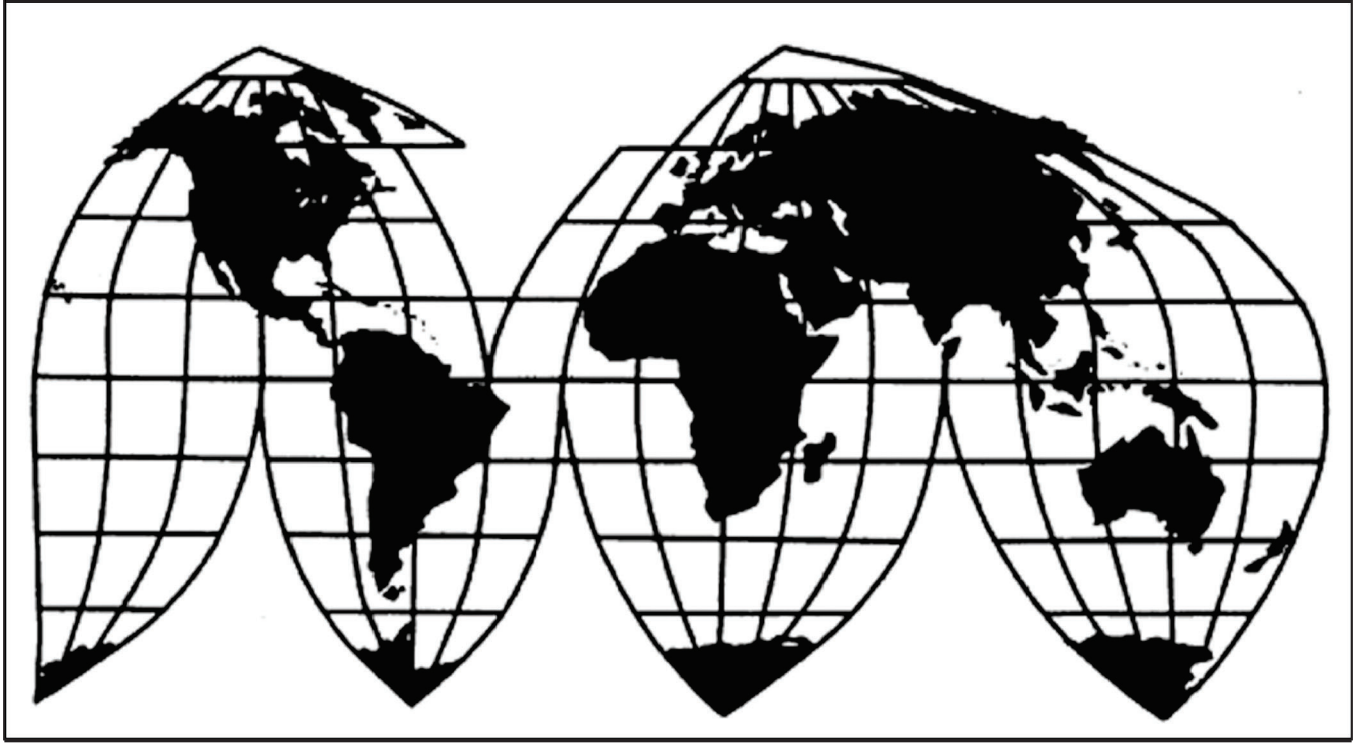
Difluoromethane (R-32) from China

Investigation No. 731-TA-1472 (Preliminary)

Publication 5036 **March 2020**

U.S. International Trade Commission



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U.S. International Trade Commission

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Note.—Information that would reveal confidential operations of individual concerns may not be published. Such information is identified by brackets in confidential reports and is deleted and replaced with asterisks (***) in public reports.

UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-1472 (Preliminary)

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 there is a reasonable indication 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 are alleged to be sold in the United States at less than fair value ("LTFV").[2]

COMMENCEMENT OF FINAL PHASE INVESTIGATION

Pursuant to section 207.18 of the Commission's rules, the Commission also gives notice of the commencement of the final phase of its investigation. The Commission will issue a final phase notice of scheduling, which will be published in the *Federal Register* as provided in section 207.21 of the Commission's rules, upon notice from the U.S. Department of Commerce ("Commerce") of an affirmative preliminary determination in the investigation under sections 703(b) or 733(b) of the Act, or, if the preliminary determination is negative, upon notice of an affirmative final determination in this investigation under sections 705(a) or 735(a) of the Act. Parties that filed entries of appearance in the preliminary phase of the investigation need not enter a separate appearance for the final phase of the investigation. Industrial users, and, if the merchandise under investigation is sold at the retail level, representative consumer organizations have the right to appear as parties in Commission antidumping duty investigations. The Secretary will prepare a public service list containing the names and addresses of all persons, or their representatives, who are parties to the investigation.

BACKGROUND

On January 23, 2020, Arkema Inc., King of Prussia, Pennsylvania filed a petition with the Commission and Commerce, alleging that an industry in the United States is materially injured or threatened with material injury by reason of LTFV imports of R-32 from China. Accordingly,

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

[2] *Difluoromethane (R-32) from China: Initiation of Less-Than-Fair-Value Investigation (85 FR 10406, February 24, 2020)*.

effective January 23, 2020, the Commission, pursuant to section 733(a) of the Act (19 U.S.C. 1673b(a)), instituted antidumping duty investigation No. 731-TA-1472 (Preliminary).

Notice of the institution of the Commission's investigation and of a public conference to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the *Federal Register* of January 29, 2020 (85 FR 5239). The conference was held in Washington, DC, on February 13, 2020, and all persons who requested the opportunity were permitted to appear in person or by counsel.

Views of the Commission

Based on the record in the preliminary phase of this investigation, we determine that there is a reasonable indication that an industry in the United States is materially injured by reason of imports of difluoromethane ("R-32") from China that are allegedly sold in the United States at less than fair value ("LTFV").

I. The Legal Standard for Preliminary Determinations

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

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

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

II. Background

The petition in this investigation was filed on January 23, 2020, by Arkema, Inc. ("Petitioner" or "Arkema"). Petitioner is a domestic producer of R-32. Petitioner appeared at the conference accompanied by counsel and submitted a postconference brief.

Postconference submissions also were made by Daikin America, Inc. ("Daikin"), and by FluoroFusion Specialty Chemicals, Inc., and Kivlan and Company, Inc. (d/b/a Dynatemp International) (jointly, "Dynatemp"), U.S. importers of R-32 from China. No other party appeared at the conference or provided postconference briefs.

U.S. industry data are based on the questionnaire response of one firm (Arkema), believed to account for all U.S. production of R-32 in 2019.[3] U.S. import data are based on responses to the Commission's importer questionnaires.[4] The Commission received questionnaire responses from 15 importers of R-32, representing *** percent of imports from China in 2019.[5] The Commission issued foreign producer/exporter questionnaires to 20 firms believed to produce or export R-32 from China. The Commission did not receive any responses to its questionnaires from foreign producers; it received one response from an exporter/reseller of R-32 in China for 2019.[6]

III. Domestic Like Product

In determining whether there is a reasonable indication that an industry in the United States is materially injured or threatened with material injury by reason of imports of the

[3] Confidential Staff Report ("CR") at I-4; Public Report ("PR") at I-4.
[4] CR/PR at I-4, IV-1, and Table IV-1.
[5] CR/PR at I-4, IV-1, and Table IV-1.
[6] CR/PR at VII-3.

subject merchandise, the Commission first defines the "domestic like product" and the "industry."[7] 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."[8] 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."[9]

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.[10] No single factor is dispositive, and the Commission may consider other factors it deems relevant based on the facts of a particular investigation.[11] The Commission looks for clear dividing lines among possible like products and disregards minor variations.[12] Although the Commission must accept

[7] 19 U.S.C. § 1677(4)(A).

[8] 19 U.S.C. § 1677(4)(A).

[9] 19 U.S.C. § 1677(10).

[10] *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) ("*Nippon*"); *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) ("*Torrington*") ("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).

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

[12] *See*, *e.g.*, *Nippon*, 19 CIT at 455; *Torrington*, 747 F. Supp. at 748-49*; see also* S. Rep. No. 96-249 at 90-91 (Congress has indicated that the like product standard should not be interpreted in "such a narrow fashion as to permit minor differences in physical characteristics or uses to lead to the

Commerce's determination as to the scope of the imported merchandise that is subsidized and/or sold at less than fair value,[13] the Commission determines what domestic product is like the imported articles Commerce has identified.[14] The Commission may, where appropriate, include domestic articles in the domestic like product in addition to those described in the scope.[15]

In its notice of initiation, Commerce defined the imported merchandise within the scope of the 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 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

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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.").

[13] *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).

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

[15] *See*, *e.g.*, *Pure Magnesium from China and Israel*, Inv. Nos. 701-TA-403 and 731-TA-895-96 (Final), USITC Pub. 3467 at 8 n.34 (Nov. 2001); *Torrington,* 747 F. Supp. at 748-49 (holding that the Commission is not legally required to limit the domestic like product to the product advocated by the petitioner, co-extensive with the scope).

> 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 these orders. 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 order.
>
> 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).
>
> 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 above mentioned 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 petition is dispositive.[16]

R-32 is a hydrofluorocarbon ("HFC"), a colorless, odorless, gaseous chemical that is primarily used as a component in HFC refrigerant blends. It may also be used to etch silicon wafers or as a stand-alone refrigerant.[17] Once blended, the HFC gases containing R-32 are used in residential and commercial refrigerant and cooling applications. R-32 has a low global warming potential, no ozone depletion potential, and is a low-to-medium temperature refrigerant.[18] R-32 is a flammable gas and is designated as a hazardous material by Occupational Safety and Health Administration regulations.[19] It is produced in both the United

[16] Difluoromethane (R-32) from the People's Republic of China: Initiation of Less-Than-Fair-Value Investigation, 85 Fed. Reg. 10406, 10410 (Feb. 24, 2020) ("*Commerce Initiation Notice*").

[17] Conference Transcript at 30 (Swan) and 32 (O'Donovan). As an HFC, R-32 and other HFC products such as R-125, are used in the production of downstream HFC blends, such as R-410a. CR/PR at I-6, I-19. HFC blends themselves are HFCs. CR/PR at I-9. While R-32 and some other products have other uses, for consistency, we refer to R-32 and other products that are used in the production of downstream HFC blends as HFC components in this opinion.

[18] CR/PR at I-6; Conference Transcript at 10 (O'Donovan).

[19] CR/PR at I-6 and n.19.

States and China to industry standards published by the Air Conditioning, Heating, and Refrigeration Institute ("AHRI"). All R-32 must conform to AHRI standard 700, with the same chemical formula (CH_2F_2) and chemical composition, whether produced in the United States, China, or elsewhere.[20]

A. Arguments of the Parties[21]

Petitioner argues that the Commission should define a single domestic like product, coextensive with the scope of Commerce's investigation.[22] It claims that all domestically produced R-32 and the subject merchandise share the same basic physical characteristics, are interchangeable and used for the same applications, are manufactured using the same process, are sold primarily to blenders to produce HFC blends used in refrigerant applications, and producers and customers perceive all R-32 to comprise a single product category.[23]

Arkema also asserts that the record establishes clear dividing lines between R-32 and other HFC components.[24] Arkema argues that clear lines divide R-32 from HFC blends, noting the Commission's final determination in *HFC Blends*. It observes the Commission concluded in that investigation that HFC blends and HFC components were separate like products.[25]

B. Analysis

Based on the record, we define a single domestic like product consisting of difluoromethane (R-32), coextensive with the scope of Commerce's investigation.

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[20] CR/PR at I-7 and n.22; Conference Transcript at 10 (O'Donovan); and Petitioner Postconference Brief at 4.

[21] No respondents made arguments regarding the domestic like product.

[22] Petitioner Postconference Brief at 4-6.

[23] Petitioner Postconference Brief at 4-5.

[24] Petitioner Postconference Brief at 5-6.

[25] Petitioner Postconference Brief at 6.

Physical Characteristics and Uses. R-32 is an HFC, a colorless, odorless gaseous chemical used as a low-to-medium temperature refrigerant that is not ozone depleting. Its principal end use is as a component in the production of HFC blends, whether internally consumed or sold to third parties for use in a variety of residential and commercial refrigerant and cooling applications.[26] A common HFC blend containing R-32 is R-410a, used in almost all modern air conditioning units. There is no substitute for R-32 in the production of R-410a.[27] Compared to other HFC components, R-32 is more flammable and has a lower global warming potential.[28] All R-32 has the same chemical composition and that composition differs from the chemical composition of other HFC components.[29]

Common Manufacturing Facilities, Production Processes, and Employees. All domestically produced R-32 is processed at the same facility, using the same production processes, and the same employees.[30] All R-32 is produced to the same AHRI standards.[31] The facility manufacturing R-32 does not produce other HFC components, and it cannot produce other HFC components without first making a significant investment of time and cost.[32]

Channels of Distribution. During the period of investigation ("POI"), both domestically produced R-32 and subject imports were sold primarily to HFC blenders with a small remainder sold to end users.[33]

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[26] Conference Transcript 10 (O'Donovan).

[27] CR/PR at I-9.

[28] CR/PR at I-6; Petition at 8, 11, and Exhibit I-4; Petitioner Postconference Brief at 38.

[29] Petitioner Postconference Brief at 12; Conference Transcript at 30 (Swan) and 32 (O'Donovan).

[30] Petitioner Postconference Brief at 6 and n.28; Conference Transcript at 11 (O'Donovan).

[31] Petitioner Postconference Brief at 12.

[32] Conference Transcript at 11 (O'Donovan); *see also* Petitioner Postconference Brief at 6.

[33] CR/PR at Table II-1.

Interchangeability. According to Petitioner, R-32 and other types of refrigerant components are not interchangeable due to their fundamentally different physical and chemical characteristics. For example, R-32 is not interchangeable with other components of HFC blends because each component has a distinct chemical composition and must be used in precise quantities to produce the particular downstream HFC blends. A common HFC blend that contains R-32 is R-410a and there are no substitutes for R-32 in its production.[34] Compared to R-32, other HFC components also can have unique downstream applications that do not overlap with downstream applications for R-32.[35]

Producer and Customer Perceptions. The record indicates that Petitioner and its customers perceive R-32 to be a unique product.[36] Petitioner testified that R-32 is unique compared to other types of refrigerant components and blends.[37]

Price. Petitioners contend that R-32 is a commodity product and is priced based on supply and demand conditions in the refrigerant market.[38] Petitioner testified that the R-32 used in semiconductor applications requires a higher than standard purity level and, therefore, typically commands a higher price.[39]

Conclusion. The information available in the preliminary phase of this investigation shows that all R-32 shares the same physical characteristics, chemical composition, and end uses, and that those physical characteristics, chemical composition, and end uses differ from

[34] CR/PR at I-9.

[35] CR/PR at II-5; Conference Transcript at 11 (O'Donovan); *see also* Petitioner Postconference Brief at 5-6.

[36] Petition at 12; Petitioner Postconference Brief at 5-6.

[37] Conference Transcript at 10-11 (O'Donovan).

[38] Petition at 12.

[39] Conference Transcript at 32 (O'Donovan).

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 domestic producer and customers perceive R-32 to be a unique product, and R-32 is not interchangeable with other refrigerant components that lack its physical and chemical characteristics. In view of the foregoing, and given no contrary argument by the respondents, we define a single domestic like product consisting of R-32 that is coextensive with the scope of this investigation.

IV. Domestic Industry

The domestic industry is defined as the domestic "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[40] 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.[41] There are no related party issues. Accordingly, we define the domestic industry to include the sole U.S. producer of R-32, Arkema.[42]

[40] 19 U.S.C. § 1677(4)(A).
[41] No respondent party made arguments regarding the domestic industry.
[42] CR/PR at I-1; *see* Petitioner Postconference Brief at 6-7.

V. Negligible Imports

Pursuant to Section 771(24) of the Tariff Act, imports from a subject country of merchandise corresponding to a domestic like product that account for less than 3 percent of all such merchandise imported into the United States during the most recent 12 months for which data are available preceding the filing of the petition shall be deemed negligible.[43]

Based on the Commission's importer questionnaire data, during the period January through December 2019, the 12 month period preceding the filing of the petition, subject imports from China accounted for *** percent of total imports of R-32 by volume.[44] Therefore, we find that subject imports of R-32 from China are not negligible.

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

A. Legal Standard

In the preliminary phase of antidumping and countervailing duty investigations, the Commission determines whether there is a reasonable indication that an industry in the United States is materially injured or threatened with material injury by reason of the imports under investigation.[45] 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

[43] 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)).

[44] CR/PR at Table IV-5.

[45] 19 U.S.C. §§ 1671b(a), 1673b(a).

operations.[46] The statute defines "material injury" as "harm which is not inconsequential, immaterial, or unimportant."[47] In assessing whether there is a reasonable indication that the domestic industry is materially injured by reason of subject imports, we consider all relevant economic factors that bear on the state of the industry in the United States.[48] 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."[49]

Although the statute requires the Commission to determine whether there is a reasonable indication that the domestic industry is "materially injured or threatened with material injury by reason of" unfairly traded imports,[50] 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.[51] 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

[46] 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).

[47] 19 U.S.C. § 1677(7)(A).

[48] 19 U.S.C. § 1677(7)(C)(iii).

[49] 19 U.S.C. § 1677(7)(C)(iii).

[50] 19 U.S.C. §§ 1671b(a), 1673b(a).

[51] *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).

cause of injury and that there is a sufficient causal, not merely a temporal, nexus between subject imports and material injury.[52]

In many investigations, there are other economic factors at work, some or all of which may also be having adverse effects on the domestic industry. Such economic factors might include nonsubject imports; changes in technology, demand, or consumer tastes; competition among domestic producers; or management decisions by domestic producers. The legislative history explains that the Commission must examine factors other than subject imports to ensure that it is not attributing injury from other factors to the subject imports, thereby inflating an otherwise tangential cause of injury into one that satisfies the statutory material injury threshold.[53] In performing its examination, however, the Commission need not isolate

[52] 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) ("*Nippon Steel*"). 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).

[53] SAA at 851-52 ("{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.

the injury caused by other factors from injury caused by unfairly traded imports.[54] 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.[55] It is clear that the existence of injury caused by other factors does not compel a negative determination.[56]

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."[57] The Commission ensures that it has "evidence in the record" to "show that the

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[54] 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.").

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

[56] *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.").

[57] *Mittal Steel*, 542 F.3d at 876 &78; *see also id.* at 873 ("While the Commission may not enter an affirmative determination unless it finds that a domestic industry is materially injured 'by reason of' subject imports, the Commission is not required to follow a single methodology for making that determination ... {and has} broad discretion with respect to its choice of methodology."), *citing United States Steel Group v. United States*, 96 F.3d 1352, 1362 (Fed. Cir. 1996) and S. Rep. 96-249 at 75. In its

harm occurred 'by reason of' the LTFV imports," and that it is "not attributing injury from other sources to the subject imports."[58] The Federal Circuit has examined and affirmed various Commission methodologies and has disavowed "rigid adherence to a specific formula."[59]

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.[60] Congress has delegated this factual finding to the Commission because of the agency's institutional expertise in resolving injury issues.[61]

A. Conditions of Competition and the Business Cycle

We initially address an issue concerning the length of the Commission's period of investigation. Arkema requested that the Commission include, in addition to its traditional 3-year period – 2017-19 in this case – the earlier year of 2016. In August 2016, an antidumping duty order was issued on imports from China of HFC blends, but not on individual HFC components (such as R-32) .[62] Arkema argues that imposition of the order on imports of HFC

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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*.

[58] *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.

[59] *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.").

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

[61] *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.").

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

blends not only led to significant declines in imports of those blends, but also to increases in the HFC component R-32, and that data from 2016 is needed to understand this impact of the order.[63] Dynatemp asserts that Arkema has not provided an adequate justification for its request and that the facts in this case are not sufficiently analogous to those in prior investigations in which the Commission examined more than three full years of data.[64]

The Commission has broad discretion to select a period of investigation that most reasonably allows it to determine whether a domestic industry is injured.[65] To balance the need for sufficient market information with the burden placed on questionnaire respondents, the Commission's typical practice is to examine the most recent three full years of data, plus data from part of the current year.[66] Longer periods of time have been examined when doing so would serve a well-defined need to obtain a broader perspective of the market.[67] Here, the Petitioner's rationale for collecting 2016 data is that it would supplement the Commission's understanding of the conditions of competition.[68] However, there is no suggestion that the information collected for 2017-2019 is insufficient to provide the basis for an injury determination during the preliminary phase of this investigation.[69] For the purposes of the

[63] *See* Petitioner Postconference Brief at 8-9.

[64] Dynatemp Postconference Brief at 3-4.

[65] *See, e.g.*, *Mexichem Fluor Inc. v. United States*, 179 F. Supp. 3d 1238, 1253-54 (Ct. Int'l Trade 2016).

[66] *Certain Aluminum Plate from South Africa*, Inv. No. 731-TA-1056 (Final), USITC Pub. 3734 (Nov. 2004) at 19, n.156; *see also Silicon Metal from Russia*, Inv. No. 731-TA-991 (Final), USITC Pub. 3584 (March 2003) at 11, n.68; *Kenda Rubber Industrial Co. v. United States*, 630 F. Supp. 354, 359 (Ct. Int'l Trade 1986).

[67] *Purified Carboxymethylcellulose from Finland, Mexico, Netherlands, and Sweden*, Inv. Nos. 731-TA-1084-1087 (Final), USITC Pub. 3787 (June 2005) at 14.

[68] Petitioner Postconference Brief at 8; *see also id.* at 9 (stating that including 2016 in the period of investigation would allow the Commission to "fully" understand the impact of the HFC blends order).

[69] Similarly, there is no indication that 2016 information would become necessary to make an injury determination in the final investigation.

preliminary determination, we therefore decline to expand the POI. If circumstances warrant, we will revisit the issue in any final phase of this investigation.

We recognize, however, that in August 2016, an antidumping duty order was issued on imports from China of the downstream product, HFC blends, and consider the order on HFC blends as a condition of competition affecting the U.S. market for R-32.

1. Captive Production

The domestic industry captively consumes a significant share of its production of the domestic like product in the manufacture of downstream articles. Accordingly, we have considered whether the statutory captive production provision requires us to focus our analysis primarily on the merchant market when assessing market share and the factors affecting the financial performance of the domestic industry.[70]

[70] 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.

The SAA indicates that where a domestic like product is transferred internally for the production of another article coming within the definition of the domestic like product, such transfers do not constitute internal transfers for the production of a "downstream article" for purposes of the captive production provision. SAA at 853. The Trade Preferences Extension Act of 2015 eliminated what had been the third statutory criterion of the captive production provision. Pub. L. 114-27, § 503(c).

Petitioner argues that the captive production provision does not apply in this investigation.[71] 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 in other investigations where the Commission found the "predominant input" requirement to have been satisfied on that basis.[72] As such, Arkema 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.[73]

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.[74] Commercial shipments (***) accounted for between *** percent and *** percent of the domestic industry's total shipments in this period.[75] We

[71] Arkema only provided argument regarding the second statutory criterion. *See* Petitioner Postconference Brief at 9-13. No respondents made any arguments regarding captive production.

[72] Petitioner Postconference Brief at 10-11 (citing *Certain Hot-Rolled Steel Products from Japan*, Inv. No. 731-TA-807 (Final), USITC Pub. 3202 (June 1999) at 27 (domestic like product accounted for 63 to nearly 100 percent of raw material costs for downstream products); *Aluminum Foil from China*, Inv. Nos. 701-TA-570 and 731-TA-1346 (Prelim.), USITC Pub. 4684 (May 2017) at 21-22 (domestic like product accounted for approximately 70 percent of the finished cost of a downstream product).

[73] Petitioner Postconference Brief at 10-11.

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

[75] CR/PR at Table III-5. The definition of an "internal transfer" for purposes of the captive production provision was addressed in *Bethlehem Steel Corp. v. United States*, 294 F. Supp. 2d 1359, 1364-68 (Ct. Int'l Trade 2003). *See* Memorandum GC-BB-006 (Jan. 12, 2004). The record indicates that the swaps with producers of the downstream HFC blends here met the criteria (transfer of title, payment of consideration, and transfer of title to an unrelated party) for "sales." Export shipments of R-32 by the domestic industry accounted for *** to *** percent of its total shipments during the period of investigation. *Id.*

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.[76] Arkema reported internal consumption of R-32 for the production of downstream HFC products and did not report any volumes of R-32 that were to be internally consumed but were diverted to the merchant market.[77] Therefore, this criterion appears to be satisfied.

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.[78] In this investigation, R-32 reportedly comprised an average of *** percent of the finished cost of downstream HFC products produced with R-32.[79] Thus, this criterion does not appear to be satisfied.

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[76] *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.

[77] CR/PR at III-13. Arkema produces R-32 as well as HFC blends of which R-32 is a component. CR/PR at II-1 and n.8.

[78] 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) (June 2003), USITC Pub. 3604 (June 2003), at 15 n.69.

[79] CR/PR at III-9, *citing* Arkema U.S. Producer Questionnaire Response at II-4. On a weighted average basis, R-32 reportedly comprised between *** and *** percent of the raw material costs of the downstream HFC blends in 2019. *See* Arkema Postconference Brief at 10 and Exhibit 7. In the data reported for HFC blends, R-32 did not comprise the predominant raw material input by cost for any HFC blend. *Id*.

Conclusion. Based on the above analysis and absent any contrary arguments by respondents, 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.

1. Demand Conditions

U.S. demand for R-32 is driven principally by demand for the downstream products that use R-32, primarily HFC blends. There is also some demand for R-32 for other uses, such as a stand-alone refrigerant and in semiconductor manufacturing.[80]

Apparent U.S. consumption of R-32 increased steadily over the POI, from *** short tons in 2017 to *** short tons in 2018 and *** short tons in 2019.[81] The U.S. producer and a majority of responding importers (7 of 13) reported that U.S. demand for R-32 increased over the POI.[82] In addition, 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.[83]

2. Supply Conditions

The domestic industry was the largest source of supply in the U.S. market throughout the period of investigation. Its share of apparent U.S. consumption declined steadily from ***

[80] CR/PR at II-1 and II-7 to II-8.
[81] CR/PR at Table C-1.
[82] CR/PR at Table II-4.
[83] CR/PR at II-9; Petition at Exhibit I-2 (IHS Chemicals Economic Handbook, Fluorocarbons, September 2017, p. 26 (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)).

percent in 2017 to *** percent in 2018 and *** percent in 2019, for an overall decline of *** percentage points from 2017 and 2019.[84] Dynatemp cites several questionnaire responses reporting Arkema's inability during the POI to provide sufficient supply to meet purchaser requirements, or failure to respond to U.S. purchaser requests for R-32 quotes or otherwise make R-32 available to purchasers during the POI.[85] Arkema disputes allegations that it refused to provide quotes for R-32, claiming that the *** citing domestic product "availability" as an issue "relate to *** unwillingness to purchase R-32 at the quoted price," rather than capacity or production restraints.[86]

Subject imports were the only other source of R-32 during the period; there were no nonsubject imports. Subject imports' share of apparent U.S. consumption increased steadily from *** present in 2017 to *** percent in 2018 and *** percent in 2019, for an overall increase of *** percentage points from 2017 and 2019.[87] [88]

3. Substitutability and Other Conditions

The record in the preliminary phase of this investigation indicates that domestically produced R-32 and subject imports are highly substitutable.[89] As noted above, all R-32 is

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

[85] Dynatemp Postconference Brief at 6-7. Apparent U.S. consumption in 2019 was *** short tons, exceeding Arkema's reported average production capacity quantity of *** short tons. CR/PR at Table C-1.

[86] Petitioner Postconference Brief, Exhibit 2 at 2. Arkema states that it supplies the U.S. market for R-32 based on overall demand; Arkema also states that it "was forced to curtail production due to a lack of demand" in 2019. *Id.* at Exhibit 2 at 3.

[87] CR/PR at Table C-1. Arkema and importers reported increased demand for domestically produced R-32 due to a temporary shortage of R-32 in China from 2017 to 2018. They also reported that the shortage of R-32 supply in China receded in 2019. CR/PR at V-10 to V-11, VI-8; Petitioner Postconference Brief, Exhibit 2 at 3.

[88] There are no section 301 tariffs in effect on subject imports from China. CR/PR at I-6.

[89] CR/PR at II-10.

produced to AHRI standards whether originating in the United States or China.[90] The U.S. producer and all responding importers reported that the domestic like product and subject imports from China were always or frequently interchangeable.[91]

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 and reliability of supply, among the most important factors in purchasing decisions for R-32.[92] The U.S. producer and a significant majority of responding importers (8 of 10) reported for all comparisons that differences other than price were only sometimes or never significant in purchasing decisions for R-32.[93]

The major raw materials used in the production of R-32 are dichloromethane (methylene chloride), chlorine gas, and hydrofluoric acid.[94] 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.[95] As a share of the domestic industry's COGS, raw material costs ranged from *** percent to *** percent during the POI.[96] Arkema reported that the average price of hydrofluoric acid increased by *** percent from 2017 to 2019, and the price of methylene chloride increased by *** percent over the same period.[97]

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[90] CR/PR at I-7 and n.22; Conference Transcript at 10 (O'Donovan); and Petitioner Postconference Brief at 4.

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

[92] CR/PR at II-11.

[93] CR/PR at Table II-6.

[94] CR/PR at V-1.

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

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

[97] CR/PR at V-1; Petitioner Postconference Brief, Exhibit 2 at 3. Arkema reported that none of its raw materials were imported and therefore were not affected by section 301 tariffs on imports from China. Conference Transcript at 60 (O'Donovan); *see also* CR/PR at II-6.

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.[98] In contrast, importers' U.S. commercial shipments were made *** on the basis of spot sales.[99]

HFC blends are produced domestically by two types of domestic refrigerant producers -- integrated producers and independent refrigerant producers. Integrated producers, such as Arkema,[100] 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.[101] Independent refrigerant blenders, which produce no HFC components, produce HFC blends using HFC components either purchased on the merchant market, which can be domestically produced or imported from China.[102] Arkema also ***, so that both HFC blend producers can manufacture an HFC blend from those HFC components. *** reports that the *** are determined pursuant to arms-length prices negotiated by the parties and reflect fair market value.[103]

[98] 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*.

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

[100] As noted, Arkema produces R-32 as well as HFC blends of which R-32 is a component. CR/PR at II-1 and n.8.

[101] 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.

[102] CR/PR at VI-2 n.6; *see also HFC Blends*, USITC Pub. No. 4629 at 33.

[103] CR/PR at VI-1; Arkema U.S. Producer Questionnaire Response at III-3b through III-3e.

As noted above, an antidumping duty order was entered in August 2016 against HFC blends, the primary downstream product for R-32.[104] 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 argues, demand for R-32 increased.[105] Respondents do not directly dispute that the HFC blends order is a condition of competition and argue more generally that any alleged injury is the result of broader market conditions, encompassing HFC blends and other components.[106]

B. Volume of Subject Imports[107]

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."[108]

[104] See Hydrofluorocarbon Blends from the People's Republic of China, 81 Fed. Reg. 55436 (Aug. 19, 2016).

[105] Petitioner Postconference Brief at 2, 7-9, 17.

[106] Daikin Postconference Brief at 7-8; Dynatemp Postconference Brief at 15-16 (citing market conditions for HFC blends and R-22).

[107] Because the subject product is entered under a basket HTS category that includes out-of-scope articles, the Commission used importer questionnaires to measure import volume. Petitioner argues that these importer data are incomplete. Specifically, Petitioner asserts that two large related U.S. importers, ***, began importing R-32 from China in 2019 but did not submit responses to the Commission's U.S. importer questionnaires. Based on *** data, Petitioner estimates that these two companies imported approximately *** percent of total R-32 subject import volume in 2019, and therefore clams their absence has a distortive effect on import volume data collected for that year. *See* Petitioner Postconference Brief at 1 n.3, 19-20, 25-26, and Exhibit 12; *see also* CR/PR at V-7 n.19; Conference Transcript at 25 (Mintzer and Kaplan). The Commission will endeavor to collect comprehensive data on subject imports in any final phase of this investigation.

[108] 19 U.S.C. § 1677(7)(C)(i).

The volume and market share of subject imports from China increased 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. 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.[109] For the purposes of this preliminary determination, 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.

C. Price Effects of the Subject Imports

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

(I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and

(II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.[110]

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 and reliability of supply to a lesser degree, is an important consideration in purchasing decisions.[111]

We have examined several sources of data in our underselling analysis, including pricing data, import purchase cost data, data derived from lost sales/lost revenue survey responses,

[109] CR/PR at Table C-1.
[110] 19 U.S.C. § 1677(7)(C)(ii).
[111] CR/PR at II-11 and Table II-6.

and other data on the record. The Commission collected quarterly pricing data from the domestic industry and U.S. importers for total quantity and f.o.b. value of one R-32 product shipped to unrelated U.S. customers during the period January 2017 through December 2019.[112] The domestic producer (Arkema) and four importers provided usable pricing data for the requested product. Pricing data reported by these firms accounted for approximately *** percent of the domestic producer's U.S. shipments in 2019, but only 4.0 percent of subject imports from China in 2019.[113] Subject imports undersold the domestic like product in 2 of 6 quarterly comparisons and oversold in the remaining four comparisons. The total quantity of subject imports in quarters with underselling was *** short tons, with margins of underselling ranging from *** to *** percent compared to *** short tons of subject imports in quarters with overselling, with margins of overselling ranging from *** to *** percent.[114] The record, which is mixed overall, indicates underselling by subject imports toward the end of the POI, in both quarters of 2019 for which pricing data were reported.[115]

The Commission also collected import purchase cost data for the same pricing product for firms that imported this product for use in the production of their own downstream products.[116] Fourteen importers reported usable import purchase cost data.[117] Purchase cost data reported by these firms accounted for 89.4 percent of subject imports from China in

[112] The pricing product was **Product 1.** -- R-32, sold in bulk to blenders. CR/PR at V-4.

[113] CR/PR at V-4. Pricing data reported by these firms accounted for approximately *** percent of the domestic producer's U.S. shipments and 4.0 percent of subject imports from China in 2019.

[114] CR/PR at Table V-5.

[115] *See* CR/PR at Table V-3.

[116] CR/PR at V-4.

[117] CR/PR at V-4.

2019.[118] Based on the purchase cost data obtained by the Commission, landed duty-paid costs for subject imports were below the sales prices for U.S. produced R-32 in 5 of 12 quarterly comparisons involving *** short tons, with price-cost differences ranging from *** 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 *** to *** percent.[119] 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.[120] The data also show that the landed duty-paid costs for subject imports were below the sales prices for U.S.-produced R-32 in all four quarterly comparisons for 2019.[121]

We recognize that the import purchase cost data may not reflect the total cost of importing and therefore requested that direct importers provide additional information regarding the costs and benefits of directly importing R-32. Nine of 13 importers that reported purchase cost data reported additional costs associated with importing R-32.[122] These costs ranging from 2 to 12 percent compared to landed duty-paid value.[123] Five importers reported

[118] CR/PR at V-4.

[119] CR/PR at V-7 to V-10, and Table V-6.

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

[121] CR/PR at Table V-3.

[122] The U.S. importer questionnaire requested respondents to report only costs they would not incur when purchasing from a U.S. purchaser or importer. We note that responding importers reported a variety of additional costs such as logistics management, insurance, freight and chassis rental. We intend to examine in any final phase of this investigation how these types of costs compare to additional costs that may be associated with purchasing from domestic producers.

[123] CR/PR at V-7 to V-8. In determining whether to directly import R-32, 6 of 13 importers (or 46.1 percent) reported that they compare costs of importing directly to the cost of purchasing from a U.S. producer, three importers compare costs to purchasing from a U.S. importer, and seven do not compare costs. CR/PR at V-9.

estimated savings, ranging from *** percent of landed duty-paid value by importing directly rather than purchasing from a U.S. producer.[124] Four of five importers (or 80.0 percent) reported that imports were priced lower when not including the additional costs, and six of seven importers (or 85.7 percent) reported that imports were priced lower when including additional costs.[125]

We have also considered purchaser lost sales/lost revenue responses. Four of six (or 66.6 percent) purchasers responding to the Commission's questionnaire reported that they had purchased subject imports instead of the domestic like product. All four of these purchasers reported that subject import prices were lower than the domestically produced product, and two purchasers reported that price was the primary reason for purchasing subject imports.[126] These data are consistent with the data described above showing prices and purchase costs for imports that were lower than domestic prices in 2019.[127]

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

[124] CR/PR at V-10.

[125] CR/PR at V-10. Several importers reported turning to subject product because they could not obtain R-32 domestically from Arkema. CR/PR at II-6 and V-18.

[126] CR/PR at V-15 and Tables V-8 & V-9.

[127] CR/PR at Table V-5. In addition to arguing that subject import volume data for 2019 is incomplete (described above), Petitioner also argues that the Commission should not give any weight to the price and purchase cost data, or alternatively disregard the quarterly data reported by importers *** between January 1, 2017, and June 30, 2018. Specifically, Petitioner cites allegations by foreign R-32 supplier *** in ongoing district court litigation that *** has not submitted payment for the vast majority of import volume it reported in questionnaire responses for that time period. Petitioner Postconference Brief at 24-25 and Exhibit 8. Petitioner estimates that the volume of subject imports alleged as unpaid accounts for *** percent of total import volume reported in the aggregate purchase cost data table, and thus should be disregarded. Petitioner Postconference Brief at 24-25 and Exhibit 13. We intend to examine any alleged discrepancies concerning the reported importer data in any final phase of this investigation.

through third quarter 2017 and then generally increased throughout 2018 and 2019, resulting in a *** percent increase over the POI.[128] Pricing data indicate that subject import prices also increased by *** percent over the period.[129]

We have also examined Petitioner's allegations of price suppression and find that 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 during the period.[130] Further, the domestic industry experienced an overall increase in its COGS to net sales ratio from *** percent in 2017 to *** percent in 2019.[131] Arkema's ***, reported that Arkema lowered its price by 15 percent for a 12-month period in 2017 and 2018 in response to a competitive offer for R-32 supply from China.[132] In light of this confirmation and the increase in the domestic industry's COGS to net sales ratio, and the fact that the increase in the domestic industry's unit sales value was not enough to cover the absolute increase in unit COGS during a period of increasing apparent U.S. consumption,[133] we find that subject imports prevented price increases, which otherwise would have occurred, to a significant degree.

[128] CR/PR at V-10 and Figure V-3.

[129] CR/PR at V-10. Import purchase costs also generally increased over the POI. *Id*.

[130] CR/PR at Table C-1. The domestic industry's unit COGS increased by *** percent over the POI, while its unit net sales' values increased by only *** percent during the period. *Id*.

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

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

[133] 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 over the POI. CR/PR at Table C-1.

In sum, for the purposes of the preliminary phase of this investigation, we find that the record shows there is mixed underselling and overselling by subject imports, and that subject imports prevented prices increases, which otherwise would have occurred, to a significant degree. We consequently find that subject imports had significant adverse price effects.

D. Impact of the Subject Imports[134]

Section 771(7)(C)(iii) of the Tariff Act provides that the Commission, in examining the impact of the subject imports on the domestic industry, "shall evaluate all relevant economic factors which have a bearing on the state of the industry." These factors include output, sales, inventories, capacity utilization, market share, employment, wages, productivity, gross profits, net profits, operating profits, cash flow, return on investment, return on capital, ability to raise capital, ability to service debt, research and development, and factors affecting domestic prices. No single factor is dispositive and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[135]

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

[134] In its notice initiating the antidumping duty investigation, Commerce reported an estimated dumping margin of 87.83 percent for imports of difluoromethane (R-32) from China. *Commerce Initiation Notice*, 85 Fed. Reg. at 10409.

[135] 19 U.S.C. § 1677(7)(C)(iii). This provision was amended by the Trade Preferences Extension Act of 2015, Pub. L. 114-27.

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.[136]

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.[137] 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.[138] 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.[139]

The domestic industry's employment-related performance indicia were mixed. Employment,[140] total hours worked,[141] and wages paid[142] increased steadily from 2017 to 2019. Hourly wages and productivity between years declined overall from 2017 to 2019.[143]

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

[137] CR/PR at Table C-1. 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. CR/PR at Table III-5.

[138] CR/PR at Tables III-6 and C-1.

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

[140] Employment increased by *** percent from 2017 to 2019, increasing from *** production-related workers ("PRWs") in 2017 to *** PRWs in 2018, and *** PRWs in 2019. CR/PR at Table C-1.

[141] Total hours worked increased by *** percent from 2017 to 2019, increasing from *** hours in 2017 to *** hours in 2018, and *** hours in 2019. CR/PR at Table C-1.

[142] Wages paid increased by *** percent from 2017 to 2019, increasing from $*** in 2017 to $*** in 2018 and 2019. CR/PR at Table C-1.

[143] 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. Productivity

Despite rising demand, the domestic industry's financial performance deteriorated over the POI. The industry's gross profit fluctuated between years, but declined overall by *** percent over the POI.[144] The industry's operating income and net income also fluctuated between years, but significantly declined overall for the POI.[145] 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 respectively.[146] Capital expenditures declined over the period, for an overall decrease of *** percent.[147]

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 at the end of the POI. The domestic industry lost *** percentage points of market share directly to the subject imports, which we cannot conclude was not the result of the underselling by subject imports.[148] These significant volumes of subject imports suppressed the industry's

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declined overall by *** percent from 2017 to 2019, increasing from *** short tons per hour in 2017 to *** short tons per hour in 2018, but then declining to *** short tons per hour in 2019. CR/PR at Table C-1.

[144] CR/PR at Table C-1. Gross profit was $*** in 2017, $*** in 2018, and $*** in 2019. *Id*.

[145] CR/PR at Table C-1. The industry's operating income declined *** percent over the POI, increasing from $*** in 2017 to $*** in 2018, before declining to $*** in 2019. Its net income declined *** percent, increasing from $*** in 2017 to $*** in 2018, and then declining to $*** in 2019. *Id*.

[146] CR/PR at Table C-1. As a ratio to net sales, the industry's operating income margin decreased by *** percentage points from 2017 to 2019, increasing from *** percent in 2017 to *** percent in 2018, before declining to *** percent in 2019. Net income as a percentage of net sales decreased over the period by *** percentage points, increasing from *** percent in 2017 to *** percent, before declining to *** percent in 2019. *Id*.

[147] CR/PR at Table C-1. Capital expenditures fluctuated between years but declined overall, increasing from $*** in 2017 to $*** in 2018, before decreasing to $*** in 2019. *Id*.

[148] We note that the domestic industry's market share declined by *** percentage points from 2016 to 2018, as subject imports' market share climbed by *** percentage points during the same time period. CR/PR at C-1.

prices to a significant degree, resulting in a cost-price squeeze and declining financial performance.

In sum, the domestic industry's trade data, prices, revenues, and financial performance were worse than they would have been otherwise because of subject imports. We therefore find that subject imports had a significant adverse 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.[149] Respondents argue that Arkema maintains large inventories of R-22, the refrigerant gas that HFC blends are intended to replace. They contend that oversupply of R-22 and the replacement HFC blends in the market, rather than subject imports, caused prices for both R-22 and HFC blends to decline significantly during the POI.[150] Dynatemp also argues that Arkema is primarily concerned either with internally consuming its R-32 to produce HFC blends or in trading or selling R-32 to *** with the goal of obtaining the other components it needs to produce HFC blends, rather than selling R-32 on the open market.[151] It notes Arkema's unused production capacity and alleges that Arkema's refusal to fully participate in the merchant market prevented independent HFC blenders from procuring a reliable supply of domestically produced R-32 during the POI.[152] In any final phase of this investigation, we will examine any issues related to competition in the U.S. market for R-32.

[149] Nonsubject imports were not present in the U.S. market during the POI.

[150] Dynatemp Postconference Brief at 5-8; Daikin Postconference Brief at 9-11.

[151] Dynatemp Postconference Brief at 11-12; *see also* Daikin Postconference Brief at 8.

[152] Dynatemp Postconference Brief at 1, 8, 11-12, and 16; *see also* Daikin Postconference Brief at 2-3 and 7-8.

VII. Conclusion

For the reasons stated above, we determine that there is a reasonable indication that an industry in the United States is materially injured by reason of subject imports of difluoromethane (R-32) from China that are allegedly sold in the United States at less than fair value.

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. ("Arkema"), King of Prussia, PA, 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 13, 2020	Commission's conference
February 24, 2020	Commerce's notice of initiation (85 FR 10406, February 24, 2020)
March 5, 2020	Commission's vote
March 9, 2020	Commission's determination
March 16, 2020	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 witnesses who appeared at the Commission's staff conference.

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

Market summary

R-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 include *** of China.[7] The leading U.S. importers of R-32 from China are ***. There were *** U.S. imports of R-32 from nonsubject countries during 2017-19. U.S. purchasers of R-32 are firms that blend R-32 into HFC blends for use in air conditioners; leading purchasers include ***.[8]

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. imports from subject sources totaled *** short tons ($***) in 2019 and accounted

[5] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.
[6] Petition, pp. 1 and 3.
[7] Petition, Exhibit I-2.
[8] The Commission received lost sales and lost revenue surveys from six firms (***).

for *** percent of apparent U.S. consumption by quantity and *** percent by value. No U.S. importer reported imports of R-32 from nonsubject sources.

Summary data and data sources

A summary of data collected in this investigation is presented in appendix C, table C-1. Except as noted, U.S. industry data are based on the questionnaire response of one firm that accounted for all known U.S. production of R-32 during 2019. U.S. imports are based on questionnaire responses of 15 firms that accounted for approximately *** percent of U.S. imports of R-32 during 2019.

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, RI; Arkema, Inc., King of Prussia, PA; The Chemours Company FC, LLC, Wilmington, DE; Honeywell International, Inc., Morristown, NJ; Hudson Technologies, Pearl River, NY; Mexichem Fluor, Inc., St. Gabriel, LA; and Worthington Industries, Inc., Columbus, OH, 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]

[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.

Nature and extent of alleged sales at LTFV

Alleged sales at LTFV

On February 24, 2020, Commerce published a notice in the *Federal Register* of the initiation of its antidumping duty investigation on product from China.[12] Commerce has initiated an antidumping duty investigation based on an estimated dumping margin of 87.83 percent for R-32 from China.

The subject merchandise

Commerce's scope

In the current proceeding, Commerce has defined the scope as follows:[13]

> *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).*

[12] 85 FR 10406, February 24, 2020.
[13] 85 FR 10406, February 24, 2020.

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 above- mentioned 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.

Tariff treatment

Based upon the scope set forth by Commerce, information available to the Commission indicates that the merchandise subject to this investigation are currently imported under statistical reporting number 2903.39.2035 of the Harmonized Tariff Schedule of the United States ("HTS").[14] Merchandise outside of the 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. An additional 15 percent duty on imports of R-32 from China from Section 301 were scheduled to go into effect on December 15, 2019; however, negotiations led to a suspension of duties on December 13th, and there are currently no Section 301 duties in effect.[15] Decisions on the tariff classification and treatment of imported goods are within the authority of U.S. Customs and Border Protection.

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.[16] 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.[17] Compared to other HFC components, R-32 has a low global

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

[15] Harmonized Tariff Schedule, 2020 Revision 1, Chapter 99, pp. 256-258, footnote 20(t).

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

[17] Petition, p.5.

warming potential, no ozone depletion potential, and is a low-to-medium temperature refrigerant.[18] R-32 is classified as a Category 1- Flammable Gas and is considered a hazardous material by the OSHA Hazard Communication Standard.[19] R-32 is produced to the same well-established standards published by the Air Conditioning, Heating, and Refrigeration Institute, known as AHRI.[20] In both the United States and China, R-32 is produced to meet the AHRI standard known as AHRI 700.[21] 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.[22] 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.[23]

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.[24] Other uses for R-32 include semiconductor silicon wafer manufacturing for etching silicon and as a stand-alone refrigerant.[25] R-32 in its application for semiconductor silicon wafer manufacturing for etching silicon requires a high-purity R-32 and makes up a limited percentage of the market.[26]

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 1996 accordance to the Montreal

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

[19] Safety Data Sheet on Difluoromethane - Airgas; https://www.airgas.com/msds/001054.pdf (accessed February 20, 2020).

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

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

[22] Air Conditioning, Heating, and Refrigeration Institute, Standard 700 – Specifications for Refrigerants, p. 7. http://www.ahrinet.org/App_Content/ahri/files/STANDARDS/AHRI/AHRI_Standard_700_2019.pdf (accessed February 20, 2020).

[23] Conference transcript, p. 10 (O'Donovan); Petitioner's postconference brief, p. 4.

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

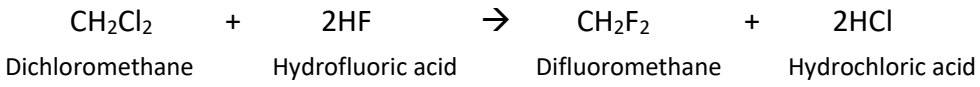
[25] Conference transcript, p. 34 (O'Donovan).

[26] Conference transcript, p. 29-30 (Swan).

Protocol.[27] HFCs, such as R-32, are intended to be a replacement for HCFCs, such as R-22,[28] in residential and commercial refrigerant and cooling applications.[29] Compared to HCFCs, HFC blends, such as those containing R-32, do not cause ozone depletion and present a more environmentally friendly option. In 2017 HFCs represented 43 percent of global consumption of fluorocarbons, while HCFCs was 53 percent. Reflecting the effort of phase out HCFCs, the global share of HCFCs shrank from *** percent in 2012 to *** percent of total fluorocarbon market in 2017. [30]

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.[31] For the specific production of R-32, dichloromethane (CH_2Cl_2; also known as methylene chloride) reacts with chlorine gas and hydrofluoric acid.[32] 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.[33] 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:



[27] IHS Chemicals Economic Handbook, Fluorocarbons, September 2017, pp. 35-36 regarding the phase out of HCFCs with the Montreal Protocol and zero ODP of HFCs. Montreal Protocol Fact Sheet. http://www.environment.gov.au/protection/ozone/publications/montreal-protocol-factsheet (accessed February 25, 2020).

[28] The chemical name for R-22 is chlorodifluoromethane. IHS Chemicals Economic Handbook, Fluorocarbons, September 2017, p. 16.

[29] Conference transcript, p. 47 (O'Donovan) and p. 48 (Swan); R-22 phase out to R-32 is stated in Daikin's postconference brief, pp. 9-11 and Fluorofusion Specialty Chemicals and Kivlan and Company's postconference brief, pp. 1-2, 9-12.

[30] IHS Chemicals Economic Handbook, Fluorocarbons, September 2017, p. 5.

[31] Petition, p. 7.

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

[33] Petition, p. 7.

According to AHRI standards, R-32 may have a maximum level of contaminants of 1.5 percent by weight.[34] Contaminants in this system are non-compressible gasses such as nitrogen. Other contaminates include moisture and oxygenated air.[35] The downstream effect on an air conditioner in a system with contaminants is lack of efficiency, through excessive energy usage or excessive heating of the air conditioner unit.[36]

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.[37] It is comprised by volume of 50 percent R-32 and 50 percent R-125.[38] 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), pentafluoroethane (R-125), and R-134a (1,1,1,2-tetraflurorethane).[39]

Domestic like product issues

No issues with respect to domestic like product have been raised in the preliminary phase of this investigation.

[34] Air Conditioning, Heating, and Refrigeration Institute, Standard 700 – Specifications for Refrigerants, p. 7. http://www.ahrinet.org/App_Content/ahri/files/STANDARDS/AHRI/AHRI_Standard_700_2019.pdf

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

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

[37] Conference transcript, p. 7 (Mintzer).

[38] R-125 is pentafluoroethane. IHS, Chemicals Economic Handbook, Fluorocarbons, September 2017, p. 16.

[39] Conference transcript, p. 11 (O'Donovan); chemical names from IHS, Chemicals Economic Handbook, Fluorocarbons, September 2017, p. 16.

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, whether internally consumed or sold to third parties.[1] [2] HFCs 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 are made using the same chemical formula.[5] R-32 has no ozone depletion potential and has low global warming potential compared to 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 comprised of 50 percent R-32 and 50 percent R-125.[7] As an input to other HFC blends, R-32 composes a varying ratio of the composition of HFC blends.[8] However, R-32 is also used as a stand-alone refrigerant in limited applications, such as window unit air conditioners.[9] Respondent Daikin 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 can also be used in semiconductor silicon wafer manufacturing for etching silicon, which is considered a limited end-use for R-32.[11]

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[1] Petition, p. 6 and Exhibit 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. *Hydroflurocarbon 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's postconference brief, p. 9.

[4] Petition, p. 1.

[5] Petition, p. 18. All R-32 conforms to 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 downstream blends cost breakdown indicated that ***. Derived from Petition Exhibit 1-9.

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

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

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

R-32 is sold in various bulk sizes, typically according to the container in which it is sold. R-32 sold in ISO tanks or a tank truck trailer is 15 to 17 tons and railcar sizes are about 60 tons. Smaller sizes include 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 and any other packaging available, but not rail car.[12]

There is one U.S. producer of R-32, Arkema, and China was the only reported source of imported R-32 during 2017-19.[13] There are few distributors of R-32 in the U.S. market, and most importers are blenders that import R-32 and internally consume the product to make HFC blends.[14] [15] The Petitioner argued that the antidumping order on HFC blends effective August 2016, [16] led to an increase in imports of R-32.[17] According to the Petitioner, new entrants, such as importers IGas and BMP USA, established operations in the United States to produce HFC blends that would otherwise be subject to the antidumping order and that incorporate R-32.[18] Petitioner also noted that the order on HFC blends increased U.S. demand for R-32.[19]

Respondents FluoroFusion and Kivlan argued that R-22, an older HFC component that is being phased out, has an impact on the R-32 market. FluoroFusion and Kivlan alleged that large supplies of R-22 "overhang" the market and impact the demand and prices of HFC blends.[20]

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

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

[14] The Commission received 15 importer questionnaires, 14 of which reported that they internally consume R-32 to produce other blends.

[15] Importers *** belong to the same parent company, though each firm submitted a separate importer questionnaire. Importers *** are also related companies and submitted separate importer questionnaires. Each firm's responses are reported separately throughout this section.

[16] 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 only of 101.82 percent for the investigated producer/exporter combinations and dumping margins of 216.3 percent for the PRC-Wide entity. *Hydroflurocarbon Blends from the People's Republic of China, Inv. No. 731-TA-1279 (Final),* USITC Publication No. 4629, (August 2016), pp. 3, 13, and 25.

[17] Conference transcript, p. 14 (Swan).

[18] Petition, pp. 21-23.

[19] Petition, pp. 22-23.

[20] FluoroFusion and Kivlan's postconference brief, p. 11.

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

Channels of distribution

*** importers sold mainly to HFC blenders, as shown in table II-1.[21]

Table II-1
R-32: U.S. producer and importers' U.S. shipments, by sources and channels of distribution, 2017-19

Item	Calendar year		
	2017	2018	2019
	Share of U.S. shipments (percent)		
U.S. producer: to Distributors	***	***	***
to HFC blenders	***	***	***
to End users	***	***	***
U.S. importers: China to Distributors	***	***	***
to HFC blenders	***	***	***
to End users	***	***	***
U.S. importers: Nonsubject to Distributors	***	***	***
to HFC blenders	***	***	***
to End users	***	***	***
U.S. importers: All sources: to Distributors	***	***	***
to HFC blenders	***	***	***
to End users	***	***	***

Note: Importer *** 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 2017 and 2018.

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

[21] As noted above, most importers are HFC blenders and imported R-32 for internal consumption. Importer *** was the only importer of 15 responding importers to report that none of its shipments were internally consumed. This importer shipped R-32 to HFC blenders.

Geographic distribution

Arkema reported selling R-32 to *** in the contiguous United States (table II-2). Importers reported selling to all regions in the contiguous United States except for 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 *** percent within 100 miles of their U.S. point of shipment, *** percent between 101 and 1,000 miles, and *** 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	***	3
Southeast	***	2
Central Southwest	***	1
Mountain	***	---
Pacific Coast	***	1
Other	***	---
All regions (except Other)	***	---
Reporting firms	1	4

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. No foreign producer of subject R-32 submitted a response to the Commission's questionnaire.

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

Item	2017	2019	2017	2019	2017	2019	Shipments by market in 2019 (percent)		Able to shift to alternate products
	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

Note: Arkema accounted for all U.S. production of R-32 in 2019. No Chinese producers responded to the Commission's questionnaire with usable data.

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 factors to this degree of responsiveness of supply are the availability of unused capacity. Factors mitigating responsiveness of supply include limited availability of inventories, limited ability to shift shipments from alternate markets, and limited ability to shift production to or from alternate products.

From 2017 to 2019, Arkema's capacity was *** and capacity utilization ***. Inventories were *** from 2017 to 2019, and home market shipments comprised the *** of Arkema's shipments. There are no reported barriers to exporting. Arkema reported that other HFC components do not share common manufacturing facilities, and that the R-32 equipment at its Calvert City, KY, plant cannot be used to produce other components.[22]

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

Subject imports from China

No foreign producers responded to the Commission's questionnaire with usable production, capacity, or trade data.[23] [24] Arkema reported that China is the major global supplier of R-32 and "has more unused capacity than there is demand in the U.S. market."[25]

Imports from nonsubject sources

There were no reported imports of R-32 from nonsubject countries during 2017- 19.

Supply constraints

Multiple U.S. importers/end users reported that Arkema was unable or unwilling to supply them with R-32 from 2017 to 2019. *** noted that it cannot rely on Arkema to meet all of its supply requirements. Related importers Fluorofusion and Kivlan and *** reported that they cannot purchase R-32 from Arkema.[26] [27] Importer *** also noted that diversity of supply is important as there is only one U.S. producer. *** stated that Arkema does not have the capacity to meet its demand. Additionally, *** noted that Arkema "would not offer additional volumes beyond the contract maximum at the existing contract price during peak seasonal demand."[28]

[23] ***, the only firm to provide a foreign producer/exporter questionnaire, reported that it ***. ***, email to USITC Staff, February 18, 2020.

[24] Part VII provides information on Chinese exports of HTS 2903.39, a basket category of chemicals not specific to R-32.

[25] Petitioner's postconference brief, p. 16.

[26] FluoroFusion and Kivlan argued that Arkema refused to supply companies with R-32 "which would be used to produce HFC blends that compete with Arkema's own HFC blends." FluoroFusion and Kivlan's postconference brief, pp. 1 and 7-8.

[27] *** noted that it sent multiple requests for quote to Arkema, and that Arkema only responded to one of the requests. This importer also reported that Arkema had "poor response time, lack of clarity, lack of formal payment and shipping terms, lack of forward-looking pricing, and lack of commitment to supply future month's requirements," all of which risked *** continuity of supply.

[28] Arkema directly addressed *** comment, arguing that this statement confirmed that Arkema lost significant volumes due to price, not availability. Petitioner's postconference brief, Exhibit 2, p 2.

Arkema reported that it was "routinely able to supply customers" and that it "did not refuse to provide a quote for R-32 to any customer." Arkema argued that it had no capacity or production constraints, but importers were unwilling to purchase R-32 at the quoted price.[29]

No importers explicitly reported a supply constraint of product from China; however, multiple importers reported that prices of R-32 from China spiked in Q2 2017 and Q2 and Q3 2018 due to temporary supply issues in China.[30]

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 small 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 (10 firms): 23-50 percent
- R-407C (10 firms): 11-50 percent
- R-407A (4 firms): 10-20 percent
- R-407H (1 firm): 33 percent
- R-422A (1 firm): 23 percent
- R-422B (1 firm): 20 percent
- R-422D (1 firm): 21 percent
- R-448A (1 firm): 26 percent
- R-453A – RS44b (1 firm): 24 percent
- R-32 for OEM testing (1 firm): 78 percent
- HFC and refrigerant blends, generally (2 firms): 22-35 percent

[29] Petitioner's postconference brief, Exhibit 2, pp. 2-3.

[30] ***, email message to USITC staff, February 18, 2020; ***, email message to USITC staff, February 12, 2020. See Part V for a discussion on quarterly prices and purchase cost data.

Petitioners noted that in terms of the ultimate end use, air conditioning systems, R-32 constitutes a very small cost share.[31]

Business cycles

*** 10 of 15 importers indicated that the market was subject to business cycles or distinct conditions of competition. *** noted that U.S. demand for R-32 in general has increased following the antidumping order on HFC blends. Ten importers reported that R-32 was subject to business cycles, citing increased demand for air conditioning refrigerants during the summer. Three 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 (***). Importer *** also noted the R-32 market has changed since January 1, 2017, reporting that it has lost market share in the refrigerant blends market due to increased Chinese imports and increasing Chinese capacity of R-32.

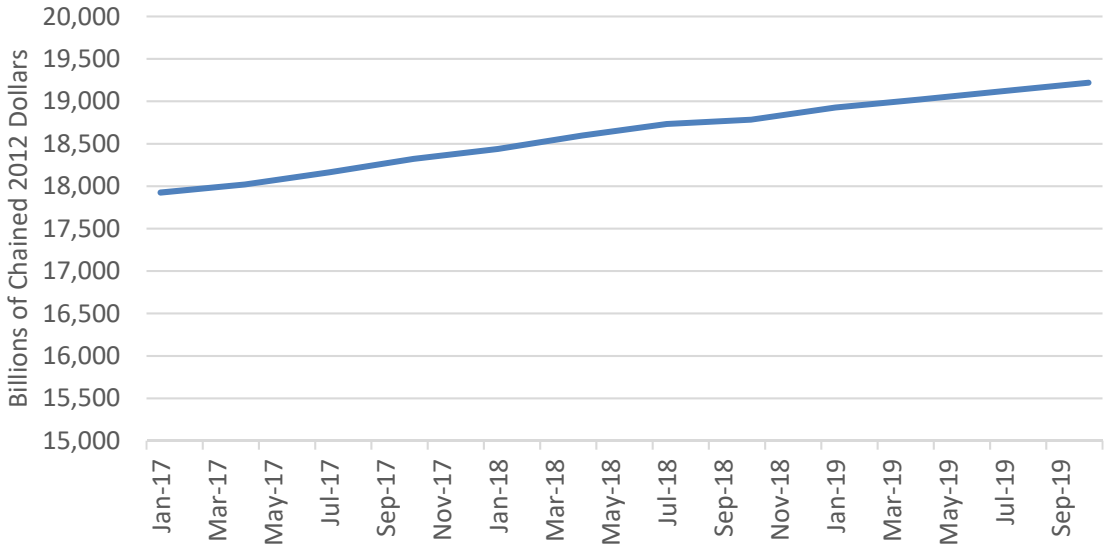
Demand trends

Arkema indicated that demand for R-32 is tied to overall growth in the economy, and that Arkema uses GDP as a demand indicator, noting that it looks "even a little bit higher than GDP in terms of growth."[32] From January 2017 through October 2019 (the last quarter in which data are available), seasonally adjusted real GDP increased by 7.2 percent (figure II-1).

[31] Conference transcript, pp. 17-18 (Kaplan).
[32] Conference transcript, pp. 58-59 (Swan).

Figure II-1

GDP: Real gross domestic product, billions of chained 2012 dollars, quarterly, seasonally adjusted annual rate, January 2017 – October 2019



Source: Federal Reserve Economic Data, Economic Research Division, Federal Reserve Bank of St. Louis. https://fred.stlouisfed.org/series/GDPC1

*** most importers reported an increase in U.S. demand for R-32 since January 1, 2017 (table II-4). *** 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 and do not contain R-32, to systems that use HFC blend R-410A, which contains R-32 (***).

Table II-4
R-32: Firms' responses regarding U.S. demand and demand outside the United States

Item	Number of firms reporting			
	Increase	No change	Decrease	Fluctuate
Demand inside the United States: U.S. producer	***	***	***	***
Importers	7	4	2	---
Demand outside the United States: U.S. producer	---	---	---	---
Importers	5	4	---	---

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

Substitute products

*** all 15 importers 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.[33]

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. *** both responding importers reported that all their commercial U.S. shipments came from inventories, with *** reporting commercial U.S. shipments from foreign inventories and *** from U.S. inventories.[34] Arkema reported an average lead time of *** days, importer *** reported an average lead time of 50 days, and importer *** reported a lead time of 3 to 5 days.[35]

[33] "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).

[34] *** reported one instance of a sale from 2017 to 2019.

[35] Most importers internally consume R-32 for blends and did not report any sales to unrelated parties. Importers *** reported commercial U.S. shipments of R-32.

Factors affecting purchasing decisions

Purchasers responding to lost sales and lost revenue allegations[36] were asked to identify the main purchasing factors their firm considered in their purchasing decisions for R-32. The major purchasing factors identified by firms included price (***), availability (***), reliable supply/supply chain continuity (***), and quality (***).

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 and U.S. importers were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in table II-5, *** almost all importers reported that U.S. and Chinese produced R-32 are always interchangeable.[37]

Table II-5
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			
	A	F	S	N	A	F	S	N
United States vs. China	***	***	***	***	10	1	---	---
United States vs. Other	---	---	---	---	6	1	---	---
China vs. Other	---	---	---	---	6	1	---	---

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

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

In addition, the U.S. producer and importers were asked to assess how often differences other than price were significant in sales of R-32 from the United States, China, or nonsubject countries. As seen in table II-6, Arkema reported that factors other than price are *** important, and a plurality of importers reported that non-price factors are sometimes important. Importers noted that there is limited or no availability of R-32 produced in the United States (***).

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

[37] Importers *** reported that "there are no U.S. or third country sources of R-32 available in the market," and therefore they cannot comment on the interchangeability of U.S.-produced R-32.

*** also reported that their Chinese supplier has a larger product range than Arkema and other U.S. importers, and that the availability of R-32 "is significantly different between China and the U.S."

Table II-6
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			
	A	F	S	N	A	F	S	N
United States vs. China	***	***	***	***	1	1	5	3
United States vs. Other	---	---	---	---	1	---	4	1
China vs. Other	---	---	---	---	1	---	3	1

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

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

Part III: U.S. producers' production, shipments, and employment

The Commission analyzes a number of factors in making injury determinations (see 19 U.S.C. §§ 1677(7)(B) and 1677(7)(C)). Information on the dumping margins was presented in *Part I* of this report and information on the volume and pricing of imports of the subject merchandise is presented in *Part IV* and *Part V*. Information on the other factors specified is presented in this section and/or *Part VI* and (except as noted) is based on the questionnaire response of one firm that accounted for all known U.S. production of R-32 during 2019.

U.S. producers

The Commission issued a U.S. producer questionnaire to four firms based on information contained in the petition and publicly available industry information. One firm, Arkema, provided usable data on their productive operations.[1] Staff believes that this response represents all known U.S. production of R-32. Table III-1 lists Arkema's production location, position on the petition, and share of total production.

Table III-1
R-32: U.S. producer Arkema's positions on the petition, production location, and share of reported production, 2019

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

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

[1] The remaining three firms, *** confirmed and/or submitted certified responses that they have not produced R-32 in the United States since January 1, 2017.

Table III-2 presents information on Arkema's ownership, related and/or affiliated firms of R-32.

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

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

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

Table III-3 presents Arkema's 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 changed in operations
Expansions:	
***	***

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.[2] While capacity remained steady during 2017-19, 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, but still increased overall during 2017-19, by *** percent with regard to production, and *** percentage points with regard to capacity utilization.

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

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

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

[2] Arkema reports in its questionnaire to have calculated its capacity by ***.

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

* * * * * * *

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.[3]

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

Table III-5 presents Arkema's U.S. shipments, export shipments, and total shipments.[4] Despite increasing between 2017 and 2018 by *** percent (approximately *** short tons), then decreasing between 2018 and 2019 by *** percent (approximately *** short tons), the quantity of Arkema's U.S. shipments increased overall during 2017-19 by *** percent. By quantity, Arkema's commercial shipments of R-32 increased each year during 2017-19 by *** percent, whereas the firm's reported internal consumption of R-32, despite increasing between 2017 and 2018 by *** percent, decreased overall during 2017-19 by *** percent. The quantity of Arkema's reported swaps ***.[5]

[3] Petition, p. 13. See also Conference transcript, p. 11 (O'Donovan).
[4] Arkema reported ***.
[5] See part VI of this report for further details on swaps.

The value of Arkema's U.S. shipments similarly increased during 2017-19, increasing between 2017 and 2018 by *** percent, decreasing by *** percent between 2018 and 2019, to end *** percent higher in 2019 than in 2017. The value of Arkema's commercial shipments increased by *** percent during 2017-19. Arkema's reported internal consumption, despite increasing between 2017 and 2018 by *** percent, fell by *** percent between 2018 and 2019, and decreased overall during 2017-19 by *** percent by value. The value of Arkema's reported swaps ***.

Unit values of Arkema's U.S. shipments ranged from $*** per short ton in 2017, to $*** per short ton in 2019, and increased during 2017-19 by *** percent. 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. As a share of both quantity and value, Arkema's U.S. shipments made up *** percent of the firm's total shipments during each year. Arkema's commercial U.S. shipments went from *** 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, exports shipments, and total shipments, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (short tons)		
Commercial U.S. shipments	***	***	***
Internal consumption	***	***	***
Transfers to related firms	***	***	***
Swaps	***	***	***
U.S. shipments	***	***	***
Commercial export shipments	***	***	***
Other export shipments	***	***	***
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	***	***	***
Other export shipments	***	***	***
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	***	***	***
Other export shipments	***	***	***
Export shipments	***	***	***
Total shipments	***	***	***

Table continued on next page.

Table III-5--Continued
R-32: U.S. producer Arkema's U.S. shipments, exports shipments, and total shipments, 2017-19

Item	Calendar year		
	2017	2018	2019
	Share of quantity (percent)		
Commercial U.S. shipments	***	***	***
Internal consumption	***	***	***
Transfers to related firms	***	***	***
Swaps	***	***	***
U.S. shipments	***	***	***
Commercial export shipments	***	***	***
Other export shipments	***	***	***
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	***	***	***
Other export shipments	***	***	***
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 *** in 2018. The ratio of Arkema's end-of period inventories to U.S. production, U.S. shipments, and total shipments generally increased during 2017-19, ending *** percentage points higher in 2019 as a ratio of end-of-period inventories to U.S. production, and *** percentage points higher in 2019 as a ratio of end-of-period inventories to U.S. and total shipments.

Table III-6
R-32: U.S. producer Arkema's inventories, 2017-19

Item	Calendar year		
	2017	2018	2019
	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 2017-19.

U.S. employment, wages, and productivity

Table III-7 shows Arkema's employment-related data. Production and related workers, hours worked, wages paid, and labor costs, increased during 2017-19, while productivity decreased during 2017-19.

Table III-7
R-32: Average number of production and related workers, hours worked, wages paid to such employees, hourly wages, productivity, and unit labor costs, 2017-19

Item	Calendar year		
	2017	2018	2019
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–[6]

> *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 *** and *** of the value of U.S. producers' U.S. 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, R-32 reportedly comprises *** percent of the finished cost of the finished blends.[7]

---

[6] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.
[7] Arkema's U.S. producer questionnaire response at section II-14.

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

U.S. importers

The Commission issued importer questionnaires to 28 firms believed to be importers of subject R-32, as well as to the sole U.S. producer of R-32.[1] Usable questionnaire responses were received from 15 companies, representing approximately *** percent of the value of U.S. imports from China in 2019 under HTS subheading 2903.39.20, a "basket" category.[2] [3] 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.[4] [5]

[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] Staff received responses from *** of the top 25 firms that imported merchandise, which may include R-32, under HTS subheading 2903.39.20 from China during 2019 based on proprietary Customs data. Collectively, the top 25 firms make up 99.96 percent of the value of all imported merchandise, which may include R-32, under HTS subheading 2903.39.20 from China during 2019.

[3] Four firms, *** submitted certified responses that they did not import subject R-32 during 2017-19. Commission staff additionally attempted to obtain information from ***, but the company did not provide a questionnaire response. Based on proprietary Customs data, ***.

[4] The Commission received a response to the U.S. importers' questionnaire from ***. The firm did not provide usable data, and thus is not included in the data presented above.

[5] BMP International, BMP USA, IGas, and Coolmaster reported in their questionnaires that the companies ***. FluoroFusion and Kivlan also reported in their questionnaire that the firms ***.

Table IV-1
R-32: U.S. importers, their headquarters, and share of total imports by source, 2019

Firm	Headquarters	Share of imports by source (percent)		
		China	Nonsubject sources	All import sources
A-Gas	Bowling Green, OH	***	***	***
BMP International	Tampa, FL	***	***	***
BMP USA	Tampa, FL	***	***	***
Chemours Company	Wilmington, DE	***	***	***
Coolmaster	Tampa, FL	***	***	***
Daikin	Orangeburg, NY	***	***	***
First Continental	Glen Rock, NJ	***	***	***
FluoroFusion	Clayton, NC	***	***	***
Honeywell	Morris Plains, NJ	***	***	***
Hudson	Pearl River, NY	***	***	***
IGas	Tampa, FL	***	***	***
Kivlan	Mechanicsburg, PA	***	***	***
Technical Chemical	Cleburne, TX	***	***	***
National Refrigerants	Philadelphia, PA	***	***	***
Weitron	Newark, DE	***	***	***
Total		***	***	***

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

U.S. imports

Table IV-2 and figure IV-1 present data for U.S. imports of R-32 from China and all other sources. U.S. imports of R-32 decreased by *** percent, by quantity, and *** percent, by value, during 2017-19, and were at their *** in 2018.[6] The increase in imports in 2018 can primarily be attributed to ***.[7] Unit values increased by *** percent between 2017 and 2018, then decreased by *** percent between 2018 and 2019, ending lower in 2019 than in 2017.[8] ***. As a ratio to U.S. production, U.S. imports decreased by *** percentage points during 2017-19.

[6] Arkema contends that, as a result of ongoing litigation between BMP International, BMP USA, Coolmaster, and IGas and foreign supplier, T.T. International involving non-payment of goods, that volume and value data reported by BMP International, BMP USA, Coolmaster, and IGas ***. See Petitioner's postconference brief at Exhibits 2 and 8.

[7] Five firms ***.

[8] Respondents stated that ***. Email from ***.

Table IV-2
R-32: U.S. imports 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.

Figure IV-1
R-32: U.S. imports volumes and prices, 2017-19

* * * * * * *

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.[9] 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.[10] Imports from China accounted for *** percent of total imports of R-32 by quantity during 2019 (table IV-3).

Table IV-3
R-32: U.S. imports by source, 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.

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. Apparent U.S. consumption increased during 2017-19, by *** percent by quantity, and *** percent by value. The quantity of U.S. importers' U.S. shipments increased during 2017-19 by *** percent, and the value of U.S. importers' U.S. shipments increased by *** percent during 2017-19. U.S. importers' market shares increased during 2017-19 by *** percentage points as a share of quantity, and by *** percentage points as a share of value.

[9] 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)).

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

Table IV-4
R-32: U.S. shipments of domestic product, U.S. shipments of imports, and apparent U.S. consumption, 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.

Figure IV-2
R-32: Apparent U.S. consumption, 2017-19

* * * * * * *

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 average price of hydrofluoric acid increased by *** percent from 2017 to 2019, and the price of methylene chloride increased by *** percent over the same period.[2] Arkema stated that none of its raw materials are imported and therefore were not impacted by section 301 tariffs on imports from China.[3]

Transportation costs to the U.S. market

Transportation costs for R-32 shipped from China to the United States averaged 3.9 percent during 2019. These estimates were derived from official import data and represent the transportation and other charges on imports.[4]

[1] Petition, p. 12.

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

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

[4] 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.

U.S. inland transportation costs

*** four U.S. importers[5] [6] reported that they typically arrange transportation to their customers. Arkema reported that its U.S. inland transportation costs were *** percent while eight importers reported costs of 1 to 19 percent.[7]

Pricing practices

Pricing methods

As presented in table V-1, *** all four 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	***	4
Contract	***	---
Set price list	***	---
Other	***	---
Responding firms	1	4

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.

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

Arkema reported selling the majority of its sales through ***, with some sales through *** and very few sales made in the ***. The four responding importers reported selling all of their R-32 in the spot market. As shown in

[5] Importers *** belong to the same company group, though each firm submitted a separate importer questionnaire. Importers *** are also related companies and submitted separate importer questionnaires. Each firm's responses are reported separately throughout this section.

[6] Most importers do not sell R-32 to unrelated parties. Fourteen of the 15 responding importers internally consumed R-32 or transferred it to related parties for blending R-32 into HFC blends. See Part II for a discussion on the end-uses of R-32.

[7] Four importers reported inland transportation costs of 0 percent. Other reported inland transportation costs were: 0.05 percent (***), 0.48 percent (***), 1 percent (***), 2 percent (***), 2.1 percent (***), 4 percent (***), 6 percent (***), 7 percent (***), 8 percent (***), and 19 percent (***).

table V-2, the U.S. producer and importers reported their 2019 U.S. commercial shipments of R-32 by type of sale.

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)	
Long-term contracts	***	***
Annual contract	***	***
Short-term contracts	***	***
Spot sales	***	***

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."[8] 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.[9] [10] Arkema also noted that "even the mere availability of Chinese R-32 can form the basis for renegotiating contract pricing."[11] Arkema reported that its long-term contracts average *** years, and that both short and longer-term contracts have ***. *** importers reported that contracts *** indexed to raw material costs.

Sales terms and discounts

*** all four responding importers quote prices on a delivered basis and no responding firms offer discounts.

[8] Conference transcript, p. 12 (O'Donovan).
[9] Conference transcript, p. 12 (O'Donovan).
[10] Arkema reported that Chinese prices triggered the meet-or-release clause in its contract with ***. Petitioner's postconference brief, p. 23.
[11] Conference transcript, p. 12 (O'Donovan).

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-December 2019. 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 four importers[12] provided usable pricing data for sales of the requested products, and 14 importers[13] provide usable purchase cost data. Pricing data reported by these firms 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 accounted for 89.4 percent of Chinese imports in 2019.

Price data and landed duty-paid ("LDP") purchase cost data[14] for product 1 are presented in table V-3 and figure V-1.[15]

[12] These four importers were: ***.

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

[14] 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.

[15] *** reported purchase cost data for imports that were ***. These companies are ***. *** importer questionnaire responses and staff telephone interview with ***.

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 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 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-December 2019

* * * * * * *

* * * * * * *

Petitioner argued that there are four problems with the pricing and purchase cost data collected. The first is that the purchase cost data does not accurately reflect China's effect on the U.S. market, and that the higher import costs after Q1 2017 do not show the reality that Arkema ***.[16] Secondly, Arkema argued that there is a "dramatic" range of reported values during each quarter.[17] Third, Arkema argued that the ongoing litigation between Chinese supplier T.T. International and importers *** "calls into question the validity" of the data collected.[18] Fourth, Arkema noted that two importers, ***, did not submit questionnaire responses.[19]

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.

Nine of 13 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

[16] Petitioner's postconference brief, pp. 23-24.

[17] Arkema reported that importers' reported purchase costs had a range of variability within quarters of *** to *** percent. Using a more complete data set, staff calculated variability of *** to *** percent within quarters, with the largest variability between minimum and maximum unit values in Q2 2017, Q2 2018, and Q3 2018, when multiple importers noted supply shortages and temporary price spikes in China. Not all importers reported these increases in purchase costs for these quarters. *See* the price and purchase cost trends section for a discussion on the increases in purchase cost data.

[18] Arkema argued that it is "inappropriate" to *** due to ongoing litigation between these companies (referred to as "BMP Group") and their Chinese supplier T.T. International. Arkema stated that these importers ***. Questionnaire responses from *** reported that ***. *** did not address the ongoing litigation in its questionnaire. Petitioner's postconference brief, pp. 24-25. The tables and analysis in this section incorporate the purchase cost data as reported by these firms.

[19] Arkema stated that these two importers imported approximately *** percent of the total volume of subject imports in 2019. Petitioner's postconference brief, p. 25.

or U.S. importer.[20] All nine importers estimated the total additional cost incurred; estimates ranged from 2 to 12 percent compared to the landed duty-paid value.[21] 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
- Logistical management costs – 7 percent
- Container leases – 5 percent
- Container returns – 5 percent[22]
- Ascertained duty – 4 percent
- Chassis rental and storage – 2 percent
- Insurance and other risk management – 2 percent
- Truck insurance – 2 percent[23]
- Warehouse costs – 2 percent
- Heel recovery – 2 percent[24]
- Driver label costs – 1 percent
- Marine insurance – 0.09 percent

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 had varying responses. Some firms reported that they could not compare additional import costs to the additional costs of purchasing from a U.S. producer because they have not purchased or received a quote from Arkema

[20] Importers *** reported they did not incur additional expenses beyond landed duty-paid costs. ***. ***. *** was the only importer to not report purchase cost data.

[21] Importers reported total additional costs of 2 percent (3 firms), 4 percent (2 firms), 8 percent, 10 percent, 11 percent, and 12 percent (1 firm for each).

[22] *** reported this expense as the "freight/duties" to return empty ISO containers to China.

[23] *** noted that its truck insurance is around *** per year.

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

(***).[25] *** reported that the additional costs of purchasing from Arkema was 2 percent compared to the cost for importing of 11 percent. *** noted that the additional costs of importing R-32 are "very small compared to the large benefit of low pricing from imported product."[26]

Six of 13 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, three importers compare costs to purchasing from a U.S. importer, and seven importers do not compare costs of purchasing from either U.S. producers or importers.[27]

Fourteen 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. *** noted that it could not buy additional volumes beyond the contract maximum at existing contract prices during peak seasonal demand. *** noted that continuous supply was a primary concern, and that Arkema had not offered to supply them. *** reported that China is a stable supply source. *** stated 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 noted that it uses its own ISO tanks and is "not restricted by time or monetarily penalized to return the assets as sometimes occurs when {it} purchase{s} from the U.S. producer." *** also reported that the U.S. producer did not have the capacity to meet its demands. Four importers reported that there are cost advantages to importing Chinese R-32 directly instead of purchasing from U.S. producers. *** reported that Chinese R-32 is generally $0.50 to $0.60 per pound cheaper than buying from Arkema, and that in 2018 the firm saved an estimated $700,000 per year. *** reported that lower cost is "the single largest benefit to importing" and that Chinese prices are "roughly 40 percent of the domestic price." *** 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.

[25] ***.

[26] *** did not report additional costs compared to purchasing from a U.S. producer.

[27] Importers *** reported comparing costs to purchasing from a U.S. producer and from a U.S. importer.

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 five importers reported that imports were priced lower when not including the additional costs, and six of seven importers reported that imports were priced lower when including additional costs.[28]

Importers *** estimated that they saved *** percent of landed duty-paid value by importing R-32 rather than purchasing from a U.S. importer, and five importers estimated savings between *** percent compared to purchasing the product from a U.S. producer.[29] Importers reported the following estimated savings by importing themselves rather than purchasing from Arkema: *** – 4 percent, *** – 5 percent, *** – 15 percent, *** – 22 percent, and *** – 50 percent.

Price and purchase cost trends

In general, prices increased during 2017-19. Table V-4 summarizes the price trends by country. As shown in the table, domestic prices increased by *** percent during 2017-19 while import prices decreased by *** percent over the period.[30] Landed duty-paid costs increased by *** percent. Indexed U.S. producer prices show that Arkema's prices *** from Q1 2017 through Q3 2017. Starting in Q4 2017, domestic prices *** throughout 2018 and 2019 (figure V-3). Import purchase costs generally rose from 2017-19. Import purchase costs spiked in Q2 2017 and Q3 2017 before falling and then spiking again in Q2 2018 (figure V-4). Importers reported that supply shortages in China

[28] *** reported that imports were not priced lower when excluding and including the additional costs.

[29] Six firms reported that they based their estimates on previous company transactions, two reported basing their estimates on market research, and four reported other bases for their estimates, including comparing the import cost to Arkema's purchase price based on prior transactions (***). Importers *** noted that they have never purchased R-32 from a U.S. producer or importer, and *** reported that it was "unclear" what methods it used to form its estimates.

[30] Import price changes were determined as the change from Q2 2017 to Q2 2019, the first and last quarters in which importers provided data.

led to temporary price increases, and a shortage of hydrofluoric acid, an input to R-32, also caused temporarily higher prices.[31] [32]

Table V-4
R-32: Summary of weighted-average f.o.b. prices and importer purchase costs

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

Note: Percentage change from the first quarter in which data were available to the last quarter in which price data were available.

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

[31] *** reported that there was a shortage of hydrofluoric acid in May 2017, which coupled with the seasonal high demand for R-32 (due to summer air conditioning season) led to higher prices for R-32 ordered in Q2 2017 and received in Q3 2017. *** reported that the increase in unit purchase cost data for Q2 2018 was due to temporary supply issues in China. *** reported that increased demand in China for refrigerants from air conditioning manufacturers in Q2 and Q3 2018 caused a decline in available supply and a corresponding increase in price. *** reported it did not know the underlying reasons for the price increase in Q2 2018. ***. Telephone interview with ***. ***, email message to USITC staff, February 18, 2020. ***, email message to USITC staff, February 11, 2020. ***, email message to USITC staff, February 13, 2020.

[32] Importers reported prices for 6 of 12 quarters, with non-consecutive quarterly data. An indexed graph of importers' prices is not provided as it is not meaningful with such limited data.

Figure V-3
R-32: Indexed U.S. producer prices, January 2017 through December 2019

* * * * * * *

Figure V-4
R-32: Indexed U.S. importer purchase costs, January 2017 through December 2019

* * * * * * *

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 6 instances (*** pounds); margins of underselling were between *** and *** percent. In the remaining 4 instances (*** pounds), prices for product from China were between *** percent above prices for the domestic product.[33]

Table V-5
R-32: Instances of underselling/overselling and the range and average of margins, by country, January 2017 through December 2019

Source	Underselling				
	Number of quarters	Quantity (pounds)	Average margin (percent)	Margin Range (percent)	
				Min	Max
Pricing data, underselling	2	***	***	***	***
Source	**(Overselling)**				
	Number of quarters	**Quantity (pounds)**	**Average margin (percent)**	**Margin Range (percent)**	
				Min	**Max**
Pricing data, overselling	4	***	***	***	***

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 5 of 12 instances (*** pounds); price-cost differentials ranged from *** percent. In the remaining 7 instances (*** pounds), landed duty-paid costs for R-32 from China were between *** percent above sales prices for the domestic product.[34]

[33] The *** margin of *** percent occurred in Q2 2018 when, as discussed above, multiple importers reported a temporary Chinese R-32 supply shortage which resulted in higher prices.

[34] 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: Comparisons of import purchase costs and U.S.-producer sales prices, January 2017 through December 2019

Source	Import purchase cost data lower than U.S. price				
	Number of quarters	Quantity (pounds)	Price-Cost Difference (percent)	Price-Cost Difference (percent)	
				Min	Max
Purchase costs, underselling	5	***	***	***	***
Source	**Import purchase cost data being higher than U.S. price**				
	Number of quarters	**Quantity (pounds)**	**Price-Cost Difference (percent)**	**Price-Cost Difference (percent)**	
				Min	**Max**
Purchase costs, overselling	7	***	***	***	***

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

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 reported that *** and also reported that it had lost sales. 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). Arkema reported that it had lost sales to *** in 2019, and *** from 2016-19 due to lower priced Chinese imports. Arkema stated that in "late 2016 and early 2017" lower-priced Chinese imports triggered the "meet-and-release" clause in its agreement with *** and resulted in Arkema reducing its price by *** percent. Arkema also reported that *** rejected "multiple offers" from Arkema due to low-priced Chinese imports during 2016-19, and had to lower its price in order to win volumes back. In its negotiations with ***, Arkema stated that it had to reduce its initial price offers "multiple times" due to pressure from Chinese imports.

Staff contacted five purchasers and received responses from six purchasers.[35] Responding purchasers reported purchasing and importing 45,579 short tons of R-32 during 2017-19 (table V-7).

[35] ***.

During 2019, responding purchasers purchased and imported 75.0 percent of their product from U.S. producers and 25.0 percent from China. Purchasers were asked about changes in their purchasing patterns from different sources since 2017. Of the responding purchasers, none reported decreasing purchases of domestic product, one reported increasing purchases, one reported no change, one reported fluctuating purchases, and three did not purchase any domestic product. ***, the only firm that reported it increased purchases of domestic product, explained that it increased purchases due to potential circumvention duties on R-32 from China.[36] *** indicated that its purchases from Arkema were constant due to its ***, and *** reported that its purchases from Arkema fluctuated due to blend demand variability.

Of the six responding purchasers, four reported that since 2017 they had purchased or imported R-32 from China instead of U.S.-produced product.[37] All four of these purchasers reported that subject import prices were lower than U.S.-produced product, and two of these purchasers reported that price was a primary reason for the decision to purchase imported product rather than U.S.-produced product. Two purchasers estimated the quantity of R-32 from China purchased instead of domestic product; quantities ranged from *** short tons to *** short tons (table V-8). Purchasers identified availability as a non-price reason for purchasing Chinese rather than U.S.-produced product.

Of the six responding purchasers, one reported that U.S. producers had reduced prices in order to compete with lower-priced imports from China; four reported that they did not know (table V-9). The reported estimated price reduction was 15 percent and was due to a competitive Chinese price that ***. ***, which indicated it did not know whether U.S. producers had reduced prices, reported that it didn't know the amount that Arkema had reduced prices, but Arkema "did complain about having to compete with low prices from China."

[36] The Department of Commerce is currently conducting four anti-circumvention inquiries related to R-32. Conference transcript, p. 58 (Mintzer).

[37] *** reported that they did not purchase imports instead of product from Arkema and noted that they purchased Chinese product due to "service excellence," high quality, and supply chain continuity that allowed for establishing production schedules at least six months in advance.

Table V-7
R-32: Purchasers' reported purchases and imports, 2017-19

Purchaser	Purchases and imports in 2017-19 (short tons)			Change in domestic share (pp, 2017-19)	Change in subject country share (pp, 2017-19)
	Domestic	Subject	All other		
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
Total	35,169	10,410	***		

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.

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

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--4; No--2	Yes--4; No--0	Yes--2; No--4	2,296	

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

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

Purchaser	Producers reduced price (Y/N)	If produced reduced prices:	
		Estimated U.S. price reduction (percent)	Additional information, if available
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
Total / average	Yes--1; No--1	15.0	

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 importer questionnaire and noted that Arkema was not willing to offer additional volumes beyond the contract maximum during peak seasonal demand. *** reported that they did not know Arkema's prices as it had never offered to supply either company.

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 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. A variance analysis of overall financial results is presented in table VI-3.[4] Table VI-4 and table VI-5 present financial results specific to open

[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.

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

[3] Arkema U.S. producer questionnaire, response to II-2. ***. Petitioner's postconference brief, Exhibit 1, p. 1.

[4] The Commission's traditional variance analysis is calculated in three parts: sales variance, 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, 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, it appears reasonable to assume that effective product mix also varied. While the Commission's variance analysis is generally more meaningful when product mix and/or customer mix remains the same throughout the period, implied changes in R-32 product mix do not appear substantial enough to undermine the utility of the variance analysis.

market operations (commercial sales only) and corresponding changes in average per short ton values. A variance analysis of open market operations financial results is presented in table VI-6.

Revenue

On a quantity basis and with respect to overall operations, R-32 *** ranged from *** percent of total sales (2016) to *** percent (2019),[5] *** ranged from *** percent (2019) to *** percent (2017), and *** ranged from *** percent (2018) to *** percent (2017).[6] *** sales, accounting for a relatively small share of total sales, ranged from *** percent (2017) to *** percent (2018). Physical differences in R-32 product mix are reportedly minimal and primarily reflect packaging type.[7]

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

[6] ***. Petitioner's postconference brief, Exhibit 3. P. 1. ***.

With respect to the GAAP accounting treatment in general, ***. Wiley GAAP 2012, pp. 830-831. ***.

[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.

Table VI-1
R-32: Results of overall operations of the U.S. producer, 2017-19

Item	Calendar Year		
	2017	2018	2019
	Quantity (short tons)		
Commercial sales	***	***	***
Transfers to related firms	***	***	***
Internal consumption	***	***	***
Swaps	***	***	***
Total net sales	***	***	***
	Value (1,000 dollars)		
Commercial sales	***	***	***
Transfers to related firms	***	***	***
Internal consumption	***	***	***
Swaps	***	***	***
Total net sales	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Total COGS	***	***	***
Gross profit or (loss)	***	***	***
SG&A expense	***	***	***
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 net sales (percent)		
Cost of goods sold.-- Raw materials	***	***	***
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 VI-1—Continued
R-32: Results of overall operations of the U.S. producer, 2017-19

Item	Calendar Year		
	2017	2018	2019
	Ratio to total COGS (percent)		
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Average COGS	***	***	***
	Unit value (dollars per short ton)		
Commercial sales	***	***	***
Transfers to related firms	***	***	***
Internal consumption	***	***	***
Swaps	***	***	***
Total net sales	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Average COGS	***	***	***
Gross profit or (loss)	***	***	***
SG&A expense	***	***	***
Operating income or (loss)	***	***	***
Net income or (loss)	***	***	***
	Number of firms reporting		
Data	1	1	1
Operating losses	***	***	***
Net losses	***	***	***

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

Table VI-2
R-32: Changes in AUV's (overall operations), 2017-19

Item	Between calendar years		
	2017-19	2017-18	2018-19
	Change in AUVs (dollars per short ton)		
Commercial sales	***	***	***
Transfers to related firms	***	***	***
Internal consumption	***	***	***
Swaps	***	***	***
Total net sales	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
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 overall financial results of the U.S. producer, 2017-19

Item	Calendar year		
	2017-19	2017-18	2018-19
	Value (1,000 dollars)		
Net sales: Price variance	***	***	***
Volume variance	***	***	***
Total net sales variance	***	***	***
COGS: Cost variance	***	***	***
Volume variance	***	***	***
Total net cost of sales variance	***	***	***
Gross profit variance	***	***	***
SG&A expenses: Expense variance	***	***	***
Volume variance	***	***	***
Total SG&A 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.

Table VI-4
R-32: Results of open market operations of the U.S. producer, 2017-19

Item	Calendar Year		
	2017	2018	2019
	Quantity (short tons)		
Commercial net sales	***	***	***
	Value (1,000 dollars)		
Commercial net sales	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Total COGS	***	***	***
Gross profit or (loss)	***	***	***
SG&A expense	***	***	***
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 net sales (percent)		
Cost of goods sold.-- Raw materials	***	***	***
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 VI-4—Continued
R-32: Results of open market operations of the U.S. producer, 2017-19

Item	Calendar Year		
	2017	2018	2019
	Ratio to total COGS (percent)		
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Average COGS	***	***	***
	Unit value (dollars per short ton)		
Commercial sales	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Average COGS	***	***	***
Gross profit or (loss)	***	***	***
SG&A expense	***	***	***
Operating income or (loss)	***	***	***
Net income or (loss)	***	***	***
	Number of firms reporting		
Data	1	1	1
Operating losses	***	***	***
Net losses	***	***	***

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

Table VI-5
R-32: Changes in AUV's (open market operations), 2017-19

Item	Between calendar years		
	2017-19	2017-18	2018-19
	Change in AUVs (dollars per short ton)		
Average commercial sales value	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
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-6
R-32: Variance analysis of the open market financial results of the U.S. producer, 2017-19

Item	Calendar years		
	2017-19	2017-18	2018-19
	Value (1,000 dollars)		
Total net sales: Price variance	***	***	***
Volume variance	***	***	***
Commercial sales variance	***	***	***
Net cost of sales: Cost variance	***	***	***
Volume variance	***	***	***
Total net cost of sales variance	***	***	***
Gross profit variance	***	***	***
SG&A expenses: Expense variance	***	***	***
Volume variance	***	***	***
Total SG&A 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.

Quantity

While overall R-32 sales quantity increased *** percent in 2018 and then declined *** percent in 2019, the directional pattern of the revenue subcategories was not uniform: commercial sales *** throughout the period, internal consumption *** to its *** level in 2018 and then *** to its *** level in 2019, and *** fluctuated but remained within a relatively narrow range. *** fluctuated sharply on a percentage basis.

With regard to the pattern of sales volume in general, Arkema attributed the pattern of R-32 sold during the period to a combination of ***.[8]

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

Value

Directionally, overall average per short ton R-32 sales value increased during the full-year period. Similar to sales quantity, however, revenue subcategories reflect different directional patterns: average commercial sales and internal consumption values ***, by varying magnitudes, while average *** declined (2018) and then marginally increased (2019), ending the period at essentially the same average value as it began.[9] [10] While the positive and negative changes in average *** were notable, this category of revenue accounts for a small share of total R-32 sales.[11]

The revenue section of the overall 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 2018-19, the decline in overall revenue was due to a negative volume variance, which was partially offset by a positive price variance. In contrast and with respect to open market operations, commercial sales increased throughout the period. As shown in the revenue section of the open market operations variance analysis (table VI-6), the increase in revenue between 2017-18 reflects a positive volume variance and a positive price variance, both of similar magnitudes, while the increase between 2018-19 primarily reflects a positive volume variance, amplified by a smaller positive price variance.

[9] ***. Petitioner's postconference brief, Exhibit 3, p. 1.
[10] ***. Petitioner's postconference brief, Exhibit 1, pp. 1-2.
[11] ***. Petitioner's postconference brief, Exhibit 3, p. 2.

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 (2019). Raw material cost shares for open market operations (table VI-4) were essentially the same as overall operations.

R-32 raw material costs, while primarily representing two material inputs (chlorinated sulfate and hydrofluoric acid),[12] also include assigned ***.[13] In 2019, the share of total raw material cost accounted for by chlorinated sulfate and hydrofluoric acid was *** percent and *** percent, respectively.[14]

On an average per short ton basis, raw material cost increased throughout the period, primarily reflecting ***.[15] [16] The relatively *** difference between average raw material cost for merchant only operations (***) and overall operations (***), was attributed to ***.[17]

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

[13] Postconference brief, Exhibit 2, p. 4.

[14] Arkema U.S. producer questionnaires, response III-9d. Arkema purchases its primary raw material inputs from third parties; i.e., Arkema's R-32 manufacturing overhead and/or direct labor are not included in reported raw material costs. Conference transcript (O'Donovan), p. 39.

[15] ***. Petitioner's postconference brief, Exhibit 1, p. 2.

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

[17] Petitioner's postconference brief, Exhibit 1, p. 2.

Direct labor and other factory costs

On an overall basis, direct labor is the smallest component of total COGS, ranging from *** percent (2019) to *** percent (2017). While average per short ton direct labor cost fluctuated somewhat, it remained within a relatively narrow range throughout the period. For overall operations, other factory costs, the second largest component of COGS, ranged from *** percent (2019) to *** percent (2017).[18] As described by Arkema and because direct labor and other factory costs are *** contributed to the overall increase in average COGS during the period.[19]

For open market operations (table VI-4), the cost shares of direct labor and other factory costs were essentially the same as overall operations. On an average per short ton basis, the difference between other factory costs for open market operations (***) and overall operations (***), was attributed to ***.

COGS

While changes in average per short ton other factory costs (positive and negative) also impacted average COGS, the period-to-period increases in average R-32 COGS (overall and open market operations) were largely due to higher average raw material costs.

Gross profit or loss

While positive throughout the period, total gross profit amounts for overall and open market operations fluctuated. In 2018 and in conjunction with the highest level of total revenue and highest gross profit ratio (total gross profit divided by total revenue), gross profit for overall operations reached its highest level. While open market operations reached its highest revenue level in 2019, absolute gross profit in that year was marginally lower compared to 2018,

[18] ***. Petitioner's postconference brief, Exhibit 2, p. 4. ***. Petitioner's postconference brief, Exhibit 2, p. 5.

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

reflecting a decline in its gross profit ratio. For both categories, the expansion of gross profit ratios in 2018 followed by contraction in 2019 generally reflects the pattern of average sales value and COGS: in 2018, percentage increases in average COGS, principally driven by higher average raw material costs, were smaller than corresponding percentage increases in average sales value; in 2019, percentage increases in average COGS, again principally driven by higher average raw material costs, were greater than corresponding percentage increases in average sales value.[20]

SG&A expenses and operating income or loss

For both overall and open market operations, total SG&A expenses increased throughout the period. Corresponding SG&A expense ratios (total SG&A expenses divided by total revenue) for both categories fluctuated but remained within relatively narrow ranges throughout the period. The pattern of *** SG&A expense ratios for open market operations (table VI-4) compared to overall operations (table VI-1) was attributed to the assignment of ***.[21]

Given the more substantial changes in gross profit during the period, corresponding changes in SG&A expenses were secondary in terms of explaining the pattern of R-32 operating results.

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

Directionally, the pattern of operating and net results was the same for both overall and open market operations: increasing on an absolute basis (2018) and then declining (2019). Because *** were reported for both categories and *** were not, absolute differences between operating results and net results reflect ***.[22]

[20] ***. Postconference brief, Exhibit 3, pp. 1-2.
[21] Postconference brief, Exhibit 2, p. 4.
[22] ***. Ibid.

Capital expenditures and research and development expenses

Table VI-7 presents Arkema's capital expenditures and research and development (R&D) expenses related to R-32.

Table VI-7
R-32: Capital expenditures and research and development (R&D) expenses of the U.S. producer, 2017-19

Item	Calendar year		
	2017	2018	2019
	Value (1,000 dollars)		
Total capital expenditures	***	***	***
Total R&D expenses	***	***	***

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

Remaining within a relatively narrow range, Arkema's total capital expenditures *** to their *** level in 2018 and then *** to their *** level in 2019.[23] With the exception of ***, when separately-reported depreciation expense for overall operations *** corresponding capital expenditures, capital expenditures were in the *** as depreciation throughout the period. See footnote 18 regarding the *** level of reported depreciation in ***.

Table VI-7 shows that Arkema reported *** levels of R&D expenses throughout the period.

Assets and return on assets

Table VI-8 presents data on the U.S. producers' total net assets and operating return on net assets related to R-32 operations.[24]

[23] ***. Petitioner's postconference brief, Exhibit 2, p. 5.

[24] 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 discrete product lines affects the meaningfulness of operating return on net assets.

Table VI-8
R-32: Total net assets and operating return on net assets of the U.S. producer, 2017-19

Firm	Calendar year		
	2017	2018	2019
	Total net assets (1,000 dollars)		
Total net assets	***	***	***
	Operating return on assets (percent)		
Average operating return on net assets	***	***	***

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-9 tabulates the responses regarding actual negative effects on investment, growth, and development, as well as anticipated negative effects. Table VI-10 presents the narrative responses of the U.S. producer regarding actual and anticipated negative effects on investment, growth, and development.

Table VI-9
R-32: Negative effects of imports from subject sources 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-10
R-32: Narrative responses of the U.S. producer regarding actual and anticipated negative effects of imports from subject sources 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] While the Commission did not receive any responses from foreign producers of R-32, one firm, Weitron International (Kunshan) Co. Ltd., provided data regarding its export operations. This firm's data is presented below in table VII-1.[4] Information regarding four of the foreign producers identified in the petition is presented below.

Table VII-1
R-32: Summary data on resellers in China exporting to the United States, 2019

Firm	Resales exported to the United States (short tons)	Share of resales exported to the United States (percent)
Weitron International (Kunshan) Co. Ltd.	***	***
Total	***	***

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

Changshu 3f Zhonghao New Chemical Materials Co., Ltd. founded in 1975, is a subsidiary of Shanghai 3F New Chemical Materials Co., Ltd. (a subsidiary of Shanghai Huayi Group Co.). The company employs a staff of 1,150, and produces fluorinated refrigerants, including R-32, fire extinguishing agents, aerosol propellants, and foaming agents. The company reportedly exports to more than 50 countries or regions.[5]

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

[4] Staff received an email response from *** after questionnaires were transmitted to foreign producers stating that the firm's operations were essentially shuttered during the Commission's questionnaire issuance period and deadline, owing to the Chinese government-mandated closure of business and other operations in several provinces in China as a result of an outbreak of COVID-19 (coronavirus). Email from ***, February 4, 2020. This information was also reported by representatives of ***. Email from ***, February 5, 2020.

[5] Changshu 3f Zhonghao New Chemical Materials Co., Ltd., "About Us", http://www.3f-cs.com/index_en.html, retrieved February 26, 2020.

Shandong Dongyue Chemical Co., Ltd. ("Shandong Dongyue") is part of the Dongyue Group, founded in 1987.[6] The firm is a producer of refrigerants, including R-32, fine chemical products such as PTFE, and other related products.[7]

Zibo Feiyuan Chemical Co., Ltd. ("Zibo Feiyuan"), a producer of R-32 based in Zibo City, Shandong Province, was established in 2004, and began production in 2005. The company produces R-32, refrigerant components such as R-134a, R-22, and R-125, refrigerant blends such as R-407C and R-410a, as well as other chemicals such as sulfur hexafluoride.[8] Zibo Feiyuan claims to have an annual output of 20,000 metric tons (22046 short tons) of R-32, and produces to the standards of ISO9000, ISO14000, and ISO18000.[9]

T.T. International Co., Ltd. (T.T.I.) is a producer of R-32 based in Dalian, Liaoning. T.T.I. produces refrigerant components such as R-125, R-134a, and R-152a, as well as firefighting equipment, disposable cylinders that meet DOT and CE specifications, and other related products.[10]

Exports

According to GTA, the leading export markets for merchandise classified under HS subheading 2903.39, which includes merchandise other than R-32 from China were the United States, Japan, and the Netherlands. During 2019, the United States was the top export market for R-32 from China, accounting for over 25 percent of exports of merchandise under subheading 2903.39 by quantity, followed by Japan and the Netherlands, accounting for 7.0 and 5.7 percent, respectively.

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[6] Dongyue Federation, "Group Profile", http://www.dongyuechem.com/en/About.aspx, retrieved February 26, 2020.

[7] Dongyue Federation, "Products", http://www.dongyuechem.com/en/Pro.aspx, retrieved February 26, 2020.

[8] Zibo Feiyuan Chemical Co., Ltd., "Product Show", http://en.feiyuanchem.com/list/?5_1.html, retrieved February 24, 2020.

[9] Zibo Feiyuan Chemical Co., Ltd., "Company Profile", http://en.feiyuanchem.com/about/?24.html, retrieved February 24, 2020.

[10] T.T. International Co., Ltd., "Products", http://www.chinarefrigerant.com/default.htm, retrieved February 24, 2020.

Table VII-2
Fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons: Exports from China by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (short tons)		
United States	65,437	74,571	73,245
Japan	19,169	20,551	20,177
Netherlands	32,056	34,476	16,405
Brazil	8,985	9,719	15,634
South 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	90,359	97,562	108,165
Total exports	261,165	287,927	288,917
	Value (1,000 dollars)		
United States	300,231	361,196	266,881
Japan	83,062	99,758	92,857
Netherlands	201,912	235,795	104,283
Brazil	30,356	38,412	47,041
South 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	320,258	428,864	401,956
Total exports	1,094,221	1,368,654	1,120,958

Table continued on next page.

Table VII-2--Continued
Fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons: Exports from China by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Unit value (dollars per short ton)		
United States	4,588	4,844	3,644
Japan	4,333	4,854	4,602
Netherlands	6,299	6,839	6,357
Brazil	3,379	3,952	3,009
South 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
Total exports	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
South 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
Total exports	100.0	100.0	100.0

Note.-- United States is shown at the top, all remaining top export destinations shown in descending order of 2019 data. Quantity conversion rate divided by 907.18474.

Source: Official exports statistics under HS subheading 2903.39 as reported by China Customs in the Global Trade Atlas database, accessed February 7, 2020.

U.S. inventories of imported merchandise

Table VII-3 presents data on U.S. importers' reported end-of-period inventories of R-32. While inventories of imports *** between 2017 and 2018, these inventories then fell by *** percent from 2018 to 2019, ending *** percent lower in 2019 than in 2017. *** out of 15 importers reported end-of-period inventories in at least one year during 2017-19, with the largest reported by *** of reported inventories in 2018.[11]

Table VII-3
R-32: U.S. importers' end-of-period inventories of imports by source, 2017-19

Item	Calendar year		
	2017	2018	2019
	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.

[11] ***.

U.S. importers' outstanding orders

The Commission requested U.S. importers to indicate whether they imported or arranged for the importation of R-32 from China after December 31, 2019. Data for the *** responding firms are presented below in table VII-4.

Table VII-4
R-32: Arranged imports, January 2020 through December 2020

Item	Period				
	Jan-Mar 2020	Apr-Jun 2020	Jul-Sept 2020	Oct-Dec 2020	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

There are no known antidumping or countervailing duty orders on R-32 in third-country markets.[12]

[12] Conference transcript, p. 43 (Mintzer).

Information on nonsubject countries

China is the world's largest producer and consumer of fluorocarbons, supplying approximately *** percent the global demand in 2017.[13] In 2017, China comprised *** percent of global R-32 production capacity and the United States comprised *** percent of global production capacity.[14] Japan, Spain and the United Kingdom are the only nonsubject countries identified with capacity to produce R-32.[15] These three nonsubject countries comprise the remaining *** percent of global production capacity, as shown in Table VII-5. However, there were *** nonsubject imports into the U.S. market during the POI.[16]

Table VII-5
R-32: Global average capacity, 2017

Country	Average annual capacity (short tons)	Percentage of total
China	***	***
USA	***	***
Japan	***	***
Spain	***	***
United Kingdom	***	***
Total	***	***

Note: Due to rounding, figures may not add up to 100.0.

Source: IHS, Chemicals Economic Handbook, Fluorocarbons, September 2017, p. 41, 70, 90, 106, converted to short tons.

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-6.[17] The largest global exporter is China, with a 54.6 percent share of quantity (287,927 short tons) in 2018, followed by the United States with a share of 18.3 percent (96,495 short tons), the Netherlands with a share of 7.3 percent (38,761 short tons), Japan with a share of 3.2 percent (17,053 short tons), and the United Kingdom with a share of 2.8 percent (14,983 short tons).

[13] IHS, Chemicals Economic Handbook, Fluorocarbons, September 2017, p. 4.
[14] IHS, Chemicals Economic Handbook, Fluorocarbons, September 2017, p. 41, 70, 90 and 106.
[15] Petition, Exhibit 1-2 (2017 IHS Report, p. 70, 90).
[16] Petition Exhibit I-1 (*** Import Data).
[17] Excludes ethylene dibromide (ISO) (1,2-dibromoethane).

Table VII-6
Fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons: Global exports by exporter, 2016-18.

Exporter	Calendar year		
	2016	2017	2018
	Quantity (short tons)		
United States	80,451	108,195	96,495
China	238,730	261,165	287,927
Netherlands	27,500	38,714	38,761
Japan	15,831	16,669	17,053
United Kingdom	12,612	14,797	14,983
Germany	11,148	13,615	12,375
France	19,595	13,588	10,111
India	5,346	12,530	8,537
Poland	278	947	7,983
Belgium	9,893	8,216	7,670
Italy	4,352	4,413	4,031
United Arab Emirates	1,288	3,366	3,079
All other exporters	19,219	19,013	18,603
Total	446,242	515,228	527,608
	Value (1,000 dollars)		
United States	453,210	639,777	767,461
China	811,900	1,094,221	1,368,654
Netherlands	454,207	712,082	875,570
Japan	250,205	278,261	268,017
United Kingdom	87,097	103,039	129,230
Germany	77,347	110,544	149,526
France	102,841	85,189	77,963
India	29,789	55,647	54,215
Poland	1,885	10,287	31,702
Belgium	60,510	50,180	59,413
Italy	30,714	35,647	61,182
United Arab Emirates	3,874	12,628	13,392
All other exporters	133,224	134,853	193,390
Total	2,496,803	3,322,356	4,049,714

Table continued on next page.

Table VII-6--Continued
Fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons: Global exports by exporter, 2016-18.

Exporter	Calendar year		
	2016	2017	2018
	Unit value (dollars per short ton)		
United States	5,633	5,913	7,953
China	3,401	4,190	4,753
Netherlands	16,517	18,394	22,589
Japan	15,805	16,693	15,717
United Kingdom	6,906	6,964	8,625
Germany	6,938	8,120	12,083
France	5,248	6,269	7,711
India	5,572	4,441	6,350
Poland	6,788	10,860	3,971
Belgium	6,116	6,107	7,746
Italy	7,058	8,078	15,178
United Arab Emirates	3,008	3,752	4,349
All other exporters	6,932	7,093	10,396
Total	5,595	6,448	7,676
	Share of quantity (percent)		
United States	18.0	21.0	18.3
China	53.5	50.7	54.6
Netherlands	6.2	7.5	7.3
Japan	3.5	3.2	3.2
United Kingdom	2.8	2.9	2.8
Germany	2.5	2.6	2.3
France	4.4	2.6	1.9
India	1.2	2.4	1.6
Poland	0.1	0.2	1.5
Belgium	2.2	1.6	1.5
Italy	1.0	0.9	0.8
United Arab Emirates	0.3	0.7	0.6
All other exporters	4.3	3.7	3.5
Total	100.0	100.0	100.0

Note.-- Data for 2019 is underreported therefore not presented in this table. Excludes ethylene dibromide (ISO) (1,2-dibromoethane). Quantity conversion rate divided by 907.18474

Source: Official exports statistics under HS subheading 2903.39 reported by various national statistical authorities in the Global Trade Atlas database, accessed February 7, 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

APPENDIX B

LIST OF STAFF CONFERENCE WITNESSES

CALENDAR OF PUBLIC PRELIMINARY CONFERENCE

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

Subject: Difluoromethane (R-32) from China

Inv. No.: 731-TA-1472 (Preliminary)

Date and Time: February 13, 2020 - 9:30 a.m.

Sessions were held in connection with this preliminary phase investigation in The Main Hearing Room (Room 101), 500 E Street, SW., Washington, DC.

OPENING REMARKS:

In Support of Imposition (**Sydney H. Mintzer**, Mayer Brown LLP)

In Support of the Imposition of Antidumping Duty Orders:

Mayer Brown LLP
Washington, DC
on behalf of

Arkema Inc.

Anthony O'Donovan, Regional President, Fluorochemicals, Arkema Inc.

Scot A. Swan, Global Market Manager, Air Conditioning & Refrigeration, Fluorochemicals, Arkema Inc.

Seth Kaplan, President, International Economic Research, LLC

Isaac Kaplan, Research Analyst, International Economic Research, LLC

Sydney H. Mintzer)
) – OF COUNSEL
Timothy Lee)

CLOSING REMARKS:

In Support of Imposition (**Sydney H. Mintzer**, Mayer Brown LLP)

APPENDIX C

SUMMARY DATA

Table C-1
R-32: Summary data concerning the U.S. market, 2017-19
(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			Comparison years		
	2017	2018	2019	2017-19	2017-18	2018-19
U.S. consumption quantity:						
Amount	***	***	***	▲***	▲***	▲***
Producers' share (fn1)	***	***	***	▼***	▼***	▼***
Importers' share (fn1):						
China	***	***	***	▲***	▲***	▲***
Nonsubject sources	***	***	***	***	***	***
All import sources	***	***	***	▲***	▲***	▲***
U.S. consumption value:						
Amount	***	***	***	▲***	▲***	▼***
Producers' share (fn1)	***	***	***	▼***	▼***	▲***
Importers' share (fn1):						
China	***	***	***	▲***	▲***	▼***
Nonsubject sources	***	***	***	***	***	***
All import sources	***	***	***	▲***	▲***	▼***
U.S. importers' U.S. shipments 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	***	***	***	▼***	▲***	▼***

Table C-1--Continued
R-32: Summary data concerning the U.S. market, 2017-19
(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			Comparison years		
	2017	2018	2019	2017-19	2017-18	2018-19
U.S. producers':--Continued						
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	***	***	***	▲***	▼***	▲***
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	***	***	***	▼***	▲***	▼***
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)	***	***	***	▼***	▲***	▼***

Notes:

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.

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