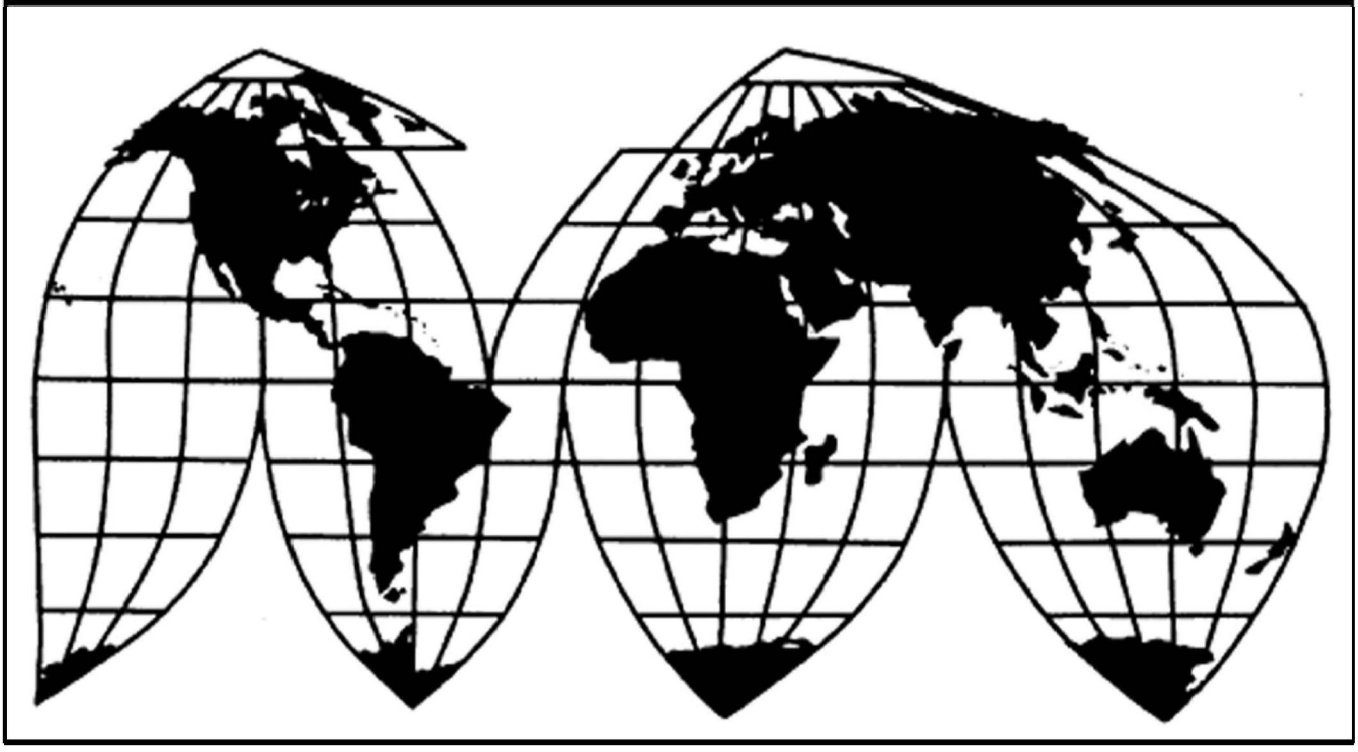
Ultra-High Molecular Weight Polyethylene from Korea

Investigation No. 731-TA-1474 (Preliminary)

Publication 5048 **April 2020**

U.S. International Trade Commission



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U.S. International Trade Commission

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-1474 (Preliminary)

Ultra-High Molecular Weight Polyethylene from Korea

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 or threatened with material injury by reason of imports of ultra-high molecular weight polyethylene from Korea, provided for in subheadings 3901.10.10 and 3901.20.10 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 section 733(b) of the Act, or, if the preliminary determination is negative, upon notice of an affirmative final determination in that investigation under section 735(a) of the Act. Parties that filed entries of appearance in the preliminary phase of the investigation need not enter a separate appearance for the final phase of the investigation. Industrial users, and, if the merchandise under investigation is sold at the retail level, representative consumer organizations have the right to appear as parties in Commission antidumping 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.

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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] Ultra-High Molecular Weight Polyethylene from the Republic of Korea: Initiation of Less-Than-Fair-Value Investigation (85 FR 17861, March 31, 2020).

BACKGROUND

On March 4, 2020, Celanese Corporation, Irving, Texas 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 ultra-high molecular weight polyethylene from Korea. Accordingly, effective March 4, 2020, the Commission instituted antidumping duty investigation No. 731-TA-1474 (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* on March 10, 2020 (*85 FR 13922*). In light of the restrictions on access to the Commission building due to the COVID-19 pandemic, the Commission conducted its conference (originally scheduled for March 24, 2020) through written questions, submissions of written testimony, written responses to questions, and postconference briefs; all persons who requested the opportunity were permitted to participate.

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 ultra-high molecular weight polyethylene ("UHMWPE") from Korea that are allegedly sold in the United States at less than fair value.

I. The Legal Standard for Preliminary Determinations

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

II. Background

Petitioner Celanese Corporation ("Petitioner" or "Celanese") filed the petition in this investigation effective March 4, 2020. Petitioner is a U.S. producer of UHMWPE. Petitioner submitted an opening statement and postconference brief.[3]

One respondent entity actively participated in this investigation. Korea Petrochemical Ind. Co., Ltd. ("Respondent" or "KPIC"), the sole Korean producer/exporter of UHMWPE, submitted an opening statement and postconference brief.

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[1] 19 U.S.C. §§ 1671b(a), 1673b(a); *see also American Lamb Co. v. United States*, 785 F.2d 994, 1001-04 (Fed. Cir. 1986); *Aristech Chem. Corp. v. United States,* 20 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).

[3] In light of the restrictions on access to the Commission building due to the COVID-19 pandemic, the Commission conducted its conference (originally scheduled for March 24, 2020) through opening statements, written questions, submissions of written testimony, written responses to questions, and postconference briefs as set forth in procedures provided to the parties.

U.S. industry data are based on the questionnaire responses of two producers, accounting for all known U.S. production of UHMWPE in 2019.[4] U.S. import data are based on data submitted in response to the Commission's importer questionnaires.[5] The Commission received a useable questionnaire response from KPIC, the only known producer/exporter of UHMWPE in Korea, accounting for 100 percent of U.S. imports of subject merchandise from Korea in 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 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

[4] Confidential Report ("CR") at I-4 & Table III-1; Public Report ("PR") at I-4 & Table III-1. Petitioner Celanese and Braskem America, Inc. ("Braskem") are the only two known domestic producers of UHMWPE. In 2019, Celanese accounted for *** percent of domestic production of UHMWPE while Braskem accounted for *** percent of domestic production. CR/PR at Table III-1. While Celanese submitted a complete U.S. Producers' questionnaire, Braskem submitted an incomplete U.S. Producers' questionnaire, which included limited trade data, no financial data, and no pricing data, citing constraints resulting from COVID-19. CR/PR at I-4 n.7 & III-1 n.1. ***. ***, emails to USITC staff, March 25, March 31 and April 1, 2020. CR/PR at III-1 n.1. Braskem's webpage states that it is "the largest petrochemical company in the Americas and the world's leading biopolymer producer" with production in Argentina, Brazil, Germany, Mexico, and the United States. Braskem produces polyethylene (PE), polypropylene (PP) and polyvinyl chloride (PVC) resins, as well as basic petrochemicals such as ethylene, propylene, butadiene, chlorine, benzene, toluene, and others. *Id*.

[5] The Commission received questionnaire responses or other data from nine importers, representing 100 percent of subject imports of UHMWPE in 2019 under Harmonized Tariff Schedule ("HTS") statistical reporting numbers 3901.10.10.00 and 3901.20.10.00, which are broad product categories that also include other ethylene polymers with a relative viscosity of 1.44 or more. CR/PR at I-4, IV-1, & Tables IV-1-2. While U.S. importer Braskem did not provide a U.S. Importers' questionnaire response, it provided staff with quantity and value data for commercial U.S. shipments, which included both U.S. produced and imported UHMWPE, and separate quantity and value data for commercial U.S. shipments, including only U.S. produced UHMWPE. Staff estimated the quantity and value of imports as the difference between both sets of commercial U.S. shipments data. Braskem confirmed that its UHMWPE imports between 2017 and 2019 were sourced from ***. CR/PR at IV-1 n.9.

[6] CR/PR at VII-3 & Table VII-1.

[7] 19 U.S.C. § 1677(4)(A).

[8] 19 U.S.C. § 1677(4)(A).

"domestic like product" as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation."[9]

By statute, the Commission's "domestic like product" analysis begins with the "article subject to an investigation," *i.e.*, the subject merchandise as determined by Commerce.[10] Therefore, Commerce's determination as to the scope of the imported merchandise that is subsidized and/or sold at less than fair value is "necessarily the starting point of the Commission's like product analysis."[11] The Commission then defines the domestic like product in light of the imported articles Commerce has identified.[12] 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.[13] No single factor is dispositive, and the Commission may consider other factors it deems relevant based on the facts of a particular investigation.[14] The

[9] 19 U.S.C. § 1677(10).

[10] 19 U.S.C. § 1677(10). The Commission must accept Commerce's determination as to the scope of the imported merchandise that is subsidized and/or sold at less than fair value. *See*, *e.g.*, *USEC, Inc. v. United States*, 34 Fed. App'x 725, 730 (Fed. Cir. 2002) ("The ITC may not modify the class or kind of imported merchandise examined by Commerce."); *Algoma Steel Corp. v. United States,* 688 F. Supp. 639, 644 (Ct. Int'l Trade 1988), *aff'd*, 865 F.3d 240 (Fed. Cir.), *cert. denied*, 492 U.S. 919 (1989).

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

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

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

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

Commission looks for clear dividing lines among possible like products and disregards minor variations.[15]

A. Scope Definition

In its notice of initiation, Commerce defined the imported merchandise within the scope of this investigation as follows:

> The merchandise covered by the scope is ultra-high molecular weight polyethylene. Ultra-high molecular weight polyethylene is a linear polyethylene, in granular or powder form. It is defined by its melt mass-flow rate of <0.1 g/10 min, measured at 190°C and 21.6 kg load, based on the methods and calculations set forth in the International Organization for Standardization (ISO) standards 21304-1 and 21304-2. Ultra-high molecular weight polyethylene has a Chemical Abstract Service (CAS) registry number of 9002-88-4.
>
> The scope includes all ultra-high molecular weight polyethylene in granular or powder forms meeting the above specifications regardless of additives introduced in the manufacturing process. Ultra-high molecular weight polyethylene blended with other products is included in the scope of this investigation where ultra-high molecular weight polyethylene accounts for more than 50 percent, by actual weight, of the blend and the resulting blend maintains a melt mass-flow rate of <0.1 g/10 min.
>
> Excluded from the scope of the investigation is medical-grade ultra-high molecular weight polyethylene. Medical grade ultra-high molecular weight polyethylene has a minimum viscosity of 2000 ml/g at a concentration of 0.02% at 135°C (275°F) in decahydronaphthalene and an elongational stress of 0.2 MPa or greater. Medical-grade ultra-high

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

> molecular weight polyethylene is further defined by its ash and trace element content, which shall not exceed the following maximum quantities as set forth in ISO-5834-1: ash (125 mg/kg), titanium (40 mg/kg), calcium (5 mg/kg), chlorine (30 mg/kg), and aluminum (20 mg/kg). ISO 5834-1 further defines medical grade ultra-high molecular weight polyethylene by its particulate matter content, which requires that there shall be no more than three particles of contaminant per 300 ± 20 g tested. Each of the above criteria is calculated based on the standards and methods used in ISO 5834-1.[16]

UHMWPE is an extremely high viscosity, linear polyethylene, typically in the form of a granule or powder.[17] UHMWPE belongs to the polyethylene family of polymers, which includes high density polyethylene (HDPE), low density polyethylene (LDPE), linear low density polyethylene (LLDPE), high molecular weight polyethylene (HMWPE), and very-high molecular weight polyethylene (VHMWPE).[18] UHMWPE is physically distinguishable when compared to these other types of polyethylene due to its higher molecular weight.[19] The molecular weight of HDPE typically ranges from 50,000 to 250,000 grams per mole, while UHMWPE produced by Petitioner ranges from 3.4 million to 10.2 million grams per mole.[20] UHMWPE has extremely long polymer chains, and these longer chains serve to transfer load more effectively to the polymer backbone by strengthening intermolecular interactions.[21] This causes UHMWPE to be very tough and gives it the highest impact strength of the different types of polyethylene.[22]

UHMWPE has unique characteristics, including a low coefficient of friction, nonstick surface, chemical resistance, energy absorption, and abrasion resistance.[23] It can be molded by downstream end users for processing into various finished products.[24] It is used for unique

[16] Ultra-High Weight Molecular Polyethylene from Korea: Initiation of Less-Than-Fair-Value Investigation, 85 Fed. Reg. 17861, 17865 (March 31, 2020).

[17] CR/PR at I-6.

[18] CR/PR at I-6.

[19] CR/PR at I-6-7.

[20] CR/PR at I-7.

[21] CR/PR at I-7.

[22] CR/PR at I-7.

[23] CR/PR at I-7.

[24] CR/PR at I-7.

applications and end uses compared to other polyethylene products, including applications that require a higher level of durability and resistance.[25]

UHMWPE is 15 times more resistant to abrasion than carbon steel and, in certain applications, it can replace steel.[26] UHMWPE is best suited to replace steel in applications where wear resistance, toughness, weight, and noise reduction are key considerations.[27] These include chain/belt drivers, curved guides, chain and belt deflecting and tensioning devices, bearing bushes, track disks and impact-absorbing elements.[28] Sheets of UHMWPE (*e.g.*, 8-20 mm thickness) are often used for lining silos, bunkers, chutes, truck loading platforms, dump trucks, rail wagons, and ships' holds.[29] UHMWPE also is used as a safer and stronger alternative to steel wire rope for heavy duty rigging and other maritime uses.[30]

B. Arguments of the Parties

Petitioner argues that the Commission should find a single domestic like product, coextensive with the scope of Commerce's investigation.[31] It maintains that all UHMWPE products within the scope have similar physical characteristics and uses, channels of distribution, common manufacturing facilities, processes, and employees, customer and producer perceptions, and are sold within a reasonable range of similar prices.[32]

Respondent KPIC agrees with Petitioner's proposed domestic like product definition for purposes of the preliminary phase of this investigation.[33]

C. Analysis

Based on the current record, we define a single domestic like product consisting of all UHMWPE coextensive with the scope. There are no contrary arguments, and as discussed below, there do not appear to be any clear dividing lines distinguishing in-scope articles.

Physical Characteristics and Uses. In-scope UHMWPE is a type of linear polyethylene.[34] All in-scope UHMWPE is produced from the same basic chemical, ethylene, which accounts for

[25] CR/PR at I-7.
[26] CR/PR at I-7-8.
[27] CR/PR at I-8.
[28] CR/PR at I-8.
[29] CR/PR at I-8.
[30] CR/PR at I-8.
[31] Petitioner's Postconf. Br. at 29-32.
[32] Petitioner's Postconf. Br. at 29-32.
[33] KPIC's Postconf. Br. at 5; KPIC's Opening Statement at 4.
[34] CR/PR at I-6.

99 percent of the raw material used to produce UHMWPE.[35] It is produced to similar industry specifications and standards[36] and typically sold in granular or powder form.[37] Due to its extremely high viscosity, abrasion resistance, impact resistance, chemical resistance, and non-sticking and self-lubricating properties, in-scope UHMWPE is used in a wide range of demanding, high-strength applications in the following industries: construction, agriculture, material handling, transportation, textile, pulp and paper, food and beverage, mining, marine, plastics, oil and gas, high performance fibers, and waste water treatment.[38] Other applications for in-scope UHMWPE include battery separators for lithium-ion batteries used in electric vehicles and ballistic grade protective gear, such as helmets and body armor.[39]

Manufacturing Facilities, Production Processes, and Employees. All in-scope UHMWPE is synthesized from its main raw material, ethylene, which is bonded together under pressure with a catalyst through a compression molding or ram extrusion process.[40] UHMWPE can be molded by downstream end users for processing into various finished products.[41] According to Celanese, both itself and Braskem, the only two domestic producers of the domestic like product, use a similar type of slurry continuous stir-tanked reactor process ("slurry CSTR process") for mixing ethylene with a catalyst and producing in-scope UHMWPE.[42] Celanese uses the same employees and same equipment at its sole facility for producing in-scope UHMWPE.[43]

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[35] CR/PR at I-8-9.

[36] All UHMWPE within the scope has a melt mass-flow rate of <0.1 g/10 min, measured at 190°C and 21.6 kg load, based on the methods and calculations set forth in the International Organization for Standardization (ISO) standards 21304-1 and 21304-2. CR/PR at I-4.

[37] CR/PR at I-6.

[38] CR/PR at I-3, I-7.

[39] CR/PR at I-3.

[40] CR/PR at I-8-9; Petitioner's Postconf. Br. at 30.

[41] *See, e.g.*, Petitioner's Postconf. Br. at 30.

[42] CR/PR at I-9-10. Petitioner states that the manufacturing process used by both Celanese and Braskem is a ***. CR/PR at I-9 n.24. However, there are unique proprietary methods for undertaking the slurry CSTR process. CR/PR at I-9-10. UHMWPE producers wishing to use another firm's proprietary process must receive a license to undertake the particular proprietary process from the process patent-holder. CR/PR at I-10. After monomer ethylene molecules have reacted in presence of catalyst to yield the polymer of ethylene, the resultant properties are measured by various methods. *Id*. There are minor impurities such as the catalyst residue in the final product, which generally do not affect the physical characteristics of UHMWPE, except in the case of medical grade products. *Id*.

[43] Petitioner's Postconf. Br. at 31-32. Domestic producer Braskem only submitted a partially complete U.S. producer questionnaire response and did not provide pertinent information on this issue.

Channels of Distribution. During the period of investigation, January 2017-December 2019 ("POI"), *** percent of the domestic industry's U.S. shipments of UHMWPE was sold to end users.[44]

Interchangeability. The record in the preliminary phase of this investigation contains limited information concerning this factor. While Petitioner recognizes that U.S. producers supply UHMWPE tailored to their various customers' specific end uses, it nonetheless claims that all domestically produced in-scope UHMWPE are commodity products and generally interchangeable.[45] KPIC acknowledges that all UHMWPE, regardless of source, is interchangeable to some degree.[46]

Producer and Customer Perceptions. The record in the preliminary phase of this investigation contains very limited information concerning this factor. According to Petitioner, customers and producers perceive all domestically produced in-scope UHMWPE as comprising its own separate and distinct product category.[47]

Price. Petitioner asserts that all domestically produced in-scope UHMWPE is priced at reasonably comparable levels.[48] The pricing data in the preliminary phase of this investigation show quarterly average prices for domestically produced UHMWPE ranging from $*** per pound to $*** per pound during the POI.[49]

Conclusion. Based on the record in the preliminary phase of this investigation, all in-scope UHMWPE have the same basic chemistry, physical properties, and is made using the same type of manufacturing facilities, production processes, and employees. The domestic industry sells in-scope UHMWPE exclusively through one channel of distribution (*i.e.*, end users). Information available in the current record indicates that customers and producers perceive all in-scope UHMWPE as comprising a single product category, which is used in a wide range of demanding, high-strength applications and is interchangeable to some degree. In view of the foregoing, and in the absence of any argument to the contrary, we define a

[44] CR/PR at Table II-1. These data only include Celanese's U.S. shipments due to the limited information provided by Braskem.

[45] Petitioner's Postconf. Br. at 30-31, 33, 38; Petition at 16.

[46] KPIC's Postconf. Br., Answers to Staff Questions at 12-13. KPIC also claims that the quality of its product is superior to domestically produced UHMWPE.

[47] Petitioner's Postconf. Br. at 31; Petition at 16-17.

[48] Petitioner's Postconf. Br. at 31-32; Petition at 17.

[49] CR/PR at Tables V-3-V-6.

single domestic like product coextensive with the scope of this investigation for purposes of our preliminary determination.[50]

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."[51] 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

[50] Petitioner also argues that the domestic like product should not be defined to encompass other polyethylene products excluded from the scope, including polyethylene terephthalate ("PET"), PET resin, LDPE, and HDPE. Petitioner's Postconf. Br. at 29-32. It asserts that these other products have different physical characteristics and uses than in-scope UHMWPE. *Id*. at 29-30. It maintains that UHMWPE, which is used for ballistic and slash-proof armor, snowboards, and skis, is more durable, and more abrasion resistant, than PET and LDPE, which are used in less demanding applications, including bottles and containers for beverages, household cleaners, cosmetics, food trays, and drinking cups. *Id*. at 30. It observes that other polyethylene products including PET resin are produced using different manufacturing processes, facilities, and employees compared with those used to produce in-scope UHMWPE. *Id*. at 31-32. According to Petitioner, in-scope UHMWPE and other polyethylene products are not interchangeable. *Id*. at 31. Petitioner states that both producers and customers perceive in-scope UHMWPE to be a unique product compared to other polyethylene products, and that in-scope UHMWPE generally is priced substantially higher than other types of polyethylene products. *Id*. at 32. While acknowledging that in-scope UHMWPE and out-of-scope polyethylene products generally are sold to end users and/or distributors, Petitioner claims that they are sold to different customers. *Id*. at 31.

As discussed above, KPIC agrees with Petitioner's proposed definition of a single domestic like product coextensive with the scope for purposes of this preliminary determination. KPIC also appears to agree with Petitioner that there are clear dividing lines between in-scope UHMWPE and out-of-scope polyethylene products: it states that in-scope UHMWPE and out-of-scope polyethylene products have different uses and generally are not interchangeable, that in-scope UHMWPE is higher-priced than out-of-scope polyethylene products, and that switching between in-scope UHMWPE and other polyethylene products may be technically feasible but also may require a factory shutdown. KPIC's Postconf. Br., Answers to Staff Questions at 14. Nonetheless, KPIC urges the Commission in any final phase of the investigation to consider the issue of whether to define the domestic like product to encompass other polyethylene products excluded from the scope, including medical grade UHMWPE. KPIC's Opening Statement at 4; KPIC's Postconf. Br. at 5.

In light of the above, and the lack of any party argument to the contrary, we do not define the domestic like product more broadly than the scope to include out-of-scope polyethylene products for purposes of this preliminary determination.

[51] 19 U.S.C. § 1677(4)(A).

the domestic merchant market. Both Petitioner and Respondent KPIC agree that the domestic industry should consist of all domestic producers of the domestic like product.[52]

There are no related party or other domestic industry issues in the preliminary phase of this investigation.[53] Accordingly, consistent with our definition of the domestic like product, we define the domestic industry as all domestic producers of UHMWPE.

V. Reasonable Indication of Material Injury by Reason of Subject Imports[54]

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.[55] In making this determination, the Commission must consider the volume of subject imports, their effect on prices for the domestic like product, and their impact on domestic producers of the domestic like product, but only in the context of U.S. production operations.[56] The statute defines "material injury" as "harm which is not inconsequential, immaterial, or unimportant."[57] 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.[58] No single factor

[52] Petitioner's Postconf. Br. at 32; KPIC Postconf. Br. at 6.

[53] No domestic producer is related to an exporter or importer of the subject merchandise, *see* CR/PR at Table III-2, and ***. CR/PR at Table III-8.

[54] Pursuant to Section 771(24) of the Tariff Act, imports from a subject country of merchandise corresponding to a domestic like product that account for less than 3 percent of all such merchandise imported into the United States during the most recent 12 months for which data are available preceding the filing of the petition shall be deemed negligible. 19 U.S.C. §§ 1673b(a), 1677(24)(A)(i).

Negligibility is not an issue in this investigation. Subject imports from Korea accounted for *** percent of total imports of UHMWPE by quantity in the 12-month period (March 2019 through February 2020) preceding the filing of the petition. CR/PR at IV-5 & Table IV-4.

[55] 19 U.S.C. §§ 1671b(a), 1673b(a). The Trade Preferences Extension Act of 2015, Pub. L. 114-27, amended the provisions of the Tariff Act pertaining to Commission determinations of reasonable indication of material injury and threat of material injury by reason of subject imports in certain respects.

[56] 19 U.S.C. § 1677(7)(B). The Commission "may consider such other economic factors as are relevant to the determination" but shall "identify each {such} factor ... {a}nd explain in full its relevance to the determination." 19 U.S.C. § 1677(7)(B).

[57] 19 U.S.C. § 1677(7)(A).

[58] 19 U.S.C. § 1677(7)(C)(iii).

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."[59]

Although the statute requires the Commission to determine whether there is a reasonable indication that the domestic industry is "materially injured by reason of" unfairly traded imports,[60] 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.[61] In identifying a causal link, if any, between subject imports and material injury to the domestic industry, the Commission examines the facts of record that relate to the significance of the volume and price effects of the subject imports and any impact of those imports on the condition of the domestic industry. This evaluation under the "by reason of" standard must ensure that subject imports are more than a minimal or tangential cause of injury and that there is a sufficient causal, not merely a temporal, nexus between subject imports and material injury.[62]

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.[63] In performing its examination, however, the Commission need not isolate

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[59] 19 U.S.C. § 1677(7)(C)(iii).

[60] 19 U.S.C. §§ 1671b(a), 1673b(a).

[61] *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).

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

[63] SAA, H.R. Rep. 103-316, Vol. I at 851-52 (1994) ("{T}he Commission must examine other factors to ensure that it is not attributing injury from other sources to the subject imports."); S. Rep. 96-249 at 75 (1979) (the Commission "will consider information which indicates that harm is caused by

the injury caused by other factors from injury caused by unfairly traded imports.[64] 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.[65] It is clear that the existence of injury caused by other factors does not compel a negative determination.[66]

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

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(…Continued)
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.

[64] 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.").

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

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

[67] *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*

harm occurred 'by reason of' the LTFV imports," and that it is "not attributing injury from other sources to the subject imports." [68] The Federal Circuit has examined and affirmed various Commission methodologies and has disavowed "rigid adherence to a specific formula."[69]

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.[70] Congress has delegated this factual finding to the Commission because of the agency's institutional expertise in resolving injury issues.[71]

B. Conditions of Competition and the Business Cycle

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

1. Demand Conditions

U.S. demand for UHMWPE is driven by demand for the downstream products that use UHMWPE.[72] Reported end uses for UHMWPE include construction, agriculture, material handling, transportation, textile, pulp and paper, food and beverage, mining, marine, plastics, oil and gas, high performance fibers, battery separators in electric vehicles, waste water treatment, and ballistic grade protective gear.[73]

(…Continued)
States Steel Group v. United States, 96 F.3d 1352, 1362 (Fed. Cir. 1996) and S. Rep. 96-249 at 75. In its decision in *Swiff-Train v. United States*, 793 F.3d 1355 (Fed. Cir. 2015), the Federal Circuit affirmed the Commission's causation analysis as comporting with the Court's guidance in *Mittal*.

[68] *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.

[69] *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.").

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

[71] *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.").

[72] CR/PR at II-7.

[73] CR/PR at II-7.

In terms of demand trends, the responses by market participants were mixed. The sole responding U.S. producer reported that U.S. demand for UHMWPE increased during the POI.[74] However, three of five responding importers reported that demand fluctuated, one importer reported that demand increased, and one importer reported no change in demand.[75] Apparent U.S. consumption of UHMWPE fluctuated but increased overall by *** percent between 2017 and 2019, increasing from *** pounds in 2017 to *** pounds in 2018, but then declining to *** pounds in 2019.[76]

2. Supply Conditions

The domestic industry was the largest source of supply over the POI.[77] Its share of apparent U.S. consumption increased from *** percent in 2017 to *** percent in 2018, but then declined to *** percent in 2019.[78] During the POI, there were two domestic producers of UHMWPE, Celanese and Braskem.[79] Until 2017, Braskem supplied the U.S. market for UHMWPE by importing nonsubject merchandise from Brazil.[80] In January 2017, Braskem became a domestic producer of UHMWPE by opening a new production facility in La Porte, Texas, and shifted its focus from importing to domestic production.[81] By 2019, Braskem accounted for *** percent of domestic production of UHMWPE, and Celanese accounted for *** percent of production in that same year.[82] The domestic industry's capacity was constant, at *** pounds, between 2017 and 2019.[83] The current record is mixed in terms of whether the domestic industry experienced supply constraints during the POI.[84]

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[74] CR/PR at Table II-4.

[75] CR/PR at Table II-4.

[76] CR/PR at Tables IV-6 & C-1.

[77] CR/PR at Tables IV-6 & C-1.

[78] CR/PR at Tables IV-6 & C-1.

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

[80] *See, e.g.*, KPIC's Opening Statement at 5-6.

[81] Although Braskem imported nonsubject merchandise from *** during the POI, its domestic production ***. CR/PR at Tables III-1, III-3, III-4, III-8, and C-1. Braskem's domestic production of UHMWPE was *** pounds in 2017, *** pounds in 2018, and *** pounds in 2019. CR/PR at Tables III-4 & III-8. Braskem's U.S. imports of nonsubject merchandise from *** were *** pounds in 2017, *** pounds in 2018, and *** pounds in 2019. CR/PR at Table III-8.

[82] CR/PR at Table III-1. Braskem takes *** on the petition. *Id*. As explained above, Braskem submitted only limited trade data in its U.S. Producer's Questionnaire and no employment, financial, or pricing data. CR/PR at II-1 n.2 & III-1 n.1.

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

[84] Two importers and one purchaser reported that they experienced supply constraints with Petitioner during the POI. CR/PR at II-6 & II-9. In addition, ***. CR/PR at III-3 n.2. However, *** reported that they did not experience any such supply constraints. CR/PR at II-6.

Subject imports accounted for the smallest share of the U.S. market during the POI.[85] Nonetheless, subject imports from Korea were the largest single country supply source of UHMWPE imports from any individual country in ***.[86] Subject imports' share of apparent U.S. consumption increased by *** percentage points from 2017 to 2019, increasing from *** percent in 2017 to *** percent in 2018 and *** percent in 2019.[87]

Nonsubject imports were the second-largest source of supply during the POI. Their share of apparent U.S consumption declined from *** percent in 2017 to *** percent in 2018, but then increased to *** percent in 2019.[88] During the POI, the largest sources of nonsubject imports were Brazil, Germany, Japan, and the Netherlands.[89]

3. Substitutability and Other Conditions

The record in the preliminary phase of this investigation indicates that domestically produced UHMWPE and subject imports from Korea are at least moderately substitutable.[90] Both responding U.S. producers reported that the domestic like product and subject imports from Korea were "always" or "frequently" interchangeable.[91] Importers' responses, however, were mixed. Two of four responding importers reported that the domestic like product and subject imports from Korea were "always" or "frequently" interchangeable while the other two importers reported that they were only "sometimes" interchangeable.[92]

The record also indicates that price is an important factor in purchasing decisions for UHMWPE, although non-price factors are also important. Purchasers responding to the lost sales and lost revenue survey ranked price, along with quality and availability, among the most important factors in purchasing decisions for UHMWPE.[93] Purchasers also identified sourcing from more than a single source, finished product characteristics, and delivery reliability as non-price factors that were important in their purchasing decisions for UHMWPE.[94] In comparing domestically produced UHMWPE and subject imports, both responding U.S. producers and

[85] CR/PR at Tables IV-5, IV-6 & C-1.

[86] CR/PR at Tables IV-2 & IV-3. Imports from Brazil declined from *** pounds in 2017 to *** pounds in 2019. *Id*.

[87] CR/PR at Tables IV-6 & C-1.

[88] CR/PR at Tables IV-6 & C-1.

[89] CR/PR at IV-4 & Table IV-3.

[90] CR/PR at II-9.

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

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

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

[94] CR/PR at II-5, V-15, and Table V-10.

most responding importers reported that differences other than price were only "sometimes" or "never" significant in purchasing decisions for UHMWPE.[95]

The primary raw material used in making UHMWPE is ethylene.[96] Ethylene prices declined by *** percent from 2017 to 2019, declining from $*** per metric ton in 2017 to $*** in 2019.[97] Raw materials as a share of the cost of goods sold ("COGS") for domestically produced UHMWPE decreased from *** percent in 2017 to *** percent in 2018 and *** percent in 2019.[98]

From 2017 to 2019, domestically produced UHMWPE was sold *** to end users while subject imports were sold mainly to distributors with substantial quantities also sold to end users.[99] During the POI, the domestic like product was typically produced-to-order with very small quantities sold from inventory while subject imports were sold mostly from inventory with lesser amounts produced-to-order.[100]

U.S. producer Celanese reported that it primarily sold UHMWPE using ***, with the remainder sold mainly using ***, and very small amounts based on ***.[101] By contrast, importers primarily sold UHMWPE using short-term contracts, with the remainder sold mainly using annual contracts, and very small amounts based on spot sales.[102] Celanese reported that its *** and importers generally reported that their short-term and annual contracts *** were not indexed to raw material costs.[103]

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[95] CR/PR at Table II-7. Three of four responding importers reported that differences other than price were only "sometimes" or "never" significant in purchasing decisions for UHMWPE while one importer reported that differences other than price were "always" significant. *Id*.

[96] CR/PR at V-1.

[97] CR/PR at V-1 & Figure V-1.

[98] CR/PR at Table VI-1.

[99] CR/PR at Table II-1. *** percent of U.S. producers' U.S. shipments were sold to end users during 2017-2019. *Id*. In 2017, *** percent of U.S. importers' U.S. shipments were sold to distributors and *** percent were sold to end users. *Id*. In 2018, *** percent of U.S. importers' U.S. shipments were sold to distributors and *** percent were sold to end users. *Id*. In 2019, *** percent of U.S. importers' U.S. shipments were sold to distributors and *** percent were sold to end users. *Id.*

[100] CR/PR at II-9.

[101] CR/PR at Table V-2. In 2019, *** percent of U.S. producers' U.S. commercial shipments were sold using long-term contracts, *** percent were sold using annual contracts, and *** percent were sold via spot sales. *Id*.

[102] CR/PR at Table V-2. In 2019, *** percent of U.S. importers' U.S. commercial shipments were sold using short-term contracts, *** percent were sold using annual contracts, and *** percent were sold via spot sales. *Id*. Importers generally reported that their short-term and annual contracts fixed both price and quantity and were not indexed to raw material costs. CR/PR at V-4.

[103] CR/PR at V-3-4.

C. Volume of Subject Imports

Section 771(7)(C)(i) of the Tariff Act provides that the "Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States, is significant."[104]

The volume of subject imports increased by *** percent during the POI, increasing from *** pounds in 2017 to *** pounds in 2018 and *** pounds in 2019.[105] These increases occurred as apparent U.S. consumption increased by *** percent between 2017 and 2018 and declined by *** percent between 2018 and 2019.[106] As a share of apparent U.S. consumption, subject import shipments increased from *** percent in 2017 to *** percent in 2018 and *** percent in 2019.[107]

For purposes of this preliminary determination, we find that the volume of subject imports, and their increase, were significant in both absolute terms and relative to consumption in the United States during the POI.

D. Price Effects of the Subject Imports

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

> (I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and
>
> (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.[108]

[104] 19 U.S.C. § 1677(7)(C)(i).

[105] CR/PR at Table IV-2.

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

[107] CR/PR at Tables IV-6 & C-1. U.S. importers' U.S. shipments of subject imports from Korea were *** pounds in 2017, *** pounds in 2018, and *** pounds in 2019. CR/PR at Table IV-5.

[108] 19 U.S.C. § 1677(7)(C)(ii).

As addressed in section V.B.3 above, the record indicates that there is at least a moderate degree of substitutability between subject imports and the domestic like product and that price is an important consideration in purchasing decisions for UHMWPE.

The Commission collected quarterly pricing data from U.S. producers and importers for total quantity and f.o.b. value on four UHMWPE products shipped to unrelated U.S. customers over the POI.[109] One U.S. producer and two importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters.[110]

The record shows pervasive underselling by subject imports. During the POI, subject imports undersold the domestic like product in ***, of the possible quarterly comparisons.[111] The reported quantity of subject imports that undersold the domestic like product during the POI was *** pounds.[112] Subject imports' margins of underselling ranged from *** percent to *** percent, with an average underselling margin of *** percent.[113] In providing information related to lost sales and lost revenues, U.S. purchasers also confirmed purchasing subject imports instead of the domestic like product and that subject imports were priced lower than the domestically produced product.[114] In light of the importance of price in purchasing

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[109] The pricing products were as follows:

Product 1: UHMWPE, with an average molecular weight/volume ranging from 6.7 to 7 106g/mol based on the producer's advertised testing methodology; in individual packaging with a net weight of 25kg;

Product 2: UHMWPE, with an average molecular weight/volume ranging from 6.7 to 7 106g/mol based on the producer's advertised testing methodology; in bulk packaging with a net pallet weight of 130,000 lbs (59 MT) to 140,000 lbs (63.5 MT);

Product 3: UHMWPE, with an average molecular weight/volume ranging from 8.7 to 9 106g/mol based on the producer's advertised testing methodology; in individual packaging with net weight greater than 453kg but less than 500 kg; and

Product 4: UHMWPE, with an average molecular weight/volume ranging from 8.7 to 9 106g/mol based on the producer's advertised testing methodology; in individual packaging with net weight ranging from 500 kg to 550 kg. CR/PR at V-4.

[110] CR/PR at V-5. Pricing data reported by these firms accounted for approximately *** percent of U.S. producers' U.S. shipments in 2019, and *** percent of U.S. shipments of subject imports from Korea in 2019. CR/PR at V-5.

[111] CR/PR at Table V-8. The underselling occurred with respect to pricing products 1 and 4, the only two products with pricing comparisons, as no U.S. importer reported pricing data for products 2 and 3. CR/PR at Tables V-4-5.

[112] CR/PR at Table V-8.

[113] CR/PR at Table V-8.

[114] *** U.S. purchasers responding to the Commission's questionnaire reported that they had purchased subject imports instead of the domestic like product since 2017. CR/PR at Table V-10. *** of these purchasers, ***, reported that subject import prices were lower than domestic prices for

decisions for UHMWPE, the substitutability between the domestic like product and subject imports, the pervasive underselling by subject imports on both a per-instance and volume basis, and the information in the record pertaining to lost sales and lost revenue, we find that there has been significant underselling of the domestic like product by subject imports.

We have also considered price trends for the domestic like product and subject imports. Despite overall increasing U.S. demand for UHMWPE during the POI, prices for each of the four domestically produced pricing products generally declined from the first quarter of 2017 to the fourth quarter of 2019, with domestic price declines ranging from *** percent to *** percent.[115] Importantly, domestic prices declines were most pronounced for the only two pricing products with head-to-head competition between subject imports and domestically produced UHMWPE (*i.e.*, Products 1 and 4).[116] For Product 1, the pricing product where subject imports were ***, domestic prices declined by *** percent.[117] For Product 4, domestic prices declined by *** percent over the course of the POI. These price declines markedly exceeded the domestic industry's price declines for Products 2 and 3, which were *** and *** percent respectively.[118]

The record implicates several additional factors that may be affecting the domestic industry's price movements. For example, the domestic industry's raw material costs declined during the POI, although it is unclear on the current record whether this likely would have affected the price of domestically produced UHMWPE.[119] As discussed above, the domestic

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(…Continued)
UHMWPE and that domestic producer Celanese had lowered its price for UHMWPE by *** percent in order to compete with subject imports. CR/PR at V-15-16 & Tables V-10-11. However, ***. CR/PR at Table V-11. We will examine further the basis for the domestic producer's price reductions in any final phase of the investigation.

[115] CR/PR at Tables V-3-7. Over the course of the POI, domestic prices declined by *** percent for Product 1, *** percent for Product 2, *** percent for Product 3, and *** percent for Product 4. CR/PR at V-7.

[116] CR/PR at Tables V-3-7. There were no reported subject import shipments for Products 2 and 3. CR/PR at Tables V-4, V-5, & V-7.

[117] CR/PR at Table V-3 & V-7. For Product 1, subject import prices declined by *** percent from the first quarter of 2017 until the fourth quarter of 2019. *Id*.

[118] CR/PR at Tables V-6-7. For Product 4, subject import prices declined by *** percent from the first quarter of 2017 until the fourth quarter of 2019. *Id*.

[119] CR/PR at Table VI-1. The domestic industry's unit raw material costs declined from $*** per pound in 2017 to $*** per pound in 2018 and $*** per pound in 2019. *Id*. The domestic industry's unit cost-of-goods-sold ("COGS") declined from $*** per pound in 2017 to $*** per pound in 2018, and $*** per pound in 2019. *Id*.

industry mainly uses ***.[120] These *** also reportedly ***[121] In addition, the record demonstrates that the domestic industry sold *** to end users while the subject imports were sold primarily to distributors during the POI,[122] raising questions regarding the subject imports' ability to impact domestic prices. Thus, in any final phase of the investigation, we intend to further examine the basis for any domestic price declines, including whether movements in U.S. producers' prices for UHMWPE may be affected by ***, and how, if at all, the differences in channels of distribution for the domestic product and subject imports may affect competition and pricing in the market.[123]

Given the significant and increasing volume of subject imports, the significant underselling by subject imports, and the domestic industry's price declines during the POI, which occurred despite increasing apparent U.S. consumption of UHMWPE, we cannot conclude, for purposes of this preliminary determination, that there is clear and convincing evidence that the subject imports were not having significant adverse price effects on the domestic industry.[124]

E. Impact of the Subject Imports[125]

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,

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[120] CR/PR at V-3-4 & Table V-2.

[121] CR/RP at V-3. As noted above, the domestic industry's raw material costs declined during the POI, and the industry's ratio of COGS to net sales also declined from *** percent in 2017 to *** percent in 2018 and *** percent in 2019. CR/PR at Table VI-1. We note, however, that *** CR/PR at V-16.

[122] For example, in 2019, *** percent of subject imports were sold through distributors and *** percent to end users. CR/PR at Table II-1.

[123] CR/PR at Tables II-1, V-3, and V-6.

[124] KPIC argues that subject imports did not have significant adverse price effects during the POI claiming that any such effects were attributable to intra-industry competition between domestic producers Celanese and Braskem. *See, e.g.*, KPIC Postconf. Br. at 23-26. In particular, KPIC maintains that domestic price declines during the POI were attributable to the additional supply of UHMWPE in the U.S. market resulting from Braskem's entry as a new domestic producer. *Id*. at 23-24 & 26. The record shows, however, ***. CR/PR at Table III-8. Therefore, Braskem's overall supply to the U.S. market in terms of both domestically U.S.-produced UHMWPE and nonsubject imports *** (CR/PR at Table III-8), and the current record does not support KPIC's assertion that domestic price declines were attributable to downward price pressure from Braskem establishing domestic production and adding additional volume to the U.S. market.

[125] Commerce initiated the investigation based on estimated dumping margins of 13.16 to 153.35 percent for subject imports from Korea. *Ultra-High Weight Molecular Polyethylene: Initiation of Less-Than-Fair-Value Investigation*, 85 Fed. Reg. 17861, 17864 (March 31, 2020).

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."[126]

Virtually all of the domestic industry's output indicia improved during the POI except for capacity, which held constant from 2017 to 2019.[127] [128] As Braskem shifted from being an importer of UHMWPE to a domestic producer, the domestic industry's production increased by *** percent from 2017 to 2019.[129] Similarly, as Braskem ramped up its production, the domestic industry's capacity utilization increased by *** percentage points from 2017 to 2019.[130] As discussed above, the domestic industry's market share increased by *** percentage points overall from 2017 to 2019, increasing from *** percent in 2017 to *** percent in 2018, but then declining to *** percent in 2019.[131] The domestic industry's U.S.

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[126] 19 U.S.C. § 1677(7)(C)(iii). This provision was amended by the Trade Preferences Extension Act of 2015, Pub. L. 114-27.

[127] The domestic industry's capacity was *** pounds in 2017, 2018, and 2019. CR/PR at Tables III-4 & C-1.

[128] Petitioner argues that the Commission should use a four-year POI covering 2016-2019 for its impact analysis, since sales of UHMWPE typically occur using long-term contracts and domestic prices for UHMWPE peaked in 2016. *See, e.g.*, Petitioner's Opening Statement at 3; Petitioner's Postconf. Br., Answers to Staff Questions at 20-21. KPIC urges the Commission to reject Petitioner's request to expand the POI to include 2016. *See e.g.*, KPIC's Postconf. Br. at 29-31. In the preliminary phase of the investigation, we have examined data covering our typical three-year POI (*i.e.*, January 2017-December 2019), and see no basis to include 2016 into the period of investigation. Although the Commission has broad discretion to select a period of investigation, it generally collects data for the most recent three full years, plus some portion of data from the current year, in order to balance its need for sufficient information to evaluate the market with the burden placed on questionnaire respondents. *See 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). Longer periods of time have been examined when doing so would serve a well-defined need to obtain a broader perspective of the market. *See Purified Carboxymethylcellulose from Finland, Mexico, Netherlands, and Sweden*, Inv. Nos. 731-TA-1084-1087 (Final), USITC Pub. 3787 (June 2005) at 14. Petitioner has not explained how long-term contracts in this market present a unique situation that requires more extensive data collection.

[129] The domestic industry's production increased from *** pounds in 2017 to *** pounds in 2018, but then declined to *** pounds in 2019. CR/PR at Tables III-4 & C-1.

[130] The domestic industry's capacity utilization increased from *** percent in 2017 to *** percent in 2018, but then declined to *** percent in 2019. CR/PR at Tables III-4 & C-1.

[131] CR/PR at Tables IV-6 & C-1.

shipment volume increased by *** percent between 2017 and 2019,[132] and its end-of-period inventories ***.[133]

Most of the domestic industry's employment-related indicators improved over the course of the POI. Although productivity and hourly wages *** during the POI,[134] the domestic industry's number of production-and-related workers ("PRWs"), total hours worked, hours worked per PRW, and wages paid *** from 2017 to 2019.[135]

The domestic industry's financial indicators all improved from 2017 to 2019. As the domestic industry's raw material costs *** during the POI,[136] the domestic industry became *** profitable. From 2017 to 2019, net sales revenues *** by *** percent,[137] gross profit *** by *** percent,[138] operating and net income both *** by *** percent, and operating and net income margins both *** by *** percentage points.[139] Capital expenditures and total assets *** by *** percent and ***, respectively, between 2017 to 2019.[140]

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[132] The domestic industry's U.S. shipments increased from *** pounds in 2017 to *** pounds in 2018, but then declined to *** pounds in 2019. CR/PR at Tables III-6 & C-1.

[133] The domestic industry's end-of-period inventories *** from *** pounds in 2017 to *** pounds in 2018 and *** pounds in 2019. CR/PR at Tables III-7 & C-1. The domestic industry's end-of-period inventories as a share of total shipments *** from *** percent in 2017 and 2018 to *** percent in 2019. *Id*.

[134] Productivity in pounds per-hour *** from *** in 2017 to *** in 2018 and *** in 2019. CR/PR at Tables III-9 & C-1. Hourly wages *** from $*** in 2017 to $*** in 2018 and $*** in 2019. *Id*.

[135] The number of PRWs *** from *** in 2017 and 2018 to *** in 2019. CR/PR at Tables III-9 & C-1. Total hours worked *** from *** in 2017 to *** in 2018 and *** in 2019. *Id*. Wages paid *** from $*** in 2017 to $*** in 2018 and $*** in 2019. *Id*. Unit labor costs ***, at $*** per pound, between 2017 and 2019. *Id*.

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

[137] The domestic industry's net sales revenues *** from $*** in 2017 to $*** in 2018, but then *** to $*** in 2019. CR/PR at Tables VI-1 & C-1.

[138] The domestic industry's gross profit *** from $*** in 2017 to $*** in 2018 and $*** in 2019. CR/PR at Tables VI-1 & C-1.

[139] The domestic industry's operating and net income increased from $*** in 2017 to $*** in 2018 and $*** in 2019. CR/PR at Tables VI-1 & C-1. The domestic industry's operating and net income margins increased from *** percent in 2017 to *** percent in 2018 and *** percent in 2019. *Id*.

[140] We note that the domestic industry reported negative effects on investment and growth and development due to subject imports during the POI. CR/PR at Table VI-7. Nonetheless, the domestic industry's capital expenditures *** from $*** in 2017 to $*** in 2018, but then *** to $*** in 2019. CR/PR at Table VI-5. The domestic industry *** research and development expenses during the POI. *Id*. The domestic industry's total net assets *** from $*** in 2017 to $*** in 2018 and $*** million in 2019. CR/PR at Table VI-6. Its operating return on assets *** from *** percent in 2017 to *** percent in 2018 and *** percent in 2019. *Id*.

Although the domestic industry's output, employment, and financial performance indicia generally improved during the POI, the data, with the exception of production and U.S. shipments, do not include information from domestic producer Braskem, which is one of only two domestic producers and accounted for almost *** percent of domestic production in 2019.[141] In its incomplete U.S. producer questionnaire response in the preliminary phase of this investigation, Braskem, which started U.S. production of UHMWPE in 2017 and had *** during the POI, provided the Commission with only limited trade data and no employment or financial data.[142] In any final phase of the investigation, we will attempt to collect additional data from Braskem in order to obtain a more complete picture of the domestic industry's overall performance.[143]

Given the significant and increasing volume of subject imports that significantly undersold the domestic like product, and the price declines experienced by the domestic industry at a time of relatively steady apparent consumption, we cannot conclude that the subject imports did not have significant adverse price effects, and therefore cannot conclude that the record of the preliminary phase of this investigation contains clear and convincing evidence that subject imports did not have a significant adverse impact on the domestic industry.

We have also considered other factors to ensure that we are not attributing any injury from other factors to the subject imports. As noted above, apparent U.S. consumption for UHMWPE increased overall during the POI so any impact on the domestic industry's condition do not appear be explained by declines in consumption.[144] Additionally, although nonsubject imports were the second-largest source of supply in the U.S. market,[145] the volume and market share of nonsubject imports declined during the POI and the average unit values ("AUVs") for nonsubject imports from leading nonsubject sources generally were higher than subject import AUVs.[146] Thus, any impact on the domestic industry's condition also likely would not be explained by nonsubject imports.

For the foregoing reasons, we find a reasonable indication of material injury by reason of subject imports.

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

[142] CR/PR at III-1 n.1.

[143] In correspondence with Commission staff, Braskem indicated ***. *See* EDIS Doc. No. 707266 (March and April 2020 emails from ***).

[144] CR/PR at Tables IV-6 & C-1.

[145] CR/PR at Tables IV-6 & C-1.

[146] CR/PR at Tables IV-2, IV-3, & C-1.

VI. 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 UHMWPE from Korea that are allegedly sold in the United States at less than fair value.

Part I: Introduction

Background

This investigation results from petitions filed with the U.S. Department of Commerce ("Commerce") and the U.S. International Trade Commission ("USITC" or "Commission") by Celanese Corporation, Irving, Texas, effective March 4, 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 ultra-high molecular weight polyethylene ("UHMWPE")[1] from Korea. The following tabulation provides information relating to the background of this investigation.[2] [3]

Effective date	Action
March 4, 2020	Petition filed with Commerce and the Commission; institution of Commission investigation (85 FR 13922, March 10, 2020)
March 24, 2020	Commission's conference
March 24, 2020	Commerce's notice of initiation (85 FR 17861, March 31, 2020)
April 17, 2020	Commission's vote
April 20, 2020	Commission's determination
April 27, 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] A list of witnesses appearing at the conference is presented in appendix B of this report.

Statutory criteria

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

> *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. (continued...)

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 margin, 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

UHMWPE is incorporated into a wide-variety of applications in multiple industries, including construction, agriculture, material handling, transportation, textile, pulp and paper, food and beverage, mining, marine, plastics, oil and gas, high performance fibers, battery separators, and waste water treatment. Some of the latest and fastest growing applications for UHMWPE include battery separators for lithium ion batteries used in electric vehicles and ballistic grade protective gear, such as helmets and body armor. The two known U.S. producers of UHMWPE are Celanese Corp. ("Celanese") and Braskem America, Inc. ("Braskem"), while the single known producer of UHMWPE in Korea is Korea Petrochemical Ind. Co., Ltd. ("KPIC"). The leading U.S. importers of UHMWPE from Korea are *** and ***. Leading importers of UHMWPE from nonsubject countries (primarily Germany, the Netherlands, and Brazil) include ***, ***, and ***. Leading purchasers include ***, *** and ***.

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

Apparent U.S. consumption of UHMWPE totaled approximately *** pounds *** in 2019. Currently, two firms are known to produce UHMWPE in the United States. U.S. producers' U.S. shipments of UHMWPE totaled *** pounds *** in 2019 and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value. U.S. imports from Korea totaled *** pounds *** in 2019 and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value. U.S. imports from nonsubject sources totaled *** pounds *** in 2019 and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value.

Summary data and data sources

A summary of data collected in this investigation is presented in appendix C, table C-1. Except as noted, U.S. industry data are based on the questionnaire responses of two U.S. producers that accounted for all known U.S. production of UHMWPE during 2019.[6] [7] U.S. imports are based on the questionnaire responses of nine firms accounting for the large majority of U.S. imports of UHMWPE in 2019, including all such imports from Korea.[8] [9] [10]

[6] Petition, exh. GEN-11.

[7] Braskem stated it was unable to submit a complete questionnaire response due to resource constraints resulting from COVID-19. Braskem's U.S. Producers' questionnaire response included limited trade data, no financial data, and no pricing data. ***. *** Braskem, emails to USITC staff, March 25, March 31 and April 1, 2020.

[8] Petition, exh. GEN-9.

[9] U.S. importer Braskem did not provide a U.S. Importers' questionnaire response due to resource constraints resulting from COVID-19. *** Braskem confirmed all of its UHMWPE imports between 2017 and 2019 were sourced from ***. *** Braskem, emails to USITC staff, March 25, March 31, April 1 and April 3, 2020

[10] The Commission also received questionnaire responses from ***. However, data reported by both firms could not be included due to *** reporting all imports under the relevant HTS statistical reporting numbers and *** confirming it provided unreliable trade data. Both firms were unable to address these data issues in a timely manner due to COVID-19 related resource constraints ***, email to USITC staff, April 2, 2020. ***, email to USITC staff, March 25, 2020.

Data on the industry in Korea are based on the questionnaire response of one Korean producer that accounted for all known Korean production of UHMWPE during 2019.

Previous and related investigations

UHMWPE has not been the subject of any prior antidumping duty investigations in the United States. Furthermore, UHMWPE from Korea has not been subject to other import relief proceedings under sections 201 and 301 of the Trade Act of 1974.

Nature and extent of alleged sales at LTFV

On March 24, 2020, Commerce published a notice in the *Federal Register* of the initiation of its antidumping duty investigation on UHMWPE from Korea.[11] Commerce has initiated an antidumping duty investigation based on estimated dumping margins ranging from 13.16 to 153.35 percent for UHMWPE from Korea.

The subject merchandise

Commerce's scope

In the current proceeding, Commerce has defined the scope as follows:[12]

> *The merchandise covered by the scope is ultra-high molecular weight polyethylene. Ultra-high molecular weight polyethylene is a linear polyethylene, in granular or powder form. It is defined by its melt mass-flow rate of <0.1 g/10 min, measured at 190°C and 21.6 kg load, based on the methods and calculations set forth in the International Organization for Standardization (ISO) standards 21304-1 and 21304-2. Ultra-high molecular weight polyethylene has a Chemical Abstract Service (CAS) registry number of 9002-88-4.*
>
> *The scope includes all ultra-high molecular weight polyethylene in granular or powder forms meeting the above specifications regardless of additives introduced in the manufacturing process. Ultra-high molecular weight polyethylene blended with other products is included in the scope of this investigation where ultra-high molecular weight polyethylene accounts for more than 50 percent, by actual weight, of the blend and the resulting blend maintains a melt mass-flow rate of <0.1 g/10 min.*

[11] 85 FR 17861, March 31, 2020.
[12] 85 FR 17861, March 31, 2020.

Excluded from the scope of the investigation is medical-grade ultra-high molecular weight polyethylene. Medical grade ultra-high molecular weight polyethylene has a minimum viscosity of 2000 ml/g at a concentration of 0.02% at 135°C (275°F) in decahydronaphthalene and an elongational stress of 0.2 MPa or greater. Medical-grade ultra-high molecular weight polyethylene is further defined by its ash and trace element content, which shall not exceed the following maximum quantities as set forth in ISO-5834-1: ash (125 mg/kg), titanium (40 mg/kg), calcium (5 mg/kg), chlorine (30 mg/kg), and aluminum (20 mg/kg). ISO 5834-1 further defines medical grade ultra-high molecular weight polyethylene by its particulate matter content, which requires that there shall be no more than three particles of contaminant per 300 ± 20 g tested. ach of the above criteria is calculated based on the standards and methods used in ISO 5834-1.

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 numbers 3901.10.1000 and 3901.20.1000. The 2020 general rate of duty is 6.5 percent *ad valorem* for HTSUS both subheadings 3901.10.10 and 3901.20.10. UHMWPE produced in China is subject to an additional 25 percent ad valorem duty under Section 301 of the Trade Act of 1974.[13] 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

The imported product subject to this investigation, UHMWPE, is an extremely high viscosity, substantially linear polyethylene, typically in the form of a granule or powder.[14] UHMWPE belongs to the polyethylene (PE) family of polymers, which includes high density polyethylene (HDPE), low density polyethylene (LDPE), linear low density polyethylene (LLDPE),

[13] The Section 301 duties became effective on August 23, 2018; 83 FR 40823, pp. 40823-40838. The U.S. Trade Representative has not granted any exclusions for HTS 3901.10.10 or 3901.20.10 from Section 301 duties under 9903.88.02. Harmonized Tariff Schedule of the United States, 2020, Chapter 99 Revision 7.

[14] Petitioner's product for UHMWPE meets the specifications set by ASTM specification D4020 and/or ISO specifications 21304- 1 and 21304-2.

(continued...)

high molecular weight polyethylene (HMWPE) and very-high molecular weight polyethylene (VHMWPE). One physical distinction UHMWPE has from its family members is its higher molecular weight.[15] The molecular weight of HDPE typically ranges from 50,000 to 250,000 grams per mole, [16] while UHMWPE produced by the petitioner ranges from 3.4 million to 10.2 million grams per mole.[17] UHMWPE has extremely long polymer chains, and these longer chains serve to transfer load more effectively to the polymer backbone by strengthening intermolecular interactions. This causes the material to be very tough and gives it the highest impact strength of the polyethylenes.[18]

UHMWPE has unique characteristics which include low coefficient of friction, nonstick surface, chemical resistance, energy absorption, and abrasion resistance. It is 15 times more resistant to abrasion than carbon steel.[19] UHMWPE can be molded by downstream end users for processing into various finished products.[20] It is used for unique applications and end-uses compared to other polyethylene products, including applications that require a higher level of durability and resistance. It can be used in certain high-strength applications in the following industries: construction, agriculture, material handling, transportation, textile, pulp and paper,

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[15] The respondent, in general, deems its products to be ultra-high, very-high, or high molecular weight polyethylene using the following divisions: "High" molecular weight products have a molecular weight less than approximately 300,000 g/mole; "Very-high" molecular weight products have a molecular weight between approximately 300,000 g/mole and 1 million g/mole; and "Ultra-high" molecular weight products have a molecular weight above approximately 1 million g/mole. Petitioner has defined the scope of this proceeding as UHMWPE with a melt mass flow rate of 0.1g/10 min measured at 190 °C and 21.6 kg load, based on the methods and calculations set forth in ISO standards 21304-1 and 21304-2. Respondent states UHMWPE with this viscosity has molecular weight of above approximately 1 million g/mole. Respondent states they export one product grade of very-high molecular weight to the U.S. that falls within the scope, which is used for Lithium-ion 2nd Battery Separators. Postconference answers to staff questions, pp. 5, 7. Petitioner produces very-high molecular weight polyethylene and states very high molecular weight polyethylene is out-of-scope. Petitioner's postconference brief, Exhibit 23, answers to staff questions, pp. 15-16.

[16] Urkac, Sadiye, "Characterization of Ultra high molecular weight polyethylene modified by metal gas hybrid ion implantation technique," 2006. https://www.semanticscholar.org/paper/Characterization-of-Ultra-High-Molecular-Weight-by-Sokullu-Emel/3d64144496685596e85483c2bf6607139dee908f.;

[17] Petitioner states the respondent KPIC produces UHMWPE from 3.7 million to 9 million grams per mole, and that the grades and specifications are similar. Petitioner's postconference brief, Exhibit 23, answers to staff questions, p. 3.

[18] Chen, Kevin, "Polyethylene UHMWPE, HDPE, LDPE, LLDPE—What are the differences?" https://www.energetic-plastics.com/info/polyethylenecomparison-i00045i1.html. retrieved April 2, 2020.

[19] Petition, p. 9.

[20] Petition, pp. 15-16.

(continued...)

food and beverage, mining, marine applications, porous plastics, oil and gas, high performance fibers, battery separators and wastewater treatment.[21]

Some examples of products made from the lower molecular weight polyethylenes such as HDPE, LDPE, and LLDPE include food packaging, non-food containers, plastic toys, and plastic bags.[22] Comparatively, UHMWPE is used to create fibers that are used in demanding, high strength applications such as ballistic and slash-proof armor.[23] As for ballistic-grade production devices, other polyethylene materials do not possess the requisite mechanical properties to adequately serve these purposes. LDPE, LLDPE, HDPE, and VHMWPE are significantly lower in fiber properties as measured by tenacity and would thus be inferior in energy absorption required for ballistic applications. For use in ballistic-grade production devices, UHMWPE possesses the necessary tensile strength that other PE fibers do not possess.[24]

Other products the fibers are used to manufacture include snowboards, skis, cut-resistant gloves, bow strings, climbing equipment, fishing line, spear lines for spear-guns, high performance sails, suspension lines on sport parachutes and paragliders, rigging in yachting, tow lines for boating, kites, and kite lines for kite sports. UHMWPE is also used in the production of specialty plectrums for guitar and other stringed instruments. UHMWPE is used in the manufacturing of products in other end applications such as food processing equipment, water treatment, conveyor lines, wear strips, bearings, gears, pistons, valves, marine equipment, and wet environments that require regular harsh cleaning.[25]

In certain applications, UHMWPE can replace steel. UHMWPE is best suited to replace steel in applications where wear resistance, toughness, weight and noise reduction are key considerations. These include chain/belt drivers, curved guides, chain and belt deflecting and tensioning devices, bearing bushes, track disks and impact-absorbing elements. Sheets of UHMWPE (e.g. 8-20 mm thickness) are often used for lining silos, bunkers, chutes, truck loading platforms, dump trucks, rail wagons, and ships' holds.

Furthermore, UHMWPE's sufficiently high tensile properties make it a replacement to certain steel products. UHMWPE is already widely used as a safer and stronger alternative to steel wire rope for heavy duty rigging and other maritime uses. UHMWPE rope is stronger,

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[21] Petition, pp. 15-16.

[22] Omnexus, "Polyethylene." https://omnexus.specialchem.com/selection-guide/polyethylene-plastic retrieved April 2, 2020.

[23] Crouch, Ian, "Body Amour, New Materials, New Systems," Defence Technology, February 27, 2019. https://www.researchgate.net/publication/331378144_Body_armour_-_New_materials_new_systems.

[24] Petitioner's postconference brief, Exhibit 23, answers to staff questions, p. 10.

[25] Petition, p. 9.

(continued...)

lighter, has higher abrasion resistance, and less recoil force than steel wire rope, while it also floats and is water resistant. While the tensile strength of ultra-high strength steel can be 780 MPa or higher, the tensile strength of UHMWPE fibers can exceed 3000 MPa, making it an ideal alternative for heavy duty rigging applications such as in mooring, maritime, and towing use.[26]

Manufacturing processes

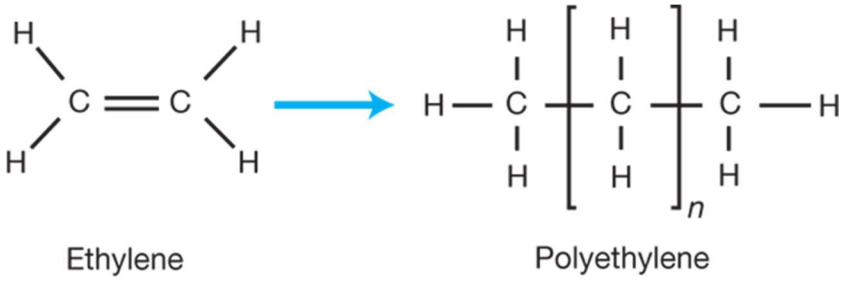
In general, the manufacturing process begins with the raw material of ethylene. Numerous ethylene molecules form a polymer via a catalyst and under pressure, as shown in Figure 1. Ethylene accounts for 99 percent of the raw material used in the chemical reaction.[27] A catalyst is used in the reaction, and for UHMWPE, several alternatives can be used, such as metallocene or Ziegler-Natta catalysts. The catalyst used in the manufacturing process is essential to producing the ultra-high molecular weight polyethylene structure.[28]

[26] Petitioner's postconference brief, Exhibit 23, answers to staff questions, pp. 11-12.

[27] Respondent postconference answers to staff questions, p. 4; Petitioner states ethylene is the main raw material used, accounting for *** percent of raw material used in the polymerization reaction. Petitioner's postconference brief, Exhibit 23, answers to staff questions, p. 6.

[28] KPIC uses a Titanium-based Ziegler-Natta catalyst method developed in-house. Respondent's postconference answers to staff questions, p. 1. Petitioner states the manufacturing process used by both Celanese and Braskem is a *** Celanese and Braskem (to the best of {Celanese's} understanding) use *** While the type of catalyst is the same there are many variants of *** that for the most part impact finished goods properties. To the best of {Celanese's} understanding they are not the same variant. Petitioner's postconference brief, Exhibit 23, answers to staff questions, p. 1.

Figure I-1: UHMWPE: Chemical structures and reaction. Polyethylene is made by the reaction of multiple ethylene molecules in the presence of catalyst.



Where n = an integer of a repeating units of CH_2[29]

The respondent states that to their available industry knowledge, all three producers use a slurry continuous stirred tank reactor (CSTR) process to effectuate the chemical mixing. The slurry CSTR process used by KPIC, Celanese, and Braskem is similar.[30] However, there are unique proprietary methods for undertaking the Slurry CSTR process. UHMWPE producers wishing to use a proprietary process not their own must receive a license to undertake the particular proprietary process from the process patent-holder.[31]

During the manufacturing process, UHMWPE powder can be produced with different molecular weights, bulk densities, average particle size, and particle size distribution. The different combinations of these variables will impart different performance characteristics to the material.[32]

After monomer ethylene molecules have reacted in presence of catalyst to yield the polymer of ethylene, the resultant properties are measured by various methods. There are minor impurities such as the catalyst residue in the final product.[33] This is a small amount that would not affect the physical characteristics of UHMWPE, except in the case of medical grade

[29] Sharpe, Peter, "Making Plastics: From Monomer to Polymer," AIChE, September 2015. https://www.aiche.org/resources/publications/cep/2015/september/making-plastics-monomer-polymer

[30] Respondent's postconference answers to staff questions, p. 1.

[31] Respondent's postconference answers to staff questions, p. 1.

[32] Petitioner's postconference brief, Exhibit 23, answers to staff questions, p. 7.

[33] Respondent's postconference answers to staff questions, p. 2; Petitioner's postconference brief, answers to staff questions, p. 3.

(continued...)

products.[34] The Total Ash standard is one method for determining the amount of impurities in a product.[35] Extraneous matter impurities are measured and measured by an alcohol test.[36]

Both petitioner and respondent agree the molecular weight of UHMWPE is difficult to measure, and they use various methods to determine final product characteristics. The respondent applies intrinsic viscosity technical standards. KPIC uses intrinsic viscosity standard ISO 1628-3 and believes based on market intelligence that Braskem uses intrinsic viscosity standard ASTM D4020.[37] The petitioner uses material flow to characterize its final product.[38]

Domestic like product issues

No issues with respect to domestic like product have been raised in this investigation. For the purposes of the preliminary investigation, both the petitioner and respondent propose the appropriate domestic like product is UHMWPE, co-extensive with the scope of the investigation.[39]

[34] Respondent's postconference answers to staff questions, p. 2.

[35] This standard is used by KPIC. Respondent's postconference answers to staff questions, p. 2.

[36] Petitioner's postconference brief, Exhibit 23, answers to staff questions, p. 3.

[37] Respondent's postconference answers to staff questions, p. 2.

[38] Petitioner defines UHMWPE by its melt mass-flow rate of <0.1 g/10 min, measured at 190 °C and 21.6 kg load, based on the International Organization for Standardization (ISO) standards 21304-1 and 21304-2. Petitioner's postconference brief, Exhibit 23, answers to staff questions, p. 3.

[39] If this investigation moves to a final stage, the respondent proposes that the Commission should examine whether there are clear dividing lines between UHMWPE and other polyethylene products made by Celanese. Respondent's preliminary conference opening statement, p. 4.

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

U.S. market characteristics

UHMWPE is typically produced as a granular or powder substance then formed into stock shapes or profiles. UHMWPE can be molded by downstream end users for processing into various finished products. The product is used in a variety of industries, including construction, agriculture, material handling, transportation, textile, pulp and paper, food and beverage, mining, marine, porous plastics, oil and gas, high performance fibers, battery separators, and waste-water treatment.[1]

Domestically produced UHMWPE comprised a majority of apparent U.S. consumption during 2017-19. U.S. producers Celanese and Braskem supplied *** percent of the U.S. market in 2017, *** percent in 2018, and *** percent in 2019.[2] Imports of UHMWPE from Korea accounted for *** percent of apparent U.S. consumption in 2017, increasing to *** percent in 2018 and to *** percent in 2019.[3] Imports of UHMWPE from nonsubject sources, primarily from Brazil, Germany, Japan, and the Netherlands, collectively accounted for *** percent of apparent U.S. consumption in 2017, *** percent in 2018, and *** percent in 2019. Overall, apparent U.S. consumption of UHMWPE increased from *** pounds in 2017 to *** pounds in 2019, a net increase of *** percent.

*** and three importers reported that there had not been significant changes in the product range, product mix, or marketing of UHMWPE since January 1, 2017. Two importers did report significant changes. One firm noted the constant development of better fiber and another mentioned increased demand for economical grades of reprocessed UHMWPE – a product produced from scrap.

[1] Petition – Product Description, p. 8.

[2] U.S. producer/importer Braskem submitted a substantially incomplete producers' questionnaire. However, after multiple attempts, staff was able to obtain the firm's U.S. shipment quantity and value for both its U.S.-produced UHMWPE and its imports from ***. Like Braskem, U.S. producer Celanese is also an importer of UHMWPE (from ***).

[3] Questionnaires from nine importers are used in this analysis; of which, two are also U.S. producers.

Channels of distribution

U.S. producers sold *** to end users, importers *** sold subject Korean product to distributors and nonsubject product was *** sold to end users (table II-1).

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

Item	Calendar year		
	2017	2018	2019
	Quantity (pounds)		
U.S. producers: to Distributors	***	***	***
to End users	***	***	***
to Blenders and compounders	***	***	***
U.S. importers: Korea to Distributors	***	***	***
to End users	***	***	***
to Blenders and compounders	***	***	***
U.S. importers: Nonsubject to Distributors	***	***	***
to End users	***	***	***
to Blenders and compounders	***	***	***
U.S. importers: All sources: to Distributors	***	***	***
to End users	***	***	***
to Blenders and compounders	***	***	***
	Share of U.S. shipments (percent)		
U.S. producers: to Distributors	***	***	***
to End users	***	***	***
to Blenders and compounders	***	***	***
U.S. importers: Korea to Distributors	***	***	***
to End users	***	***	***
to Blenders and compounders	***	***	***
U.S. importers: Nonsubject to Distributors	***	***	***
to End users	***	***	***
to Blenders and compounders	***	***	***
U.S. importers: All sources to Distributors	***	***	***
to End users	***	***	***
to Blenders and compounders	***	***	***

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

Geographic distribution

*** reported selling UHMWPE to all regions in the contiguous United States (table II-2). Importers reported selling to all regions in the contiguous United States as well as other U.S. markets. For the U.S. producer, *** percent of sales were within 100 miles of their production facility, *** percent were between 101 and 1,000 miles, and *** percent were over 1,000 miles. Responding importers sold *** percent within 100 miles of their U.S. point of shipment, *** percent were between 101 and 1,000 miles, and *** percent were over 1,000 miles.

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

Region	U.S. producers	Subject U.S. importers
Northeast	***	***
Midwest	***	***
Southeast	***	***
Central Southwest	***	***
Mountains	***	***
Pacific Coast	***	***
Other	***	***
All regions (except Other)	***	***
Reporting firms	1	2

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 UHMWPE from U.S. producers and the Korean producer.[4] The U.S. producers reported *** capacity during 2017-19 while the responding Korean firm reported *** capacity. Both U.S. producers and the foreign producer of UHMWPE had increasing inventories and an ability to produce alternative products.

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

Item	Capacity (1,000 pounds)		Capacity utilization (percent)		Inventories as a ratio to total shipments (percent)		Shipments by market in 2019 (percent)		Able to shift to alternate products
	2017	2019	2017	2019	2017	2019	Home market shipments	Exports to non-U.S. markets	No. of firms reporting "yes"
United States	***	***	***	***	***	***	***	***	*** of 2
Korea	***	***	***	***	***	***	***	***	*** of 1

Note: Data provided by the two U.S. producers and the one Korean producer are believed to account for all U.S. and Korean production and shipments. For additional data on the number of responding firms and their share of U.S. production and of U.S. imports from each subject country, please refer to Part I, "Summary Data and Data Sources."

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

Domestic production

Based on available information, U.S. producers of UHMWPE have the ability to respond to changes in demand with large changes in the quantity of shipments of U.S.-produced UHMWPE to the U.S. market. The main contributing factors to this degree of responsiveness of supply are the availability of unused capacity, increasing amounts of inventories, and some ability to shift production to or from alternate products. One factor mitigating responsiveness of supply is the relative limited ability to shift shipments from alternate markets.

[4] Petitioner identified one known producer and exporter of UHMWPE from Korea. Petition, p.12. The leading producer of UHMWPE in Korea is Korea Petrochemical Ind. Co., Ltd. ("KPIC").

U.S. producers' capacity utilization increased from 2017 to 2019, as production capacity remained stable and production increased.[5] Celanese's inventories as a share of total shipments *** from *** percent in 2017 to *** percent in 2019.[6] Celanese's export shipments *** from 2017 to 2019.[7] Celanese reportedly can produce *** on the same equipment as UHMWPE. Factors affecting its ability to shift production include ***. Celanese *** supply constraints during 2017-19.

Subject imports from Korea

Based on available information, KPIC *** to respond to changes in demand with *** changes in the quantity of shipments of UHMWPE to the U.S. market. The main contributing factors to this degree of responsiveness of supply are ***, the ***, and the ***. Factors mitigating responsiveness of supply include ***.

KPIC's capacity utilization *** from 2017 to 2019, as production capacity and production rose.[8] KPIC reported that one production constraint is the ***. However, the producer reported an ***. KPIC's export shipments as a share of its total shipments were *** in 2019 compared to 2017.[9] KPIC reportedly can produce *** on the same equipment as UHMWPE. Factors affecting KPIC's ability to shift production include ***.

[5] *** capacity utilization percent was *** percent in 2017 and *** percent in 2019. ***. ***, email to USITC staff, March 31, 2020.

[6] Braskem did not provide inventory data.

[7] Celanese reported its principal export markets were ***. Braskem did not report export data but reported that *** were its principal export markets.

[8] KPIC's ***.

[9] KPIC's principal export markets were the ***.

Imports from nonsubject sources

Nonsubject imports accounted for *** percent of total U.S. imports in 2019, down from *** percent in 2017. In 2017, the *** source of nonsubject imports was Brazil, which accounted for *** percent of nonsubject imports; Germany accounted for *** percent, Japan accounted for *** percent, and the Netherlands accounted for *** percent. The share of nonsubject imports from Brazil declined to *** percent in 2019, while Japan increased to *** percent, Germany to *** percent, and the Netherlands to *** percent.

Supply constraints

*** and three importers reported that they had not experienced any supply constraints since January 1, 2017. One importer, ***, reported it had experienced supply capacity constraints.[10] Importer *** reported that "Celanese has struggled with delivery reliability from time to time forcing us to purchase additional product from KPIC."

U.S. demand

Based on available information, the overall demand for UHMWPE is likely to experience small-to-moderate changes in response to changes in price. The main contributing factor to this level of demand responsiveness is the lack of substitute products and the broad range of end uses and related cost shares.

End uses and cost share

U.S. demand for UHMWPE depends on the demand for U.S. produced downstream products. The product is used in a variety of industries, including construction, agriculture, material handling, transportation, textile, pulp and paper, food and beverage, mining, marine, porous plastics, oil and gas, high performance fibers, battery separators, and waste-water treatment. UHMWPE is incorporated into a wide-variety of end-uses where it accounts for 100 percent of the finished product (sheet) to a fraction of a percent of the finished product (automotive applications).[11]

[10] *** only imported UHMWPE from nonsubject source *** during 2017-19.

[11] Petitioner Celanese's postconference brief, responses to staff questions, Exhibit 23, p. 18.

Business cycles

*** indicated that the market was not subject to business cycles but was subject to conditions of competition. It noted that it is subject to increasing competition and loss of market share as a result of subject imports from Korea. Importer *** reported that the market was subject to business cycles and noted the addition of Braskem as a new U.S. producer. Three importers reported that the market was not subject to either business cycles or conditions of competition.

Demand trends

U.S. producer *** reported *** in demand for UHMWPE since January 1, 2017; most of the responding importers indicated a fluctuation in demand (table II-4). Petitioner Celanese projects that much of the demand is expected to be driven by electric vehicle production, as UHMWPE is commonly used as a battery separator in electric vehicle batteries as well as to manufacture spare electric vehicle parts.[12] Respondent KPIC also stated that there would be strong demand for UHMWPE stemming from electric vehicle batteries.[13] Importer ***, who indicated a fluctuation in demand, cited market segments as the reason.

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

Item	Number of firms reporting			
	Increase	No change	Decrease	Fluctuate
Demand inside the United States: U.S. producers	***	***	***	***
Importers	1	1	---	3
Demand outside the United States: U.S. producers	***	***	***	***
Importers	1	1	---	3

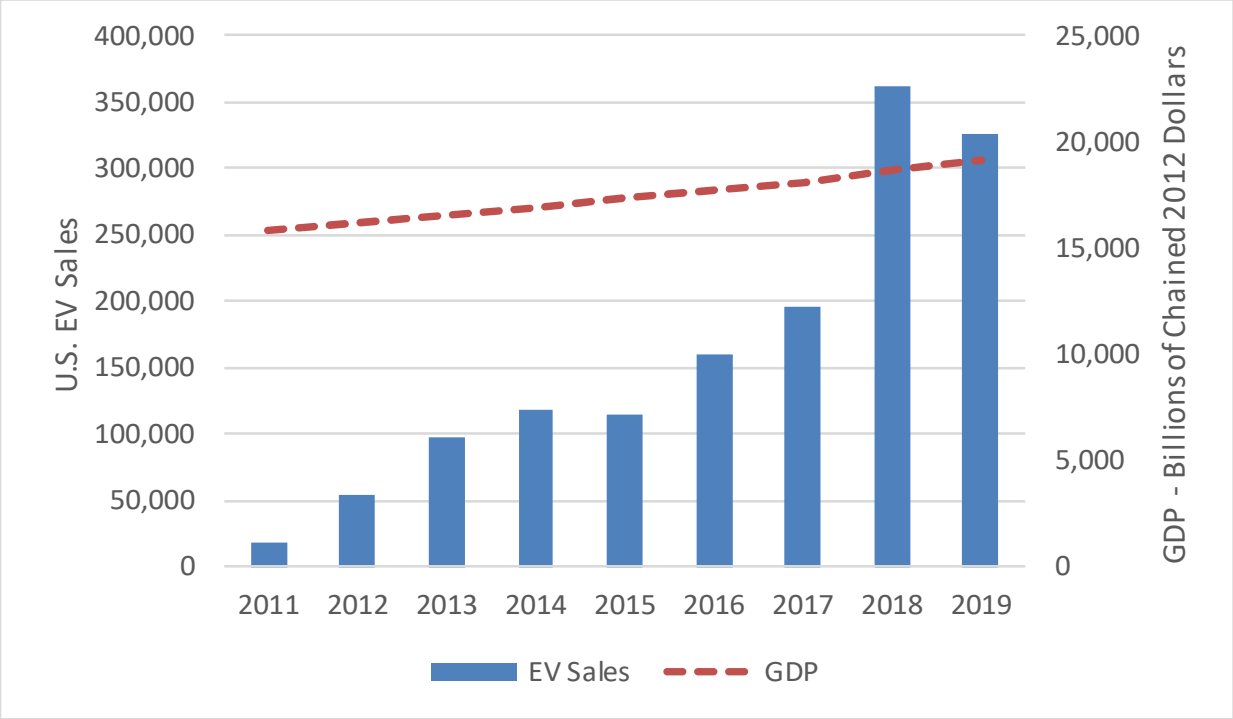
Source: Compiled from data submitted in response to Commission questionnaires.

U.S. demand for UHMWPE is driven partially by demand in the electric-vehicle (EV) market of the automotive industry sector. Increased sales of electric vehicles contribute to increased demand for lithium-ion batteries which rely on UHMWPE to function. Demand indicators from the automotive industry are closely related to GDP growth. As shown in figure II-1, EV sales increased by 84.7 percent from 2017 to 2018, with peak sales of 361 thousand

[12] Petitioner Celanese's postconference brief, p. 35.
[13] Respondent KPIC's postconference brief, responses to staff questions, p. 11.

vehicles, before declining by 9.6 percent in 2019. Overall, EV sales increased by 67.0 percent during 2017-19. GDP experienced steady growth from 2017 to 2019.

Figure II-1
U.S. electric vehicle sales and U.S. GDP



Sources: Transportation Research Center at Argonne National Laboratory, anl.gov/es/light-duty-electric-drive-vehicles-monthly-sales-updates; and Real Gross Domestic Product, Billions of Chained 2012 Dollars, Annual, Not Seasonally Adjusted, accessed from St. Louis Federal Reserve Economic Data, April 2, 2020.

Substitute products

U.S. producer Celanese reported that there are *** substitutes for UHMWPE. Three of four importers reported there are no substitutes. Importer *** reported that high molecular weight polyethylene (HMWPE) and high-density polyethylene (HDPE) sheets are substitutes and that changes in price of these substitutes affected the price for UHMWPE.

Substitutability issues

The degree of substitution between domestic and imported UHMWPE 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, availability of certain product types from different sources, etc.).

Based on available data, staff believes that there is at least a moderate degree of substitutability between domestically produced UHMWPE and UHMWPE imported from Korea.

Lead times

U.S. producer Celanese reported that *** percent of its commercial shipments were produced-to-order, with lead times averaging *** days. The remaining *** percent of its commercial shipments came from inventories, with lead times averaging *** days. Two importers reported an average *** percent of their commercial shipments were sold from inventories, with lead times averaging *** days. Importers reported an average *** percent of shipments were produced-to-order, with lead times averaging *** days. An average of *** percent of importers' shipments came from foreign manufacturers' inventories, with lead times averaging *** days.

Factors affecting purchasing decisions

Purchasers responding to lost sales lost revenue allegations[14] were asked to identify the main purchasing factors their firm considered in their purchasing decisions for UHMWPE. As shown in table II-5, the major purchasing factors identified by firms include price (cited by all 3 firms), quality (3 firms), and availability (2 firms). One purchaser listed quality, one listed the credibility of supplier, and one listed a global procurement directive to have a minimum of two sources for raw materials as the most important factors. Two firms listed quality and one firm listed availability as the second-most important factors. Price was cited by all three firms as the third-most important factor affecting purchasing decisions.

Purchaser *** reported that it experienced delivery and availability issues from Celanese over the last year, which raised serious concerns about interruption to its business and forced it to further diversify its supply chain. It continued that it validated Braskem's product as an alternative UHMWPE resin in case the issues continue with Celanese.

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

Table II-5
UHMWPE: Ranking of factors used in purchasing decisions as reported by U.S. purchasers, by factor

Item	1st	2nd	3rd	Total
	Number of firms (number)			
Price / Cost	---	---	3	3
Quality	1	2	---	3
Availability / Supply	1	1	1	2
Credibility	1	---	---	1
All other factors	---	---	---	NA

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

Comparison of U.S.-produced and imported UHMWPE

In order to determine whether U.S.-produced UHMWPE can generally be used in the same applications as imports from Korea, U.S. producers and importers were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in table II-6, both U.S. producers reported that UHMWPE from all sources can *** be used interchangeably, while half of responding importers reported that they can sometimes be used interchangeably and the other half reported always or frequently. In additional comments, U.S. producer *** noted that country of origin requirements could limit interchangeability.

Table II-6
UHMWPE: Interchangeability between UHMWPE 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. Korea	***	***	***	***	1	1	2	---
United States vs. Other	***	***	***	***	1	1	2	---
Korea vs. Other	***	***	***	***	1	1	2	---

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

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

In addition, U.S. producers and importers were asked to assess how often differences other than price were significant in sales of UHMWPE from the United States, subject, or nonsubject countries. As shown in table II-7, U.S. producers reported that differences other than price from all sources were *** significant, while U.S. importers' response were more diverse.

Table II-7
UHMWPE: Significance of differences other than price between UHMWPE 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. Korea	***	***	***	***	1	---	2	1
United States vs. Other	***	***	***	***	1	---	2	1
Korea vs. Other	***	***	***	***	1	---	2	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 responses of two firms that accounted for all known U.S. production of UHMWPE during 2019.

U.S. producers

The Commission issued a U.S. producer questionnaire to two firms based on information contained in the petition. Two firms provided complete or partial usable data on their operations.[1] Staff believes that these responses represent all known U.S. production of UHMWPE.

Table III-1 lists U.S. producers of UHMWPE, their production locations, positions on the petition, and shares of total production.

[1] U.S. producer Braskem submitted an incomplete U.S. Producers' questionnaire which included limited trade data, no financial data, and no pricing data. ***. ***, Braskem, emails to USITC staff, March 25, March 31 and April 1, 2020. Braskem's webpage states that it is "the largest petrochemical company in the Americas and the world's leading biopolymer producer" with production in Brazil, Germany, Mexico, and the United States. Braskem produces polyethylene (PE), polypropylene (PP) and polyvinyl chloride (PVC) resins, as well as basic petrochemicals such as ethylene, propylene, butadiene, chlorine, benzene, toluene, and others. Braskem's webpage, https://www.braskem.com.br/usa/profile, retrieved April 1, 2020.

Table III-1
UHMWPE: U.S. producers of UHMWPE, their position on the petition, production location, and share of reported production, 2019

Firm	Position on petition	Production location(s)	Share of production (percent)
Celanese	Petitioner	Bishop, Texas	***
Braskem	***	La Porte, Texas	***
Total			100.0

Note: Due to its limited questionnaire response, production data for Braskem are directly estimated ***.

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

Table III-2 presents information on U.S. producers' ownership, related and/or affiliated firms. As indicated in table III-2, both U.S. producers are related to foreign producers of UHMWPE located in countries other than Korea, and import UHMWPE from countries other than Korea.

Table III-2
UHMWPE: U.S. producers' ownership, related and/or affiliated firms

Item / Firm	Firm Name	Affiliated/Ownership
Ownership:		
***	***	***
***	***	***
Related importers/exporters:		
***	***	***
***	***	***
Related producers:		
***	***	***
***	***	***

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

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

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

Item / Firm	Reported changed in operations
Plant openings:	
***	***
Expansions:	
***	***
Prolonged shutdowns or curtailments:	
***	***

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

U.S. production, capacity, and capacity utilization

Table III-4 and figure III-1 present U.S. producers' production, capacity, and capacity utilization. U.S. producers' capacity remained steady between 2017 and 2019, while U.S. producers' production increased by *** percent between 2017 and 2018, and then decreased by *** percent between 2018 and 2019.[2] U.S. producers' capacity utilization increased by *** percentage points between 2017 and 2018, and then decreased by *** percentage points between 2018 and 2019.

Table III-4
UHMWPE: U.S. producers' production, capacity, and capacity utilization, 2017-19

Item	Calendar year		
	2017	2018	2019
	Capacity (1,000 pounds)		
Celanese	***	***	***
Braskem	***	***	***
All firms	***	***	***
	Production (1,000 pounds)		
Celanese	***	***	***
Braskem	***	***	***
All firms	***	***	***

Table continued on next page.

[2] *** ***, email to USITC staff, March 31, 2020.

Table III-4—Continued
UHMWPE: U.S. producers' production, capacity, and capacity utilization, 2017-19

Item	Calendar year		
	2017	2018	2019
	Capacity utilization (percent)		
Celanese	***	***	***
Braskem	***	***	***
All firms	***	***	***
	Share of production (percent)		
Celanese	***	***	***
Braskem	***	***	***
All firms	100.0	100.0	100.0

Note: Due to its limited questionnaire response, production data for Braskem are directly estimated ***.

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

Figure III-1
UHMWPE: U.S. producers' production, capacity, and capacity utilization, 2017-19

* * * * * * *

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

Alternative products

As shown in table III-5, more than *** percent of the product produced between 2017 and 2019 by U.S. producers was UHMWPE. In addition to UHMWPE, *** reported producing ***. *** did not report whether it produced any out-of-scope merchandise using the same equipment.

Table III-5
UHMWPE: U.S. producers' overall plant capacity and production on the same equipment as subject production, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
Overall capacity	***	***	***
Production: UHMWPE	***	***	***
Medical grade UHMWPE	***	***	***
Other products	***	***	***
Out-of-scope production	***	***	***
Total production on same machinery	***	***	***
	Ratios and shares (percent)		
Overall capacity utilization	***	***	***
Share of production: UHMWPE	***	***	***
Medical grade UHMWPE	***	***	***
Other products	***	***	***
Out-of-scope production	***	***	***
Total production on same machinery	100.0	100.0	100.0

Note: Due to its limited questionnaire response, production data for Braskem are directly estimated ***. *** did not report whether it produced any out-of-scope merchandise using the same equipment.

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

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

Table III-6 presents U.S. producers' U.S. shipments, export shipments, and total shipments for use in apparent consumption. Total shipments by quantity increased by *** percent between 2017 and 2018, and then decreased by *** percent between 2018 and 2019. More than *** percent of U.S. producers' shipments by quantity were U.S. shipments between 2017 and 2019. U.S. producers' export shipments *** by *** percent between 2017 and 2019. While the unit values of U.S. shipments increased by *** percent between 2017 and 2019, unit values for export shipments *** by *** percent during the same time period.

Table III-6
UHMWPE: U.S. producers' U.S. shipments, exports shipments, and total shipments, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
U.S. shipments	***	***	***
Export shipments	***	***	***
Total shipments	***	***	***
	Value (1,000 dollars)		
U.S. shipments	***	***	***
Export shipments	***	***	***
Total shipments	***	***	***
	Unit value (dollars per pound)		
U.S. shipments	***	***	***
Export shipments	***	***	***
Total shipments	***	***	***
	Share of quantity (percent)		
U.S. shipments	***	***	***
Export shipments	***	***	***
Total shipments	100.0	100.0	100.0
	Share of value (percent)		
U.S. shipments	***	***	***
Export shipments	***	***	***
Total shipments	100.0	100.0	100.0

Note: Export shipments might be modestly understated. Braskem did not provide export data but ***. *** Braskem, emails to USITC staff, March 25, March 31 and April 1, 2020

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

U.S. producers' inventories

Table III-7 presents U.S. producers' end-of-period inventories and the ratio of these inventories to U.S. producers' production, U.S. shipments, and total shipments**.** U.S. producers' end-of-period inventories *** by *** percent between 2017 and 2019. The ratios of inventories to U.S. production and U.S. shipments were *** in 2018 than in 2017 but *** in 2019 than in 2018.

Table III-7
UHMWPE: U.S. producers' inventories, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
U.S. producers' end-of-period inventories	***	***	***
	Ratio (percent)		
Ratio of inventories to.--			
U.S. production	***	***	***
U.S. shipments	***	***	***
Total shipments	***	***	***

Note: Inventories might be modestly understated. U.S. producer Braskem did not provide inventory data.

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

U.S. producers' imports and purchases

Table III-8 presents U.S. producers' U.S. production, imports and purchases. Both U.S. producers imported UHMWPE from nonsubject countries between 2017 and 2019. *** imported UHMWPE from *** while Braskem imported UHMWPE from ***.[3] Celanese's U.S. imports from *** by *** percent between 2017 and 2018, and then *** by *** percent between 2018 and 2019. Celanese's ratio to U.S. production of imports from *** by *** percentage points between 2017 and 2018, and then *** by *** percentage points between 2018 and 2019. Braskem's U.S. imports from *** by *** percent between 2017 and 2018, and then *** by *** percent between 2018 and 2019. Braskem's ratio to U.S. production of imports from *** by *** percentage points between 2017 and 2018, and then *** by *** percentage points between 2018 and 2019.

Table III-8
UHMWPE: U.S. producers' U.S. production, imports and purchases, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
Braskem's U.S. production	***	***	***
Braskem's U.S. imports from.--			
Nonsubject ***	***	***	***
	Ratio (percent)		
Braskem's ratio to U.S. production of imports from.--			
Nonsubject ***	***	***	***

Table continued on next page.

[3] ***, email to USITC staff, April 3, 2020

Table III-8—Continued
UHMWPE: U.S. producers' U.S. production, imports and purchases, 2017-19

Item	Calendar year		
	2017	2018	2019
	Narrative		
Braskem's reason for importing	***		
	Quantity (1,000 pounds)		
Celanese's U.S. production	***	***	***
Celanese's U.S. imports from.-- Nonsubject ***	***	***	***
	Ratio (percent)		
Celanese's ratio to U.S. production of imports from.-- Nonsubject ***	***	***	***
	Narrative		
Celanese's reason for importing	***		

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

U.S. employment, wages, and productivity

Table III-9 shows U.S. producer Celanese's employment-related data. Between 2017 and 2019, the number of production and related workers ("PRWs"), total hours worked, and total wages paid ***, however hourly wages *** percent during the same time period.

Table III-9
UHMWPE: U.S. producer Celanese's employment related data, 2017-19

Item	Calendar year		
	2017	2018	2019
Production and related workers (PRWs) (number)	***	***	***
Total hours worked (1,000 hours)	***	***	***
Wages paid ($1,000)	***	***	***
Hourly wages (dollars per hour)	***	***	***
Productivity (pounds per hour)	***	***	***
Unit labor costs (dollars per pound)	***	***	***

Note: U.S. producer Braskem did not provide employment data, therefore productivity and unit labor cost are calculated using only production data for ***.

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

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

U.S. importers

The Commission issued importer questionnaires to 20 firms believed to be importers of UHMWPE, as well as to all U.S. producers of UHMWPE.[1] Usable questionnaire responses were received from nine companies, representing the large majority of U.S. imports of UHMWPE in 2019 entered under statistical reporting numbers 3901.10.10.00 and 3901.20.10.00, a broad product category that also includes other polymers of ethylene with a relative viscosity of 1.44 or more.[2] Table IV-1 lists all responding U.S. importers of UHMWPE from Korea and other sources, their locations, and their shares of U.S. imports, in 2019.

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

Firm	Headquarters	Share of imports by source (percent)		
		Korea	Nonsubject sources	All import sources
Braskem	Philadelphia, PA	***	***	***
Celanese	Irving, TX	***	***	***
DSM	Greenville, NC	***	***	***
Entek	Lebanon, OR	***	***	***
Itochu	White Plains, NY	***	***	***
Mitsubishi	Reading, PA	***	***	***
Mitsui	Rye Brook, NY	***	***	***
Pacific High	Williamsville, NY	***	***	***
Rochling	Dallas, NC	***	***	***
Total		100.0	100.0	100.0

Table continued on next page.

[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 statistical reporting numbers 3901.10.10.00 and 3901.20.10.00 between 2017 and 2019.

[2] U.S. importer Braskem did not provide a U.S. Importers' questionnaire response due to resource constraints resulting from COVID-19. *** Braskem confirmed all of its UHMWPE imports between 2017 and 2019 were sourced from ***. *** Braskem, emails to USITC staff, March 25, March 31, April 1 and April 3, 2020

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

Note: The Commission also received questionnaire responses from ***. However, data reported by both firms could not be included due to *** reporting all imports under the relevant HTS statistical reporting numbers and *** confirming it provided unreliable trade data.

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 UHMWPE from Korea and nonsubject sources. Between 2017 and 2018, U.S. imports from Korea increased by *** percent while imports from nonsubject sources decreased by *** percent. The decrease in nonsubject source imports largely reflects ***. Between 2018 and 2019, imports from Korea increased by *** percent while imports from nonsubject sources increased by *** percent.

The total value of imports from Korea increased by *** percent between 2017 and 2019, while the total value of nonsubject source imports decreased by *** percent during the same time period. Unit values for imports from Korea *** between 2017 and 2019, while unit values for imports from nonsubject sources increased by *** percent during the same time period.[3]

The share of imports by quantity from Korea increased by *** percent between 2017 and 2019, while the share of imports by value from Korea increased by *** percent during the same time period.

Table IV-2
UHMWPE: U.S. imports by source, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
U.S. imports from.--			
Korea	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***

Table continued on next page.

[3] Values and unit values reported by *** are drawn from the firm's reporting of U.S. shipments, and are therefore overstated.

Table IV-2—Continued
UHMWPE: U.S. imports by source, 2017-19

Item	Calendar year		
	2017	2018	2019
	Value (1,000 dollars)		
U.S. imports from.--			
Korea	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
	Unit value (dollars per pound)		
U.S. imports from.--			
Korea	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
	Share of quantity (percent)		
U.S. imports from.--			
Korea	***	***	***
Nonsubject sources	***	***	***
All import sources	100.0	100.0	100.0
	Share of value (percent)		
U.S. imports from.--			
Korea	***	***	***
Nonsubject sources	***	***	***
All import sources	100.0	100.0	100.0
	Ratio to U.S. production		
U.S. imports from.--			
Korea	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***

Note: U.S. imports from nonsubject sources include U.S. shipments of imports reported by ***.

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

Figure IV-1
UHMWPE: U.S. import quantity and average unit values 2017-19

* * * * * * *

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

Table IV-3 presents U.S. imports from nonsubject sources. Between 2017 and 2019, ***. U.S. importer *** accounted for *** known imports of UHMWPE from Brazil. Imports from Brazil decreased by *** percent between 2017 and 2018, and then decreased by *** percent between 2018 and 2019. The decrease in imports from Brazil occurred after ***.

U.S. importer *** accounted for *** known imports of UHMWPE from Germany. Imports from Germany increased by *** percent between 2017 and 2018, and then decreased by *** percent between 2018 and 2019. U.S. importers *** and *** accounted for *** known imports of UHMWPE from Japan. Imports from Japan increased by *** percent between 2017 and 2018, and then increased by *** percent between 2018 and 2019. U.S. importer *** accounted for *** known imports from the Netherlands. Imports from the Netherlands decreased by *** percent between 2017 and 2018, and then increased by *** percent between 2018 and 2019.

Between 2017 and 2019, the share of imports from Brazil by quantity decreased by *** percent, while the share of imports by quantity from Japan, the Netherlands and Germany increased by *** percent, *** percent, and *** percent respectively.

Table IV-3
UHMWPE: U.S. imports from nonsubject sources, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
U.S. imports from nonsubject sources.-- Brazil	***	***	***
China	***	***	***
Japan	***	***	***
Netherlands	***	***	***
All other sources	***	***	***
Nonsubject sources	***	***	***
	Value (1,000 dollars)		
U.S. imports from nonsubject sources.-- Brazil	***	***	***
China	***	***	***
Japan	***	***	***
Netherlands	***	***	***
All other sources	***	***	***
Nonsubject sources	***	***	***
	Unit value (dollars per pound)		
U.S. imports from nonsubject sources.-- Brazil	***	***	***
China	***	***	***
Japan	***	***	***
Netherlands	***	***	***
All other sources	***	***	***
Nonsubject sources	***	***	***
	Share of total import quantity (percent)		
U.S. imports from nonsubject sources.-- Brazil	***	***	***
China	***	***	***
Japan	***	***	***
Netherlands	***	***	***
All other sources	***	***	***
Nonsubject sources	***	***	***
	Share of total import value (percent)		
U.S. imports from nonsubject sources.-- Brazil	***	***	***
China	***	***	***
Japan	***	***	***
Netherlands	***	***	***
All other sources	***	***	***
Nonsubject sources	***	***	***

Note: U.S. imports from nonsubject sources include U.S. shipments of imports reported by ***.

Note: *** reported imports from all other sources and accounted for all known imports of UHMWPE from Germany.

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.[4] 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.[5] Imports from Korea accounted for *** percent of total imports of UHMWPE by quantity during March 2019 through February 2020. Volume data for U.S. imports from Korea in the 12-month period preceding the filing of the petition are shown in table IV-4.

Table IV-4
UHMWPE: U.S. imports by source, March 2019 through February 2020

Item	March 2019 through February 2020	
	Quantity (1,000 pounds)	Share quantity (percent)
U.S. imports from.--		
Korea	***	***
Nonsubject sources	***	***
All import sources	***	***

Note: U.S. imports from nonsubject sources include U.S. shipments of imports reported by *** for the period January-December 2019.

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

[4] 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)).

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

Apparent U.S. consumption

Table IV-5 and figure IV-2 present data on apparent U.S. consumption for UHMWPE. Apparent U.S. consumption increased by *** percent between 2017 and 2018, and then decreased by *** percent between 2018 and 2019. U.S. producers' U.S. shipments increased by *** percent between 2017 and 2018, and then decreased by *** percent between 2018 and 2019. Between 2017 and 2018, U.S. importers' U.S. shipments from Korea increased by *** percent, while U.S. shipments of imports from nonsubject sources decreased by *** percent during the same time period. Between 2018 and 2019, U.S. importers' U.S. shipments from Korea increased by *** percent while U.S. importers' U.S. shipments of imports from nonsubject sources increased by *** percent between 2018 and 2019.

Table IV-5
UHMWPE: 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 (1,000 pounds)		
U.S. producers' U.S. shipments	***	***	***
U.S. importers' U.S. shipments from.-- Korea	***	***	***
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.-- Korea	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
Apparent U.S. consumption	***	***	***

Note: U.S. imports from nonsubject sources include U.S. shipments of imports reported by ***.

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

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

* * * * * * *

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

U.S. market shares

U.S. market share data are presented in table IV-6. The share of U.S. producers' U.S. shipments by quantity increased by *** percentage points between 2017 and 2018, and then decreased by *** percentage points between 2018 and 2019. U.S. importers' U.S. shipments by quantity from Korea increased by *** percentage points between 2017 and 2018, and then increased by *** percentage points between 2018 and 2019. U.S. importers' U.S. shipments by quantity from nonsubject sources decreased by *** percentage points between 2017 and 2018, and then increased by *** percentage points between 2018 and 2019.

U.S. producers' U.S. shipments by value increased by *** percentage points between 2017 and 2018, and then decreased by *** percentage points between 2018 and 2019. U.S. importers' U.S. shipments by value from Korea increased by *** percentage points between 2017 and 2018, and then increased by *** percentage points between 2018 and 2019. U.S. importers' U.S. shipments by value from nonsubject sources decreased by *** percentage points between 2017 and 2018, and then increased by *** percentage points between 2018 and 2019.

Table IV-6
UHMWPE: U.S. consumption and market shares, 2017-19

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

Note: U.S. imports from nonsubject sources include U.S. shipments of imports reported by ***.

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

Part V: Pricing data

Factors affecting prices

Raw material costs

UHMWPE is synthesized from its monomer ethylene, which is bonded together to form the base polyethylene product.[1] The manufacturing process of ethylene is primarily dependent upon steam cracking of hydrocarbons. A variety of hydrocarbons can be used in this process ranging from natural gas liquids (ethane, propane, butane) to petroleum liquids (naphtha, gas oil, crude oil).[2] The price for ethylene decreased by *** percent from *** per metric ton in 2017 to *** in 2019, a ten-year low. Raw material costs reported by Celanese ranged between *** percent (2017) and *** percent (2019) of the total cost of goods sold (COGS).

Figure V-1
Prices for ethylene and crude oil

* * * * * * *

Sources: Ethylene – IHS Markit, February 2020; Crude oil – U.S. Energy Information Administration

[1] Petition, p. 10.
[2] 2020 Chemical Economics Handbook: Ethylene. IHS Markit.

U.S. producer and importer Braskem[3] reported that raw material prices have *** since January 1, 2017. U.S. producer and importer Celanese noted that raw material prices *** during this time period. Three importers[4] reported a decrease in prices of raw materials. Importer *** noted the decrease in raw material prices was due to a decrease in polyethylene (PE) price. Importer *** reported an increase in the usage of cheaper off-grade resin from its domestic source. *** reported that prices of UHMWPE are correlated with prices of crude oil – as oil prices fluctuate, selling prices of UHMWPE change accordingly. One additional importer reported that prices fluctuated.

Energy costs

Common energy sources in the polymerization of UHMWPE by both domestic and foreign producers are electricity and steam energy; other sources are cooling water and fuel gas.[5] Celanese stated that its total energy cost is about *** of UHMWPE produced,[6] equivalent to approximately *** of reported total COGS in 2019.

Transportation costs to the U.S. market

Transportation costs for UHMWPE shipped from Korea to the United States averaged 8.8 percent during 2019. These estimates were derived from official import data and represent the transportation and other charges on imports.[7]

U.S. inland transportation costs

Both U.S. producers/importers and 4 importers reported that they typically arrange transportation to their customers. One U.S. producer/importer reported that its U.S. inland transportation costs were *** percent and four responding importers reported no inland transportation costs. Importer *** noted that all its shipments from storage facilities are f.o.b. term.

---

[3] Braskem submitted a largely incomplete U.S. producer questionnaire and provided small amounts of information for the importer questionnaire.

[4] Questionnaires from nine importers are used in this analysis; of which, two are also U.S. producers.

[5] Petitioner Celanese's postconference brief, response to staff questions, Exhibit 23 p. 6, and respondent KPIC's postconference brief, response to staff questions, p. 4.

[6] Petitioner Celanese's postconference brief, response to staff questions, Exhibit 23 p. 7.

[7] 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 same HTS subheadings used in Part IV.

Pricing practices

Pricing methods

U.S. producers and importers reported using transaction-by-transaction negotiations, contracts, and price lists in order to set prices for UHMWPE. As presented in table V-1, contracts are the most common method of UHMWPE sales.[8]

Table V-1
UHMWPE: U.S. producers' and importers' reported price setting methods, by number of responding firms

Method	U.S. producers	U.S. importers
Transaction-by-transaction	***	3
Contract	***	5
Set price list	***	1
Other	***	---
Responding firms	1	5

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.

U.S. producer Celanese reported selling *** of its UHMWPE under *** and importers reported *** selling under *** (table V-2).

Table V-2
UHMWPE: U.S. producers' and importers' shares of U.S. commercial shipments by type of sale, 2019

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

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

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

The average contract duration for *** reported by U.S. producer Celanese was *** years. It reported that its ***. Importer *** reported that its annual contracts fixed price, prices were not renegotiated during the contract period, and that contracts were not indexed

[8] Celanese reported that contract negotiations typically take place over a period of 3-6 months. Petitioner Celanese's postconference brief, response to staff questions, Exhibit 23 p. 19.

to raw material costs. Two importers reported that short-term contracts fixed both price and quantity; *** reported short-term contracts ranged between 7-14 days. Five importers reported that prices were not renegotiated during contract periods and two importers reported that prices were not indexed to raw material costs.

Sales terms and discounts

One U.S. producer and two importers responded that they usually quote prices on a delivered basis. One importer reported that it typically quotes prices on an f.o.b. basis. Celanese reported that it has some contracts that include ***.[9] One importer reported quantity-based discounts, two importers reported total volume discounts, and two importers reported no discount policy.

Price data

The Commission requested U.S. producers and importers to provide quarterly data for the total quantity and f.o.b. value of the following UHMWPE products shipped to unrelated U.S. customers during January 2017 to December 2019.

Product 1.--UHMWPE, with an average molecular weight/volume ranging from 6.7 to 7 106g/mol based on the producer's advertised testing methodology; in individual packaging with a net weight of 25kg.

Product 2.--UHMWPE, with an average molecular weight/volume ranging from 6.7 to 7 106g/mol based on the producer's advertised testing methodology; in bulk packaging with a net pallet weight of 130,000 lbs (59 MT) to 140,000 lbs (63.5 MT).

Product 3.--UHMWPE, with an average molecular weight/volume ranging from 8.7 to 9 106g/mol based on the producer's advertised testing methodology; in individual packaging with net weight greater than 453kg but less than 500 kg.

Product 4.--UHMWPE, with an average molecular weight/volume ranging from 8.7 to 9 106g/mol based on the producer's advertised testing methodology; in individual packaging with net weight ranging from 500 kg to 550 kg.

[9] Petitioner Celanese's postconference brief, response to staff questions, Exhibit 23 p. 18.

One U.S. producer and two importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters.[10] Pricing data reported by these firms accounted for approximately *** percent of U.S. producers' shipments of UHMWPE in 2019.[11] Pricing data reported by importers accounted for *** percent of U.S. shipments of subject imports from Korea in 2019.[12]

Price data for products 1-4 are presented in tables V-3 to V-6 and figures V-2 to V-5.

Table V-3
UHMWPE: Weighted-average f.o.b. prices and quantities of domestic and imported product 1 and margins of underselling/(overselling), by quarter, 2017-19

	United States		Korea		
Period	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2017: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***

Note: Product 1: UHMWPE, with an average molecular weight/volume ranging from 6.7 to 7 106g/mol based on the producer's advertised testing methodology; in individual packaging with a net weight of 25kg.

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

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

[11] This coverage reflects the fact that *** did not report price data, only U.S. commercial shipments data. Pricing data reported by *** accounted for *** percent of its U.S. commercial shipments of UHMWPE in 2019.

[12] No importers reported price data for products 2 and 3 imported from Korea during 2017-19.

Table V-4
UHMWPE: Weighted-average f.o.b. prices and quantities of domestic and imported product 2, and margins of underselling/(overselling), by quarter, January 2017 through December 2019

Period	United States		Korea		
	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2017: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***

Note: Product 2: UHMWPE, with an average molecular weight/volume ranging from 6.7 to 7 106g/mol based on the producer's advertised testing methodology; in bulk packaging with a net pallet weight of 130,000 lbs (59 MT) to 140,000 lbs (63.5 MT).

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

Table V-5

UHMWPE: Weighted-average f.o.b. prices and quantities of domestic and imported product 3, and margins of underselling/(overselling), by quarter, January 2017 through December 2019

	United States		Korea		
Period	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2017: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***

Note: Product 3: UHMWPE, with an average molecular weight/volume ranging from 8.7 to 9 106g/mol based on the producer's advertised testing methodology; in individual packaging with net weight greater than 453kg but less than 500 kg.

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

Table V-6

UHMWPE: Weighted-average f.o.b. prices and quantities of domestic and imported product 4, and margins of underselling/(overselling), by quarter, January 2017 through December 2019

	United States		Korea		
Period	Price (dollars per pound)	Quantity (pounds)	Price (dollars per pound)	Quantity (pounds)	Margin (percent)
2017: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***
Apr.-Jun.	***	***	***	***	***
Jul.-Sep.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***

Note: Product 4: UHMWPE, with an average molecular weight/volume ranging from 8.7 to 9 106g/mol based on the producer's advertised testing methodology; in individual packaging with net weight ranging from 500 kg to 550 kg.

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

Figure V-2
UHMWPE: Weighted-average prices and quantities of domestic and imported product 1, by quarter, 2017-19

* * * * * * *

Product 1: UHMWPE, with an average molecular weight/volume ranging from 6.7 to 7 106g/mol based on the producer's advertised testing methodology; in individual packaging with a net weight of 25kg.

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

Figure V-3
UHMWPE: Weighted-average prices and quantities of domestic and imported product 2, by quarter, 2017-19

* * * * * * *

Product 2: UHMWPE, with an average molecular weight/volume ranging from 6.7 to 7 106g/mol based on the producer's advertised testing methodology; in bulk packaging with a net pallet weight of 130,000 lbs (59 MT) to 140,000 lbs (63.5 MT).

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

Figure V-4
UHMWPE: Weighted-average prices and quantities of domestic and imported product 3, by quarter, 2017-19

* * * * * * *

Product 3: UHMWPE, with an average molecular weight/volume ranging from 8.7 to 9 106g/mol based on the producer's advertised testing methodology; in individual packaging with net weight greater than 453kg but less than 500 kg.

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

Figure V-5
UHMWPE: Weighted-average prices and quantities of domestic and imported product 4, by quarter, 2017-19

* * * * * * *

Product 4: UHMWPE, with an average molecular weight/volume ranging from 8.7 to 9 106g/mol based on the producer's advertised testing methodology; in individual packaging with net weight ranging from 500 kg to 550 kg.

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

Price trends

Prices decreased overall during 2017-19. Table V-7 summarizes the price trends, by country and by product. As shown in the table, domestic price decreases for products *** ranged from *** to *** percent; domestic price decreases for products *** ranged from *** to *** percent; and import price decreases for products *** ranged from *** to *** percent.

Table V-7
UHMWPE: Summary of weighted-average f.o.b. prices for products 1-4 from the United States and Korea

Item	Number of quarters	Low price (dollars per pound)	High price (dollars per pound)	Change in price over period (percent)
Product 1:				
United States	***	***	***	***
Korea	***	***	***	***
Product 2:				
United States	***	***	***	***
Korea	***	***	***	***
Product 3:				
United States	***	***	***	***
Korea	***	***	***	***
Product 4:				
United States	***	***	***	***
Korea	***	***	***	***

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

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

Price comparisons

As shown in table V-8, prices for product imported from Korea were below those for U.S.-produced product in all 24 instances (*** pounds); margins of underselling ranged from *** to *** percent.[13] There were no reported instances where prices for product from Korea were above prices for the domestic product.

Table V-8
UHMWPE: Instances of underselling/overselling and the range and average of margins, by country, 2017-19

Source	Underselling				
	Number of quarters	Quantity (pounds)	Average margin (percent)	Margin range (percent)	
				Min	Max
Product 1	***	***	***	***	***
Product 2	***	***	***	***	***
Product 3	***	***	***	***	***
Product 4	***	***	***	***	***
Total, underselling	24	***	***	***	***
Source	**(Overselling)**				
	Number of quarters	**Quantity (pounds)**	**Average margin (percent)**	**Margin range (percent)**	
				Min	**Max**
Product 1	---	---	---	---	---
Product 2	---	---	---	---	---
Product 3	---	---	---	---	---
Product 4	---	---	---	---	---
Total, overselling	---	---	---	---	---

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 U.S. producers of UHMWPE report purchasers with which they experienced instances of lost sales or revenue due to competition from subject imports of UHMWPE from Korea during January 2017-December 2019. One of two responding U.S. producers reported usable lost sales and lost revenue information. *** reported that it had to *** and ***. The firm also reported that it had ***. Petitioner Celanese submitted lost sales and lost revenue allegations, identifying *** firms.

[13] No importers reported price data for products 2 and 3 imported from Korea during 2017-19.

Staff contacted *** purchasers and received responses from ***. Responding purchasers reported purchasing *** pounds of UHMWPE during 2017-19 (table V-9).

Table V-9
UHMWPE: Purchasers' responses to purchasing patterns

Purchaser	Purchases and imports in 2017-19 (pounds)			Change in domestic share (pp, 2017-19)	Change in subject country share (pp, 2017-19)
	Domestic	Subject	All other		
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
Total	***	***	***	***	***

Notes: All other includes unknown sources.
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.

During 2019, responding purchasers purchased *** percent of product from U.S. producers and purchased and/or imported *** percent from Korea; there were *** reported purchases from nonsubject countries or unknown sources. Purchasers were asked about changes in their purchasing patterns from different sources since 2017. Of the responding purchasers, ***. One reason for reporting a fluctuation in purchases from domestic sources was "product mix changes" (***). For imports from Korea, ***.

*** responding purchasers reported that, since 2017, they had purchased imported UHMWPE from Korea instead of U.S.-produced product. *** of these purchasers reported that subject import prices were lower than U.S.-produced product, and none of these purchasers reported that price was a primary reason for the decision to purchase imported product rather than U.S.-produced product. No purchasers estimated the quantity of UHMWPE purchased from Korea instead of domestic product (table V-10). ***, *** largest reporting purchasers of UHMWPE during 2017-19, identified non-price reasons for purchasing imported rather than U.S.-produced product. *** stated a strategy to diversify from single-source vendor system and *** reported finished product characteristics as non-price reasons for purchasing subject imports.

Table V-10
UHMWPE: Purchasers' responses to purchasing subject imports instead of domestic product, by firm

Purchaser	Subject imports purchased instead of domestic (Y/N)	Imports priced lower (Y/N)	If purchased subject imports instead of domestic, was price a primary reason		
			Y/N	If Yes, quantity (pounds)	If No, non-price reason
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
Total	Yes--***; No--***	Yes--***; No--***	Yes--***; No--***	***	

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

Of the *** responding purchasers, one reported that U.S. producers had reduced prices in order to compete with lower-priced imports from Korea; one firm reported that U.S. producers had not reduced prices; and one reported that they did not know (table V-11). The reported estimated price reduction was *** percent.

Table V-11
UHMWPE: Purchasers' responses to U.S. producer price reductions, by firm

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

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

In responding to the lost sales lost revenue survey, one purchaser provided additional information on purchases and market dynamics. *** reported "***."

Part VI: Financial experience of U.S. producers

Background

The petitioner, Celanese, is the only U.S. producer of UHMWPE that provided usable financial data.[1] Celanese's fiscal year ends on December 31 and provided financial data on the basis of generally accepted accounting principles (GAAP). Revenue reflects ***.[2]

Operations on UHMWPE

Table VI-1 presents aggregated data on Celanese's U.S. operations in relation to UHMWPE during 2017-19, while table VI-2 presents corresponding changes in average unit values.

[1] The only other known U.S. producer, Braskem, provided limited trade data and no financial or pricing data. Because the firm did not provide financial data in its questionnaire response, its responses to questions related to such data (***) are not included in this section of the report.

Braskem's webpage states that it is "the largest petrochemical company in the Americas and the world's leading biopolymer producer" with production in Brazil, Germany, Mexico, and the United States. Braskem produces polyethylene (PE), polypropylene (PP) and polyvinyl chloride (PVC) resins, as well as basic petrochemicals such as ethylene, propylene, butadiene, chlorine, benzene, toluene, and others. Braskem's webpage, https://www.braskem.com.br/usa/profile, retrieved April 1, 2020.

***. ***, email to USITC staff, March 31, 2020.

[2] Celanese's UHMWPE operations are part of the company's Engineering Materials business segment and includes operations of more than ten other chemicals including: polyoxymethylene, polybutylene terephthalate, long-fiber reinforced thermoplastics, liquid crystal polymers, thermoplastic elastomers, nylon compounds or formulations, polypropylene compounds or formulations, polyphenylene sulfide, acesulfame potassium, potassium sorbate, and sorbic acid. In 2019, the reported net sales of UHMWPE were *** percent of the $2.4 billion net sales in Celanese's Engineering Materials business segment. Celanese's 2019 Form 10-K, pp. 5 and 37 (as filed).

Table VI-1
UHMWPE: Results of Celanese's U.S. operations, 2017-19

Item	Fiscal year		
	2017	2018	2019
	Quantity (1,000 pounds)		
Total net sales	***	***	***
	Value (1,000 dollars)		
Total net sales	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Total COGS	***	***	***
Gross profit	***	***	***
SG&A expense	***	***	***
Operating income or (loss)	***	***	***
Interest expense	***	***	***
All other expenses	***	***	***
All other income	***	***	***
Net income or (loss)	***	***	***
Depreciation/amortization	***	***	***
Cash flow	***	***	***
	Ratio to net sales (percent)		
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Average COGS	***	***	***
Gross profit	***	***	***
SG&A expense	***	***	***
Operating income or (loss)	***	***	***
Net income or (loss)	***	***	***

Table continued on next page.

Table VI-1—Continued
UHMWPE: Results of Celanese's U.S. operations, 2017-19

Item	Fiscal 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 pound)		
Total net sales	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Average COGS	***	***	***
Gross profit	***	***	***
SG&A expense	***	***	***
Operating income or (loss)	***	***	***
Net income or (loss)	***	***	***
	Number of firms reporting		
Operating losses	***	***	***
Net losses	***	***	***
Data	***	***	***

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

Table VI-2
UHMWPE: Changes in AUVs between fiscal years

Item	Between fiscal years		
	2017-19	2017-18	2018-19
	Change in AUVs (dollars per pound)		
Total net sales	***	***	***
Cost of goods sold.-- Raw materials	***	***	***
Direct labor	***	***	***
Other factory costs	***	***	***
Average COGS	***	***	***
Gross profit	***	***	***
SG&A expense	***	***	***
Operating income or (loss)	***	***	***
Net income or (loss)	***	***	***

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

Net sales

Total net sales quantity and value of U.S. producer Celanese *** within *** from 2017 to 2019, *** *** percent by quantity and *** percent by value from 2017 to 2018 before *** *** percent by quantity and *** percent by value percent from 2018 to 2019 (tables VI-1 and C-1). Average unit values of net sales *** from $*** per-pound in 2017 to $*** per-pound in in 2019 (table VI-1).

Cost of goods sold and gross profit or (loss)

Celanese's total cost of goods sold ("COGS") *** from 2017 to 2019, *** from 2017 to 2018 before declining in 2019 to the *** of the three annual periods (tables VI-1 and C-1). Average per unit values of COGS *** by *** percent from 2017 to 2019 (table C-1). As a ratio to net sales, COGS *** from a *** of *** percent in 2017 to a *** of *** percent in 2019 (table VI-1), mostly attributable to the *** in *** costs over this period.

Raw material costs represent the *** share of total COGS, *** from *** percent in 2017 to *** percent of total COGS. Raw materials costs *** by *** percent in absolute values from 2016 to 2018 (calculated from table VI-1). Average per unit raw material costs *** each year, from $*** per-pound in 2017 to $*** per-pound in 2019 (table VI-1). As a ratio to net sales, raw materials *** from a *** of *** percent in 2017 to a *** of *** percent in 2019 (table VI-1).

Table VI-3 presents details on specific raw material inputs as a share of total raw material costs in 2019. Ethylene accounted for *** of raw material costs. Celanese reported *** ethylene prices per-ton of $*** in 2017, $*** in 2018, and $*** in 2019.[3] Other raw materials accounted for *** share of total raw materials at *** percent and less than $*** per-pound and include *** and *** as a chain terminator.[4] Celanese uses ***. Celanese's *** process uses ***.[5]

[3] Celanese stated that the *** prices for ethylene were at ***. Ibid.

[4] As explained in Part I of this report, UHMWPE is manufactured using two possible production processes: Ziegler-Natta or metallocene.

[5] ***. ***, email to USITC staff, March 27, 2020.

Table VI-3
UHMWPE: Raw material costs reported by U.S. producer Celanese, 2019

Raw materials	Calendar 2019		
	Value (1,000 dollars)	Unit value (dollars per 1,000 pound)	Share of value (percent)
Ethylene	***	***	***
Other material inputs	***	***	***
Total, raw materials	***	***	***

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

Other factory costs represent the *** share of total COGS, *** from *** percent in 2017 to *** percent in 2019, primarily a function of *** raw material costs. Other factory costs *** in absolute values from 2016 to 2018, *** by *** percent from 2017 to 2018 before *** by *** percent from 2018 to 2019 (table VI-1). Average per unit other factory costs ***, ranging from $*** per-pound to $*** per-pound from 2017 to 2019 (table VI-1). As a ratio to net sales, other factory costs ***, ranging from *** percent to *** percent from 2017 to 2019 (table VI-1).

Direct labor costs represent the *** share of total COGS and were ***, increasing from *** percent in 2017 to *** percent in 2019 as *** of total COGS declined. Direct labor costs *** by *** percent in absolute values from 2017 to 2019 (table VI-1). Average per unit direct labor costs *** at $*** per-pound in 2017 and 2019 and was $*** per-pound in 2018 (table VI-1). As a ratio to net sales, direct labor costs pattern was *** at *** percent in 2017 and 2018 and *** percent in 2019 (table VI-1).

As presented in tables VI-1 and C-1, Celanese's gross profit *** by *** percent from 2017 to 2019 (***). Gross margins ***, from *** percent in 2017 to *** percent in 2018 and *** to *** percent in 2019. The *** in gross profits *** with the *** in raw material costs from 2017 to 2019.

SG&A expenses and operating income or (loss)

Celanese's selling, general, and administrative ("SG&A") expense ratios (i.e., total SG&A expenses divided by net sales) *** in each annual period from 2017 to 2019, from *** of *** percent in 2017 to a *** of *** percent in 2019. Selling expenses and general and administrative expenses each made up approximately *** of total SG&A costs. Celanese explained that selling expense were *** and the *** resulted in the *** of selling expenses over the period examined.[6]

As presented in tables VI-1 and C-1, Celanese's operating income *** its *** gross profit trends, *** by *** percent from 2017 to 2019 (***). Operating margins (i.e. operating income divided by net sales) followed the same directional pattern as ***, *** from *** percent in 2017 to *** percent in 2018 and *** to *** percent in 2019.

All other expenses and net income or (loss)

Celanese reported *** other expenses or income related to UHMWPE operations from 2017 to 2019 and *** its net income is ***.

[6] Celanese ***. ***, email to USITC staff, March 27, 2020.

Variance analysis

A variance analysis for Celanese's operations of UHMWPE is presented in table VI-4.[7] The information for this variance analysis is derived from table VI-1. From 2017 to 2019, the *** in operating income is primarily attributable to a ***.

Table VI-4
UHMWPE: Variance analysis of U.S. producer Celanese, between fiscal years

Item	Between fiscal years		
	2017-19	2017-18	2018-19
	Value (1,000 dollars)		
Net sales:			
Price variance	***	***	***
Volume variance	***	***	***
Net sales variance	***	***	***
COGS:			
Cost variance	***	***	***
Volume variance	***	***	***
COGS variance	***	***	***
Gross profit variance	***	***	***
SG&A expenses:			
Cost/expense variance	***	***	***
Volume variance	***	***	***
Total SG&A expense variance	***	***	***
Operating income variance	***	***	***
Summarized (at the operating income level) as:			
Price variance	***	***	***
Net cost/expense variance	***	***	***
Net volume variance	***	***	***

Note.--Unfavorable variances are shown in parentheses; all others are favorable.

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

[7] The Commission's variance analysis is calculated in three parts: Sales variance, cost of sales variance (COGS variance), and SG&A expense 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 expense variance), and a volume variance. The sales or cost/expense variance is calculated as the change in unit price or per unit cost/expense times the new volume, while the volume variance is calculated as the change in volume times the old unit price or per unit cost/expense. 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 expense variances. The overall volume component of the variance analysis is generally small.

Capital expenditures and research and development expenses

Table VI-5 presents Celanese's capital expenditures and research and development ("R&D") expenses related to UHMWPE. Celanese's total capital expenditures *** dramatically over the three years examined, explaining that ***.[8] In addition to refurbishment cycles, Celanese's capital expenditures average $*** per year for ***. In 2020 and 2021, Celanese expects ***.[9] Celanese stated that R&D expenses are ***.[10]

Table VI-5
UHMWPE: Capital expenditures and R&D expenses of U.S. producer Celanese, 2017-19

Item	Fiscal year		
	2017	2018	2019
	Capital expenditures (1,000 dollars)		
Celanese	***	***	***
	R&D expenses (1,000 dollars)		
Celanese	***	***	***

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

Assets and return on assets

Table VI-6 presents data on the U.S. producer Celanese's total assets and return on assets ("ROA") related to UHMWPE operations.[11] Total assets utilized by Celanese's UHMWPE operations *** by *** percent from 2017 to 2019 and its ROA ***.

Table VI-6
UHMWPE: Total assets and return on assets of U.S. producer Celanese, 2017-19

Firm	Fiscal years		
	2017	2018	2019
	Total net assets (1,000 dollars)		
Celanese	***	***	***
	Operating return on assets (percent)		
Celanese	***	***	***

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

[8] ***, email to USITC staff, March 27, 2020.

[9] Ibid.

[10] As discussed at the beginning of this section, UMHWPE is a part of Celanese's Engineering Materials reporting segment . ***. Ibid.

[11] The return on assets ("ROA") is calculated as operating income divided by total assets. With respect to a firm's overall operations, the total asset value reflects an aggregation of a number of assets which are generally not product specific. Thus, high-level allocations are generally required in order to report a total asset value for the subject product.

Capital and investment

The Commission requested U.S. producers of UHMWPE to describe any actual or potential negative effects of imports of UHMWPE from Korea on their firms' growth, investment, ability to raise capital, development and production efforts, or the scale of capital investments. Table VI-7 presents U.S. producer Celanese's responses on the impact of subject imports in each category and table VI-8 provides the narrative responses.

Table VI-7
UHMWPE: Actual and anticipated negative effects of imports on investment, growth, and development reported by U.S. producer Celanese, since January 1, 2017

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

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

Table VI-8
UHMWPE: Narratives relating to actual and anticipated negative effects of imports on investment, growth, and development reported by U.S. producer Celanese, since January 1, 2017

Item / Firm	Narrative
Reduction in the size of capital investments:	
***	***.
Other effects on growth and development:	
***	***.
Anticipated effects of imports:	
***	***.

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* of this report; 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 Korea

The Commission issued a foreign producers' or exporters' questionnaire to one firm believed to produce and export UHMWPE from Korea.[3] A usable response to the Commission's questionnaire was received from the sole responding party firm: KPIC. KPIC's exports to the United States accounted for all known U.S. imports of UHMWPE from Korea in 2019. Similarly, according to KPIC, the production of UHMWPE in Korea reported in KPIC's questionnaire accounts for all known production of UHMWPE in Korea.[4] Table VII- 1 presents information on the UHMWPE operations of the responding producer/exporter in Korea, KPIC.

Table VII-1
UHMWPE: Summary data for Korean producer KPIC, 2019

Firm	Production (1,000 pounds)	Share of reported production (percent)	Exports to the United States (1,000 pounds)	Share of reported exports to the United States (percent)	Total shipments (1,000 pounds)	Share of firm's total shipments exported to the United States (percent)
KPIC	***	100.0	***	100.0	***	***
Total	***	100.0	***	100.0	***	***

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

Changes in operations

As presented in table VII-2 Korean producer KPIC reported multiple operational and organizational changes since January 1, 2017.

[3] This firm was identified through a review of information submitted in the petition and contained in *** records.

[4] Respondent's preliminary conference opening statement, p. 1

Table VII-2
UHMWPE: Korean producer KPIC's reported changes in operations, since January 1, 2017

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

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

Operations on UHMWPE

Table VII-3 presents information on the UHMWPE operations of KPIC. KPIC's capacity increased by *** percent between 2017 and 2019, increasing during both 2017-2018 and 2018-2019. Production increased by *** percent between 2017 and 2019, increasing during both 2017-2018 and 2018-2019. Production is expected to decrease by *** percent in 2020 but increase by *** percent between 2020 and 2021. KPIC's capacity utilization increased by *** percentage points between 2017 and 2018, and then increased by an additional *** percentage points between 2018 and 2019. KPIC's inventories decreased by *** percent between 2017 and 2018, but then more than *** between 2018 and 2019.

Export shipments to the United States increased by *** percent between 2017 and 2019, increasing during 2017-2018 and during 2018-2019. Export shipments to non-U.S. markets increased by *** percent between 2017 and 2019, increasing during 2017-2018 and 2018-2019.[5] Export shipments are projected to increase by *** percent in 2020, and then increase an additional *** percent between 2020 and 2021. KPIC's exports to the United States ranged from *** percent to *** percent of total shipments between 2017 and 2019.

[5] KPIC's principal non-U.S. export markets include ***, KPIC's foreign producer questionnaire response p. 12.

Table VII-3
UHMWPE: Data on industry in Korea, 2017-2019 and projection calendar years 2020 and 2021

Item	Actual experience			Projections	
	Calendar year			Calendar year	
	2017	2018	2019	2020	2021
	Quantity (1,000 pounds)				
Capacity	***	***	***	***	***
Production	***	***	***	***	***
End-of-period inventories	***	***	***	***	***
Shipments:					
Home market shipments:					
Internal consumption/ transfers	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***
Total home market shipments	***	***	***	***	***
Export shipments to:					
United States	***	***	***	***	***
All other markets	***	***	***	***	***
Total exports	***	***	***	***	***
Total shipments	***	***	***	***	***
	Ratios and shares (percent)				
Capacity utilization	***	***	***	***	***
Inventories/production	***	***	***	***	***
Inventories/total shipments	***	***	***	***	***
Share of shipments:					
Home market shipments:					
Internal consumption/ transfers	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***
Total home market shipments	***	***	***	***	***
Export shipments to:					
United States	***	***	***	***	***
All other markets	***	***	***	***	***
Total exports	***	***	***	***	***
Total shipments	100.0	100.0	100.0	100.0	100.0

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

Alternative products

As shown in table VII-4, KPIC produced other products on the same equipment and machinery used to produce UHMWPE.[6] The share of in-scope production increased from *** percent of total production to *** of total production during 2017-2019, increasing by *** percentage points between 2017 and 2018, and then further increasing by *** percentage points between 2018 and 2019.

[6] ***.

Table VII-4
UHMWPE: Overall capacity and production on the same equipment as in-scope production by Korean producer KPIC, 2017-19

Item	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
Overall capacity	***	***	***
Production:			
UHMWPE	***	***	***
Medical grade UHMWPE	***	***	***
Other products	***	***	***
Out-of-scope production	***	***	***
Total production on same machinery	***	***	***
	Ratios and shares (percent)		
Overall capacity utilization	***	***	***
Share of production:			
UHMWPE	***	***	***
Medical grade UHMWPE	***	***	***
Other products	***	***	***
Out-of-scope production	***	***	***
Total production on same machinery	100.0	100.0	100.0

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

Exports

According to GTA, the leading export markets for polyethylene from Korea are China, Vietnam and Russia (table VII-5). During 2019, China was the top export market for polyethylene from Korea, accounting for 58.1 percent of Korean exports by quantity, followed by Vietnam, accounting for 5.8 percent of exports by quantity.

Table VII-5
Polyethylene, in primary forms: Korea exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
United States	46,546	41,457	33,393
China	2,130,943	2,314,671	2,677,329
Vietnam	393,306	362,646	266,479
Russia	110,101	108,166	169,969
Turkey	228,380	187,363	158,181
India	91,949	88,715	115,441
Belgium	84,532	51,033	69,398
Spain	82,856	52,253	65,365
Indonesia	57,090	69,555	62,982
Netherlands	65,725	65,891	57,026
All other destination markets	1,194,058	1,250,978	931,308
Total exports	4,485,486	4,592,727	4,606,871
	Value (1,000 dollars)		
United States	34,866	34,579	27,556
China	1,203,232	1,361,094	1,326,886
Vietnam	216,373	215,081	129,558
Russia	64,702	66,771	87,405
Turkey	128,955	114,961	80,917
India	58,334	59,533	65,561
Belgium	47,347	30,250	35,436
Spain	44,348	30,676	32,507
Indonesia	36,560	43,957	34,177
Netherlands	41,604	44,162	33,707
All other destination markets	710,073	806,985	501,141
Total exports	2,586,395	2,808,049	2,354,851
	Unit value (dollars per pound)		
United States	0.75	0.83	0.83
China	0.56	0.59	0.50
Vietnam	0.55	0.59	0.49
Russia	0.59	0.62	0.51
Turkey	0.56	0.61	0.51
India	0.63	0.67	0.57
Belgium	0.56	0.59	0.51
Spain	0.54	0.59	0.50
Indonesia	0.64	0.63	0.54
Netherlands	0.63	0.67	0.59
All other destination markets	0.59	0.65	0.54
Total exports	0.58	0.61	0.51

Table continued on next page.

Table VII-5—Continued.
Polyethylene, In primary forms: Korea exports by destination market, 2017-19

Destination market	Calendar Year		
	2017	2018	2019
	Share of quantity (percent)		
United States	1.0	0.9	0.7
China	47.5	50.4	58.1
Vietnam	8.8	7.9	5.8
Russia	2.5	2.4	3.7
Turkey	5.1	4.1	3.4
India	2.0	1.9	2.5
Belgium	1.9	1.1	1.5
Spain	1.8	1.1	1.4
Indonesia	1.3	1.5	1.4
Netherlands	1.5	1.4	1.2
All other destination markets	26.6	27.2	20.2
Total exports	100.0	100.0	100.0

Source: Official exports statistics under HS subheading 3910.10 and 3910.20 as reported by Korea Customs and Trade Development Institution in the Global Trade Atlas database, accessed April 2nd, 2020

U.S. inventories of imported merchandise

Table VII-6 presents data on U.S. importers' reported inventories of UHMWPE. Inventories of imports from Korea increased by *** percent between 2017 and 2018, and then by *** percent between 2018 and 2019.

Table VII-6
UHMWPE: U.S. importers' end-of-period inventories of imports by source, 2017-19

Item	Calendar year		
	2017	2018	2019
	Inventories (1,000 pounds); Ratios (percent)		
Imports from Koera			
Inventories	***	***	***
Ratio to U.S. imports	***	***	***
Ratio to U.S. shipments of imports	***	***	***
Ratio to total shipments of imports	***	***	***
Imports from nonsubject sources:			
Inventories	***	***	***
Ratio to U.S. imports	***	***	***
Ratio to U.S. shipments of imports	***	***	***
Ratio to total shipments of imports	***	***	***
Imports from all import sources:			
Inventories	***	***	***
Ratio to U.S. imports	***	***	***
Ratio to U.S. shipments of imports	***	***	***
Ratio to total shipments of imports	***	***	***

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

U.S. importers' outstanding orders

The Commission requested importers to indicate whether they imported or arranged for the importation of UHMWPE after 2019. Table VII-7 presents arranged imports for 2020.

Table VII-7
UHMWPE: Arranged imports, January 2020 through December 2020

Item	Period				
	Jan-Mar 2020	Apr-Jun 2020	Jul-Sept 2020	Oct-Dec 2020	Total
	Quantity (1,000 pounds)				
Arranged U.S. imports from.--					
Korea	***	***	***	***	***
Nonsubject 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 UHMWPE in third-country markets.[7]

Information on nonsubject countries

Petitioner states, based on its industry knowledge, that Germany, France, China and the United Kingdom are nonsubject countries.[8] The respondent states that Japan exports to the United States, and that nonsubject imports play a significant role in the U.S. UHMWPE market.[9] The respondent expects the largest nonsubject imports are from ***.[10]

The respondent states that Celanese *** and Braskem ***. ***. *** And although *** did not report the countries from which it primarily imported, because it sources from

[7] Petitioner's postconference brief, Exhibit 23, answers to staff questions, p. 23; Respondent's postconference answers to staff questions, p. 13.

[8] Petitioner's postconference brief, Exhibit 23, p. 23. Petitioner reports that China and the United Kingdom are immaterial.

[9] Respondent's postconference answers to staff questions, p. 13.

[10] Respondent's postconference answers to staff questions, p. 14.

***, it is likely that *** also imports primarily from ***.[11]

The global UHMWPE market size was estimated at $1.60 billion in 2018. It is expected to register a compound annual growth rate of 13.8 percent during the forecast period of 2019-25.[12] The UHMWPE global market size and projection includes in and out-of-scope products. Medical grade and prosthetics, which is out of scope, led the application segment of the UHMWPE market and is expected to reach $1.37 billion by 2025. Medical grade UHMWPE (outside the scope of this investigation) is estimated to witness highest growth over the forecast period and is followed by the batteries market.[13]

Another source projects that consumption of a downstream product of UHMWPE, fiber material, will increase *** percent per year from 2018 to 2023.[14] Global annual capacity of these high strength fibers was about *** in 2018, with capacity in China of ***, the U.S. ***, Japan ***, Western Europe ***, and Korea ***.[15]

At the global exporter level, UHMWPE falls under the category of polyethylene in primary forms. In 2019, the three largest global exporters in this larger category of products were the United States (13.3 billion pounds, 18.7 percent of total share of value), Singapore (6.2 billion pounds, 8.8 percent of total share of value), and Belgium (6.2 billion pounds, 8.7 percent of total share of value), as shown in table VII-8.

[11] Respondent's postconference answers to staff questions, pp. 13-14.

[12] Grandview Research, Ultra High Molecular Weight Polyethylene (UHMWPE) Market Size, Share & Trends Analysis Report by Product (Medical Grade & Prosthetics, Fibers, Sheet, Rod), by Application, and Segment Forecasts, 2019 – 2025," March 2019. https://www.grandviewresearch.com/industry-analysis/ultra-high-molecular-weight-polyethylene-market.

[13] Non-medical grade products are in scope products.

[14] IHS Markit, *Chemical Economics Handbook, Fibers, Specialty Organic*, May 15, 2019, p. 43.

[15] IHS Markit, *Chemical Economics Handbook, Fibers, Specialty Organic*, May 15, 2019, pp. 37-38. The capacity numbers do not appear to contain any medical grade out-of-scope product.

Table VII-8
Polyethylene, in primary forms: Global exports by exporter, 2017-19

Exporter	Calendar year		
	2017	2018	2019
	Quantity (1,000 pounds)		
United States	7,846,709	9,649,057	13,278,106
Korea	4,485,486	4,592,727	4,606,871
Singapore	5,084,510	5,243,800	6,241,837
Belgium	6,777,031	6,413,972	6,166,749
Thailand	3,923,044	4,356,243	4,696,779
Germany	4,527,539	4,309,203	4,116,444
Canada	3,022,543	3,477,813	3,806,281
Malaysia	1,623,348	2,911,521	3,176,368
Netherlands	3,108,812	3,253,153	3,174,242
All other exporters	55,018,500	48,746,454	21,610,581
Total	95,417,523	92,953,943	70,874,259
	Value (1,000 dollars)		
United States	4,699,653	5,965,812	6,364,492
Korea	2,586,395	2,808,049	2,354,851
Singapore	2,829,699	3,063,703	2,926,710
Belgium	4,311,664	4,219,819	3,605,252
Thailand	2,200,060	2,635,167	2,264,445
Germany	3,054,492	3,072,155	2,624,771
Canada	1,746,891	2,100,833	1,914,486
Malaysia	818,686	1,516,835	1,413,740
Netherlands	2,011,363	2,123,902	1,826,327
All other exporters	28,747,278	26,775,354	11,277,116
Total	53,006,181	54,281,628	36,572,191
	Unit value (dollars per pound)		
United States	0.60	0.62	0.48
Korea	0.58	0.61	0.51
Singapore	0.56	0.58	0.47
Belgium	0.64	0.66	0.58
Thailand	0.56	0.60	0.48
Germany	0.67	0.71	0.64
Canada	0.58	0.60	0.50
Malaysia	0.50	0.52	0.45
Netherlands	0.65	0.65	0.58
All other exporters	0.52	0.55	0.52
Total	0.56	0.58	0.52

Table continued on next page.

Table VII-8—Continued
Polyethylene, in primary forms: Global exports by exporter, 2017-19

Exporter	Calendar year		
	2017	2018	2019
	Share of quantity (percent)		
United States	8.2	10.4	18.7
Korea	4.7	4.9	6.5
Singapore	5.3	5.6	8.8
Belgium	7.1	6.9	8.7
Thailand	4.1	4.7	6.6
Germany	4.7	4.6	5.8
Canada	3.2	3.7	5.4
Malaysia	1.7	3.1	4.5
Netherlands	3.3	3.5	4.5
All other exporters	57.7	52.4	30.5
Total	100.0	100.0	100.0

Source: Official exports statistics under HS subheadings 3901.10 and 3901.20 reported by various national statistical authorities in the Global Trade Atlas database, accessed April 2, 2020. HS subheadings 3901.10 and 3901.20 include products that are outside the scope of these investigations and therefore overstate exports data.

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 13922, March 10, 2020	*Ultra-High Molecular Weight Polyethylene From Korea; Institution of Anti-Dumping Duty Investigation and Scheduling of Preliminary Phase Investigations*	https://www.govinfo.gov/content/pkg/FR-2020-03-10/pdf/2020-04830.pdf
85 FR 17861, March 31, 2020	*Ultra-High Molecular Weight Polyethylene From the Republic of Korea: Initiation of Less-Than-Fair-Value Investigation*	https://www.govinfo.gov/content/pkg/FR-2020-03-31/pdf/2020-06589.pdf

APPENDIX B

LIST OF STAFF CONFERENCE WITNESSES

CALENDAR OF PRELIMINARY CONFERENCE

Those listed below participated in the United States International Trade Commission's preliminary conference. The Commission conducted its preliminary conference through submissions of written testimony and postconference briefs:

Subject: Ultra-High Molecular Weight Polyethylene from Korea

Inv. No.: 731-TA-1474 (Preliminary)

Date: March 24, 2020

OPENING REMARKS:

In Support of Imposition (**Daniel Cannistra**, Crowell & Moring LLP)
In Opposition to Imposition (**Deanna Tanner Okun**, Adduci, Mastriani & Schaumberg LLP)

In Support of the Imposition of Antidumping Duty Order:

Crowell & Moring LLP
Washington, DC
on behalf of

Celanese Corporation

Michelle Lee, Commercial Vice President, Celanese Corporation

Daniel Cannistra)
Spencer Toubia)
) – OF COUNSEL
Brian McGrath)
Cherie Walterman)

In Opposition to the Imposition of Antidumping Duty Order:

Adduci, Mastriani & Schaumberg LLP
Washington, DC
on behalf of

Korea Petrochemical Industry Corporation ("KPIC")

Un Kyung Kim, General Manager, Business Division 1, KPIC Corporation

Deanna Tanner Okun)
) – OF COUNSEL
Louis S. Mastriani)

- END -

APPENDIX C

SUMMARY DATA

Table C-1
UHMWPE: Summary data concerning the U.S. market, 2017-19
(Quantity=1,000 pounds; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per pound; Period changes=percent--exceptions noted)

	Reported data			Period changes		
	Calendar year			Calendar year		
	2017	2018	2019	2017-19	2017-18	2018-19
U.S. consumption quantity:						
Amount	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***
Importers' share (fn1):						
Korea	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***
All import sources	***	***	***	***	***	***
U.S. consumption value:						
Amount	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***
Importers' share (fn1):						
Korea	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***
All import sources	***	***	***	***	***	***
U.S. shipments of imports from:						
Korea:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
Nonsubject sources:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
All import sources:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
U.S. producers':						
Average capacity quantity	***	***	***	***	***	***
Production quantity	***	***	***	***	***	***
Capacity utilization (fn1)	***	***	***	***	***	***
U.S. shipments:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Export shipments:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
Inventories/total shipments (fn1)	***	***	***	***	***	***
Production workers	***	***	***	***	***	***
Hours worked (1,000s)	***	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***	***
Hourly wages (dollars per hour)	***	***	***	***	***	***
Productivity (pounds per hour)	***	***	***	***	***	***
Unit labor costs	***	***	***	***	***	***

Table continued.

Table C-1--Continued
UHMWPE: Summary data concerning the U.S. market, 2017-19
(Quantity=1,000 pounds; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per pound; Period changes=percent--exceptions noted)

	Reported data			Period changes		
	Calendar year			Calendar year		
	2017	2018	2019	2017-19	2017-18	2018-19
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	***	***	***	***	***	***
R& D expenses	***	***	***	***	***	***
Net assets	***	***	***	***	***	***
Unit COGS	***	***	***	***	***	***
Unit SG&A expenses	***	***	***	***	***	***
Unit operating income or (loss) (fn2)	***	***	***	***	***	***
Unit net income or (loss) (fn2)	***	***	***	***	***	***
COGS/sales (fn1)	***	***	***	***	***	***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	***
Net income or (loss)/sales (fn1)	***	***	***	***	***	***

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 “---“. Directional change of period changes is only noted as an increase or decrease (black/red font formatting) through the U.S. producers' U.S. shipments. All items after that have no signficance behind the formatting.

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.