent (roughly *** short tons) between 2018 and 2019, similarly decreasing capacity utilization by *** percentage points. Despite the decrease, Arkema's production and capacity utilization still increased overall during 2017-19, by *** percent with regard to production, and *** percentage points with regard to capacity utilization. Arkema's production and capacity utilization were *** percent and *** percentage points lower, respectively, in January-September 2020 than in January-September 2019.

Table III-4
R-32: U.S. producer Arkema's production, capacity, and capacity utilization, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Quantity (short tons)				
Capacity	***	***	***	***	***
Production	***	***	***	***	***
	Ratio (percent)				
Capacity utilization	***	***	***	***	***

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

Figure III-1
R-32: U.S. producer Arkema's production, capacity, and capacity utilization, 2017-19, January-September 2019, and January-September 2020

* * * * * * *

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

Alternative products

Arkema reported that alternative products could not be produced on the same machinery as R-32.[1]

[1] Petition, p. 13. See also Conference transcript, p. 11 (O'Donovan)

U.S. producers' U.S. shipments and exports

Table III-5 presents U.S. producers' U.S. shipments, export shipments, and total shipments.[2] The quantity of Arkema's total shipments, inclusive of U.S. and export shipments, increased by *** percent during 2017-19, was highest in 2018, and was *** percent lower in January-September 2020 than in January-September 2019. The increase during 2017-19 was largely driven by the increase in commercial U.S. shipments, while internal consumption declined, and swaps remained relatively consistent.

Similarly, the quantity of Arkema's U.S. shipments, despite increasing between 2017 and 2018 by *** percent, then decreasing between 2018 and 2019 by *** percent, increased overall during 2017-19, by *** percent, and were *** percent higher in January-September 2020 than in January-September 2019. By quantity, Arkema's commercial shipments of R-32 increased each year during 2017-19, for a net increase of *** percent, and were *** percent higher in January-September 2020 than in January-September 2019.

Arkema's internal consumption of R-32, decreased overall during 2017-19 by *** percent, despite increasing between 2017 and 2018 by *** percent, and was *** percent lower in January-September 2020 than in January-September 2019. The quantity of Arkema's swaps ***.[3] The quantity of Arkema's reported swaps were *** percent lower in January-September 2020 than in January-September 2019.

The value of Arkema's total shipments increased during 2017-19 by *** percent, and were *** percent higher in January-September 2020 than in January-September 2019. U.S. shipments similarly increased overall during 2017-19, increasing between 2017 and 2018 by *** percent, then decreasing by *** percent between 2018 and 2019 to end *** percent higher in 2019 than in 2017. Arkema's U.S. shipments, by value were *** percent higher in January-September 2020 than in January-September 2019. The value of Arkema's commercial shipments increased by *** percent during 2017-19, and was *** percent higher in January-September 2020 than in January-September 2019. Arkema's reported internal consumption, by value, fell by *** percent between 2018 and 2019 despite increasing between 2017 and 2018 by *** percent, resulting in an overall decline of *** percent during 2017-19, and was slightly lower in January-September 2020 than in January-September 2019. The value of Arkema's swaps ***. Arkema's swaps were *** percent lower in January-September 2020 than in January-September 2019.

---

[2] Arkema reported ***. These ***.

[3] See part VI of this report for further details on swaps.

The unit value of Arkema's U.S. shipments increased from $*** per short ton in 2017 to $*** per short ton in 2019, for a net increase of *** percent, and was *** percent higher in January-September 2020 than in January-September 2019. While the unit values of Arkema's swaps *** during 2017-19, the unit values of Arkema's commercial U.S. shipments and internal consumption increased each year during 2017-19, and were higher in January-September 2020 than in January-September 2019. As a share of both quantity and value, U.S. shipments made up *** percent of Arkema's total shipments during each year. Arkema's commercial U.S. shipments went from accounting for *** in 2017 to comprising *** in 2019, increasing by *** percentage points by quantity and *** percentage points by value during 2017-19.

Table III-5
R-32: U.S. producer Arkema's U.S. shipments, export shipments, and total shipments, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Quantity (short tons)				
Commercial U.S. shipments	***	***	***	***	***
Internal consumption	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
Swaps	***	***	***	***	***
U.S. shipments	***	***	***	***	***
Commercial export shipments	***	***	***	***	***
Export transfers to related firms	***	***	***	***	***
Export swaps	***	***	***	***	***
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***
	Value (1,000 dollars)				
Commercial U.S. shipments	***	***	***	***	***
Internal consumption	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
Swaps	***	***	***	***	***
U.S. shipments	***	***	***	***	***
Commercial export shipments	***	***	***	***	***
Export transfers to related firms	***	***	***	***	***
Export swaps	***	***	***	***	***
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***
	Unit value (dollars per short ton)				
Commercial U.S. shipments	***	***	***	***	***
Internal consumption	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
Swaps	***	***	***	***	***
U.S. shipments	***	***	***	***	***
Commercial export shipments	***	***	***	***	***
Export transfers to related firms	***	***	***	***	***
Export swaps	***	***	***	***	***
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***

Table continued on next page.

Table III-5--Continued
R-32: U.S. producer Arkema's U.S. shipments, export shipments, and total shipments, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Share of quantity (percent)				
Commercial U.S. shipments	***	***	***	***	***
Internal consumption	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
Swaps	***	***	***	***	***
U.S. shipments	***	***	***	***	***
Commercial export shipments	***	***	***	***	***
Export transfers to related firms	***	***	***	***	***
Export swaps	***	***	***	***	***
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***
	Share of value (percent)				
Commercial U.S. shipments	***	***	***	***	***
Internal consumption	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
Swaps	***	***	***	***	***
U.S. shipments	***	***	***	***	***
Commercial export shipments	***	***	***	***	***
Export transfers to related firms	***	***	***	***	***
Export swaps	***	***	***	***	***
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***

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

U.S. producers' inventories

Table III-6 presents Arkema's end-of-period inventories and the ratio of these inventories to Arkema's production, U.S. shipments, and total shipments**.** Arkema's end-of-period inventories increased during 2017-19 by *** percent and were the *** in 2018. End-of-period inventories were *** percent lower in January-September 2020 than in January-September 2019. The ratio of Arkema's end-of period inventories to U.S. production, U.S. shipments, and total shipments increased between 2017 and 2019, each ending *** percentage points higher in 2019.

Table III-6
R-32: U.S. producer Arkema's inventories, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Quantity (short tons)				
U.S. producers' end-of-period inventories	***	***	***	***	***
	Ratio (percent)				
Ratio of inventories to.--					
U.S. production	***	***	***	***	***
U.S. shipments	***	***	***	***	***
Total shipments	***	***	***	***	***

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

U.S. producers' imports and purchases

Arkema reported *** of R-32 during the period for which data were collected.

U.S. employment, wages, and productivity

Table III-7 shows U.S. producers' employment-related data. Production and related workers, hours worked, and wages paid increased during 2017-19, but were equal or lower in January-September 2020 than in January-September 2019. In contrast, productivity and hourly wages decreased during 2017-19, but were higher in January-September 2020 than in January-September 2019. Unit labor costs decreased between 2017 and 2018, then increased between 2018 and 2019 for a net increase of *** percent during 2017-19. Unit labor costs were higher in January-September 2020 than in January-September 2019.

Table III-7
R-32: U.S. producer Arkema's employment related data, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
Production and related workers (PRWs) (number)	***	***	***	***	***
Total hours worked (1,000 hours)	***	***	***	***	***
Hours worked per PRW (hours)	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***
Hourly wages (dollars per hour)	***	***	***	***	***
Productivity (short tons per 1,000 hours)	***	***	***	***	***
Unit labor costs (dollars per short ton)	***	***	***	***	***

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

Captive consumption

Section 771(7)(C)(iv) of the Act states that–[4]

> *If domestic producers internally transfer significant production of the domestic like product for the production of a downstream article and sell significant production of the domestic like product in the merchant market, and the Commission finds that–*
>
> *(I) the domestic like product produced that is internally transferred for processing into that downstream article does not enter the merchant market for the domestic like product,*
>
> *(II) the domestic like product is the predominant material input in the production of that downstream article, and*
>
> *then the Commission, in determining market share and the factors affecting financial performance . . ., shall focus primarily on the merchant market for the domestic like product.*

Transfers and sales

As reported in table III-5 above, internal consumption accounted for between *** percent and *** percent of Arkema's total shipments of R-32.

First statutory criterion in captive consumption

The first requirement for application of the captive consumption provision is that the domestic like product that is internally transferred for processing into that downstream article not enter the merchant market for the domestic like product. Arkema reported internal consumption of R-32 for the production of ***. Arkema reported *** diversion of R-32 intended for internal consumption to the merchant market.

Second statutory criterion in captive consumption

The second criterion of the captive consumption provision concerns whether the domestic like product is the predominant material input in the production of the downstream article that is captively produced. With respect to the downstream articles resulting from captive production, as shown in table III-8, R-32 reportedly comprises *** percent of the finished cost of finished HFC blend R-410a, and *** percent of the finished cost of other

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

downstream products. As a share of quantity, R-32 accounts for *** percent of the material inputs into R-410A, and *** percent of other blends.[5]

Table III-8
R-32: U.S. producer Arkema's share of materials in production of downstream articles

Item	Share of material inputs	
	Share of value (percent)	Share of quantity (percent)
Production of R-410A.--		
R-32's share	***	***
Other inputs' share	***	***
All material inputs	***	***
Production of other blends (R-407A, R-407C and R-427A).--		
R-32's share	***	***
Other inputs' share	***	***
All material inputs	***	***

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

[5] Petitioner noted that R-32 "represents a small percent of the raw material cost on a weighted-average basis, and that the majority of responses by U.S. importers {similarly support} the low-cost share percentage." Petitioner's pre-hearing brief, p. 13.

Part IV: U.S. imports, apparent U.S. consumption, and market shares

U.S. importers

The Commission issued importer questionnaires to 25 firms believed to be importers of subject R-32, as well as to the sole U.S. producers of R-32.[1] Usable questionnaire responses were received from 13 companies, representing *** percent of U.S. imports from China in 2019 under HTS statistical reporting number 2903.39.2035, a "basket" category.[2] [3] [4] [5] Table IV-1 lists all responding U.S. importers of R-32 from China and other sources, their locations, and their shares of U.S. imports, in 2019.[6]

[1] The Commission issued questionnaires to those firms identified in the petition, along with firms that, based on a review of data provided by U.S. Customs and Border Protection ("Customs"), may have accounted for more than one percent of total imports under HTS subheading 2903.39.20 in 2019.

[2] Useable questionnaire responses were received from *** of the top *** firms that imported merchandise from China during 2017-19 under HTS statistical 2903.39.2035, which also includes nonsubject merchandise, and *** of the top ten firms that imported merchandise from China during 2019. Collectively, the top *** firms make up *** percent of the value of all such imports during 2019.

[3] ***. Icool USA, Inc., ***, did not provide a questionnaire response and has not responded to Staff's requests, including to the counsel representing Icool before the Department of Commerce. *** (along with ***, collectively referred to in this report as "the BMP Group"). While these entities participated in the preliminary phase of this investigation, counsel for the BMP Group informed the Commission that the companies would not be providing a questionnaire response and, subsequently have not participated in the investigation. See the BMP Group's letter, "Response to Final Phase Importer and Purchaser Questionnaires," submitted on November 20, 2020.

[4] Importers *** are related entities who identified ***. ***. ***.

[5] Daikin America, Inc., a party to the investigation, participated in the preliminary phase of this investigation, however did not provide a U.S. importer questionnaire response for the final phase. In the preliminary phase of this investigation, ***.

[6] Importers FluoroFusion and Kivlan and Co. reported that the firms ***.

Table IV-1
R-32: U.S. importers by source, 2019

Firm	Headquarters	Share of imports by source (percent)		
		China	Nonsubject sources	All import sources
A-Gas	Bowling Green, OH	***	***	***
Chemours	Wilmington, DE	***	***	***
First Continental	Glen Rock, NJ	***	***	***
FluoroFusion	Clayton, NC	***	***	***
Golden G	Tampa, FL	***	***	***
Honeywell	Morris Plains, NJ	***	***	***
Hudson Tech	Pearl River, NY	***	***	***
Kivlan and Co.	Clayton, NC	***	***	***
National	Philadelphia, PA	***	***	***
RAMJ	Tampa, FL	***	***	***
Scales N Stuff	Tampa, FL	***	***	***
Technical Chemical	Cleburne, TX	***	***	***
Weitron USA	Newark, DE	***	***	***
Total		***	***	***

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

U.S. imports

Table IV-2 presents data for U.S. imports of R-32 from China and all other sources.[7] The quantity of U.S. imports increased by *** percent during 2017-19, and was *** percent higher in January-September 2020 than in January-September 2019. Most of this increase occurred between 2018 and 2019, as ***.[8] In addition, ***.[9] There were ***.

The value of U.S. imports from China increased by *** percent during 2017-19, and was *** percent higher in January-September 2020 than in January-September 2019. The unit value of U.S. imports from China increased between 2017 and 2018 by *** percent before decreasing between 2018 and 2019 by *** percent for a net decrease of *** percent during 2017-19.[10] Unit values were *** percent lower in January-September 2020 than in January-September 2019. The decrease in unit values between 2018 and 2019 and between the two January-September interim periods can primarily be attributed to ***.[11]

[7] Appendix E presents additional data regarding U.S. imports and apparent U.S. consumption by source during 2017-19, inclusive of data reported by the BMP Group and Daikin America in the preliminary phase of this investigation.

[8] ***.

[9] ***. Email from ***.

[10] Firms provided differing explanations for the increase in the average unit value in 2018. In the preliminary phase of this investigation, *** stated that ***. Email from ***.

In contrast, ***, and when asked to explain the fluctuations in its unit values from year to year, ***." Emails from ***.

[11] The unit value reported by firms *** in 2019. ***.

Table IV-2
R-32: U.S. imports by source, 2017-19, January to September 2019, and January to September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Quantity (short tons)				
U.S. imports from.--China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
	Value (1,000 dollars)				
U.S. imports from.--China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
	Unit value (dollars per short ton)				
U.S. imports from.--China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
	Share of quantity (percent)				
U.S. imports from.--China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
	Share of value (percent)				
U.S. imports from.--China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
	Ratio to U.S. production				
U.S. imports from.--China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***

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

Figure IV-1
R-32: U.S. imports by source, 2017-19, January to September 2019, and January to September 2020

* * * * * * *

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

Negligibility

The statute requires that an investigation be terminated without an injury determination if imports of the subject merchandise are found to be negligible.[12] Negligible imports are generally defined in the Act, 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.[13] As shown in table IV-3, imports from China accounted for *** percent of total imports of R-32 by quantity during 2019.[14]

Table IV-3
R-32: U.S. imports in the twelve-month period preceding the filing of the petition, January 2019 through December 2019

Item	January 2019 through December 2019	
	Quantity (short tons)	Share quantity (percent)
U.S. imports from.--		
China	***	***
Nonsubject sources	***	***
All import sources	***	***

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

[12] 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)).

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

[14] Imports from China, based on official statistics, accounted for 96.0 percent of all imports of merchandise imported in 2019 under HTS statistical reporting number 2903.39.2035.

Apparent U.S. consumption and U.S. market shares

Table IV-4 and figure IV-2 present data on apparent U.S. consumption and U.S. market shares for R-32. The quantity of apparent U.S. consumption increased during 2017-19 by *** percent, and was *** percent higher in January-September 2020 than in January-September 2019. The value of apparent U.S. consumption increased by *** percent during 2017-19, and was *** percent higher in January-September 2020 than in January-September 2019. The quantity of U.S. importers' U.S. shipments increased by *** percent during 2017-19, and the value of U.S. importers' U.S. shipments increased by *** percent. During 2017-19, U.S. importers' market share increased by *** percentage points as a share of quantity, and *** percentage points as a share of value. As a share of quantity and value, market shares held by subject imports were *** percentage points higher and *** percentage points higher, respectively, in January-September 2020 than in January-September 2019.

Table IV-4
R-32: U.S. shipments of domestic product, U.S. shipments of imports, and apparent U.S. consumption, 2017-19, January to September 2019, and January to September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Quantity (short tons)				
U.S. producers' U.S. shipments	***	***	***	***	***
U.S. importers' U.S. shipments from.-- China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
Apparent U.S. consumption	***	***	***	***	***
	Value (1,000 dollars)				
U.S. producers' U.S. shipments	***	***	***	***	***
U.S. importers' U.S. shipments from.-- China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
Apparent U.S. consumption	***	***	***	***	***
	Share of quantity (percent)				
U.S. producers' U.S. shipments	***	***	***	***	***
U.S. importers' U.S. shipments from.-- China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
	Share of value (percent)				
U.S. producers' U.S. shipments	***	***	***	***	***
U.S. importers' U.S. shipments from.-- China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***

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

Figure IV-2
R-32: Apparent U.S. consumption, 2017-19, January to September 2019, and January to September 2020

* * * * * * *

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

Part V: Pricing data

Factors affecting prices

Raw material costs

R-32 is produced through a reaction of dichloromethane (methylene chloride) with chlorine gas and hydrofluoric acid.[1] During 2017-19, Arkema's raw materials' share of the cost of goods sold increased, from *** percent to *** percent. Arkema reported that the share of hydrofluoric acid in the cost of goods sold increased from *** percent to *** percent from 2017-19, and the share of methylene chloride in the cost of goods sold increased from *** percent to *** percent over the same period. Arkema stated that none of its raw materials are imported and therefore, the section 301 tariffs on imports from China had no effect on its costs.[2]

Transportation costs to the U.S. market

Transportation costs for R-32 shipped from China to the United States averaged 5.1 percent during 2019. These estimates were derived from official import data and represent the transportation and other charges on imports.[3]

U.S. inland transportation costs

*** three U.S. importers[4] reported that they typically arrange transportation to their customers. Arkema reported that its U.S. inland transportation costs were *** percent while most responding importers reported costs of 1 to 18 percent.

---

[1] Petition, p. 12.

[2] Conference transcript, p. 60 (O'Donovan).

[3] The estimated transportation costs were obtained by subtracting the customs value from the c.i.f. value of the imports for 2019 and then dividing by the customs value based on the HTS subheading 2903.39.2035. HTS subheading 2903.39.2035 is not specific to R-32 and contains out-of-scope product.

[4] Importers *** share common ownership, though each firm submitted a separate importers' questionnaire. Importers *** are also related companies and submitted separate importers' questionnaires. Each firm's responses are reported separately throughout this section.

Pricing practices

Pricing methods[5]

As presented in table V-1, *** three responding importers, ***, set prices primarily on a transaction-by-transaction basis. Arkema also reported setting prices based on ***.

Table V-1
R-32: U.S. producer's and importers' reported price setting methods, by number of responding firms

Method	U.S. producers	U.S. importers
Transaction-by-transaction	***	3
Contract	***	---
Set price list	***	---
Other	***	3
Responding firms	1	6

Note.-- 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.

Note.-- The three importers ***.

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

Arkema reported making the majority of its sales through ***, with some sales through ***, and very few sales made in the ***.[6] The six responding importers reported selling all of their R-32 in the spot market. Table V-2 shows the U.S. producer and importers reported 2019 U.S. commercial shipments of R-32 by type of sale.

[5] Data reported by importers in this section are firms that commercially sold the R-32 they import to unrelated customers. These sales represented approximately half of all imports in 2019.

[6] Arkema reported that it sold the majority of its R-32 "to downstream blenders with the remainder internally consumed to produce HFC blends." Petitioner's prehearing brief, p. 15.

Table V-2
R-32: U.S. producer's and importers' shares of U.S. commercial shipments by type of sale, 2019

Item	U.S. producers	Subject U.S. importers
	Share (percent)	
Share of commercial U.S. shipments.--		
Long-term contracts	***	---
Annual contract	***	---
Short-term contracts	***	---
Spot sales	***	100.0
Total	100.0	100.0

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

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

Arkema stated that prices are negotiated "on a spot basis, through short-term contracts of less than a year, and longer-term contracts."[7] In both types of contacts, prices can be renegotiated through "meet-or-release" provisions if a customer can buy R-32 at a lower price from another supplier.[8] [9] Arkema also noted that "even the mere availability of Chinese R-32 can form the basis for renegotiating contract pricing."[10] Arkema reported that its long-term contracts average *** years, and that both short- and longer-term contracts have ***. *** reported that contracts *** indexed to raw material costs.

No purchasers reported that they purchase product daily, three purchase weekly, three purchase monthly, two purchase quarterly, three purchase annually, four purchase on an as-needed basis, one purchases on a semimonthly basis, and one purchases two to four times per year. Ten of 17 responding purchasers reported that their purchasing frequency had not changed since 2017. A majority of the responding purchasers (14 of 17) contact at least one to three suppliers before making a purchase.

[7] Conference transcript, p. 12 (O'Donovan). See also petitioner's prehearing brief, p. 15 (noting that "R-32 is sold under long{-}term contracts, short{-}term contracts, or in the spot market").

[8] Conference transcript, p. 12 (O'Donovan).

[9] Arkema reported that Chinese prices triggered the meet-or-release clause in its contract with ***. Petitioner's postconference brief, p. 23. Arkema reported ***. Petitioner's prehearing brief, p. 51. Arkema also reported ***. Petitioner's prehearing brief, pp. 51-52.

[10] Conference transcript, p. 12 (O'Donovan). See also petitioner's prehearing brief, p. 56.

Sales terms and discounts

*** all six responding importers quote prices on a delivered basis. Three responding importers do not offer discounts, while the other three noted that they do not set prices and "only facilitate the transaction."[11]

Price leadership

Seven of 15 responding purchasers reported one or more price leaders. Four purchasers reported that Arkema was a price leader. Two of these purchasers noted that Arkema has significant impact on pricing, due to it being the largest/only U.S. producer. One purchaser reported that BMP (an importer) was a price leader, noting that the large amount of product BMP imports can reduce the price of blends below the purchaser's manufacturing costs. One purchaser reported that several firms from China, Sinochem Lantian, Dongyue Chemical, Sanmei Chemical,[12] and Jujua are price leaders, noting that China controls market pricing.

Price and purchase cost 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-32 product shipped to unrelated U.S. customers during January 2017-September 2020. In addition, firms that imported this product from China for their own use in the production of downstream products were requested to provide import purchase cost data.

Product 1.-- R-32, sold in bulk to blenders.

Arkema and three importers[13] provided usable pricing data for sales of the requested product, and nine importers[14] provided usable purchase cost data. Pricing data reported by these firms accounted for *** percent of Arkema's shipments of R-32 and less than 1

[11] These three importers, *** are related entities.

[12] Purchaser *** did not distinguish between related entities Shandong Dongyue Chemical and Huantai Dongyue, nor did *** distinguish between related entities Jiangsu Sanmei Chemical and Zhejiang Sanmei Chemical.

[13] These three importers were: ***.

[14] These nine importers were: ***.

percent[15] of subject imports from China in 2019. Purchase cost data reported by these firms accounted for 50.4 percent of imports from China in 2019.[16] [17]

Price data and landed duty-paid ("LDP") purchase cost data[18] for product 1 are presented in table V-3 and figure V-1.

[15] Petitioner argued that 2019 and 2020 purchase cost data are "tainted" by ***. These three importers reported ***. See ***. ***.

[16] Petitioner argued that purchase cost data does not accurately reflect China's effect on the U.S. market, and that the higher import purchase costs after Q1 2017 do not show the reality that Arkema ***. Petitioner's postconference brief, pp. 23-24. Petitioner also argued that "the 2017 and 2018 pricing and import purchase cost data are {…} unreliable because *** failed to submit questionnaire responses in the final phase of this investigation." Petitioner's prehearing brief, p. 33.

[17] Appendix F presents additional data regarding pricing and purchase cost data during 2017-19, inclusive of data reported by the BMP Group and Daikin America in the preliminary phase of this investigation. ***.

[18] LDP import value does not include any potential additional costs that a purchaser may incur by importing rather than purchasing from another importer or U.S. producer. Price-cost differentials are based on LDP import values whereas margins of underselling/overselling are based on importer sales prices.

Table V-3
R-32: Weighted-average f.o.b. prices and quantities of domestic and imported product 1, and margins of underselling/(overselling), and Chinese landed duty paid costs and quantities and price cost differences by quarter, January 2017 through September 2020

Period	United States		China – price			China - costs		
	Price (dollars per short ton)	Quantity (short tons)	Price (dollars per short ton)	Quantity (short tons)	Margin (percent)	Unit LDP value (dollars per short ton)	Quantity (short tons)	Price-cost differential (percent)
2017: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***
2020: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***	***	***	***

Note.-- Product 1: R-32, sold in bulk to blenders.
Note.-- Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

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

Figure V-1
R-32: Weighted-average prices, import purchase costs, and quantities of domestic and imported product 1, by quarter, January 2017-September 2020

* * * * * * *

* * * * * * *

Import purchase cost data

Importers reporting import purchase cost data were asked to provide additional information regarding the costs and benefits of directly importing R-32.

Six of 11 responding importers reported that they incurred additional costs beyond landed duty-paid costs by importing R-32 directly rather than purchasing from a U.S. producer or U.S. importer. Five of the six importers estimated the total additional cost incurred; estimates ranged from 1 to 11 percent of the landed duty-paid value. Firms were also asked to identify specific additional costs they incurred as a result of directly importing R-32 themselves. Reported costs and the estimated additional cost compared to landed duty-paid value included:

- Freight from port to the plant – 2 percent, 4 percent, 8 percent
- Container leases – 5 percent
- Container returns – 5 percent
- Chassis rental and storage – 2 percent
- Heel consolidation – 2 percent[19]

Firms were also asked to describe how these additional costs incurred by importing R-32 directly compared with additional costs incurred when purchasing from a U.S. producer or U.S. importer. Firms' responses varied. One firm reported that the additional cost of purchasing from Arkema was 2 percent and the cost of importing 11 percent. One reported that domestic prices for R-32 are higher than imports, even when the additional cost of *** is included when importing R-32. One reported that there were "{n}o additional costs from the U.S. supplier." Importers *** reported an additional cost ***.

Seven of 12 responding importers reported that they compare costs of importing directly to the cost of purchasing from a U.S. producer in determining whether to import R-32, 5 importers compare costs to purchasing from a U.S. importer, and 5 importers do not compare costs of purchasing from either U.S. producers or importers.

Seven importers identified benefits from importing R-32 directly instead of purchasing from the U.S. producer or importers, with most firms reporting that they import because they have been unable to source R-32 from Arkema. *** reported that it could not buy additional volumes beyond the contract maximum at existing contract prices during peak seasonal demand. *** reported that continuous supply was a primary concern, but

[19] *** described heel consolidation as the cost of "recover{ing} residual R-32 from empty ISO" containers.

***. It notes that ***.[20] *** reported that China is a stable supply source. *** reported that it was "forced" to diversify its supply as it has been unable to rely on Arkema to satisfy all of its supply needs. It also reported that it uses its own ISO tanks when importing and is "not restricted by time or monetarily penalized to return the assets like {it is} when {it} purchase{s} from the U.S. producer." Two importers reported that there are cost advantages to importing Chinese R-32 directly instead of purchasing from U.S. producers.[21] *** stated that importing directly provides a lower delivered cost, and that imports also provide an additional source of supply. *** noted that there are "sometimes cost advantages depending on global market conditions," but also reported that it was important to have supplier diversity to ensure availability of product.

Firms were also asked whether the import cost (both excluding and including additional costs of the R-32 they imported) was lower than the price of purchasing R-32 from a U.S. producer or importer. Four of six importers reported that imports were priced lower when not including the additional costs, and five of seven importers reported that imports were priced lower when including additional costs.

Four importers estimated savings between *** percent from importing rather than purchasing from a U.S. producer. Importers reported the following estimated savings by importing themselves rather than purchasing from Arkema: *** – 4 percent, *** – 5 percent, *** – 15 percent, and *** – 22 percent.[22] Importers *** reported saving 10 percent by importing themselves, rather than purchasing from a U.S. importer.

Price and purchase cost trends

Prices and landed duty paid costs increased overall during January 2017-September 2020. Table V-4 summarizes the price trends by country. As shown in the table, domestic prices increased by *** percent during January 2017-September 2020. Import prices were not

[20] *** reported ***.

[21] In addition, *** reported in its preliminary importers' questionnaire that lower cost is "the single largest benefit to importing" and that Chinese prices are "roughly 40 percent of the domestic price." It did not submit an importers' questionnaire for the final phase of this investigation.

[22] Importer *** reported in the preliminary phase that it saved ***. This importer ***.

available for the whole period but decreased by *** percent between Q2 2017 and Q3 of 2020. Landed duty-paid costs increased by *** percent during January 2017-September 2020. Arkema's prices *** from Q1 2017 through Q3 2017 and increased irregularly thereafter (figure V-3). Import purchase costs varied much more than U.S. prices during January 2017-September 2020. Import purchase costs increased between Q1 and Q3 of 2017 before falling and then spiking again in Q2 2018. Import purchase costs generally decreased from Q3 2018 to Q1 2020 and rose after Q1 2020 (figure V-4). Importers reported that a shortage of hydrofluoric acid, an input to R-32, in May of 2017 resulted in a shortage of R-32 and caused high prices for products ordered at that time. Importers also reported that increased demand in China in Q2 2018 resulted in higher prices for product ordered in that quarter.

Table V-4
R-32: Summary of weighted-average f.o.b. prices and importer purchase costs, January 2017 through September 2020

Item	Number of quarters	Low price (dollars per short ton)	High price (dollars per short ton)	Change in price over period (percent)
Product 1:				
United States	***	***	***	***
China—price	***	***	***	***
China—cost	***	***	***	***

Note.-- Percentage change from the first quarter of 2017 to the third quarter of 2020.
Note.-- Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

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

Figure V-3s
R-32: Indexed U.S. producer prices, January 2017 through September 2020

* * * * * * *

Figure V-4
R-32: Indexed U.S. importer purchase costs, January 2017 through September 2020

* * * * * * *

Price and purchase cost comparisons

Price comparisons

As shown in table V-5, prices for product imported from China were below those for U.S.-produced product in 2 of 8 instances (*** short tons); margins of underselling were between *** and *** percent. In the remaining 6 instances (*** short tons), prices for product from China were between *** percent above prices for the domestic product.[23]

Table V-5
R-32: Instances of underselling/overselling and the range and average of margins, by country, January 2017 through September 2020

Source	Underselling				
	Number of quarters	Quantity (short tons)	Average margin (percent)	Margin Range (percent)	
				Min	Max
Pricing data, underselling	2	***	***	***	***
Source	**(Overselling)**				
	Number of quarters	**Quantity (short tons)**	**Average margin (percent)**	**Margin Range (percent)**	
				Min	**Max**
Pricing data, overselling	6	***	***	***	***

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.

Price-cost comparisons

As shown in table V-6, landed duty-paid costs for R-32 imported from China were below the sales price for U.S.-produced product in *** of *** instances (*** short tons); price-cost differentials ranged from *** percent. In the remaining *** instances (*** short tons), landed duty-paid costs for R-32 from China were between *** percent above sales prices for the domestic product.[24]

[23] The overselling margin of *** percent occurred in Q2 2018 when, as discussed above, multiple importers reported a temporary Chinese R-32 supply shortage and high prices.

[24] The price-cost differences in Q2 2017 of *** percent, Q3 2017 of *** percent, and Q2 2018 of *** occurred during temporary shortages of Chinese R-32 which temporarily increased Chinese prices.

Table V-6
R-32: Instances of lower/(higher) average unit purchase costs compared to U.S. prices and the range and average of price/cost differentials, by product and by country, January 2017 through September 2020

Source	Unit purchase cost data lower than U.S. prices				
	Number of quarters	Quantity (short tons)	Average price / cost differential (percent)	Price / cost differential range (percent)	
				Min	Max
Purchase costs, lower	***	***	***	***	***
Source	**(Unit purchase cost data higher than U.S. prices)**				
	Number of quarters	Quantity (short tons)	Average price / cost differential (percent)	Price / cost differential range (percent)	
				Min	Max
Purchase costs, higher	***	***	***	***	***

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.

Lost sales and lost revenue

In the preliminary phase of this investigation, the Commission requested that Arkema report purchasers with which they experienced instances of lost sales or revenue due to competition from imports of R-32 from China during 2017-19. Arkema identified *** firms with which it lost sales or revenue (*** consisting of lost sales allegations, *** consisting of lost revenue allegations, and *** consisting of both types of allegations).

In the final phase of the investigation, Arkema reported that it ***.

Staff contacted 34 purchasers and received responses from 17 purchasers.[25] Responding purchasers reported purchasing and importing *** short tons of R-32 during January 2017-September 2020 (table V-7).

Of the 17 responding purchasers, 7 reported that, since 2017, they had purchased or imported R-32 from China instead of U.S.-produced product. Four of these purchasers reported that subject import prices were lower than U.S.-produced product, and three of these purchasers reported that price was a primary reason for the decision to purchase imported product rather than U.S.-produced product.[26] Three purchasers estimated the quantity of R-32

[25] ***.

[26] Purchaser *** reported ***.

from China purchased instead of domestic product; quantities ranged from *** short tons to *** short tons (table V-8). Purchasers identified availability and supplier diversity as a non-price reason for purchasing Chinese-produced product, rather than U.S.-produced product.

Table V-7
R-32: U.S. purchasers' U.S. purchases and U.S. imports, January 2017 to September 2020

Purchaser	Purchases and imports in January 2017 to September 2020 (short tons)			Change in domestic share (pp, 2017-19)	Change in subject country share (pp, 2017-19)
	Domestic	Subject	All other		
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
Total	***	***	***	***	***

Note.-- Includes all other sources and unknown sources.
Note.-- Percentage points (pp) change: Change in the share of the firm's total purchases of domestic and/or subject country imports between first and last years.
Note.-- Changes of 100 percent indicate that these firms did not purchase from the source in either the first or the last year.

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

Table V-8
R-32: Purchasers' responses to purchasing subject imports instead of domestic product, by firm

Purchaser	Subject imports purchased instead of domestic (Y/N)	Imports priced lower (Y/N)	If purchased subject imports instead of domestic, was price a primary reason		
			Y/N	If Yes, quantity (short tons)	If No, non-price reason
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
Total	Yes—7; No—10	Yes—4; No—2	Yes—3; No—4	***	

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

Of the 17 responding purchasers, 3 reported that U.S. producers had reduced prices in order to compete with lower-priced imports from China; five reported that they did not know (table V-9). The reported average price reduction was 28.3 percent and was due to a competitive Chinese price that *** and ***. Nine purchasers reported that U.S. producers did not reduce their prices of domestically produced R-32 in order to compete with lower-priced imports of R-32 from China.

Table V-9
R-32: Purchasers' responses to U.S. producer price reductions, by firm

		If produced reduced prices:	
Purchaser	Producers reduced price (Y/N)	Estimated U.S. price reduction (percent)	Additional information, if available
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
Total / average	Yes—3; No—9	***	

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

In responding to the lost sales lost revenue survey, some purchasers provided additional information on purchases and market dynamics. *** stated that it purchased Chinese product because Arkema had no available capacity. *** echoed its importers' questionnaire and noted that Arkema was not willing to offer additional volumes beyond the contract maximum during peak seasonal demand.

Part VI: Financial experience of U.S. producers

Background

One U.S. producer, Arkema, reported financial results on R-32 operations.[1] [2] Arkema, as noted previously in this report, is the only U.S. producer of R-32.

During the period examined, Arkema's R-32 operations were reportedly impacted by ***.[3] The effect of *** on the company's R-32 financial results is described generally below. Arkema's description regarding the impact of COVID-19 on its financial results is noted below.

Operations on R-32

Table VI-1 and table VI-2 present overall R-32 financial results and corresponding changes in average per short ton values, respectively. A variance analysis of overall financial results is presented in table VI-3.[4] Appendix D presents financial results for commercial sales and combined commercial sales and swap operations.

[1] Arkema's R-32 operations are part of the company's Fluorochemicals business unit. Conference transcript (O'Donovan), p. 9. ***. Arkema U.S. producer questionnaire, response to III-2.B.4. Petitioner's postconference brief, Exhibit 1, p. 1. On December 8, 2020, staff conducted a verification of the financial section of Arkema's U.S. producer questionnaire. ***. Verification report, p. 2.

[2] With respect to the operations where R-32 is produced, R-32 accounts for *** percent of 2019 sales. Arkema U.S. producer's questionnaire, response to III-5.

[3] Arkema U.S. producer questionnaire, response to II-2.

[4] The Commission's traditional variance analysis is calculated in three parts: sales variance, cost of goods sold ("COGS") variance, and selling, general, and administrative ("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 variances), 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 the table, the price variance is from sales, the cost/expense variance is the sum of those items from 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. As noted in the *Revenue* section below, physical differences in R-32 product mix are primarily limited to the form/type of packaging. Since the shares of total R-32 sales accounted for by the subcategories of revenue varied somewhat during the period, effective product mix also varied. Implied changes in R-32 product mix, however, do not appear substantial enough to undermine the utility of the variance analysis.

Table VI-1
R-32: Results of operations of the U.S. producer, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Quantity (short tons)				
Out-of-swap commercial sales	***	***	***	***	***
All other commercial sales	***	***	***	***	***
Total net commercial sales	***	***	***	***	***
Internal consumption	***	***	***	***	***
Transfer sales	***	***	***	***	***
Swaps	***	***	***	***	***
Total net sales quantity	***	***	***	***	***
	Value (1,000 dollars)				
Out-of-swap commercial sales	***	***	***	***	***
All other commercial sales	***	***	***	***	***
Total net commercial sales	***	***	***	***	***
Internal consumption	***	***	***	***	***
Transfer sales	***	***	***	***	***
Swaps	***	***	***	***	***
Total net sales value	***	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Total COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expenses	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Interest expense	***	***	***	***	***
Other expenses	***	***	***	***	***
Other income items	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
Depreciation/amortization	***	***	***	***	***
Estimated cash flow from operations	***	***	***	***	***

Table continued on next page.

Table VI-1—Continued
R-32: Results of operations of the U.S. producer, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Ratio to net sales (percent)				
Cost of goods sold.--					
Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expenses	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
	Ratio to total COGS (percent)				
Cost of goods.--					
Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
	Unit value (dollars per short ton)				
Out-of-swap commercial sales	***	***	***	***	***
All other commercial sales	***	***	***	***	***
Total net commercial sales	***	***	***	***	***
Internal consumption	***	***	***	***	***
Transfer sales	***	***	***	***	***
Swaps	***	***	***	***	***
Average net sales	***	***	***	***	***

Table continued on next page.

Table VI-1—Continued
R-32: Results of operations of the U.S. producer, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Unit value (dollars per short ton)				
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expenses	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
	Number of firms reporting				
Operating losses	***	***	***	***	***
Net losses	***	***	***	***	***
Data	1	1	1	1	1

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

Table VI-2
R-32: Changes in AUV's, 2017-19, January-September 2019, and January-September 2020

Item	Between calendar years			Between partial year period
	2017-19	2017-18	2018-19	2019-20
	Change in AUVs (percent)			
Out-of-swap commercial sales	***	***	***	***
All other commercial sales	***	***	***	***
Total net commercial sales	***	***	***	***
Internal consumption	***	***	***	***
Transfers to related firms	***	***	***	***
Swaps	***	***	***	***
Total net sales	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***
Dichloromethane	***	***	***	***
Other raw materials	***	***	***	***
Total raw materials costs	***	***	***	***
Direct labor	***	***	***	***
Other factory costs	***	***	***	***
Average COGS	***	***	***	***

Table continued on next page.

Table VI-2—Continued
R-32: Changes in AUV's, 2017-19, January-September 2019, and January-September 2020

Item	Between calendar years			Between partial year period
	2017-19	2017-18	2018-19	2019-20
	Change in AUVs (dollars per short ton)			
Out-of-swap commercial sales	***	***	***	***
All other commercial sales	***	***	***	***
Total net commercial sales	***	***	***	***
Internal consumption	***	***	***	***
Transfers to related firms	***	***	***	***
Swaps	***	***	***	***
Total net sales	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***
Dichloromethane	***	***	***	***
Other raw materials	***	***	***	***
Total raw materials costs	***	***	***	***
Direct labor	***	***	***	***
Other factory costs	***	***	***	***
Average COGS	***	***	***	***
Gross profit or (loss)	***	***	***	***
SG&A expense	***	***	***	***
Operating income or (loss)	***	***	***	***
Net income or (loss)	***	***	***	***

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

Table VI-3
R-32: Variance analysis of the financial results of the U.S. producer, 2017-19, January-September 2019, and January-September 2020

Item	Between calendar years			Between partial year period
	2017-19	2017-18	2018-19	2019-20
	Value (1,000 dollars)			
Net sales:				
Price variance	***	***	***	***
Volume variance	***	***	***	***
Net sales variance	***	***	***	***
COGS:				
Cost variance	***	***	***	***
Volume variance	***	***	***	***
COGS variance	***	***	***	***
Gross profit variance	***	***	***	***
SG&A expenses:				
Cost/expense variance	***	***	***	***
Volume variance	***	***	***	***
Total SG&A expenses variance	***	***	***	***
Operating income variance	***	***	***	***
Summarized as:				
Price variance	***	***	***	***
Net cost/expense variance	***	***	***	***
Net volume variance	***	***	***	***

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

Revenue

In 2019, commercial sales accounted for *** percent of total R-32 sales on a quantity basis, reflecting ***. *** accounted for *** percent,[5] internal consumption accounted for *** percent, and transfer

[5] ***. With respect to U.S. GAAP accounting treatment in general, swap transactions are nonmonetary exchanges (specifically exchanges of inventory for similar products) that would normally be recognized at carrying value, as opposed to fair value. Under these circumstances and because the earnings process has not been completed, profit or loss on the swap transactions would generally not be recognized. Wiley GAAP 2012, pp. 830-831. ***. Arkema U.S. producer questionnaire, response to III-4a. ***. Petitioner's postconference brief, Exhibit 3. P. 1. ***.

***. Petitioner's postconference brief, Exhibit 1, pp. 1-2.

sales accounted for *** percent.[6] Internal consumption's share of total sales quantity *** beween 2017 and 2019, while the corresponding shares accounted for by *** increased. Physical differences in R-32 product mix are reportedly minimal and primarily reflect packaging type.[7]

Quantity

While total R-32 sales quantity increased *** percent in 2018, declined *** percent in 2019, and was *** percent lower in January-September 2020 compared to January-September 2019, the directional pattern of the revenue subcategories was not uniform: total commercial sales quantity *** throughout the period;[8] internal consumption quantity *** to its *** full-year level in 2018, *** in 2019, and was somewhat lower in January-September 2020 compared to January-September 2019; total *** quantity fluctuated

[6] ***. Email with attachments from Sydney Mintzer, Attorney, Mayer Brown counsel on behalf of Arkema to USITC staff, December 4, 2020.

[7] As described by an Arkema company official at the staff conference, "In terms of specification of the chemical, there is only one differentiated product that we're aware of, which is for the semiconductor industry, which is based on a purity level . . . The bulk of the R-32, chemically, is the same. There are differences in package type which do affect pricing if you're putting it into a cylinder for package versus sending it in bulk." Conference transcript (O'Donovan), p. 35.

[8] As shown in table VI-1, ***, which increased throughout the period. In contrast, the quantity of *** declined overall during the full-year period and were not reported during January-September 2020. ***. Arkema U.S. producer questionnaire, response to III-4e. ***. Email with attachments from Sydney Mintzer, Attorney, Mayer Brown counsel on behalf of Arkema to USITC staff, December 4, 2020.

somewhat but remained within a relatively narrow range;[9] and *** quantity, the smallest revenue category, fluctuated sharply on a percentage basis.

With regard to the pattern of R-32 sales volume in general, Arkema attributed it to a combination of ***.[10]

Value

The revenue section of the variance analysis (table VI-3) shows that the 2017-18 increase in total revenue was a function of a positive sales volume variance and a positive price variance, both of similar magnitudes. Between 2018 and 2019, the decline in overall revenue was due to a negative volume variance, which was partially offset by a positive price variance. As shown in table VI-1, the overall decline in sales quantity between 2018 and 2019 reflects a *** in internal consumption. In January-September 2020 compared to January-September 2019, total sales value was higher due to a positive price variance that more than offset the corresponding negative volume variance.

Directionally, average per short ton R-32 sales value increased during the full-year period and was higher in January-September 2020 compared to January-September 2019. Similar to sales quantity, however, the revenue subcategories reflect different directional patterns: average per short ton commercial sales and internal consumption values ***

[9] ***. Arkema U.S. producer questionnaire, response to III-4d.

[10] ***. Petitioner's postconference brief, Exhibit 2, p. 3.

*** throughout the period, by varying magnitudes,[11] while average *** value declined (2018) and then marginally increased (2019), ending the period at essentially the same average per short ton value as it began.[12] While the positive and negative changes in average *** were notable, this category accounts for only a small share of total R-32 sales.[13]

For routine accounting purposes, Arkema's *** value is booked as revenue, *** commercial sales value (see footnote 8), while R-32 ***. ***.[14] As explained by Arkema, internal consumption value reflects a ***[15] and ***, as noted above, reflects the ***

[11] As shown in tables VI-2, the *** value moved within a narrow range throughout the period when these sales were reported, generally reflecting the *** (see footnote 8). In contrast, the average per short ton "all other" commercial sales value increased during the full-year and interim period. ***. Email with attachments from Sydney Mintzer, Attorney, Mayer Brown counsel on behalf of Arkema to USITC staff, December 4, 2020.

[12] ***. Arkema U.S. producer questionnaire, response to III-4e.

[13] ***. Petitioner's postconference brief, Exhibit 3, p. 2.

[14] Email with attachments from Sydney Mintzer, Attorney, Mayer Brown counsel on behalf of Arkema to USITC staff, December 4, 2020. While U.S. GAAP and IFRS have detailed rules/standards regarding the determination of fair market value, *** are ultimately eliminated and not included in consolidated financial results (see footnote 5), while internal consumption is a cost for routine accounting purposes. As such and with respect to the valuation of Arkema's ***, the detailed fair market rules/standards pursuant to U.S. GAAP and IFRS do not appear relevant/applicable.

[15] Petitioner's postconference brief, Exhibit 3, p. 1.

***. From Arkema's perspective, both valuations *** reflect relevant fair market value.[16]

Cost of goods sold and gross profit or loss

Raw materials

With respect to overall operations, total raw material cost accounts for the largest share of COGS, ranging from *** percent of total COGS (2017) to *** percent (full-year 2019). R-32 raw material costs, while primarily representing two material inputs (dichloromethane (DCM) and hydrofluoric acid),[17] also include assigned ***.[18] In 2019, the share of total raw material cost accounted for by DCM and hydrofluoric acid was *** percent and *** percent, respectively.[19]

[16] ***. Email with attachments from Sydney Mintzer, Attorney, Mayer Brown counsel on behalf of Arkema to USITC staff, December 4, 2020.

[17] Conference transcript (O'Donovan), p. 10.

[18] Email with attachments from Sydney Mintzer, Attorney, Mayer Brown counsel on behalf of Arkema to USITC staff, December 4, 2020.

[19] ***. Ibid.

On an average per short ton basis, raw material cost increased throughout the full-year period, primarily reflecting ***.[20] ***.[21] In January-September 2020 compared to January-September 2019, the average per short ton cost of *** inputs was lower.[22]

Direct labor and other factory costs

Direct labor is the smallest component of total COGS, ranging from *** percent (January-September 2019) to *** percent (2017). While average per short ton direct labor cost fluctuated somewhat, it remained within a relatively narrow range throughout the period.

Other factory costs, the second largest component of COGS, ranged from *** percent of COGS (January-September 2019) to *** percent (2017) and, on an average per short ton basis, fluctuated more substantially compared to average direct labor. ***

[20] ***. Ibid.

[21] Petitioner's postconference brief, Exhibit 1, p. 1.

[22] ***. Email with attachments from Sydney Mintzer, Attorney, Mayer Brown counsel on behalf of Arkema to USITC staff, December 4, 2020.

***.[23] As described by Arkema, direct labor and other factory costs are ***.[24]
***.[25]

COGS

While changes in average per short ton direct labor and other factory costs (positive and negative) also impacted average COGS, the pattern of average per short ton COGS (increasing during the full-year period and lower in January-September 2020 compared to January-September 2019) primarily reflect the previously noted changes in average per short ton raw material costs (see table VI-2).

Gross profit or loss

While positive throughout the period, total gross profit and gross profit ratio (total gross profit divided by total revenue) fluctuated. In 2018, in conjunction with the period's highest level of total revenue and gross profit ratio, total gross profit reached its highest level. The expansion of gross profit ratio in 2018 reflects a larger percentage increase in average per short ton sales value compared to the corresponding percentage increase in average per short ton COGS (see table VI-2). The subsequent contraction in gross profit ratio in 2019, to its lowest level of the period, reflects a percentage increase in average per short ton sales value that was

[23] Petitioner's postconference brief, Exhibit 2, p. 4. ***. Petitioner's postconference brief, Exhibit 2, p. 5.
[24] Petitioner's postconference brief, Exhibit 1, p. 1.
[25] Ibid.

exceeded by the corresponding percentage increase in average per short ton COGS.[26] The expansion of gross profit ratio in January-September 2020 compared to January-September 2019, reflects both higher average per short ton sales value and lower average COGS.[27]

SG&A expenses and operating income or loss

Total SG&A expenses and SG&A expense ratios (total SG&A expenses divided by total revenue) increased throughout the period (see table VI-1).[28] Notwithstanding the increase in SG&A expenses, the more substantial changes in corresponding gross profit during the period (positive and negative) were the primary factors impacting Arkema's R-32 operating results.

Interest expense, other expenses and income, and net income or loss

Arkema, which reported ***, reported other expenses of varying magnitude throughout the period.[29] Directionally, the pattern of total operating income and net income was the same: *** between 2017 and 2018, *** between 2018 and 2019, and *** in January-September 2020 compared to January-September 2019.

[26] ***. Postconference brief, Exhibit 3, pp. 1-2.

[27] ***. Arkema U.S. producer questionnaire, response to III-9e.

[28] ***. Email with attachments from Sydney Mintzer, Attorney, Mayer Brown counsel on behalf of Arkema to USITC staff, December 4, 2020.

[29] ***. Petitioner's postconference brief, Exhibit 2, p. 4.

Capital expenditures and research and development expenses

Table VI-4 presents Arkema's capital expenditures and research and development (R&D) expenses related to R-32 and table VI-5 presents corresponding narrative descriptions.

Table VI-4
R-32: Capital expenditures and research and development (R&D) expenses of the U.S. producer, 2017-19, January-September 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Value (1,000 dollars)				
Capital expenditures	***	***	***	***	***
R&D expenses	***	***	***	***	***

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

Table VI-5
R-32: Narrative descriptions of the U.S. producer's capital expenditures and R&D expenses since January 1, 2017

Capital expenditures	
Firm	**Narrative**
Arkema	***
R&D expenses	
Firm	**Narrative**
Arkema	***

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

Assets and return on assets

Table VI-6 presents data on the U.S. producer's total net assets and operating return on net assets related to R-32 operations.[30]

[30] 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 current and non-current assets, which, in many instances, are not product specific. In most cases, allocation factors are necessary in order to report total asset values on a product-specific basis. The ability of a U.S. producer to assign total asset values to a discrete product line, in this case R-32, and corresponding operations affects the meaningfulness of operating return on net assets.

Table VI-6
R-32: Total net assets and operating return on net assets of the U.S. producer, 2017-19

Item	Calendar years ended		
	2017	2018	2019
	Value (1,000 dollars)		
Total net assets	***	***	***
	Ratio (percent)		
Operating return on assets	***	***	***

Note.—Based on the sales and total asset information reported in its U.S. producer questionnaire, Arkema's asset turnover ratio (total sales divided by total assets) ranged from ***. Parent company Arkema France's asset turnover ratios, in contrast, were 0.8 (2019) to 0.9 (2017 and 2018), which, in general, are within the expected asset turnover range for the chemical industry. Substituting parent company Arkema France's asset turnover ratios for Arkema's standalone R-32 asset turnover ratios yields the following estimated ROA ratios for R-32: ***. USITC auditor prehearing notes.

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

Capital and investment

The Commission requested the U.S. producer of R-32 to describe any actual or potential negative effects on its return on investment or its 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-32 from China. Table VI-7 tabulates the responses regarding actual negative effects on investment, growth, and development, as well as anticipated negative effects. Table VI-8 presents the narrative responses of the U.S. producer regarding actual and anticipated negative effects on investment, growth, and development.

Table VI-7
R-32: Negative effects of imports from China on investment, growth, and development since January 1, 2017

Item	No	Yes
Negative effects on investment	***	***
Cancellation, postponement, or rejection of expansion projects		***
Denial or rejection of investment proposal		***
Reduction in the size of capital investments		***
Return on specific investments negatively impacted		***
Other		***
Negative effects on growth and development	***	***
Rejection of bank loans		***
Lowering of credit rating		***
Problem related to the issue of stocks or bonds		***
Ability to service debt		***
Other		***
Anticipated negative effects of imports	***	***

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

Table VI-8
R-32: Narrative responses of the U.S. producer regarding actual and anticipated negative effects of imports from China on investment, growth, and development since January 1, 2017

Effects/Firm	Narrative
Negative impact on investment	
Cancellation, postponement, or rejection of expansion projects:	
Arkema	***
Reduction in the size of capital investments:	
Arkema	***
Negative impact on growth and development	
Other:	
Arkema	***
Anticipated effects of imports	
Arkema	***

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

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.

[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."

The industry in China

The Commission issued foreign producers' or exporters' questionnaires to 20 firms believed to produce and/or export R-32 from China.[3] Usable responses to the Commission's questionnaire were received from ten firms; six producers of R-32 and four exporters/resellers of R-32. These firms' exports to the United States accounted for *** percent of reported U.S. imports of merchandise under HTS statistical reporting number 2903.39.2035, a "basket" category that also contains out-of-scope merchandise. According to estimates requested of the responding Chinese producers, the production of R-32 in China reported in questionnaires accounts for approximately *** percent of overall production of R-32 in China.

Tables VII-1 and VII-2 present information on the R-32 operations of the responding producers and exporters in China.

Table VII-1
R-32: Summary data for producers in China, 2019

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)
Dongying	***	***	***	***	***	***
Jiangsu Sanmei	***	***	***	***	***	***
Shandong Dongyue	***	***	***	***	***	***
Taizhou Qingsong	***	***	***	***	***	***
Zhejiang Quzhou Juxin	***	***	***	***	***	***
Zibo Feiyuan	***	***	***	***	***	***
All firms	***	***	***	***	***	***

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

[3] These firms were identified through a review of information submitted in the petition and contained in *** records.

Table VII-2
R-32: Summary data for exporters/resellers in China exporting to the United States, 2019

Firm	Production (short tons)	Share of reported production (percent)
Huantai Dongyue	***	***
Shandong Dongyue	***	***
Weitron	***	***
Zhejiang Quhua-Fluor	***	***
Zhejiang Sanmei	***	***
All firms	***	***

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

Changes in operations

As presented in table VII-3, producers in China reported several operational and organizational changes since January 1, 2017. Three firms reported expansions, one firm reported *** production of R-32.

Table VII-3
R-32: Chinese producers' reported changes in operations, since January 1, 2017

Item / Firm	Reported changes in operations
Expansions:	
***	***
***	***
***	***
Other:	
***	***

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

Operations on R-32

Table VII-4 presents information on the R-32 operations of the responding producers and exporters in China. Chinese producers' capacity increased during 2017-19 by *** percent, with much of this increase occurring between 2018 and 2019, as ***. Chinese producers' capacity was *** percent higher in January-September 2020 than in January-September 2019, and is projected to increase by *** percent between 2019 and 2020, then decrease *** percent between 2020 and 2021. Chinese producers' production increased during 2017-19 by *** percent, and was *** percent higher in January-September 2020 than in January-September 2019. Production is projected to increase *** percent between 2019 and 2020, then decrease *** percent between 2020 and 2021. Capacity utilization remained relatively high during 2017-19; it increased from *** percent in 2017 to *** percent in 2018, then decreased in 2019 to *** percent for a net decrease of *** percentage points. Capacity utilization was *** percentage points lower in January-September 2020 than in January-September 2019, though is projected to increase by *** percentage points between 2019 and 2020, then increase again by *** percentage points between 2020 and 2021. Chinese producers' end-of-period inventories *** during 2017-19, and were higher in January-September 2020 than in January-September 2019. Chinese producers' end-of-period inventories are projected to remain higher in 2020 and 2021 than reported in 2019. As a share of production and total shipments to the US, end-of-period inventories increased each year, from *** percent in 2017 to a projected high of *** percent in 2021.

The majority of Chinese producers' shipments were commercial home market shipments, which increased during 2017-19 by *** percent and were *** percent higher in January-September 2020 than in January-September 2019. Chinese producers reported internal consumption and/or transfers to related firms increased during 2017-19 by *** percent, and were slightly higher in January-September 2020 than in January-September 2019. Collectively, total home market shipments accounted for between *** percent and *** percent of Chinese producers' total shipments during 2017-19, and are projected to increase in 2020 and 2021. Exports to the United States accounted for a *** of total shipments, and were higher in January-September 2020 than in January-September 2019. While the share of exports of R-32 to the United States by resellers accounted for *** of total exports to the United States in 2017, resellers' share of exports decreased to *** percent of total exports in 2019, and there were ***.

Table VII-4
R-32: Data for producers in China, 2017-19, January to September 2019, January to September 2020, and projections calendar years 2020 and 2021

Item	Actual experience					Projections	
	Calendar year			January to September		Calendar year	
	2017	2018	2019	2019	2020	2020	2021
	Quantity (short tons)						
Capacity	***	***	***	***	***	***	***
Production	***	***	***	***	***	***	***
End-of-period inventories	***	***	***	***	***	***	***
Shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Capacity utilization	***	***	***	***	***	***	***
Inventories/production	***	***	***	***	***	***	***
Inventories/total shipments	***	***	***	***	***	***	***
Share of shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Quantity (short tons)						
Resales exported to the United States	***	***	***	***	***	***	***
Total exports to the United States	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Share of total exports to the United States:							
Exported by producers	***	***	***	***	***	***	***
Exported by resellers	***	***	***	***	***	***	***
Adjusted share of total shipments exported to the United States	***	***	***	***	***	***	***

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

Alternative products

Responding Chinese firms reported producing no other products on the same equipment and machinery used to produce R-32, and no producers reported the ability to shift production from R-32 to other products.

Exports

According to the Global Trade Atlas ("GTA"), the leading export markets for fluorinated, brominated, or iodinated derivatives of acyclic hydrocarbons, including R-32, from China are the United States, Japan, and the Netherlands (table VII-5). During 2019, the United States was the top export market for fluorinated, brominated, or iodinated derivatives of acyclic hydrocarbons from China, accounting for 25.4 percent, followed by Japan, accounting for 7.0 percent.

Table VII-5
Fluorinated, brominated, or iodinated derivatives of acyclic hydrocarbons: Exports from China, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (short tons)		
United States	65,438	74,610	73,247
Japan	19,169	20,551	20,177
Netherlands	32,056	34,476	16,405
Brazil	8,985	9,719	15,634
Korea	14,999	16,235	15,218
Thailand	9,346	9,686	13,602
India	6,635	9,083	9,180
Turkey	6,833	7,710	9,013
Mexico	7,346	8,333	8,277
All other destination markets	90,358	97,523	108,164
All destination markets	261,165	287,927	288,917
	Value (1,000 dollars)		
United States	300,239	361,372	266,889
Japan	83,062	99,758	92,857
Netherlands	201,912	235,795	104,283
Brazil	30,356	38,412	47,041
Korea	65,748	79,393	86,260
Thailand	26,864	32,611	38,105
India	28,843	39,647	29,845
Turkey	18,317	26,324	28,508
Mexico	18,631	26,653	25,222
All other destination markets	320,251	428,689	401,947
All destination markets	1,094,221	1,368,654	1,120,958

Table continued on next page.

Table VII-5--Continued
Fluorinated, brominated, or iodinated derivatives of acyclic hydrocarbons: Exports from China, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Unit value (dollars per short ton)		
United States	4,588	4,843	3,644
Japan	4,333	4,854	4,602
Netherlands	6,299	6,839	6,357
Brazil	3,379	3,952	3,009
Korea	4,383	4,890	5,668
Thailand	2,874	3,367	2,802
India	4,347	4,365	3,251
Turkey	2,681	3,414	3,163
Mexico	2,536	3,198	3,047
All other destination markets	3,544	4,396	3,716
All destination markets	4,190	4,753	3,880
	Share of quantity (percent)		
United States	25.1	25.9	25.4
Japan	7.3	7.1	7.0
Netherlands	12.3	12.0	5.7
Brazil	3.4	3.4	5.4
Korea	5.7	5.6	5.3
Thailand	3.6	3.4	4.7
India	2.5	3.2	3.2
Turkey	2.6	2.7	3.1
Mexico	2.8	2.9	2.9
All other destination markets	34.6	33.9	37.4
All destination markets	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. United States is shown at the top, all remaining top export destinations shown in descending order of 2019 data. HS subheading 2903.39 contain products outside the scope of this investigation and therefore may overstate the volume of exports of subject merchandise.

Source: Official exports statistics under HS subheading 2903.39 as reported by China Customs in the Global Trade Atlas database, accessed November 23, 2020.

U.S. inventories of imported merchandise

Table VII-6 presents data on U.S. importers' reported inventories of R-32. Reported end-of-period inventories from China increased each year during 2017-19, but in January-September 2020 were *** of the inventories reported in January-September 2019.

Table VII-6
R-32: U.S. importers' inventories, 2017-19, January to September 2019, and January to September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Inventories (short tons); Ratios (percent)				
Imports from China					
Inventories	***	***	***	***	***
Ratio to U.S. imports	***	***	***	***	***
Ratio to U.S. shipments of imports	***	***	***	***	***
Ratio to total shipments of imports	***	***	***	***	***
Imports from nonsubject sources:					
Inventories	***	***	***	***	***
Ratio to U.S. imports	***	***	***	***	***
Ratio to U.S. shipments of imports	***	***	***	***	***
Ratio to total shipments of imports	***	***	***	***	***
Imports from all import sources:					
Inventories	***	***	***	***	***
Ratio to U.S. imports	***	***	***	***	***
Ratio to U.S. shipments of imports	***	***	***	***	***
Ratio to total shipments of imports	***	***	***	***	***

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

U.S. importers' outstanding orders

The Commission requested importers to indicate whether they imported or arranged for the importation of R-32 after September 30, 2020 (table VII-7). *** indicated that they had arranged for the importation of R-32 from China after September 30, 2020, while three arranged imports from all other sources.

Table VII-7
R-32: U.S. importers' inventories, 2017-19, January to September 2019, and January to September 2020

Item	Period				
	Oct-Dec 2020	Jan-Mar 2021	Apr-Jun 2021	Jul-Sept 2021	Total
	Quantity (short tons)				
Arranged U.S. imports from.--					
China	***	***	***	***	***
All other sources	***	***	***	***	***
All import sources	***	***	***	***	***

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

Antidumping or countervailing duty orders in third-country markets

On September 28, 2020, India initiated an antidumping duty investigation into Chinese R-32. The period of investigation for the purpose of India's present investigation is from April 1, 2019 to March 31, 2020. The injury investigation period will cover the period of investigation and the periods of April 1, 2016 to March 31, 2017, April 1, 2017 to March 31, 2018, and April 1, 2018 to March 31, 2019.[4]

Information on nonsubject countries

China is the world's largest producer and consumer of fluorocarbons, supplying approximately *** percent of global demand in 2019.[5] In 2019, China comprised *** percent of global R-32 production capacity and the United States comprised *** percent of global production capacity.[6] Japan, India and Korea are the only nonsubject countries identified with capacity to produce R-32.[7] These three nonsubject countries comprise the remaining *** percent of global production capacity, as shown in Table VII-8. However, there were *** nonsubject imports into the U.S. market during the POI.[8]

Table VII-8
R-32: Global average capacity, 2019

Country	Average Annual Capacity 2019 (short tons)	Share of total (percent)
China	***	***
USA	***	***
India	***	***
Korea	***	***
Japan	***	***
Total	***	***

Source: IHS Markit, Chemicals Economics Handbook, Fluorocarbons, June 2020, p. 48, 105, 111, 132, converted to short tons.

[4] Petitioner's prehearing brief, p. 55, Exhibit 17 (Initiation of Anti-Dumping Investigation Concerning Imports of Hydrofluorocarbons (HFC) Component R-32, Inv. No. AD (OI)-28/2020 (Sept. 28, 2020)), and https://www.dgtr.gov.in/anti-dumping-cases/anti-dumping-investigation-concerning-imports-hydrofluorocarbons-hfc-component-r.

[5] IHS Markit, Chemical Economics Handbook, Fluorocarbons, June 2020, p. 7.

[6] IHS Markit, Chemical Economics Handbook, Fluorocarbons, June 2020, pp. 48, 111.

[7] Petition, Exhibit 1-2 (2019 IHS Report, pp. 105, 132).

[8] Petition, Exhibit I-1 (*** Import Data).

Global exports of a larger category than the single chemical compound of R-32, which includes other fluorocarbons and other halogenated compounds, is shown in Table VII-9.[9] The largest global exporter is China, with a 60.3 percent share of quantity (288,917 short tons) in 2019, followed by the United States with a share of 12.7 percent (61,087 short tons), the Netherlands with a share of 7.3 percent (35,161 short tons), Japan with a share of 3.6 percent (17,129 short tons), and the United Kingdom with a share of 2.7 percent (12,934 short tons).

[9] Excludes ethylene dibromide (ISO) (1,2-dibromoethane).

Table VII-9
Fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons: Global exports by exporter, 2017-19.

Exporter	Calendar year		
	2017	2018	2019
	Quantity (short tons)		
United States	95,200	73,178	61,087
China	261,165	287,927	288,917
Netherlands	38,714	38,761	35,161
Japan	16,669	17,053	17,129
United Kingdom	15,310	15,455	12,934
Germany	13,615	12,375	10,307
India	12,530	8,537	9,990
France	13,588	10,111	9,653
Belgium	8,225	7,765	8,944
Italy	4,413	4,031	3,793
United Arab Emirates	3,366	3,079	3,622
Singapore	3,369	2,792	2,880
All other exporters	16,619	24,317	14,846
All reporting exporters	502,783	505,382	479,263
	Value (1,000 dollars)		
United States	640,054	767,235	796,867
China	1,094,221	1,368,654	1,120,958
Netherlands	712,082	875,570	676,402
Japan	278,261	268,017	264,261
United Kingdom	105,958	133,528	98,322
Germany	110,544	149,526	108,234
India	55,647	54,215	60,443
France	85,189	77,963	76,467
Belgium	50,246	59,309	62,485
Italy	35,647	61,182	49,763
United Arab Emirates	12,628	13,392	14,010
Singapore	18,434	18,200	25,976
All other exporters	126,655	209,494	210,661
All reporting exporters	3,325,566	4,056,285	3,564,851

Table continued on next page.

Table VII-9--Continued
Fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons: Global exports by exporter, 2017-19.

Exporter	Calendar year		
	2017	2018	2019
	Unit value (dollars per short ton)		
United States	6,723	10,484	13,045
China	4,190	4,753	3,880
Netherlands	18,394	22,589	19,238
Japan	16,693	15,717	15,428
United Kingdom	6,921	8,640	7,602
Germany	8,120	12,083	10,501
India	4,441	6,350	6,050
France	6,269	7,711	7,921
Belgium	6,109	7,638	6,987
Italy	8,078	15,178	13,121
United Arab Emirates	3,752	4,349	3,868
Singapore	5,471	6,519	9,018
All other exporters	7,621	8,615	14,190
All reporting exporters	6,614	8,026	7,438
	Share of quantity (percent)		
United States	18.9	14.5	12.7
China	51.9	57.0	60.3
Netherlands	7.7	7.7	7.3
Japan	3.3	3.4	3.6
United Kingdom	3.0	3.1	2.7
Germany	2.7	2.4	2.2
India	2.5	1.7	2.1
France	2.7	2.0	2.0
Belgium	1.6	1.5	1.9
Italy	0.9	0.8	0.8
United Arab Emirates	0.7	0.6	0.8
Singapore	0.7	0.6	0.6
All other exporters	3.3	4.8	3.1
All reporting exporters	100.0	100.0	100.0

Note.-- Excludes ethylene dibromide (ISO) (1,2-dibromoethane). Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. HS subheading 2903.39 contains products outside the scope of this investigation and therefore may overstate the volume of exports of subject merchandise.

Source: Official exports statistics under HS subheading 2903.39 reported by various national statistical authorities in the Global Trade Atlas database, accessed November 23, 2020.

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
85 FR 5239, January 23, 2020	*Difluoromethane (R-32) From China; Institution of Anti-Dumping Duty Investigation and Scheduling of Preliminary Phase Investigation*	https://www.govinfo.gov/content/pkg/FR-2020-01-29/pdf/2020-01514.pdf
85 FR 10406, February 24, 2020	*Difluoromethane (R–32) From the People's Republic of China: Initiation of Less-Than-Fair-Value Investigation*	https://www.govinfo.gov/content/pkg/FR-2020-02-24/pdf/2020-03527.pdf
85 FR 14703, March 13, 2020	*Difluoromethane (R-32) From China; Notice of Determination*	https://www.govinfo.gov/content/pkg/FR-2020-03-13/pdf/2020-05125.pdf
85 FR 52950, August 27, 2020	*Difluoromethane (R-32) From the People's Republic of China: Preliminary Affirmative Determination of Sales at Less Than Fair Value and Postponement of Final Determination*	https://www.govinfo.gov/content/pkg/FR-2020-08-27/pdf/2020-18811.pdf
85 FR 55688, September 9, 2020	*Difluoromethane (R-32) From China; Scheduling of the Final Phase of an Anti-Dumping Duty Investigation*	https://www.govinfo.gov/content/pkg/FR-2020-09-09/pdf/2020-19831.pdf
85 FR 67566, October 23, 2020	*Difluoromethane (R-32) from China; Revised Schedule for the Subject Investigation*	https://www.govinfo.gov/content/pkg/FR-2020-10-23/pdf/2020-23460.pdf
86 FR 5136, January 19, 2021	*Difluoromethane (R-32) From the People's Republic of China: Final Affirmative Determination of Sales at Less Than Fair Value*	https://www.govinfo.gov/content/pkg/FR-2021-01-19/pdf/2021-01014.pdf
86 FR 6670, January 22, 2021	*Difluoromethane (R-32) from China; Cancellation of Hearing*	https://www.govinfo.gov/content/pkg/FR-2021-01-22/pdf/2021-01271.pdf

APPENDIX B

PETITIONER'S WITHDRAWAL OF REQUEST TO APPEAR AT HEARING

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January 12, 2021

PUBLIC DOCUMENT
Inv. No. 731-TA-1472 (Final)

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

Re: *Difluoromethane (R-32) from the People's Republic of China:*
Petitioner Withdrawal of Request to Appear at Hearing

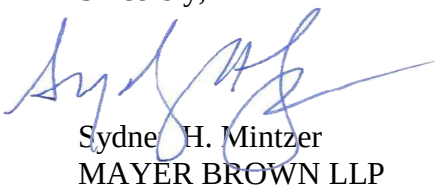
Dear Secretary Barton:

On behalf of Arkema Inc. ("Petitioner"), the undersigned hereby submits this letter withdrawing its January 8, 2021 request to appear[1] at the U.S. International Trade Commission's (the "Commission) hearing scheduled for 9:30am on Thursday, January 14, 2021. Based on discussions with Commission staff, and given that no parties in opposition to the imposition of an antidumping duty order on difluoromethane (R-32) from China submitted a request to appear at the Commission's hearing, Petitioner will instead respond to questions from the Commission in lieu of a hearing in the above-referenced investigation, which will be submitted with Petitioner's Post-Hearing Brief due on January 21, 2021.

[1] *See* Letter from Sydney H. Mintzer, Mayer Brown LLP, to the U.S. Int'l Trade Comm'n, regarding "*Petitioner Request to Appear at Hearing*" (Jan. 8, 2021).

If you have any questions concerning this submission, please do no hesitate to contact the undersigned.

Sincerely,



Sydney H. Mintzer
MAYER BROWN LLP
Counsel to Arkema Inc.

APPENDIX C

SUMMARY DATA

Total market

Table C-1

R-32: Summary data concerning the U.S. total market, 2017-19, January to September 2019, and January to September 2020

(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			January to September		Comparison years			Jan-Sep
	2017	2018	2019	2019	2020	2017-19	2017-18	2018-19	2019-20
U.S. total market consumption quantity:									
Amount	***	***	***	***	***	▲***	▲***	▲***	▲***
Producers' share (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Importers' share (fn1):									
China	***	***	***	***	***	▲***	▲***	▲***	▲***
Nonsubject sources	***	***	***	***	***	***	***	***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▲***	▲***
U.S. total market consumption value:									
Amount	***	***	***	***	***	▲***	▲***	▲***	▲***
Producers' share (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Importers' share (fn1):									
China	***	***	***	***	***	▲***	▲***	▲***	▲***
Nonsubject sources	***	***	***	***	***	***	***	***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▲***	▲***
U.S. importers' U.S. shipments of imports from:									
China:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▼***
Ending inventory quantity	***	***	***	***	***	▲***	▲***	▲***	▼***
Nonsubject sources:									
Quantity	***	***	***	***	***	***	***	***	▲***
Value	***	***	***	***	***	***	***	***	▲***
Unit value	***	***	***	***	***	***	***	***	▲***
Ending inventory quantity	***	***	***	***	***	***	***	***	▲***
All import sources:									
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 per hour)	***	***	***	***	***	▼***	▲***	▼***	▲***
Productivity (short tons per 1,000 hours)	***	***	***	***	***	▼***	▲***	▼***	▲***
Unit labor costs	***	***	***	***	***	▲***	▼***	▲***	▲***

Table continued.

Total market

Table C-1--Continued

R-32: Summary data concerning the U.S. total market, 2017-19, January to September 2019, and January to September 2020

(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			January to September		Comparison years			Jan-Sep
	2017	2018	2019	2019	2020	2017-19	2017-18	2018-19	2019-20
U.S. producers'--continued:									
Net sales:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▼***
Value	***	***	***	***	***	▲***	▲***	▼***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Cost of goods sold (COGS)	***	***	***	***	***	▲***	▲***	▲***	▼***
Gross profit or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Operating income or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
Net income or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
Capital expenditures	***	***	***	***	***	▼***	▲***	▼***	▼***
Research and development expenses	***	***	***	***	***	▲***	▲***	▲***	▼***
Net assets	***	***	***	***	***	▲***	▲***	▲***	***
Unit COGS	***	***	***	***	***	▲***	▲***	▲***	▼***
Unit SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit operating income or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
Unit net income or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
COGS/sales (fn1)	***	***	***	***	***	▲***	▼***	▲***	▼***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▲***	▼***	▲***
Net income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▲***	▼***	▲***

Note.--Shares and ratios shown as "0.0" percent represent non-zero values less than "0.05" percent (if positive) and greater than "(0.05)" percent (if negative). Zeroes, null values, and undefined calculations are suppressed and shown as "---". Period changes preceded by a "▲" represent an increase, while period changes preceded by a "▼" represent a decrease.

fn1.--Reported data are in percent and period changes are in percentage points.

fn2.--Percent changes only calculated when both comparison values represent profits; The directional change in profitability provided when one or both comparison values represent a loss.

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

Commercial sales

Table C-2

R-32: Summary data concerning U.S. commercial sales, 2017-19, January to September 2019, and January to September 2020

(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			January to September		Comparison years			Jan-Sep
	2017	2018	2019	2019	2020	2017-19	2017-18	2018-19	2019-20
U.S. commercial consumption quantity:									
Amount	***	***	***	***	***	▲***	▲***	▲***	▲***
Producers' share (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Importers' share (fn1):									
China	***	***	***	***	***	▲***	▲***	▲***	▲***
Nonsubject sources	***	***	***	***	***	***	***	***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▲***	▲***
U.S. commercial consumption value:									
Amount	***	***	***	***	***	▲***	▲***	▲***	▲***
Producers' share (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Importers' share (fn1):									
China	***	***	***	***	***	▲***	▲***	▲***	▲***
Nonsubject sources	***	***	***	***	***	***	***	***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▲***	▲***
U.S. importers' U.S. shipments of imports from:									
China:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▼***
Ending inventory quantity	***	***	***	***	***	▲***	▲***	▲***	▼***
Nonsubject sources:									
Quantity	***	***	***	***	***	***	***	***	▲***
Value	***	***	***	***	***	***	***	***	▲***
Unit value	***	***	***	***	***	***	***	***	▲***
Ending inventory quantity	***	***	***	***	***	***	***	***	▲***
All import sources:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▼***
Ending inventory quantity	***	***	***	***	***	▲***	▲***	▲***	▼***
U.S. producers':									
Commercial U.S. shipments:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Commercial sales:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Cost of goods sold (COGS)	***	***	***	***	***	▲***	▲***	▲***	▲***
Gross profit or (loss) (fn2)	***	***	***	***	***	▲***	▲***	▼***	▲***
SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Operating income or (loss) (fn2)	***	***	***	***	***	▲***	▲***	▼***	▲***
Net income or (loss) (fn2)	***	***	***	***	***	▲***	▲***	▼***	▲***
Unit COGS	***	***	***	***	***	▲***	▲***	▲***	▼***
Unit SG&A expenses	***	***	***	***	***	▲***	▼***	▲***	▲***
Unit operating income or (loss) (fn2)	***	***	***	***	***	▲***	▲***	▼***	▲***
Unit net income or (loss) (fn2)	***	***	***	***	***	▲***	▲***	▼***	▲***
COGS/sales (fn1)	***	***	***	***	***	▼***	▼***	▲***	▼***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	▲***	▲***	▼***	▲***
Net income or (loss)/sales (fn1)	***	***	***	***	***	▲***	▲***	▼***	▲***

Note.--Shares and ratios shown as "0.0" percent represent non-zero values less than "0.05" percent (if positive) and greater than "(0.05)" percent (if negative). Zeroes, null values, and undefined calculations are suppressed and shown as "---". Period changes preceded by a "▲" represent an increase, while period changes preceded by a "▼" represent a decrease.

fn1.--Reported data are in percent and period changes are in percentage points.
fn2.--Percent changes only calculated when both comparison values represent profits; The directional change in profitability provided when one or both comparison values represent a loss.

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

Commercial & swap sales

Table C-3

R-32: Summary data concerning U.S. commercial and swap sales, 2017-19, January to September 2019, and January to September 2020

(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			January to September		Comparison years			Jan-Sep
	2017	2018	2019	2019	2020	2017-19	2017-18	2018-19	2019-20
U.S. commercial and swaps consumption quantity:									
Amount	***	***	***	***	***	▲***	▲***	▲***	▲***
Producers' share (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Importers' share (fn1):									
China	***	***	***	***	***	▲***	▲***	▲***	▲***
Nonsubject sources	***	***	***	***	***	***	***	***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▲***	▲***
U.S. commercial and swaps consumption value:									
Amount	***	***	***	***	***	▲***	▲***	▲***	▲***
Producers' share (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Importers' share (fn1):									
China	***	***	***	***	***	▲***	▲***	▲***	▲***
Nonsubject sources	***	***	***	***	***	***	***	***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▲***	▲***
U.S. importers' U.S. shipments of imports from:									
China:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▼***
Ending inventory quantity	***	***	***	***	***	▲***	▲***	▲***	▼***
Nonsubject sources:									
Quantity	***	***	***	***	***	***	***	***	▲***
Value	***	***	***	***	***	***	***	***	▲***
Unit value	***	***	***	***	***	***	***	***	▲***
Ending inventory quantity	***	***	***	***	***	***	***	***	▲***
All import sources:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▼***
Ending inventory quantity	***	***	***	***	***	▲***	▲***	▲***	▼***
U.S. producers':									
Commercial U.S. shipments and swaps:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Commercial and swap sales:									
Quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Cost of goods sold (COGS)	***	***	***	***	***	▲***	▲***	▲***	▼***
Gross profit or (loss) (fn2)	***	***	***	***	***	▲***	▲***	▼***	▲***
SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Operating income or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
Net income or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
Unit COGS	***	***	***	***	***	▲***	▲***	▲***	▼***
Unit SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit operating income or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
Unit net income or (loss) (fn2)	***	***	***	***	***	▼***	▲***	▼***	▲***
COGS/sales (fn1)	***	***	***	***	***	▲***	▼***	▲***	▼***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▲***	▼***	▲***
Net income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▲***	▼***	▲***

Note.--Shares and ratios shown as "0.0" percent represent non-zero values less than "0.05" percent (if positive) and greater than "(0.05)" percent (if negative). Zeroes, null values, and undefined calculations are suppressed and shown as "---". Period changes preceded by a "▲" represent an increase, while period changes preceded by a "▼" represent a decrease.

fn1.--Reported data are in percent and period changes are in percentage points.

fn2.--Percent changes only calculated when both comparison values represent profits; The directional change in profitability provided when one or both comparison values represent a loss.

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

APPENDIX D

U.S. PRODUCER'S FINANCIAL RESULTS ON COMMERCIAL SALES AND COMBINED COMMERCIAL SALES AND SWAP OPERATIONS

Table D-1
R-32: Results of commercial sales of the U.S. producer, 2017-19, January-Septmeber 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Quantity (short tons)				
Commercial sales	***	***	***	***	***
	Value (1,000 dollars)				
Commercial sales	***	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Total COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expenses	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Interest expense	***	***	***	***	***
All other expenses	***	***	***	***	***
All other income	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
Depreciation/amortization	***	***	***	***	***
Estimated cash flow from operations	***	***	***	***	***
	Ratio to commercial sales (percent)				
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expense	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss)	***	***	***	***	***

Table continued on next page.

Table D-1—Continued
R-32: Results of commercial sales of the U.S. producer, 2017-19, January-Septmeber 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Ratio to total COGS (percent)				
Cost of goods sold.--					
Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
	Unit value (dollars per short ton)				
Commercial sales	***	***	***	***	***
Cost of goods sold.--					
Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expenses	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
	Number of firms reporting				
Operating losses	***	***	***	***	***
Net losses	***	***	***	***	***
Data	1	1	1	1	1

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

Table D-2
R-32: Changes in AUV's (commercial sales), 2017-19, January-September 2019, and January-September 2020

Item	Between calendar years			Between partial year period
	2017-19	2017-18	2018-19	2019-20
	Change in AUVs (percent)			
Commercial sales	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***
Dichloromethane	***	***	***	***
Other raw materials	***	***	***	***
Total raw materials costs	***	***	***	***
Direct labor	***	***	***	***
Other factory costs	***	***	***	***
Average COGS	***	***	***	***
	Change in AUVs (dollars per short ton)			
Commercial sales	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***
Dichloromethane	***	***	***	***
Other raw materials	***	***	***	***
Total raw materials costs	***	***	***	***
Direct labor	***	***	***	***
Other factory costs	***	***	***	***
Average COGS	***	***	***	***
Gross profit or (loss)	***	***	***	***
SG&A expenses	***	***	***	***
Operating income or (loss)	***	***	***	***
Net income or (loss)	***	***	***	***

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

Table D-3
R-32: Results of commercial and swap operations of the U.S. producer, 2017-19, January-Septmeber 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Quantity (short tons)				
Commercial sales and swaps	***	***	***	***	***
	Value (1,000 dollars)				
Commercial sales and swaps	***	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Total COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expenses	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Interest expense	***	***	***	***	***
All other expenses	***	***	***	***	***
All other income	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
Depreciation/amortization	***	***	***	***	***
Estimated cash flow from operations	***	***	***	***	***
	Ratio to commercial and swap sales (percent)				
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expenses	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss)	***	***	***	***	***

Table continued on next page.

Table D-3—Continued
R-32: Results of commercial and swap operations of the U.S. producer, 2017-19, January-Septmeber 2019, and January-September 2020

Item	Calendar year			January to September	
	2017	2018	2019	2019	2020
	Ratio to total COGS (percent)				
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
	Unit value (dollars per short ton)				
Commercial sales and swaps	***	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***	***
Dichloromethane	***	***	***	***	***
Other raw materials	***	***	***	***	***
Total raw materials costs	***	***	***	***	***
Direct labor	***	***	***	***	***
Other factory costs	***	***	***	***	***
Average COGS	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***
SG&A expenses	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss)	***	***	***	***	***
	Number of firms reporting				
Operating losses	***	***	***	***	***
Net losses	***	***	***	***	***
Data	1	1	1	1	1

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

Table D-4
R-32: Changes in AUV's (commercial and swap operations), 2017-19, January-September 2019, and January-September 2020

Item	Between calendar years			Between partial year period
	2017-19	2017-18	2018-19	2019-20
	Change in AUVs (percent)			
Commercial sales and swaps	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***
Dichloromethane	***	***	***	***
Other raw materials	***	***	***	***
Total raw materials costs	***	***	***	***
Direct labor	***	***	***	***
Other factory costs	***	***	***	***
Average COGS	***	***	***	***
	Change in AUVs (dollars per short ton)			
Commercial sales and swaps	***	***	***	***
Cost of goods sold.-- Hydrofluoric acid	***	***	***	***
Dichloromethane	***	***	***	***
Other raw materials	***	***	***	***
Total raw materials costs	***	***	***	***
Direct labor	***	***	***	***
Other factory costs	***	***	***	***
Average COGS	***	***	***	***
Gross profit or (loss)	***	***	***	***
SG&A expense	***	***	***	***
Operating income or (loss)	***	***	***	***
Net income or (loss)	***	***	***	***

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

APPENDIX E

U.S. IMPORTS AND APPARENT U.S. CONSUMPTION INCLUDING THE BMP GROUP AND DAIKIN AMERICA

Tables E-1 and E-2 present U.S. import data and apparent U.S. consumption inclusive of data reported by the BMP Group (***) and Daikin America during the preliminary phase of this investigation. As discussed in Part IV, while these entities participated in the preliminary phase of this investigation, counsel for the BMP Group informed the Commission that the companies would not be providing a questionnaire response and, subsequently have not participated in the final phase of this investigation. According to ***.

The quantity of U.S. imports increased by *** percent during 2017-19, with most of the increase occurring between 2017 and 2018. This is in contrast to Part IV, where most of the increase occurred between 2018 and 2019, ***.[1] In 2018 ***. The value of U.S. imports from China increased by *** percent during 2017-19, and was highest in 2018. The unit value of U.S. imports increased between 2017 and 2018 before decreasing between 2018 and 2019 for an overall decrease of *** percent during 2017-19.

[1] According to ***. While ***.

Table E-1
R-32: U.S. imports including data reported by the BMP Group and Daikin America by source, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (short tons)		
U.S. imports from.--			
China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
	Value (1,000 dollars)		
U.S. imports from.--			
China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
	Unit value (dollars per short ton)		
U.S. imports from.--			
China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
	Share of quantity (percent)		
U.S. imports from.--			
China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
	Share of value (percent)		
U.S. imports from.--			
China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
	Ratio to U.S. production		
U.S. imports from.--			
China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires in the preliminary and final phases of this investigation.

The quantity of apparent U.S. consumption increased each year during 2017-19, increasing overall by *** percent, and the value of apparent U.S. consumption increased by *** percent during 2017-19. While Arkema's U.S. shipments ***, the quantity of U.S. importers' U.S. shipments increased by *** percent during 2017-19, and the value of U.S. importers' U.S. shipments increased by *** percent. During 2017-19, U.S. importers' market share increased by *** percentage points as a share of quantity, and *** percentage points as a share of value.

Table E-2
R-32: Apparent U.S. consumption including data reported by the BMP Group and Daikin America by source, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (short tons)		
U.S. producers' U.S. shipments	***	***	***
U.S. importers' U.S. shipments from.--China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
Apparent U.S. consumption	***	***	***
	Value (1,000 dollars)		
U.S. producers' U.S. shipments	***	***	***
U.S. importers' U.S. shipments from.--China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
Apparent U.S. consumption	***	***	***
	Share of quantity (percent)		
U.S. producers' U.S. shipments	***	***	***
U.S. importers' U.S. shipments from.--China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
	Share of value (percent)		
U.S. producers' U.S. shipments	***	***	***
U.S. importers' U.S. shipments from.--China	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires in the preliminary and final phases of this investigation.

APPENDIX F

PRICING AND PURCHASE COST DATA AS REPORTED IN THE PRELIMINARY PHASE OF THE INVESTIGATION

Table F-1 presents preliminary-phase price data and landed duty-paid ("LDP") purchase cost data.[1] This preliminary-phase data includes data reported by the BMP Group and Daikin America.[2] [3] As discussed in Part II, while these entities participated in the preliminary phase of this investigation, counsel for the BMP Group informed the Commission that the companies would not be providing a questionnaire response and, subsequently, have not participated in the final phase of this investigation. According to ***. In 2017, ***. In 2018, ***.

In the preliminary phase of the investigation, Arkema and four importers[4] provided usable pricing data for sales of the requested products, and 14 importers[5] provided usable

[1] LDP import value does not include any potential additional costs that a purchaser may incur by importing rather than purchasing from another importer or U.S. producer. Price-cost differentials are based on LDP import values whereas margins of underselling/overselling are based on importer sales prices.

[2] Importers *** submitted questionnaires in the preliminary phase, but they did not submit questionnaires in the final phase. *** belong to the same parent company, ***, and each firm submitted a separate importer questionnaire in the preliminary phase. Counsel for ***. ***, email message to USITC staff, November 6, 2020. Staff are also following up with Daikin America to obtain the firm's response to the U.S. importers' questionnaire.

[3] Three responding importers, ***, noted that they do not set prices and "only facilitate the transaction." These importers *** importers' questionnaires in the final phase of the investigation. Petitioner ***. Petitioner's prehearing brief, pp. 31, 34. However, these three importers reported ***. See ***. These three importers ***. See ***.

[4] The four importers in the preliminary phase were: ***.

[5] The 14 importers in the preliminary phase were: ***.

purchase cost data. Pricing data reported by these firms in the preliminary phase accounted for *** percent of Arkema's shipments of R-32 and 4.0 percent of subject imports from China in 2019. Purchase cost data reported by these firms in the preliminary phase accounted for 89.4 percent of Chinese imports in 2019.[6]

Table F-1
R-32: Preliminary phase weighted-average f.o.b. prices and quantities of domestic and imported product 1 and margins of underselling/(overselling), and landed duty-paid costs and price-cost differential, by quarter, January 2017-December 2019

	United States		China - price			China - cost		
Period	Price (per pound)	Quantity (pounds)	Price (per pound)	Quantity (pounds)	Margin (percent)	LDP value (per pound)	Quantity (pounds)	Price-cost differential (percent)
2017: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***

Note: Product 1: R-32, sold in bulk to blenders.

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

[6] *** reported purchase cost data in the preliminary phase for imports that were ***.

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