



# 2018 Minerals Yearbook

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MICA [ADVANCE RELEASE]

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# MICA

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The United States was one of the world's leading producers of mica; scrap and flake mica production in 2018 was 44,000 metric tons (t), an increase of 10% compared with 40,000 t in 2017. World production of mica was estimated to have increased by 6% to 375,000 t from 353,000 t in 2017 (tables 1, 11). The quantity of ground mica sold or used by producers decreased by 6% to 65,300 t valued at \$22.8 million from 69,700 t valued at \$23.4 million in 2017 (tables 1, 2). Essentially all sheet mica used in the United States was imported. China, Brazil, Belgium, and India were, in decreasing order by quantity, the major suppliers (tables 7, 9). Consumption of mica splittings was 243 t in 2018, a 5% decrease from 255 t in 2017 (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, and resilient, and range in opacity from transparent to opaque. Mica is stable when exposed to electricity, light, moisture, and extreme temperatures. The mica group represents 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 2018, eight companies produced scrap and flake mica in four States with the largest quantity produced in Georgia. The U.S. Geological Survey (USGS) obtained the data in this report through 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.

## 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 243 t in 2018, a 5% decrease from 255 t in 2017 (table 3). Muscovite splittings from India accounted for essentially all domestic consumption.

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

The leading use of block mica is as an electrical insulator in electronic equipment. Consumption of muscovite block mica was withheld to avoid disclosing company proprietary data. High-quality block mica is 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 include 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 are 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).

## Stocks

In 2018, industry stocks of muscovite and phlogopite mica splittings were an estimated 74 t, a 4% increase from 71 t in 2017 (table 3). The industry stocks of muscovite block mica were withheld to avoid disclosing company proprietary data.

**Built-Up Mica.**—In 2017, the total quantity of built-up mica that was consumed or shipped was about 236 t (table 4). Segment plate and molding plate were the major end-use products and accounted for 61% and 14% 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 is used primarily as an electrical insulation material. Mica insulation is 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 are bonding materials; flexible, heater, molding, and segment plates; mica paper; and tape.

Flexible plate (cold) is used in electric motor and generator armatures, field coil insulation, and magnet and commutator core insulation. In 2018, mica consumption in flexible plate was an estimated 11 t valued at \$74,000.

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 by 18% to an estimated 32 t in 2018 valued at \$257,000.

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 about 143 t in 2018 valued at \$220,000. Phlogopite built-up mica is 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 are produced in wide, continuous sheets that are 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 the scrap was India.

**Scrap and Flake.**—Production of scrap and flake mica in the United States increased to 44,000 t, 10% more than that of 2017 (table 1). This scrap and flake mica was sold to domestic grinding plants with very little being exported in this form.

**Ground Mica.**—The quantity of ground mica sold or used by producers decreased by 6% to 65,300 t valued at \$22.8 million from 69,700 t valued at \$23.4 million in 2017 (tables 1, 2). 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 42.0% of ground mica sold or used by producers in 2018 (table 2). Mica acts as a filler and extender, provides smooth consistency, improves the workability of the compound, and provides resistance to cracking.

“Other” uses for ground mica, which together accounted for 29.6% 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. This category included mica used in electrical insulation, roofing, rubber, textile and decorative coatings, welding rods, well drilling mud, and miscellaneous uses.

Consumption in paint accounted for 26.8% of the ground mica used in 2018, a 24% decrease in tonnage compared with 2017. In the paint industry, ground mica is 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 parts for automobiles as lightweight insulation to suppress sound and vibration. In 2018, consumption of ground mica in plastic applications accounted for 1.8% of the total. Mica is 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 good surface properties.

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 2018, the number of drill rigs operating in the United States was 924 rigs at the beginning of the year and 1,083 rigs at the end of December, which was the high for the year. The average weekly drill rig count for 2018 was 1,032 operating rigs, compared with an average of 876 in 2017 (Baker Hughes Inc., 2019).

Other uses for ground mica are 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 is used in decorative coatings on wallpaper, concrete, stucco, and tile surfaces. It also is used as an ingredient in flux coatings on welding rods, in some special greases, and as coatings for core and mold release compounds, facing agents, and mold washes in foundry applications (MICAMAFCO, 2011).

Ground phlogopite mica is 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, is used primarily in pearlescent paints by the automotive industry. In the cosmetics industry, its reflective and refractive properties make mica an important ingredient in blushes, eyeliner, eyeshadow, foundation, hair and body glitter, lipstick, lip gloss, mascara, moisturizing lotions, and nail polish. Mica is added to latex balloons to provide a colored shiny surface.

Natural mica is used by the Taos and Picuris Pueblos Indians in north-central New Mexico to make pottery. The pottery is made from weathered Precambrian mica schist and has flecks of mica throughout the vessels. Tewa Pueblo pottery is made by coating the clay with mica to provide a dense, glittery micaceous finish over the entire object.

## Prices

Sheet mica prices vary with grade and can range 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 2018 were muscovite splittings, \$1.61 per kilogram, and phlogopite splittings, \$7.68 per kilogram. The estimated average unit values for block mica consumed in the United States in 2018 were withheld to avoid disclosing company proprietary data.

In 2018, the average unit value of scrap and flake mica produced in the United States, which included high-quality sericite, was \$122 per metric ton (table 1). The average value of dry-ground mica was \$308 per metric ton, and the average value of wet-ground mica was \$454 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 2018 was 6,720 t valued at \$23.5 million, a 10% decrease in quantity and a slight decrease in value from those of 2017 (table 10). The quantity of domestic ground mica (powder) exports was 5,780 t valued at \$9.35 million, a 9% decrease in quantity and a 3% increase in value from those of 2017. The quantity of exports of crude and rifted mica in 2018 was 113 t valued at \$358,000 (table 5). This is a 75% decrease in quantity and a slight decrease in value from those in 2017. The quantity of worked and unworked sheet mica exports was 686 t valued at \$13.8 million, a slight decrease in quantity and a 3% decrease in value from those in 2017 (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 295 t valued at \$555,000, an 86% decrease in quantity and a 68% decrease in value from those of 2017. Imports from Brazil of scrap mica (less than \$6 per kilogram) went from 1,160 t to 160 t, and imports from India fell from 894 t to zero (table 7). The quantity of U.S. imports of worked and unworked sheet mica was 1,890 t valued at \$15.9 million, a slight increase in quantity and value from those of 2017 (table 10). The quantity of ground mica (powder) imports was 27,400 t valued at \$20.6 million, a slight increase in quantity and a 14% increase in value from those of 2017 (table 8). The quantity of worked mica imports was 1,790 t valued at \$15.5 million, a slight increase in quantity and a slight decrease in value from those of 2017 (table 9). Canada was the leading supplier of mica to the United States, followed by China, India, Brazil, and Japan.

## World Review

World production of mica was estimated to be 375,000 t, a 6% increase compared with 353,000 t in 2018 (table 11). China was the leading producer of mica, followed by Finland, the United States, and Madagascar.

In Canada, official statistics for mica production were withheld to avoid disclosing company proprietary data. The quantity of exports from Canada was used as the basis to estimate production in 2016 through 2018.

## Outlook

The major markets for 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 be stable or to show a slight increase in production. Demand 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. North American automobile production is forecast to decrease slightly in 2019 (J.D. Power and Associates, 2018).

Demand for ground mica in smaller 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 generally low percentage 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.

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## 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

- Economics of Mica, The (8th ed.). Roskill Information Services Ltd., 1997.
- Mica. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.

TABLE 1  
SALIENT MICA STATISTICS<sup>1</sup>

		2014	2015	2016	2017	2018
United States:						
Production, sold or used by producers:						
Scrap and flake mica:						
Quantity	metric tons	48,200	32,600	28,000	40,000	44,000
Value	thousands	\$5,640	\$4,640	\$4,250	\$6,590	\$5,360
Ground mica:						
Quantity	metric tons	81,600	65,800	59,500	69,700	65,300
Value	thousands	\$26,500	\$22,400	\$21,500	\$23,400	\$22,800
Average unit value:						
Scrap and flake mica	dollars per metric ton	117	142	152	165	122
Ground:						
Dry	do.	281	305	320	292	308
Wet	do.	458	423	435	424	454
Sheet, muscovite and phlogopite:						
Block	dollars per kilogram	278	W	W	W	W
Splittings	do.	1.70	1.61	1.61	1.66	1.65
Consumption:						
Block, muscovite:						
Quantity	kilograms	294	W	W	W	W
Value	thousands	\$82	W	W	W	W
Splittings, all types						
Quantity	metric tons	268	272	243	255	243
Value	thousands	\$455	\$438	\$392	\$423	\$400
Exports <sup>2</sup>	metric tons	8,950	8,350	7,030	7,490	6,720
Imports <sup>3</sup>	do.	35,900	35,300	33,600	31,500 <sup>r</sup>	30,400
World, production <sup>e</sup>	do.	341,000	338,000	338,000 <sup>r</sup>	353,000 <sup>r</sup>	375,000

<sup>e</sup>Estimated. <sup>r</sup>Revised. do. Ditto. W Withheld to avoid disclosing company proprietary data.

<sup>1</sup>Table includes data available through April 1, 2020. Data are rounded to no more than three significant digits.

<sup>2</sup>Source: U.S. Census Bureau. Includes Schedule B Numbers 2525.10.0000, 2525.20.0000, 2525.30.0000, 6814.10.0000, 6814.90.0000.

<sup>3</sup>Source: 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, 6814.90.0000.

TABLE 2  
GROUND MICA SOLD OR USED BY PRODUCERS IN THE UNITED STATES, BY END USE  
AND METHOD OF GRINDING<sup>1,2</sup>

	2017			2018		
	Quantity (metric tons)	Value (thousands)	Unit value	Quantity (metric tons)	Value (thousands)	Unit value
End use:						
Joint compound	29,400	\$8,170	\$278	27,400	\$8,400	\$307
Paint	22,900	9,850	430	17,500	7,880	450
Plastics	1,690	1,190	707	1,160	873	752
Other <sup>3</sup>	15,700	4,230	269	19,300	5,650	293
Total	69,700	23,400	337	65,300	22,800	349
Method of grinding:						
Dry	W	W	292	W	W	308
Wet	W	W	424	W	W	454

W Withheld to avoid disclosing company proprietary data.

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

<sup>2</sup>Domestic material and imported scrap. Low-quality sericite is not included.

<sup>3</sup>Includes 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 STATES<sup>1</sup>

Year	Consumption		Stocks on December 31 (metric tons)
	Quantity (metric tons)	Value (thousands)	
2017	255	\$423	71
2018	243	400	74

<sup>1</sup>Table includes data available through April 1, 2020.

TABLE 4  
ESTIMATED BUILT-UP MICA SOLD OR USED IN THE UNITED STATES, BY PRODUCT<sup>1,2</sup>

Product	2017		2018	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Flexible plate (cold)	11	\$90	11	\$74
Molding plate	39	342	32	257
Segment plate	143	221	143	220
Other	52	97	50	92
Total	245	749	236	643

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

<sup>2</sup>Consists 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 LOCALITY<sup>1</sup>

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)
2017	449	\$329	2	\$32	6,340	\$9,040	3	\$11
2018:								
Algeria	--	--	--	--	92	20	--	--
Angola	--	--	--	--	33	8	--	--
Bahamas, The	--	--	29	234	--	--	--	--
Barbados	--	--	--	--	43	62	--	--
Belgium	--	--	--	--	47	409	--	--
Brazil	--	--	--	--	532	572	--	--
Canada	9	3	--	--	588	1,320	151	150
Chile	19	12	--	--	(2)	9	--	--
China	3	9	--	--	224	790	--	--
Costa Rica	--	--	(2)	6	20	14	--	--
Dominica	--	--	--	--	13	20	--	--
Dominican Republic	--	--	--	--	59	48	--	--
Germany	1	4	--	--	572	1,730	--	--
Guatemala	--	--	(2)	3	15	21	--	--
Honduras	--	--	--	--	22	8	--	--
India	23	38	--	--	53	115	--	--
Italy	--	--	--	--	73	158	--	--
Jamaica	--	--	--	--	22	35	--	--
Japan	--	--	--	--	420	781	--	--
Korea, Republic of	3	8	--	--	163	309	--	--
Mexico	20	20	--	--	2,190	1,540	19	39
Netherlands	--	--	--	--	98	133	--	--
Pakistan	--	--	--	--	16	72	--	--
Peru	--	--	--	--	31	13	--	--
Singapore	--	--	--	--	20	34	--	--
Spain	--	--	--	--	16	25	--	--
St. Lucia	--	--	--	--	42	29	--	--
Taiwan	--	--	--	--	12	102	--	--
United Kingdom	3	8	--	--	72	125	--	--
Other	2	6	(2)	6	290	849	--	--
Total	83	108	30	250	5,780	9,350	170	190

-- Zero.

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

<sup>2</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 6  
U.S. EXPORTS OF WORKED MICA, BY COUNTRY OR LOCALITY<sup>1</sup>

Country or locality	Plates, sheets		Other	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2017	330	\$9,180	371	\$5,020
2018:				
Brazil	55	1,660	9	345
Canada	43	1,140	119	1,570
China	8	339	47	352
Germany	13	433	100	640
Italy	16	572	(2)	39
Japan	5	187	24	178
Mexico	73	1,770	45	1,290
Other	52	1,770	43	1,270
Total	267	7,870	389	5,690

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

<sup>2</sup>Less than ½ unit.

Source: U.S. Census Bureau.



TABLE 7  
U.S. IMPORTS FOR CONSUMPTION OF CRUDE AND RIFTED MICA, BY COUNTRY OR LOCALITY<sup>1</sup>

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)
2017	29	\$62	36	\$82	2,070	\$1,560	1	\$10
2018:								
Brazil	--	--	--	--	160	124	--	--
Canada	--	--	--	--	2	4	--	--
China	--	--	--	--	--	--	3	171
India	25	37	67	149	--	--	5	51
Mexico	--	--	--	--	(2)	3	--	--
Spain	--	--	--	--	32	13	--	--
United Kingdom	--	--	--	--	--	--	(2)	4
Total	25	37	67	149	195	143	8	226

-- Zero.

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

<sup>2</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 8  
U.S. IMPORTS FOR CONSUMPTION OF MICA POWDER AND WASTE, BY COUNTRY OR LOCALITY<sup>1</sup>

Country or locality	Powder		Waste	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2017:	27,000	\$18,000 <sup>r</sup>	658	\$517
2018:				
Brazil	972	827	--	--
Canada	12,800	7,740	--	--
China	8,150	3,190	--	--
Colombia	196	24	--	--
Finland	1,210	568	--	--
Germany	200	150	--	--
India	1,620	1,210	537	424
Japan	1,380	5,450	--	--
Norway	93	114	--	--
Thailand	106	306	--	--
United Kingdom	398	487	--	--
Other	249	569	--	--
Total	27,400	20,600	537	424

<sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through April 1, 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 LOCALITY<sup>1</sup>

Country or locality	Plates, sheets		Other	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2017	1,110	\$10,700	670	\$4,960
2018:				
Austria	24	638	49	1,160
Belgium	107	1,400	(2)	5
Brazil	140	910	169	258
China	561	3,170	388	1,450
Czechia	40	435	1	27
France	64	547	3	107
Japan	22	555	37	219
United Kingdom	52	966	26	207
Other	72	1,990	31	1,460
Total	1,080	10,600	703	4,900

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

<sup>2</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 10  
SUMMARY OF U.S. MICA TRADE DATA<sup>1</sup>

	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:								
2017	6,340	\$9,040	452	\$340	2	\$32	702	\$14,200
2018	5,780	9,350	253	298	30	250	656	13,600
Imports for consumption:								
2017	27,000	18,000 <sup>r</sup>	2,730	2,080	66	154	1,780	15,600
2018	27,400	20,600	732	566	100	412	1,790	15,500

<sup>r</sup>Revised.

<sup>1</sup>Table includes data available through April 1, 2020. Data are rounded to no more than three significant digits.

Source: U.S. Census Bureau.

TABLE 11  
MICA: WORLD PRODUCTION, BY COUNTRY OR LOCALITY<sup>1</sup>

(Metric tons)

Country or locality <sup>2</sup>	2014	2015	2016	2017	2018
Argentina	575	583	564	550 <sup>e</sup>	550 <sup>e</sup>
Austria <sup>c</sup>	3,900	4,000	3,800	4,400	4,500
Brazil	10,313	11,000 <sup>e</sup>	10,800 <sup>e</sup>	10,100 <sup>e</sup>	11,000 <sup>e</sup>
Canada	NA	NA	22,000 <sup>e</sup>	24,000 <sup>e</sup>	23,000 <sup>e</sup>
China <sup>c</sup>	95,000	85,000	95,000	100,000 <sup>r</sup>	100,000
Egypt <sup>c</sup>	3,000	10,000	10,000	10,000	10,000
Finland:					
Biotite	41,997	38,169	52,310	47,123	50,456
Concentrate	11,973	11,836	10,843	10,740	12,122
Total	53,970 <sup>r</sup>	50,005 <sup>r</sup>	63,153 <sup>r</sup>	57,863 <sup>r</sup>	62,578
France <sup>c</sup>	20,200	20,700	19,600	19,200 <sup>r</sup>	20,000
India: <sup>c</sup>					
Crude	962	902	850	1,000	1,000
Scrap and waste	16,200	13,800	13,000	14,000	15,000
Total	17,200	14,700	13,900	15,000	16,000
Iran <sup>e,3</sup>	5,600	5,600	1,500 <sup>r</sup>	1,500 <sup>r</sup>	1,500
Korea, Republic of, all grades	24,200 <sup>e</sup>	17,405	12,934	14,567	16,559
Madagascar, phlogopite	12,232	16,634	22,311	34,817 <sup>r</sup>	35,000 <sup>e</sup>
Malaysia	5,659	4,788	4,716	4,787	5,000 <sup>e</sup>
Mexico, all grades	160 <sup>e</sup>	145	145	145 <sup>e</sup>	150 <sup>e</sup>
Nigeria	1,077	570 <sup>e</sup>	79	1,180 <sup>r</sup>	3,547
Peru	109	115	111	234	183
Russia	10,000 <sup>e</sup>	4,823	3,701	5,129 <sup>r</sup>	4,465
South Africa, ground and scrap	83	29	8	21 <sup>r</sup>	20 <sup>e</sup>
Spain	4,049	4,355	5,521 <sup>r</sup>	6,333 <sup>r</sup>	6,000 <sup>e</sup>
Sri Lanka, schist <sup>c</sup>	1,500	1,500	1,500	1,480	1,400
Sudan	1,000	NA <sup>r</sup>	NA <sup>r</sup>	NA <sup>r</sup>	NA
Taiwan	5,016	8,287	1,880 <sup>e</sup>	750 <sup>r</sup>	2,970
Turkey:					
Illite	16,200	44,000	12,110	-- <sup>r,e</sup>	6,000 <sup>e</sup>
Other	1,240	637	3,321	204 <sup>r,e</sup>	500 <sup>e</sup>
Total	17,440 <sup>r</sup>	44,637 <sup>r</sup>	15,431 <sup>r</sup>	204 <sup>r,e</sup>	6,500 <sup>e</sup>
United States, scrap and flake <sup>4</sup>	48,200	32,600	28,000	40,000	44,000
Zimbabwe <sup>c</sup>	1,000	1,000	1,000	500	500
Grand total <sup>c</sup>	341,000	338,000	338,000 <sup>r</sup>	353,000 <sup>r</sup>	375,000

<sup>e</sup>Estimated. <sup>r</sup>Revised. NA Not available. -- Zero.

<sup>1</sup>Table includes data available through September 24, 2019. 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.

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

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

<sup>4</sup>Does not include, if any, U.S. production of low-quality sericite and sheet mica.