Pure Magnesium from China

Investigation No. 731-TA-696 (Fifth Review)

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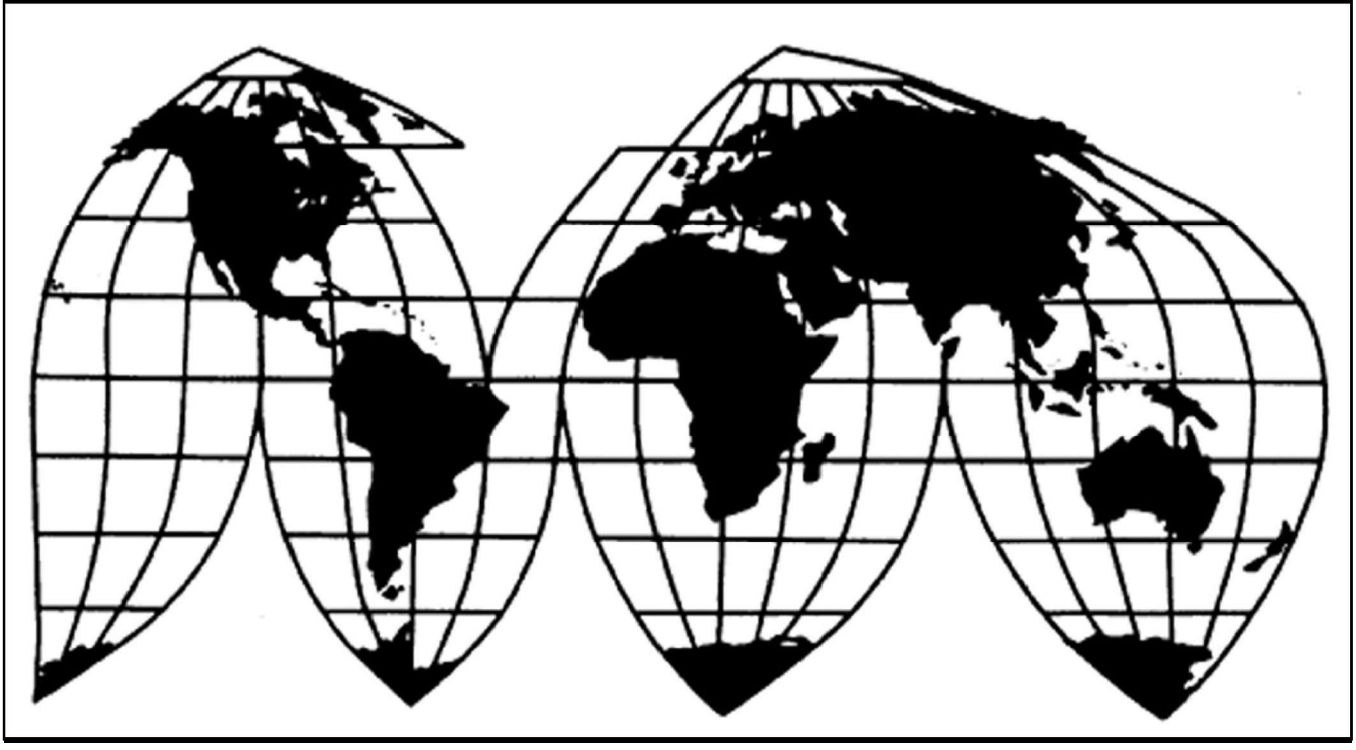
U.S. International Trade Commission



Washington, DC 20436

U.S. International Trade Commission

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Note.—Information that would reveal confidential operations of individual concerns may not be published.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

UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-696 (Fifth Review)

Pure Magnesium from China

DETERMINATION

On the basis of the record[1] developed in the subject five-year review, the United States International Trade Commission ("Commission") determines, pursuant to the Tariff Act of 1930 ("the Act"), that revocation of the antidumping duty order on pure magnesium from China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[2]

BACKGROUND

The Commission instituted this review on March 1, 2022 (87 FR 11472) and determined on June 6, 2022 that it would conduct a full review (87 FR 35997, June 14, 2022). Notice of the scheduling of the Commission's review and of a public hearing to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the *Federal Register* on October 27, 2022 (87 FR 65822, November 1, 2022). The Commission conducted its hearing on March 14, 2023. All persons who requested the opportunity were permitted to participate.

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued:

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

[2] Commissioner Randolph J. Stayin did not participate.

Views of the Commission

Based on the record in this five-year review, we determine under section 751(c) of the Tariff Act of 1930, as amended ("the Tariff Act"), that revocation of the antidumping duty order on pure magnesium from China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

I. Background

Original Investigations. In March 1994, Magnesium Corporation of America, the corporate predecessor of US Magnesium, and two labor unions filed a petition alleging material injury and threat of material injury by reason of imports of primary magnesium from China, Russia, and Ukraine sold at less-than-fair value ("LTFV"). In June 1994, domestic producer Dow Chemical Company joined the petition. The Commission issued its final determinations in May 1995.[1] The Commission found two separate like products – pure magnesium and alloy magnesium – coextensive with the two classes or kinds of merchandise defined by Commerce. The Commission cumulated subject imports of pure magnesium from China with subject imports of pure magnesium from Russia and Ukraine and found that the domestic industry producing pure magnesium was materially injured by reason of the cumulated imports.[2] On May 12, 1995, Commerce published antidumping duty orders covering the subject merchandise.[3]

The respondent U.S. importer in the Ukraine investigation, Gerald Metals, Inc. ("Gerald Metals"), appealed the Commission's affirmative determinations. The U.S. Court of International Trade ("CIT") affirmed the Commission's determinations.[4] Gerald Metals appealed to the U.S. Court of Appeals for the Federal Circuit ("CAFC") and the CAFC remanded the determinations.[5]

The Commission's negative determination on remand, which was affirmed by the CAFC,[6] only applied to imports of pure magnesium from Ukraine because Gerald Metals was the only party to appeal the Commission's original determinations. As a result of the Commission's negative redetermination on remand, Commerce revoked the antidumping duty order on pure magnesium from Ukraine.[7] The antidumping duty orders on pure magnesium from China and Russia remained in effect. In July 2000, however, Commerce revoked the antidumping duty

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[1] *Magnesium from China, Russia, and Ukraine*, Inv. Nos. 731-TA-696-698 (Final), USITC Pub. 2885 (May 1995) ("*Original Determination*").

[2] *Original Determination*, USITC Pub. 2885 (May 1995) at 15-16, 22.

[3] 60 Fed. Reg. 25691 (May 12, 1995).

[4] *Gerald Metals, Inc. v. United States*, 937 F. Supp. 930 (Ct. Int'l Trade 1996).

[5] *Gerald Metals, Inc. v. United States,* 132 F.3d 716 (Fed. Cir. 1997) ("Gerald Metals II").

[6] *Gerald Metals v. USITC*, 27 F. Supp. 2d 1351 (Ct. Int'l Trade 1998).

[7] *See* 63 Fed. Reg. 67854, 67854-55 (Dec. 8, 1998).

order on pure magnesium from Russia because no domestic interested party timely responded to the notice of initiation in the five-year review of the order.[8]

First Review. On April 3, 2000, the Commission instituted its first five-year review of the antidumping duty order on pure magnesium from China.[9] The Commission conducted an expedited review and in July 2000 determined that revocation of the antidumping duty order on pure magnesium would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[10]

Second Review. On September 1, 2005, the Commission instituted its second five-year review of the antidumping duty order on pure magnesium from China.[11] The Commission conducted a full review and in July 2006 determined that revocation of the antidumping duty order on pure magnesium would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[12]

Third Review. On June 1, 2011, the Commission instituted its third five-year review of the antidumping duty order on pure magnesium from China.[13] The Commission conducted an expedited review and in October 2011 determined that revocation of the antidumping duty order on pure magnesium would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[14]

Fourth Review. The Commission instituted its fourth five-year review of the antidumping duty order on pure magnesium from China on October 3, 2016.[15] The Commission conducted an expedited review and in March 2017 determined that revocation of the antidumping duty order on pure magnesium would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[16]

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[8] 65 Fed. Reg. 41944 (July 7, 2000). As a result, the Commission terminated its five-year review of pure magnesium from Russia effective July 7, 2000.

[9] 65 Fed. Reg. 17531 (Apr. 3, 2000).

[10] *Pure Magnesium from China*, Inv. No. 731-TA-696 (Review), USITC Pub. 3346 (Sept. 2000) ("*First Five-Year Review*").

[11] 70 Fed. Reg. 52122 (Sept. 1, 2005).

[12] *Pure and Alloy Magnesium from Canada and China*, Inv. Nos. 701-TA-309-A-B and 731-TA-696 (Second Review), USITC Pub. 3859 (July 2006) ("*Second Five-Year Review*"). For administrative convenience and efficiency, the Commission conducted its second five-year review of the antidumping duty order on pure magnesium from China concurrently with reviews of countervailing duty orders on pure and alloy magnesium from Canada. The Commission conducted a full review, notwithstanding an inadequate respondent party group response, to further examine the definition of the domestic like product. *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at Appendix A (Explanation of Commission Determination on Adequacy).

[13] 76 Fed. Reg. 31635 (June 1, 2011).

[14] *Pure Magnesium from China*, Inv. No. 731-TA-696 (Third Review), USITC Pub. 4274 (Oct. 2011) ("*Third Five-Year Review*").

[15] 81 Fed. Reg. 68046 (Oct. 3, 2016).

[16] *Pure Magnesium (Ingot) from China*, Inv. No. 731-TA-696 (Fourth Review), USITC Pub. 4678 (Mar. 2017) ("*Fourth Five-Year Review*").

Current Review. The Commission instituted this fifth five-year review of the antidumping duty order on pure magnesium from China on March 1, 2022.[17] The Commission received a joint response to its notice of institution filed on behalf of US Magnesium LLC, a domestic producer of pure magnesium, and the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union, Local 8319 ("Local 8319"), which represents the workers producing magnesium at US Magnesium's production facility (collectively, "US Magnesium").[18] The Commission did not receive a response to the notice of institution from any respondent interested party.[19] On June 6, 2022, the Commission found that the domestic interested party group response was adequate and that the respondent interested party group response was inadequate but that other circumstances nevertheless warranted the conduct of a full review.[20]

The Commission received prehearing briefs,[21] posthearing briefs,[22] and final comments[23] filed on behalf of US Magnesium and respondent Kaiser. Representatives of US Magnesium, as well as from Kaiser, appeared at the Commission's hearing accompanied by counsel.[24]

U.S. industry data are based on the questionnaire responses of five firms, two of which (US Magnesium and Magpro) reported producing in-scope merchandise and accounted for a majority of domestic production of pure magnesium in 2021.[25] U.S. import data and related

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[17] 87 Fed. Reg. 11472 (Mar. 1, 2022).

[18] US Magnesium's Substantive Response to the Notice of Institution, EDIS Doc. 767040 (Mar. 31, 2022).

[19] Kaiser Aluminum Corporation ("Kaiser"), an U.S. industrial user of pure magnesium and party to this proceeding that opposes continuation of the order, filed information relevant to the Commission's review. Kaiser's Response to the Notice of Institution, EDIS Doc. 767065 (Mar. 31, 2022).

[20] 87 Fed. Reg. 35997 (June 14, 2022). In particular, the Commission found it necessary to further examine the definitions of the domestic like product, domestic industry, and changes in the conditions of competition in the U.S. market for pure magnesium, including US Magnesium's invocation of *force majeure* in 2021. Explanation of Commission Determination on Adequacy, EDIS Doc. 791734 (June 6, 2022). Vice Chair Stayin did not participate, and Commissioner Schmidtlein voted to conduct an expedited review. *Id.*

[21] US Magnesium's Prehearing Br., EDIS Doc. 791581 (Mar. 2, 2023) ("US Magnesium's Prehearing Br."); Kaiser's Prehearing Br., EDIS Doc. 791641 (Mar. 2, 2023) ("Kaiser's Prehearing Br.").

[22] US Magnesium's Posthearing Br., EDIS Doc. 793063 (Mar. 23, 2023) (US Magnesium's Posthearing Br."); Kaiser's Posthearing Br., EDIS Doc. 793084 (Mar. 23, 2023) ("Kaiser's Posthearing Br."). Trinity Metals LLC filed a posthearing written statement of information pertinent to the review in support of continuation of the order. EDIS Doc. 793040 (Mar. 22, 2023).

[23] US Magnesium's Final Comments, EDIS Doc. 794658 (Apr. 20, 2023); Kaiser's Final Comments, EDIS Doc. 794621 (Apr. 20, 2023).

[24] A witness representing Magpro LLC ("Magpro") also appeared at the hearing on behalf of the domestic industry.

[25] Confidential Report, INV-VV-029 (Apr. 7, 2023) (as revised by INV-VV-031 (Apr. 18, 2023) and INV-VV-033 (Apr. 23, 2023)) ("CR") at III-1; Public Report, *Pure Magnesium from China*, Inv. No. 731-TA-696 (Fifth Review), USITC Pub. 5420 (May 2023) ("PR") at III-1. The other three responding U.S. producers (Advanced Magnesium Alloys Corporation ("AMACOR"), Luxfer Magtech Inc. ("Luxfer (Continued…)

information are based on Commerce's official import statistics and the questionnaire responses of 12 U.S. importers of pure magnesium. While *** importer reported subject imports of pure magnesium from China in 2021, importers' questionnaire data accounted for the vast majority of total U.S. imports of pure magnesium during 2021.[26] Foreign industry data and related information are based on the questionnaire response of Nanjing Welbow Metals Co., Ltd, ("Welbow Metals"), information from the original investigations and prior five-year reviews, available information submitted by US Magnesium in the current five-year review, and publicly available data, such as Global Trade Atlas data, gathered by Commission staff. Welbow Metals estimates that it accounted for *** percent of pure magnesium production in China in 2021.[27]

II. Domestic Like Product and Industry

A. Domestic Like Product

In making its determination under section 751(c) of the Tariff Act, the Commission defines the "domestic like product" and the "industry."[28] The Tariff Act defines "domestic like product" as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation under this subtitle."[29] The Commission's practice in five-year reviews is to examine the domestic like product definition from the original investigation and consider whether the record indicates any reason to revisit the prior findings.[30]

Commerce has defined the imported merchandise within the scope of the order under review as follows:

> Merchandise covered by the order is pure magnesium regardless of chemistry, form or size, unless expressly excluded from the scope of the order. Pure magnesium is a metal or alloy containing by weight primarily the element magnesium and produced by decomposing raw materials into magnesium metal. Pure primary magnesium is used primarily as a chemical in the aluminum

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Magtech"), and Magnesium Products of America Inc. ("MPA")) produced "other" magnesium, which includes out-of-scope ASTM spec alloy magnesium and granular magnesium. CR/PR at III-1, n.1.

[26] CR/PR at IV-1. According to official import statistics, there were 12 MT of imports of pure magnesium from China in 2021. *See* CR/PR at App. G.

[27] CR/PR at IV-7.

[28] 19 U.S.C. § 1677(4)(A).

[29] 19 U.S.C. § 1677(10); *see*, *e.g., Cleo Inc. v. United States*, 501 F.3d 1291, 1299 (Fed. Cir. 2007); *NEC Corp. v. Department of Commerce*, 36 F. Supp. 2d 380, 383 (Ct. Int'l Trade 1998); *Nippon Steel Corp. v. United States*, 19 CIT 450, 455 (1995); *Timken Co. v. United States*, 913 F. Supp. 580, 584 (Ct. Int'l Trade 1996); *Torrington Co. v. United States*, 747 F. Supp. 744, 748-49 (Ct. Int'l Trade 1990), *aff'd*, 938 F.2d 1278 (Fed. Cir. 1991); *see also* S. Rep. No. 249, 96th Cong., 1st Sess. 90-91 (1979).

[30] *See*, *e.g.*, *Internal Combustion Industrial Forklift Trucks from Japan*, Inv. No. 731-TA-377 (Second Review), USITC Pub. 3831 at 8-9 (Dec. 2005); *Crawfish Tail Meat from China*, Inv. No. 731-TA-752 (Review), USITC Pub. 3614 at 4 (July 2003); *Steel Concrete Reinforcing Bar from Turkey*, Inv. No. 731-TA-745 (Review), USITC Pub. 3577 at 4 (Feb. 2003).

alloying, desulfurization, and chemical reduction industries. In addition, pure magnesium is used as an input in producing magnesium alloy. Pure magnesium encompasses products (including, but not limited to, butt ends, stubs, crowns and crystals) with the following primary magnesium contents:

(1) Products that contain at least 99.95% primary magnesium, by weight (generally referred to as ''ultra pure'' magnesium) and are thus outside the scope of the existing antidumping orders on magnesium from China (generally referred to as "alloy" magnesium).

(2) Products that contain less than 99.95% but not less than 99.8% primary magnesium, by weight (generally referred to as ''pure'' magnesium); and

(3) Products that contain 50% or greater, but less than 99.8% primary magnesium, by weight, and that do not conform to ASTM specifications for alloy magnesium (generally referred to as ''off–specification pure'' magnesium).

''Off–specification pure'' magnesium is pure primary magnesium containing magnesium scrap, secondary magnesium, oxidized magnesium or impurities (whether or not intentionally added) that cause the primary magnesium content to fall below 99.8% by weight. It generally does not contain, individually or in combination, 1.5% or more, by weight, of the following alloying elements: aluminum, manganese, zinc, silicon, thorium, zirconium and rare earths.

Excluded from the scope of the order are alloy primary magnesium (that meets specifications for alloy magnesium), primary magnesium anodes, granular primary magnesium (including turnings, chips and powder) having a maximum physical dimension (*i.e.,* length or diameter) of one inch or less, secondary magnesium (which has pure primary magnesium content of less than 50% by weight), and remelted magnesium whose pure primary magnesium content is less than 50% by weight.[31]

Magnesium is a silver-white metallic element and the lightest of all structural metals.[32] Magnesium's light weight and high vibrational-dampening properties have led to development of magnesium-based alloys with improved physical and mechanical properties ideal for use as a structural metal in certain applications.[33]

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[31] 87 Fed. Reg. 35732 (June 13, 2022); Issues and Decision Memorandum for the Final Results of Expedited Sunset Review of Pure Magnesium from the People's Republic of China (June 7, 2022) at 2-3.

Commerce has not conducted any changed circumstances reviews or scope rulings since the completion of the last five-year review. In addition, Commerce has not issued any anti-circumvention findings, company revocations, or duty absorption findings since imposition of the order. CR/PR at I-14 n.29.

[32] CR/PR at I-17.

[33] *See* CR/PR at I-17, 25.

Magnesium is available in two principal forms, pure and alloy.[34] Pure magnesium contains at least 99.8 percent magnesium by weight.[35] Pure magnesium is widely used in commercial and industrial applications because it is easily machined and lightweight, has a high strength-to-weight ratio, has special electrical properties, and has special metallurgical and chemical properties that allow it to alloy well with metals, such as aluminum.[36] Due to its low tensile and yield strengths, pure magnesium is not typically used in structural applications.[37] Alloy magnesium is an alloy consisting of magnesium and other metals, containing less than 99.8 percent magnesium by weight, with magnesium the largest metallic element in the alloy by weight.[38] Alloy magnesium has certain properties that improve its strength, ductility, workability, corrosion resistance, density, or castability compared with pure magnesium.[39] It is commonly used in structural applications such as castings (die, permanent mold, and sand) and extrusions for the automotive industry.[40]

Pure and alloy magnesium are produced as either primary or secondary magnesium. Primary magnesium is magnesium produced by decomposing virgin raw materials into magnesium metal.[41] Secondary magnesium is magnesium produced by recycling (or melting) magnesium-based scrap.[42] Unwrought magnesium may be cast into ingots or further processed into granular magnesium, which consists of all other physical forms of magnesium, such as raspings, turnings, granules, and powders.[43]

1. The Original Investigations and Prior Reviews

The definition of the domestic like product in magnesium investigations has a long history. In its first investigations involving the issue of imported pure and alloy magnesium, namely, the 1992 investigations of magnesium from Canada, the Commission found pure and alloy magnesium to constitute a single domestic like product.[44] A U.S.-Canada binational panel reversed the Commission's single like product determination, however, and held that pure and alloy magnesium were separate like products. In subsequent proceedings (including the

[34] CR/PR at I-17.

[35] CR/PR at I-18. The scope definition, however, defines "off-specification pure" magnesium as products that contain 50% or greater, but less than 99.8% primary magnesium, by weight, and that do not conform to ASTM specifications for alloy magnesium. *Id.* at I-15.

[36] CR/PR at I-18.

[37] CR/PR at I-19.

[38] CR/PR at I-18

[39] CR/PR at I-19.

[40] CR/PR at I-19.

[41] CR/PR at I-19.

[42] CR/PR at I-19.

[43] CR/PR at I-20.

[44] *Magnesium from Canada*, Inv. Nos. 701-TA-309 and 731-TA-528 (Final), USITC Pub. 1992 (Aug. 1992) at 8-11 ("*Canada Determination*").

original investigations underlying this review),[45] the Commission found pure and alloy magnesium to be separate like products.[46] Further, in the first review of this order, which was conducted on an expedited basis, the Commission declined to expand the like product definition beyond pure magnesium to encompass alloy magnesium.[47]

This treatment of pure and alloy magnesium as separate domestic like products changed with the 2005 original investigations of alloy magnesium from China and pure and alloy magnesium from Russia. In those investigations, the Commission determined pure and alloy magnesium constituted a single domestic like product, finding that circumstances had changed sufficiently from previous investigations involving magnesium products so as to blur the clear dividing line that had existed between pure and alloy magnesium.[48] It based its finding on (1) the shared essential physical characteristics between pure and alloy magnesium; (2) the overlapping uses of pure and alloy magnesium, especially in aluminum production; (3) the recognition of increased competition between pure and alloy magnesium by many industry participants; (4) shared production facilities and employees; (5) general similarities in the channels of distribution for pure and alloy magnesium; and (6) the convergence in prices for the two types of magnesium.[49] The Commission also found that ingot (cast) and granular magnesium, and primary and secondary magnesium, were part of the same domestic like product.[50]

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[45] The scope in the Commission's original investigations included pure and alloy magnesium. The Commission made a negative determination with respect to alloy magnesium. *Original Determination,* USITC Pub. 2885 (May 1995) at 7-9.

[46] *Original Determination,* USITC Pub. 2885 (May 1995) at 7-9; *see also Magnesium from Canada*, Inv. Nos. 701-TA-309 (A-B) and 731-TA-528 (Review), USITC Pub. 3324 (July 2000) at 5-6.

[47] *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 5-6.

[48] *Pure Magnesium from China, Israel, and Russia*, Inv. Nos. 701-TA-403 and 731-TA-895-897 (Preliminary), USITC Pub. 3376 (Dec. 2000) at 7; *see also Magnesium from China and Russia*, Inv. Nos. 731-TA-1071 and 1072 (Final), USITC Pub. 3763 (Apr. 2005) at 6-11 ("*Magnesium 2005 Final Determination*"). These investigations were also the first in which Commerce defined pure and alloy magnesium as a single class or kind of merchandise. We note that the Commission is not required to conform its domestic like product definition to the scope of the investigation (*i.e.*, commensurate with Commerce's class or kind definition). The Commission may include, where appropriate, domestic articles in the domestic like product that are in addition to those described in the scope, or may find two or more domestic like products in a given investigation. *See, e.g., Hosiden Corp. v. Advanced Display Mfrs.*, 85 F.3d 1561, 1568 (Fed. Cir. 1996) (Commission may find a single like product corresponding to several classes or kinds of merchandise as defined by Commerce).

[49] *Magnesium 2005 Final Determination*, USITC Pub. 3763 (Apr. 2005) at 6-11.

[50] *Magnesium 2005 Final Determination*, USITC Pub. 3763 (Apr. 2005) at 6. *See also Magnesium from China and Russia*, Inv. Nos. 731-TA-1071 and 1072 (Review), USITC Pub. 4214 (Feb. 2011) ("*2011 China/Russia Review*") at 7-10. The Commission found no reason to reexamine its determination in the original determinations that primary and secondary magnesium, and ingot and granular magnesium were part of the same single domestic like product. *Id*. at 7 n.7. The Commission reiterated this finding in its review of alloy magnesium from China. *Alloy Magnesium from China*, Inv. No. 731-TA-1071 (Second Review), USITC Pub. 4618 (June 2016) ("*2016 China Alloy Review*"), at 6-7.

In the second five-year review of the order underlying the current review, which was conducted simultaneously with the five-year review of pure and alloy magnesium from Canada, the Commission was evenly divided on the question of whether pure and alloy magnesium constituted one or two like products. Three Commissioners found that pure and alloy magnesium constituted a single domestic like product; they also determined that primary and secondary magnesium,[51] as well as cast and granular magnesium, were also part of the single domestic like product.[52] The other three Commissioners found pure and alloy magnesium constituted two separate domestic like products; they also found that secondary magnesium was also part of the domestic like product that included alloy magnesium, but they declined to expand either of the domestic like product definitions to include granular magnesium.[53]

In its expedited third and fourth reviews of the antidumping duty order on pure magnesium from China, the Commission defined a single domestic like product encompassing pure and alloy magnesium, including primary and secondary magnesium and ingot (cast) and granular magnesium. In these third and fourth reviews, the Commission explained that the domestic interested parties agreed with the Commission's definition of a single domestic like

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[51] *Second Five-Year Review*, USITC Pub. 3859 (July 2006), at 7-13. In expanding the like product definition to include secondary magnesium, the three Commissioners found no indication in the record that circumstances had changed since the China/Russia 2005 investigations where the Commission had found that primary and secondary magnesium were part of the same like product. The Commission further observed that: while they are produced in separate facilities, most primary and secondary magnesium is similar physically and chemically; they can be used interchangeably in automotive diecasting applications if appropriate methods are utilized to assure the purity of the secondary magnesium by removing impurities; both primary and secondary magnesium are generally sold directly to end users through common channels of distribution; because primary and higher purity secondary alloy magnesium are largely identical products and are interchangeable for the same purposes, principally automotive diecastings, neither customers nor producers perceive them to be significantly different products; and lower-purity secondary alloy magnesium, while not interchangeable with primary magnesium in automotive structural applications, is interchangeable with primary magnesium in many other non-structural magnesium applications. *Id.* at 11-12.

[52] *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 7-13.

In expanding the like product to include granular magnesium, the Commissioners found no indication in the record that circumstances had changed since the China/Russia 2005 investigations where the Commission had found that granular and ingot magnesium were produced in a continuum of forms and sizes, without any clear dividing line; shared the same chemical properties; were sold through similar channels of distribution; were interchangeable at least for significant end uses (particularly in desulfurization), and used the same manufacturing facilities and employees up to the grinding stages. *Id.* at 12; *See also Magnesium from China and Russia,* Inv. Nos. 731-TA-1071-1072 (Preliminary) USITC Pub. 3678 (Apr. 2004) at 10-11, *and Magnesium from China and Israel*, Inv. Nos. 701-TA-403 and 731-TA-895-896 (Final), USITC Pub. 3467 (Nov. 2001).

[53] *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 40-42.

product including pure and alloy magnesium, no party had argued otherwise, and there was no new information in the record that warranted revisiting the definition.[54]

2. The Current Review

a. Arguments of the Parties

US Magnesium. US Magnesium argues that the Commission should again define a single domestic like product consisting of pure and alloy magnesium, primary and secondary magnesium, and magnesium in cast and granular form.[55] US Magnesium contends that all forms of magnesium share the same basic physical characteristics and uses, are reasonably interchangeable, are sold to end users in the U.S market, are increasingly considered by producers and purchasers to be part of the same overall product category, are reported as priced mostly or somewhat similarly by market participants, and, with certain exceptions, are produced using the same manufacturing facilities, processes, and employees.[56]

Kaiser. Kaiser argues that the Commission should define the domestic like product to include only pure magnesium, coextensive with Commerce's scope.[57] Kaiser argues there have been important changes since the last review as a result of US Magnesium's *force majeure* declaration in September 2021 and subsequent production stoppage in August 2022 that change the analysis with respect to at least three of the Commission's traditional like product factors in consideration of whether clear dividing lines exist between pure and alloy magnesium.[58]

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[54] *Third Five-Year Review*, USITC Pub. 4274 (Oct. 2011) at 6-7 (the three Commissioners who had found a single domestic like product in the second review comprised a majority in the third review); *Fourth Five-Year Review,* USITC Pub 4678, at 9.

[55] US Magnesium's Prehearing Br. at 12-13; US Magnesium's Posthearing Br. at Exh. 1, pp. 2, 5.

[56] US Magnesium's Posthearing Br. at Exh.1, pp. 5-8.

[57] Kaiser's Posthearing Br. at 1-8. We note that in arguing for a domestic like product definition coextensive with Commerce's scope--which includes 99.8 percent pure magnesium and off-specification pure magnesium--Kaiser appears to refer only to 99.8 percent pure magnesium. *See* Kaiser's Prehearing Br. at 5; Kaiser's Posthearing Br. at 8-15; Hearing Tr. at 172-73 (Spooner).

[58] Kaiser Posthearing Br. at 3-8. Specifically, Kaiser argues that because US Magnesium has halted production, the price of pure magnesium now is likely substantially higher than the price of alloy magnesium, the extent to which pure and alloy magnesium share common manufacturing facilities, processes, and employees has diminished, and the channels of distribution for pure and alloy magnesium no longer overlap. Kaiser also argues that the physical characteristics and uses of pure and alloy magnesium are limited insofar as certain industries, such as pharmaceuticals, aerospace, and the nuclear fuel industry, require pure magnesium, and that these considerations imply limitations to interchangeability and customer and producer perceptions.

We note that Kaiser raised its arguments concerning the domestic like product definition for the first time during the hearing. Hearing Tr. at 127, 167-68 (Spooner, Vaughn). We remind parties that as a general matter, as our rules contemplate, arguments related to the domestic like product definition should be included in written comments on draft questionnaires to permit the Commission to collect appropriate data, if warranted. *See* 19 C.F.R. § 207.63(b).

Kaiser does not directly contest the inclusion of secondary magnesium or granular magnesium in the definition of the domestic like product.[59]

b. Analysis

The record in this review does not indicate that clear dividing lines exist between pure and alloy magnesium.[60] We therefore define a single domestic like product that encompasses pure and alloy magnesium, including primary and secondary magnesium and cast and granular magnesium, based on the following analysis.

Physical Characteristics and Uses. Pure and alloy magnesium share the basic physical characteristics of being lightweight and strong with a low density. Both products consist mostly of magnesium: pure magnesium contains at least 99.8 percent magnesium by weight, and alloy magnesium usually contains at least 90 percent magnesium, with the balance consisting of certain alloying elements. The two products differ physically in that alloy magnesium possesses certain properties, imparted by the alloying elements, that improve its strength, ductility, workability, corrosion resistance, density, and castability, as compared with pure magnesium.[61] Pure magnesium's lack of structural integrity excludes it from the structural applications served by alloy magnesium, such as diecasting. However, ***.[62]

Both pure and alloy magnesium are used in applications where magnesium is an alloying element, including in aluminum production.[63] However, alloy magnesium does not meet the purity requirements needed for smaller end use markets, including the metal reduction industry, which makes zirconium and beryllium, as well as certain chemical applications, such as evasive flares, and in certain aluminum sectors, such as aerospace.[64] Nevertheless, the record indicates that a substantial share of the domestic industry's U.S. shipments of both pure and alloy magnesium were made to aluminum producers. Specifically,

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[59] *See* Kaiser Posthearing Br. at 3-8.

[60] As explained further below in parts II.B.2 and III.E.2, US Magnesium maintained normal production for most of the POR, and we are persuaded that US Magnesium is likely to recommence production within the reasonably foreseeable future. Accordingly, Kaiser's claims with respect to US Magnesium's *force majeure* declaration and subsequent production stoppage as they relate to the definition of the domestic like product are misplaced. We note also that Commerce's scope expressly defines "off-specification pure magnesium" to encompass products that contain 50 percent or greater, but less than 99.8 percent primary magnesium by weight that do not conform to ASTM specifications for alloy magnesium. 87 Fed. Reg. 35732 (June 13, 2022); Issues and Decision Memorandum for the Final Results of Expedited Sunset Review of Pure Magnesium from the People's Republic of China (June 7, 2022) at 2-3. Kaiser's claims generally do not account for domestic production of off-specification pure magnesium. *See* Kaiser's Prehearing Br. at 5; Kaiser's Posthearing Br. at 8-15; Hearing Tr. at 172-73 (Spooner). However, Magpro reported producing *** quantities of off-specification pure magnesium during the POR. *See* Magpro's Supplemental Questionnaire Response at Table S-1; US Magnesium's Posthearing Br. at Exh.1, p. 18; *see also* PR/CR at Table F-1; Hearing Tr. at 55 (Lutz).

[61] CR/PR at I-24-25.

[62] CR/PR at Table E-1 (***).

[63] Hearing Tr. at 27 (Slade), 57 (Vaughn).

[64] Hearing Tr. at 27, 58-59 (Slade); Kaiser's Posthearing Br. at 6-7.

U.S. producers' commercial U.S. shipments of pure magnesium to aluminum manufacturers as a share of their total U.S. shipments of pure magnesium were *** percent in 2019, *** percent in 2020, and *** percent in 2021.[65] U.S. producers' commercial U.S. shipments of alloy magnesium to aluminum manufacturers as a share of their total U.S. shipments of alloy magnesium were *** percent in 2019, *** percent in 2020, and *** percent in 2021.[66] These data indicate that there was substantial overlap in the end uses for pure and alloy magnesium in the production of aluminum.

Interchangeability. As discussed above, in its investigations of magnesium from Russia and China in 2005, the Commission found that the clear dividing line between pure and alloy magnesium had blurred because traditional users of pure magnesium were increasingly substituting alloy magnesium in applications formerly reserved for pure magnesium. This was particularly true for aluminum manufacturers who had developed technology that permitted the use of alloy magnesium in aluminum production.[67] In this review, the record does not indicate that the degree of interchangeability between pure and alloy magnesium has changed. To the contrary, the record continues to show a substantial degree of interchangeability between pure and alloy magnesium, although the degree of interchangeability may vary depending on the customer and end use application. While some downstream aluminum products require pure magnesium,[68] and some aluminum manufactures, including Kaiser, may have a preference for pure magnesium due to issues of product consistency, the record indicates that pure and alloy magnesium remain generally interchangeable in the aluminum industry, the largest consuming industry for magnesium.[69] Moreover, the record indicates that pure and alloy magnesium may also be used interchangeably in most other applications.[70] The

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[65] CR/PR at Table I-7.

[66] *Derived from* CR/PR at Table I-7 *and* Questionnaire Reponses of *** and *** at V-2b.

[67] *Magnesium 2005 Final Determination*, USITC Pub. 3763 (April 2005) at 9-10; CR/PR at I-25-26.

[68] End uses that require pure magnesium in alloying aluminum include the aerospace sector and some packaging products. Hearing Tr. at 58-59 (Lutz), 124 (Badgett); CR/PR at Table E-3.

[69] *See* CR/PR at I-24-25; Hearing Tr. at 124 (Badgett) ("we have the ability to use both {pure and alloy}, but we do have certain products, like in aerospace or some of our packaging, that does require purity of 99.8"); *Id.* at 125 (Donnan) ("…we strive for pure magnesium. When we can't find it, we'll try to adjust it, but that means the plant has to look at the recipes that go into the cast house, try to adjust those recipes for the variability {of alloy magnesium}"). Although Kaiser prefers to use pure magnesium for *** percent of its aluminum production, pure magnesium is only required for *** percent of such production. Kaiser Posthearing Br. at 6-7, Exh. C at 1, 2.

See also Purchasers' Narratives Regarding the Domestic Like Product Factors, CR/PR at Table E-3. For instance, aluminum manufacturers *** and aluminum manufacturer ***. Aluminum manufacturers ***. CR/PR at Table E-3.

[70] CR/PR at I-26, Table E-3; Hearing Tr. at 58-59 (Haack) and (Slade). Exceptions include aerospace, the metal reduction industry that makes zirconium and beryllium, as well certain chemical applications, like evasive flares, where the alloy magnesium does not meet the required purity. Hearing Tr. at 58-59 (Slade); CR/PR at Table E-3.

In the second review, the three Commissioners that defined a single domestic like product encompassing pure and alloy magnesium found that the increasing use of alloy magnesium by aluminum (Continued…)

record also indicates that purchasers switched from pure to alloy magnesium when US Magnesium reduced the available supply of pure magnesium, further demonstrating the interchangeability of pure and alloy magnesium in the same end use applications.[71]

Channels of Distribution. Pure and alloy magnesium were sold through similar channels of distribution during the January 2019—September 2022 period of review ("POR"). Both pure and alloy magnesium are sold primarily to end users.[72] The majority of U.S. producers' commercial U.S. shipments of in-scope pure magnesium and alloy magnesium were to aluminum manufacturers in 2020 and 2021.[73]

Customer and Producer Perceptions. Although many customers may use both pure and alloy magnesium interchangeably, the record suggests that market participants perceive that pure magnesium differs from alloy magnesium in composition and consistency.[74] Additionally, as described previously, some customers require the use of pure magnesium in their products.[75] On the other hand, the interchangeability of pure and alloy magnesium in many of the same end use applications, and ***, suggest that customer and producer perceptions of the products overlap to some extent.[76]

Manufacturing Facilities, Production Process, and Employees. ***, US Magnesium produced pure and alloy magnesium in the same facilities with the same employees.[77] Magpro also reported producing both pure and alloy magnesium at its production site, but using separate production processes.[78] *** reported producing either pure magnesium or other magnesium products.[79] For a primary magnesium producer like US Magnesium, the production of alloy magnesium is an extension of the process for making pure magnesium, involving the addition of alloy ingredients prior to casting.[80] On the other hand, the ***.[81]

Price. Responding domestic producers, importers, and purchasers generally indicated that alloy magnesium is priced lower than pure magnesium and that prices for the two

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manufacturers may have been fueled in part by the availability of lower priced imported alloy magnesium in the market. In this review, even in the absence of significant quantities of low-priced imports from China, importer ***. CR/PR at Table E-2.

[71] *See, e.g.,* US Magnesium's Posthearing Br. at Exh. 1, p. 30; Hearing Tr. at 61 (Lutz) ("…a recent article in *Platts* {indicates} that many aluminum producers are switching to even ASTM spec alloys to supply the magnesium for their operations").

[72] CR/PR at I-27.

[73] *Derived from* CR/PR at Table I-7 and Questionnaire Reponses of *** and *** at V-2b. In 2019, the majority of U.S. producers' commercial shipments of alloy magnesium were to diecasters. *Id.*

[74] Specifically, the record suggests that aluminum manufacturers perceive that primary pure magnesium is distinct from all other U.S.-produced magnesium, including the in-scope off-specification pure magnesium produced by Magpro. Hearing Tr. at 109 (Fahey), 172-73 (Spooner).

[75] *See* CR/PR at Table E-3.

[76] CR/PR at Table E-1 (***)

[77] CR/PR at I-29.

[78] Hearing Tr. at 54 (Haack), 57 (Vaughn).

[79] CR/PR at I-29.

[80] CR/PR at I-29.

[81] CR/PR at Table E-1 (***).

products usually follow the same trends, although the degree of correlation may vary.[82] The record indicates that the magnesium content of a product is an important determinant of the product's price.[83] Nevertheless, the average unit values ("AUVs") of the domestic industry's U.S. shipments of alloy magnesium generally exceeded those of the industry's U.S. shipments of pure magnesium. Specifically, the AUVs of U.S. producers' U.S. shipments of pure magnesium, including off-specification pure, were $*** per metric ton ("MT") in 2019, $*** per MT in 2020, and $*** per MT in 2021; they were $*** per MT in January-September 2021 ("interim 2021") and $*** per MT in January-September 2022 ("interim 2022"). The AUVs for U.S. producer's U.S. shipments of alloy magnesium were $*** per MT in 2019, $*** per MT in 2020, and $*** per MT in 2021; they were $*** per MT in interim 2021 and $*** per MT in interim 2022.[84]

Conclusion. On balance, and as with the prior reviews of this order, the record shows more similarities than differences between pure and alloy magnesium with respect to the Commission's domestic like product factors. In particular, pure and alloy magnesium both consist primarily of magnesium—usually at least 90 percent by weight. There is also considerable overlap between pure and alloy magnesium in terms of end uses and interchangeability. Aluminum manufacturers, the single largest consuming industry for magnesium, consume both pure and alloy magnesium and are able to adapt their production processes to use either type of magnesium. Pure and alloy magnesium may also be used interchangeably in most other end use applications and are similar in terms of channels of distribution and prices.[85]

There are also some differences between pure and alloy magnesium. The different physical characteristics of pure and alloy magnesium are reflected in some differences in customer perception of the products. We further acknowledge that US Magnesium's idling of its production facility in 2022 vastly reduced the quantity of pure and alloy magnesium produced in the same facilities by the same employees and shipped through similar channels of distribution. Notwithstanding US Magnesium's temporary idling, however, US Magnesium produced pure and alloy magnesium in the same facilities using the same employees throughout the vast majority of the POR and also shipped pure and alloy magnesium through similar channels of distribution during that time. Moreover, as discussed in section III.E.2, we are persuaded that US Magnesium is likely to recommence production within the reasonably foreseeable future.

Based on the foregoing, we define a single domestic like product encompassing both pure and alloy magnesium. Furthermore, because the relevant facts do not appear to have

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[82] CR/PR at Tables E1 – E3. Importer ***. CR/PR at Table E-2, p. E-9.

[83] CR/PR at Tables E1 – E3.

[84] CR/PR at Table I-8.

[85] With respect to prices, Kaiser argues that the respective prices of pure and alloy magnesium have changed since the second review where the Commission found that prices for pure and alloy magnesium had converged. Kaiser's Posthearing Br. at 3; *see also Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 11. Contrary to this argument, however, the record indicates that the respective prices of pure and alloy magnesium generally remained within a similar range during most of the period of review, as discussed above. CR/PR at Table I-8; *see also id.* at Tables E1 – E3.

changed since the prior reviews, we also continue to define the domestic like product to include both primary and secondary magnesium,[86] as well as both cast and granular magnesium.[87]

B. Domestic Industry

Section 771(4)(A) of the Tariff Act defines the relevant industry 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."[88] In defining the domestic industry, the Commission's general practice has been to include in the industry producers of all domestic production of the like product, whether toll-produced, captively consumed, or sold in the domestic merchant market.

We define the domestic industry as all domestic producers of pure and alloy magnesium, including primary and secondary magnesium and magnesium in cast and granular form, with the exception of diecasters that recycle their magnesium scrap as part of their diecasting operation.

1. The Original Investigations and Prior Reviews

In the original investigations and the first five-year review, the Commission defined the domestic industry as consisting of all domestic producers of pure magnesium.[89] In the second review, those Commissioners who defined the like product as including pure and alloy magnesium defined the domestic industry to include domestic producers of pure and alloy magnesium, including primary and secondary magnesium, and magnesium in cast and granular form. These Commissioners considered whether grinders and certain magnesium diecasters that produced secondary magnesium by recycling scrap engaged in sufficient production-

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[86] There is limited information in the record of this full review concerning the similarities and differences between primary and secondary magnesium. However, the information available indicates that primary magnesium and secondary magnesium continue to be similar in terms of physical characteristics and uses, interchangeability, customer and producer perceptions, channels of distribution, and price. *See* CR/PR at I-19, I-25-29, Tables I-7, E-1 – E-3.

[87] There is limited information in the record of this full review concerning the similarities and differences between cast and granular magnesium, as one U.S. producer of granular magnesium, Luxfer Magtech, provided the Commission with information concerning granular magnesium and its operations. Nonetheless, the information available indicates that there continues to be more similarities than differences between cast and granular magnesium with respect to physical characteristics and uses, interchangeability, customer and producer perceptions, channels of distribution, and price. *See* CR/PR at I-20, I-25-29, Tables I-7-8, E-1, ***'s U.S. Producers' Questionnaire Response at V-2b.

[88] 19 U.S.C. § 1677(4)(A). The definitions in 19 U.S.C. § 1677 are applicable to the entire subtitle containing the antidumping and countervailing duty laws, including 19 U.S.C. §§ 1675 and 1675a. *See* 19 U.S.C. § 1677.

[89] *Original Determination,* USITC Pub. 2885 (May 1995), at 10 and *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 6.

related activity to qualify as domestic producers. Based on limited information in the record and the Commission's decision in another magnesium investigation,[90] these Commissioners included grinders in the domestic industry but did not include the diecasters.[91] Those Commissioners who found pure and alloy magnesium to be separate like products defined the domestic industry producing pure magnesium as consisting of the sole domestic producer of pure magnesium at that time, US Magnesium.[92]

In the expedited third and fourth five-year reviews, the Commission defined the domestic industry as all domestic producers of pure and alloy magnesium, including primary and secondary magnesium, and magnesium in ingot and granular form.[93] In each of these reviews, only US Magnesium provided data on its operations. In the third review, the Commission did not address grinders or diecasters in its domestic industry analysis, and in the fourth review, having received no data from any diecaster, the Commission found no need to determine whether diecasting operations constituted domestic production.[94]

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[90] *Pure Magnesium from China and Israel*, Inv. Nos. 701-TA-403 and 731-TA-895-96 (Final), USITC Pub. 3467 (Nov. 2001) at 10-12.

[91] *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 13-15; *See also Pure Magnesium from China and Israel*, USITC Pub. 3467 (Nov. 2001) at 10-13. Although the Commission included grinders in the domestic industry, it observed that it had not obtained any industry data from grinders. It also determined, based on the limited information in the record, that the certain diecasters were not part of the domestic industry producing secondary magnesium. The Commission based its finding on diecasters' technical expertise, value added, and employment levels. It found that the technical expertise involved in the diecasters' scrap recycling production activities was comparable to that of other secondary producers but noted that the diecasters' production was basically a constantly recycled stream of input to, and output from, their true business, producing castings. *Id*. at 14-15.

[92] *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 43.

[93] *Third Five-Year Review*, USITC Pub. 4274 (Oct. 2011) at 8; *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 10.

[94] *Third Five-Year Review*, USITC Pub. 4274 (Oct. 2011) at 8; *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 10. In the third review, in its summary of the prior proceedings, the Commission made note of a related sunset review in which it considered whether Spartan Light Metal Products ("Spartan Metal"), a diecaster that recycled magnesium scrap, engaged in sufficient production related activities to be deemed a domestic producer, and concluded that it did. *Third Five-Year Review*, USITC Pub. 4274 (Oct. 2011) at 8, n.30; *See 2011 China/Russia Review,* USITC Pub. 4214 (Feb. 2011). In that related review, the Commission based its finding on Spartan Metal's significant capital investment, its not insignificant employment levels, and the technical expertise involved in its operation which appeared comparable to the activity of other secondary magnesium producers. In its analysis, the Commission noted that Spartan Metal's magnesium production did not consist entirely of recycling "run-around scrap"—it also purchased scrap metal to use in its alloy magnesium production. *2011 China/Russia Review,* USITC Pub. 4214 (Feb. 2011) at 12.

2. The Current Review

a. Arguments of the Parties

US Magnesium. US Magnesium argues that the Commission should define the domestic industry to include all domestic producers of pure and alloy magnesium, including primary and secondary magnesium, and magnesium in cast and granular form, with the exception of firms that recycle the scrap generated in their diecasting operations into magnesium.[95] US Magnesium contests Kaiser's claim that US Magnesium has left the domestic industry, asserting that US Magnesium is taking aggressive action to resume production following the stoppage in 2022 and has continued to engage in production-related activities after production was halted.[96]

Kaiser. Kaiser argues that there are no domestic producers of pure magnesium and therefore no domestic industry.[97] Kaiser asserts that US Magnesium has ceased production of pure magnesium and that US Magnesium's claims that it will resume production later this year are highly speculative, and that another two years may be needed for production to resume once equipment repairs are made.[98] Kaiser asserts that an analysis of the Commission's sufficient production related activities factors demonstrates that US Magnesium does not qualify as a domestic producer since terminating production.[99] Kaiser also argues that Magpro and Western Magnesium Corporation ("Western Magnesium") do not qualify as domestic producers because each is either not producing the domestic like product or not engaged in production-related activities that would directly lead to production of the domestic like product within a reasonably foreseeable time.[100]

Kaiser does not contest the exclusion of firms that recycle the scrap generated in their diecasting operations into magnesium from the definition of the domestic like product.

b. Analysis

Consistent with our definition of the domestic like product, we define the domestic industry as all domestic producers of pure and alloy magnesium, including primary and secondary magnesium and magnesium in cast and granular form, with the exception of diecasters that recycle their magnesium scrap as part of their diecasting operation.

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[95] US Magnesium's Prehearing Br. at 13.

[96] US Magnesium's Posthearing Br. at 14-15.

[97] Kaiser's Posthearing Br. at 8-15.

[98] Kaiser's Posthearing Br. at 10-13.

[99] Kaiser's Posthearing Br. at 8-13 (citing *Low Enriched Uranium from France Second Review*, USITC Pub. 4436 (Dec. 2013), at 7-13).

[100] *See* Kaiser's Posthearing Br. at 8-15. Because Western Magnesium did not complete a domestic producers' questionnaire response, its inclusion or exclusion from the domestic industry could make no difference to our analysis in this review. Consequently, there is no need for us to determine whether Western Magnesium engaged in sufficient production-related activities to qualify as a domestic producer.

As an initial matter, we reject Kaiser's assertion that Magpro is not a domestic producer. Magpro produced substantial quantities of the domestic like product throughout the POR, primarily off-specification pure magnesium which is under Commerce's scope and within the definition of the domestic like product in this review.[101] Specifically, Magpro produced *** MT of pure magnesium in 2019, accounting for *** percent of domestic industry production, *** MT in 2020, accounting for *** percent of domestic industry production, and *** MT in 2021, accounting for *** percent of domestic industry production.[102] Accordingly, Kaiser's argument that Magpro is not a domestic producer is without merit. Aside from Magpro, there was substantial production of the domestic like product by AMACOR, Luxfer Magtech, and, as discussed in the following paragraph, by US Magnesium during the POR.[103]

US Magnesium was one of the largest domestic producers of the domestic like product throughout the POR.[104] It produced *** MT of the domestic like product in 2019, accounting for *** percent of domestic industry production, *** MT in 2020, accounting for *** percent of domestic industry production, and *** MT in 2021, accounting for *** percent of domestic industry production. US Magnesium produced *** MT in interim 2021, accounting for *** percent of domestic industry production, and *** MT in interim 2022, accounting for *** percent of domestic industry production.[105] Furthermore, quarterly pricing data show that US Magnesium continued to supply the U.S. market through the end of the POR, despite stopping production in August 2022.[106] In addition, US Magnesium's overall investment in its U.S. facility is estimated at over $***.[107] Prior to stopping production, US Magnesium employed over *** workers, and after stopping production continued to employ *** workers assigned to its magnesium operations.[108]

Further, for purposes of our analysis in a sunset review, we focus on the likely volume, price effect, and impact of subject imports on the domestic industry in a reasonably foreseeable time if the order is revoked. As discussed in Section III.E.2 below, we find that US Magnesium is likely to recommence production in the reasonably foreseeable future and thus consider the likely impact of subject imports on the domestic industry that is likely to exist in the reasonably foreseeable future.

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[101] As previously noted, Commerce's scope expressly defines "off-specification pure magnesium" to encompass products that contain 50 percent or greater, but less than 99.8 percent primary magnesium by weight that do not conform to ASTM specifications for alloy. 87 Fed. Reg. 35732 (June 13, 2022); Issues and Decision Memorandum for the Final Results of Expedited Sunset Review of Pure Magnesium from the People's Republic of China (June 7, 2022) at 2-3. Kaiser's claims generally do not account for domestic production of off-specification pure magnesium. *See* Kaiser's Prehearing Br. at 5; Kaiser's Posthearing Br. at 8-15; Hearing Tr. at 172-73 (Spooner).

[102] CR/PR at Table F-7.

[103] CR/PR at Tables I-9 and F-7.

[104] CR/PR at Table F-7.

[105] CR/PR at Table F-7.

[106] US Magnesium's U.S. Producers' Questionnaire Response at IV-2b.

[107] CR/PR at Table III-6.

[108] US Magnesium's Posthearing Br. at Exh. 1, p. 16, Exh. 2, pp. 6-7; Hearing Tr. at 69 (Thayer).

We reject Kaiser's argument that analysis under the sufficient production-related activities factors demonstrates that US Magnesium does not qualify as a domestic producer on account of it terminating production in 2022.[109] Assuming *arguendo* that the Commission's sufficient production-related factors are relevant in the circumstances of this review, we would find that US Magnesium engaged in sufficient production-related activities to qualify as a domestic producer in view of its substantial production, sales, investments, and employment levels during the POR, as reviewed above, in addition to its efforts to repair its facility, which include planned investments of $***, and the continued employment of *** workers assigned to its magnesium operations.[110]

Thus, consistent with our definition of the domestic like product, we define the domestic industry as all domestic producers of pure and alloy magnesium, including primary and secondary magnesium and magnesium in cast and granular form,[111] with the exception of diecasters that recycle their magnesium scrap as part of their diecasting operation.[112]

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[109] Kaiser's Posthearing Br. at 10-13.

[110] US Magnesium's Posthearing Br. at Exh. 1, p. 44 and Exh. 2, pp. 5-6, and Exh. 5, paras. 5&6. Further, US Magnesium's production processes required a high degree of technical expertise, and the value added by these processes ranged from *** percent. CR/PR at Table III-9.

[111] The Commission received a questionnaire response from Luxfer Magtech, a producer of granular magnesium that ***. Luxfer Magtech provided limited information concerning its production-related activities, and no party addressed the issue of whether to include magnesium grinders in the domestic industry definition.

In *Magnesium from Israel*, the Commission found that grinders engaged in sufficient production-related activities to qualify as domestic producers, based on information submitted by Luxfer Magtech in those investigations. The Commission found that the capital investment required to produce granular magnesium was substantial, the atomization process employed by Luxfer Magtech to produce magnesium particles was sophisticated, required technical expertise, and added substantial value to the product; and that the employment levels and domestically manufactured raw material values reported were not insignificant. *Magnesium from Israel,* Inv. Nos. 701-TA-614 and 731-TA-1431 (Final)*,* USITC Pub. 5009 (Jan. 2020) at 9-10. There is no new information in the record of this review indicating that Luxfer Magtech's production operations have substantially changed since those investigations and it does not appear that the circumstances which led the Commission to include grinders as part of the domestic industry have changed since the prior reviews. *See* Luxfer Magtech's U.S. Producers' Questionnaire Response at I-8, I-10 *and* CR/PR at Table III-7. Based on the foregoing, and in the absence of any contrary argument, we find that grinders engage in sufficient production-related activities to qualify as domestic producers.

[112] The Commission received a questionnaire response from MPA, a producer of secondary alloy magnesium internally consumed in the production of diecast magnesium products. The information available, including comparisons with the production-related activities of secondary magnesium producers AMACOR and Magpro, indicate that MPA's production-related activities are relatively limited. *See* MPA's U.S. Producers' Questionnaire Response at I-9a – I-9b, V-2a; CR/PR at Tables III-6, III-7, III-9, F-7; US Magnesium's Posthearing Br. at Exh. 1, p.19; Hearing Tr. at 64, 65-67 (Lutz, Haack).

Additionally, the record gives no indication that the conditions which previously led the Commission to exclude diecasters from the domestic industry have changed. There is no indication in (Continued…)

III. Revocation of the Antidumping Duty Order Would Likely Lead to Continuation or Recurrence of Material Injury Within a Reasonably Foreseeable Time

A. Legal Standards

In a five-year review conducted under section 751(c) of the Tariff Act, Commerce will revoke an antidumping or countervailing duty order unless: (1) it makes a determination that dumping or subsidization is likely to continue or recur and (2) the Commission makes a determination that revocation of the antidumping or countervailing duty order "would be likely to lead to continuation or recurrence of material injury within a reasonably foreseeable time."[113] The SAA states that "under the likelihood standard, the Commission will engage in a counterfactual analysis; it must decide the likely impact in the reasonably foreseeable future of an important change in the status quo – the revocation or termination of a proceeding and the elimination of its restraining effects on volumes and prices of imports."[114] Thus, the likelihood standard is prospective in nature.[115] The U.S. Court of International Trade has found that "likely," as used in the five-year review provisions of the Act, means "probable," and the Commission applies that standard in five-year reviews.[116]

The statute states that "the Commission shall consider that the effects of revocation or termination may not be imminent, but may manifest themselves only over a longer period of

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the record that ***'s production did not consist entirely of recycling "run-around scrap" rather than purchasing scrap metal to use in its alloy magnesium production. Based on the foregoing, we find that diecasters that recycle their magnesium scrap do not engage in sufficient production-related activities to qualify as domestic producers.

[113] 19 U.S.C. § 1675a(a).

[114] SAA at 883-84. The SAA states that "{t}he likelihood of injury standard applies regardless of the nature of the Commission's original determination (material injury, threat of material injury, or material retardation of an industry). Likewise, the standard applies to suspended investigations that were never completed." *Id*. at 883.

[115] While the SAA states that "a separate determination regarding current material injury is not necessary," it indicates that "the Commission may consider relevant factors such as current and likely continued depressed shipment levels and current and likely continued {sic} prices for the domestic like product in the U.S. market in making its determination of the likelihood of continuation or recurrence of material injury if the order is revoked." SAA at 884.

[116] *See NMB Singapore Ltd. v. United States*, 288 F. Supp. 2d 1306, 1352 (Ct. Int'l Trade 2003) ("'likely' means probable within the context of 19 U.S.C. § 1675(c) and 19 U.S.C. § 1675a(a)"), *aff'd mem.*, 140 Fed. Appx. 268 (Fed. Cir. 2005); *Nippon Steel Corp. v. United States*, 26 CIT 1416, 1419 (2002) (same); *Usinor Industeel, S.A. v. United States*, 26 CIT 1402, 1404 nn.3, 6 (2002) ("more likely than not" standard is "consistent with the court's opinion;" "the court has not interpreted 'likely' to imply any particular degree of 'certainty'"); *Indorama Chemicals (Thailand) Ltd. v. United States*, 26 CIT 1059, 1070 (2002) ("standard is based on a likelihood of continuation or recurrence of injury, not a certainty"); *Usinor v. United States*, 26 CIT 767, 794 (2002) ("'likely' is tantamount to 'probable,' not merely 'possible'").

time."[117] According to the SAA, a "'reasonably foreseeable time' will vary from case-to-case, but normally will exceed the 'imminent' timeframe applicable in a threat of injury analysis in original investigations."[118]

Although the standard in a five-year review is not the same as the standard applied in an original investigation, it contains some of the same fundamental elements. The statute provides that the Commission is to "consider the likely volume, price effect, and impact of imports of the subject merchandise on the industry if the orders are revoked or the suspended investigation is terminated."[119] It directs the Commission to take into account its prior injury determination, whether any improvement in the state of the industry is related to the order or the suspension agreement under review, whether the industry is vulnerable to material injury if an order is revoked or a suspension agreement is terminated, and any findings by Commerce regarding duty absorption pursuant to 19 U.S.C. § 1675(a)(4).[120] The statute further provides that the presence or absence of any factor that the Commission is required to consider shall not necessarily give decisive guidance with respect to the Commission's determination.[121]

In evaluating the likely volume of imports of subject merchandise if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider whether the likely volume of imports would be significant either in absolute terms or relative to production or consumption in the United States.[122] In doing so, the Commission must consider "all relevant economic factors," including four enumerated factors: (1) any likely increase in production capacity or existing unused production capacity in the exporting country; (2) existing inventories of the subject merchandise, or likely increases in inventories; (3) the existence of barriers to the importation of the subject merchandise into countries other than the United States; and (4) 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.[123]

In evaluating the likely price effects of subject imports if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider whether there is likely to be significant underselling by the subject imports as compared to the domestic like product and whether the subject imports are likely to enter the

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[117] 19 U.S.C. § 1675a(a)(5).

[118] SAA at 887. Among the factors that the Commission should consider in this regard are "the fungibility or differentiation within the product in question, the level of substitutability between the imported and domestic products, the channels of distribution used, the methods of contracting (such as spot sales or long-term contracts), and lead times for delivery of goods, as well as other factors that may only manifest themselves in the longer term, such as planned investment and the shifting of production facilities." *Id*.

[119] 19 U.S.C. § 1675a(a)(1).

[120] 19 U.S.C. § 1675a(a)(1). Commerce has not made any duty absorption findings with respect to this order. CR/PR at I-14, n.29.

[121] 19 U.S.C. § 1675a(a)(5). Although the Commission must consider all factors, no one factor is necessarily dispositive. SAA at 886.

[122] 19 U.S.C. § 1675a(a)(2).

[123] 19 U.S.C. § 1675a(a)(2)(A-D).

United States at prices that otherwise would have a significant depressing or suppressing effect on the price of the domestic like product.[124]

In evaluating the likely impact of imports of subject merchandise if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider all relevant economic factors that are likely to have a bearing on the state of the industry in the United States, including but not limited to the following: (1) likely declines in output, sales, market share, profits, productivity, return on investments, and utilization of capacity; (2) likely negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment; and (3) likely negative effects on the existing development and production efforts of the industry, including efforts to develop a derivative or more advanced version of the domestic like product.[125] All relevant economic factors are to be considered within the context of the business cycle and the conditions of competition that are distinctive to the industry. As instructed by the statute, we have considered the extent to which any improvement in the state of the domestic industry is related to the orders under review and whether the industry is vulnerable to material injury upon revocation.[126]

B. Conditions of Competition and the Business Cycle

In evaluating the likely impact of the subject imports on the domestic industry if an order is revoked, the statute directs the Commission to consider all relevant economic factors "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[127] The following conditions of competition inform our determination.

1. The Original Investigations and Prior Reviews

In the original investigations, the Commission identified a number of conditions of competition pertinent to the domestic pure magnesium industry, including the relationship between demand for pure magnesium and the demand for the products in which it is used, and the need to keep electrolytic cells in constant operation to avoid their deterioration.[128]

In the first and second five-year reviews, the Commission reiterated these conditions and also described a number of other conditions affecting the domestic industry, finding that

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[124] *See* 19 U.S.C. § 1675a(a)(3). The SAA states that "{c}onsistent with its practice in investigations, in considering the likely price effects of imports in the event of revocation and termination, the Commission may rely on circumstantial, as well as direct, evidence of the adverse effects of unfairly traded imports on domestic prices." SAA at 886.

[125] 19 U.S.C. § 1675a(a)(4).

[126] The SAA states that in assessing whether the domestic industry is vulnerable to injury if the order is revoked, the Commission "considers, in addition to imports, other factors that may be contributing to overall injury. While these factors, in some cases, may account for the injury to the domestic industry, they may also demonstrate that an industry is facing difficulties from a variety of sources and is vulnerable to dumped or subsidized imports." SAA at 885.

[127] 19 U.S.C. § 1675a(a)(4).

[128] *Original Determination,* USITC Pub. 2885 (May 1995), at 16-17.

the production processes for pure and alloy magnesium are very similar and are typically performed at common manufacturing facilities by the same employees; domestic pure magnesium and subject imports are substitutable with each other and with nonsubject imports; the market for pure magnesium is price competitive; and nonsubject imports play a role in the U.S. market.[129]

In the third five-year review, the Commission found that the conditions of competition it relied upon in making its determinations in the prior reviews generally continued. In addition, the Commission found that pure magnesium was typically used in such end uses as the production of aluminum alloys for use in beverage cans and in some automotive parts; iron and steel desulfurization, as a reducing agent for various nonferrous metals; magnesium anodes for the protection of iron and steel in underground pipe and water tanks and various marine applications; and the production of titanium sponge; and that alloy magnesium was principally used in structural applications, primarily in casting and extrusions for the automotive industry, with some alloy magnesium also being used in aluminum production.[130]

In the fourth five-year review, the Commission found that demand for magnesium was derived from demand for downstream applications, including aluminum production, diecasting, and iron and steel desulfurization, and remained closely correlated with general economic activity.[131] The Commission observed that US Magnesium had increased its production capacity since the prior five-year review. It reiterated that primary magnesium producers such as US Magnesium had a strong incentive to maintain a continuous level of production because the electrolytic cells used to make primary magnesium had to be kept in constant operation to avoid deterioration and significant rebuilding costs. The Commission found that the domestic industry supplied the largest share of apparent U.S. consumption in 2015, followed by nonsubject imports and subject imports.[132] It also found that there continued to be a moderate to high degree of substitutability between the domestic like product and subject imports, and that price remained an important factor in purchasing decisions, as magnesium continued to be a fungible commodity product competing primarily on the basis of price.[133]

2. The Current Review

a. Demand

Demand for magnesium is derived from demand for the applications in which magnesium is used, including aluminum production, diecast magnesium products, and iron and

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[129] *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 8-10 and *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 27-29 and 59-61.

[130] *Third Five-Year Review*, USITC Pub. 4274 (Oct. 2011) at 11-12.

[131] *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 14-15.

[132] *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 15-16.

[133] *See Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 16. *See also Original Determination,* USITC Pub. 2885 (May 1995) at 20-22, *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 8-9, *and Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 27-28.

steel desulfurization, and remains correlated with general economic conditions.[134] Most responding purchasers, and a plurality of responding domestic producers and importers, reported that U.S. demand for pure magnesium had increased since 2019 and will likely continue to increase over the next two years.[135] No responding domestic producer, importer, or purchaser reported anticipating that demand will decrease.[136]

Apparent U.S. consumption of magnesium fluctuated but decreased overall by *** percent from 2019 to 2021, decreasing from *** MT in 2019 to *** MT in 2020, then increasing to *** MT in 2021. Apparent U.S. consumption was *** percent lower in interim 2022, at *** MT, than in interim 2021, at *** MT.[137]

b. Supply

During the POR, the domestic industry was the largest source of supply to the U.S. market.[138] The domestic industry's share of apparent U.S. consumption declined irregularly by *** percentage points from 2019 to 2021, decreasing from *** percent in 2019 to *** percent in 2020, before increasing to *** percent in 2021; it was lower in interim 2022, at *** percent, than in interim 2021, at *** percent.[139]

US Magnesium was the largest domestic producer of magnesium during the POR, accounting for *** of the domestic industry's production from 2019 to 2021, despite reported declines in its production capacity in 2020 and 2021 and between the interim periods, as *** and worsening equipment failures reduced its practical capacity.[140] The domestic industry's

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[134] CR/PR at I-18-19, II-9; US Magnesium's Prehearing Br. at 17.

[135] CR/PR at II-10 and Tables II-6-7. Most other responding domestic producers, importers, and purchasers reported that demand either fluctuated or remained unchanged, and will likely fluctuate or remain unchanged. *Id.* Only two responding importers reported that demand declined during the POR. *Id.* at Table II-6. Reasons cited for increased demand include increased demand in the aerospace, aluminum, automotive, and packaging industries. *Id.* at II-10; Hearing Tr. at 50 (Haack), 52-53 (Slade) ("Demand did start to recover in 2021, and, in fact, by the end of year 2022, we see that based on imports and our knowledge of U.S. production that demand actually has surpassed pre pandemic levels. And I think a large driver of strong demand in the United States has been the aluminum industry"). Reported declines in demand were attributed to the COVID-19 pandemic and the computer chip shortage affecting the automotive industry. *Id.*

[136] CR/PR at II-10 and Table II-6.

[137] CR/PR at Table C-3.

[138] CR/PR at Table C-3.

[139] CR/PR at Table C-3.

[140] US Magnesium's reported production capacity decreased from *** MT in 2019 to *** MT in 2020 and *** MT in 2021; it was lower in interim 2022, at *** MT, than in interim 2021, at *** MT. CR at Table F-7. US Magnesium reported that ***. CR/PR at III-21, n.29. Then, as discussed previously, US Magnesium suffered a series of equipment failures beginning in *** 2021 that led to reduced magnesium production and the eventual idling of its facility in August 2022. Hearing Tr. at 16-17 (Thayer), 94-95 (Slade), 115 (Donnan); US Magnesium's Posthearing Br. at Exh. 2 (Declaration of ***), pp. 3-4.

overall production capacity decreased from *** MT in 2019 to *** MT in 2020 and *** MT in 2021; it was lower in interim 2022, at *** MT, than in interim 2021, at *** MT.[141] [142]

Subject imports were the smallest source of supply in the U.S. market but maintained a presence in the U.S. market during the POR. Subject imports accounted for *** of apparent U.S. consumption during the 2019-2021 period and *** percent of apparent U.S. consumption in interim 2022, compared to *** percent in interim 2021.[143]

Nonsubject imports were the second largest source of supply in the U.S. market. Nonsubject imports as a share of apparent U.S. consumption increased irregularly by *** percentage points from 2019 to 2021, increasing from *** percent in 2019 to *** percent in 2020 before decreasing to *** percent in 2021; their market share was higher in interim 2022, at *** percent, than in interim 2021, at *** percent.[144] The largest country sources of nonsubject imports were Brazil, Israel, Russia, and Turkey.[145]

All 13 responding purchasers reported that there had been supply constraints in the U.S. market during the period of review, with eight purchasers citing U.S. Magnesium's *force majeure* or inability to supply magnesium as a supply constraint. Three purchasers reported that supply chain issues, related to the COVID-19 pandemic or otherwise, were a constraint on the supply of imported magnesium.[146]

c. Substitutability and Other Conditions

We find that there is a moderate to high degree of substitutability between the domestic like product and subject imports.[147] There is no new information on the record of this review indicating that this degree of substitutability has changed from the prior reviews.[148] All responding domestic producers, nine of 10 responding importers, and eight of 10 responding purchasers reported that subject imports and domestically produced pure magnesium were always or frequently interchangeable, while one of 10 responding importers and two of 10

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[141] CR at Table C-3.

[142] *** reported toll and non-toll production. CR/PR at Table F-7 note. Toll production was modest compared to non-toll production. *Compare* CR/PR at Table F-10 *with* Table F-12. Tollers did not report tolling for imported magnesium. CR/PR at Table F-13 note.

[143] CR/PR at Table C-3. According to official U.S. import statistics, the quantity of subject imports was 149 MT in 2019, 25 MT in 2020, and 12 MT in 2021; it was 4 MT in interim 2021 and 2,592 in interim 2022. CR/PR at Table G-1.

[144] *See* CR/PR at Table C-3.

[145] CR/PR at II-7.

[146] CR/PR at II-8.

[147] Factors limiting substitutability include limited availability of domestic product, reported product applications that require 99.8 percent pure magnesium or greater rather than other types of magnesium, some reported quality differences, and purchaser preferences for pure magnesium from domestic sources. CR/PR at II-12.

[148] *See Original Determination,* USITC Pub. 2885 (May 1995) at 20-22, *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 8-9, *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 27-28, *and Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 16.

responding purchasers reported they were sometimes interchangeable.[149] Most responding purchasers reported that domestically produced pure magnesium and subject imports always or usually met minimum quality specifications.[150] Most responding purchasers also reported that domestically produced pure magnesium was comparable or superior to subject imports with respect to most purchasing factors, with the exception of availability, discounts offered, price, reliability of supply, and supplier diversity.[151]

We also find that price is an important factor in purchasing decisions, although reliability of supply and product quality are also important factors. More responding purchasers ranked price as the number one most important purchasing factor, and as among their top three purchasing factors, than any other factor.[152] Ten of 13 responding purchasers rated price as a very important purchasing factor, although a greater number rated availability (13 purchasers); product consistency, quality meets industry standards, and reliability of supply (12 purchasers each); and delivery time (11 purchasers) as very important.[153]

Magnesium production is capital intensive with high fixed costs. Consequently, domestic producers must operate at a high rate of capacity utilization to reduce unit fixed costs to an economic level. US Magnesium, in particular, has a strong incentive to maintain a continuous level of production because its electrolytic cells must be kept in constant operation to avoid deterioration and significant rebuilding costs.[154]

Domestic producers and U.S. importers reported selling magnesium pursuant to contracts and in the spot market. Domestic producers reported selling most of their pure magnesium pursuant to long-term contracts, with most of the balance sold pursuant to annual contracts.[155] Prices are set during negotiations between suppliers and individual customers,

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[149] CR/PR at Tables II-14, II-15, and II-16. As previously discussed, the record also shows that there is substantial interchangeability between pure and alloy magnesium, particularly for aluminum. *See, e.g.,* CR at I-26. The record also supports that primary and secondary magnesium are interchangeable in automotive diecasting and other applications if appropriate methods are utilized to assure the purity of the secondary magnesium, and that cast and granular magnesium are interchangeable to the extent that a grinder or iron and steel desulfurization customer must first grind cast magnesium into granular magnesium. *Id.* at CR I-26-27.

[150] CR/PR at Table II-11.

[151] CR/PR at Table II-13. Responding purchasers were evenly split on whether domestically produced pure magnesium were superior or comparable to, or inferior to, subject imports with respect to availability, discounts offered, price, reliability of supply. *Id.* A majority of responding purchasers rated domestically produced pure magnesium as inferior to subject imports with respect to supplier diversity. *Id.*

[152] CR/PR at Table II-9. Price was the most frequently cited first-most important factor (six purchasers), followed by availability/supply (five purchasers). The most often cited top three factors purchasers consider in their purchasing decisions for pure magnesium were price (11 purchasers) and availability/supply and quality (ten purchasers each). *Id.*

[153] CR/PR at Table II-10.

[154] CR/PR at I-21, n.49; US Magnesium's Prehearing Br. at 18.

[155] CR/PR at V-2. US Magnesium sells *** of its magnesium under longer-term and annual contracts. In comparison, ***. CR/PR at V-11 n.7; US Magnesium's Posthearing Br. at Exh. 1, pp. 32-33.

and based on the existing supply and demand dynamics.[156] Eight responding purchasers reported that US Magnesium was a price leader for pure magnesium, while three responding purchasers reported that various U.S. importers were price leaders, including an importer of pure magnesium from China.[157]

The primary raw materials used to produce pure and alloy magnesium in cast form are magnesium chloride derived from brine and magnesium-containing scrap.[158] The domestic industry's unit raw material cost, which accounted for the smallest component of the industry's total cost of goods sold ("COGS"), increased from $*** per MT in 2019 to $*** per MT in 2020 before decreasing to $*** per MT in 2021, and was *** higher in interim 2022, at $*** per MT, compared with interim 2021, at $*** per MT.[159]

Pure magnesium imported from China under HTS subheading 8104.11 is not subject to an additional *ad valorem* duty under Section 301 of the Trade Act of 1974, as amended ("section 301 tariffs"), nor an additional duty under Section 232 of the Trade Expansion Act of 1962 ("section 232 tariffs").[160]

C. Likely Volume of Subject Imports

1. The Original Investigations and Prior Five-Year Reviews

In the original investigations, the Commission found that the volume of cumulated subject imports was significant and increased substantially from 1992 through the first half of 1994. The Commission further found that the market share of subject imports of pure magnesium, by both quantity and value, increased significantly during the period of investigation.[161]

In the first, second, third, and fourth five-year reviews, the Commission found that subject import volume would likely be significant if the antidumping duty order on pure

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[156] Hearing Tr. at 86-90 (Slade), 90 (Haack).

[157] CR/PR at V-3.

[158] CR/PR at III-39. ***. *Id.* at n.47. The cost of ***. *Id.* at n.48. Accordingly, unit raw material costs varied widely between US Magnesium and Magpro, ***, although they followed the same directional trends during the POR. *See* CR/PR at Table III-19.

Raw material costs were ***. ***. Magpro explained that ***. CR/PR at III-39, n.49. *See* Hearing Tr. at 133-134 (Fahey).

[159] CR/PR at III-39 and Table III-17.

[160] CR/PR at I-16-17. The record indicates that section 301 tariffs have not had an impact on the U.S. magnesium market. *See* CR/PR at II-1; Hearing Tr. at 79-80 (Slade). With respect to section 232 tariffs, although most market participants reported such tariffs have had no direct effects on the U.S. magnesium market, other information in the record indicates that section 232 tariffs on imports of aluminum indirectly boosted U.S. demand for magnesium by strengthening the domestic aluminum industry. Hearing Tr. at 79-80 (Slade); CR/PR at II-1.

[161] *Original Determination,* USITC Pub. 2885 (May 1995), at 19-20. Cumulated subject imports included imports from Russia and Ukraine. *See Id*. at 15-16. The volume of subject imports from China was *** MT in 1992, *** MT in 1993, and *** MT in 1994. Confidential Staff Report, INV-S-50, at Table 23 (Apr. 20, 1995).

magnesium from China were revoked. The Commission based its findings on the growth and substantial capacity and excess capacity of the Chinese magnesium industry, that industry's export orientation, the presence of import barriers on pure magnesium from China in third country markets, and the ability of Chinese producers to switch production from alloy magnesium to pure magnesium if the order on pure magnesium were revoked.[162] In the second and third five-year reviews, the Commission also based its findings on the strong interest of Chinese producers in supplying the U.S. market, as demonstrated by their shift to exporting other types of magnesium to the United States whenever an order on one type of magnesium was imposed.[163]

In the fourth five-year review, the Commission found that subject imports were present in appreciable quantities throughout the period of review.[164] The Commission also found that the subject industry's capacity in 2015, at 1.6 million MT, was greater than during the original investigations and prior reviews and vastly exceeded apparent U.S. consumption that year. The record also showed that Chinese producers could easily switch production from alloy magnesium to pure magnesium.[165]

The Commission further found that the magnesium industry in China remained export oriented and that the United States continued to be an attractive market for subject producers. China was the world's largest exporter of magnesium in 2015, accounting for 11.0 percent of global exports of magnesium by value, and there was evidence that prices for magnesium were higher in the United States than in other markets. Additionally, Brazil had maintained antidumping duties on imports of pure magnesium from China since 2004. For these reasons, the Commission concluded that the likely volume of subject imports, both in absolute terms and as a share of the U.S. market, would be significant if the order were revoked.[166]

2. The Current Review

The available data show that subject imports maintained a presence in the U.S. market during the POR, notwithstanding the disciplining effect of the order, particularly in the interim period. The quantity of subject imports was 149 MT in 2019, 25 MT in 2020, and 12 MT in

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[162] *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 10-12; *Second Five-Year Reviews*, USITC Pub. 3859 (July 2006) at 29-31 and 61-62; *Third Five-Year Reviews,* USITC Pub. 4274 (Oct. 2011) at 13-14. The volume of subject imports from China was *** MT in 1999, *** MT in 2005, and *** MT in 2010. CR/PR at Table I-3.

[163] *Second Five-Year Reviews*, USITC Pub. 3859 (July 2006) at 29-31 and 61-62; *Third Five-Year Review,* USITC Pub. 4274 (Oct. 2011) at 13.

[164] *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 17. Subject import volume was *** MT in 2011, *** MT in 2012, *** MT in 2013, *** MT in 2014, and *** MT in 2015. CR/PR at Table I-2. Because the official import statistics used to compile import data included out-of-scope magnesium products, they likely overstated subject imports. *Id* at 17 n.91; *Confidential Fourth Five-Year Review Determination*, EDIS Doc. 607284 (Apr. 3, 2017) at 26, n.91.

[165] *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 18.

[166] *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 18-19.

2021; subject imports were 2,592 MT in interim 2022, up from 4 MT in interim 2021.[167] After accounting for a negligible share of apparent U.S. consumption during the 2019-2021 period, subject imports accounted for *** percent of apparent U.S. consumption in interim 2022.[168]

The subject industry in China has the ability and incentive to increase subject imports to significant levels in the U.S. market if the order were revoked. The record indicates that the subject industry's capacity, including excess capacity, was large and increasing during the period of review. Since the original investigations, the magnesium industry in China has grown to become the world's largest, by far, accounting for approximately 90 percent of global production in 2021 and 2022.[169] The U.S. Geological Survey (USGS) reports that in 2020, the most recent year for which data are available, the Chinese industry's primary magnesium production capacity was 1.8 million MT, its production was 886,000 MT, and its capacity utilization rate was less than 50 percent, yielding excess capacity of about 900,000 MT.[170] Thus, in 2020, the subject industry's excess capacity was at least *** times greater than apparent U.S. consumption that year.[171]

The record also indicates that the subject industry's massive excess capacity has not prevented the industry from continuing its expansion. In 2022, Yunhai Special Metals announced a plan to spend 4.7 billion yuan ($656 million) to build four new magnesium projects, including a project in Shanxi province to increase output by 100,000 MT annually.[172] Presenters at the International Magnesium Conference in August 2022 indicated that 330,000 MT of new magnesium capacity is currently under construction in China and that a project adding 300,000 MT of magnesium capacity is scheduled to become operational in the first quarter of 2023.[173]

Responding subject producer Welbow Metals, which estimates that it accounted for *** percent of pure magnesium production in China in 2021,[174] reported increased production capacity towards the end of the period of review and plans to further increase its production capacity. After maintaining an annual production capacity of *** MT during the 2019-2021 period, Welbow Metals' production capacity was *** percent higher in interim 2022, at *** MT, than in interim 2021, at ***.[175] Welbow Metals's production was *** to its capacity

[167] CR/PR at Table G-1.

[168] CR/PR at C-3.

[169] CR/PR at IV-16. During the original investigations, China's magnesium production capacity was an estimated 26,000 MT in 1993. *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 11.

[170] CR/PR at IV-7.

[171] CR/PR at Table C-3.

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

[173] US Magnesium's Prehearing Br. at 35, Exhibits 4, 11.

[174] We note that Welbow Metal's reported production of *** MT in 2021 is only *** percent of the 930,000 MT of China's smelter production of primary magnesium in 2021, as estimated by the USGS. *See* CR/PR at IV-16, Table IV-9.

[175] CR/PR at Table IV-9.

throughout the POR.[176] Welbow Metals also reported ***.[177] Although Welbow Metals reported that it uses *** to produce ***,[178] the Commission has previously found that subject producers can easily switch production from alloy magnesium to pure magnesium.[179] The Chinese magnesium industry's history of exporting to the United States significant volumes of any magnesium product not subject to antidumping duties, whether pure or alloy, further demonstrates the Chinese magnesium industry's interest in the U.S. market and ability to export to the United States including by shifting production to pure magnesium if the order were revoked.[180]

The subject industry in China is also a large exporter. According to Global Trade Atlas ("GTA") data, China was the world's largest exporter of pure magnesium throughout the POR, accounting for 78.1 percent of global exports of pure magnesium in 2021.[181] In addition, subject producers have demonstrated the ability to rapidly increase their exports of pure magnesium, having increased such exports by 77,785 MT, or 38.2 percent, between 2020 and 2021.[182]

The record further shows that the U.S. market remained attractive during the POR and that Chinese producers would have an incentive to export subject merchandise to the United States if the order were revoked. Subject imports remained present, although at low levels, in the U.S. market throughout 2019-2021 and were substantially higher in interim 2022 than in interim 2021 despite the disciplining effect of the order. Responding purchaser ***.[183] Kaiser similarly reported ***.[184]

Furthermore, the United States is one of the world's largest markets for magnesium, and prices in the U.S. market are generally higher than in other markets.[185] Responding

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[176] CR/PR at Table IV-9.

[177] CR/PR at Table IV-8. Specifically, Welbow Metals reported ***. CR/PR at IV-9, n.9. Although the record indicates that some magnesium production operations in China were idled in August and September of 2021 because of government energy use requirements, these restrictions were only in place through December 2021. CR/PR at Table IV-6.

[178] CR/PR at IV-11.

[179] *See Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 30.

[180] Kaiser argues that the antidumping duty order on alloy magnesium from China has effectively precluded imports of alloy magnesium from China, which would encourage Chinese producers to shift production from alloy magnesium to pure magnesium for export to the United States in the event of revocation of the order on pure magnesium. Hearing Tr. at 173 (Spooner) ("It's our understanding that Magpro's output, its alloys, conform to ASTM standards and are, therefore, protected by the scope of another order, the magnesium metal from China order, not the order before us today").

[181] CR/PR at Table IV-12. Welbow Metals reported that its exports accounted for less than *** percent of its total shipments during the POR. Its exports increased overall by *** percent from 2019 to 2021, decreasing from *** MT in 2019 to *** MT in 2020 before increasing to *** MT in 2021; they were lower in interim 2022, at *** MT, than in interim 2021, at *** MT. CR/PR at Table IV-9.

[182] *See* CR/PR at Table IV-11.

[183] CR/PR at IV-2, n.7.

[184] *See* *** at II-2 ("***").

[185] US Magnesium's Prehearing Br. at 25; CR/PR at V-12.

importers with knowledge of prices in non-U.S. markets reported that prices in Europe and other markets outside the United States are lower than prices in the U.S. market.[186] Moreover, the AUVs of the subject industry's exports of pure magnesium to third country markets were well below the AUV's of the domestic industry's U.S. shipments of pure magnesium during the POR.[187] The relatively higher pure magnesium prices available in the U.S. market would create an economic incentive for Chinese producers to fill their excess capacity by increasing exports to the U.S. market if the order were revoked.[188]

The record also suggests that subject producers' ability to export substantial volumes of pure magnesium to the United States would be facilitated by the large presence of magnesium from China in the Canadian market. In 2021, Canada was the subject industry's second largest export market, demonstrating that subject producers have remained active in North America.[189] Subject producers and exporters could likely leverage their experience serving the Canadian market to increase their presence in the U.S. market if the order were revoked.

Accordingly, based on the foregoing, including the significant and increasing volume of subject imports during the original investigations, the continued presence of subject imports in the U.S. market during the POR and the higher presence in interim 2022, the subject industry's substantial production capacity, including excess capacity, and exports, and the attractiveness of the U.S. market, we find that the volume of subject imports would likely be significant, both in absolute terms and relative to U.S. consumption and production, if the order were revoked.[190]

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[186] CR/PR at V-12. U.S. importer *** reported that prices in Europe are generally lower than in the United States, and importers *** reported that prices outside of the U.S. market are generally lower. *Id.*

[187] According to GTA data, the AUVs of exports of pure magnesium from China to third country markets were $2,411 per MT in 2019, $2,384 per MT in 2020, and $4,176 per MT in 2021. CR/PR at Table IV-11. By comparison, the AUVs of the domestic industry's commercial U.S. shipments of pure magnesium were consistently higher, at $*** per MT in 2019, $*** per MT in 2020, and $*** per MT in 2021. CR/PR at Table III-14.

[188] We also observe Brazil has maintained antidumping duties on imports of pure magnesium from China since 2004, restricting the subject industry's access to an important export market and providing an additional incentive for subject producers to target the U.S. market if the order were revoked. CR/PR at IV-14.

[189] CR/PR at Table IV-11.

[190] We have also examined inventories in our analysis of the likely volume of subject imports. End-of-period inventories of subject merchandise in the United States during the POR were only reported in interim 2022 (*** MT). CR/PR at Table IV-4. Welbow Metals' end-of-period inventories were *** MT in 2019, *** MT in 2020, and *** in 2021; they were *** in interim 2021 and *** in interim 2022. CR/PR at Table IV-9.

*** reported importing or arranging for the importation subject merchandise after September 2022. CR/PR at IV-5.

D. Likely Price Effects

1. The Original Investigations and Prior Five-Year Reviews

In the original investigations, the Commission found that the large and increasing volume of cumulated subject imports during the period of investigation depressed prices or prevented price increases that otherwise would have occurred to a significant degree. Noting the general substitutability between the domestic like product and subject imports, the Commission observed that prices for domestic pure magnesium rose and fell in relation to the presence in the U.S. market of unfairly traded imports. Additionally, subject imports on a cumulated basis undersold domestically produced pure magnesium in the vast majority of pricing comparisons. In particular, price data collected from U.S. purchasers during the original investigations showed underselling by imports from China in nine of 13 price comparisons.[191]

In the first, second, third, and fourth five-year reviews, the Commission determined that revocation of the antidumping duty order on pure magnesium would be likely to lead to significant underselling of the domestic like product by subject imports, as well as significant price effects, including price depression and suppression.[192] In the first review, the Commission relied on pricing patterns for subject imports both during and subsequent to the original period of investigation to conclude that subject imports would likely be priced aggressively if the order were revoked.[193] In the second review, the Commission relied on limited AUV data for the period of review, as well as pricing patterns for subject imports during the original period of investigation and the first review, to conclude that subject imports would likely be priced aggressively if the order were revoked.[194] In the third review, the Commission relied on evidence in the record indicating that prices for pure magnesium in the United States were higher than prices in other markets. The Commission found that underselling was likely to result in significant price effects, similar to those found in the original investigations.[195]

In the fourth review, the Commission found that the information available indicated that subject imports were priced lower than the domestic like product. Given evidence that prices for pure magnesium in the United States were higher than prices in other markets, the Commission found that subject producers and exporters would have an incentive to undersell prevailing U.S. prices to induce purchasers to switch to subject imports if the order were revoked. The Commission concluded that absent the disciplining effects of the order, the significant quantities of subject imports that would likely undersell the domestic like product would likely have significant depressing or suppressing effects on prices for the domestic like product.[196]

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[191] *Original Determination*, USITC Pub. 2885, at 20-21.

[192] *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 10-12; *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 31-32 and 62-63; *Third Five-Year Review,* USITC Pub. 4274 (Oct. 2011) at 15; *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 20.

[193] *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 10-12.

[194] *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 31-32 and 62-63.

[195] *Third Five-Year Review*, USITC Pub. 4274 (Oct. 2011) at 15.

[196] *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 20.

2. The Current Review

As previously discussed in Section III.B.2, we find that there is a moderate to high degree of substitutability between the domestic like product and subject imports, and that price is an important factor in purchasing decisions.

The Commission collected quarterly price data on three magnesium pricing products.[197] *** U.S. producers and *** importer provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters. Pricing data reported by these firms accounted for approximately *** percent of U.S. producers' U.S. shipments of in-scope pure magnesium in 2021.[198] ***.[199] These limited pricing data show that subject imports undersold the domestic like product in *** of *** quarterly comparisons, at a margin of *** percent. The quantity of subject imports that undersold the domestic like product was *** MT.[200]

Domestic producers' prices for products 1 and 3 fluctuated from the first quarter of 2019 through the fourth quarter of 2021 and then increased over the first three quarters of 2022 to levels more than *** percent higher than in the first quarter of 2019.[201] Domestic prices for product 2 were comparatively flat, increasing from the fourth quarter of 2019 to the first quarter of 2020, remaining elevated through the fourth quarter of 2020, and then declining in the first quarter of 2021 to near 2019 levels, where prices generally remained through the remainder of the period.[202]

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[197] CR/PR at V-3. The Commission requested pricing data for the following products:

Product 1.-- Pure magnesium ingots containing at least 99.9 percent magnesium.

Product 2.-- Pure magnesium ingots containing at least 99.8 percent magnesium but less than 99.9 percent magnesium by weight.

Product 3.-- Magnesium ingots containing 50 percent or greater, but less than 99.8 percent magnesium by weight, that do not conform to ASTM specifications for alloy magnesium ("off-specification pure" magnesium). *Id.*

[198] CR/PR at V-4.

[199] CR/PR at V-4.

[200] CR/PR at Table V-7. We observe that the AUV of U.S. importers' U.S. shipments of subject merchandise in interim 2022 ($*** per MT) was higher than the AUV of the domestic industry's commercial U.S. shipments during the period ($*** per MT). According to the domestic producers, the higher AUV for subject imports resulted from the antidumping duties paid by importers and is not an indication that subject imports are unlikely to undersell the domestic like product if the order were revoked. *See* Hearing Tr. at 76-79 (Lutz, Slade).

[201] CR/PR at Tables V-3, V-5, V-6.

[202] CR/PR at V-11 and Table V-4. The divergence in price trends between pricing products 1 and 3, and product 2, may be explained by differences in contract terms among the three products. Nearly all of product 2 (99.8 percent pure magnesium) was sold by US Magnesium pursuant to long-term and annual contracts. US Magnesium explained that its sales of product 2 in 2022 were primarily priced according to its 2021 contracts as a result of its *force majeure* declaration. In contrast, US Magnesium explained that spot sales of product 1 (ultra-high pure magnesium) in 2022 had a large effect on its average prices for product 1 because it was a much lower volume product—domestic producers sold (Continued…)

Given the underselling by subject imports in the original investigations and during the POR, as well as our finding that the volume of subject imports would likely be significant after revocation, we find that subject imports are likely to undersell the domestic like product to a significant degree if the order were revoked. As further evidence that significant underselling by subject imports is likely after revocation, we observe that the AUVs of exports from China to third countries, including Canada, were much lower than the AUVs of the domestic industry's U.S. shipments during the POR.[203] Given the moderate-to-high degree of substitutability between subject imports and the domestic like product and the importance of price in purchasing decisions, the significant volume of low-priced subject imports that is likely after revocation would likely force the domestic industry to either reduce its prices, forego needed price increases, or lose sales and market share to subject imports.

Indeed, many participants in the U.S. market reported expecting that revocation of the order would lead to negative price effects for domestic producers.[204] For example, responding U.S. importer Greenwich Metals Inc. ("Greenwich Metals") predicted that if the order were revoked, "***", and responding purchaser *** anticipated that revocation "***."[205] Even a Kaiser company official stated at the hearing that if the order were revoked, "…you would see a dropping, if anything, of pricing."[206] Responding importer *** reported, "***," and responding importer *** reported that after revocation of the order "***."[207] Similarly, responding purchaser *** reported that "***".[208]

For the foregoing reasons, we find that if the order were revoked, significant volumes of subject imports would likely undersell the domestic like product to a significant degree, leading subject imports to gain sales and market share at the expense of the domestic industry and/or depressing or suppressing prices for the domestic like product to a significant degree.

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only *** MT of product 1 during the POR compared with *** MT of product 2. Product 3 (off-specification pure) was sold primarily by Magpro pursuant to short-term contracts and spot sales and therefore more affected by short term supply and demand dynamics. CR/PR at V-11, n.7; US Magnesium's Posthearing Br. at Exh. 1, pp. 32-34.

[203] *Compare* CR/PR at Table III-14 *with* Table IV-11. The subject industry's AUVs for exports of pure magnesium to Canada was $2,402 per MT in 2019, $2,076 per MT in 2020, and $4,195 per MT in 2021. CR/PR at Table IV-11. The domestic industry's AUVs for its commercial U.S. shipments were $*** per MT in 2019, $*** per MT in 2020, and $*** per MT in 2021. *Id.* at Table C-3.

[204] *See* CR/PR at Table D-1.

[205] CR/PR at Table D-1.

[206] Hearing Tr. at 133 (Badgett). In its questionnaire response, *** similarly acknowledged that "***." CR/PR at Table D-1. Other market participants reported similar consequences. U.S. importer ***, anticipates that if the order were revoked "***." *Id.*

[207] CR/PR at Table D-1.

[208] CR/PR at Table D-1.

E. Likely Impact

1. The Original Investigations and Prior Five-Year Reviews

In the original investigations, the Commission found that the significant and increasing volume of subject imports and the declines in their prices from 1992 to mid-1994 had a significant adverse impact on the domestic pure magnesium industry. The entry of these imports resulted in increased domestic inventories and placed significant pressure on the domestic producers to lower their prices. The Commission determined that the losses in market share and price pressures resulted in reductions in capacity to produce pure magnesium, and declines in employment.[209]

In the first five-year review, under the protection of the antidumping order, the Commission found that the record did not support a finding that the domestic industry was vulnerable. Nonetheless, the Commission found that, given the vast amounts of Chinese production capacity and increasing worldwide magnesium capacity, the likely return of significant volumes of pure magnesium from China upon revocation of the order would likely send the domestic industry into decline. It concluded that, in light of the likely significant increases in the volume of subject imports at prices that would likely undersell the domestic like product and significantly depress U.S. prices, revocation of the order would likely have a significant adverse impact on the domestic industry.[210]

In the second five-year review, the Commission found that the domestic industry was vulnerable. The industry's trade and financial indicators were mixed during the 2000-2005 period of review. The Commission found that, given the vast amounts of Chinese production capacity, the likely return of significant volumes of pure magnesium from China upon revocation of the order would likely push the domestic industry back into decline and prevent it from improving its financial condition. It concluded that in light of the likely significant increases in the volume of subject imports at prices that would likely undersell the domestic like product and significantly depress U.S. prices, revocation of the order would likely have a significant adverse impact on the domestic industry.[211]

In the third and fourth expedited five-year reviews, the Commission made similar findings about likely impact. It observed that the record information on the domestic industry's condition was based only on data provided by US Magnesium. In the third and fourth reviews, the Commission found it could not determine whether the domestic industry was vulnerable due to the limited record. Based on the information available, the Commission found that the likely significant volume and price effects of the subject imports would likely have a significant impact on the production, shipments, sales, market share, and revenues of the domestic industry. It observed that declines in the indicators of industry performance would have a

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[209] *Original Determination,* USITC Pub. 2885 (May 1995) at 22.

[210] *First Five-Year Review*, USITC Pub. 3346 (Sept. 2000) at 14-16.

[211] *Second Five-Year Review*, USITC Pub. 3859 (July 2006) at 32-33 and 63-65.

direct adverse impact on the industry's profitability and employment, as well as its ability to raise capital, to make and maintain capital investments.[212]

The Commission also considered the role of factors other than subject imports. In the third review, the Commission recognized that the 2009 economic downturn depressed demand for magnesium and that the recovery from this downturn was not complete. It found that, while nonsubject imports declined irregularly during the period of review, they continued to be a significant factor in the U.S. market. The Commission found that any lingering effects of the economic downturn and the continued presence of nonsubject imports were not likely to sever the causal nexus between subject imports and their likely significant impact on the domestic industry if the order were revoked.[213]

In the fourth review, the Commission found nonsubject imports continued to be a significant factor in the U.S. market during the period of review, increasing from 2011 to 2014 before declining in 2015. However, the domestic industry's production, capacity utilization, and U.S. shipments were higher in 2015 than in 2010.[214] Because the domestic industry in 2015 was the largest supplier in the market, the Commission reasoned, any increase in subject import volume and market penetration was likely to come at least in part at the expense of the domestic industry. The Commission concluded that, if the antidumping duty order were revoked, subject imports from China would likely have a significant impact on the domestic industry within a reasonably foreseeable time.[215]

2. The Current Review

The domestic industry benefitted from the order during the POR, as subject import volumes remained low, underselling was limited, and prices for domestically produced product generally increased during the period. Nevertheless, as discussed previously, US Magnesium declared *force majeure* and ultimately idled magnesium production after suffering a series of equipment failures, leading to a significant decline in its performance, particularly in 2021 and interim 2022. As a result, the domestic industry's performance deteriorated by most measures during the POR.

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[212] *Third Five-Year Review*, USITC Pub. 4274 (Oct. 2011) at 17; *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 21-22.

[213] *Third Five-Year Review*, USITC Pub. 4274 (Oct. 2011) at 17.

[214] *Fourth Five-Year Review*, USITC Pub 4678 (Mar. 2017) at 22.

[215] *Fourth Five-Year Review,* USITC Pub. 4678 (Mar. 2017) at 22.

The domestic industry's capacity and production declined from 2019 to 2021, and both measures were lower in interim 2022 than in interim 2021.[216] Capacity utilization fluctuated, increasing irregularly from 2019 to 2021, but lower in interim 2022 than in interim 2021.[217]

The domestic industry's employment indicia generally declined from 2019 to 2021 and were lower in interim 2022 compared to interim 2021. The industry's number of production-related workers ("PRWs"),[218] total hours worked,[219] wages paid,[220] and productivity,[221] all declined from 2019 to 2021; PRWs and productivity were lower in interim 2022 than in interim 2021, while hours worked, wages paid, and unit labor costs were higher. The industry's unit labor costs and hourly wages increased irregularly from 2019 to 2021, and were higher in interim 2022 than interim 2021.[222]

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[216] U.S. producers' non-toller production capacity decreased by *** percent from 2019 to 2021, from *** MT in 2019 to *** MT in 2020 and *** MT in 2021; it was *** percent lower in interim 2022 (*** MT) than in interim 2021 (*** MT). CR/PR at Table C-3. U.S. producers' non-toller production decreased by *** percent from 2019 to 2021, decreasing from *** MT in 2019 to *** MT in 2019 and *** MT in 2021; it was *** percent lower in interim 2022 (*** MT) than in interim 2021 (*** MT). *Id.* Toll production was modest compared to non-toll production. *Compare* CR/PR at Table F-10 *with* Table F-12. U.S. toll producers' production capacity increased from *** MT in 2019 and 2020 to *** MT in 2021; it was *** MT in interim 2021 and interim 2022. U.S. toll producers' production decreased from *** MT in 2019 to *** MT in 2020, before increasing to *** MT in 2021; it was *** MT in interim 2021 and *** MT in interim 2022. CR/PR at Table C-3.

[217] U.S. producers' non-toller capacity utilization decreased from *** percent in 2019 to *** percent in 2020 before increasing to *** percent in 2021; it was lower in interim 2022 (*** percent) than in interim 2021 (*** percent). CR/PR at Table C-3. U.S. producers' tolling capacity utilization decreased from *** percent in 2019 to *** percent in 2020, before increasing to *** percent in 2021; it was *** percent in interim 2021 and *** percent in interim 2022. *Id.*

[218] The industry's PRWs decreased from *** in 2019 to *** in 2020 and *** in 2021; they were lower in interim 2022 (***) than in interim 2021 (***). CR/PR at Table C-3.

[219] Total hours worked decreased from *** in 2019 to *** in 2020 and *** in 2021; they were higher in interim 2022 (***) than in interim 2021 (***). CR/PR at Table C-3.

[220] Wages paid decreased from $*** in 2019 to $*** in 2020 and $*** in 2021; they were higher in interim 2022 ($***) than in interim 2021 ($***). CR/PR at Table C-3.

[221] U.S. producers non-tolling productivity decreased from *** MT per hour in 2019 to *** MT per hour in 2020 and *** MT per hour in 2021, an overall decrease of *** percent; productivity was *** percent lower in interim 2022 (*** MT per hour) than in interim 2021 (*** MT per hour). CR/PR at Table C-3. U.S. producers' tolling productivity decreased from *** MT per hour in 2019 to *** MT per hour in 2020, before increasing to *** MT per hour in 2021; it was *** MT per hour in interim 2021 and *** MT per hour in interim 2022. *Id.*

[222] U.S. producers' non-toller unit labor costs increased from $*** per MT in 2019 to $*** per MT in 2020 and $*** per MT in 2021, an overall increase of *** percent; they were *** percent higher in interim 2022 ($*** per MT) than in interim 2021 ($*** per MT). CR/PR at Table C-3. U.S. producers' tolling unit labor costs increased from $*** per MT in 2019 to $*** per MT in 2020, and $*** per MT in 2021; they were $*** per MT in interim 2021, and $*** per MT in interim 2022. *Id.*

Hourly wages increased from $*** per hour in 2019 to $*** per hour in 2020 and $*** per hour in 2021; they were higher in interim 2022 ($*** per hour) than in interim 2021 ($*** per hour). CR/PR at Table C-3.

The industry's U.S. shipments decreased by *** percent overall from 2019 to 2021, decreasing from *** MT in 2019 to *** MT in 2020, before increasing to *** MT in 2021; they were *** percent lower in interim 2022 (*** MT) than in interim 2021 (*** MT).[223] The domestic industry's share of apparent U.S. consumption, by quantity, decreased by *** percentage points overall from 2019 to 2021, declining from *** percent in 2019 to *** percent in 2020, before increasing to *** percent in 2021; it was *** percentage points lower in interim 2022 (*** percent) than in interim 2021 (*** percent).[224]

U.S. producers' end-of-period inventories declined irregularly from 2019 to 2021 and were lower in interim 2022 than in interim 2021.[225] As a share of total shipments, their end-of-period inventories declined irregularly from 2019 to 2021 but were higher in interim 2022 than in interim 2021.[226]

The domestic industry's financial indicia generally deteriorated from 2019 to 2021 and were worse in interim 2022 compared with interim 2021. The domestic industry's net sales,[227]

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[223] CR/PR at Table C-3.

[224] CR/PR at Table C-3. By value, the domestic industry's share of apparent U.S. consumption decreased by *** percentage points from 2019 to 2021, decreasing from *** percent in 2019 to *** percent in 2020 and *** percent in 2021; it was *** percentage points lower in interim 2022 (*** percent) than in interim 2021 (*** percent). *Id.*

[225] U.S. producers' non-toller end-of-period inventories increased from *** MT in 2019 to *** in 2020, before decreasing to *** in 2021; they were lower in interim 2022 (*** MT) than in interim 2021 (*** MT). CR/PR at Table C-3.

[226] As a share of total shipments, U.S. non-toller producers' end-of-period inventories declined irregularly from 2019 to 2021, increasing from *** percent in 2019 to *** percent in 2020, before decreasing to *** percent in 2021; they were higher in interim 2022, at *** percent, than in interim 2021, at *** percent. CR/PR at Table C-3.

[227] The domestic industry's non-toller net sales, by value, decreased from $*** in 2019 to $*** in 2020, before increasing to $*** in 2021, an overall decrease of *** percent; they were *** percent lower in interim 2022 ($***) than in interim 2021 ($***). CR/PR at Table C-3. The domestic industry's net tolling, by value, decreased from $*** in 2019 to $*** in 2020, before increasing to $*** in 2021; it was $*** in interim 2021 and $*** in interim 2022. *Id.*

The industry's non-toller unit net sales values increased from $*** per MT in 2019 to $*** per MT in 2020 and $*** per MT in 2021; they were higher in interim 2022 ($*** per MT) than in interim 2021 ($*** per MT). CR/PR at Table C-3. The industry's unit net sales value for tolling increased from $*** per MT in 2019 to $*** per MT in 2020 and $*** per MT in 2021; it was $*** per MT in interim 2021 and $*** per MT in interim 2022. *Id.*

gross profits,[228] operating income,[229] and net income,[230] all declined overall from 2019 to 2021, and were *** worse in interim 2022 than in interim 2021. The industry's COGS to net sales ratio increased over the POR as net sales decreased by more than total COGS.[231] The industry's operating income as a ratio to net sales declined from *** percent in 2019 to *** percent in 2020 and *** percent in 2021; it was *** percentage points lower in interim 2022 (*** percent) than in interim 2021 (*** percent).[232] The industry's return on assets declined from *** percent in 2019 to *** percent in 2020 and *** percent in 2021.[233] Capital expenditures generally increased during the POR.[234]

Based on the foregoing, we find that domestic industry is vulnerable to the continuation or recurrence of material injury if the order were revoked. The domestic industry's output indicators – including production and U.S. shipments – fell by substantially more than the decline in apparent U.S. consumption over the POR, and domestic producers experienced poor and worsening financial performance, including increasing operating and net ***. The domestic industry's vulnerability largely stems from US Magnesium's poor and deteriorating performance during the POR,[235] and its production problems beginning in *** 2021 were responsible for the industry's steep financial decline from 2021 into interim 2022.[236] As US Magnesium curtailed its production and shipments, its per unit COGS increased, as there were fewer sales over which to spread its fixed costs, resulting in a per-unit operating *** of $***

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[228] U.S. producers' non-toller gross profits decreased from $*** in 2019 to $*** in 2020 to *** of $*** in 2021; they were lower in interim 2022 (*** of $***) than in interim 2021 (*** of $***). CR/PR at Table C-3. U.S. producers' tolling gross profits decreased from $*** in 2019 to $*** in 2020, before increasing to $*** in 2021; they were $*** in interim 2021 and $*** in interim 2022. *Id.*

[229] U.S. producers' non-tolling operating income decreased from *** in 2019 to *** in 2020 and *** in 2021; it was *** in interim 2021 and *** in interim 2022. CR/PR at Table C-3. U.S. producers' tolling operating income decreased from $*** in 2019 to $*** in 2020 and *** $*** in 2021; it was $*** in interim 2021 and *** $*** in interim 2022. *Id.*

[230] Net income was *** in 2019, *** in 2020, and *** in 2021; it was *** in interim 2021 and *** in interim 2022. CR/PR at Table C-3.

[231] CR/PR at Table C-3.

[232] CR/PR at Table C-3. For U.S. non-tolling operations, income as a ratio to net sales declined from *** percent in 2019 and 2020 to *** percent in 2021; it was lower in interim 2022 (*** percent) than in interim 2021 (*** percent). *Id.* For U.S. tolling operations, operating income as a ratio to net sales declined from *** percent in 2019 to *** percent in 2020 and *** percent in 2021; it was *** percent in interim 2021 and *** percent in interim 2022. *Id.*

[233] CR/PR at Table C-3.

[234] Capital expenditures increased from $*** in 2019 to $*** in 2020 and $*** in 2021; they were $*** in interim 2021 and $*** in interim 2022. CR/PR at Table C-3. ***. III-43 n.56.

[235] For its pure magnesium operations, US Magnesium reported ***. Its operating income margin decreased from *** percent in 2019 to *** percent in 2020 and *** percent in 2021; it was lower in interim 2022 (*** percent) than in interim 2021 (*** percent). CR/PR at Table III-19.

[236] As discussed in more detail previously, US Magnesium suffered a series of equipment failures beginning in *** 2021 that led to reduced production and caused US Magnesium to declare *force majeure* in September 2021. It produced magnesium at reduced levels until additional equipment failures forced it to halt production and idle its facility in August 2022. Hearing Tr. at 16-17 (Thayer).

per MT in interim 2022 compared with a *** of $*** per MT in interim 2021 (for its pure magnesium operations), and an overall operating *** of $*** in interim 2022 compared with a *** of $*** in interim 2021.[237] US Magnesium's need to ramp up production (including in light of high fixed costs associated with pure magnesium production) after completion of needed repairs and to secure sales of that production to recoup costs and return to profitability contributes to our finding of vulnerability.

Kaiser argues that because, in its view, US Magnesium no longer qualifies as a domestic producer, having ceased production of pure magnesium, there is no domestic pure magnesium industry that could be injured by subject imports if the order were revoked.[238] In the alternative, Kaiser argues that if the order were revoked, any negative impact on the domestic industry would not be attributable to subject imports given questions regarding US Magnesium's ability to resume production, the duration its plant has been idled, the circumstances that led to its shutdown, and its ability to source brine from the Great Salt Lake in the future.[239]

We are unpersuaded by Kaiser's arguments. First, as mentioned previously, there was substantial production of the domestic like product by domestic producers other than US Magnesium during the POR, such as AMACOR, Luxfer Magtech and Magpro, including substantial production of pure magnesium.[240] Thus, whether US Magnesium will recommence production within a reasonably foreseeable time is not determinative as to whether revocation of the order would lead to recurrence of injury to a domestic industry.

Nonetheless, based on the record in this review, we also find that US Magnesium has sufficiently demonstrated that it will likely recommence production of the domestic like product within a reasonably foreseeable time. Although US Magnesium has not produced magnesium since its idling in August 2022,[241] it supplied the U.S. market with magnesium throughout the POR.[242] US Magnesium's investment of $*** and planned investment of $*** on *** show that it is committed to resuming magnesium production in the near future,[243] as

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[237] CR/PR at Table III-19. Led by an increase in its per-unit factory costs, US Magnesium's unit COGS increased from $*** per MT in 2019 to $*** per MT in 2020 and *** per MT in 2021; they were higher in interim 2022 ($*** per MT) compared with interim 2021 ($*** per MT). CR/PR at Table III-19. Its per-unit factory costs increased from $*** per MT in 2019 to $*** per MT in 2020 and $*** in 2021; they were higher in interim 2022 ($*** per MT) than in interim 2021 ($*** per MT). *Id.*

[238] *See* Kaiser's Posthearing Br. at 10 and Exh. 3, p. 12.

[239] Kaiser's Posthearing Br. at 12-13; Kaiser's Prehearing Br. at 5-10.

[240] CR/PR at Tables I-9 and F-7.

[241] Hearing Tr. at 94-95 (Slade).

[242] *See* US Magnesium's reported production and commercial U.S. shipments, CR/PR at Table III-11 and US Magnesium's U.S. Producers' Questionnaire Response at II-4a, V-2a.

[243] A company official testified that US Magnesium plans to resume production by the early third quarter of 2023, but qualified this estimate, saying that it is "kind of dependent on the contractors we're utilizing for some of the major repairs." The official explained that there are "only… two major equipment groups that need work before we can restart. Rebuilding of our electrolytic cells is going to (Continued…)

does its continued employment of over *** workers, most of whom are assigned to the repair and rebuilding of its facility.[244] Furthermore, US Magnesium's overall investment in its U.S. facility is estimated at over $***,[245] and it has long been the largest domestic producer of magnesium, including during the 2019-21 period.[246] For the foregoing reasons, and those discussed in section II.B.2.b above, we find that US Magnesium remains a domestic producer, whose ongoing efforts to repair its production facility make it particularly vulnerable to the continuation or recurrence of material injury after revocation.[247] Moreover, as discussed in section II.B.2.b, we would find that US Magnesium has engaged in sufficient production related activities despite its idling to qualify as a domestic producer. Thus, we reject Kaiser's argument that there would be no domestic pure magnesium industry that could be injured by subject imports if the order were revoked or that the likely significant volume of low-priced subject imports could not harm the domestic industry.

As discussed above, we have found that the volume of subject imports would likely be significant if the order under review were revoked, and that subject imports would likely undersell the domestic like product to a significant degree, forcing the domestic industry to either cut prices or forgo price increases, or else lose sales and market share to subject imports. Consequently, the likely significant volume of low-priced subject imports and their significant price effects would likely adversely impact the production, shipments, and revenues of the

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be dependent upon timing of refractory deliveries out of Hungary {and} {r}ebuilding our spray drying chambers will take external contactors." Hearing Tr. at 43-44 (Thayer).

In the six months from September 2022 through February 2023, US Magnesium ***. US Magnesium's Posthearing Br. at Exh. 2, Declaration of ***, pp. 5-6. US Magnesium provided ***. *Id.* at Exh. 14.

[244] *See also* Staff Site Visit to US Magnesium, EDIS Doc. 792800 (Mar. 7, 2023). During the site visit to US Magnesium's production facility in March 2023, ***. *Id.*

[245] From a greenfield perspective, US Magnesium's capital investment in its production facility is an estimated $***. CR/PR at Table III-6. This estimate represents the capital investment that would be needed to recreate the firm's production capabilities today.

[246] US Magnesium (and its predecessor in interest, Magnesium Corp. of America) has been the largest domestic producer of magnesium since the original investigations and was the largest producer of magnesium from 2019 through 2021. CR/PR at Tables III-11, Table F-7; US Magnesium's Posthearing Br. at Exh. 1, p.17.

In addition, the record does not indicate that the water level of the Great Salt Lake will significantly impact US Magnesium's ability to produce magnesium in the reasonably foreseeable future. US Magnesium ***. CR/PR at III-21 n.21; US Magnesium's Prehearing Br. at 54, n.181. In addition, there is some indication that the lake's water levels are rising. Hearing Tr. at 18-19 (Thayer) ("between last November and February of this year, the lake has risen more than a foot and a half due to heavy rain and winter snowfalls"). The record also does not clearly indicate that US Magnesium's ability to make use of this water resource will be significantly impacted. US Magnesium explains that, although the State of Utah issued a denial of its permit application to extend its intake canals, the denial only affects how it upgrades the canals. *See* Hearing Tr. at 19 (Thayer); US Magnesium's Prehearing Br. at 54, n.181.

[247] Chairman Johanson notes that interested parties are not foreclosed from requesting a changed circumstances review in the event that the domestic industry's projected recovery in production volume fails to materialize. *See* 19 U.S.C. 1675(b).

domestic industry, which, in turn, would have an adverse impact on the industry's profitability and employment, as well as its ability to raise capital and make and maintain necessary investments. In particular, the significant volume of low-priced subject imports that is likely after revocation would jeopardize US Magnesium's ability to regain the sales and market share necessary to sustainably restore its production and employment to prior levels.

We have also considered the role of nonsubject imports in the U.S. market. Nonsubject imports had a substantial and increasing presence in the U.S. market during the POR. Nonsubject imports as a share of apparent U.S. consumption increased irregularly from 2019 to 2021 and were *** higher in interim 2022 than in interim 2021.[248] We find that the presence of nonsubject imports would not prevent low-priced subject imports from significantly increasing their presence in the U.S. market if the order were revoked, in light of the size and excess capacity of the subject industry and the attractiveness of the U.S. market. Given the moderate to high degree of substitutability between subject imports and the domestic like product and the importance of price in purchasing decisions, the significant volume of low-priced subject imports that is likely after revocation would likely take market share from the domestic industry and/or force U.S. producers to either lower prices or forgo price increases to retain market share, notwithstanding any market share that subject imports might also gain at the expense of nonsubject imports. For these reasons, we find that subject imports would likely cause adverse effects on the domestic industry that are distinct from any effects attributable to nonsubject imports in the event of revocation.

As discussed in section III.B.2 above, apparent U.S. consumption declined *** percent from 2019 to 2021 and was *** percent lower in interim 2022 compared to interim 2021.[249] Nevertheless, most responding purchasers, and a plurality of responding domestic producers and importers, reported that demand for magnesium increased during the POR, and anticipated that demand would continue to increase.[250] Consistent with this evidence, a US Magnesium official stated at the hearing that by the end of 2022, demand had surpassed pre-pandemic levels.[251] To the extent that demand for magnesium may decline, it would be unlikely to fully explain any decline in prices upon revocation of the order or explain any loss in market share. Accordingly, the adverse effects likely to be caused by subject imports after revocation of the order would be distinct from any adverse effects caused by declines in demand.

In sum, we find that if the order were revoked, subject imports from China would likely have a significant impact on the domestic industry within a reasonably foreseeable time.

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[248] *See* CR/PR at Table C-3. The volume of nonsubject imports was *** MT in 2019, *** MT in 2020, and *** MT in 2021; it was *** MT in interim 2021 and *** MT in interim 2022. Nonsubject imports as a share of apparent U.S. consumption increased irregularly by *** percentage points from 2019 to 2021, increasing from *** percent in 2019 to *** percent in 2020, before decreasing to *** percent in 2021; their market share was higher in interim 2022, at *** percent, than in interim 2021, at *** percent. *Id.*

[249] CR/PR at Table C-3.

[250] CR/PR at II-10 and Tables II-6 & II-7.

[251] Hearing Tr. at 52-53 (Slade).

IV. Conclusion

For the above-stated reasons, we determine that revocation of the antidumping duty order on pure magnesium from China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

Part I: Introduction

Background

On March 1, 2022, the U.S. International Trade Commission ("Commission" or "USITC") gave notice, pursuant to section 751(c) of the Tariff Act of 1930, as amended ("the Act"),[1] that it had instituted a review to determine whether revocation of the antidumping duty order on pure magnesium from China would likely lead to the continuation or recurrence of material injury to a domestic industry.[2] [3] On June 6, 2022, the Commission determined that it would conduct a full review pursuant to section 751(c)(5) of the Act.[4] Table I-1 presents information relating to the background and schedule of this proceeding.[5]

[1] 19 U.S.C. 1675(c).

[2] 87 FR 11472, March 1, 2022. All interested parties were requested to respond to this notice by submitting the information requested by the Commission.

[3] In accordance with section 751(c) of the Act, the U.S. Department of Commerce ("Commerce") published a notice of initiation of its five-year review of the subject antidumping duty order. 87 FR 11416, March 1, 2022.

[4] 87 FR 35997, June 14, 2022. The Commission found that the domestic interested party group response to its notice of institution was adequate. The Commission found that the respondent interested party group response was inadequate but found that other circumstances warranted conducting a full review.

[5] The Commission's notice of institution, notice to conduct a full review and scheduling notice are referenced in appendix A and may also be found at the Commission's web site (internet address *www.usitc.gov*). Commissioners' votes on whether to conduct expedited or full reviews may also be found at the web site. Appendix B presents the witnesses who appeared at the Commission's hearing.

Table I-1
Pure magnesium: Information relating to the background and schedule of this proceeding

Effective date	Action
May 12, 1995	Commerce's antidumping duty order on pure magnesium from China, Russia and Ukraine (60 FR 25691, May 12, 1995)
August 24, 1999	Commerce's revocation the antidumping duty order on pure magnesium from Ukraine (64 FR 46182, August 24, 1999)
July 7, 2000	Commerce's revocation of the antidumping duty order with respect to Russia (65 FR 41944, July 7, 2000, corrected in 65 FR 53700, September 5, 2000)
October 27, 2000	Commerce's continuation of antidumping duty order on pure magnesium from China (65 FR 64423, October 27, 2000)
July 10, 2006	Commerce's continuation of antidumping duty order on pure magnesium from China (71 FR 38860, July 10, 2006)
November 22, 2011	Commerce's continuation of antidumping duty order on pure magnesium from China (76 FR 72172, November 22, 2011)
April 17, 2017	Commerce's continuation of antidumping duty order on pure magnesium from China (82 FR 18114, April 17, 2017)
March 1, 2022	Commerce's initiation of five-year reviews (87 FR 11416, March 1, 2022)
March 1, 2022	Commission's institution of five-year review (87 FR 11472, March 1, 2022)
June 6, 2022	Commission's determination to conduct a full five-year review (87 FR 35997, June 14, 2022)
June 13, 2022	Commerce's final results of expedited five-year review of the antidumping duty order (87 FR 35732, June 13, 2022)
October 27, 2022	Commission's scheduling of the reviews (87 FR 65822, November 1, 2022)
March 14, 2023	Commission's hearing
April 26, 2023	Scheduled date for the Commission's vote
May 15, 2023	Scheduled date for the Commission's determination and views

The original investigations

The original investigations resulted from petitions filed by Magnesium Corporation of America ("Magcorp"), Salt Lake City, Utah; the International Union of Operating Engineers, Local 564, Freeport, Texas; and the United Steelworkers of America, Local 8319, Salt Lake City, Utah, on March 31, 1994, 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 pure magnesium from China, Russia, and Ukraine.[6] On March 30, 1995, Commerce determined that imports of pure magnesium and alloy magnesium from China, Russia, and Ukraine were being sold at less than fair value ("LTFV").[7] The Commission determined on May 10, 1995, that a domestic industry was materially injured by reason of LTFV imports of pure magnesium from China, Russia, and Ukraine. The Commission further determined that an industry in the United

[6] Magnesium from China, Russia, and Ukraine, Inv. Nos. 731-TA-696-698 (Final), USITC Publication 2885, May 1995 ("Original publication"), p. I-3.

[7] 60 FR 16437, 16440, 16432, March 30, 1995.

States was not materially injured or threatened with material injury, and the establishment of an industry in the United States was not materially retarded, by reason of imports of alloy magnesium from China, Russia, and Ukraine.[8] Commerce published the antidumping duty orders on subject imports of pure magnesium from China, Russia, and Ukraine on May 12, 1995.[9]

First five-year review

On April 3, 2000, Commerce initiated, and the Commission instituted five-year reviews on the antidumping duty orders on pure magnesium from China and Russia.[10] On July 6, 2000, the Commission determined that it would conduct an expedited review of the antidumping duty order on pure magnesium from China.[11] On August 3, 2000, Commerce determined that revocation of the antidumping duty order on pure magnesium from China would be likely to lead to continuation or recurrence of dumping.[12] On August 31, 2000, the Commission determined that revocation of the antidumping duty order on pure magnesium from China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[13] Following affirmative determinations in the five-year reviews by Commerce and the Commission, effective October 27, 2000,

[8] 60 FR 26456, May 17, 1995.

[9] 60 FR 25691, May 12, 1995. Following publication of the orders, Gerald Metals, Inc. filed a lawsuit with the U.S. Court of International Trade (''CIT'') challenging the Commission's final affirmative determination of material injury with respect to the Ukrainian imports. In its first decision, the CIT affirmed the Commission's final affirmative determination of material injury with respect to Ukrainian imports. However, the U.S. Court of Appeals for the Federal Circuit subsequently directed the CIT to vacate its decision affirming the Commission's final affirmative determination of material injury with respect to Ukrainian imports and to remand the case to the Commission. See Gerald Metals, Inc. v. United States, 132 F.3d 716 (Fed. Cir. 1997). On remand, the Commission determined that the U.S. industry was not being materially injured by reason of Ukrainian imports and that there was no threat of material injury. The issue of material retardation of the establishment of a U.S. industry was not raised before the Commission. The CIT affirmed the Commission's remand determination on October 20, 1998. 63 FR 67854, December 9, 1998. As a result of the remand determination, Commerce revoked the antidumping duty order on pure magnesium from Ukraine effective August 24, 1999. 64 FR 46182, August 24, 1999.

[10] 65 FR 17484, 65 FR 17531, April 3, 2000. Because no domestic interested party responded to the sunset review notice of initiation by the applicable deadline with respect to the antidumping duty order on pure magnesium from Russia, Commerce revoked the order with respect to Russia effective July 7, 2000. 65 FR 41944, July 7, 2000 (and as corrected in 65 FR 53700, September 5, 2000).

[11] 65 FR 45105, July 20, 2000.

[12] 65 FR 47713, August 3, 2000.

[13] 65 FR 55047, September 12, 2000.

Commerce issued a continuation of the antidumping order on imports of pure magnesium from China.[14]

Second five-year review

On December 5, 2005, the Commission determined that it would conduct a full review of the antidumping duty order on pure magnesium from China.[15] On January 5, 2006, Commerce determined that revocation of the antidumping duty order on pure magnesium from China would be likely to lead to continuation or recurrence of dumping.[16] On June 26, 2006, the Commission determined that material injury would be likely to continue or recur within a reasonably foreseeable time.[17] Following affirmative determinations in the five-year reviews by Commerce and the Commission, effective July 10, 2006, Commerce issued a continuation of the antidumping order on imports of pure magnesium from China.[18]

Third five-year review

On September 6, 2011, the Commission determined that it would conduct an expedited review of the antidumping duty order on pure magnesium from China.[19] On October 6, 2011, Commerce determined that revocation of the order would be likely to lead to continuation or recurrence of dumping.[20] On October 31, 2011, the Commission determined that material injury would be likely to continue or recur within a reasonably foreseeable time.[21] Following affirmative determinations in the five-year reviews by Commerce and the Commission, effective November 22, 2011, Commerce issued a continuation of the antidumping order on imports of pure magnesium from China.[22]

[14] 65 FR 64423, October 27, 2000.

[15] 70 FR 75483, December 20, 2005. The full review of the antidumping order on imports of pure magnesium from China was combined with a full review of CVD orders on imports of pure and alloy magnesium from Canada that resulted from previous related investigations (Investigation Nos. 701-TA-309-A-B). See the section entitled "Previous and related investigations" for more information.

[16] 71 FR 580, January 5, 2006.

[17] 71 FR 36359, June 26, 2006.

[18] 71 FR 38860, July 10, 2006.

[19] 76 FR 62091, October 6, 2011.

[20] 76 FR 62040, October 6, 2011.

[21] 76 FR 69284, November 8, 2011.

[22] 76 FR 72172, November 22, 2011.

Fourth five-year review

On January 6, 2017, the Commission determined that it would conduct an expedited review of the antidumping duty order on pure magnesium from China.[23] On February 3, 2017, Commerce determined that revocation of the antidumping duty order on pure magnesium from China would be likely to lead to continuation or recurrence of dumping.[24] On March 29, 2017, the Commission determined that material injury would be likely to continue or recur within a reasonably foreseeable time.[25] Following affirmative determinations in the five-year reviews by Commerce and the Commission, effective April 17, 2017, Commerce issued a continuation of the antidumping order on imports of pure magnesium from China.[26]

Previous and related investigations

Table I-2 presents information on previous and related title VII investigations. As shown, there are currently three antidumping duty orders covering imports of magnesium products from China in effect (including the current order being reviewed). The three antidumping duty orders in effect cover the following magnesium products: pure ingot, pure granular, and alloy.

[23] 82 FR 9596, February 7, 2017.
[24] 82 FR 9198, February 3, 2017.
[25] 82 FR 17280, April 10, 2017.
[26] 82 FR 18114, April 17, 2017.

Table I-2
Magnesium: Previous and related Commission proceedings

Date	Number	Country	Determination	Current status of order
1991	701-TA-309	Canada	Affirmative (pure and alloy ingot)	Revoked effective August 16, 2005, following second five-year review.
1991	731-TA-528	Canada	Affirmative (pure ingot)	Revoked effective August 1, 2000, following NAFTA Panel remand following first five-year review.
1991	701-TA-310	Norway	Terminated by Commerce during preliminary phase	Not applicable
1991	731-TA-529	Norway	Negative (Commerce)	Not applicable
1994	731-TA-696	China	Affirmative (pure ingot)	Current review. Order in effect.
1994	731-TA-697	Russia	Affirmative (pure ingot)	Revoked effective May 12, 2000, due to no interested party response to Commerce during first five-year review.
1994	731-TA-698	Ukraine	Affirmative (pure ingot); Negative on remand (Commission)	Revoked effective August 24, 1999, following Commission's negative determination on remand.
2000	731-TA-895	China	Affirmative (pure granular)	Order continued March 12, 2018, following third five-year review. Order in effect.
2000	701-TA-403	Israel	Negative (Commission)	Not applicable
2000	731-TA-896	Israel	Negative (Commission)	Not applicable
2000	731-TA-897	Russia	Negative (Commerce)	Not applicable
2004	731-TA-1071	China	Affirmative (alloy)	Order continued November 26, 2021, following third five-year review. Order in effect.
2004	731-TA-1072	Russia	Affirmative (pure and alloy)	Order revoked effective April 15, 2010, following first five-year review.
2018	701-TA-614	Israel	Negative (Commission)	Not applicable
2018	731-TA-1431	Israel	Negative (Commission)	Not applicable

Summary data

Table I-3 and figure I-1 presents a summary of data from the original investigations, prior reviews, and the current full five-year review. The Commission expanded its definition of domestic like product in the second five-year review determination, which broadened the number of producers subject to the investigation in 2005, 2010, and 2015 compared to the original investigation.

Apparent U.S. consumption, by quantity, was *** percent lower in 2021 than in 2015. U.S. producers' share of apparent U.S. consumption, by quantity, was *** percentage points higher in 2021 than in 2015. Subject imports' share of apparent U.S. consumption has historically been *** and was *** in 1999 and 2021. The quantity of nonsubject imports decreased by *** percent from 2015 to 2021 and nonsubject importers' market share by quantity decreased by *** percentage points from 2015 to 2021.

U.S. producers' production capacity and production were *** percent and *** percent lower, respectively, in 2021 than in 2015. The quantity of U.S. producers' U.S. shipments was *** percent lower in 2021 than in 2015, while the value of U.S. producers' U.S. shipments was *** percent lower in 2021 than in 2015.

Table I-3
Pure magnesium: Comparative data from the original investigations and subsequent reviews to-date, by terminal years

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton; Shares in percent

Item	Measure	1994	1999	2005	2010	2015	2021
Apparent consumption	Quantity	***	***	***	***	***	***
U.S. producers market share	Share of quantity	***	***	***	***	***	***
China market share	Share of quantity	***	***	***	***	***	***
Nonsubject market share	Share of quantity	***	***	***	***	***	***
Import market share	Share of quantity	***	***	***	***	***	***
Apparent consumption	Value	***	***	***	***	***	***
U.S. producers market share	Share of value	***	***	***	***	***	***
China market share	Share of value	***	***	***	***	***	***
Nonsubject market share	Share of value	***	***	***	***	***	***
Import market share	Share of value	***	***	***	***	***	***
China	Quantity	***	***	***	***	***	***
China	Value	***	***	***	***	***	***
China	Unit value	***	***	***	***	***	***
Nonsubject source	Quantity	***	***	***	***	***	***
Nonsubject source	Value	***	***	***	***	***	***
Nonsubject source	Unit value	***	***	***	***	***	***
All import sources	Quantity	***	***	***	***	***	***
All import sources	Value	***	***	***	***	***	***
All import sources	Unit value	***	***	***	***	***	***

Table continued.

Table I-3 Continued
Pure magnesium: Comparative data from the original investigations and subsequent reviews to-date, by terminal years

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton; Shares in percent

Item	Measure	1994	1999	2005	2010	2015	2021
Capacity	Quantity	***	***	***	***	***	***
Production	Quantity	***	***	***	***	***	***
Capacity utilization	Ratio	***	***	***	***	***	***
Producer U.S. shipments	Quantity	***	***	***	***	***	***
Producer U.S. shipments	Value	***	***	***	***	***	***
Producer U.S. shipments	Unit value	***	***	***	***	***	***
Producer inventories	Quantity	***	***	***	NA	NA	***
Producer inventory ratio to total shipments	Ratio	***	***	***	NA	NA	***
Production workers (number)	Noted in label	***	***	***	NA	NA	***
Hours worked (1,000 hours)	Noted in label	***	***	***	NA	NA	***
Wages paid (1,000 dollars)	Value	***	***	***	NA	NA	***
Hourly wages (dollars per hour)	Value	***	***	***	NA	NA	***
Productivity (metric tons per 1,000 hours)	Noted in label	***	***	***	NA	NA	***
Net sales	Quantity	***	***	***	NA	NA	***
Net sales	Value	***	***	***	***	***	***
Net sales	Unit value	***	***	***	NA	NA	***
Cost of goods sold	Value	***	***	***	***	***	***
Gross profit or (loss)	Value	***	***	***	***	***	***
SG&A expense	Value	***	***	***	***	***	***
Operating income or (loss)	Value	***	***	***	***	***	***
Unit COGS	Unit value	***	***	***	NA	NA	***
Unit operating income	Unit value	***	***	***	NA	NA	***
COGS/ Sales	Ratio	***	***	***	***	***	***
Operating income or (loss)/ Sales	Ratio	***	***	***	***	***	***

Source: Office of Investigations memorandum INV-S-50 (April 20, 1995), memorandum INV-X-173 (August 1, 2000), memorandum INV-DD-069 (May 19, 2006), memorandum INV-JJ-097 (October 3, 2011), memorandum INV-PP-034 (March 15, 2017), and compiled from data submitted in response to Commission questionnaires.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Data for 1994 are from the last year of the original investigations; 1999 from the last year of the first review; 2005 the last year of the second full review; 2010 the last year of the third review; 2015 the last year of the fourth review; and 2021 the last year of this review, the fifth review. Reviews from 1994, 1999, 2005, 2010, and 2021 only included magnesium alloy and pure magnesium, HTS 8104.11.00, and reviews from 2015 included all magnesium, HTS 8104.11.00, 8104.19.00, 8104.20.00, 8104.30.00, 8104.90.00, 3824.90.11, 3824.90.19 and 9817.00.90.

Figure I-1
Pure magnesium: Historical apparent U.S. consumption based on quantity, by period and source

* * * * * * *

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

Statutory criteria

Section 751(c) of the Act requires Commerce and the Commission to conduct a review no later than five years after the issuance of an antidumping or countervailing duty order or the suspension of an investigation to determine whether revocation of the order or termination of the suspended investigation "would be likely to lead to continuation or recurrence of dumping or a countervailable subsidy (as the case may be) and of material injury."

Section 752(a) of the Act provides that in making its determination of likelihood of continuation or recurrence of material injury--

> *(1) IN GENERAL.-- . . . the Commission shall determine whether revocation of an order, or termination of a suspended investigation, would be likely to lead to continuation or recurrence of material injury within a reasonably foreseeable time. The Commission shall consider the likely volume, price effect, and impact of imports of the subject merchandise on the industry if the order is revoked or the suspended investigation is terminated. The Commission shall take into account--*

(A) its prior injury determinations, including the volume, price effect, and impact of imports of the subject merchandise on the industry before the order was issued or the suspension agreement was accepted,

(B) whether any improvement in the state of the industry is related to the order or the suspension agreement,

(C) whether the industry is vulnerable to material injury if the order is revoked or the suspension agreement is terminated, and

(D) in an antidumping proceeding . . ., (Commerce's findings) regarding duty absorption . . ..

(2) VOLUME.--In evaluating the likely volume of imports of the subject merchandise if the order is revoked or the suspended investigation is terminated, the Commission shall consider whether the likely volume of imports of the subject merchandise would be significant if the order is revoked or the suspended investigation is terminated, either in absolute terms or relative to production or consumption in the United States. In so doing, the Commission shall consider all relevant economic factors, including--

(A) any likely increase in production capacity or existing unused production capacity in the exporting country,

(B) existing inventories of the subject merchandise, or likely increases in inventories,

(C) the existence of barriers to the importation of such merchandise into countries other than the United States, and

(D) 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.

(3) PRICE.--In evaluating the likely price effects of imports of the subject merchandise if the order is revoked or the suspended investigation is terminated, the Commission shall consider whether--

(A) there is likely to be significant price underselling by imports of the subject merchandise as compared to domestic like products, and

(B) imports of the subject merchandise are likely to enter the United States at prices that otherwise would have a significant depressing or suppressing effect on the price of domestic like products.

(4) IMPACT ON THE INDUSTRY.--In evaluating the likely impact of imports of the subject merchandise on the industry if the order is revoked or the suspended investigation is terminated, the Commission shall consider all relevant economic factors which are likely to have a bearing on the state of the industry in the United States, including, but not limited to–

(A) likely declines in output, sales, market share, profits, productivity, return on investments, and utilization of capacity,

(B) likely negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment, and

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

The Commission shall evaluate all such relevant economic factors . . . within the context of the business cycle and the conditions of competition that are distinctive to the affected industry.

Section 752(a)(6) of the Act states further that in making its determination, "the Commission may consider the magnitude of the margin of dumping or the magnitude of the net countervailable subsidy. If a countervailable subsidy is involved, the Commission shall consider information regarding the nature of the countervailable subsidy and whether the subsidy is a subsidy described in Article 3 or 6.1 of the Subsidies Agreement."

Organization of report

Information obtained during the course of the review that relates to the statutory criteria is presented throughout this report. A summary of trade and financial data for pure magnesium as collected in the review is presented in appendix C. U.S. industry data are based on the questionnaire responses of two U.S. producers of pure magnesium that are believed to have accounted for the majority of domestic production of pure magnesium in 2021.[27] U.S. import data and related information are based on the questionnaire responses of 12 U.S. importers of pure magnesium.[28] While *** reported imports from China in 2021, 11 firms represented the vast majority of U.S. imports from nonsubject sources in 2021. Foreign industry data and related information are based on the questionnaire responses of one producer of pure magnesium in China. This producer accounted for an estimated *** percent of total production of pure magnesium in China. Responses by U.S. producers, importers, purchasers, and foreign producers of pure magnesium to a series of questions concerning the significance of the existing antidumping duty order and the likely effects of revocation of the order are presented in appendix D.

[27] U.S. Magnesium is the *** U.S. producer and reported it accounts for *** percent of the production of pure magnesium in the United States in 2021. U.S. Magnesium's response to the notice of institution, March 31, 2022, p. 13.

[28] In addition to these responses, a U.S. importer questionnaire was submitted late by MTALX Limited. Due to the timing of this submission, data for MTALX are not incorporated into this report and have not been verified. ***. MTALX Limited's importer questionnaire response, section II-5a and section II-6a.

Commerce's reviews[29]

Administrative reviews

China

Commerce has completed fifteen administrative reviews of the outstanding antidumping duty orders on pure magnesium from China.[30] Commerce also completed one new shipper review in 1998. The results of the administrative reviews are shown in table I-4.

Table I-4
Pure magnesium: Administrative reviews of the antidumping duty order for China

Date results published	Period of review	Producer or exporter	Margin (percent)
63 FR 3085, January 21, 1998	May 1, 1996, through October 31, 1996	Taiyuan Heavy Machinery Import and Export Corporation	69.53
71 FR 61019, October 17, 2006	May 1, 2004, through April 30, 2005	Tianjin Magnesium International, Ltd	0.00
73 FR 76336, December 16, 2008	May 1, 2006, through April 30, 2007	Datuhe	111.73
73 FR 76336, December 16, 2008, amended in 77 FR 28570, May 15, 2012	May 1, 2006, through April 30, 2007	Tianjin Magnesium International, Ltd	111.73
74 FR 66089, December 14, 2009	May 1, 2007, through April 30, 2008	Tianjin Magnesium International, Ltd	111.73
75 FR 80791, December 23, 2010; amended in 79 FR 30546, May 28, 2014	May 1, 2008, through April 30, 2009	Tianjin Magnesium International Co. Ltd	111.73
76 FR 76945, Dec. 9, 2011, as amended in 80 FR 31889, June 4, 2015	May 1, 2009, through April 30, 2010	Tianjin Magnesium International Co. Ltd.	51.26
79 FR 94, January 2, 2014	May 1, 2011, through April 30, 2012	Tianjin Magnesium International Co., Ltd	0.03 percent (de minimis)

Source: Cited Federal Register notices.

Note: Commerce completed nine administrative reviews since 2013. In each of these reviews, Tianjin Magnesium International, Co., Ltd./Tianjin Magnesium Metal Co., Ltd. had no shipments of subject merchandise and the cash deposit rate remained unchanged from the rate assigned to Tianjin Magnesium International, Ltd /Tianjin Magnesium Metal Co., Ltd in the most recently completed review of the companies.

[29] Commerce has not conducted any changed circumstances review or scope rulings, since the completion of the last five-year review. In addition, Commerce has not issued any duty absorption findings, any company revocations, anti-circumvention findings since the imposition of the order.

[30] For previously reviewed or investigated companies not included in an administrative review, the cash deposit rate continues to be the company-specific rate published for the most recent period.

Five-year reviews

Commerce has issued the final results of its expedited/full reviews with respect to all subject countries. Table I-5 presents the dumping margins calculated by Commerce in its original investigations and reviews.

Table I-5
Pure magnesium: Commerce's original and subsequent five-year review dumping margins for producers/exporters in China

Producer/exporter	Original margin (percent)	First five-year review margin (percent)	Second five-year review margin (percent)	Third five-year review margin (percent)	Fourth five-year review margin (percent)	Fifth five-year review margin (percent)
China-wide	108.26	108.26	108.26	108.26	108.26	108.26

Source: 60 FR 16437, March 30, 1995; 65 FR 47713, August 3, 2000; 71 FR 580, January 5, 2006; 76 FR 62040, October 6, 2011; 82 FR 9198, February 3, 2017, 87 FR 35732, June 13, 2022.

The subject merchandise

Commerce's scope

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

> *(P)ure magnesium regardless of chemistry, form or size, unless expressly excluded from the scope of the order. Pure magnesium is a metal or alloy containing by weight primarily the element magnesium and produced by decomposing raw materials*
>
> *into magnesium metal. Pure primary magnesium is used primarily as a chemical in the aluminum alloying, desulfurization, and chemical reduction industries. In addition, pure magnesium is used as an input in producing magnesium alloy. Pure magnesium encompasses products (including, but not limited to, butt ends, stubs, crowns and crystals) with the following primary magnesium contents:*
>
> *(1) Products that contain at least 99.95% primary magnesium, by weight (generally referred to as "ultrapure" magnesium); (2) Products that contain less than 99.95% but not less than 99.8%*
>
> *primary magnesium, by weight (generally referred to as "pure" magnesium); and (3) Products that contain 50% or greater, but less than 99.8% primary magnesium, by weight, and that do not conform to ASTM specifications for alloy magnesium (generally referred to as "off-specification pure" magnesium).*

"Off-specification pure" magnesium is pure primary magnesium containing magnesium scrap, secondary magnesium, oxidized magnesium or impurities (whether or not intentionally added) that cause the primary magnesium content to fall below 99.8% by weight. It generally does not contain, individually or in combination, 1.5% or more, by weight, of the following alloying elements: Aluminum, manganese, zinc, silicon, thorium, zirconium and rare earths.

Excluded from the scope of the order are alloy primary magnesium (that meets specifications for alloy magnesium), primary magnesium anodes, granular primary magnesium (including turnings, chips and powder) having a maximum physical dimension (i.e., length or diameter) of one inch or less, secondary magnesium (which has pure primary magnesium content of less than 50% by weight), and remelted magnesium whose pure primary magnesium content is less than 50% by weight.

Tariff treatment

Pure unwrought magnesium is currently provided for in Harmonized Tariff Schedule of the United States ("HTS") subheading 8104.11.00 ("unwrought magnesium: containing at least 99.8 percent by weight of magnesium").[31] Pure unwrought magnesium produced in China under HTS subheading 8104.11 is imported into the U.S. market at a column 1-general duty rate of 8 percent ad valorem.[32] Pure magnesium produced under HTS subheading 8104.11 is not subject to an additional ad valorem duty under Section 301 of the Trade Act of 1974, as amended,[33] nor an additional national security import duty under Section 232 of the Trade Expansion Act of 1962, as amended.[34] Subject pure primary magnesium products may also be

[31] The term "unwrought" in this section of the HTS refers to metal, whether or not refined, in the form of ingots, blocks, lumps, billets, cakes, slabs, pigs, cathodes, anodes, briquettes, cubes, sticks, grains, sponge, pellets, flattened pellets, rounds, rondelles, shot and similar manufactured primary forms, but does not cover rolled, forged, drawn or extruded products, tubular products or cast or sintered forms which have been machined or processed otherwise than by simple trimming, scalping or descaling. HTSUS (2023) Revision 3, USITC Publication 5422, March 2023, p. XV-3.

[32] HTSUS (2023) Revision 3, USITC Publication 5422, March 2023, p. 81-4.

[33] Section 301 of the Trade Act, as amended (19 U.S.C. § 2411) authorizes the Office of the United States Trade Representative ("USTR"), at the direction of the President, to take appropriate action to respond to a foreign country's unfair trade practices. Following investigations into "China's acts, policies, and practices related to technology transfer, intellectual property, and innovation" (82 FR 40213, August 24, 2017), USTR published its determination, on April 6, 2018, that the acts, policies, and practices of China under investigation are unreasonable or discriminatory and burden or restrict U.S. commerce, and are thus actionable under section 301(b) of the Trade Act (83 FR 14906, April 6, 2018).

[34] Section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. §1862), authorizes the President, on advice of the Secretary of Commerce, to adjust the imports of an article and its derivatives

(*continued*...)

imported under the following subheadings: 8104.20.00 (magnesium waste and scrap); 8104.30.00 (magnesium raspings, turnings and granules, and powders); 8104.90.00 (other, nesoi, unwrought); 3824.99.11 and 3824.99.19 (chemical products and preparations . . . not elsewhere specified); or receive duty treatment under 9817.00.90 (remelt scrap ingot). Effective May 10, 2019, subject pure primary magnesium products produced in China under HTS subheadings 8104.30.00, 8104.90.00, 3824.99.11, and 3824.99.19 are subject to an additional 25 percent ad valorem duty under Section 301 of the Trade Act of 1974.[35] 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[36]

Magnesium, the eighth most abundant element in the earth's crust and the third most plentiful element dissolved in seawater, is a silver-white metallic element. It is the lightest of all structural metals with a density approximately 63 percent that of aluminum, the principal metal with which it competes in the U.S. market. Magnesium is available in two principal forms: pure and alloy.

that are being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security. Adjusting Imports of Steel Into the United States, Presidential Proclamation 9705, March 8, 2018 (83 FR 11625, March 15, 2018).

[35] 83 FR 47974, September 21, 2018; 84 FR 20459, May 9, 2019. See also HTS headings 9903.88.03 and 9903.88.04 and U.S. notes 20(e)–20(g) to subchapter III of chapter 99 and related tariff provisions for this duty treatment. HTSUS (2023) Revision 3, USITC Publication 5422, March 2023, pp. 99-III-27–99-III-52, 99-III-297. Goods exported from China to the United States prior to May 10, 2019, and entering the United States prior to June 1, 2019, were not subject to the escalated 25 percent duty (84 FR 21892, May 15, 2019).

[36] Unless otherwise noted, this information is based on Pure Magnesium (Ingot) from China, Investigation Nos. 731-TA-696 (Fourth Review), USITC Publication 4678, March 2017, pp. I-5-I-7.

Pure magnesium

Pure magnesium in unwrought form[37] contains at least 99.8 percent magnesium by weight.[38] Pure magnesium is widely used in commercial and industrial applications because it is easily machined and lightweight, has a high strength-to-weight ratio, and has special chemical and electrical properties. Pure magnesium also has special metallurgical and chemical properties that allow it to alloy well with metals, such as aluminum. Pure magnesium is typically sold to end users who then combine it with other elements for use in a final product. Pure magnesium is used in the production of aluminum alloys for use in die cast automotive parts, in beverage cans, in iron and steel desulfurization, as a reducing agent for various nonferrous metals (titanium, zirconium, hafnium, uranium, and beryllium), and in magnesium anodes for the protection of iron and steel in underground pipe and water tanks and various marine applications. Pure magnesium is also used in the production of titanium sponge, which is a precursor metal product in the production of titanium metal products for use in aerospace, medical, and industrial applications.

Pure magnesium is typically sold directly to end users, although pure magnesium used for iron and steel desulfurization is subjected to further processing before being consumed by iron and steel mills. The product is sold on both a spot and contract basis, with pricing quoted on a per-pound basis. U.S. Magnesium LLC ("U.S. Magnesium") reports that it sells most of its volume through contracts, negotiated at the end of the calendar year for sales in the following year. Most contracts cover a period of one year.[39]

Alloy magnesium

Nonsubject alloy magnesium ("magnesium alloy") consists of magnesium and other metals, typically aluminum and zinc, containing less than 99.8 percent magnesium by weight but more than 50 percent magnesium by weight, with magnesium the largest metallic element in the alloy by weight. Alloy magnesium is typically produced to meet various industry-recognized American Society for Testing and Materials ("ASTM") specifications for alloy

[37] "Unwrought" magnesium is pure magnesium that has not been worked in any way. "Wrought" magnesium is magnesium that has been worked into a desired shape, for example the working of the magnesium to produce extrusions, rolled product, forgings, etc.

[38] Ultra-high purity ("UHP") magnesium is unwrought magnesium containing at least 99.95 percent magnesium by weight and is used as a reagent in the pharmaceutical and chemical industries. Commodity-grade pure magnesium is unwrought magnesium containing at least 99.8 percent magnesium but less than 99.95 percent magnesium by weight and is most commonly used in the aluminum alloying industry.

[39] Domestic interested party's response to the notice of institution, March 31, 2022, p. 23.

magnesium such as AM50A, AM60B, and AZ91D.[40] It is principally used in structural applications, primarily in castings (die, permanent mold, and sand) and extrusions for the automotive industry. Alloy magnesium has certain properties that improve its strength, ductility, workability, corrosion resistance, density, or castability compared to pure magnesium. In contrast, pure magnesium is not used in structural applications because its tensile and yield strengths are low.

Primary versus secondary magnesium

Primary magnesium refers to unwrought magnesium metal shapes (typically ingots) which are produced by decomposing raw materials into magnesium metal. Secondary magnesium is pure or alloy magnesium that is produced by recycling magnesium-based scrap. Magnesium alloys can be recycled back into products displaying the same chemical, physical, and mechanical characteristics as primary metal.[41]

Magnesium scrap

Magnesium scrap is typically separated into two categories: old scrap and new scrap. Old scrap becomes available to producers of secondary magnesium when durable and nondurable consumer products are discarded from various end-uses, such as packaging, building and construction, automobiles, electrical, and machinery and equipment.

New scrap is metal that never reaches the consumer. Rather, the scrap is generated from wrought and cast products as they are processed by fabricators into consumer or industrial products. Home scrap is new scrap that is recycled within the company that generated it and consequently, seldom enters the commercial secondary magnesium market. Prompt industrial scrap is new scrap from a fabricator that does not choose to or is not equipped to recycle. This scrap then enters the secondary magnesium market. New scrap may include solids, clippings, stampings, and cuttings; borings and turnings that are generated during machining operations; and melt residues, such as skimmings, drosses, spillings, and sweepings.

[40] The ASTM specifications designate the chemical composition of the alloy. The first two letters designate the two alloying elements most prevalent in the alloy (e.g., "A" for aluminum, "M" for manganese, or "Z" for zinc), while the numbers represent the percent of other elements contained in the alloy, by weight. For example, AZ91D contains 9 percent aluminum, 1 percent zinc, and 90 percent magnesium.

[41] International Magnesium Association. "Recycling Magnesium." Accessed March 20, 2023. https://www.intlmag.org/page/sustain_recycle_ima.

Granular magnesium

Granular magnesium consists of all physical forms of unwrought magnesium other than ingots, such as raspings, turnings, granules, and powders.[42] Granular magnesium is typically used in the production of magnesium-based desulfurizing reagent mixtures that are used in the steelmaking process to reduce the sulfur content of steel.[43] Lesser amounts of granular magnesium are used in defense applications, such as military ordnance and flares.

"Off-specification pure" magnesium

"Off-specification pure" magnesium is pure primary magnesium containing magnesium scrap, secondary magnesium, oxidized magnesium, or impurities (whether or not intentionally added) that cause the primary magnesium content to fall below 99.8 percent by weight. "Off-specification pure" magnesium products contain 50 percent or greater, but less than 99.8 percent primary magnesium, by weight, do not conform to ASTM specifications for alloy magnesium, and generally do not contain individually or in combination, 1.5 percent or more, by weight, of the following alloying elements: aluminum, manganese, zinc, silicon, thorium, zirconium, and rare earths. "Off-specification pure" magnesium is acceptable for most aluminum uses apart from diecast aerospace parts, where even a slight variation in composition could expose manufacturers to litigation in the event of an accident.[44]

[42] Granular magnesium may be either pure or alloy magnesium. However, based on information obtained in previous proceedings on granular magnesium from China, granular magnesium is typically pure magnesium or "off-specification pure" magnesium (alloy magnesium not meeting ASTM specifications for alloy magnesium).

[43] U.S. grinders typically sell three different steel desulfurization blends: (1) containing 90 percent pure magnesium powder and 10 percent lime; (2) containing 25 percent magnesium and 75 percent lime; and (3) containing 8-10 percent magnesium with the remainder lime and calcium carbonate. Fluorspar and a fluidizer are also incorporated in these products.

[44] Email message from Lee Bray, U.S. Geological Survey, March 20, 2023.

Manufacturing processes[45]

Primary Magnesium

Worldwide, most magnesium is derived from magnesium-bearing ores (dolomite, magnesite, brucite, and olivine) or seawater and well and lake brines. Large deposits of dolomite are widely distributed throughout the world, and dolomite is the principal magnesium-bearing ore found in the United States. Magnesium-bearing ores are mined by the open-pit method. In the United States, U.S. Magnesium produces primary magnesium by extracting magnesium from brines of the surface waters of the Great Salt Lake in Utah.

Magnesium metal is normally produced by either an electrolytic process or a silicothermic process, with the electrolytic process dominating in terms of the volume of United States production. The silicothermic process (also known as the Pidgeon process) is used by most producers in China. The silicothermic process is a relatively easy operation as it does not require a highly trained work force or sophisticated engineering, it is easy to adjust production to meet demand, and it only requires a small amount of capital cost compared to electrolytic processes.[46] However, it requires more labor and energy than the electrolytic process while producing more waste and greenhouse gas emissions.[47] ***.[48]

U.S. Magnesium uses the electrolytic method to produce magnesium. A schematic diagram of U.S. Magnesium's production process is presented in figure I-2. In the electrolytic process, seawater or brine is evaporated and treated to produce a concentrated solution of magnesium chloride, which is further concentrated and dried to yield magnesium chloride powder. The powder is then melted, further purified, and fed into electrolytic cells operating at 700 degrees Celsius. Direct electrical current is sent through the cells to break down the magnesium chloride into chlorine gas and molten magnesium metal.[49] The metal rises to the surface where it is guided into storage wells and cast into ingots.

[45] Unless otherwise noted, this information is based on Pure Magnesium (Ingot) from China, Investigation Nos. 731-TA-696 (Fourth Review), USITC Publication 4678, March 2017, pp. I-7-I-9.

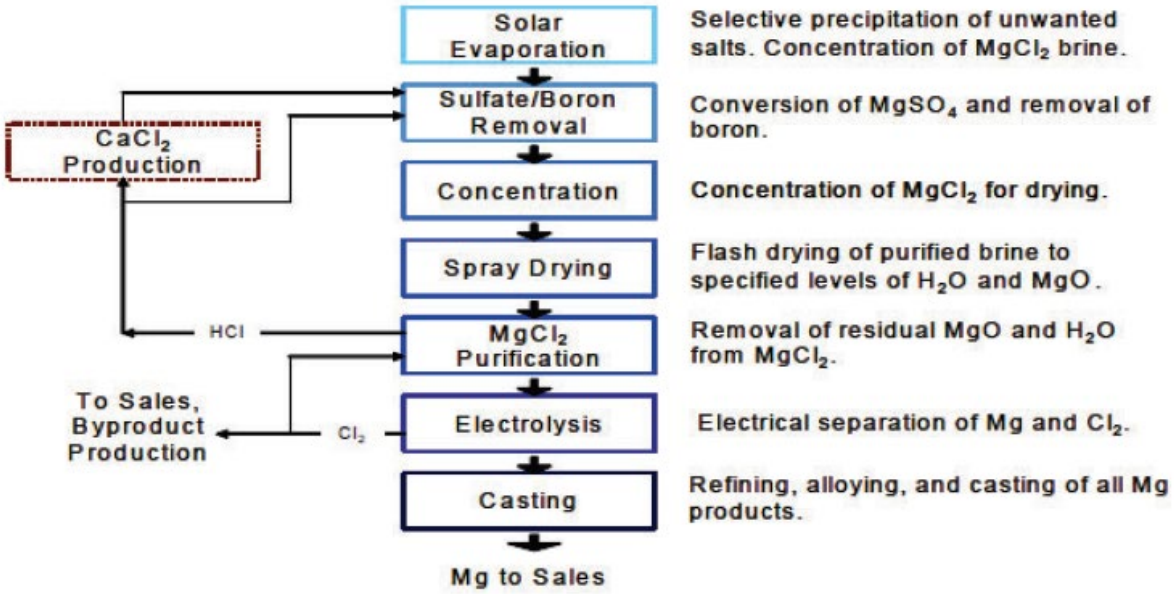
[46] Wulandari, Winny; Brooks, Geoffrey; Rhamdhani, Muhammad; and Monaghan, Brian. "Magnesium: current and alternative production routes," 2010, https://ro.uow.edu.au/engpapers/1254.

[47] Baker, Phillip. "Pidgeon or Electrolytic Technology: The Choice for Modern China." International Magnesium Association Conference, May 2016. https://www.researchgate.net/publication/304582678.

[48] Domestic interested parties' posthearing brief, March 23, 2023, exh. 13.

[49] The electrolytic cells must be kept in constant operation. If they are shut down, refractory linings require rebuilding, which is costly and time consuming.

Figure I-2:
Magnesium: Schematic diagram of U.S. Magnesium's production process flow chart



Source: Alloy Magnesium from China, Investigation Nos. 731-TA-1071 (Second review), USITC Publication 4618, June 2016, pp. I-9.

Once the electrolytic or silicothermic reduction of magnesium is completed, the manufacturing processes used for the production of both pure and alloy magnesium ingot are very similar. In the U.S. facility that produces both pure magnesium and alloy magnesium (U.S. Magnesium's facility), the same production workers work on both lines.

Both primary pure magnesium and primary alloy magnesium begin with the production of liquid pure magnesium. The liquid pure magnesium is either cast directly into pure magnesium ingots or is alloyed by the addition of alloying elements (typically aluminum and zinc) and scrap magnesium and then cast to produce alloy magnesium ingots.

Primary magnesium is typically cast into ingots or slabs. Most pure magnesium ingots are sold in standard bar sizes ranging in weight from 12 to 500 pounds per bar.[50] Aluminum producers typically purchase larger pure cast shapes such as rounds, billets, peg-lock ingots, or T-shapes. Producers of magnesium powder for steel desulfurization applications typically purchase smaller ingots or magnesium "chips" that are then ground into powder[51] and used internally to produce magnesium-based reagent mixtures or, to a lesser extent, pyrotechnic products. Die casters can purchase ingots and granular primary alloy magnesium for use in

[50] Pure Granular Magnesium from China, Inv. No. 731-TA-895 (Third Review), USITC Publication 4761, February 2018, p. I-18.

[51] Magnesium chips are ground into powder using a particle reduction process. Magnesium powder can also be produced by atomization of molten pure magnesium; however, this technique is less frequently used than grinding.

magnesium alloy castings, and/or recycle scrap magnesium generated in their die casting operations into secondary alloy magnesium.

Magnesium, in a molten or ingot form, is also used in the production of titanium sponge, which is a precursor metal product in the production of titanium metal products. In the Kroll reduction process, titanium sponge results from the reduction of titanium tetrachloride ($TiCl_4$) with magnesium. The titanium tetrachloride is reacted in a molten pool of magnesium metal in which the temperature and composition of the mixture are carefully controlled. Along with pure titanium metal sponge, molten magnesium chloride (resulting from magnesium reacting with the titanium tetrachloride liquid) is a product of the reaction. The magnesium chloride can be further refined back to pure magnesium in an electrolytic cell. The electrolytic cell separates the magnesium metal from the chlorine which is also collected for sale.

Secondary Magnesium

Secondary magnesium is produced from recycling magnesium-based scrap. Magnesium scrap arrives at the recycler either in a loose form or contained in boxes. There are many methods that can be used for recycling, including flux refining after melting, fluxless melting and settling, or fluxless melting and gas sparging. In the melting step, the recycler separates the magnesium from other alloys and heats it in a steel crucible to around 700 degrees Celsius. A salt flux, if used, is added to agglomerate to the impurities which are then removed as a sludge. The fluxless settling method uses molten salt, particle sedimentation, and adhesion to clean the magnesium metal as it moves through a series of furnace chambers. In gas sparging, a surface gas such as argon is used to remove small impurities while filtering is used to remove large impurities. Since no salt is used in this method, it can result in high-purity magnesium alloys.[52] Alloying elements such as aluminum, manganese, or zinc can then be added to the liquid magnesium and the alloyed magnesium can then be transferred to ingot molds by hand ladling, pumping, or tilt pouring. Magnesium scrap can also be generated by the direct grinding of scrap into powder for iron and steel desulfurization applications. Finally, recycled alloy magnesium contained in used aluminum beverage cans typically remains with the recycled can since virtually all aluminum beverage can scrap is melted and converted into body stock and then converted into new aluminum beverage cans.[53]

[52] Bell, S., Boyd Davis, Amjad Javaid, and E. Essadiqi. "Final Report on Refining Technologies of Magnesium," March 1, 2006, pp. 1-9.

[53] Aluminum beverage can manufacturers are sensitive to the presence of beryllium in melted scrap. Therefore, these firms generally do not purchase recycled alloy magnesium produced from scrap.

Domestic like product issues[54]

In the original determinations, the Commission found the two classes or kinds of subject merchandise in the scope—pure and alloy magnesium—to be separate domestic like products.[55] The Commission found that a domestic industry was materially injured by reason of subject imports of pure magnesium but reached a negative determination with respect to imports of alloy magnesium. In its expedited first five-year review of this order, the Commission defined the domestic like product as pure magnesium, coextensive with the scope. In its full second five-year review of this order, the Commission was evenly divided on the question of whether to define the domestic like product more broadly than Commerce's scope to include alloy magnesium. The three Commissioners that found the domestic like product consisted of pure and alloy magnesium also found that primary and secondary magnesium, and ingot (cast) and granular magnesium, were part of the domestic like product, i.e., they expanded the domestic like product to encompass alloy magnesium, secondary magnesium, and granular magnesium.[56] In its expedited third and fourth five-year reviews of this order, the Commission defined the domestic like product more broadly than Commerce's scope, as consisting of pure and alloy magnesium, including primary and secondary magnesium, and ingot (cast) and granular magnesium.[57]

In its notice of institution in these current five-year reviews, the Commission solicited comments from interested parties regarding the appropriate domestic like product and domestic industry.[58] In its response to the notice of institution, the domestic interested parties generally agreed with the Commission's most recent determinations regarding the definition of the domestic like product and domestic industry to encompass pure and alloy, primary and secondary, and ingot and granular magnesium. They also argued that magnesium die-casters that recycle their own scrap generated in their die-casting operations should not be considered domestic producers of magnesium. To the extent that these die-casters are simply recycling "runaround scrap" and are not producing a saleable product, the respondent interested parties maintained that the Commission should not consider them to be domestic producers of the

[54] Narratives regarding on the domestic like product factors comparing in-scope pure magnesium and out-of-scope other magnesium are contained in Appendix E.

[55] Original publication, pp. 7-10.

[56] The other three Commissioners did not broaden the domestic like product and defined it as pure magnesium, coextensive with the scope.

[57] 87 FR 11472, March 1, 2022.

[58] 87 FR 11472, March 1, 2022

domestic like product.[59] No other party addressed the definitions of the domestic like product or domestic industry in response to the notice of institution .

No party requested that the Commission collect data concerning other possible domestic like products in their comments on the Commission's draft questionnaires**.**

The Commission's decision regarding the appropriate domestic product(s) that are "like" the subject imported product is based on a number of factors including: (1) physical characteristics and uses; (2) interchangeability; (3) channels of distribution; (4) common manufacturing facilities, production processes, and production employees; (5) customer and producer perceptions; and (6) price. Information regarding these factors is discussed below.

Staff requested information on the comparability of pure and other magnesium from U.S. producers.[60]

Physical characteristics and uses[61]

Pure magnesium contains not less than 99.8 percent magnesium by weight. It is typically sold to end users who then combine it with other elements, typically aluminum, for use in a final product. A magnesium ingot in its pure state generally has little direct commercial application except when alloyed.

Alloy magnesium consists of chemical combinations of magnesium and other materials in which the magnesium content is 50 percent or greater but less than 99.8 percent by weight, whether or not conforming to an ASTM specification for magnesium alloy. Alloy magnesium has a high strength-to weight ratio and is easily machined, making it ideal for use in a number of structural components; for example, the alloying elements contained in alloy magnesium are critical in imparting to the product the structural characteristics necessary for use in diecasting applications.

Pure and alloy magnesium share the basic physical characteristics of being lightweight and strong and having low density. Both products consist mostly of magnesium: pure magnesium contains at least 99.8 percent magnesium by weight, and alloy magnesium usually contains at least 90 percent. The two products differ from each other in that alloy magnesium has certain properties that improve its strength, ductility, workability, corrosion resistance, density, and castability, as compared with pure magnesium.

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[59] U.S. Magnesium's response to the notice of institution, March 31, 2022, p. 29.

[60] Other magnesium is defined as primary and secondary alloy magnesium ingots that meet ASTM specifications for alloy magnesium, pure granular magnesium (including turnings, chips and powder) having a maximum physical dimension (i.e., length or diameter) of one inch or less, and alloy granular magnesium.

[61] Unless otherwise noted, this section is drawn from the second review publication.

Most primary and secondary alloy magnesium is similar physically and chemically, except for the magnesium content. However, higher purity secondary alloy magnesium, typically produced from scrap recovered from used automotive parts, is acceptable for use in automotive diecasting applications.

The chemical compositions of cast and granular magnesium are identical since granular magnesium is typically ground from cast magnesium.

Interchangeability

Pure and alloy magnesium are interchangeable for some end use applications.[62] Both pure and alloy magnesium are used in aluminum production.[63] Pure magnesium is generally used in aluminum alloys and in certain other applications because of its special metallurgical and chemical properties. At the same time, pure magnesium's lack of structural integrity excludes it from structural applications served by alloy magnesium, which is primarily used in diecasting of various structural parts for automobiles. Because of the need for structural integrity, automotive manufacturers must certify that suppliers possess both the physical equipment and the technical ability to produce automotive-grade alloy magnesium. Alloy magnesium is not able to be used in applications that requires specific magnesium purity.[64]

Primary and secondary alloy magnesium can be used interchangeably in automotive diecasting applications if appropriate methods are utilized to assure the purity of the secondary magnesium by removing impurities such as copper. Secondary magnesium and pure magnesium are both used in the diecast and aluminum industry.[65]

[62] Magpro stated that "alloy magnesium, primary magnesium, and secondary magnesium are totally interchangeable." U.S. Magnesium adds that while "{t}here's a small, very small, set of customers maybe a total of 500 metric tons per year in the marketplace that requires an ultra-high purity material or would have to have the 99.8" percent magnesium, "for the most part…everyone can substitute and especially the aluminum industry because the major alloying component for these alternative sources is aluminum." Hearing transcript, p. 58 (Haak) and (Slade).

[63] See Part III and appendix F.

[64] U.S. Magnesium reports, "Alloy magnesium and off spec pure magnesium are substitutable for pure magnesium in virtually all of the segments, with the exception of the metal reduction industry that makes zirconium and beryllium, as well as a few chemical applications, like evasive flares, where the alloy magnesium doesn't meet the purity." Hearing transcript, pp. 58-59 (Slade). There is a "very, very strong preference" for pure magnesium in industries that require consistency such as the aerospace and food and beverage packaging industries. Hearing transcript at 124, 125 (Badgett, Donnan).

[65] See Part III and appendix F.

Cast and granular magnesium are not considered to be interchangeable as inputs for ultimate use in the iron and steel desulfurization market. Cast or granular pure magnesium must first be shipped to grinders, ground into powder per customer specifications, and then sold to the iron and steel industry. Iron and steel desulfurization customers do not have the capability to grind cast magnesium.

Channels of distribution

Both pure and alloy magnesium are sold to end users. The vast majority of pure and alloy magnesium is transported directly from a magnesium production facility (in the case of U.S. producers) and from a distribution or warehouse center (in the case of the imported product) to end users in full truckload lots by either contract or common carriers, with lesser amounts transported by rail. Diecasters will recycle their magnesium for in-house use with no merchant distribution.[66]

In 2021, the *** of domestically produced pure magesnium and other magnesium was shipped to aluminum manufacturers.[67] Throughout the period of review, *** U.S. shipments of pure magnesium were to aluminum manufacturers, while the share of *** U.S. shipments of pure magnesium to aluminum manufactuers ranged between *** during the same time period. *** was the only responding U.S. producer to report U.S. shipments of other magnesium to aluminum manufacturers during 2019-20, while both *** and *** reported U.S. shipments of other magnesium to aluminum manufacturers during 2021 and interim 2022. Throughout the period of review, *** U.S. shipments of other magnesium were to discasters, while the large majority of *** U.S. shipments of other magnesium to discasters ranged between *** percent and *** percent throughout the period of review.

Primary and secondary alloy magnesium are generally sold directly to end users through common channels of distribution.

[66] Hearing transcript, p. 63 (Slade).
[67] See table I-7.

Customer and producer perceptions

Historically, customers of domestically produced pure magnesium were largely distinct from customers of domestically produced alloy magnesium. However, traditional users of pure magnesium increasingly turned to the alloy market. This was particularly true for aluminum manufacturers who had developed new technology that permitted the use of alloy magnesium in aluminum production.[68] Due to the current force majeure, U.S. Magnesium reports its "customers very quickly had to use…their innate ability to substitute not only different suppliers, either primary or secondary or alloy or off spec pure alloy, to substitute those products to use in the same applications that they were using our pure magnesium for." ASTM alloy and off spec pure alloy magnesium were "substituted for our pure magnesium in fairly short order."[69]

There are still some industries that perceive a difference between pure and alloy mangesium. For instance, pharmaceutical manufacturers and nuclear fuel producers purchase pure magnesium for its chemical properties, and automotive diecasters purchase alloy magnesium because of its structural and mechanical properties.[70]

Because primary and higher-purity secondary alloy magnesium are largely identical products and are interchangeable for the same purposes, principally automotive diecastings, neither consumers nor producers perceive primary and higher-purity alloy magnesium to be significantly different products.

Producers of reagents, also known as grinders for iron and steel desulfurization customers, perceive both granular and cast magnesium as potentially usable in the production of these reagents because they are able to grind cast magnesium to the appropriate size requirements. Iron and steel desulfurization customers do not perceive cast and granular magnesium to be the same product.

[68] Second review publication, p. 10.

[69] Hearing transcript, pp. 58-59 (Slade).

[70] See appendix E. for responding firms' narrative responses regarding the domestic like product factors comparing in-scope pure magnesium to out-of-scope other magnesium.

Manufacturing facilities, production process, and production employees

While U.S. Magnesium makes both pure and alloy magnesium using the same machinery, equipment, and workers, *** reported only producing either pure or other magnesium products.[71] Pure magnesium is typically produced by a primary magnesium producer that extracts pure magnesium from magnesium-bearing ores or seawater and well and lake brines. The manufacturing processes to produce both pure and alloy magnesium ingot are similar. The process is the same until liquid pure magnesium is either cast directly into pure magnesium ingots or is alloyed by adding alloying elements and scrap magnesium prior to the casting of ingots. Diecasters recycle their own magnesium scrap in-house and they use it internally, and that material is not offered for sale to the external market.[72]

Primary and secondary alloy magnesium are normally produced in separate facilities using separate production processes and employees. Secondary alloy magnesium is produced by recyclers from delivered scrap which is melted in a steel crucible.

The production facilities, processes, and employees of cast and granular magnesium production do not overlap. Granular production facilities (firms known as “grinders”) purchase cast ingot pure magnesium, transform the physical shape by grinding it, and then sell powdered/granule magnesium to end users. Conversely, casters of magnesium extract magnesium from raw materials and cast it into primary pure magnesium ingots.

[71] While Magpro ***, it reported in its posthearing brief that produces both pure and alloy and primary and secondary magnesium in its production facilities. Posthearing brief, exh. 1, p. 18.

[72] Hearing transcript, p. 63 (Slade).

Price

Pricing data for pure magnesium obtained in this review are presented in Part V of this report. Table I-8 presents U.S. producers' average unit values for pure and other magnesium by product type.

Market participants were asked to indicate whether pure magnesium and other magnesium products are fully comparable, mostly comparable, somewhat comparable, or never or not-at-all comparable. Table I-6 shows the responses.

Table I-6
Pure magnesium: Count of firms' responses regarding the domestic like factors comparing in-scope pure magnesium to out-of-scope other magnesium

Count in number of firms reporting

Factor	Firm type	Fully	Mostly	Somewhat	Never
Physical characteristics	U.S. producers	0	2	1	2
Physical characteristics	Importers	0	5	7	1
Physical characteristics	Purchasers	0	2	3	3
Interchangeability	U.S. producers	0	3	0	2
Interchangeability	Importers	0	5	8	1
Interchangeability	Purchasers	1	1	3	3
Channels	U.S. producers	2	0	1	2
Channels	Importers	3	2	8	1
Channels	Purchasers	2	3	1	0
Manufacturing	U.S. producers	0	1	0	4
Manufacturing	Importers	2	0	6	6
Manufacturing	Purchasers	1	1	3	2
Perceptions	U.S. producers	1	0	2	2
Perceptions	Importers	0	6	5	3
Perceptions	Purchasers	0	4	1	2
Price	U.S. producers	0	1	2	2
Price	Importers	1	0	8	5
Price	Purchasers	0	2	2	3

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

Note: AMACOR submitted both producer and importer questionnaires and is counted in each firm type.

Table I-7
All magnesium: U.S. producers' channel of distribution by product type and year

Shares in percent

Channel	Product	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
To Distributors	Pure	***	***	***	***	***
To Aluminum	Pure	***	***	***	***	***
To Granular/Reagent	Pure	***	***	***	***	***
To Diecasters	Pure	***	***	***	***	***
To Iron/steel desulfization	Pure	***	***	***	***	***
To Other end users	Pure	***	***	***	***	***
All channels	Pure	***	***	***	***	***
To Distributors	Other	***	***	***	***	***
To Aluminum	Other	***	***	***	***	***
To Granular/Reagent	Other	***	***	***	***	***
To Diecasters	Other	***	***	***	***	***
To Iron/steel desulfization	Other	***	***	***	***	***
To Other end users	Other	***	***	***	***	***
All channels	Other	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table I-8
All magnesium: U.S. producers' average unit values by product type

Unit values in dollars per metric ton

Source	Product	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Ultra pure magnesium ingot	Pure	***	***	***	***	***
Pure magnesium ingot	Pure	***	***	***	***	***
Off specification pure magnesium ingot	Pure	***	***	***	***	***
All products: pure magnesium	Pure	***	***	***	***	***
ASTM specification alloy magnesium ingot	Other	***	***	***	***	***
Pure granular magnesium	Other	***	***	***	***	***
All products: other magnesium	Other	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table I-9
All magnesium: U.S. producers' manufacturing facilities

Count in number of firms reporting

Source	Number of firms	Firm names
Only produced pure magnesium	1	***
Only produced other magnesium	3	***
Produce pure and other: same machinery	1	***
Produce pure and other: different machinery	0	***

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

U.S. market participants

U.S. producers

During the original investigations, three firms supplied the Commission with information on their U.S. operations with respect to pure magnesium: Magcorp, Dow Chemical Company ("Dow"), and Northwest Alloys (a wholly owned subsidiary of Aluminum Company of America ("Alcoa")).[73] These firms accounted for the *** of U.S. production of pure magnesium in 1994. During the first expedited five-year review, Magcorp and Northwest Alloys were the only remaining known U.S. producers of pure magnesium after it was determined that Dow had shut down its domestic pure magnesium operations in November 1998 following extensive damage to its facility in Texas from lightning strikes and flooding.[74]

During the full second five-year review, U.S. industry data were based on the questionnaire responses of two U.S. producers of primary magnesium believed to account for all known U.S. production of primary magnesium during 2000-05: U.S. Magnesium (formerly Magcorp)[75] and Northwest Alloys. It was noted, however, that Northwest Alloys had also ceased magnesium production in October 2001.[76]

[73] Original publication, p. I-10.

[74] Pure Magnesium from China, Investigation No. 731-TA-696 (Review), USITC Publication 3346, August 2000 ("First Review Publication"), p. I-9.

[75] U.S. Magnesium, Salt Lake City, Utah, is a wholly owned subsidiary of Renco Group, Inc., New York, New York. U.S. Magnesium is the successor company to Magcorp. On August 3, 2001, Magcorp filed for protection under Chapter 11 of the U.S. Bankruptcy Code. The bankruptcy court authorized the sale of substantially all Magcorp's assets to U.S. Magnesium. The sale was completed in June 2002.

[76] Pure Magnesium from China, Investigation No. 731-TA-696 (Review), USITC Publication 3859, July 2006 ("Second Review Publication"), p. III-2.

As in the second review, in the expedited third and fourth five-year reviews, the Commission had defined the domestic like product more broadly than Commerce's scope, as consisting of pure and alloy magnesium, including primary and secondary magnesium, and ingot (cast) and granular magnesium.[77] During the expedited third five-year review, U.S. Magnesium provided a list of nine U.S. producers of pure and alloy magnesium, including primary and secondary magnesium, and magnesium in ingot and granular form.[78] During the expedited fourth five-year review, U.S. Magnesium provided a list of nine other known operating U.S. producers of the domestic like product and estimated that its own production accounted for *** percent of total production of primary and secondary magnesium ingot produced in the United States as well as the granular magnesium produced from non-U.S. Magnesium produced magnesium ingot in the United States during 2015.[79]

In this current proceeding, the Commission issued U.S. producers' questionnaires to ten firms. While five firms provided the Commission with information on their production operations, only two reported producing pure magnesium.[80] Presented in table I-10 is a list of current domestic producers of pure magnesium and each company's position on continuation of the orders, production locations, related and/or affiliated firms, and share of reported production of pure magnesium in 2021.[81] [82]

[77] 87 FR 11472, March 1, 2022.

[78] Domestic interested parties' response to the third review notice of institution, July 5, 2011, attachment 8.

[79] Domestic interested parties' response to the fourth review notice of institution, November 2, 2016, attachments 11 and 12.

[80] U.S. Magnesium is the *** producer and reported it accounted for *** percent of the production of pure magnesium in the United States in 2021. U.S. Magnesium also reported it accounts for *** percent of total U.S. production of pure and alloy, primary and secondary magnesium in ingot or granular form. If die casters are included in the coverage calculation, U.S. Magnesium accounted for *** percent of pure and other magnesium. Domestic interested parties' response to the notice of institution, March 31, 2022, p. 13.

[81] In 2021, Magpro represented *** percent of domestic production of magnesium. Moreover, in the first nine months of 2022, Magpro accounted for *** percent of domestic production of magnesium. Domestic interested parties' posthearing brief, exh. 1, p. 18.

[82] U.S. producer questionnaires were received from three producers who did not produce pure magnesium. Information on the broader industry is available in appendix F and the activities of the other purchasers are in table F-7.

Table I-10
Pure magnesium: U.S. producers, positions on orders, U.S. production locations, and shares of reported U.S. production, 2021
Share in percent

Firm	Position on orders	Production location(s)	Share of production
Magpro	***	Camden TN	***
U.S. Magnesium	***	Salt Lake City, UT Rowley, UT	***
All firms	Various	Various	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

As indicated in table I-11, no U.S. producers of pure magnesium are related to foreign producers of the subject merchandise nor are any related to U.S. importers of the subject merchandise. No U.S. producer of pure magnesium directly imported or purchased the pure magnesium.

Table I-11
Pure magnesium: U.S. producers' ownership, related and/or affiliated firms

Reporting firm	Relationship type and related firm	Details of relationship
***	***	***

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

U.S. importers

In the original investigations, 14 U.S. importing firms supplied the Commission with usable information on their operations involving the importation of magnesium, accounting for *** percent of U.S. imports from subject sources during 1992-94.[83] Although the Commission did not receive responses from any respondent interested parties in its first five-year review, Magcorp indicated that nine U.S. importers were listed in PIERS as having imported the subject merchandise during the period from 1998 through February 2000.[84]

[83] Original publication, p. I-10; Investigation Nos. 731-TA-696-698: Magnesium from China, Russia, and Ukraine, Confidential Report, INV-S-50, April 20, 1995, supplemented with additional information in INV-S-55, April 25, 1995, and INV-S-56, April 26, 1995, ("Confidential original report"), pp. I-13-I-14.

[84] First review publication, p. I-12.

During the second full review, the Commission sent importers' questionnaires to 60 firms believed to be importing pure or alloy magnesium from Canada or China from 2000-05, and 18 firms provided importers' questionnaire responses; however, none of the firms reported imports of the subject merchandise from China (it was believed that there were virtually no U.S. imports of pure magnesium from China during the period 2000-05).[85]

Although the Commission did not receive responses from any importer respondent interested parties in its expedited third or fourth five-year reviews, the responding domestic interested parties listed two importers of subject merchandise from China during the third review[86] and listed three importers of magnesium products from China during the fourth review.[87]

In the current proceeding, the Commission issued U.S. importers' questionnaires to 20 firms believed to be importers of pure magnesium, as well as to all U.S. producers of pure magnesium. Usable questionnaire responses were received from 12 firms.[88] While *** reported imports from China in 2021, 11 responding firms represented *** of U.S. imports from nonsubject sources in 2021.[89] Table I-12 lists all responding U.S. importers of pure magnesium from China and other sources, their locations, and their shares of U.S. imports in 2021.

[85] Second review publication, p. IV-1.

[86] Pure Magnesium from China, Investigation No. 731-TA-696 (Third Review), USITC Publication 4274, October 2011 ("Third Review Publication"), p. I-20.

[87] Pure Magnesium from China, Investigation No. 731-TA-696 (Fourth Review), USITC Publication 4678, March 2017 ("Fourth Review Publication"), pp. I-18-19.

[88] A total of 18 questionnaires were received from firms that imported either pure or other magnesium.

[89] *** firms reported importing from China in interim 2022, accounting for *** percent of imports from China in that period. According to official import stats, pure magnesium imports from China were modest during 2019-21. Please see Appendix G for data on imports of pure magnesium from China.

Table I-12
Pure magnesium: U.S. importers, their headquarters, and share of imports within each source, 2021

Share in percent

Firm	Headquarters	China	Nonsubject sources	All import sources
Alliance Magnesium	Danville, QC	***	***	***
Bhatt	Kansas City, MO	***	***	***
Dead Sea	St. Louis, MO	***	***	***
Global Specialty	Beverly, OH	***	***	***
Greenwich Metals	Greenwich, CT	***	***	***
Heneken	Bratislava, SK	***	***	***
Howmet	Pittsburgh, PA	***	***	***
Laurand	Boca Raton, FL	***	***	***
Non Ferrum	North Charleston, SC	***	***	***
Polymet Alloys	Birmingham, AL	***	***	***
Traxys	New York, NY	***	***	***
VSMPO	Highlands Ranch, CO	***	***	***
All firms	Various	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

U.S. purchasers

The Commission received 13 usable questionnaire responses from firms that bought pure magnesium since January 1, 2019.[90] Eight responding purchasers are aluminum maker end users, one is a diecaster end user, and five are other end users: ***.[91] In general, responding U.S. purchasers were located in the Midwest, Mid-Atlantic, South Atlantic, and South Central regions. The responding purchasers represented firms in a variety of domestic industries, including the aerospace, automotive, beverage, chemical, and industrial industries. Large purchasers of pure magnesium include ***. ***

[90] Of the 13 responding purchasers, 9 purchased the domestic product, 1 *** purchased imports of the subject merchandise from China, and 9 purchased imports of pure magnesium from other sources.

[91] Purchaser ***.

***. *** was the only responding purchaser to report purchasing pure magnesium produced in China in 2021.

Apparent U.S. consumption and market shares

Quantity[92]

Table I-13 and figure I-3 present data on apparent U.S. consumption and market shares for pure magnesium by quantity. Apparent U.S. consumption by quantity fluctuated, decreasing by *** percent from 2019 to 2020 and increasing *** percent from 2020 to 2021, decreasing overall by *** during 2019-21.[93] It was *** percent lower in January-June ("interim") 2022 than in interim 2021. The quantity of U.S. producers' U.S. shipments fluctuated, decreasing by *** percent from 2019 to 2020 before increasing *** percent from 2020 to 2021, overall decreasing by *** percent during 2019-21.[94] It was *** percent lower in interim 2022 than in interim 2021. U.S. shipments of subject imports were ***.[95] The quantity of shipments of nonsubject imports increased by *** percent from 2019 to 2020, but then decreased by *** percent from 2020 to 2021, ending *** percent higher in 2021 than in 2019. It was *** percent higher in interim 2022 than in interim 2021.

U.S. producers' market share, by quantity, decreased from *** percent in 2019 to *** percent in 2021. It was *** percent in interim 2022, compared to *** percent in interim 2021. The market share, by quantity, of U.S. imports from China was *** percent in interim 2022. The market shares of U.S. imports from nonsubject sources, by quantity, increased *** percentage points during 2019-21, and was *** percent in interim 2022, compared to *** percent in interim 2021.

[92] See table F-4 and figure F-1 for apparent U.S. consumption and market shares by quantity for all magnesium.

[93] See part II for additional information on demand factors.

[94] See part III for additional information on U.S. producers' U.S. shipments.

[95] See part IV for additional information on U.S. imports.

Table I-13
Pure magnesium: Apparent U.S. consumption and market shares based on quantity, by source and period

Quantity in metric tons; shares in percent

Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
U.S. producers	Quantity	***	***	***	***	***
China	Quantity	***	***	***	***	***
Nonsubject sources	Quantity	***	***	***	***	***
All import sources	Quantity	***	***	***	***	***
All sources	Quantity	***	***	***	***	***
U.S. producers	Share	***	***	***	***	***
China	Share	***	***	***	***	***
Nonsubject sources	Share	***	***	***	***	***
All import sources	Share	***	***	***	***	***
All sources	Share	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Figure I-3
Pure magnesium: Apparent U.S. consumption based on quantity, by source and period

* * * * * * *

Source: Compiled from data submitted in response to Commission questionnaires

Value[96]

Table I-14 and figure I-4 present data on apparent U.S. consumption and U.S. market shares by value for pure magnesium. The value of apparent U.S. consumption fluctuated during 2019-21, decreasing by *** percent from 2019 to 2020, then increasing by *** percent from 2020 to 2021, ending *** percent higher in 2021 than in 2019. Apparent U.S. consumption, by value, was *** percent higher in interim 2022 than in interim 2021.

U.S. producers' market share, by value, decreased from *** percent in 2019 to *** percent in 2021. It was *** percent in interim 2022, compared to *** percent in interim 2021. The market share, by value, of U.S. imports from China was *** percent in interim 2022. The market shares of U.S. imports from nonsubject sources, by value, increased *** percentage points during 2019-21, and was *** percentage points higher in interim 2022 compared to interim 2021.

Table I-14
Pure magnesium: Apparent U.S. consumption and market shares based on value, by source and period
Value in 1,000 dollars; shares in percent

Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
U.S. producers	Value	***	***	***	***	***
China	Value	***	***	***	***	***
Nonsubject sources	Value	***	***	***	***	***
All import sources	Value	***	***	***	***	***
All sources	Value	***	***	***	***	***
U.S. producers	Share of value	***	***	***	***	***
China	Share of value	***	***	***	***	***
Nonsubject sources	Share of value	***	***	***	***	***
All import sources	Share of value	***	***	***	***	***
All sources	Share of value	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

[96] See table F-5 and figure F-2 for apparent U.S. consumption and market shares by quantity for the broader product.

Figure I-4
Pure magnesium: Apparent U.S. consumption based on value, by source and period

* * * * * * *

Source: Compiled from data submitted in response to Commission questionnaires

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

U.S. market characteristics

Pure magnesium is typically used in the production of aluminum alloys, in iron and steel desulfurization, as a reducing agent for various nonferrous metals, and as anodes. It is used in flares used by the military, lightweight aluminum alloys used in automotive production, magnesium alloys for aerospace applications, steel production, and coil for beverage and food packing applications.[1]

Apparent U.S. consumption of pure magnesium decreased by *** percent between 2019 and 2021, and was also *** percent lower in January-September 2022 compared to January-September 2021.

Impact of section 301 tariffs and 232 tariffs

U.S. producers, importers, and purchasers were asked to report the impact of section 301 tariffs and 232 tariffs on overall demand, supply, prices, or raw material costs for pure magnesium (tables II-1 and II-2). Most firms (***, 8 of 12 responding importers, and 10 of 13 purchasers) reported either that there was either no impact or they did not know the impact of section 301 tariffs on imported pure magnesium from China. Similarly, most firms (12 of 13 responding importers and 12 of 13 purchasers) reported that there was either no impact or they did not know the impact of section of section 232 tariffs on imported steel and aluminum, ***. Of the firms that did report an impact of the section 232 or section 301 tariffs (tables II-1 and II-2), most firms did not report either section 232 or section 301 tariffs as having decreased or increased either domestic or imported supply in the market, prices of pure magnesium, or overall demand.

[1] Hearing transcript, p. 26 (Haack) and p. 113 (Donnan).

Table II-1
Pure magnesium: Count of firms' responses regarding the impact of the 232 tariffs on steel and aluminum imports

Impact on	Firm type	Increase	No change	Decrease	Fluctuate
Domestic supply in market	U.S. producers	***	***	***	***
Domestic supply in market	Importers	0	1	0	1
Domestic supply in market	Purchasers	0	3	1	0
Import supply in market	U.S. producers	***	***	***	***
Import supply in market	Importers	1	0	0	1
Import supply in market	Purchasers	0	3	0	1
Prices of pure magnesium	U.S. producers	***	***	***	***
Prices of pure magnesium	Importers	0	1	0	1
Prices of pure magnesium	Purchasers	2	3	0	0
Overall demand in market	U.S. producers	***	***	***	***
Overall demand in market	Importers	1	0	0	1
Overall demand in market	Purchasers	1	3	0	1
Raw material costs of pure magnesium	U.S. producers	***	***	***	***
Raw material costs of pure magnesium	Importers	0	1	0	1
Raw material costs of pure magnesium	Purchasers	0	3	0	1

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

Table II-2
Pure magnesium: Count of firms' responses regarding the impact of the 301 tariffs on Chinese origin products

Impact on	Firm type	Increase	No change	Decrease	Fluctuate
Domestic supply in market	U.S. producers	***	***	***	***
Domestic supply in market	Importers	1	2	1	2
Domestic supply in market	Purchasers	0	4	3	0
China supply in market	U.S. producers	***	***	***	***
China supply in market	Importers	1	2	1	2
China supply in market	Purchasers	1	3	2	1
Nonsubject countries supply in market	U.S. producers	***	***	***	***
Nonsubject countries supply in market	Importers	3	2	0	1
Nonsubject countries supply in market	Purchasers	2	4	0	1
Prices of pure magnesium	U.S. producers	***	***	***	***
Prices of pure magnesium	Importers	2	2	0	2
Prices of pure magnesium	Purchasers	4	3	0	0
Overall demand in market	U.S. producers	***	***	***	***
Overall demand in market	Importers	2	3	0	1
Overall demand in market	Purchasers	1	4	0	2
Raw material costs of pure magnesium	U.S. producers	***	***	***	***
Raw material costs of pure magnesium	Importers	1	4	0	1
Raw material costs of pure magnesium	Purchasers	1	5	0	1

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

Channels of distribution

The *** of U.S. producers' U.S. shipments of pure magnesium were made to aluminum manufacturers, while *** of U.S. shipments of imports from China were made to other end users, as shown in table II-3. *** U.S. shipments of nonsubject imports were made to aluminum manufacturers, with *** being made to iron/steel desulfurization and other end users.

Table II-3
Pure magnesium: Share of U.S. producers' and importers' U.S. shipments within each source, by channel of distribution and period

Shares in percent

Source	Channel	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
United States	Distributors	***	***	***	***	***
United States	Aluminum manufacturers	***	***	***	***	***
United States	Granular/reagent producers	***	***	***	***	***
United States	Diecasters	***	***	***	***	***
United States	Iron/steel desulfurization	***	***	***	***	***
United States	Other end users	***	***	***	***	***
China	Distributors	***	***	***	***	***
China	Aluminum manufacturers	***	***	***	***	***
China	Granular/reagent producers	***	***	***	***	***
China	Diecasters	***	***	***	***	***
China	Iron/steel desulfurization	***	***	***	***	***
China	Other end users	***	***	***	***	***
Nonsubject	Distributors	***	***	***	***	***
Nonsubject	Aluminum manufacturers	***	***	***	***	***
Nonsubject	Granular/reagent producers	***	***	***	***	***
Nonsubject	Diecasters	***	***	***	***	***
Nonsubject	Iron/steel desulfurization	***	***	***	***	***
Nonsubject	Other end users	***	***	***	***	***
All imports	Distributors	***	***	***	***	***
All imports	Aluminum manufacturers	***	***	***	***	***
All imports	Granular/reagent producers	***	***	***	***	***
All imports	Diecasters	***	***	***	***	***
All imports	Iron/steel desulfurization	***	***	***	***	***
All imports	Other end users	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

Geographic distribution

U.S. producers reported selling pure magnesium to all regions in the contiguous United States (table II-4). Importers reported selling to the Midwest and Central Southwest regions. For U.S. producers, *** percent of sales were within 100 miles of their production facility, *** percent were between 101 and 1,000 miles, and *** percent were over 1,000 miles. Importers sold *** percent over 1,000 miles.

Table II-4
Pure magnesium: Count of U.S. producers' and U.S. importers' geographic markets

Region	U.S. producers	China
Northeast	***	***
Midwest	***	***
Southeast	***	***
Central Southwest	***	***
Mountain	***	***
Pacific Coast	***	***
Other	***	***
All regions (except Other)	***	***
Reporting firms	***	***

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

Note: Other U.S. markets include AK, HI, PR, and VI.

Supply and demand considerations

U.S. supply

Table II-5 provides a summary of the supply factors regarding pure magnesium from U.S. producers and from China. Capacity in China was more than triple U.S. capacity in 2021, with high capacity utilization high in both the United States and China. Capacity in the United States *** during 2019-21, while capacity *** in China.

Table II-5
Pure magnesium: Supply factors that affect the ability to increase shipments to the U.S. market, by country

Quantity in metric tons; ratio and share in percent

Factor	Measure	United States	China
Capacity 2019	Quantity	***	***
Capacity 2021	Quantity	***	***
Capacity utilization 2019	Ratio	***	***
Capacity utilization 2021	Ratio	***	***
Ending inventories 2019	Ratio	***	***
Ending inventories 2021	Ratio	***	***
Home market 2021	Share	***	***
Non-US export markets 2021	Share	***	***
Ability to shift production	Count	***	***

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

Note: Responding U.S. producers accounted for more than 75 percent of U.S. production of pure magnesium in 2021. The information on the industry in China is based on the response of one producer of pure magnesium. For additional data on the number of responding firms and their share of U.S. production and of U.S. imports from China, please refer to Part I, “Summary Data and Data Sources.”

Domestic production

Based on available information, U.S. producers of pure magnesium have the ability to respond to changes in demand with small changes in the quantity of shipments of U.S.-produced pure magnesium to the U.S. market. The main contributing factors to this degree of responsiveness of supply are limited availability of unused capacity and inventories and limited ability to shift shipments from alternate markets or inventories.

U.S. producers’ capacity decreased by *** percent between 2019 and 2021 while in-scope production decreased by *** percent, leading to an increase in capacity utilization. ***

***[2]. Reported barriers to exporting include lack of experience in exporting and inability to command prices equivalent to those present in the U.S. pure magnesium market. Pure magnesium and alloy magnesium can be produced using the same equipment and the same labor.[3]

Subject imports from China

Based on available information, producers of pure magnesium from China have the ability to respond to changes in demand with moderate changes in the quantity of shipments of pure magnesium to the U.S. market. The main contributing factor to this degree of responsiveness of supply includes the ability to shift shipments from alternate markets.

According to estimates, China has 90 percent of the world's magnesium metal smelting capacity.[4] Chinese producers' estimated capacity has remained constant between 2019 and 2021. The responding foreign producer reportedly can produce alloy magnesium on the same equipment as pure magnesium. Factors mitigating responsiveness of supply include limited availability of unused capacity and inventories ***. ***.

Imports from nonsubject sources

The largest sources of nonsubject imports during January 2019–September 2022 were Brazil, Israel, Russia, and Turkey.

Supply constraints

*** U.S. producers and 4 of 12 responding importers reported that they had experienced supply constraints since January 1, 2019. *** reported supply constraints: U.S. Magnesium declared a force majeure in September 2021 due to "unforeseeable equipment failures" that that reduced magnesium production levels and then

[2] For more information on these conditions, please refer to Part IIIB.

[3] ***. Purchaser Kaiser posthearing brief, p. 1. ***. Domestic Interested Parties' posthearing brief, pp. 17-18.

[4] United States Geological Survey, Mineral Commodity Summaries 2021, p. 103, https://pubs.usgs.gov/periodicals/mcs2021/mcs2021.pdf, accessed February 11, 2023.

forced it to temporarily stop production in August of 2022, which is its current status. U.S. Magnesium reports that it expects to resume production and U.S. shipments during the late second quarter or early third quarter of 2023.[5]

Several importers of pure magnesium from nonsubject countries also reported supply constraints. Importer *** reported that its own production capacity was limited ***, *** reported that delivery delays were limited to *** and were resolved within the terms of its agreements, and *** reported that it could not ship to the United States in a timely or cost-efficient manner.

All 13 responding purchasers reported that there had been supply constraints. Eight purchasers cited U.S. Magnesium's force majeure or inability to supply magnesium as a supply constraint. Other constraints attributed to U.S. Magnesium included being unable to deliver on contractual agreements, declining to quote, reducing and ending shipments, and unclear timelines/communications for purchasing. Purchaser *** reported that Dead Sea Magnesium limited the volume supplied, *** and *** reported supply chain issues related to the COVID-19 pandemic, and *** reported that its suppliers had limited product allocations due to port congestion/logistics availability.

New suppliers

Six of 13 purchasers indicated that new suppliers entered the U.S. market since January 1, 2019 and expect additional entrants. Purchasers named Alliance Magnesium, Kar Magnesium, Pinda Tech, and Salgo as new entrants. Purchasers cited Australia, Canada, China, Kazakhstan, and Turkey as new country sources of supply. Purchaser *** reported that the Australian producer's facility is expected to be commissioned in early 2024, with a North American distribution agreement already reportedly in force.

An Australian firm, Magnium Australia, is reportedly constructing the world's first decarbonized magnesium metal plant producing zero carbon magnesium metal ingots of 99.8 percent purity, and its first production plant is slated to produce 1,000 tons of magnesium a year.[6] In addition, Western Magnesium Corporation has announced initial optimization runs

[5] Hearing transcript, pp. 16-17 and 43 (Thayer).

[6] Magnium Australia. "About Us", accessed March 22, 2023. https://www.magnium.com.au/about-us/.

producing 99.84% percent magnesium metal using a continuous silicothermic process at its commercial pilot plant in Nevada.[7]

U.S. demand

Based on available information, the overall demand for pure magnesium is likely to experience small changes in response to changes in price. The main contributing factors are the lack of substitute products and the small cost share of pure magnesium in end-use products. By one estimate, U.S. demand for magnesium is estimated to be 100,000 MT per year.[8]

End uses and cost share

U.S. demand for pure magnesium depends on the demand for U.S.-produced downstream products such as those produced by the aluminum, automotive, beverage, and industrial industries. Almost all responding firms (***, all 12 importers, and 10 of 11 purchasers) reported no changes in end uses since January 1, 2019 or anticipating any future changes. The one purchaser (***) reporting changes in end uses reported that there was potential for significant growth in the use of granular pure magnesium in battery anode applications and that ***.

Pure magnesium accounts for a small share of the cost of the end-use products in which it is used. Most purchasers reported cost shares of 1 to 5 percent for end-use products. Reported cost shares for some end uses were as follows: 1 percent (aluminum extrusions, aluminum sheet, and can body stock), 2 percent (aluminum billets and canstock), 3 percent (aluminum alloy), 4 percent (zirconium sponge), 5 percent (packaging body and lid), 26 percent (***), and 30 percent (***).

Business cycles

***, 10 of 11 importers, and 7 of 13 purchasers indicated that the market was subject to business cycles and/or other conditions of competition distinctive to pure magnesium. Specifically, importer *** reported that demand is seasonal, importer/purchaser *** reported that it is a “classic commodity cycle”, and importer

[7] The Newswire, Western Magnesium Provides Technical Update, February 13, 2023, https://www.thenewswire.com/press-releases/1LmPFpjVa-western-magnesium-provides-technical-update.html.

[8] Trinity posthearing statement, p. 2.

*** reported that it is a "normal" business cycle. Purchaser *** reported that environmental/energy considerations and provincial actions by the Chinese government have affected the global market for pure magnesium. Purchaser *** also cited the energy intensity of pure magnesium mining and the environmental requirements as having an impact on supply. Purchasers also cited U.S. Magnesium's force majeure as a distinct condition of competition.

Demand trends

A plurality of firms reported an increase in U.S. demand for pure magnesium since January 1, 2019 (table II-6) and anticipate demand to increase over the next two years (table II-7). No firms reported that they expect demand to decrease over the next two years. *** reported that demand increased in 2019, fell during the pandemic in 2020, and started rebounding to pre-pandemic levels in 2021. Importers reported that increased demand in the aerospace, aluminum, and automotive industries will continue to drive demand growth for pure magnesium. Importer *** reported that approximately 35-40 percent of global primary pure magnesium demand comes from the aluminum industry and that there has been a shift from plastic to aluminum packaging; it also reported that increased U.S. infrastructure spending has been a demand driver for pure magnesium. Purchasers also reported increased demand in the overall aluminum and magnesium markets and increased demand from the aerospace, automotives, and food packaging. However, three purchasers (***) reported a decline in demand over the period of review due to the COVID-19 pandemic, and two purchasers (***) mentioned recessionary activity as a demand driver when describing 2020 and 2021 demand trends.[9]

[9] According to the National Bureau of Economic Research's Business Cycle Dating Committee, the most recent U.S. recession occurred in April 2020. National Bureau of Economic Research, "Business Cycle Dating Committee Announcement July 19, 2021", https://www.nber.org/news/business-cycle-dating-committee-announcement-july-19-2021, retrieved February 6, 2023.

Table II-6
Pure magnesium: Count of firms' responses regarding overall domestic and foreign demand since January 1, 2019, by firm type

Market	Firm type	Increase	No change	Decrease	Fluctuate
U.S. demand	U.S. producers	***	***	***	***
U.S. demand	Importers	3	2	2	3
U.S. demand	Purchasers	7	3	0	2
U.S. demand	Foreign producers	0	1	0	0
Foreign demand	U.S. producers	***	***	***	***
Foreign demand	Importers	3	2	2	3
Foreign demand	Purchasers	4	2	0	4
Demand in subject country	Foreign producers	0	1	0	0
Demand in other export markets	Foreign producers	0	1	0	0
Demand for end use products	Purchasers	6	1	0	5

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

Table II-7
Pure magnesium: Count of firms' responses regarding anticipated overall domestic and foreign demand, by firm type

Market	Firm type	Increase	No change	Decrease	Fluctuate
U.S. demand	U.S. producers	***	***	***	***
U.S. demand	Importers	4	3	0	3
U.S. demand	Purchasers	9	2	0	2
U.S. demand	Foreign producers	0	1	0	0
Foreign demand	U.S. producers	***	***	***	***
Foreign demand	Importers	4	3	0	3
Foreign demand	Purchasers	7	2	0	2
Demand in subject country	Foreign producers	0	1	0	0
Demand in other export markets	Foreign producers	0	1	0	0

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

Substitute products

Most responding firms (***, 10 of 13 importers, and 12 of 13 purchasers) reported no changes or anticipated changes in the number or types of products that can be substituted for pure magnesium. However, in a posthearing statement, Trinity Metals, the largest domestic ***, reported that scrap magnesium and secondary remelt magnesium ingot can be used as a direct substitute for primary and secondary magnesium.[10]

Substitutability issues

This section assesses the degree to which U.S.-produced pure magnesium and imports of pure magnesium from China can be substituted for one another by examining the importance of certain purchasing factors and the comparability of pure magnesium from domestic and imported sources based on those factors. Based on available data, staff believes that there is a moderate-to-high degree of substitutability between domestically produced pure magnesium and pure magnesium imported from China.[11] Factors contributing to this level of substitutability include no requirements for particular countries of origin or producers, similarities between domestically produced pure magnesium and subject imports across multiple purchase factors, and interchangeability between domestic and subject product. Factors reducing substitutability include limited availability of domestic product, reported product applications that require 99.8 percent purity magnesium or greater rather than other types of magnesium, some reported quality differences, and purchaser preferences for pure magnesium from domestic sources.

[10] Trinity posthearing statement, pp. 1-2.

[11] The degree of substitution between domestic and imported pure magnesium depends upon the extent of product differentiation between the domestic and imported products and reflects how easily purchasers can switch from domestically produced pure magnesium to the pure magnesium imported from subject countries (or vice versa) when prices change. The degree of substitution may include such factors as relative prices (discounts/rebates), quality differences (e.g., grade standards, defect rates, etc.), and differences in sales conditions (e.g., lead times between order and delivery dates, reliability of supply, product services, etc.).

Factors affecting purchasing decisions[12]

Purchaser decisions based on source

As shown in table II-8, 5 of 13 responding purchasers always make purchasing decisions based on the producer, while the remaining 8 reported that they sometimes or never do. Most purchasers or their customers sometimes or never make purchasing decisions based on the country of origin. Of the 5 purchasers that reported that they always make decisions based on the manufacturer, 3 cited quality/qualification processes, 2 firms cited existing relationships with suppliers, and 2 cited price. Other reasons cited include confidence in quality, support, material risk, and supplier capacity.

Table II-8
Pure magnesium: Count of purchasers' responses regarding frequency of purchasing decisions based on producer and country of origin

Firm making decision	Decision based on	Always	Usually	Sometimes	Never
Purchaser	Producer	5	0	4	4
Customer	Producer	1	0	3	5
Purchaser	Country	2	2	4	5
Customer	Country	0	0	4	4

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

Importance of purchasing domestic product

All 12 responding purchasers reported that all of their purchases did not require U.S.-produced product.[13] Seven of 13 purchasers reported that they or their customers had a country preference. Five of these purchasers reported preferring pure magnesium from domestic sources, one reported preferring pure magnesium sourced from Israel, and two reported that they avoid sources with geopolitical risk or restrictions. Reasons cited for preferring domestic product included avoiding geopolitical risk, supply chain reliability, lower transportation costs and shorter delivery times, and quality consistency.

Most important purchase factors

The most often cited top three factors firms consider in their purchasing decisions for pure magnesium were price (11 firms) and availability/supply and quality (10 firms each), as shown in table II-9. Price was the most frequently cited first-most important factor (cited by 6

[12] Eleven purchasers indicated they had marketing/pricing knowledge of domestic product, 8 of Chinese product, and 12 of product from nonsubject countries.

[13] One purchaser did not answer the question.

firms), followed by availability/supply (5 firms); availability/supply and quality were cited by 4 firms each as the second-most important factor; and quality was the most frequently reported third-most important factor (5 firms).

Table II-9
Pure magnesium: Count of ranking of factors used in purchasing decisions as reported by purchasers, by factor

Factor	First	Second	Third	Total
Quality	1	4	5	10
Price	6	3	2	11
Availability/Supply	5	4	3	10
All other factors	1	2	3	NA

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

The majority of purchasers (6 of 13) reported that they sometimes purchase the lowest-priced product, while 5 purchasers reported that they usually purchase the lowest-priced product.

Importance of specified purchase factors

Purchasers were asked to rate the importance of 16 factors in their purchasing decisions (table II-10). The factors rated as very important by more than half of responding purchasers were availability (13 purchasers); product consistency, quality meets industry standards, and reliability of supply (12 each); delivery time (11); price (10); and delivery terms (7).

Table II-10
Pure magnesium: Count of purchasers' responses regarding importance of purchase factors, by factor

Factor	Very important	Somewhat important	Not important
Availability	13	0	0
Delivery terms	7	6	0
Delivery time	11	2	0
Discounts offered	2	11	0
Minimum quantity requirements	1	6	6
Packaging	4	6	3
Payment terms	4	9	0
Price	10	2	0
Product consistency	12	1	0
Product range	1	8	4
Quality meets industry standards	12	1	0
Quality exceeds industry standards	4	7	2
Reliability of supply	12	0	0
Supplier diversity	5	7	1
Technical support/service	0	9	4
U.S. transportation costs	3	8	2

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

Lead times

Pure magnesium is primarily sold from inventory. U.S. producers reported that *** percent of their commercial shipments in 2021 were from inventories, with lead times averaging *** days.[14] The remaining *** percent of their commercial shipments was produced-to-order, with lead times averaging *** days. Importers of pure magnesium from China reported that *** percent of their commercial shipments from January-September 2022 were from inventories, with lead times averaging *** days. The remaining *** percent of their commercial shipments were produced-to-order, with lead times averaging *** days.[15]

Supplier certification

Ten of 11 responding purchasers require their suppliers to become certified or qualified to sell pure magnesium to their firm. Purchasers reported that the time to qualify a new supplier ranged from 7 days to 2 years. Seven purchasers reported ranges that were less than a year. Purchaser qualification times included 7-30 days, 15-75 days, 90 days and 90-180 days. Purchasers reported that the process involved aspects such as administrative qualification, laboratory sample, trial production test, risk assessment, and packaging, quality, and consistency checks.

Four purchasers reported that foreign suppliers had failed in their attempts to qualify pure magnesium, or had lost approved status since 2019. *** reported that Brazilian producer Rima and several Chinese producers had failed to qualify. *** reported that KAR Magnesium (Turkey) failed certification for aerospace grade material. *** reported that some suppliers lost certification before recertifying, that some Chinese producers failed to certify, and that the most common reason for failure to certify was oxides in the product or issues during casting.

Minimum quality specifications

As can be seen from table II-11, most responding purchasers reported that domestically produced product and product imported from China and nonsubject sources always or usually met minimum quality specifications. Eight responding purchasers reported that pure magnesium from the United States always met minimum quality specifications, while three

[14] ***.

[15] Since subject U.S. importers only reported shipments for partial year 2022, reported percentages were calculated from the available period of data, January-September 2022.

responding purchasers reported that pure magnesium from China always met minimum quality specifications.

Table II-11
Pure magnesium: Count of purchasers' responses regarding suppliers' ability to meet minimum quality specifications, by source

Source of purchases	Always	Usually	Sometimes	Rarely or never	Don't Know
United States	8	3	0	1	1
China	3	3	1	1	4
Nonsubject sources	5	7	0	0	0

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

Note: Purchasers were asked how often domestically produced or imported pure magnesium meets minimum quality specifications for their own or their customers' uses.

Changes in purchasing patterns

Twelve of 13 responding purchasers reported that they had changed suppliers since January 1, 2019. Six purchasers cited domestic supply disruptions or forces majeures as reasons for changing suppliers. Purchaser *** reported adding domestic supplier Merelex Corporation (American Elements). Purchaser *** reported adding Chinese suppliers Grand Sunrise, Jinson Metal Limited, Jinzhi Group, and ***. Two purchasers (***) added a Turkish primary magnesium supplier (*** added Traxys), one (***) added Alliance, a Canadian supplier, and Pinda Tech, a Taiwan supplier, and two purchasers (***) increased purchases from Dead Sea, an Israeli supplier. Two purchasers (***) stopped purchasing from Russian suppliers.

Purchasers were also asked about changes in their purchasing patterns from different countries since January 1, 2019 (table II-12). *** reported decreased purchases of U.S.-produced product and increased purchases of pure magnesium from China because of availability. *** reported decreased domestic purchases and cited U.S. Magnesium's failure to perform at U.S. Magnesium's single production site {in Rowley, Utah}. *** reported decreased domestic purchases due to force majeure and increased purchases of Israeli pure magnesium. *** also reported decreased domestic purchases due to force majeure and increased purchases of pure magnesium from nonsubject sources. *** reported increased domestic purchases and cited product stability as an advantage for domestic purchases and cost reductions as an advantage of imports, and it also reported increased purchases of Israeli pure magnesium.

Table II-12
Pure magnesium: Count of purchasers' responses regarding changes in purchase patterns from U.S., subject, and nonsubject countries

Source of purchases	Decreased	Increased	Constant	Fluctuated	Did not purchase
United States	9	2	1	1	1
China	0	4	0	0	8
Nonsubject sources	0	9	1	1	2
Sources unknown	0	1	1	1	7

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

Purchase factor comparisons of domestic products, subject imports, and nonsubject imports

Purchasers were asked a number of questions comparing pure magnesium produced in the United States, China, and nonsubject countries. First, purchasers were asked for a country-by-country comparison on the same 16 factors (table II-13) for which they were asked to rate the importance.

Most responding purchasers reported that U.S. pure magnesium and subject imports were comparable on payment terms, product consistency, quality meets industry standards, and U.S. transportation costs (6 purchasers each), and on minimum quantity requirements, packaging, product range, and quality exceeds industry standards (5 purchasers each). Most purchasers reported that the U.S. product was superior to subject imports on delivery time (a very important factor for 10 of 11 purchasers). Half of responding purchasers reported that pure magnesium from the United States was inferior to pure magnesium from China on availability, a very important factor for all 11 responding purchasers. With respect to price (a very important factor for 8 purchasers), responses were equally divided between the Chinese product being lower-priced than the domestic product and the two sources being comparable. A majority of purchasers reported that pure magnesium from the United States was inferior to pure magnesium from nonsubject sources on availability and supplier diversity. Responses were mixed with respect to price; 5 responding purchasers responded that pure magnesium from the United States was comparable to pure magnesium from nonsubject sources on price, while 4 purchasers reported that product from the United States was inferior on price. A majority of purchasers also reported that Chinese pure magnesium was comparable or superior to nonsubject product on every factor except for payment terms (4 purchasers reported that it was inferior, and 3 purchasers reported that it was comparable, and 1 purchaser reported that it was superior).

Table II-13
Pure magnesium: Count of purchasers' responses comparing U.S.-produced and imported product, by factor and country pair

Factor	Country pair	Superior	Comparable	Inferior
Availability	US v. China	2	2	4
Delivery terms	US v. China	2	4	2
Delivery time	US v. China	5	1	2
Discounts offered	US v. China	0	4	4
Minimum quantity requirements	US v. China	0	5	2
Packaging	US v. China	3	5	0
Payment terms	US v. China	1	6	1
Price	US v. China	0	4	4
Product consistency	US v. China	1	6	0
Product range	US v. China	3	5	0
Quality meets industry standards	US v. China	2	6	0
Quality exceeds industry standards	US v. China	3	5	0
Reliability of supply	US v. China	1	3	4
Supplier diversity	US v. China	0	2	6
Technical support/service	US v. China	3	4	0
U.S. transportation costs	US v. China	2	6	0

Table continued.

Table II-13 Continued
Pure magnesium: Count of purchasers' responses comparing U.S.-produced and imported product, by factor and country pair

Factor	Country pair	Superior	Comparable	Inferior
Availability	US v. Nonsubject	1	4	6
Delivery terms	US v. Nonsubject	1	8	2
Delivery time	US v. Nonsubject	6	2	3
Discounts offered	US v. Nonsubject	2	6	3
Minimum quantity requirements	US v. Nonsubject	0	7	3
Packaging	US v. Nonsubject	1	9	1
Payment terms	US v. Nonsubject	0	9	2
Price	US v. Nonsubject	0	6	5
Product consistency	US v. Nonsubject	1	8	1
Product range	US v. Nonsubject	3	7	1
Quality meets industry standards	US v. Nonsubject	1	8	2
Quality exceeds industry standards	US v. Nonsubject	2	7	2
Reliability of supply	US v. Nonsubject	1	5	5
Supplier diversity	US v. Nonsubject	1	4	6
Technical support/service	US v. Nonsubject	3	6	1
U.S. transportation costs	US v. Nonsubject	3	7	1

Table continued.

Table II-13 Continued
Pure magnesium: Count of purchasers' responses comparing U.S.-produced and imported product, by factor and country pair

Factor	Country pair	Superior	Comparable	Inferior
Availability	China v. Nonsubject sources	3	5	0
Delivery terms	China v. Nonsubject sources	0	5	3
Delivery time	China v. Nonsubject sources	1	4	3
Discounts offered	China v. Nonsubject sources	3	5	0
Minimum quantity requirements	China v. Nonsubject sources	0	7	0
Packaging	China v. Nonsubject sources	0	6	2
Payment terms	China v. Nonsubject sources	1	3	4
Price	China v. Nonsubject sources	3	3	2
Product consistency	China v. Nonsubject sources	1	4	3
Product range	China v. Nonsubject sources	0	5	3
Quality meets industry standards	China v. Nonsubject sources	1	5	2
Quality exceeds industry standards	China v. Nonsubject sources	0	6	2
Reliability of supply	China v. Nonsubject sources	0	6	2
Supplier diversity	China v. Nonsubject sources	1	6	1
Technical support/service	China v. Nonsubject sources	0	4	3
U.S. transportation costs	China v. Nonsubject sources	0	6	2

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

Note: A rating of superior means that price/U.S. transportation cost is generally lower. For example, if a firm reported "U.S. superior," it meant that the U.S. product was generally priced lower than the imported product.

Comparison of U.S.-produced and imported pure magnesium

In order to determine whether U.S.-produced pure magnesium can generally be used in the same applications as imports from China, U.S. producers, importers, and purchasers were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in tables II-14 to II-16, ***, almost all U.S. importers, and most purchasers reported that pure magnesium from domestic sources and imported from China and nonsubject countries can always or frequently be used interchangeably. *** reported that imports from nonsubject countries were frequently rather than always interchangeable with domestic and Chinese product since some applications require high purity magnesium which is not produced by all countries. Importer *** reported that interchangeability is affected by the producer of the product, quality of the product, technical requirements, and due diligence. Purchaser *** reported that Chinese magnesium is of lower quality, less consistent, and that product flows are more vulnerable due to supply chain and transportation risks. Purchaser *** reported that Chinese material could be used in place of U.S. material in certain markets where specifications are less stringent and that formatting differences such as t-bars/saws (as opposed to ingots) and quality issues could affect interchangeability.

Some purchasers reported that some applications of pure magnesium require higher grades of purity. For example, purchaser *** reports that higher grades of purity are required for aerospace applications. Purchaser ***, a ***, reported that it has a requirement of 99.90 percent purity ***. Purchaser *** reported that ultra-high purity grade magnesium has a purity of 99.97 percent, that many recycler/scrap manufacturers cannot reach this purity, and that U.S. Magnesium, Dead Sea Magnesium, and Merelex Corporation, are the only manufacturers it is aware of that can produce this purity.

Purchaser *** reported that *** of all of its production requires pure magnesium, and it prefers to use pure magnesium for *** percent of its production. It also reports that this requirement is ***, and that using magnesium alloys due to supply variability disrupts production, causes inefficiency, and impacts products and customers.[16]

[16] Purchaser *** counsel, e-mail message to USITC staff, March 27, 2023.

Table II-14
Pure magnesium: Count of U.S. producers reporting the interchangeability between product produced in the United States and in other countries, by country pair

Country pair	Always	Frequently	Sometimes	Never
U.S. vs. China	***	***	***	***
U.S. vs. other	***	***	***	***
China vs. Other	***	***	***	***

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

Table II-15
Pure magnesium: Count of importers reporting the interchangeability between product produced in the United States and in other countries, by country pair

Country pair	Always	Frequently	Sometimes	Never
U.S. vs. China	5	4	1	0
U.S. vs. other	6	4	1	0
China vs. Other	5	2	0	0

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

Table II-16
Pure magnesium: Count of purchasers reporting the interchangeability between product produced in the United States and in other countries, by country pair

Country pair	Always	Frequently	Sometimes	Never
U.S. vs. China	2	6	2	0
U.S. vs. other	2	6	3	0
China vs. Other	1	5	2	0

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

In addition, U.S. producers, importers, and purchasers were asked to assess how often differences other than price were significant in sales of pure magnesium from the United States, subject, or nonsubject countries. As seen in tables II-17 to II-19, the majority of U.S. producers, importers, and purchasers reported that differences other than price are sometimes or never significant in sales of pure magnesium across sources. Purchasers reported that such differences include quality, supply flexibility, availability, supply chain risks, payment terms, incoterms, applicable law, packaging, transportation cost, and general terms of sale. Purchaser *** reported that it rated factors other than price from a historical perspective since it was unable to obtain pure magnesium from the United States.

Table II-17
Pure magnesium: Perceived importance of factors other than price between product produced in the United States and in other countries reported by U.S. producers, by country pair

Country pair	Always	Frequently	Sometimes	Never
U.S. vs. China	0	0	1	1
U.S. vs. other	0	0	1	1
China vs. Other	0	0	1	1

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

Table II-18
Pure magnesium: Perceived importance of factors other than price between product produced in the United States and in other countries reported by U.S. importers, by country pair

Country pair	Always	Frequently	Sometimes	Never
U.S. vs. China	2	1	5	2
U.S. vs. other	2	2	5	2
China vs. Other	1	2	4	2

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

Table II-19
Pure magnesium: Perceived importance of factors other than price between product produced in the United States and in other countries reported by U.S. purchasers, by country pair

Country pair	Always	Frequently	Sometimes	Never
U.S. vs. China	2	1	6	1
U.S. vs. Other	3	1	6	1
China vs. Other	2	1	3	1

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

Elasticity estimates

This section discusses elasticity estimates. No parties commented on these estimates in their prehearing or posthearing brief.

U.S. supply elasticity

The domestic supply elasticity for pure magnesium measures the sensitivity of the quantity supplied by U.S. producers to changes in the U.S. market price of pure magnesium. The elasticity of domestic supply depends on several factors including the level of excess capacity, the ease with which producers can alter capacity, producers' ability to shift to production of other products, the existence of inventories, and the availability of alternate markets for U.S.-produced pure magnesium. Analysis of these factors above indicates that the U.S. industry has limited ability to increase shipments to the U.S. market; a range of 1 to 3 is suggested.

U.S. demand elasticity

The U.S. demand elasticity for pure magnesium measures the sensitivity of the overall quantity demanded to a change in the U.S. market price of pure magnesium. This estimate depends on factors discussed above such as the existence, availability, and commercial viability of substitute products, as well as the component share of the pure magnesium in the production of any downstream products. Based on the available information, the aggregate demand for pure magnesium is likely to be moderately inelastic; a range of -0.5 to -1.0 is suggested.

Substitution elasticity

The elasticity of substitution depends upon the extent of product differentiation between the domestic and imported products.[17] Product differentiation, in turn, depends upon such factors as quality (e.g., chemistry, appearance, etc.) and conditions of sale (e.g., availability, sales terms/discounts/promotions, etc.). Based on available information, the elasticity of substitution between U.S.-produced pure magnesium and imported pure magnesium is likely to be in the range of 4 to 6. Factors contributing to substitutability include no requirements for particular countries of origin or producers, similarities between domestically produced pure magnesium and subject imports across multiple purchase factors, and interchangeability between domestic and product. Factors reducing substitutability include limited availability of domestic product, some reported quality differences, and purchaser preferences for pure magnesium from domestic sources.

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

Part III: Condition of the U.S. industry

Overview

The Commission issued a U.S. producer questionnaire to ten firms based on information contained in the response to the notice of institution. Five firms provided usable data on their operations, two of which reported producing pure magnesium.[1] [2] The information in this section of the report was compiled from responses to the Commission's questionnaires of two firms, U.S. Magnesium and Magpro LLC ("Magpro"), which accounted for the majority of U.S. production of pure magnesium during 2021, and supplied information on their operations in this review.[3] U.S. Magnesium uses the electrolytic method and produces primary magnesium by extracting magnesium from brines of the surface waters of the Great Salt Lake in Utah.[4] U.S. Magnesium produces both pure and alloy magnesium.

Magpro produces both pure and alloy and primary and secondary magnesium in its production facilities.[5] ***.[6] Magpro claims it is the second largest producer of primary magnesium in the United States and that it is one of the largest recyclers of magnesium in the world and reports it produces and sells *** magnesium in the United States.[7] Magpro relies on magnesium dross, a form of waste produced when

[1] One firm, ***, reported it did not produce magnesium during the period of review. Advanced Magnesium Alloys Corporation ("AMACOR"), Luxfer Magtech Inc. ("Luxfer Magtech"), and Magnesium Products of America Inc. ("MPA") reported only producing other magnesium. Luxfer Magtech is a grinder and MPA is a diecaster. Despite several attempts, staff did not receive a response from ***.

[2] During the hearing, U.S. Magnesium reported that Western Magnesium has "raised some capital and are making plans to start construction on a pilot plant for production in the USA, so I think that the higher prices in the USA market are a positive benefit to them to potentially start that project." Hearing transcript p. 85, (Slade). Western Magnesium's website (www.westernmagnesium.com) claims it has made >99.8 magnesium at their pilot facility and that they have talked to purchasers. However, the website provides no evidence that they have sold any product, just testing and refining their process.

[3] U.S. Magnesium is the *** U.S. producer and reported it accounts for *** percent of the production of pure magnesium in the United States in 2021. Domestic interested parties' response to the notice of institution, March 31, 2022, p. 13.

[4] See Part I for more information on the manufacturing process.

[5] Hearing transcript, pp. 20, 22, (Haack); domestic interested parties' posthearing brief, exh 1, p 18. Magpro estimates ***. Domestic interested parties' posthearing brief, exh. 13.

[6] Domestic interested parties' posthearing brief, exh.1, p. 18.

[7] Domestic interested parties' posthearing brief, exh.1, p. 18; Hearing transcript pp. 20, 22, (Haack).

magnesium alloys are produced. It extracts magnesium oxide and converts it to magnesium using a proprietary thermal reduction process.[8] For its primary production, Magpro, "thermal reduces magnesium containing compounds to make primary magnesium that is pure, 99 A+ magnesium."[9] Magpro consumes the majority of the pure magnesium it produces in the production of alloy or off-specification pure magnesium.[10]

Table III-1 presents events in the U.S. industry since January 1, 2019.

[8] Hearing Transcript p. 22, (Haack).

[9] Hearing Transcript, p. 54, (Haack). Kaiser disputes Magpro's claim that it is a producer of pure magnesium. Kaiser's posthearing brief, pp. 13-14.

[10] Hearing transcript, pp. 54-55, (Haack). Magpro indicated to Kaiser that it uses pure magnesium to dilute the scrap that it recycles when making some of its secondary grades and reportedly told Kaiser it does not currently sell any pure magnesium. Kaiser's posthearing brief, p. 1. ***. Domestic interested parties' posthearing, exh. 1, p. 18.

Table III-1
Pure magnesium: Developments in the U.S. industry since 2019

Item	Firm	Event
***	***	***
***	***	***
Equipment Failure	U.S. Magnesium	U.S. Magnesium suffered equipment failure in September 2021 at its plant in Utah, ***. The shutdown of capacity in Utah was cited as the reason for the average price of imports into the United States increasing to $5.13 per pound at the end of September 2021 and $7.63 per pound at the end of October 2021.
Input (Chlorine) Shortage	U.S. Magnesium	The closure of multiple chlorine manufacturing facilities in 2021 led to extended lead times to purchase chlorine supplies of as much as 50%. It also led to reduced product allocation for customers in an attempt to keep all critical customers (primarily water and wastewater systems) in operation. As of November 2022, the nation's second-largest manufacturer of dry chlorine products, BioLab in Westlake, Louisiana, was on track to reopen its hurricane-damaged facilities by summer 2023.
***	***	***
***	***	***
Permit Denied	U.S. Magnesium	The Utah Division of Environmental Quality denied a request in December 2022 from U.S. Magnesium to dredge and extend its intake canals from the Great Salt Lake. Declining water levels after several years of drought threatened to disrupt production. U.S. Magnesium can reapply with more detail about water impacts and undergo another public comment period. ***

Source: *** U.S. Producer questionnaire response, Part II-2a; *** U.S. Producer questionnaire response, Part II-12; Domestic interested party's response to the notice of institution, March 31, 2022, p. 27; "Mineral Commodity Summaries: Magnesium Metal," U.S. Geological Survey, January 2022, https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-magnesium-metal.pdf; *** U.S. Producer questionnaire response, Part II-2a; "Status of Chlorine Product Availability and Pricing," U.S. Environmental Protection Agency, May 18, 2022, https://www.epa.gov/waterutilityresponse/status-chlorine-product-availability-and-pricing; "BioLab Plant Reopening Will Impact Chlorine Prices for 2023." PoolMagazine (blog), November 4, 2022, https://www.poolmagazine.com/cleaning/biolab-plant-reopening-will-impact-chlorine-prices-for-2023/; *** U.S. Producer questionnaire response, Part II-2b; Larson, Leia, "Utah DEQ denies U.S. Magnesium's request to extend water canals deeper into the Great Salt Lake," The Salt Lake Tribune, December 29, 2022, https://www.sltrib.com/news/environment/2022/12/29/utah-deq-denies-us-magnesiums/; "Mineral Commodity Summaries 2023," U.S. Geological Survey, January 2023, p. 113; USITC Commission Staff Fieldwork at U.S. Magnesium, March 7, 2023.

Note: Brackets indicate business proprietary information revealed in questionnaires for which no public source was found.

Changes experienced by the industry

Producers in the United States were asked to report any change in the character of their operations or organization relating to the production of pure magnesium since 2019. Both producers indicated in their questionnaires that they had experienced such changes. In September 2021, U.S. Magnesium declared a force majeure[11] on magnesium products due to equipment failure and has idled all magnesium production since August 2022, with no scheduled resumption date.[12] U.S. Magnesium indicated it has already spent millions of dollars to repair and restore the equipment and to get its facility back into operation and that workers are currently rebuilding cells much of the repair work at issue has largely been completed.[13] During these repairs, U.S. Magnesium is being funded by the Renco Group and claims it has "not abandoned the magnesium market" and states the current situation a "temporary challenge."[14] [15] Magpro reported it increased capacity and production and was able to supply customers who experienced shortages due to the force majeure.[16] U.S. Magnesium also

[11] Magnesium Supply Cut Prompts Kaiser To Declare Force Majeure At Warrick Aluminium Rolling Mill – Aluminium Insider

[12] Hearing transcript, p. 16, (Thayer). *** questionnaire response, section II-2a.

[13] Hearing transcript, pp. 17-18, (Thayer).

[14] Hearing transcript, p. 18, (Thayer).

[15] ***. Staff field trip report, U.S. Magnesium, March 7, 2023.

[16] Hearing transcript, p. 24, (Haack).

indicated the COVID-19 pandemic had disrupted its ability to obtain supplies and highly specialized labor that delayed the completion of repairs.[17]

As U.S. Magnesium was its largest supplier of magnesium, the limited availability of magnesium led Kaiser Aluminum to declare force majeure at its Warrick aluminum can sheet rolling mill in Indiana on July 7, 2022.[18] Kaiser Aluminum lifted the force majeure on September 6, 2022 after it secured magnesium from alternative sources to meet its requirements for the remainder of 2022, and Kaiser Warrick plans to return to full production.[19]

Table III-2 presents the changes identified by these producers.

Table III-2
Pure magnesium: U.S. producers' reported changes in operations since January 1, 2019, by type of change and firm

Type of change	Firm name and narrative on changes in operations
Expansions	***
Prolonged shutdowns or curtailments	***
Force majeure events	***
Other	***

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

[17] Hearing transcript, p. 17, (Thayer). *** questionnaire response, section II-2b.

[18] Aluminum Insider, https://aluminiuminsider.com/magnesium-supply-cut-prompts-kaiser-to-declare-force-majeure-at-warrick-aluminium-rolling-mill/, retrieved April 6, 2023.

[19] Kaiser Aluminum webpage, https://investors.kaiseraluminum.com/investors/news/news-details/2022/Kaiser-Aluminum-Lifts-Force-Majeure-at-its-Warrick-Rolling-Mill-09-06-2022/default.aspx, retrieved April 6, 2023.

Anticipated changes in operations

The Commission asked domestic producers to report anticipated changes in the character of their operations relating to the production of pure magnesium. Both producers indicated in their questionnaires that they anticipated such changes. U.S. Magnesium indicated it plans on ***.[20] Magpro indicated ***. Their responses appear in table III-3.

Table III-3
Pure magnesium: U.S. producers' anticipated changes in operations, by type of change and firm

Firm	Narrative on anticipated changes in operations
***	***
***	***

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

[20] *** questionnaire response, section II-2c.

Domestic production-related activities

Table III-4 presents the magnesium production process from each of the U.S. producers. U.S. Magnesium extracts magnesium chloride from the Great Salt Lake to produce pure and alloy magnesium. Magpro melts and recycles magnesium to produce primary magnesium. Advanced Magnesium Alloys Corporation ("AMACOR") recycles magnesium scrap, Luxfer Magtech is a grinder, and MPA is a diecaster.

Table III-4
All magnesium: U.S. producers' magnesium production process, by firm

Firm	Narrative on magnesium production process
Amacor	***
Luxfer Magtech	***
Magpro	***
MPA	***
U.S. Magnesium	***

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

Table III-5 presents data on whether each responding U.S. producer is able to produce pure magnesium containing at least 99.8 percent magnesium. *** are the only firms that reported being able to produce pure magnesium containing at least 99.8 percent magnesium. *** are not able to produce pure magnesium containing at least 99.8 percent magnesium.

Table III-5
All magnesium: U.S. producers' production capability and actual production of pure magnesium ingots containing at least 99.8 percent magnesium

Count in number of firms reporting

Firm	Able to produce and actually produced	Able to produce, but did not actually produce	Not able to produce
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
All producers	***	***	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Table III-6 shows data for sufficient production-related activities reported by all U.S. producers of both pure and other magnesium. Complete data is unavailable because ***.

Table III-6
All magnesium: U.S. producers' aggregate data for sufficient production-related activities by factor

Firm	Amacor	Luxfer Magtech	Magpro	MPA	U.S. Magnesium
Capital investments (Value in 1,000 dollars)	***	***	***	***	***
Technical expertise (Value in 1,000 dollars)	***	***	***	***	***
Value added (percent)	***	***	***	***	***
Employment (number of production related workers)	***	***	***	***	***
Quantity, type and source of parts (Value in 1,000 dollars)	***	***	***	***	***

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

Note. Capital investments are the reported investments from a greenfield perspective. Technical expertise is the aggregated range of R&D expenses reported from 2019-2021 but no producers reported R&D expenses. Value added data are the range of conversion costs divided by total COGS percentages reported from 2019-2021 by each firm. Employment data are aggregate annual production and related workers (PRWs) range from 2019-2021. Quantity, type and source of parts data are the aggregate annual domestic raw materials costs for 2019-2021. Raw material costs assume that all reported raw materials are domestic. ***.

Table III-7 shows the count of U.S. producers' rating complexity of operations. U.S. producers of pure and other magnesium were requested to provide data on factors related to their production-related activities. Luxfer Magtech reported *** and rated the complexity of grinding operations at a *** out of 5.[21] [22] AMACOR rated the complexity of its recycling operations a *** out of 5. MPA reported it operates ***. MPA rated the complexity of grinding operations at a *** out of 5, as ***.[23] [24] Both U.S. Magnesium and Magpro rated the complexity of their primary magnesium production and recycling operations at a *** out of 5.

Table III-7
All magnesium: Count of U.S. producers' rating complexity of operations

Count in number of firms reporting.

Firm	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
All producers	***	***	***	***	***

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

Note: Ratings are on a scale of 1-5 with 1 being the least complex and 5 the most. All magnesium includes pure magnesium and other magnesium.

[21] ***. *** U.S. producer questionnaire response, section I-8c.
[22] See appendix F for more information on diecasting operations.
[23] ***. *** questionnaire response, section I-9c.
[24] See appendix F for more information on grinding operations.

Table III-8 presents the narratives of the complexity of operations as reported by all U.S. producers of pure and other magnesium.

Table III-8
All magnesium: U.S. producers' narratives regarding complexity and importance of overall operations

Firm	Firm name and narrative on complexity of overall operations
Amacor	***
Luxfer Magtech	***
Magpro	***
MPA	***
U.S. Magnesium	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Table III-9 presents the narrative responses for all U.S. producers of both pure and other magnesium on their complexity of operations by capital investments, technical expertise, value added, employment, quantity, type and source of parts, and costs and activities.

Table III-9
All magnesium: U.S. producer * narratives regarding complexity of operations, by item**

Item	Firm name and narrative on complexity of operations
Capital investments	***
Technical expertise	***
Value added	***
Employment	***
Quantity, type and source of parts	***
Costs and activities	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Table III-9 Continued
All magnesium: U.S. producer * narratives regarding complexity of operations, by item**

Item	Firm name and narrative on complexity of operations
Capital investments	***
Technical expertise	***
Value added	***
Employment	***
Quantity, type and source of parts	***
Costs and activities	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Table III-9 Continued
All magnesium: U.S. producer * narratives regarding complexity of operations, by item**

Item	Firm name and narrative on complexity of operations
Capital investments	***
Technical expertise	***

Table continued.

Table III-9 Continued
All magnesium: U.S. producer * narratives regarding complexity of operations, by item**

Item	Firm name and narrative on complexity of operations
Technical expertise continued	***
Value added	***

Table continued.

Table III-9 Continued
All magnesium: U.S. producer * narratives regarding complexity of operations, by item**

Item	Firm name and narrative on complexity of operations
Employment	***
Quantity, type and source of parts	***
Costs and activities	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Table III-9 Continued
All magnesium: U.S. producer * narratives regarding complexity of operations, by item**

Item	Firm name and narrative on complexity of operations
Capital investments	***
Technical expertise	***
Value added	***
Employment	***
Quantity, type and source of parts	***
Costs and activities	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Table III-9 Continued
All magnesium: U.S. producer * narratives regarding complexity of operations, by item**

Item	Firm name and narrative on complexity of operations
Capital investments	***
Technical expertise	***
Value added	***
Employment	***
Quantity, type and source of parts	***
Costs and activities	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Installed capacity and production on same machinery

Table III-10 shows U.S. producers' installed and practical capacity and production of pure and other magnesium on same equipment. [25] Installed overall capacity remained relatively ***, overall increasing *** percent during 2019-21 and was *** percent higher in interim 2022 compared to interim 2021. However, due to the force majeure of U.S. Magnesium, installed overall production, practical overall capacity and practical overall production decreased during 2019-21.[26] Installed overall production decreased in each year, decreasing *** percent during 2019-21 and was *** percent lower in interim 2022 compared to interim 2021. Installed overall capacity utilization decreased *** percentage points from 2019 to 2021 and was *** percentage points lower in interim 2022 compared to interim 2021.

Similarly, practical overall capacity decreased *** percent during 2019-21 and practical overall production decreased *** percent during the same period. Practical overall capacity and practical overall production were *** and *** percent lower in interim 2022 compared to interim 2021, respectively. Capacity utilization for practical overall capacity increased from *** percent in 2019 to *** percent in 2021 and was *** percentage points lower in interim 2022 compared to interim 2021.

[25] ***.

[26] The decrease was driven by ***.

Table III-10
Pure magnesium and other magnesium: U.S. producers' installed and practical capacity and production on the same equipment as subject production, by period

Capacity and production in metric tons; utilization in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Installed overall	Capacity	***	***	***	***	***
Installed overall	Production	***	***	***	***	***
Installed overall	Utilization	***	***	***	***	***
Practical overall	Capacity	***	***	***	***	***
Practical overall	Production	***	***	***	***	***
Practical overall	Utilization	***	***	***	***	***
Practical pure magnesium	Capacity	***	***	***	***	***
Practical pure magnesium	Production	***	***	***	***	***
Practical pure magnesium	Utilization	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

U.S. production, capacity, and capacity utilization

Table III-11 presents U.S. producers' production, capacity, and capacity utilization. Practical pure magnesium capacity of responding U.S. producers decreased in each year, overall decreasing by *** percent during 2019-21 and was *** percent lower in interim 2022 compared to interim 2021.[27] While the force majeure of U.S. Magnesium drove the decrease in the U.S. industry, Magpro reported ***.

Similarly, production of pure magnesium overall decreased by *** percent during 2019-21 and was *** percent lower in interim 2022 compared to interim 2021, largely accounted for by ***.[28]

[27] Magpro reported ***. *** questionnaire response, section II-2a.
[28] ***.

Consequently, capacity utilization for pure magnesium initially decreased by *** percentage points from 2019 to 2020 before increasing by *** percentage points from 2020 to 2021, increasing overall by *** percentage points. This increase in capacity utilization was driven by *** reduction in practical pure magnesium capacity. The capacity utilization for pure magnesium was *** percentage points lower in interim 2022 compared to interim 2021. U.S. Magnesium operated at *** percent capacity utilization during 2021 and during the interim periods.

U.S. Magnesium represented over *** percent of U.S. production of pure magnesium in 2021. U.S. Magnesium's share of U.S. production ***.

Table III-11
Pure magnesium: Firm-by-firm U.S. producers' average production capacity, by period
Capacity in metric tons

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-11 Continued
Pure magnesium: Firm-by-firm U.S. producers' production, by period
Production in metric tons

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-11 Continued
Pure magnesium: Firm-by-firm U.S. producers' capacity utilization, by period
Capacity utilization ratios in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-11 Continued
Pure magnesium: Firm-by-firm U.S. producers' share of U.S. production, by period
Share of production in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Figure III-1
Pure magnesium: U.S. producers' capacity, production, and capacity utilization, by period

* * * * * * *

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

Constraints on capacity

Table III-12 presents responding U.S. producers' constraints on capacity. Both responding U.S. producers reported constraints in the manufacturing process. Besides the ***, *** reported the labor force as a constraint to production operations.[29] Additionally, the current drought conditions in Utah have caused historic lows in the water level of the Great Salt Lake, resulting in U.S. Magnesium submitting an emergency repair and protection application on March 7, 2022. These conditions have created "an imminent threat of economic hardship and loss of property for U.S. Magnesium."[30] The state of Utah denied the request in December 2022.[31] U.S. Magnesium states that it currently has no difficulty using their intake canals as the recent heavy precipitation has replenished lake levels in the Great Salt Lake. However, they will continue to plan for an eventual dredging of their intake canals to guard against lower lake levels in future years.[32]

[29] ***. *** questionnaire responses, section II-3d.

[30] Utah 401 Water Quality Certification Application Supplemental Information, August 29, 2022, Appendix C.

[31] "Utah DEQ denies U.S. Magnesium's request to extend water canals deeper into the Great Salt Lake," December 29, 2022, https://www.sltrib.com/news/environment/2022/12/29/utah-deq-denies-us-magnesiums/. ***. Phone call with ***, February 13, 2023.

[32] Hearing transcript, pp. 81-82 (Thayer).

Table III-12
Pure magnesium: U.S. producers' reported production constraints since January 1 2019, by type of change and firm

Type of production constraint	Firm name and narrative on production constraints
Production bottlenecks	***
Existing labor force	***
Existing labor force	***
Supply of material inputs	***
Logistics/transportation	***

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

Other magnesium and alternative products

As shown in table III-13, only *** reported producing both pure and other magnesium on same machinery. Between *** percent of production during 2019-21 was other magnesium.[33] Additionally, *** reported producing other magnesium in interim 2022. The share of production of other magnesium was *** in interim 2021 and *** in interim 2022.

Table III-13
Pure magnesium: U.S. producers' overall production on the same equipment as subject production, by period

Quantity in metric tons; shares in percent

Production type	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Pure magnesium	Quantity	***	***	***	***	***
Other magnesium	Quantity	***	***	***	***	***
Other production	Quantity	***	***	***	***	***
All out of scope production	Quantity	***	***	***	***	***
Total production	Quantity	***	***	***	***	***
Pure magnesium	Share	***	***	***	***	***
Other magnesium	Share	***	***	***	***	***
Other production	Share	***	***	***	***	***
All out of scope production	Share	***	***	***	***	***
Total production	Share	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

[33] ***.

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

Table III-14 presents U.S. producers' U.S. shipments, export shipments, and total shipments of pure magnesium. U.S. shipments accounted for *** of total shipments by quantity in 2019, 2021, and the interim periods, but accounted for *** percent in 2020, due to an increase in export shipments.[34] Quantity of U.S. shipments irregularly decreased by *** percent during 2019-21, decreasing by *** percent from 2019 to 2020 before increasing by *** percent from 2020 to 2021 and were *** percent lower in interim 2022 than in interim 2021.[35] The value of U.S. shipments moved in the same direction as quantity, decreasing by *** percent from 2019 to 2020, increasing by *** percent from 2020 to 2021, decreasing overall by *** percent during 2019-21. The value of U.S. shipments was *** percent lower in interim 2021 compared to interim 2022. The unit value of U.S. shipments increased by *** percent from 2019 to 2020 and decreased by *** percent from 2020 to 2021, overall increasing by *** percent during 2019-21. The unit value of U.S. shipments was *** percent higher in interim 2021 than in interim 2022.[36] [37]

Export shipments, by quantity and value, represented less than *** percent of total shipments in each full or partial period, except for 2020 when the share of export shipments was *** and *** percent, respectively. The quantity of export shipments increased by *** percent from 2019 to 2020 before decreasing by *** percent from 2020 to 2021, increasing overall by *** percent during 2019-21. Export shipments by quantity were *** percent lower in interim 2022 compared to interim 2021. The value of export shipments moved

[34] ***. Email from ***, January 27, 2023.

[35] ***. Email from ***, January 27, 2023.

[36] The decrease from 2020 to 2021 was largely led by ***. Email from ***, January 27, 2023. The higher unit values in interim 2022 compared to interim 2021 were led by ***. Email from ***, January 25, 2023.

[37] Magpro reported that in 2023, "prices have gradually declined…fairly significantly in the first quarter of {2023}. The contract season from last year is in place now for a lot of annual contracts that will remain the same, but spot purchases, the prices are down to more normal levels." Hearing pg. 91, Mr. Haack.

in the same direction as quantity, increasing by *** percent from 2019 to 2020, decreasing by *** percent from 2020 to 2021, increasing overall by *** percent during 2019-21. The value of export shipments was *** percent lower in interim 2021 compared to interim 2022. The unit value of export shipments decreased by *** percent from 2019 to 2020, increased by *** percent from 2020 to 2021, overall increasing by *** percent during 2019-21. The unit value of export shipments was *** percent higher in interim 2022 compared to interim 2021.

Table III-14
Pure magnesium: U.S. producers' shipments, by location of shipment and by period

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton; Shares in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
U.S. shipments	Quantity	***	***	***	***	***
Export shipments	Quantity	***	***	***	***	***
Total shipments	Quantity	***	***	***	***	***
U.S. shipments	Value	***	***	***	***	***
Export shipments	Value	***	***	***	***	***
Total shipments	Value	***	***	***	***	***
U.S. shipments	Unit value	***	***	***	***	***
Export shipments	Unit value	***	***	***	***	***
Total shipments	Unit value	***	***	***	***	***
U.S. shipments	Share of quantity	***	***	***	***	***
Export shipments	Share of quantity	***	***	***	***	***
Total shipments	Share of quantity	***	***	***	***	***
U.S. shipments	Share of value	***	***	***	***	***
Export shipments	Share of value	***	***	***	***	***
Total shipments	Share of value	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

U.S. producers' inventories

Table III-15 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**.** Responding U.S. producers' end-of-period inventories peaked in 2020 and declined thereafter, overall decreasing by *** percent and were *** percent lower in interim 2022 compared to interim 2021. The ratio of U.S. producers' end-of-period inventories to U.S. production ranged from *** percent in 2021 to *** percent in 2020 and was *** percent in interim 2021, compared to *** percent in interim 2022. The ratio of U.S. producers' inventories to U.S. shipments ranged from *** percent in 2021 to *** percent in 2020 and was *** percent in interim 2021, compared with *** percent in interim 2022.

Table III-15
Pure magnesium: U.S. producers' inventories, by period
Quantity in metric tons; inventory ratios in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
End-of-period inventory	Quantity	***	***	***	***	***
Inventory to U.S. production	Ratio	***	***	***	***	***
Inventory to U.S. shipments	Ratio	***	***	***	***	***
Inventory to total shipments	Ratio	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

U.S. employment, wages, and productivity

Table III-16 shows U.S. producers' employment-related data. The number of production related workers ("PRWs") reported by U.S. producers fluctuated during 2019-21, decreasing overall by *** percent but were *** percent higher in interim 2022 compared to interim 2021.[38] The majority of the decrease occurred from 2019 to 2020 when the number of PRWs decreased by *** percent. Total hours worked decreased by *** percent from 2019 to 2020 and increased by *** percent from 2020 to 2021, decreasing overall by *** percent and were *** percent higher in interim 2022 compared to interim 2021. Wages paid decreased in each year, decreasing overall by *** percent during 2019-21, but were *** percent higher in interim 2022 compared to interim 2021. Like wages paid, productivity decreased in each year, decreasing overall by *** percent during 2019-21. Productivity was *** percent lower in interim 2022 compared to interim 2021. Unit labor cost increased in each year, overall increasing by *** percent during 2019-21 and was *** percent higher in interim 2022 compared to interim 2021.[39]

Table III-16
Pure magnesium: U.S. producers' employment related data, by period

Item	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Production and related workers (PRWs) (number)	***	***	***	***	***
Total hours worked (1,000 hours)	***	***	***	***	***
Hours worked per PRW (hours)	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***
Hourly wages (dollars per hour)	***	***	***	***	***
Productivity (metric tons per 1,000 hours)	***	***	***	***	***
Unit labor costs (dollars per metric ton)	***	***	***	***	***

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

[38] U.S. Magnesium currently employees 300 people onsite, two thirds of which work in the magnesium sector. Hearing p. 69, Thayer. ***. ***. Domestic Interested Parties' posthearing brief, exh. 1, p. 44.

[39] ***. *** U.S. producers questionnaire response, section II-2b.

Financial experience of U.S. producers

Background[40]

Magpro and U.S. Magnesium provided usable financial results on their pure magnesium operations. Both U.S. producers reported financial data on a calendar year and on the basis of GAAP.[41] [42] [43]

Figure III-2 presents each responding firm's share of the total reported net sales quantity in 2021.

[40] The following abbreviations may be used in the tables and/or text of this section: generally accepted accounting principles ("GAAP"), fiscal year ("FY"), net sales ("NS"), cost of goods sold ("COGS"), selling, general, and administrative expenses ("SG&A expenses"), average unit values ("AUVs"), research and development ("R&D"), and return on assets ("ROA").

[41] ***. U.S. producers' questionnaire response, section III-2A.

[42] ***. U.S. producers' questionnaire response, section II-2a, and email from ***, January 27, 2023.

[43] ***. U.S. producers' questionnaire responses, section III-5.

Figure III-2
Pure magnesium: Share of net sales quantity in 2021, by firm

* * * * * * *

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

Operations on pure magnesium

Table III-17 presents aggregated data on U.S. producers' operations in relation to pure magnesium, while table III-18 presents corresponding changes in AUVs. Table III-19 presents selected company-specific financial data.

Table III-17
Pure magnesium: Results of operations of U.S. producers, by item and period

Quantity in metric tons; value in 1,000 dollars; ratios in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Total net sales	Quantity	***	***	***	***	***
Total net sales	Value	***	***	***	***	***
COGS: Raw materials	Value	***	***	***	***	***
COGS: Direct labor	Value	***	***	***	***	***
COGS: Other factory	Value	***	***	***	***	***
COGS: Total	Value	***	***	***	***	***
Gross profit or (loss)	Value	***	***	***	***	***
SG&A expenses	Value	***	***	***	***	***
Operating income or (loss)	Value	***	***	***	***	***
Interest expense	Value	***	***	***	***	***
All other expenses	Value	***	***	***	***	***
All other income	Value	***	***	***	***	***
Net income or (loss)	Value	***	***	***	***	***
Depreciation/amortization	Value	***	***	***	***	***
Cash flow	Value	***	***	***	***	***
COGS: Raw materials	Ratio to NS	***	***	***	***	***
COGS: Direct labor	Ratio to NS	***	***	***	***	***
COGS: Other factory	Ratio to NS	***	***	***	***	***
COGS: Total	Ratio to NS	***	***	***	***	***
Gross profit	Ratio to NS	***	***	***	***	***
SG&A expense	Ratio to NS	***	***	***	***	***
Operating income or (loss)	Ratio to NS	***	***	***	***	***
Net income or (loss)	Ratio to NS	***	***	***	***	***

Table continued.

Table III-17 Continued
Pure magnesium: Results of operations of U.S. producers, by item and period

Shares in percent; unit values in dollars per metric ton; count in number of firms reporting

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
COGS: Raw materials	Share	***	***	***	***	***
COGS: Direct labor	Share	***	***	***	***	***
COGS: Other factory	Share	***	***	***	***	***
COGS: Total	Share	***	***	***	***	***
Total net sales	Unit value	***	***	***	***	***
COGS: Raw materials	Unit value	***	***	***	***	***
COGS: Direct labor	Unit value	***	***	***	***	***
COGS: Other factory	Unit value	***	***	***	***	***
COGS: Total	Unit value	***	***	***	***	***
Gross profit or (loss)	Unit value	***	***	***	***	***
SG&A expenses	Unit value	***	***	***	***	***
Operating income or (loss)	Unit value	***	***	***	***	***
Net income or (loss)	Unit value	***	***	***	***	***
Operating losses	Count	***	***	***	***	***
Net losses	Count	***	***	***	***	***
Data	Count	***	***	***	***	***

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

Note: Shares represent the share of COGS.

Table III-18
Pure magnesium: Changes in AUVs between comparison periods

Changes in percent

Item	2019-21	2019-20	2020-21	Jan-Sep 2021-22
Total net sales	▲***	▲***	▼***	▲***
COGS: Raw materials	▼***	▲***	▼***	▲***
COGS: Direct labor	▲***	▲***	▼***	▲***
COGS: Other factory	▲***	▲***	▲***	▲***
COGS: Total	▲***	▲***	▲***	▲***

Table continued.

Table III-18 Continued
Pure magnesium: Changes in AUVs between comparison periods

Changes in dollars per metric ton

Item	2019-21	2019-20	2020-21	Jan-Sep 2021-22
Total net sales	▲***	▲***	▼***	▲***
COGS: Raw materials	▼***	▲***	▼***	▲***
COGS: Direct labor	▲***	▲***	▼***	▲***
COGS: Other factory	▲***	▲***	▲***	▲***
COGS: Total	▲***	▲***	▲***	▲***
Gross profit or (loss)	▼***	▼***	▼***	▼***
SG&A expense	▼***	▲***	▼***	▲***
Operating income or (loss)	▼***	▼***	▼***	▼***
Net income or (loss)	▼***	▼***	▼***	▼***

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

Table III-19
Pure magnesium: Firm-by-firm total net sales quantity, by period

Net sales quantity

Quantity in metric tons

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm total net sales value, by period

Net sales value

Value in 1,000 dollars

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm cost of goods sold ("COGS"), by period

COGS

Value in 1,000 dollars

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm gross profit or (loss), by period

Gross profit or (loss)

Value in 1,000 dollars

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm selling, general, and administrative ("SG&A") expenses, by period

SG&A expenses

Value in 1,000 dollars

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm operating income or (loss), by period

Operating income or (loss)

Value in 1,000 dollars

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm net income or (loss), by period

Net income or (loss)

Value in 1,000 dollars

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm ratio of COGS to net sales value, by period

COGS to net sales ratio

Ratios in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm ratio of gross profit or (loss) to net sales value, by period

Gross profit or (loss) to net sales ratio

Ratios in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm ratio of SG&A expenses to net sales value, by period

SG&A expenses to net sales ratio

Ratios in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm ratio of operating income or (loss) to net sales value, by period

Operating income or (loss) to net sales ratio

Ratios in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm ratio of net income or (loss) to net sales value, by period

Net income or (loss) to net sales ratio

Ratios in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit net sales value, by period

Unit net sales value

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit raw material costs, by period

Unit raw material

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit direct labor cost, by period

Unit direct labor

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit other factory costs, by period

Unit other factory costs

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit COGS, by period

Unit COGS

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit gross profit or (loss), by period

Unit gross profit or (loss)

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit SG&A expenses, by period

Unit SG&A expenses

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit operating income or (loss), by period

Unit operating income or (loss)

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table III-19 Continued
Pure magnesium: Firm-by-firm unit net income or (loss), by period

Unit net income or (loss)

Unit values in dollars per metric ton

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

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

Net sales

As shown in table III-17, total net sales quantity decreased by *** percent from 2019 to 2020 before increasing by *** percent from 2020 to 2021, and overall decreased by *** percent from 2019 to 2021. Total net sales quantity was *** percent lower in interim 2022 compared with interim 2021. Total net sales value also decreased from 2019 to 2020 by *** percent, then increased by *** percent in 2021 and overall decreased by *** percent from 2019 to 2021. Total net sales value was *** percent lower in interim 2022 compared with interim 2021. As shown in table III-19, *** reported a decrease in sales quantity and value from 2019 to 2020 (***)[44] followed by an increase in 2021. *** reported higher sales volume and revenue in interim 2022 compared with interim 2021, while ***'s sales were significantly lower during the same comparable period.[45] On a per-metric ton basis, sales value increased from $*** in 2019 to $*** in 2020 then declined to $*** in 2021, and was higher in interim 2022 at $*** compared with interim 2021 at $***. *** reported an increase in their sales unit values from 2019 to 2020 followed by a decrease in 2021, and differed in directional trends between the comparable interim periods.[46]

[44] Email from ***, January 27, 2023.
[45] ***. Email from ***, January 27, 2023.
[46] ***. Email from ***, February 1, 2023.

Cost of goods sold and gross profit or loss

Raw material costs, direct labor and other factory costs accounted for *** percent of total COGS, respectively, in 2021.

Raw material costs, the smallest component of COGS, decreased from 2019 to 2021, and were higher in interim 2022 compared with interim 2021. On a per-metric ton basis, raw material costs increased from $*** in 2019 to $*** in 2020 then decreased to $*** in 2021, and were higher in interim 2022 at $*** compared with interim 2021 at $***. As shown in table III-19, the per metric-ton value of raw material costs varied widely between the two U.S. producers (due to the difference in production process), but followed the same directional trends during the full year periods, and in interim 2022 compared with interim 2021.[47] [48] [49] As a ratio to net sales, raw material costs increased from *** percent in 2019 to *** percent in 2020 then decreased to *** percent in 2021, and were higher in interim 2022 at *** percent compared with interim 2021 at *** percent.

[47] ***. U.S. producers' questionnaire responses, section I-7a.

[48] ***. Email from ***, January 30, 2023.

[49] ***. Email from ***, January 27, 2023. ***. Email from ***, February 9, 2023.

Table III-20 presents raw materials, by type.

Table III-20
Pure magnesium: Raw material costs in 2021

Value in 1,000 dollars; share of value in percent

Item	Value	Share of value
Magnesium chloride	***	***
Magnesium containing scrap	***	***
All raw materials	***	***

Source: Compiled from data submitted in response to Commission questionnaires

Note: ***.

Direct labor costs, the second largest component of COGS, decreased from 2019 to 2021 and were higher in interim 2022 compared with interim 2021. On a per-metric ton basis, direct labor costs increased from $*** in 2019 to $*** in 2020 then decreased to $*** in 2021, and were higher in interim 2022 at $*** compared with interim 2021 at $***. As shown in table III-19, directional trends between the *** varied from 2019 to 2020, while *** reported a decrease in their direct labor costs per-metric ton values from 2020 to 2021, and *** reported higher direct labor costs in interim 2022 compared with interim 2021. As a ratio to net sales, direct labor costs increased from *** percent in 2019 to *** percent in 2020 then decreased to *** percent in 2021, and were higher in interim 2022 at *** percent compared with interim 2021 at *** percent (reflecting the lower sales volumes in that period).

Other factory costs, the largest component of COGS, decreased by *** percent in 2020, then increased by *** percent in 2021 (largely reflecting ***), and were *** percent higher in interim 2022 compared with interim 2021. On a per-metric ton basis, other factory costs increased from $*** in 2019 to $*** in 2021, and were higher in interim 2022 at $*** compared with interim 2021 at $***. *** reported an increase in their other factory costs during the full year periods, and in the comparable interim periods. As a ratio to net sales, other factory costs decreased from *** percent in 2019 to *** percent in 2020, then increased to *** percent in 2021, and were higher interim 2022 at *** percent compared with interim 2021 at *** percent.[50]

[50] ***. Emails from ***, January 27, and February 3, 2023.

Total COGS decreased by *** percent from 2019 to 2020, before increasing by *** percent in 2021, and was *** percent higher in interim 2022 compared with interim 2021. On a per-metric ton basis, total COGS increased from $*** in 2019, to $*** in 2020 and $*** in 2021, and was higher in interim 2022 at $*** compared with interim 2021 at $***. As a ratio to net sales, total COGS increased from *** percent in 2019 to *** in 2021, and was higher in interim 2022 at *** percent compared with interim 2021 at *** percent.

As shown in table III-17, gross profit decreased from $*** in 2019 to a *** of $*** in 2020 and a greater *** of $*** in 2021. The reported gross *** was higher in interim 2022 at $*** compared with a *** of $*** in interim 2021. As a ratio to net sales, gross profit decreased from *** percent in 2019 to a *** percent in 2020 and a *** percent in 2021, and was *** percent in interim 2022 compared with a *** percent in interim 2021. As shown in table III-19, results between the two U.S. producers varied ***, while *** reported increasing gross profits from 2019 to 2021 and a higher gross profit in interim 2022 compared with interim 2021, *** reported a decrease in its gross profit from 2019 ($***) to a *** in 2020 and a *** in 2021, *** also reported a higher gross *** in interim 2022 ($***) compared with interim 2021 ($***).

SG&A expenses and operating income or loss

U.S. producers' SG&A expenses decreased by *** from 2019 to 2021, and were *** percent higher in interim 2022 compared with interim 2021. As shown in table III-19, ***'s SG&A expenses increased from 2019 to 2021, while those of *** decreased during the same period. *** reported higher SG&A expenses in interim 2022 compared with interim 2021. The corresponding SG&A expense ratio (total SG&A expenses divided by total sales value) increased from *** percent in 2019 to *** percent in

2020, then decreased to *** percent in 2021, and was higher in interim 2022 at *** percent compared with interim 2021 at *** percent.[51]

U.S. producers' operating income declined from *** in 2019 to *** in 2020 and *** in 2021. Operating income was lower in interim 2022 at *** compared with interim 2021 at ***. As a ratio to net sales, operating income decreased from a *** percent in 2019 to a *** percent in 2021, and was *** percent in interim 2022 compared with a *** percent in interim 2021. Similar to gross profits, the two U.S. producers varied in trends during the full years and in the interim periods. *** reported an increase in its operating profit from 2019 to 2021, and higher operating profits in interim 2022 compared with interim 2021, while *** increased from 2019 to 2021, and were higher in interim 2022 compared with interim 2021.

All other expenses and net income or loss

Classified below the operating income level are interest expenses, other expenses, and other income (largely reported by ***). Total interest expenses increased from 2019 to 2021, and were higher in interim 2022 compared with interim 2021.[52] Other expenses increased from 2019 to 2020 then declined in 2021, and were higher in interim 2022 compared with interim 2021. [53] Other income increased from 2019 to 2021 and was lower in interim 2022 compared with interim 2021.[54]

Net *** increased from $*** in 2019 to $*** in 2020 and $*** in 2021, and were higher in interim 2022 at $*** compared with interim 2021 at $***. As a ratio to net sales, net income declined from a *** percent in

[51] ***. Email from ***, January 27, 2023.

[52] Interest expenses reported were comprised of ***. Email from ***, January 7, 2023 and email from ***, January 30, 2023.

[53] ***. Email from ***, January 30, 2023 and *** producer questionnaire response, section III-10.

[54] ***. Email from ***, January 27, 2023.

2019 to a *** percent in 2021, and was much lower in interim 2022 at a *** compared with a *** percent in interim 2021. On a firm-by-firm basis, *** reported an increase in its net income from 2019 to 2021 and higher net income in interim 2022 compared with interim 2021, while *** reported declines from 2019 to 2021, and in interim 2022 compared with interim 2021.[55]

Capital expenditures and R&D expenses[56]

Table III-21 presents capital expenditures, by firm and table III-22 present the firms' narrative explanations of the nature, focus, and significance of their capital expenditures. Total capital expenditures increased from 2019 to 2021 and was higher in interim 2022 compared with interim 2021. ***. *** capital expenditures increased from 2019 to 2021 and were slightly lower between the comparable interim periods.

Table III-21
Pure magnesium: U.S. producers' capital expenditures, by firm and period

Value in 1,000 dollars

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Magpro	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

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

Table III-22
Pure magnesium: Narrative descriptions of U.S. producers' capital expenditures, by firm

Firm	Narrative on capital expenditures
Magpro	***
U.S. Magnesium	***

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

[55] Due to the differences in ***, a variance analysis is not presented in this report.
[56] ***.

Assets and return on assets

Table III-23 presents data on the U.S. producers' total net assets, while table III-24 presents their operating ROA.[57] Table III-25 presents U.S. producers' narrative responses explaining their major asset categories and any significant changes in asset levels over time. The U.S. producers' total net assets overall decreased from 2019 to 2021 (largely reflecting *** data). The calculated ROA declined from a *** percent in 2019 to a *** percent in 2021.

Table III-23
Pure magnesium: U.S. producers' total net assets, by firm and period

Value in 1,000 dollars

Firm	2019	2020	2021
Magpro	***	***	***
U.S. Magnesium	***	***	***
All firms	***	***	***

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

Table III-24
Pure magnesium: U.S. producers' ROA, by firm and period

Ratio in percent

Firm	2019	2020	2021
Magpro	***	***	***
U.S. Magnesium	***	***	***
All firms	***	***	***

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

Table III-25
Pure magnesium: Narrative descriptions of U.S. producers' total net assets, by firm

Firm	Narrative on assets
Magpro	***
U.S. Magnesium	***

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

[57] The operating 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 on a product-specific basis.

Part IV: U.S. imports and the foreign industry

U.S. imports

Overview

The Commission issued questionnaires to 19 firms that may have imported pure magnesium between 2019 to 2021.[1] Twelve firms provided data and information in response to the questionnaires, and one firm indicated that they had not imported pure magnesium during the period for which data were collected.[2] [3] While *** importer reported imports of pure magnesium from China in 2021, based on official Commerce statistics, importers' questionnaire data accounted the vast majority of total U.S. imports of pure magnesium during 2021.[4] In light of the data coverage by the Commission's questionnaires, import data in this report are based on questionnaire responses for pure magnesium.[5]

Supplemental data was collected for imports of primary and secondary alloy magnesium ingots that meet ASTM specifications for alloy magnesium, pure granular magnesium (including turnings, chips and powder) having a maximum physical dimension (i.e., length or diameter) of one inch or less, and alloy granular magnesium.[6]

[1] Despite staff's efforts, six firms did not provide a response.

[2] Staff sent questionnaires to a total of 50 potential importers of pure and other magnesium and a total of 18 firms that imported either pure or other mangeisum submitted a questionnaire response. *** submitted a response with limited trade data so it was not incorporated into the report. Eleven firms reported importing other magnesium. See app. F for more information.

[3] In addition to these responses, a U.S. importer questionnaire was submitted late by MTALX Limited. Due to the timing of this submission, data for MTALX are not incorporated into this report and have not been verified. ***. MTALX Limited's importer questionnaire response, sections II-5a and II-6a.

[4] According to official import statistics, there were only 12 metric tons of imports of pure magnesium from China in 2021. Please see app. G for official import stats for pure magnesium.

[5] Coverage statistics are based on HTUS subheading 8104.11.0000. While pure magnesium can also be imported under HTSUS subheadings 8104.19.00, 8104.20.00, 8104.30.00, 8104.90.00, 3824.90.11, 3824.90.19 and 9817.00.90, these are basket categories and would overstate the imports of pure magnesium into the United States.

[6] Data for imports of both other magnesium and pure magnesium are presented in app. F.

Imports from subject and nonsubject countries

Table IV-1 presents information on U.S. imports of pure magnesium from China and all other sources over the period examined. Imports of pure magnesium from China were *** and represented *** percent of total imports of pure magnesium and *** percent of the share of value of total imports in that period.[7]

The majority of imports were accounted for by two firms, ***[8]. The quantity of imports of pure magnesium from nonsubject sources fluctuated, increasing by *** percent from 2019 to 2020 before decreasing by *** percent from 2020 to 2021, overall increasing by *** percent during 2019-21, largely driven by ***.[9] [10] However, the quantity of imports from nonsubject sources were *** percent higher in interim 2022 compared to interim 2021. *** reported an increase in imports from interim 2021 to interim 2022. This increase was largely led by ***, which said the increase in imports was a result of ***.[11] The value of imports from nonsubject sources increased by *** percent during 2019-21, increasing by *** percent from 2019 to 2020 and decreasing by *** percent from 2020 to 2021, and was *** percent higher in interim 2022 compared to interim 2021.[12] Consequently, the unit value of nonsubject sources increased

[7] ***. *** questionnaire response, section II-7.

[8] ***.

[9] *** reports that the increase in imports from 2019 to 2020 was a ***. The reduction in demand starting in 2020, lasting into 2021, was a result of ***. Email from ***, January 27, 2023.

[10] ***. Email from ***, January 23, 2023. *** reported a ***. *** supplemental response, February 3, 2023.

[11] *** supplemental response, February 3, 2023.

[12] *** importers reported higher value of imports in interim 2022 compared to 2021. ***. Email from ***, January 27, 2023. ***. *** supplemental response, February 3, 2023.

overall during 2019-21 by *** percent and was *** percent higher in interim 2022 compared to interim 2021.

The ratio of nonsubject imports to production increased by *** percentage points from 2019 to 2020 before increasing *** from 2020 to 2021. However, the same ratio *** from interim 2021 to interim 2022 likely due to the ***.

Table IV-1
Pure magnesium: U.S. imports by source and period

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton; Share and ratio in percent

Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
China	Quantity	***	***	***	***	***
Nonsubject sources	Quantity	***	***	***	***	***
All import sources	Quantity	***	***	***	***	***
China	Value	***	***	***	***	***
Nonsubject sources	Value	***	***	***	***	***
All import sources	Value	***	***	***	***	***
China	Unit value	***	***	***	***	***
Nonsubject sources	Unit value	***	***	***	***	***
All import sources	Unit value	***	***	***	***	***
China	Share of quantity	***	***	***	***	***
Nonsubject sources	Share of quantity	***	***	***	***	***
All import sources	Share of quantity	***	***	***	***	***
China	Share of value	***	***	***	***	***
Nonsubject sources	Share of value	***	***	***	***	***
All import sources	Share of value	***	***	***	***	***
China	Ratio	***	***	***	***	***
Nonsubject sources	Ratio	***	***	***	***	***
All import sources	Ratio	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

Table IV-2
Pure magnesium: Changes in import quantity, values, and unit values between comparison periods

Changes in percent

Source	Measure	2019-21	2019-20	2020-21	Jan-Sep 2021-22
China	%Δ Quantity	***	***	***	***
Nonsubject sources	%Δ Quantity	▲***	▲***	▼***	▲***
All import sources	%Δ Quantity	▲***	▲***	▼***	▲***
China	%Δ Value	***	***	***	***
Nonsubject sources	%Δ Value	▲***	▲***	▼***	▲***
All import sources	%Δ Value	▲***	▲***	▼***	▲***
China	%Δ Unit value	***	***	***	***
Nonsubject sources	%Δ Unit value	▲***	▲***	▲***	▲***
All import sources	%Δ Unit value	▲***	▲***	▲***	▲***

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

Note: Percentages shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Figure IV-1
Pure magnesium: U.S. import quantities and average unit values, by source and by period

* * * * * * *

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

U.S. importers' imports subsequent to September 2022

The Commission requested importers to indicate whether they had imported or arranged for the importation of pure magnesium from China for delivery after September 30, 2022. *** reported imports from China after September 2022. *** accounted for the largest overall share of arranged imports during October 2022-September 2023, as its arranged imports *** throughout the period. *** accounted for the largest share of arranged imports in October-December 2022 but reported no other arranged imports.

Table IV-3
Pure magnesium: U.S. importers' arranged imports, by source and period

Quantity in metric tons

Source	Oct-Dec 2022	Jan-Mar 2023	Apr-Jun 2023	Jul-Sept 2023	Total
China	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***

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

U.S. inventories of imported merchandise

Table IV-4 presents data for inventories of U.S. imports of pure magnesium from China and all other sources held in the United States. Inventories for imports from China were *** reported in interim 2022. Inventories for imports from nonsubject sources fluctuated, increasing by *** percent from 2019 to 2020 before decreasing by *** percent during 2020 to 2021, overall decreasing by *** percent during 2019-21 and were *** percent lower in interim 2022 compared to interim 2021.[13] The ratios of ending period inventories to imports, U.S. shipments of imports, and total shipments of imports all declined over the period of review, overall decreasing by ***, ***, and *** percentage points during 2019-21, respectively. Similarly, the ratios of ending period inventories to imports, U.S. shipments of imports, and total shipments of imports were, respectively, ***, ***, and *** percentage points lower in interim 2022 compared to interim 2021.

[13] Over *** percent of ending inventories from nonsubject sources were held by *** in each full and partial period, and *** reported an increase in imports from interim 2021 to interim 2022, driving down the interim 2022 ratios.

Table IV-4

Pure magnesium: U.S. importers' end-of-period inventories of imports, by source and period

Quantity in metric tons; Ratios in percent

Measure	Source	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Inventories quantity	China	***	***	***	***	***
Ratio to imports	China	***	***	***	***	***
Ratio to U.S. shipments of imports	China	***	***	***	***	***
Ratio to total shipments of imports	China	***	***	***	***	***
Inventories quantity	Nonsubject	***	***	***	***	***
Ratio to imports	Nonsubject	***	***	***	***	***
Ratio to U.S. shipments of imports	Nonsubject	***	***	***	***	***
Ratio to total shipments of imports	Nonsubject	***	***	***	***	***
Inventories quantity	All	***	***	***	***	***
Ratio to imports	All	***	***	***	***	***
Ratio to U.S. shipments of imports	All	***	***	***	***	***
Ratio to total shipments of imports	All	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

The industry in China

Overview

Foreign producer questionnaires were sent to 19 firms and one firm, Nanjing Welbow Metals Co., Ltd, ("Welbow Metals") provided a response.[14] Welbow Metals reported it accounted for about *** percent of total production of pure magnesium in China in 2021.[15] China's primary magnesium capacity was 1.8 million metric tons in 2020 while its production was 886,000 metric tons in the same year, accounting for 88.6 percent of magnesium production in the world.[16] In 2020, the industry was operating at less than 50 percent of capacity.[17]

Table IV-5 presents information on the pure magnesium operations of the responding producer and exporter in China.

Table IV-5
Pure magnesium: Summary data for Welbow Metals, 2021

Firm	Production (metric tons)	Share of reported production (percent)	Exports to the United States (metric tons)	Share of reported exports to the United States (percent)	Total shipments (metric tons)	Share of firm's total shipments exported to the United States (percent)
Welbow Metals	***	***	***	***	***	***
All firms	***	***	***	***	***	***

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

[14] One firm reported it did not produce pure magnesium in China. Despite staff's efforts, no response was received from the other 17 firms.

[15] Welbow Metals' questionnaire response, section II-6.

[16] Total global production for 2020 is estimated to be one million metric tons. USGS Minerals yearbook, Domestic interested party's prehearing brief, Exh. 5

[17] USGS Minerals yearbook, Domestic interested party's prehearing brief, Exh. 5

Table IV-6 presents events in China's pure magnesium industry since January 1, 2019.

Table IV-6
Pure magnesium: Recent developments in the Chinese industry

Item	Firm	Event
Smelters closed	Magnesium smelting enterprises in Yulin, Fugu County, Shaanxi province, China	In August and September of 2021, the local government of the area of Yulin in Shaanxi province ordered 35 of about 50 magnesium smelters closed until the end of the year and the rest to cut production by fifty percent in order to meet energy use requirements.
Tax reduction	Western China	China announced that it would remove a 15 percent tax on magnesium produced in certain areas of the western part of the country, effective March 1, 2021. The tax exemption was part of a policy to encourage development of the magnesium industry in the western part of China and increase consumption.
Expansion	Yunhai Special Metals	Yunhai Special Metals announced in 2022 a plan to spend 4.7 billion yuan ($656 million) to build four new magnesium projects, including a project in Shanxi province to increase output by 100,000 MT annually.

Source: Hume, Neil, "China's magnesium shortage threatens global car industry," Financial Times, October 19, 2021, https://www.ft.com/content/1611e936-08a5-4654-987e-664f50133a4b, retrieved May 2, 2022; "Fugu develops 'magnesium' business and continues to write a new chapter in the industry," INEWS, March 5, 2022, https://inf.news/en/economy/0ca2dfe5f218de659374b873edf21970.html, retrieved May 2, 2022; Domestic interested party's response to the notice of institution, March 31, 2022, p. 32; "Mineral Commodity Summaries: Magnesium Metal," U.S. Geological Survey, January 2022, https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-magnesium-metal.pdf; Shihua, Tang, "China's Yunhai Special Metals Jumps on USD656 Million Capacity Expansion Plans," Yicai Global, November 25, 2022, https://www.yicaiglobal.com/news/china-yunhai-special-metals-jumps-on-usd656-million-capacity-expansion-plans, retrieved April 4, 2023.

Changes in operations

Producers in China were asked to report any change in the character of their operations or organization relating to the production of pure magnesium since 2019. Table IV-7 presents the changes identified by Welbow Metals.

Table IV-7
Pure magnesium: Reported changes in operations by firms in China, since January 1, 2019

Item	Firm name and narrative on changes in operations
Plant openings	***
Expansions	***

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

Operations on pure magnesium

Table IV-8 presents data on Welbow Metals' installed and practical capacity. Welbow Metals reports it operated at *** percent capacity utilization for its pure magnesium production, in all periods ***.[18] Additionally, Welbow Metals stated it that uses *** to produce ***.[19] Installed and practical capacity *** during 2019-21 but increased from *** metric tons in interim 2021 to *** metric tons in interim 2022.[20]

Table IV-8
Pure magnesium: Welbow Metal's installed and practical capacity and production on the same equipment as subject production, by period

Capacity and production in metric tons; utilization in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Installed overall	Capacity	***	***	***	***	***
Installed overall	Production	***	***	***	***	***
Installed overall	Utilization	***	***	***	***	***
Practical overall	Capacity	***	***	***	***	***
Practical overall	Production	***	***	***	***	***
Practical overall	Utilization	***	***	***	***	***
Practical pure magnesium	Capacity	***	***	***	***	***
Practical pure magnesium	Production	***	***	***	***	***
Practical pure magnesium	Utilization	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

[18] Email from ***, January 31, 2023.
[19] Email from ***, January 31, 2023.
[20] Welbow Metals reported ***. Welbow Metals questionnaire response, section II-3a.

Table IV-9 presents the responding Chinese producer's data on the pure magnesium industry in China. The *** of Welbow Metals' shipments were used for internal consumption to produce ***. Production remained constant from 2019-21 and was *** percent higher in interim 2022 compared to interim 2021. Welbow Metals reported that it exports only to ***. These exports fluctuated, overall increasing by *** percent during 2019-21 and were *** percent lower in interim 2022 compared to interim 2021.[21] End of period inventory levels represented a *** share of production, ranging from *** percent during the full and partial periods.

Table IV-9
Pure magnesium: Data on industry by Welbow Metals, by item and period

Quantity in metric tons; Value in 1,000 dollars

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Capacity	Quantity	***	***	***	***	***
Production	Quantity	***	***	***	***	***
End-of-period inventories	Quantity	***	***	***	***	***
Internal consumption and transfers	Quantity	***	***	***	***	***
Commercial home market shipments	Quantity	***	***	***	***	***
Home market shipments	Quantity	***	***	***	***	***
Export shipments	Quantity	***	***	***	***	***
Total shipments	Quantity	***	***	***	***	***
Internal consumption and transfers	Value	***	***	***	***	***
Commercial home market shipments	Value	***	***	***	***	***
Home market shipments	Value	***	***	***	***	***
Export shipments	Value	***	***	***	***	***
Total shipments	Value	***	***	***	***	***

Table continued.

[21] Welbow Metals states it has ***. Welbow Metals questionnaire response, section II-9a.

Table IV-9 Continued
Pure magnesium: Data on industry by Welbow Metals, by item and period

Unit values in dollars per metric tons; Shares in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Internal consumption and transfers	Unit value	***	***	***	***	***
Commercial home market shipments	Unit value	***	***	***	***	***
Home market shipments	Unit value	***	***	***	***	***
Export shipments	Unit value	***	***	***	***	***
Total shipments	Unit value	***	***	***	***	***
Capacity utilization ratio	Ratio	***	***	***	***	***
Inventory ratio to production	Ratio	***	***	***	***	***
Inventory ratio to total shipments	Ratio	***	***	***	***	***
Internal consumption and transfers	Share	***	***	***	***	***
Commercial home market shipments	Share	***	***	***	***	***
Home market shipments	Share	***	***	***	***	***
Export shipments	Share	***	***	***	***	***
Total shipments	Share	***	***	***	***	***

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

Alternative products

While Welbow Metals did not report producing alternative products on same machinery, it does produce ***.

Production constraints

Table IV-10 presents production constraints reported by Welbow Metals.

Table IV-10
Pure magnesium: Foreign producers' reported production constraints since January 1, 2019, by type of change and firm

Type of production constraint	Firm name and narrative on production constraints
Other constraints	***

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

Exports

According to GTA, the leading export markets for pure magnesium from China are the Netherlands, Japan, and Canada (table IV-11). During 2021, the United States accounted for less than 0.05 percent of exports of pure magnesium from China. The Netherlands was the top export market for pure magnesium from China, accounting for 29.3 percent.

Table IV-11:
Pure magnesium: Exports from China, by period

Quantity in metric tons; Value in 1,000 dollars

Destination market	Measure	2016	2017	2018	2019	2020	2021
United States	Quantity	---	44	98	74	21	21
Netherlands	Quantity	51,111	67,512	54,347	61,129	46,776	82,433
Japan	Quantity	20,012	25,985	17,823	21,509	23,020	26,179
Canada	Quantity	14,295	22,297	23,171	18,338	14,364	26,713
India	Quantity	11,952	16,535	18,225	18,270	14,039	17,517
South Korea	Quantity	11,041	14,168	12,121	14,504	13,850	15,384
United Arab Emirates	Quantity	7,661	11,788	10,169	11,571	6,171	12,180
Bahrain	Quantity	3,470	4,613	4,694	5,541	4,216	8,240
Russia	Quantity	1,664	7,322	2,751	6,417	8,697	8,199
All other destination markets	Quantity	59,802	80,234	72,016	85,922	72,385	84,458
Non-U.S. destination markets	Quantity	181,008	250,454	215,317	243,201	203,518	281,303
All destination markets	Quantity	181,008	250,498	215,415	243,275	203,539	281,324
United States	Value	---	66	186	182	41	199
Netherlands	Value	120,399	146,160	122,268	148,473	108,245	351,467
Japan	Value	42,987	57,378	45,052	52,119	57,297	117,835
Canada	Value	30,769	50,402	57,304	44,057	29,816	112,057
India	Value	28,773	38,870	44,986	46,526	33,527	78,623
South Korea	Value	27,897	32,426	29,315	36,070	32,453	61,666
United Arab Emirates	Value	16,901	25,445	24,282	27,053	15,371	57,187
Bahrain	Value	7,364	10,146	10,847	13,575	9,847	35,596
Russia	Value	3,709	15,933	6,528	14,618	20,950	34,232
All other destination markets	Value	135,810	177,443	164,794	203,989	177,720	325,996
Non-U.S. destination markets	Value	414,609	554,203	505,375	586,479	485,226	1,174,660
All destination markets	Value	414,609	554,269	505,561	586,661	485,267	1,174,859

Table continued.

Table IV-11 Continued
Pure magnesium: Exports from China, by period

Unit values in dollars per metric ton; Shares in percent

Destination market	Measure	2016	2017	2018	2019	2020	2021
United States	Unit value	---	1,505	1,899	2,458	1,942	9,487
Netherlands	Unit value	2,356	2,165	2,250	2,429	2,314	4,264
Japan	Unit value	2,148	2,208	2,528	2,423	2,489	4,501
Canada	Unit value	2,152	2,260	2,473	2,402	2,076	4,195
India	Unit value	2,407	2,351	2,468	2,547	2,388	4,488
South Korea	Unit value	2,527	2,289	2,418	2,487	2,343	4,008
United Arab Emirates	Unit value	2,206	2,159	2,388	2,338	2,491	4,695
Bahrain	Unit value	2,122	2,199	2,311	2,450	2,336	4,320
Russia	Unit value	2,229	2,176	2,373	2,278	2,409	4,175
All other destination markets	Unit value	2,271	2,212	2,288	2,374	2,455	3,860
Non-U.S. destination markets	Unit value	2,291	2,213	2,347	2,411	2,384	4,176
All destination markets	Unit value	2,291	2,213	2,347	2,412	2,384	4,176
United States	Share of quantity	---	0.0	0.0	0.0	0.0	0.0
Netherlands	Share of quantity	28.2	27.0	25.2	25.1	23.0	29.3
Japan	Share of quantity	11.1	10.4	8.3	8.8	11.3	9.3
Canada	Share of quantity	7.9	8.9	10.8	7.5	7.1	9.5
India	Share of quantity	6.6	6.6	8.5	7.5	6.9	6.2
South Korea	Share of quantity	6.1	5.7	5.6	6.0	6.8	5.5
United Arab Emirates	Share of quantity	4.2	4.7	4.7	4.8	3.0	4.3
Bahrain	Share of quantity	1.9	1.8	2.2	2.3	2.1	2.9
Russia	Share of quantity	0.9	2.9	1.3	2.6	4.3	2.9
All other destination markets	Share of quantity	33.0	32.0	33.4	35.3	35.6	30.0
Non-U.S. destination markets	Share of quantity	100.0	100.0	100.0	100.0	100.0	100.0
All destination markets	Share of quantity	100.0	100.0	100.0	100.0	100.0	100.0

Source: Official exports statistics under HS subheading 8104.11 reported by China Customs in the Global Trade Atlas database, accessed January 30, 2023.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". United States is shown at the top followed by the top exporting countries in descending order of 2021 data.

Third-country China trade actions

In October 2004, Brazil imposed antidumping duties on magnesium from China. These duties applied to imports of metallic magnesium in unwrought forms, containing at least 99.8% by weight of magnesium, classified in HTS subheading 8104.11.00, and others (magnesium in raw form) classified in HTS subheading 8104.19. [22] Subsequently, Brazil conducted three reviews, with the most recent review in 2021. In September 2021, Brazil determined that the duties would be maintained. The current Brazilian antidumping duties are $1.18 per kilogram ($0.535 per pound).[23]

[22] Resolução CAMEX 27/2004; Resolução CAMEX 28/2005.
[23] Resolução GECEX 253/2021.

Global market

Table IV-12 presents global export data for magnesium, containing 99.8% or more magnesium by weight, unwrought, (by source in descending order of quantity for 2021).

Table IV-12
Pure Magnesium: Value of global exports by country and period

Value in 1,000 dollars; Shares in percent

Exporting country	Measure	2016	2017	2018	2019	2020	2021
United States	Value	23,978	19,642	23,964	23,409	24,970	22,542
China	Value	414,609	554,269	505,561	586,661	485,267	1,174,859
Netherlands	Value	80,026	79,958	88,257	83,867	60,381	127,083
Israel	Value	50,433	47,156	42,776	50,264	38,742	56,418
Turkey	Value	2,273	7,196	5,454	18,787	38,313	40,842
Russia	Value	7,501	14,428	11,742	13,934	23,524	24,181
Belgium	Value	4,514	4,901	4,192	4,850	4,681	14,321
Slovenia	Value	11,567	12,698	7,859	17,121	10,066	12,918
Italy	Value	1,954	2,520	1,654	3,511	1,807	8,356
Croatia	Value	2,390	2,552	3,892	4,606	5,345	5,431
Germany	Value	15,272	17,017	13,141	11,863	9,168	4,396
Kazakhstan	Value	900	47	1,081	1,501	1,811	2,088
All other exporters	Value	7,372	12,108	7,849	9,404	4,725	11,388
All reporting exporters	Value	622,788	774,491	717,422	829,777	708,799	1,504,824
United States	Share of value	3.9	2.5	3.3	2.8	3.5	1.5
China	Share of value	66.6	71.6	70.5	70.7	68.5	78.1
Netherlands	Share of value	12.8	10.3	12.3	10.1	8.5	8.4
Israel	Share of value	8.1	6.1	6.0	6.1	5.5	3.7
Turkey	Share of value	0.4	0.9	0.8	2.3	5.4	2.7
Russia	Share of value	1.2	1.9	1.6	1.7	3.3	1.6
Belgium	Share of value	0.7	0.6	0.6	0.6	0.7	1.0
Slovenia	Share of value	1.9	1.6	1.1	2.1	1.4	0.9
Italy	Share of value	0.3	0.3	0.2	0.4	0.3	0.6
Croatia	Share of value	0.4	0.3	0.5	0.6	0.8	0.4
Germany	Share of value	2.5	2.2	1.8	1.4	1.3	0.3
Kazakhstan	Share of value	0.1	0.0	0.2	0.2	0.3	0.1
All other exporters	Share of value	1.2	1.6	1.1	1.1	0.7	0.8
All reporting exporters	Share of value	100.0	100.0	100.0	100.0	100.0	100.0

Source: Official exports statistics under HS subheading 8104.11 reported by various national statistical authorities in the Global Trade Atlas database, accessed January 31, 2023.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". United States is shown at the top followed by the countries under order, all remaining top exporting countries in descending order of 2021 data.

Production capacity

The U.S. Geological Survey reports that there were approximately 1,070,000 metric tons of smelter production of primary magnesium outside of the United States in 2021 and an estimated 1,000,000 metric tons in 2022. China was estimated to have accounted for 930,000 metric tons of this total in 2021 and 900,000 in 2022, while Russia was the next largest producer with an estimated 58,000 metric tons in 2021 and 50,000 metric tons in 2022. Other, smaller sources of primary magnesium include Brazil, Israel, Kazakhstan, Turkey, and Ukraine.[24]

[24] "Mineral Commodity Summaries 2023," U.S. Geological Survey, January 2023, https://pubs.er.usgs.gov/publication/mcs2023, p. 113.

Part V: Pricing data

Factors affecting prices

Raw material costs

Raw materials such as magnesium chloride, magnesium containing scrap, and other raw material inputs are used to produce pure magnesium. In 2021, magnesium chloride was estimated to comprise the largest share of raw material costs (***) of pure magnesium production, followed by magnesium-containing scrap (***).[1] No U.S. producers or importers reported that their contracts are indexed to raw materials.

Transportation costs to the U.S. market

Transportation costs for pure magnesium shipped from China to the United States averaged 8.4 percent during 2021. These estimates were derived from official import data and represent the transportation and other charges on imports.[2]

U.S. inland transportation costs

*** U.S. producers and 9 of 12 responding U.S. importers reported that they typically arrange transportation to their customers. U.S. producers reported that their U.S. inland transportation costs ranged from *** percent while importers reported costs of *** percent.

Pricing practices

Pricing methods

U.S. producers and importers reported setting prices using transaction-by-transaction negotiations and contracts (table V-1). According to representatives from U.S. Magnesium and Magpro, prices are directly set in an individual negotiation between the supplier and consumer

[1] ***. For more information on raw material costs, please refer to Part IIIB.

[2] The estimated transportation costs were obtained by subtracting the customs value from the LDP value of the imports for 2021 and then dividing by the customs value based on the HTS statistical reporting numbers 8104.20.0000, 8104.11.0000, 8104.19.0000, 3824.99.1100, 3824.90.1100, 8104.30.0000, 8104.90.0000, 3824.99.1900, 3824.90.1900, and 9817.00.9040.

and are based on supply dynamics at the time of that negotiation. If the contract being negotiated is lost, prices are adjusted for the next negotiation.[3]

Table V-1
Pure magnesium: Count of U.S. producers' and importers' reported price setting methods

Method	U.S. producers	Importers
Transaction-by-transaction	2	9
Contract	2	6
Set price list	0	0
Other	0	1
Responding firms	2	12

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

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.

U.S. producers reported selling most of their pure magnesium under long-term contracts, with the next largest portion sold under annual contracts (table V-2). Producer ***. Producer ***. The average contract durations reported by U.S. producers were *** for long term contracts, and *** for short-term contracts.

Table V-2
Pure magnesium: U.S. producers' and importers' shares of commercial U.S. shipments by type of sale, 2021

Share in percent

Type of sale	U.S. producers	Importers
Long-term contracts	***	***
Annual contracts	***	***
Short-term contracts	***	***
Spot sales	***	***

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

Note: Because of rounding, figures may not add to the totals shown. No subject U.S. importers with commercial shipments reported percentages for this question.

Five purchasers reported that they purchase product annually, 3 purchase monthly, one purchases weekly, and one purchases daily. Four reported "other" as a purchasing frequency: *** reported a mix of annual and spot purchases, *** reported a mix of contract and

[3] Hearing transcript, pp. 86-90 (Slade and Haack).

spot purchases, and *** reported purchasing bi-annually. Frequently reported ranges of suppliers contacted before making a purchase were 1-2 suppliers, 2-4 suppliers, and 3-6 suppliers (reported by two purchasers each); no purchasers reported contacting more than 10 suppliers before making a purchase.

Sales terms and discounts

*** reported that they quote prices on a delivered basis, while *** reported that they quote prices on an f.o.b. basis. *** do not offer discounts; however, *** reported that it responds to verified competitor offers that include discounts for volumes, market share percentages, percentage of requirements, and terms of agreement.

Price leadership

Eight purchasers reported that U.S. Magnesium was a price leader in the pure magnesium market, two purchasers reported that Israeli supplier Dead Sea Magnesium was a price leader, one purchaser reported that Chinese supplier Crown Metals was a price leader, and one reported that Greenwich Metals was a price leader. One purchaser reported that it was unaware of any price leaders. Purchasers indicating the presence of price leaders reported that these price leaders led by quoting prices first, employing “take it or leave it” offers, commanding a price premium due to product purity, being the largest in the market, and by providing pricing based on quantities.

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 pure magnesium products shipped to unrelated U.S. customers during January 2019-September 2022.

Product 1.-- Pure magnesium ingots containing at least 99.90 percent magnesium.

Product 2.-- Pure magnesium ingots containing at least 99.8 percent magnesium but less than 99.9 percent magnesium by weight.

Product 3.-- Magnesium ingots containing 50 percent or greater, but less than 99.8 percent magnesium by weight, that do not conform to ASTM specifications for alloy magnesium (“off-specification pure” magnesium).

*** provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters.4 Pricing data reported by these firms accounted for approximately *** percent of U.S. producers' U.S. shipments of pure magnesium in 2021.5 ***.6

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

[4] 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. In addition to these responses, a U.S. importer questionnaire was received by staff on April 3, 2023 from MTALX Limited. MTLAX did not respond to staff questions; therefore, its response could not be verified or included. ***.

[5] Pricing coverage is based on commercial U.S. shipments reported in questionnaires. ***.

[6] ***.

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

Price in dollars per metric ton, quantity in metric tons, margin in percent.

Period	US price	US quantity	China price	China quantity	China margin
2019 Q1	***	***	***	***	***
2019 Q2	***	***	***	***	***
2019 Q3	***	***	***	***	***
2019 Q4	***	***	***	***	***
2020 Q1	***	***	***	***	***
2020 Q2	***	***	***	***	***
2020 Q3	***	***	***	***	***
2020 Q4	***	***	***	***	***
2021 Q1	***	***	***	***	***
2021 Q2	***	***	***	***	***
2021 Q3	***	***	***	***	***
2021 Q4	***	***	***	***	***
2022 Q1	***	***	***	***	***
2022 Q2	***	***	***	***	***
2022 Q3	***	***	***	***	***

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

Note: Product 1: Pure magnesium ingots containing at least 99.90 percent magnesium.***.

Figure V-1
Pure magnesium: Weighted-average prices and quantities of domestic and imported product 1, by source and quarter

Price of product 1

* * * * * * *

Volume of product 1

* * * * * * *

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

Note: Product 1: Pure magnesium ingots containing at least 99.90 percent magnesium. ***.

Table V-4
Pure magnesium: Weighted-average f.o.b. prices and quantities of domestic and imported product 2 and margins of underselling/(overselling), by source and quarter

Price in dollars per metric ton, quantity in metric tons, margin in percent.

Period	US price	US quantity	China price	China quantity	China margin
2019 Q1	***	***	***	***	***
2019 Q2	***	***	***	***	***
2019 Q3	***	***	***	***	***
2019 Q4	***	***	***	***	***
2020 Q1	***	***	***	***	***
2020 Q2	***	***	***	***	***
2020 Q3	***	***	***	***	***
2020 Q4	***	***	***	***	***
2021 Q1	***	***	***	***	***
2021 Q2	***	***	***	***	***
2021 Q3	***	***	***	***	***
2021 Q4	***	***	***	***	***
2022 Q1	***	***	***	***	***
2022 Q2	***	***	***	***	***
2022 Q3	***	***	***	***	***

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

Note: Product 2: Pure magnesium ingots containing at least 99.8 percent magnesium but less than 99.9 percent magnesium by weight. ***.

Figure V-2
Pure magnesium: Weighted-average prices and quantities of domestic and imported product 2, by source and quarter

Price of product 2

* * * * * * *

Volume of product 2

* * * * * * *

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

Note: Product 2: Pure magnesium ingots containing at least 99.8 percent magnesium but less than 99.9 percent magnesium by weight. ***.

Table V-5
Pure magnesium: Weighted-average f.o.b. prices and quantities of domestic and imported product 3 and margins of underselling/(overselling), by source and quarter

Price in dollars per metric ton, quantity in metric tons, margin in percent.

Period	US price	US quantity	China price	China quantity	China margin
2019 Q1	***	***	***	***	***
2019 Q2	***	***	***	***	***
2019 Q3	***	***	***	***	***
2019 Q4	***	***	***	***	***
2020 Q1	***	***	***	***	***
2020 Q2	***	***	***	***	***
2020 Q3	***	***	***	***	***
2020 Q4	***	***	***	***	***
2021 Q1	***	***	***	***	***
2021 Q2	***	***	***	***	***
2021 Q3	***	***	***	***	***
2021 Q4	***	***	***	***	***
2022 Q1	***	***	***	***	***
2022 Q2	***	***	***	***	***
2022 Q3	***	***	***	***	***

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

Note: Product 3: Magnesium ingots containing 50 percent or greater, but less than 99.8 percent magnesium by weight, that do not conform to ASTM specifications for alloy magnesium (“off-specification pure” magnesium). ***.

Figure V-3
Pure magnesium: Weighted-average prices and quantities of domestic and imported product 3, by source and quarter

Price of product 3

* * * * * * *

Volume of product 3

* * * * * * *

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

Note: Product 3: Magnesium ingots containing 50 percent or greater, but less than 99.8 percent magnesium by weight, that do not conform to ASTM specifications for alloy magnesium (“off-specification pure” magnesium). ***.

pure" magnesium). ***.

Price trends

Domestic prices fluctuated over the review period, with prices of products 1 and 3, but not product 2, experiencing large increases in 2022.[7] Domestic prices for product 1, the smallest volume product, fluctuated over the period of review but increased by *** percent in the second quarter of 2022 before more than doubling in the third quarter. Domestic prices for product 2, the highest volume product, increased in the first quarter of 2020 and then decreased back to 2019 levels beginning in the first quarter of 2021, where prices generally remained through the remainder of the period.[8] Domestic prices for product 3 first increased in the second quarter of 2020 and remained elevated until the fourth quarter of 2021 before more than doubling in 2022. Table V-6 summarizes the price trends, by country and by product.

Table V-6
Pure magnesium: Summary of price data, by product and source, January 2019-September 2022

Quantity in metric tons, price in dollars per metric ton

Product	Source	Number of quarters	Quantity of shipments	Low price	High price	First quarter price	Last quarter price	Percent change in price over period
Product 1	United States	***	***	***	***	***	***	***
Product 1	China	***	***	***	***	***	***	***
Product 2	United States	***	***	***	***	***	***	***
Product 2	China	***	***	***	***	***	***	***
Product 3	United States	***	***	***	***	***	***	***
Product 3	China	***	***	***	***	***	***	***

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

[7] Counsel for domestic interested parties attributed differences in pricing product trends between pricing products to differing contract terms, ***. Domestic interested parties' posthearing brief, pp.32-34.

[8] Product 2 prices increased by *** percent in the first quarter of 2020, which coincided with a *** percent drop in quantities sold; when domestic prices fell by *** percent in the first quarter of 2021, quantities sold increased by *** percent.

Note: Percent change column is percentage change from the first quarter 2019 to the last quarter in 2021.

Price comparisons[9]

As shown in table V-7, prices for pure magnesium imported from China were below those for U.S.-produced product in ***; the margin of underselling was *** percent. ***.

Table V-7
Pure magnesium: Instances of underselling/overselling and the range and average of margins, by product, January 2019 through September 2022

Quantity in metric tons; margins and differentials in percent.

Product	Type	Number of quarters	Quantity	Average margin	Minimum margin	Maximum margin
Product 1	Underselling	***	***	***	***	***
Product 2	Underselling	***	***	***	***	***
Product 3	Underselling	***	***	***	***	***
All products	Underselling	***	***	***	***	***
Product 1	Overselling	***	***	***	***	***
Product 2	Overselling	***	***	***	***	***
Product 3	Overselling	***	***	***	***	***
All products	Overselling	***	***	***	***	***

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

Prices in the U.S. market compared to non-U.S. markets

Producer *** reported that prices in non-U.S. markets are significantly lower than in the United States. Ten of 12 responding importers reported that they were aware of prices of pure magnesium in non-U.S. markets. Importers *** reported that prices in Europe follow Chinese pure magnesium prices, while *** reported that European prices are generally lower than U.S. prices. Importers *** reported that prices outside of the United States are lower than in other markets.

[9] In the original investigations, subject imports from China were priced lower than domestic product in 9 of 13 comparisons, with underselling margins ranging from 0.8 to 11.6 percent. In the remaining 4 instances, prices for Chinese magnesium were above those for the domestic product, with margins ranging from 0.1 and 3.5 percent. *Magnesium from China, Russia, and Ukraine (Final),* USITC Publication 2885, May 1995, p. I-61. In the second reviews, no firms reported pricing data for sales of imported pure magnesium from China. Pricing data were not collected for the expedited third and fourth reviews.

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
87 FR 11472, March 1, 2022	*Commission's institution of five-year reviews*	https://www.govinfo.gov/content/pkg/FR-2022-03-01/pdf/2022-04202.pdf
87 FR 11416, March 1, 2022	*Commerce's initiation of five-year reviews*	https://www.govinfo.gov/content/pkg/FR-2022-03-01/pdf/2022-04283.pdf
87 FR 35732, June 13, 2022	*Commerce's Final Results of Expedited Fifth Sunset Review of the Antidumping Duty Order*	https://www.govinfo.gov/content/pkg/FR-2022-06-13/pdf/2022-12707.pdf
87 FR 35997, June 14, 2022	*Commission's determinations to conduct full five-year reviews*	https://www.govinfo.gov/content/pkg/FR-2022-06-14/pdf/2022-12815.pdf
87 FR 65822, November 1, 2022	*Scheduling of a Full Five-Year Review*	https://www.govinfo.gov/content/pkg/FR-2022-11-01/pdf/2022-23763.pdf

APPENDIX B

LIST OF HEARING WITNESSES

CALENDAR OF PUBLIC HEARING

Those listed below appeared in the United States International Trade Commission's hearing:

Subject: Pure Magnesium from China

Inv. No.: 731-TA-696 (Fifth Review)

Date and Time: March 14, 2023 - 9:30 a.m.

OPENING REMARKS:

In Support of Continuation (**Stephen P. Vaughn**, King & Spalding LLP)
In Opposition to Continuation (**Clinton K. Yu**, Barnes & Thornburg LLP)

In Support of the Continuation of the Antidumping Duty Order:

King & Spalding LLP
Washington, DC
on behalf of

US Magnesium LLC ("US Magnesium")
United Steel, Paper and Forestry, Rubber, Manufacturing, Energy,
Allied Industrial and Service Workers International Union, Local 8319

Ron Thayer, President and Chief Executive Officer, US Magnesium

Susan Slade, Vice President of Sales and Marketing, US Magnesium

John Haack, President, MagPro LLC

Jennifer Lutz, Partner, ION Economics, LLC

Susannah Perkins, Economic Consultant, ION Economics, LLC

Stephen P. Vaughn) – OF COUNSEL

In Opposition to the Continuation of the Antidumping Duty Order:

Barnes & Thornburg LLP
Washington, DC
on behalf of

Kaiser Aluminum Corporation ("Kaiser Aluminum")

John Donnan, Executive Vice President, Chief Administrative Officer, and General Counsel, Kaiser Aluminum

Steve Fahey, Vice President, Global Supply Chain, Kaiser Aluminum

Nick Badgett, Senior Director, Raw Materials, Kaiser Aluminum

David M. Spooner)
Clinton K. Yu) – OF COUNSEL
Kristen McCannon Krishnamurthy)

REBUTTAL/CLOSING REMARKS:

In Support of Continuation (**Stephen P. Vaughn**, King & Spalding LLP)
In Opposition to Continuation (**David M. Spooner**, Barnes & Thornburg LLP)

-END-

APPENDIX C

SUMMARY DATA

Single like product: Co-

Table C-1
Pure magnesium: Summary data concerning the U.S. market, by item and period
Quantity=metric tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per metric ton; Period changes=percent--exceptions noted

	Reported data					Period changes			
	Calendar year			Jan-Sep		Calendar year			Jan-Sep
Item	2019	2020	2021	2021	2022	2019-21	2019-20	2020-21	2021-22
U.S. consumption quantity:									
Amount	***	***	***	***	***	▼***	▼***	▲***	▼***
Producers' share (fn1)	***	***	***	***	***	▼***	▼***	▲***	▼***
Importers' share (fn1):									
China	***	***	***	***	***	***	***	***	▲***
Nonsubject sources	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▼***	▲***
U.S. consumption value:									
Amount	***	***	***	***	***	▲***	▼***	▲***	▲***
Producers' share (fn1)	***	***	***	***	***	▼***	▼***	▲***	▼***
Importers' share (fn1):									
China	***	***	***	***	***	***	***	***	▲***
Nonsubject sources	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▼***	▲***
U.S. importers' U.S. shipments of imports from:									
China:									
Quantity	***	***	***	***	***	***	***	***	▲***
Value	***	***	***	***	***	***	***	***	▲***
Unit value	***	***	***	***	***	***	***	***	▲***
Ending inventory quantity	***	***	***	***	***	***	***	***	▲***
Nonsubject sources:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
All import sources:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
U.S. producers':									
Average capacity quantity	***	***	***	***	***	▼***	▼***	▼***	▼***
Production quantity	***	***	***	***	***	▼***	▼***	▼***	▼***
Capacity utilization (fn1)	***	***	***	***	***	▲***	▼***	▲***	▼***
U.S. shipments:									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▼***
Value	***	***	***	***	***	▼***	▼***	▲***	▼***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▲***
Export shipments:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▼***
Value	***	***	***	***	***	▲***	▲***	▼***	▼***
Unit value	***	***	***	***	***	▲***	▼***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
Inventories/total shipments (fn1)	***	***	***	***	***	▼***	▲***	▼***	▲***
Production workers	***	***	***	***	***	▼***	▼***	▲***	▲***
Hours worked (1,000s)	***	***	***	***	***	▼***	▼***	▲***	▲***
Wages paid ($1,000)	***	***	***	***	***	▼***	▼***	▼***	▲***
Hourly wages (dollars per hour)	***	***	***	***	***	▲***	▲***	▼***	▲***
Productivity (metric tons per 1,000 hours)	***	***	***	***	***	▼***	▼***	▼***	▼***
Unit labor costs	***	***	***	***	***	▲***	▲***	▲***	▲***

Table continued.

Table C-1 Continued
Pure magnesium: Summary data concerning the U.S. market, by item and period
Quantity=metric tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per metric ton; Period changes=percent--exceptions noted

	Reported data					Period changes			
	Calendar year			Jan-Sep		Calendar year			Jan-Sep
Item	2019	2020	2021	2021	2022	2019-21	2019-20	2020-21	2021-22
U.S. producers': Continued									
Net sales:									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▼***
Value	***	***	***	***	***	▼***	▼***	▲***	▼***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▲***
Cost of goods sold (COGS)	***	***	***	***	***	▲***	▼***	▲***	▲***
Gross profit or (loss) (fn2)	***	***	***	***	***	▼***	▼***	▼***	▼***
SG&A expenses	***	***	***	***	***	▼***	▼***	▼***	▲***
Operating income or (loss) (fn2)	***	***	***	***	***	▼***	▼***	▼***	▼***
Net income or (loss) (fn2)	***	***	***	***	***	▼***	▼***	▼***	▼***
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)	***	***	***	***	***	▼***	▼***	▼***	▼***
Capital expenditures	***	***	***	***	***	▲***	▲***	▲***	▲***
Research and development expenses	***	***	***	***	***	***	***	***	***
Net assets	***	***	***	***	***	▼***	▼***	▼***	***

Source: Compiled from data submitted in response to Commission questionnaires. 508-compliant tables containing these data are contained in parts I, III, and IV.

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

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

Expanded like product: All magnesium

Table C-2

All magnesium: Summary data concerning the U.S. market, by item and period

Quantity=metric tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per metric ton; Productivity=metric tons per 1,000 hours; Period changes=percent--exceptions noted

	Reported data					Period changes			
	Calendar year			Jan-Sep		Calendar year			Jan-Sep
Item	2019	2020	2021	2021	2022	2019-21	2019-20	2020-21	2021-22
U.S. consumption quantity:									
Amount	***	***	***	***	***	▼***	▼***	▲***	▼***
Producers' share (fn1)(fn2)	***	***	***	***	***	▼***	▼***	▲***	▼***
Importers' share (fn1):									
China, pure	***	***	***	***	***	▲***	***	***	▲***
Nonsubject sources, pure	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources, pure	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources, other	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▼***	▲***
U.S. consumption value:									
Amount	***	***	***	***	***	▲***	▼***	▲***	▲***
Producers' share (fn1):									
Non-toller domestic value (fn2)	***	***	***	***	***	▼***	▼***	▲***	▼***
Toller domestic value-added (fn2)	***	***	***	***	***	▼***	▼***	▲***	▼***
Fully domestic value (fn2)	***	***	***	***	***	▼***	▼***	▲***	▼***
Importers' share (fn1):									
China, pure	***	***	***	***	***	***	***	***	▲***
Nonsubject sources, pure	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources, pure	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources, other	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▼***	▲***
U.S. importers' U.S. shipments of imports from:									
China, pure:									
Quantity	***	***	***	***	***	***	***	***	▲***
Value	***	***	***	***	***	***	***	***	▲***
Unit value	***	***	***	***	***	***	***	***	▲***
Ending inventory quantity	***	***	***	***	***	***	***	***	▲***
Nonsubject sources, pure:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
All import sources, pure:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
All import sources, other:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▲***
All import sources:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▲***
Non-toller U.S. producers' and U.S. tollers':									
Non-toller: Average capacity quantity	***	***	***	***	***	▼***	▼***	▼***	▼***
Non-toller: Production quantity	***	***	***	***	***	▼***	▼***	▼***	▼***
Non-toller: Capacity utilization (fn1)	***	***	***	***	***	▲***	▼***	▲***	▼***
Toller: Average capacity quantity	***	***	***	***	***	▲***	***	▲***	***
Toller: Production quantity	***	***	***	***	***	▼***	▼***	▲***	▲***
Toller: Capacity utilization (fn1)	***	***	***	***	***	▼***	▼***	▲***	▲***
U.S. shipments (fn2):									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▼***
Value:									
Non-toller domestic value (fn2):	***	***	***	***	***	▲***	▼***	▲***	▲***
Toller domestic value-added (fn2)	***	***	***	***	***	▼***	▼***	▲***	▲***
Fully domestic value (fn2)	***	***	***	***	***	▲***	▼***	▲***	▲***
Unit value (fn2)	***	***	***	***	***	▲***	▲***	▲***	▲***

Table continued.

Table C-2 Continued

All magnesium: Summary data concerning the U.S. market, by item and period

Quantity=metric tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per metric ton; Productivity=metric tons per 1,000 hours; Period changes=percent--exceptions noted

	Reported data					Period changes			
	Calendar year			Jan-Sep		Calendar year			Jan-Sep
Item	2019	2020	2021	2021	2022	2019-21	2019-20	2020-21	2021-22
Non-toller U.S. producers' (fn4):									
Export shipments:									
Quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
Value	***	***	***	***	***	▲***	▲***	▼***	▼***
Unit value	***	***	***	***	***	▲***	▼***	▲***	▲***
Non-toller: Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
Non-toller: Inv./total shipments (fn1)	***	***	***	***	***	▼***	▲***	▼***	▲***
Production workers (fn3)	***	***	***	***	***	▼***	▼***	▼***	▼***
Hours worked (1,000s) (fn3)	***	***	***	***	***	▼***	▼***	▼***	▲***
Wages paid ($1,000) (fn3)	***	***	***	***	***	▼***	▼***	▼***	▲***
Hourly wages (dollars per hour) (fn3)	***	***	***	***	***	▲***	▲***	▼***	▲***
Non-toller: Productivity (fn3)	***	***	***	***	***	▼***	▼***	▼***	▼***
Non-toller: Unit labor costs (fn3)	***	***	***	***	***	▲***	▲***	▲***	▲***
Toller: Productivity	***	***	***	***	***	▲***	▼***	▲***	▼***
Toller: Unit labor costs	***	***	***	***	***	▲***	▲***	▲***	▲***
Net sales:									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▼***
Value	***	***	***	***	***	▼***	▼***	▲***	▼***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Cost of goods sold (COGS)	***	***	***	***	***	▲***	▼***	▲***	▲***
Gross profit or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Operating income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
Net income or (loss) (fn5)	***	***	***	***	***	▼***	▲***	▼***	▼***
Unit COGS	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit operating income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
Unit net income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
COGS/sales (fn1)	***	***	***	***	***	▲***	▲***	▲***	▲***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Net income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Capital expenditures	***	***	***	***	***	▲***	▲***	▲***	▲***
Research and development expenses	***	***	***	***	***	***	***	***	***
Net assets	***	***	***	***	***	▼***	▼***	▼***	***
U.S. tollers' (fn4):									
Net tolling:									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▲***
Value	***	***	***	***	***	▼***	▼***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Total cost of tolling services (COTS)	***	***	***	***	***	▼***	▼***	▲***	▲***
Gross profit or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▲***	▲***
G&A expenses	***	***	***	***	***	▲***	▼***	▲***	▲***
Operating income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
Unit COTS	***	***	***	***	***	▲***	▼***	▲***	▲***
Unit G&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit operating income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
COTS/sales (fn1)	***	***	***	***	***	▼***	▼***	▲***	▲***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***

Table notes on next page.

Table C-2 Continued
All magnesium: Summary data concerning the U.S. market, by item and period

Quantity=metric tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per metric ton; Productivity=metric tons per 1,000 hours; Period changes=percent--exceptions noted

Source: Compiled from data submitted in response to Commission questionnaires. 508-compliant tables containing these data are contained in appendix F and H.

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

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

fn2.--Quantity for U.S. producers' U.S. shipments reflects non-toll producer's U.S. shipment quantities. Value for U.S. producers' U.S. shipments reflect non-toll producers' U.S. shipment values plus the additional value added by domestic U.S. toller producers to domestically manufactured magnesium. The unit values for U.S. producers reflect the fully domestic value for U.S. producers (including non-toll producers plus the valued added by toll processing) divided by the quantity for non-toll producers. Tollers did not report tolling for imported magnesium. In measuring consumption and market share this methodology avoids reclassifying and/or double counting merchandise already reported by non-toll U.S. producers.

fn3.--***.

fn4.--***.

fn5.--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.

Expanded like product: Sufficient production-related activities exclusion

Table C-3

All magnesium: Summary data concerning the U.S. market excluding one U.S. producer *, by item and period**

Quantity=metric tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per metric ton; Productivity=metric tons per 1,000 hours; Period changes=percent--exceptions noted

	Reported data					Period changes			
	Calendar year			Jan-Sep		Calendar year			Jan-Sep
Item	2019	2020	2021	2021	2022	2019-21	2019-20	2020-21	2021-22
U.S. consumption quantity:									
Amount	***	***	***	***	***	▼***	▼***	▲***	▼***
Producers' share (fn1)(fn2):									
Included producers	***	***	***	***	***	▼***	▼***	▲***	▼***
Excluded producers	***	***	***	***	***	▼***	▼***	▼***	▲***
All producers	***	***	***	***	***	▼***	▼***	▲***	▼***
Importers' share (fn1):									
China, pure	***	***	***	***	***	***	***	***	▲***
Nonsubject sources, pure	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources, pure	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources, other	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▼***	▲***
U.S. consumption value:									
Amount	***	***	***	***	***	▲***	▼***	▲***	▲***
Producers' share (fn1)(fn2):									
Included producers	***	***	***	***	***	▼***	▼***	▼***	▼***
Excluded producers	***	***	***	***	***	▲***	▼***	▲***	▲***
All producers	***	***	***	***	***	▼***	▼***	▲***	▼***
Importers' share (fn1):									
China, pure	***	***	***	***	***	***	***	***	▲***
Nonsubject sources, pure	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources, pure	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources, other	***	***	***	***	***	▲***	▲***	▼***	▲***
All import sources	***	***	***	***	***	▲***	▲***	▼***	▲***
U.S. importers' U.S. shipments of imports from:									
China, pure:									
Quantity	***	***	***	***	***	***	***	***	▲***
Value	***	***	***	***	***	***	***	***	▲***
Unit value	***	***	***	***	***	***	***	***	▲***
Ending inventory quantity	***	***	***	***	***	***	***	***	▲***
Nonsubject sources, pure:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
All import sources, pure:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
All import sources, other:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▲***
All import sources:									
Quantity	***	***	***	***	***	▲***	▲***	▼***	▲***
Value	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▲***
Included non-toller U.S. producers' and U.S. tollers':									
Non-toller: Average capacity quantity	***	***	***	***	***	▼***	▼***	▼***	▼***
Non-toller: Production quantity	***	***	***	***	***	▼***	▼***	▼***	▼***
Non-toller: Capacity utilization (fn1)	***	***	***	***	***	▲***	▼***	▲***	▼***
Toller: Average capacity quantity	***	***	***	***	***	▲***	***	▲***	***
Toller: Production quantity	***	***	***	***	***	▼***	▼***	▲***	▲***
Toller: Capacity utilization (fn1)	***	***	***	***	***	▼***	▼***	▲***	▲***

Table continued.

Table C-3 Continued

All magnesium: Summary data concerning the U.S. market excluding one U.S. producer *, by item and period**

Quantity=metric tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per metric ton; Productivity=metric tons per 1,000 hours; Period changes=percent--exceptions noted

	Reported data					Period changes			
	Calendar year			Jan-Sep		Calendar year			Jan-Sep
Item	2019	2020	2021	2021	2022	2019-21	2019-20	2020-21	2021-22
Included non-toller U.S. producers' and U.S. tollers':									
U.S. shipments (fn2):									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▼***
Value	***	***	***	***	***	▼***	▼***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▲***
Export shipments:									
Quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
Value	***	***	***	***	***	▲***	▲***	▼***	▼***
Unit value	***	***	***	***	***	▲***	▼***	▲***	▲***
Non-toller: Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
Non-toller: Inv./total shipments (fn1)	***	***	***	***	***	▼***	▲***	▼***	▲***
Production workers (fn3)	***	***	***	***	***	▼***	▼***	▼***	▼***
Hours worked (1,000s) (fn3)	***	***	***	***	***	▼***	▼***	▼***	▲***
Wages paid ($1,000) (fn3)	***	***	***	***	***	▼***	▼***	▼***	▲***
Hourly wages (dollars per hour) (fn3)	***	***	***	***	***	▲***	▲***	▼***	▲***
Non-toller: Productivity (fn3)	***	***	***	***	***	▼***	▼***	▼***	▼***
Non-toller: Unit labor costs (fn3)	***	***	***	***	***	▲***	▲***	▲***	▲***
Toller: Productivity	***	***	***	***	***	▲***	▼***	▲***	▼***
Toller: Unit labor costs	***	***	***	***	***	▲***	▲***	▲***	▲***
Included non-toller U.S. producers' (fn4):									
Net sales:									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▼***
Value	***	***	***	***	***	▼***	▼***	▲***	▼***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Cost of goods sold (COGS)	***	***	***	***	***	▲***	▼***	▲***	▲***
Gross profit or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Operating income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
Net income or (loss) (fn5)	***	***	***	***	***	▼***	▲***	▼***	▼***
Unit COGS	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit SG&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit operating income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
Unit net income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
COGS/sales (fn1)	***	***	***	***	***	▲***	▲***	▲***	▲***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Net income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
Capital expenditures	***	***	***	***	***	▲***	▲***	▲***	▲***
Research and development expenses	***	***	***	***	***	***	***	***	***
Net assets	***	***	***	***	***	▼***	▼***	▼***	***
Included U.S. tollers' (fn4):									
Net tolling:									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▲***
Value	***	***	***	***	***	▼***	▼***	▲***	▲***
Unit value	***	***	***	***	***	▲***	▲***	▲***	▲***
Total cost of tolling services (COTS)	***	***	***	***	***	▼***	▼***	▲***	▲***
Gross profit or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▲***	▲***
G&A expenses	***	***	***	***	***	▲***	▼***	▲***	▲***
Operating income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
Unit COTS	***	***	***	***	***	▲***	▼***	▲***	▲***
Unit G&A expenses	***	***	***	***	***	▲***	▲***	▲***	▲***
Unit operating income or (loss) (fn5)	***	***	***	***	***	▼***	▼***	▼***	▼***
COTS/sales (fn1)	***	***	***	***	***	▼***	▼***	▲***	▲***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***

Table notes on next page.

Table C-3 Continued
All magnesium: Summary data concerning the U.S. market excluding one U.S. producer *, by item and period**

Quantity=metric tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per metric ton; Productivity=metric tons per 1,000 hours; Period changes=percent--exceptions noted

---

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

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

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

fn2.--See footnote 2 from table C-2 above for the discussion of the treatment of U.S. toll producers' value-added in the compilation of apparent U.S. consumption. While the lines for non-toller U.S. producers' U.S. shipment values and the toller U.S. producers' U.S. shipment value-added are not shown separately in this table, the data treatment is nonetheless the same as discussed and presented in table C-2.

fn3.--***.

fn4.--***.

fn5.--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.

APPENDIX D

FIRMS' NARRATIVES ON THE IMPACT OF THE ORDER AND THE LIKELY IMPACT OF REVOCATION

Table D-1
Pure magnesium: Firms' narratives on the impact of the order and the likely impact of revocation

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***
Likely impact of revocation	U.S. producers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Likely impact of revocation	U.S. producers	***
Likely impact of revocation	U.S. producers	***
Likely impact of revocation	U.S. producers	***
Effect of order	Importers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Effect of order	Purchasers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Likely impact of revocation	Purchasers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***

Response type	Firm type	Firm name and narrative on impact or likely impact
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Effect of order	Foreign producers	***

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

APPENDIX E

NARRATIVES REGARDING THE DOMESTIC LIKE PRODUCT FACTORS COMPARING IN-SCOPE PURE MAGNESIUM TO OUT-OF-SCOPE OTHER MAGNESIUM

Table E-1
Pure magnesium: U.S. producers' narratives regarding the domestic like product factors comparing in-scope pure magnesium to out-of-scope other magnesium

Factor	Producer name and narrative
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Channels	***
Channels	***
Channels	***
Channels	***
Manufacturing	***
Manufacturing	***

Factor	Producer name and narrative
Manufacturing	***
Perceptions	***
Perceptions	***
Perceptions	***
Price	***
Price	***
Price	***

Source: Compiled from data submitted in response to Commission questionnaires

Table E-2
Pure magnesium: U.S. importers' narratives regarding the domestic like product factors comparing in-scope pure magnesium to out-of-scope other magnesium

Factor	Importer name and narrative
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***

Factor	Importer name and narrative
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***

Factor	Importer name and narrative
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***

Factor	Importer name and narrative
Channels	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Perceptions	***
Perceptions	***

Factor	Importer name and narrative
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***

Factor	Importer name and narrative
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***

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

Table E-3
Pure magnesium: U.S. purchasers' narratives regarding the domestic like product factors comparing in-scope pure magnesium to out-of-scope other magnesium

Factor	Purchaser name and narrative
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Physical characteristics	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***

Factor	Purchaser name and narrative
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Interchangeability	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Channels	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Manufacturing	***
Perceptions	***

Factor	Purchaser name and narrative
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Perceptions	***
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***
Price	***

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

APPENDIX F

DATA ON EXPANDED DOMESTIC INDUSTRY

Table F-1
All magnesium: U.S. producers, their position on the order(s), toller status, types of operation, location of production, and share of reported production in 2021, by firm

Shares in percent

Firm	Position on orders	Types of operation	Production location(s)	Share of pure magnesium production	Share of other magnesium production	Share of all magnesium production
Amacor	***	Toller, Non-toller	Anderson, IN	***	***	***
Luxfer Magtech	***	Toller, Non-toller	Manchester Township, NJ Tamaqua, PA Saxonburg, PA	***	***	***
Magpro	***	Non-toller	Camden TN	***	***	***
MPA	***	Non-toller	Eaton Rapids, MI	***	***	***
U.S. Magnesium	***	Non-toller	Salt Lake City, UT Rowley, UT	***	***	***
All firms	Various	Various	Various	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". All magnesium includes pure magnesium and other magnesium.

Table F-2
All magnesium: U.S. producers' ownership, related and/or affiliated firms

Reporting firm	Relationship type and related firm	Details of relationship
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***

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

Note: ***. There does not appear to be any basis to treat *** as a related party.

Table F-3
All magnesium: U.S. importers, their headquarters, and share of total imports within a given source

Shares in percent

Firm	Headquarters	Pure magnesium: China	Pure magnesium: Nonsubject sources	Pure magnesium: All import sources	Other magnesium: All import sources	All magnesium: All import sources
Alliance Magnesium	Danville, QC	***	***	***	***	***
Amacor	Anderson, IN	***	***	***	***	***
Bhatt	Kansas City, MO	***	***	***	***	***
Dead Sea	St. Louis, MO	***	***	***	***	***
Global Specialty	Beverly, OH	***	***	***	***	***
Greenwich Metals	Greenwich, CT	***	***	***	***	***
Heneken	Bratislava, SK	***	***	***	***	***
Howmet	Pittsburgh, PA	***	***	***	***	***
Laurand	Boca Raton, FL	***	***	***	***	***
Magontec	Bottrop, Germany,	***	***	***	***	***
Magpro	Camden, TN	***	***	***	***	***
MPA	Eaton Rapids, MI	***	***	***	***	***
Non Ferrum	North Charleston, SC	***	***	***	***	***
Polymet Alloys	Birmingham, AL	***	***	***	***	***
RIISA	Cienega De Flores, NL	***	***	***	***	***
So Feng	Taipei,	***	***	***	***	***
Traxys	New York, NY	***	***	***	***	***
VSMPO	Highlands Ranch, CO	***	***	***	***	***
All firms	Various	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Table F-4
All magnesium: Apparent U.S. consumption and market share based on quantity, by period and source

Quantity in metric tons; Shares in percent

Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
U.S. producers	Quantity	***	***	***	***	***
China, pure	Quantity	***	***	***	***	***
Nonsubject sources, pure	Quantity	***	***	***	***	***
All import sources, pure	Quantity	***	***	***	***	***
All import sources, other	Quantity	***	***	***	***	***
All import sources	Quantity	***	***	***	***	***
All sources	Quantity	***	***	***	***	***
U.S. producers	Share	***	***	***	***	***
China, pure	Share	***	***	***	***	***
Nonsubject sources, pure	Share	***	***	***	***	***
All import sources, pure	Share	***	***	***	***	***
All import sources, other	Share	***	***	***	***	***
All import sources	Share	***	***	***	***	***
All sources	Share	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Figure F-1
All magnesium: Apparent U.S. consumption and market share based on quantity, by period and source

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

Table F-5
All magnesium: Apparent U.S. consumption and market share based on value, by period and source

Value in 1,000 dollars; Shares in percent

Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
U.S. producers' integrated value	Value	***	***	***	***	***
U.S. producers' value added to domestic	Value	***	***	***	***	***
U.S. producers' fully domestic	Value	***	***	***	***	***
U.S. producers' value added to imports	Value	***	***	***	***	***
U.S. producers' total	Value	***	***	***	***	***
China, pure	Value	***	***	***	***	***
Nonsubject sources, pure	Value	***	***	***	***	***
All import sources, pure	Value	***	***	***	***	***
All import sources, other	Value	***	***	***	***	***
All import sources	Value	***	***	***	***	***
All sources	Value	***	***	***	***	***
U.S. shipments integrated value	Share	***	***	***	***	***
U.S. shipments value added to domestic	Share	***	***	***	***	***
U.S. shipments fully domestic	Share	***	***	***	***	***
U.S. shipments value added to imports	Share	***	***	***	***	***
U.S. shipments total	Share	***	***	***	***	***
China, pure	Share	***	***	***	***	***
Nonsubject sources, pure	Share	***	***	***	***	***
All import sources, pure	Share	***	***	***	***	***
All import sources, other	Share	***	***	***	***	***
All import sources	Share	***	***	***	***	***
All sources	Share	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Figure F-2
All magnesium: Apparent U.S. consumption based on value, by period and source

* * * * * * *

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

Note: *** All magnesium includes pure magnesium and other magnesium.

Table F-6
All magnesium: U.S. producers' reported changes in operations

Type of change	Firm name and narrative on changes in operations
Expansions	***
Prolonged shutdowns or curtailments	***
Prolonged shutdowns or curtailments	***
Force majeure events	***
Other	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Table F-7
All magnesium: Firm-by-firm non-toller U.S. producers' average production capacity, by period

Capacity in metric tons

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Amacor	***	***	***	***	***
Luxfer Magtech	***	***	***	***	***
Magpro	***	***	***	***	***
MPA	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table F-7 Continued
All magnesium: Firm-by-firm non-toller U.S. producers' production, by period

Production in metric tons

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Amacor	***	***	***	***	***
Luxfer Magtech	***	***	***	***	***
Magpro	***	***	***	***	***
MPA	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table F-7 Continued
All magnesium: Firm-by-firm non-toller U.S. producers' capacity utilization, by period

Capacity utilization ratios in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Amacor	***	***	***	***	***
Luxfer Magtech	***	***	***	***	***
Magpro	***	***	***	***	***
MPA	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

Table continued.

Table F-7 Continued
All magnesium: Firm-by-firm U.S. non-toller producers' share of U.S. production, by period

Share of production in percent

Firm	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Amacor	***	***	***	***	***
Luxfer Magtech	***	***	***	***	***
Magpro	***	***	***	***	***
MPA	***	***	***	***	***
U.S. Magnesium	***	***	***	***	***
All firms	***	***	***	***	***

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

Note: Two firms, *** reported toll production of other magnesium in addition to non-toll production of other magnesium.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Figure F-3

All magnesium: Non-toller U.S. producers' capacity, production, and capacity utilization, by period

* * * * * * *

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

Note: All magnesium includes pure magnesium and other magnesium.

Table F-8
All magnesium: Firm-by-firm U.S. tollers' practical scope capacity, production, and capacity utilization, by period

Capacity and production in metric tons; Capacity utilization in percent

Item	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Capacity	***	***	***	***	***
Production	***	***	***	***	***
Capacity utilization	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Figure F-4
All magnesium: U.S. tollers' capacity, production, and capacity utilization, by period

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

Note: All magnesium includes pure magnesium and other magnesium.

Table F-9
All magnesium: Non-toller U.S. producers' shipments, by location of shipment and by period

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton; Shares in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
U.S. shipments	Quantity	***	***	***	***	***
Export shipments	Quantity	***	***	***	***	***
Total shipments	Quantity	***	***	***	***	***
U.S. shipments	Value	***	***	***	***	***
Export shipments	Value	***	***	***	***	***
Total shipments	Value	***	***	***	***	***
U.S. shipments	Unit value	***	***	***	***	***
Export shipments	Unit value	***	***	***	***	***
Total shipments	Unit value	***	***	***	***	***
U.S. shipments	Share of quantity	***	***	***	***	***
Export shipments	Share of quantity	***	***	***	***	***
Total shipments	Share of quantity	***	***	***	***	***
U.S. shipments	Share of value	***	***	***	***	***
Export shipments	Share of value	***	***	***	***	***
Total shipments	Share of value	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Table F-10
All magnesium: Non-toller U.S. producers' U.S. shipments, by product type and period

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton

Product type	Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Pure magnesium ingot	U.S. producers	Quantity	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Quantity	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Quantity	***	***	***	***	***
Pure granular magnesium	U.S. producers	Quantity	***	***	***	***	***
Other magnesium	U.S. producers	Quantity	***	***	***	***	***
All magnesium	U.S. producers	Quantity	***	***	***	***	***
Pure magnesium ingot	U.S. producers	Value	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Value	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Value	***	***	***	***	***
Pure granular magnesium	U.S. producers	Value	***	***	***	***	***
Other magnesium	U.S. producers	Value	***	***	***	***	***
All magnesium	U.S. producers	Value	***	***	***	***	***
Pure magnesium ingot	U.S. producers	Unit value	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Unit value	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Unit value	***	***	***	***	***
Pure granular magnesium	U.S. producers	Unit value	***	***	***	***	***
Other magnesium	U.S. producers	Unit value	***	***	***	***	***
All magnesium	U.S. producers	Unit value	***	***	***	***	***

Table continued.

Table F-10 Continued
All magnesium: Non-toller U.S. producers' U.S. shipments, by product type and period

Product type	Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Pure magnesium ingot	U.S. producers	Share of quantity	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Share of quantity	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Share of quantity	***	***	***	***	***
Pure granular magnesium	U.S. producers	Share of quantity	***	***	***	***	***
Other magnesium	U.S. producers	Share of quantity	***	***	***	***	***
All magnesium	U.S. producers	Share of quantity	***	***	***	***	***
Pure magnesium ingot	U.S. producers	Share of value	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Share of value	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Share of value	***	***	***	***	***
Pure granular magnesium	U.S. producers	Share of value	***	***	***	***	***
Other magnesium	U.S. producers	Share of value	***	***	***	***	***
All magnesium	U.S. producers	Share of value	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Table F-11
All magnesium: U.S. importers' U.S. shipments, by product type and period

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton

Product type	Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Pure magnesium ingot	U.S. producers	Quantity	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Quantity	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Quantity	***	***	***	***	***
Pure granular magnesium	U.S. producers	Quantity	***	***	***	***	***
Other magnesium	U.S. producers	Quantity	***	***	***	***	***
All magnesium	U.S. producers	Quantity	***	***	***	***	***
Pure magnesium ingot	U.S. producers	Value	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Value	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Value	***	***	***	***	***
Pure granular magnesium	U.S. producers	Value	***	***	***	***	***
Other magnesium	U.S. producers	Value	***	***	***	***	***
All magnesium	U.S. producers	Value	***	***	***	***	***
Pure magnesium ingot	U.S. producers	Unit value	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Unit value	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Unit value	***	***	***	***	***
Pure granular magnesium	U.S. producers	Unit value	***	***	***	***	***
Other magnesium	U.S. producers	Unit value	***	***	***	***	***
All magnesium	U.S. producers	Unit value	***	***	***	***	***

Table continued.

Table F-11 Continued
All magnesium: U.S. importers' U.S. shipments, by product type and period

Product type	Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Pure magnesium ingot	U.S. producers	Share of quantity	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Share of quantity	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Share of quantity	***	***	***	***	***
Pure granular magnesium	U.S. producers	Share of quantity	***	***	***	***	***
Other magnesium	U.S. producers	Share of quantity	***	***	***	***	***
All magnesium	U.S. producers	Share of quantity	***	***	***	***	***
Pure magnesium ingot	U.S. producers	Share of value	***	***	***	***	***
ASTM spec alloy magnesium ingot	U.S. producers	Share of value	***	***	***	***	***
Alloy granular magnesium	U.S. producers	Share of value	***	***	***	***	***
Pure granular magnesium	U.S. producers	Share of value	***	***	***	***	***
Other magnesium	U.S. producers	Share of value	***	***	***	***	***
All magnesium	U.S. producers	Share of value	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Table F-12
All magnesium: U.S. tollers' shipments returned to tollee, by tollee and period

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton; Shares in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Shipments for U.S. producers	Quantity	***	***	***	***	***
Shipments for U.S. importers	Quantity	***	***	***	***	***
Shipments for other customers	Quantity	***	***	***	***	***
All toller shipments	Quantity	***	***	***	***	***
Shipments for U.S. producers	Value	***	***	***	***	***
Shipments for U.S. importers	Value	***	***	***	***	***
Shipments for other customers	Value	***	***	***	***	***
All toller shipments	Value	***	***	***	***	***
Shipments for U.S. producers	Unit value	***	***	***	***	***
Shipments for U.S. importers	Unit value	***	***	***	***	***
Shipments for other customers	Unit value	***	***	***	***	***
All toller shipments	Unit value	***	***	***	***	***
Shipments for U.S. producers	Share of quantity	***	***	***	***	***
Shipments for U.S. importers	Share of quantity	***	***	***	***	***
Shipments for other customers	Share of quantity	***	***	***	***	***
All toller shipments	Share of quantity	***	***	***	***	***
Shipments for U.S. producers	Share of value	***	***	***	***	***
Shipments for U.S. importers	Share of value	***	***	***	***	***
Shipments for other customers	Share of value	***	***	***	***	***
All toller shipments	Share of value	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Table F-13
All magnesium: U.S. producers' U.S. shipments for use in apparent consumption, by period

Quantity in metric tons; Value in 1,000 dollars

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
U.S. shipments	Quantity	***	***	***	***	***
U.S. shipments integrated value	Value	***	***	***	***	***
U.S. shipments value added to domestic	Value	***	***	***	***	***
U.S. shipments fully domestic	Value	***	***	***	***	***
U.S. shipments value added to imports	Value	***	***	***	***	***
U.S. shipments total	Value	***	***	***	***	***

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

Note.--Quantity for U.S. producers' U.S. shipments reflects non-toll producer's U.S. shipment quantities. Value for U.S. producers' U.S. shipments reflects pure magnesium products sold in the United States from domestically manufactured pure magnesium (including the value added by U.S. tollers to domestic pure magnesium). Tollers did not report tolling for imported magnesium. In measuring consumption and market share this methodology avoids reclassifying and/or double counting merchandise already reported by non-toll U.S. producers. All magnesium includes pure magnesium and other magnesium.

Table F-14
All magnesium: Non-toller U.S. producers' inventories, by period

Quantity in metric tons; inventory Ratios in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
End-of-period inventory	Quantity	***	***	***	***	***
Inventory to U.S. production	Ratio	***	***	***	***	***
Inventory to U.S. shipments	Ratio	***	***	***	***	***
Inventory to total shipments	Ratio	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Table F-15
All magnesium: Non-toller U.S. producers' employment related data, by period

Item	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Production and related workers (PRWs) (number)	***	***	***	***	***
Total hours worked (1,000 hours)	***	***	***	***	***
Hours worked per PRW (hours)	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***
Hourly wages (dollars per hour)	***	***	***	***	***
Productivity (metric tons per 1,000 hours)	***	***	***	***	***
Unit labor costs (dollars per metric ton)	***	***	***	***	***

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

Note: All magnesium includes pure magnesium and other magnesium. ***.

Table F-16
All magnesium: U.S. tollers' employment related data, by period

Item	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Production and related workers (PRWs) (number)	***	***	***	***	***
Total hours worked (1,000 hours)	***	***	***	***	***
Hours worked per PRW (hours)	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***
Hourly wages (dollars per hour)	***	***	***	***	***
Productivity (metric tons per 1,000 hours)	***	***	***	***	***
Unit labor costs (dollars per metric ton)	***	***	***	***	***

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

Note: All magnesium includes pure magnesium and other magnesium.

Table F-17
All magnesium: U.S. non-toll producers' and tollers' combined employment related data, by period

Item	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Production and related workers (PRWs) (number)	***	***	***	***	***
Total hours worked (1,000 hours)	***	***	***	***	***
Hours worked per PRW (hours)	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***
Hourly wages (dollars per hour)	***	***	***	***	***

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

Note: All magnesium includes pure magnesium and other magnesium. ***.

Table F-18
All magnesium: U.S. imports, by source and by period

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton

Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
China, pure	Quantity	***	***	***	***	***
Nonsubject sources, pure	Quantity	***	***	***	***	***
All import sources, pure	Quantity	***	***	***	***	***
All import sources, other	Quantity	***	***	***	***	***
All import sources	Quantity	***	***	***	***	***
China, pure	Value	***	***	***	***	***
Nonsubject sources, pure	Value	***	***	***	***	***
All import sources, pure	Value	***	***	***	***	***
All import sources, other	Value	***	***	***	***	***
All import sources	Value	***	***	***	***	***
China, pure	Unit value	***	***	***	***	***
Nonsubject sources, pure	Unit value	***	***	***	***	***
All import sources, pure	Unit value	***	***	***	***	***
All import sources, other	Unit value	***	***	***	***	***
All import sources	Unit value	***	***	***	***	***
China, pure	Share of quantity	***	***	***	***	***
Nonsubject sources, pure	Share of quantity	***	***	***	***	***
All import sources, pure	Share of quantity	***	***	***	***	***
All import sources, other	Share of quantity	***	***	***	***	***
All import sources	Share of quantity	***	***	***	***	***
China, pure	Share of value	***	***	***	***	***
Nonsubject sources, pure	Share of value	***	***	***	***	***
All import sources, pure	Share of value	***	***	***	***	***
All import sources, other	Share of value	***	***	***	***	***
All import sources	Share of value	***	***	***	***	***
China, pure	Ratio	***	***	***	***	***
Nonsubject sources, pure	Ratio	***	***	***	***	***
All import sources, pure	Ratio	***	***	***	***	***
All import sources, other	Ratio	***	***	***	***	***
All import sources	Ratio	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. All magnesium includes pure magnesium and other magnesium.

Table F-19
All magnesium: Changes in import quantity, values, and unit values between comparison periods

Changes in percent

Source	Measure	2019-21	2019-20	2020-21	Jan-Sep 2021-22
China, pure	%Δ Quantity	***	***	***	***
Nonsubject sources, pure	%Δ Quantity	▲***	▲***	▼***	▲***
All import sources, pure	%Δ Quantity	▲***	▲***	▼***	▲***
All import sources, other	%Δ Quantity	▲***	▲***	▼***	▲***
All import sources	%Δ Quantity	▲***	▲***	▼***	▲***
China, pure	%Δ Value	***	***	***	***
Nonsubject sources, pure	%Δ Value	▲***	▲***	▼***	▲***
All import sources, pure	%Δ Value	▲***	▲***	▼***	▲***
All import sources, other	%Δ Value	▲***	▲***	▼***	▲***
All import sources	%Δ Value	▲***	▲***	▼***	▲***
China, pure	%Δ Unit value	***	***	***	***
Nonsubject sources, pure	%Δ Unit value	▲***	▲***	▲***	▲***
All import sources, pure	%Δ Unit value	▲***	▲***	▲***	▲***
All import sources, other	%Δ Unit value	▲***	▲***	▲***	▲***
All import sources	%Δ Unit value	▲***	▲***	▲***	▲***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". All magnesium includes pure magnesium and other magnesium.

Figure F-5
All magnesium: U.S. import quantities and average unit values, by source and by period

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

Note: All magnesium includes pure magnesium and other magnesium.

Table F-20
All magnesium: U.S. importers' end-of-period inventories of imports, by source and period

Quantity in metric tons; Ratios in percent

Measure	Source	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Inventories quantity	China, pure	***	***	***	***	***
Ratio to imports	China, pure	***	***	***	***	***
Ratio to U.S. shipments of imports	China, pure	***	***	***	***	***
Ratio to total shipments of imports	China, pure	***	***	***	***	***
Inventories quantity	Nonsubject, pure	***	***	***	***	***
Ratio to imports	Nonsubject, pure	***	***	***	***	***
Ratio to U.S. shipments of imports	Nonsubject, pure	***	***	***	***	***
Ratio to total shipments of imports	Nonsubject, pure	***	***	***	***	***
Inventories quantity	All import sources, pure	***	***	***	***	***
Ratio to imports	All import sources, pure	***	***	***	***	***
Ratio to U.S. shipments of imports	All import sources, pure	***	***	***	***	***
Ratio to total shipments of imports	All import sources, pure	***	***	***	***	***
Inventories quantity	All import sources, other	***	***	***	***	***
Ratio to imports	All import sources, other	***	***	***	***	***
Ratio to U.S. shipments of imports	All import sources, other	***	***	***	***	***
Ratio to total shipments of imports	All import sources, other	***	***	***	***	***
Inventories quantity	All import sources	***	***	***	***	***
Ratio to imports	All import sources	***	***	***	***	***
Ratio to U.S. shipments of imports	All import sources	***	***	***	***	***
Ratio to total shipments of imports	All import sources	***	***	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". All magnesium includes pure magnesium and other magnesium.

Table F-21
Magnesium: Exports from China, by destination market and by period

Quantity in metric tons; Value in 1,000 dollars

Destination market	Measure	2016	2017	2018	2019	2020	2021
United States, pure	Quantity	---	44	98	74	21	21
United States, other	Quantity	197,694	216,201	242,241	190,109	173,450	235,175
United States, all	Quantity	197,694	216,245	242,339	190,183	173,471	235,196
Japan	Quantity	408,890	452,572	411,731	356,625	301,383	372,962
Indonesia	Quantity	196,429	229,541	248,091	294,512	271,193	362,347
Malaysia	Quantity	182,882	239,708	270,452	240,487	255,613	331,613
South Korea	Quantity	275,463	288,932	280,509	275,637	281,178	331,042
Thailand	Quantity	127,369	157,079	174,561	192,718	220,058	308,241
Vietnam	Quantity	132,706	171,294	197,174	201,194	223,879	284,384
Netherlands	Quantity	140,724	187,137	185,434	177,748	145,215	260,490
India	Quantity	207,007	263,461	291,722	269,038	235,942	252,547
All other destination markets	Quantity	1,272,328	1,459,459	1,417,512	1,592,099	1,695,041	1,860,980
Non-U.S. destination markets	Quantity	2,943,798	3,449,183	3,477,186	3,600,058	3,629,502	4,364,606
All destination markets	Quantity	3,141,492	3,665,428	3,719,525	3,790,241	3,802,973	4,599,802
United States, pure	Value	---	66	186	182	41	199
United States, other	Value	331,580	383,903	520,923	404,053	359,719	581,411
United States, all	Value	331,580	383,969	521,109	404,235	359,760	581,610
Japan	Value	298,177	342,312	360,621	368,743	337,125	533,677
Indonesia	Value	90,298	91,820	107,435	120,246	124,287	181,640
Malaysia	Value	79,402	104,653	138,288	147,581	155,754	220,727
South Korea	Value	298,030	334,349	393,827	385,612	428,049	669,924
Thailand	Value	104,590	139,498	176,289	171,929	223,276	322,714
Vietnam	Value	115,323	147,420	188,240	210,166	288,222	400,260
Netherlands	Value	292,144	374,240	368,006	385,898	339,148	760,604
India	Value	170,909	211,727	264,631	256,098	227,658	399,413
All other destination markets	Value	1,622,476	1,870,308	2,067,841	2,158,938	2,136,036	3,436,578
Non-U.S. destination markets	Value	3,071,350	3,616,326	4,065,179	4,205,211	4,259,555	6,925,538
All destination markets	Value	3,402,930	4,000,295	4,586,288	4,609,446	4,619,315	7,507,148

Table continued.

Table F-21 Continued
Magnesium: Exports from China, by destination market and by period

Unit values in dollars per metric ton; Share in percent

Destination market	Measure	2016	2017	2018	2019	2020	2021
United States, pure	Unit value	---	1,505	1,899	2,458	1,942	9,487
United States, other	Unit value	1,677	1,776	2,150	2,125	2,074	2,472
United States, all	Unit value	1,677	1,776	2,150	2,126	2,074	2,473
Japan	Unit value	729	756	876	1,034	1,119	1,431
Indonesia	Unit value	460	400	433	408	458	501
Malaysia	Unit value	434	437	511	614	609	666
South Korea	Unit value	1,082	1,157	1,404	1,399	1,522	2,024
Thailand	Unit value	821	888	1,010	892	1,015	1,047
Vietnam	Unit value	869	861	955	1,045	1,287	1,407
Netherlands	Unit value	2,076	2,000	1,985	2,171	2,335	2,920
India	Unit value	826	804	907	952	965	1,582
All other destination markets	Unit value	1,275	1,282	1,459	1,356	1,260	1,847
Non-U.S. destination markets	Unit value	1,043	1,048	1,169	1,168	1,174	1,587
All destination markets	Unit value	1,083	1,091	1,233	1,216	1,215	1,632
United States, pure	Share of quantity	---	0.0	0.0	0.0	0.0	0.0
United States, other	Share of quantity	6.3	5.9	6.5	5.0	4.6	5.1
United States, all	Share of quantity	6.3	5.9	6.5	5.0	4.6	5.1
Japan	Share of quantity	13.0	12.3	11.1	9.4	7.9	8.1
Indonesia	Share of quantity	6.3	6.3	6.7	7.8	7.1	7.9
Malaysia	Share of quantity	5.8	6.5	7.3	6.3	6.7	7.2
South Korea	Share of quantity	8.8	7.9	7.5	7.3	7.4	7.2
Thailand	Share of quantity	4.1	4.3	4.7	5.1	5.8	6.7
Vietnam	Share of quantity	4.2	4.7	5.3	5.3	5.9	6.2
Netherlands	Share of quantity	4.5	5.1	5.0	4.7	3.8	5.7
India	Share of quantity	6.6	7.2	7.8	7.1	6.2	5.5
All other destination markets	Share of quantity	40.5	39.8	38.1	42.0	44.6	40.5
Non-U.S. destination markets	Share of quantity	93.7	94.1	93.5	95.0	95.4	94.9
All destination markets	Share of quantity	100.0	100.0	100.0	100.0	100.0	100.0

Source: Official exports statistics under HS subheading 8104.11, 8104.19, 8104.20, 8104.30, 8104.90, 3824.99, 3824.90 (discontinued in 2017), and 9817.00 reported by China Customs in the Global Trade Atlas database, accessed January 24, 2023.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". United States is shown at the top followed by the top exporting countries in descending order of 2021 data. United States pure magnesium is presented using data from HS subheading 8104.11 and United States other contains all remaining HS subheadings.

Table F-22
Magnesium: Global exports, by reporting country and by period

Value in 1,000 dollars

Exporting country	Measure	2016	2017	2018	2019	2020	2021
United States	Value	3,874,603	3,778,561	4,085,563	4,355,745	4,496,722	5,177,404
China	Value	3,402,930	4,000,295	4,586,288	4,609,446	4,619,315	7,507,148
Germany	Value	4,210,047	4,695,603	5,262,712	4,959,809	4,823,759	5,972,716
Japan	Value	3,476,138	3,635,252	3,907,469	3,603,679	3,543,978	4,515,434
Ireland	Value	2,200,459	2,199,949	2,582,124	2,424,834	2,330,037	2,709,688
Netherlands	Value	1,614,237	1,910,036	2,072,416	1,989,519	1,915,154	2,369,345
France	Value	1,436,561	1,640,090	1,769,275	1,630,430	1,537,080	1,941,132
Belgium	Value	1,375,103	1,527,901	1,778,504	1,611,831	1,478,742	1,911,012
South Korea	Value	884,670	919,330	1,039,687	1,088,105	1,096,685	1,391,874
United Kingdom	Value	1,036,010	918,216	1,121,168	1,053,044	963,031	1,235,727
Hong Kong	Value	581,549	626,830	682,504	646,215	871,743	1,029,150
Malaysia	Value	663,035	551,474	583,450	834,336	659,950	922,767
All other exporters	Value	7,671,644	6,817,118	7,824,076	7,440,731	7,475,147	9,221,201
All reporting exporters	Value	32,426,986	33,220,654	37,295,237	36,247,722	35,811,343	45,904,598

Table continued.

Table F-22 Continued
Magnesium: Global exports, by reporting country and by period

Share in percent

Exporting country	Measure	2016	2017	2018	2019	2020	2021
United States	Share of value	11.9	11.4	11.0	12.0	12.6	11.3
China	Share of value	10.5	12.0	12.3	12.7	12.9	16.4
Germany	Share of value	13.0	14.1	14.1	13.7	13.5	13.0
Japan	Share of value	10.7	10.9	10.5	9.9	9.9	9.8
Ireland	Share of value	6.8	6.6	6.9	6.7	6.5	5.9
Netherlands	Share of value	5.0	5.7	5.6	5.5	5.3	5.2
France	Share of value	4.4	4.9	4.7	4.5	4.3	4.2
Belgium	Share of value	4.2	4.6	4.8	4.4	4.1	4.2
South Korea	Share of value	2.7	2.8	2.8	3.0	3.1	3.0
United Kingdom	Share of value	3.2	2.8	3.0	2.9	2.7	2.7
Hong Kong	Share of value	1.8	1.9	1.8	1.8	2.4	2.2
Malaysia	Share of value	2.0	1.7	1.6	2.3	1.8	2.0
All other exporters	Share of value	23.7	20.5	21.0	20.5	20.9	20.1
All reporting exporters	Share of value	100.0	100.0	100.0	100.0	100.0	100.0

Source: Official exports statistics under HS subheading 8104.11, 8104.19, 8104.20, 8104.30, 8104.90, 3824.99, 3824.90 (discontinued in 2017), and 9817.00 reported by various national statistical authorities in the Global Trade Atlas database, accessed January 24, 2023.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". United States is shown at the top followed by the countries under order, all remaining top exporting countries in descending order of 2021 data.

Table F-23
Pure magnesium: Count of firms' responses regarding domestic and foreign demand ***

Number of firms reporting

Market	Firm type	Increase	No change	Decrease	Fluctuate
U.S. demand	U.S. producers	***	***	***	***
U.S. demand	Importers	3	2	2	3
U.S. demand	Purchasers	7	3	0	2
U.S. demand	Foreign producers	0	1	0	0
Foreign demand	U.S. producers	***	***	***	***
Foreign demand	Importers	3	2	2	3
Foreign demand	Purchasers	4	2	0	4
Demand in subject home market	Foreign producers	0	1	0	0
Demand in other export markets	Foreign producers	0	1	0	0
Demand for end use products	Purchasers	6	1	0	5

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

Table F-24

Pure magnesium: Count of firms' responses regarding anticipated domestic and foreign demand ***

Number of firms reporting

Market	Firm type	Increase	No change	Decrease	Fluctuate
U.S. demand	U.S. producers	***	***	***	***
U.S. demand	Importers	4	3	0	3
U.S. demand	Purchasers	9	2	0	2
U.S. demand	Foreign producers	0	1	0	0
Foreign demand	U.S. producers	***	***	***	***
Foreign demand	Importers	4	3	0	3
Foreign demand	Purchasers	7	2	0	2
Demand in subject home market	Foreign producers	0	1	0	0
Demand in other export markets	Foreign producers	0	1	0	0
Demand for end use products	Purchasers	6	1	0	5

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

Table F-25

Pure magnesium: Interchangeability between product produced in the United States and in other countries reported by U.S. producers *, by country pair**

Number of firms reporting

Country pair	Always	Frequently	Sometimes	Never
United States vs. China	***	***	***	***
United States vs. Other	***	***	***	***
China vs. Other	***	***	***	***

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

APPENDIX G

PURE MAGNESIUM IMPORT STATISTICS

Table G-1
Pure magnesium: U.S. imports, by source and by period

Quantity in metric tons; Value in 1,000 dollars; Unit values in dollars per metric ton; Share in percent

Source	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
China	Quantity	149	25	12	4	2,592
Nonsubject sources	Quantity	12,064	9,970	6,298	5,308	5,723
All import sources	Quantity	12,213	9,995	6,310	5,312	8,314
China	Value	484	95	132	13	17,449
Nonsubject sources	Value	55,083	91,475	58,331	39,364	203,377
All import sources	Value	55,567	91,570	58,463	39,376	220,826
China	Unit value	3,251	3,768	10,588	2,800	6,733
Nonsubject sources	Unit value	4,566	9,175	9,262	7,417	35,538
All import sources	Unit value	4,550	9,161	9,265	7,413	26,559
China	Share of quantity	1.2	0.3	0.2	0.1	31.2
Nonsubject sources	Share of quantity	98.8	99.7	99.8	99.9	68.8
All import sources	Share of quantity	100.0	100.0	100.0	100.0	100.0
China	Share of value	0.9	0.1	0.2	0.0	7.9
Nonsubject sources	Share of value	99.1	99.9	99.8	100.0	92.1
All import sources	Share of value	100.0	100.0	100.0	100.0	100.0

Source: Compiled from official U.S. import statistics of the U.S. Department of Commerce Census Bureau using HTS statistical reporting number 8104.11.0000, accessed on January 24, 2023. Imports are based on the imports for consumption data series. Imports value data reflect landed duty-paid values.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---".

Table G-2
Pure magnesium: Changes in import quantity, values, and unit values between comparison periods

Changes in percent

Source	Measure	2019-21	2019-20	2020-21	Jan-Sep 2021-22
China	%Δ Quantity	▼***	▼***	▼***	▲***
Nonsubject sources	%Δ Quantity	▼***	▼***	▼***	▲***
All import sources	%Δ Quantity	▼***	▼***	▼***	▲***
China	%Δ Value	▼***	▼***	▲***	▲***
Nonsubject sources	%Δ Value	▲***	▲***	▼***	▲***
All import sources	%Δ Value	▲***	▲***	▼***	▲***
China	%Δ Unit value	▲***	▲***	▲***	▲***
Nonsubject sources	%Δ Unit value	▲***	▲***	▲***	▲***
All import sources	%Δ Unit value	▲***	▲***	▲***	▲***

Source: Compiled from official U.S. import statistics of the U.S. Department of Commerce Census Bureau using HTS statistical reporting number 8104.11.0000, accessed on January 24, 2023. Imports are based on the imports for consumption data series. Imports value data reflect landed duty-paid values.

Note: Percentages shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

Figure G-1
Pure magnesium: U.S. import quantities and average unit values, by source and by period

* * * * * * *

Source: Compiled from official U.S. import statistics of the U.S. Department of Commerce Census Bureau using HTS statistical reporting number 8104.11.0000, accessed on January 24, 2023. Imports are based on the imports for consumption data series.

APPENDIX H

FINANCIAL DATA ON EXPANDED DOMESTIC INDUSTRY

Figure H-1
All magnesium: Non-toller U.S. producers' share of net sales quantity by firm, 2021

* * * * * * *

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

Note: ***.

Table H-1
All magnesium: Results of operations of non-toller U.S. producers, by item and period

Quantity in metric tons; Value in 1,000 dollars; Ratios in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Total net sales	Quantity	***	***	***	***	***
Total net sales	Value	***	***	***	***	***
COGS: Raw materials	Value	***	***	***	***	***
COGS: Direct labor	Value	***	***	***	***	***
COGS: Other factory	Value	***	***	***	***	***
COGS: Less by-product revenue	Value	***	***	***	***	***
COGS: Total	Value	***	***	***	***	***
Gross profit or (loss)	Value	***	***	***	***	***
SG&A expenses	Value	***	***	***	***	***
Operating income or (loss)	Value	***	***	***	***	***
Interest expense	Value	***	***	***	***	***
All other expenses	Value	***	***	***	***	***
All other income	Value	***	***	***	***	***
Net income or (loss)	Value	***	***	***	***	***
Depreciation/amortization	Value	***	***	***	***	***
Cash flow	Value	***	***	***	***	***
COGS: Raw materials	Ratio to NS	***	***	***	***	***
COGS: Direct labor	Ratio to NS	***	***	***	***	***
COGS: Other factory	Ratio to NS	***	***	***	***	***
COGS: Less by-product revenue	Ratio to NS	***	***	***	***	***
COGS: Total	Ratio to NS	***	***	***	***	***
Gross profit	Ratio to NS	***	***	***	***	***
SG&A expense	Ratio to NS	***	***	***	***	***
Operating income or (loss)	Ratio to NS	***	***	***	***	***
Net income or (loss)	Ratio to NS	***	***	***	***	***

Table continued.

Table H-1 Continued
All magnesium: Results of operations of non-toller U.S. producers, by item and period

Shares in percent; Unit values in dollars per metric ton; Count in number of firms reporting

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
COGS: Raw materials	Share	***	***	***	***	***
COGS: Direct labor	Share	***	***	***	***	***
COGS: Other factory	Share	***	***	***	***	***
COGS: Total	Share	***	***	***	***	***
Total net sales	Unit value	***	***	***	***	***
COGS: Raw materials	Unit value	***	***	***	***	***
COGS: Direct labor	Unit value	***	***	***	***	***
COGS: Other factory	Unit value	***	***	***	***	***
COGS: Less by-product revenue	Unit value	***	***	***	***	***
COGS: Total	Unit value	***	***	***	***	***
Gross profit or (loss)	Unit value	***	***	***	***	***
SG&A expenses	Unit value	***	***	***	***	***
Operating income or (loss)	Unit value	***	***	***	***	***
Net income or (loss)	Unit value	***	***	***	***	***
Operating losses	Count	***	***	***	***	***
Net losses	Count	***	***	***	***	***
Data	Count	***	***	***	***	***

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

Table H-2
All magnesium: Non-toller U.S. producers' changes in average unit values between comparison periods

Changes in percent

Item	2019-21	2019-20	2020-21	Jan-Sep 2021-22
Total net sales	▲***	▲***	▲***	▲***
COGS: Raw materials	▲***	▲***	▼***	▲***
COGS: Direct labor	▲***	▲***	▼***	▲***
COGS: Other factory	▲***	▼***	▲***	▲***
COGS: Less by-product revenue	▼***	▼***	▼***	▲***
COGS: Total	▲***	▲***	▲***	▲***

Table continued.

Table H-2 Continued
All magnesium: Non-toller U.S. producers' changes in average unit values between comparison periods

Changes dollars per metric ton

Item	2019-21	2019-20	2020-21	Jan-Sep 2021-22
Total net sales	▲***	▲***	▲***	▲***
COGS: Raw materials	▲***	▲***	▼***	▲***
COGS: Direct labor	▲***	▲***	▼***	▲***
COGS: Other factory	▲***	▼***	▲***	▲***
COGS: Less by-product revenue	▼***	▼***	▼***	▲***
COGS: Total	▲***	▲***	▲***	▲***
Gross profit or (loss)	▼***	▼***	▼***	▼***
SG&A expense	▲***	▲***	▲***	▲***
Operating income or (loss)	▼***	▼***	▼***	▼***
Net income or (loss)	▼***	▼***	▼***	▼***

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

Table H-3
All magnesium: Results of operations of U.S. tollers, by item and period

Quantity in metric tons; Value in 1,000 dollars; Ratios in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Net tolled quantity	Quantity	***	***	***	***	***
Net tolling revenue	Value	***	***	***	***	***
COTS: Raw materials not from tollee	Value	***	***	***	***	***
COTS: Direct labor cost	Value	***	***	***	***	***
COTS: Other factory cost	Value	***	***	***	***	***
COTS: Total	Value	***	***	***	***	***
Gross profit or (loss)	Value	***	***	***	***	***
G&A expenses	Value	***	***	***	***	***
Operating income or (loss)	Value	***	***	***	***	***
COTS: Raw materials not from tollee	Ratio to tolling revenue	***	***	***	***	***
COTS: Direct labor cost	Ratio to tolling revenue	***	***	***	***	***
COTS: Other factory cost	Ratio to tolling revenue	***	***	***	***	***
COTS: Total	Ratio to tolling revenue	***	***	***	***	***
Gross profit or (loss)	Ratio to tolling revenue	***	***	***	***	***
G&A expenses	Ratio to tolling revenue	***	***	***	***	***
Operating income or (loss)	Ratio to tolling revenue	***	***	***	***	***

Table continued.

Table H-3 Continued
All magnesium: Results of operations of U.S. tollers, by item and period

Shares in percent; Unit values in dollars per metric ton; Count in number of firms reporting

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
COTS: Raw materials not from tollee	Share	***	***	***	***	***
COTS: Direct labor cost	Share	***	***	***	***	***
COTS: Other factory cost	Share	***	***	***	***	***
COTS: Total	Share	***	***	***	***	***
Net tolling revenue	Unit value	***	***	***	***	***
COTS: Raw materials not from tollee	Unit value	***	***	***	***	***
COTS: Direct labor cost	Unit value	***	***	***	***	***
COTS: Other factory cost	Unit value	***	***	***	***	***
COTS: Total	Unit value	***	***	***	***	***
Gross profit or (loss)	Unit value	***	***	***	***	***
G&A expenses	Unit value	***	***	***	***	***
Operating income or (loss)	Unit value	***	***	***	***	***

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

Table H-4
All magnesium: U.S. tollers' changes in average unit values between comparison periods

Changes in percent

Item	2019-21	2019-20	2020-21	Jan-Sep 2021-22
Net tolling revenue	***	***	***	***
COTS: Raw materials not from tollee	***	***	***	***
COTS: Direct labor cost	***	***	***	***
COTS: Other factory cost	***	***	***	***
COTS: Total	***	***	***	***

Table continued.

Table H-4 Continued
All magnesium: U.S. tollers' changes in average unit values between comparison periods

Changes in dollars per metric ton

Item	2019-21	2019-20	2020-21	Jan-Sep 2021-22
Net tolling revenue	***	***	***	***
COTS: Raw materials not from tollee	***	***	***	***
COTS: Direct labor cost	***	***	***	***
COTS: Other factory cost	***	***	***	***
COTS: Total	***	***	***	***
Gross profit or (loss)	***	***	***	***
SG&A expense	***	***	***	***
Operating income or (loss)	***	***	***	***

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

Table H-5
All magnesium: Combined results of operations of non-toller U.S. producers and U.S. tollers

Value in 1,000 dollars; Ratio in percent

Item	Measure	2019	2020	2021	Jan-Sep 2021	Jan-Sep 2022
Total revenue	Value	***	***	***	***	***
Raw materials	Value	***	***	***	***	***
Direct labor cost	Value	***	***	***	***	***
Other factory costs	Value	***	***	***	***	***
Less by-product revenue	Value	***	***	***	***	***
COGS/COTS	Value	***	***	***	***	***
Gross profit or (loss)	Value	***	***	***	***	***
SG&A expenses	Value	***	***	***	***	***
Operating income or (loss)	Value	***	***	***	***	***
Raw materials	Ratio to total revenue	***	***	***	***	***
Direct labor cost	Ratio to total revenue	***	***	***	***	***
Other factory costs	Ratio to total revenue	***	***	***	***	***
Less by-product revenue	Ratio to total revenue	***	***	***	***	***
COGS/COTS	Ratio to total revenue	***	***	***	***	***
Gross profit or (loss)	Ratio to total revenue	***	***	***	***	***
SG&A expenses	Ratio to total revenue	***	***	***	***	***
Operating income or (loss)	Ratio to total revenue	***	***	***	***	***

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