



2019 Minerals Yearbook

MICA [ADVANCE RELEASE]

MICA

By Stephen M. Jasinski

Domestic survey data and tables were prepared by Sheema Merchant, statistical assistant, and the author.

The United States was the world's fourth leading producer of mica in 2019 (table 11). Scrap and flake mica production in the United States was an estimated 40,100 metric tons (t), a decrease of 5% compared with 42,000 t in 2018. World production of mica increased by 5% to 406,000 t from 388,000 t in 2018 (tables 1, 11). The quantity of ground mica sold or used by producers in the United States decreased by 10% to 61,300 t valued at \$20.5 million from 68,400 t valued at \$23.9 million (revised) in 2018 (tables 1, 2). Essentially all sheet mica used in the United States was imported. China, Canada, and India were, in decreasing order of quantity, the major suppliers of all forms of mica combined (tables 7–9). Consumption of mica splittings was 245 t in 2019, a slight increase from 243 t in 2018 (tables 1, 3).

Mica's value is based on several of its unique physical properties. The crystalline structure of mica forms layers that can be split or delaminated into thin sheets. These sheets are chemically inert, dielectric, elastic, flexible, hydrophilic, insulating, lightweight, platy, reflective, refractive, resilient, and range in opacity from transparent to opaque. Mica is stable when exposed to electricity, light, moisture, and extreme temperatures. The mica group is composed of 37 phyllosilicate minerals that have a layered or platy texture. The commercially important micas are muscovite and phlogopite, which are used in a variety of applications. Muscovite is the principal mica used by the electrical industry to make mica-based capacitors that can operate in environments with temperatures and (or) frequencies that are too high for polypropylene capacitors. Phlogopite mica is used in plastic composites for automotive applications because of its dimensional stability, increased stiffness, and improved heat distortion temperature. Muscovite and phlogopite are used in sheet and ground forms (Rieder and others, 1998, p. 43–45).

Production

In 2019, eight companies produced scrap and flake mica in three States; South Dakota produced the most mica, followed by Georgia and North Carolina, in terms of tonnage. The U.S. Geological Survey (USGS) obtained the data used in this report from two voluntary surveys of U.S. scrap and flake and ground mica producers. Responses were received from two scrap and flake producers and one ground mica producer. The USGS estimated the production quantities and values of nonreporting companies on the basis of past reports from producers, adjusted by employment data from the Mine Safety and Health Administration, U.S. Department of Labor.

Production of scrap and flake mica in the United States decreased to 40,100 t, 5% less than that in 2018 (table 1). Eight companies in three States produced ground mica in 2019 from domestic and imported scrap and flake mica; five plants produced dry-ground mica and three produced wet-ground mica (tables 1, 2).

Consumption

Block and Sheet Mica.—Sheet mica was used principally in the electronics and electrical industries. Its usefulness in these applications is derived from its unique electrical and thermal insulating properties and its mechanical properties, which allow it to be cut, punched, stamped, and machined to close tolerances.

Mica splittings represented the largest part of the sheet mica industry in the United States. Consumption of muscovite and phlogopite splittings was 245 t in 2019, a slight increase from 243 t in 2018 (table 3).

Only high-quality muscovite film mica, which is known as either India ruby mica or ruby muscovite mica, was used as a dielectric in capacitors. The highest quality mica film was used to manufacture capacitors for calibration standards. The next lower grade was used in transmitting capacitors. Receiving capacitors used a slightly lower grade of high-quality muscovite.

The leading use of block mica was as an electrical insulator in electronic equipment. Consumption of muscovite block mica was withheld to protect company proprietary data. High-quality block mica was processed to line the gauge glasses of high-pressure steam boilers because of its flexibility, transparency, and resistance to heat and chemical attack. Other uses included diaphragms for oxygen breathing equipment, marker dials for navigation compasses, optical filters, pyrometers, retardation plates in helium-neon lasers, thermal regulators, and stove and kerosene heater windows. Specialized applications for sheet mica were in aerospace components, laser devices, medical electronics, missile systems, optical instrumentation, radar systems, and radiation detector windows that are transparent to alpha emissions (Geiger-Mueller tubes).

Built-Up Mica.—In 2019, the total quantity of built-up mica that was sold or used in the United States was 234 t (table 4). Segment plate and molding plate were the major end-use products and accounted for 60% and 13% of the total, respectively.

Muscovite and phlogopite splittings were fabricated into various built-up mica products by seven companies that operated seven plants in five States. Produced by mechanized or hand setting of overlapping splittings and alternate layers of binders and splittings, built-up mica was used primarily as an electrical insulation material. Mica insulation was used in high-temperature and fire-resistant power cable in aluminum plants, blast furnaces, critical wiring circuits (for example, defense systems, fire and security alarm systems, and surveillance systems), heaters and boilers, lumber kilns, metal smelters, and tanks and furnace wiring. Specific high-temperature mica-insulated wire and cable are rated to work for up to 15 minutes in molten aluminum, glass, and steel. Major products were bonding materials; flexible, heater, molding, and segment plates; mica paper; and tape.

Flexible plate (cold) was used in electric motor and generator armatures, field coil insulation, and magnet and commutator core insulation. In 2019, mica consumption in flexible plate was an estimated 11 t valued at \$81,000 (table 4).

Molding plate is sheet mica from which V-rings are cut and stamped for use in insulating the copper segments from the steel shaft ends of a commutator. Molding plate is also fabricated into tubes and rings for insulation in armatures, motor starters, and transformers. Consumption for molding plate decreased slightly to an estimated 31 t in 2019 valued at \$272,000 (table 4).

Segment plate acts as insulation between the copper commutator segments of direct-current universal motors and generators. Consumption of mica in the production of segment plate was estimated to be 141 t in 2019 valued at \$232,000 (table 4). Phlogopite built-up mica was preferred because it wears at the same rate as the copper segments. Although muscovite has a greater resistance to wear, it causes uneven ridges that may interfere with the operation of a motor or generator.

Some types of built-up mica have bonded splittings reinforced with glass, linen, muslin, plastic, silk, or special paper. These products are very flexible and were produced in wide, continuous sheets that were either used as is, rolled, cut into ribbons or tapes, or trimmed to specified dimensions. Built-up mica products may also be corrugated or reinforced by multiple layering.

Mica Paper (Reconstituted Mica).—Primary uses for mica paper were the same as those for built-up mica. Five companies consumed scrap mica to produce mica paper for electrical and insulation applications. The principal source of imported scrap mica was India (table 8).

Scrap and Flake.—Very little scrap and flake mica was exported, most being sold to domestic grinding plants.

Ground Mica.—The leading domestic use of ground mica was in joint compound for filling and finishing seams and blemishes in gypsum wallboard (drywall), which accounted for 46% of ground mica sold or used by producers in 2019 (table 2). Mica acts as a filler and extender, improves the workability of the compound, and provides smooth consistency and resistance to cracking.

Consumption in paint accounted for 30% of the ground mica used in 2019 (table 2). In the paint industry, ground mica was used as a pigment extender that also facilitates suspension, reduces chalking, prevents shrinking and shearing of the paint film, increases resistance of the paint film to water penetration and weathering, and brightens the tone of colored pigments. Mica also promotes paint adhesion in aqueous and oleoresinous formulations.

The plastics industry used ground mica as an extender and filler, especially in automobile parts as lightweight insulation to suppress sound and vibration. In 2019, consumption of ground mica in plastic applications accounted for 2% of the total (table 2). Mica was used in plastic automobile fascia and fenders as a reinforcing material, improving mechanical properties and increasing dimensional stability, stiffness, and strength. Mica-reinforced plastics also have high-heat dimensional stability, reduced warpage, and uniform surface properties.

“Other” uses for ground mica, which together accounted for 21% of ground mica consumption, included several end-use categories for which data were withheld to avoid

disclosing company proprietary data and (or) were very small in comparison to other specified end uses. The “other” category included mica used in electrical insulation, roofing, rubber, textile and decorative coatings, welding rods, well-drilling mud, and miscellaneous uses (table 2).

Ground mica was used as an additive to drilling muds by the well-drilling industry. Coarsely ground mica flakes help prevent the loss of circulation by sealing porous sections of the drill hole. During 2019, the number of drill rigs operating in the United States was 1,075 at the beginning of the year and 805 at the end of December. The average weekly drill rig count for 2019 was 943 operating rigs, compared with an average of 1,032 in 2018 (Baker Hughes Inc., 2020).

Other uses for ground mica were in the rubber industry as an inert filler and mold release compound. As a rubber additive, mica reduces gas permeability and improves resiliency. The platy nature of mica enhances release performance in the manufacture of molded rubber products. As a surface coating in the production of rolled roofing and asphalt shingles, mica prevents the sticking of adjacent surfaces. Mica was used in decorative coatings on wallpaper, concrete, stucco, and tile surfaces. It also was used as an ingredient in flux coatings on welding rods, in special greases, and as coatings for core and mold release compounds, facing agents, and mold washes in foundry applications (MICAMAFCO, 2011).

Ground phlogopite mica was used in automotive brake linings and clutch plates to reduce noise and vibration (as an asbestos substitute); as sound-absorbing insulation for coatings and polymer systems; in reinforcing additives for polymers to increase strength and stiffness and to improve stability to heat, chemicals, and ultraviolet radiation; in heat shields and temperature insulation; in industrial coating additives to decrease the permeability of moisture and hydrocarbons; and in polar polymer formulations to increase the strength of epoxies, nylons, and polyesters (Imerys Performance Additives, undated).

Wet-ground mica, which retains the brilliancy of its cleavage faces, was used primarily in pearlescent paints by the automotive industry. In the cosmetics industry, its reflective and refractive properties made mica an important ingredient in blushes, eyeliner, eyeshadow, foundation, hair and body glitter, lip gloss, lipstick, mascara, moisturizing lotions, and nail polish. Mica was added to latex balloons to provide a colored shiny surface.

Stocks

In 2019, industry stocks of muscovite and phlogopite mica splittings were an estimated 78 t, a 5% increase from 74 t in 2018 (table 3). The industry stocks of muscovite block mica were withheld to avoid disclosing company proprietary data.

Prices

Sheet mica prices varied with grade and ranged from less than \$1 per kilogram for low-quality mica to more than \$2,000 per kilogram for the highest quality. The estimated average unit values of mica splittings consumed in the United States in 2019 were muscovite splittings at \$1.66 per kilogram and phlogopite splittings at \$7.82 per kilogram. The estimated average unit

values for block mica consumed in the United States in 2019 were withheld to avoid disclosing company proprietary data.

In 2019, the average unit value of scrap and flake mica produced in the United States, which included high-quality sericite, was \$118 per metric ton. The average value of dry-ground mica was \$316 per metric ton and the average value of wet-ground mica was \$394 per metric ton (tables 1, 2).

Foreign Trade

According to data from the U.S. Census Bureau, the quantity of U.S. total exports of mica in 2019 was 6,290 t valued at \$28.7 million, a 6% decrease in quantity and a 22% increase in value from that in 2018 (table 10). The quantity of domestic ground mica (powder) exports was 5,360 t valued at \$8.95 million, a 7% decrease in quantity and a 4% decrease in value from that in 2018. The quantity of exports of crude and rifted mica in 2019 was 81 t valued at \$191,000 (table 5), a 28% decrease in quantity and a 47% decrease in value from that in 2018. The quantity of worked and unworked sheet mica exports was 793 t valued at \$19.6 million, a 16% increase in quantity and a 42% increase in value over that in 2018 (table 10).

The quantity of U.S. imports of all mica totaled 29,800 t valued at \$37.0 million, a slight decrease in quantity and essentially the same value as that in 2018 (table 10). The quantity of total imports for consumption of unworked split block, film, splittings, and mica sheet categorized as “Other,” almost all of which consisted of unworked low-value scrap mica (less than \$6.00 per kilogram), was 888 t, which was three times that in 2018. The value was \$644,000, which was nearly double that in 2018 (table 7). The quantity of U.S. imports of worked and unworked sheet mica was 3,140 t valued at \$20.5 million, a 67% increase in quantity and a 29% increase in value from that in 2018 (table 10). The quantity of ground mica (powder) imports was 25,900 t valued at \$16.0 million, a 6% decrease in quantity and a 22% decrease in value from that in 2018 (table 8). The quantity of worked mica imports was 3,077 t valued at \$20.0 million, a 72% increase in quantity and a 29% decrease in value from that in 2018 (table 9). For all categories of mica, China was the leading supplier to the United States, followed by Canada, India, Finland, and Brazil.

World Review

World production of mica was 406,000 t, a 5% increase compared with 388,000 t in 2018 (table 11). China was the leading producer of mica, followed by Finland, Madagascar, and the United States.

Outlook

The major uses of ground mica—drywall joint compounds and paints—are mature and relatively stable, with growth tied to

housing construction. The long-term outlook for ground mica is expected to follow trends in housing construction and therefore mica consumption is expected to be stable or to show a slight increase. Mica consumption also is affected by automobile production because interior and exterior parts typically contain dry-ground mica or engineered mica composites, and exterior surfaces may be painted with wet-ground pearlescent pigments and mica-containing coatings.

Consumption of ground mica in small specialty markets, such as coated micas, cosmetics, nylon and polyester resins, and polypropylene composites, is expected to have an annual growth rate slightly higher than that of the entire ground mica industry.

Consumption of block mica is expected to stay steady or increase slightly as demand increases in a few specialty markets, such as electronics. A shortage of high-quality block mica is expected to continue because of the lack of high-quality mica in deposits currently being mined, mostly from pegmatites.

Consumption of mica splittings, which is the principal type of sheet mica consumed in the United States, has been in the range of 200 to 300 metric tons per year in recent years. With no potential new uses apparent and many substitute materials being used, substantial growth is not expected.

References Cited

- Baker Hughes Inc., 2020, North America rotary rig count (January 2000–current): Houston, TX, Baker Hughes Inc., September 25. (Accessed September 28, 2020, at <https://bakerhughesrigcount.gcs-web.com/na-rig-count?c=79687&p=irol-reportsother>.)
- Imerys Performance Additives, [undated], Mica: Roswell, GA, Imerys Performance Additives. (Accessed July 19, 2018, at <https://www.imerys-performance-additives.com/our-minerals/mica>.)
- MICAMAFCO, 2011, Mica powder and mica flakes: West Bengal, India, MICAMAFCO. (Accessed December 18, 2017, at <http://www.micaworld.in/micapowderandflakes.html>.)
- Rieder, Milan, Cavazzini, Giancarlo, D'yakonov, Y.S., Frank-Kamenetskii, V.A., Gottardi, Glauco, Guggenheim, Stephen, Koval, P.V., Mueller, Georg, Neiva, A.M.R., Radoslovich, E.W., Robert, Jean-Louis, Sassi, F.P., Takeda, Hiroshi, Weiss, Zdenek, and Wones, D.R., 1998, Nomenclature of the micas: Chantilly, VA, American Mineralogist IMA Mica Report, v. 83, no. 11–12, part 1, November–December, 1,385 p.

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

- Historical Statistics for Mineral and Material Commodities in the United States. Data Series 140.
- Mica. Ch. in United States Mineral Resources, Professional Paper 820, 1973.
- Mica (Natural). Ch. in Mineral Commodity Summaries, annual.

Other

- Mica. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.

TABLE 1
SALIENT MICA STATISTICS¹

		2015	2016	2017	2018	2019
United States:						
Production, sold or used by producers: ^c						
Scrap and flake mica:						
Quantity	metric tons	32,600	28,000	40,000	42,000 ^r	40,100
Value	thousands	\$4,640	\$4,250	\$6,590	\$5,250 ^r	\$4,720
Ground mica:						
Quantity	metric tons	65,800	59,500	69,700	68,400 ^r	61,300
Value	thousands	\$22,400	\$21,500	\$23,400	\$23,900 ^r	\$20,500
Average unit value: ^c						
Scrap and flake mica	dollars per metric ton	142	152	165	125 ^r	118
Ground mica:						
Dry	do.	305	320	292	308	316
Wet	do.	423	435	424	396 ^r	394
Sheet, muscovite and phlogopite:						
Block	dollars per kilogram	W	W	W	W	W
Splittings	do.	1.61	1.61	1.66	1.65	1.66
Consumption: ^c						
Block, muscovite:						
Quantity	kilograms	W	W	W	W	W
Value	thousands	W	W	W	W	W
Splittings, all types:						
Quantity	metric tons	272	243	255	243	245
Value	thousands	\$438	\$392	\$423	\$400	\$406
Exports ²	metric tons	8,350	7,030	7,490	6,720	6,290
Imports ³	do.	35,300	33,600	31,500	30,400	29,800
World, production	do.	341,000 ^r	341,000 ^r	354,000 ^r	388,000 ^r	406,000 ^c

^cEstimated. ^rRevised. do. Ditto. W Withheld to avoid disclosing company proprietary data.

¹Table includes data available through August 26, 2020. Data are rounded to no more than three significant digits.

²Source: U.S. Census Bureau. Includes Schedule B numbers 2525.10.0000, 2525.20.0000, 2525.30.0000, 6814.10.0000, and 6814.90.0000.

³Source: U.S. Census Bureau. Includes Harmonized Tariff Schedule of the United States codes 2525.10.0010, 2525.10.0020, 2525.10.0050, 2525.20.0000, 2525.30.0000, 6814.10.0000, and 6814.90.0000.

TABLE 2
ESTIMATED GROUND MICA SOLD OR USED BY PRODUCERS IN THE UNITED STATES, BY END USE
AND METHOD OF GRINDING^{1,2}

	2018			2019		
	Quantity (metric tons)	Value (thousands)	Unit value	Quantity (metric tons)	Value (thousands)	Unit value
End use:						
Joint compound	30,700 ^r	\$9,540 ^r	\$311 ^r	28,500	\$8,390	\$295
Paint	22,400 ^r	9,380 ^r	419 ^r	18,500	7,440	402
Plastics	925 ^r	729 ^r	789 ^r	1,120	833	759
Other ³	14,300 ^r	4,290 ^r	299 ^r	13,200	3,890	296
Total	68,400 ^r	23,900 ^r	350 ^r	61,300	20,500	341
Method of grinding:						
Dry	W	W	308	W	W	316
Wet	W	W	422 ^r	W	W	394

^rRevised. W Withheld to avoid disclosing company proprietary data.

¹Table includes data available through August 26, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Domestic material and imported scrap. Low-quality sericite is not included.

³Includes mica used for molded electrical insulation, roofing, rubber, textile and decorative coatings, welding rods, well drilling mud, and miscellaneous.

TABLE 3
ESTIMATED CONSUMPTION AND STOCKS OF
MICA SPLITTINGS IN THE UNITED STATES¹

Year	Consumption		Stocks on December 31 (metric tons)
	Quantity (metric tons)	Value (thousands)	
2018	243	\$400	74
2019	245	406	78

¹Table includes data available through August 26, 2020.

TABLE 4
ESTIMATED BUILT-UP MICA SOLD OR USED IN THE UNITED STATES, BY PRODUCT^{1,2}

Product	2018		2019	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Flexible plate (cold)	11	\$74	11	\$81
Molding plate	32	257	31	272
Segment plate	143	220	141	232
Other	50	92	51	79
Total	236	643	234	664

¹Table includes data available through August 26, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Consists of alternating layers of binder and irregularly arranged and partly overlapped splittings.

TABLE 5
U.S. EXPORTS OF CRUDE AND RIFTED MICA, MICA POWDER, AND WASTE, BY COUNTRY OR LOCALITY¹

Country or locality	Crude and rifted							
	Less than \$6 per kilogram		More than \$6 per kilogram		Powder		Waste	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2018	83	\$108	30	\$250	5,780	\$9,350	170	\$190
2019:								
Bahamas, The	--	--	14	126	--	--	--	--
Belgium	--	--	--	--	18	271	--	--
Brazil	--	--	--	--	848	657	--	--
Canada	24	7	--	--	609	1,460	--	--
Chile	--	--	--	--	20	32	--	--
China	19	7	--	--	197	523	--	--
Costa Rica	--	--	--	--	20	15	--	--
Dominica	--	--	--	--	6	10	--	--
Dominican Republic	--	--	--	--	98	42	1	5
Germany	8	10	--	--	484	1,650	--	--
Guatemala	--	--	--	--	17	30	--	--
Honduras	--	--	--	--	6	24	--	--
India	--	--	--	--	64	138	--	--
Italy	--	--	--	--	122	277	--	--
Jamaica	--	--	--	--	9	18	--	--
Japan	--	--	--	--	427	859	--	--
Korea, Republic of	--	--	--	--	292	455	--	--
Mexico	16	29	--	--	1,680	1,290	--	--
Netherlands	--	--	--	--	62	87	--	--
Pakistan	--	--	--	--	11	49	--	--
Peru	--	--	--	--	(2)	8	--	--
Singapore	--	--	--	--	21	43	--	--
Spain	--	--	--	--	8	11	--	--
St. Lucia	--	--	--	--	2	4	--	--
Taiwan	--	--	--	--	17	121	--	--
United Kingdom	--	--	--	--	9	21	--	--
Other	1	3	(2)	9	310	855	71	128
Total	67	56	14	135	5,360	8,940	72	133

-- Zero.

¹Table includes data available through May 12, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 6
U.S. EXPORTS OF WORKED MICA, BY COUNTRY OR LOCALITY¹

Country or locality	Plates, sheets		Other	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2018	267	\$7,870	389	\$5,690
2019:				
Brazil	38	791	3	119
Canada	50	1,560	55	1,220
China	3	128	25	160
Germany	6	250	10	69
India	238	6,500	--	--
Italy	45	1,430	4	340
Japan	6	187	34	328
Mexico	60	1,690	19	682
Other	75	2,410	93	1,440
Total	520	14,900	245	4,360

-- Zero.

¹Table includes data available through September 1, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF CRUDE AND RIFTED MICA, BY COUNTRY OR LOCALITY¹

Country or locality	Split block		Splittings		Other			
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Less than \$6 per kilogram		More than \$6 per kilogram	
					Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2018	25	\$37	67	\$149	195	\$143	8	\$226
2019:								
Brazil	--	--	--	--	593	375	--	--
Canada	--	--	15	5	--	--	--	--
China	--	--	--	--	--	--	5	290
Germany	--	--	--	--	--	--	(2)	7
India	17	19	29	71	235	175	--	--
Korea, Republic of	--	--	--	--	--	--	1	26
Total	17	19	43	76	828	550	6	323

-- Zero.

¹Table includes data available through May 7, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF MICA POWDER AND WASTE, BY COUNTRY OR LOCALITY¹

Country or locality	Powder		Waste	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2018	27,400	\$20,600	537	\$424
2019:				
Brazil	216	168	--	--
Canada	10,700	5,930	--	--
China	10,100	3,530	--	--
Colombia	95	13	--	--
Finland	1,190	549	--	--
Germany	56	31	--	--
India	1,820	1,490	560	404
Japan	887	2,980	--	--
Norway	46	58	--	--
Thailand	88	255	--	--
United Kingdom	501	654	--	--
Other	189	388	--	--
Total	25,900	16,000	560	404

-- Zero.

¹Table includes data available through May 7, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 9
U.S. IMPORTS FOR CONSUMPTION OF WORKED MICA, BY COUNTRY OR LOCALITY¹

Country or locality	Plates, sheets		Other	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2018	1,080	\$10,600	704	\$4,900
2019:				
Austria	63	1,220	19	541
Belgium	132	2,110	(2)	24
Brazil	121	723	146	202
China	288	1,690	1,980	7,600
Czechia	39	459	2	54
France	39	327	(2)	14
Japan	35	1,070	32	132
United Kingdom	49	969	2	163
Other	59	1,480	66	1,260
Total	825	10,000	2,250	9,990

¹Table includes data available through May 12, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 10
SUMMARY OF U.S. MICA TRADE DATA¹

	Scrap and flake mica				Sheet mica			
	Powder		Waste		Unworked		Worked	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Exports:								
2018	5,780	\$9,350	253	\$298	30	\$250	656	\$13,600
2019	5,360	8,940	140	189	14	135	779	19,400
Imports for consumption:								
2018	27,400	20,600	732	566	100	412	1,790	15,500
2019	25,900	16,000	755	547	66	418	3,080	20,000

¹Table includes data available through May 12, 2020. Data are rounded to no more than three significant digits.

Source: U.S. Census Bureau.

TABLE 11
MICA: WORLD PRODUCTION, BY COUNTRY OR LOCALITY¹

(Metric tons)

Country or locality ²	2015	2016	2017	2018	2019
Argentina	583	564	189 ^r	120 ^r	120 ^e
Austria ^e	4,000	3,800	4,400	4,500	4,500
Brazil ^e	11,000	10,800	10,100	11,000	11,000
Canada	NA	22,000 ^e	22,000 ^{r,e}	21,000 ^{r,e}	21,000 ^e
China ^e	85,000	95,000	100,000	100,000	100,000
Egypt ^e	10,000	10,000	10,000	10,000	10,000
Finland:					
Biotite	38,169	52,310	47,123	50,456	64,505
Concentrate	11,836	10,843	10,740	12,122	9,440
Total	50,005	63,153	57,863	62,578	73,945
France ^e	20,700	19,600	19,200	20,000	20,000
India: ^e					
Crude	902	850	1,000	1,000	1,000
Scrap and flake	13,800	13,000	14,000	15,000	15,000
Total	14,700	13,900	15,000	16,000	16,000
Iran ^{e,3}	5,600	1,500	1,500	1,500	1,500
Korea, Republic of, all grades	17,405	12,934	14,567	16,559	23,433
Madagascar, phlogopite	16,710 ^r	22,311	34,817	48,763 ^r	50,000 ^e
Malaysia	4,788	4,716	4,787	5,000 ^e	5,000 ^e
Mexico, all grades	145	145	145 ^e	150 ^e	150 ^e
Nigeria	570 ^e	79	1,180	3,547	3,600 ^e
Peru	115	111	234	183	52
Russia	4,823	3,701	5,219	4,465	4,500 ^e
South Africa, ground and scrap	29	8	21	32 ^r	30 ^e
Spain	4,355	5,521	6,333	6,000 ^e	6,000 ^e
Sri Lanka, schist	4,120 ^r	5,021 ^r	4,957 ^r	5,000 ^{r,e}	5,000 ^e
Taiwan	8,287	1,880 ^e	750	2,970	3,312
Turkey:					
Illite	44,000	12,110	-- ^e	6,000 ^e	6,000 ^e
Other	637	3,321	204 ^e	500 ^e	500 ^e
Total	44,637	15,431	204 ^e	6,500 ^e	6,500 ^e
United States, scrap and flake ^{e,4}	32,600	28,000	40,000	42,000 ^r	40,100
Zimbabwe ^e	1,000	1,000	500	500	500
Grand total	341,000 ^r	341,000 ^r	354,000 ^r	388,000 ^r	406,000 ^e

^eEstimated. ^rRevised. NA Not available. -- Zero.

¹Table includes data available through September 3, 2020. All data are reported unless otherwise noted. Grand totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the countries and (or) localities listed, Pakistan, Romania, Sudan, and Sweden may have produced mica, but available information was inadequate to make reliable estimates of output.

³Production is based on fiscal year, with a starting date of March 21 of the year shown.

⁴Does not include, if any, U.S. production of low-quality sericite or sheet mica.