

## FELDSPAR AND NEPHELINE SYENITE

(Data in thousand metric tons unless otherwise noted)

**Domestic Production and Use:** U.S. feldspar production in 2018 had an estimated value of \$28 million. The three leading companies mined and processed about 80% of production; four other companies supplied the remainder. Producing States were North Carolina, Virginia, California, Idaho, South Dakota, and Oklahoma, in descending order of estimated tonnage. Feldspar processors reported joint product recovery of mica and silica sand. Nepheline syenite produced in the United States was not included in production figures because the material was not considered to be marketable as a flux and was mostly used in construction applications.

Feldspar is ground to about 20 mesh for glassmaking and to 200 mesh or finer for most ceramic and filler applications. It was estimated that domestically produced feldspar was transported by ship, rail, or truck to at least 30 States and to foreign destinations, including Canada and Mexico. In pottery and glass, feldspar and nepheline syenite function as a flux. The estimated 2018 end-use distribution of domestic feldspar and nepheline syenite was glass, about 60%, and ceramic tile, pottery, and other uses, 40%.

<b><u>Salient Statistics—United States:</u></b>	<b><u>2014</u></b>	<b><u>2015</u></b>	<b><u>2016</u></b>	<b><u>2017</u></b>	<b><u>2018<sup>e</sup></u></b>
Production, marketable <sup>1</sup>	530	520	470	440	450
Imports for consumption:					
Feldspar	8	120	37	290	140
Nepheline syenite	503	449	572	1,460	1,200
Exports, feldspar	16	15	6	5	10
Consumption, apparent <sup>1, 2</sup>					
Feldspar only	520	630	500	730	580
Feldspar and nepheline syenite	1,000	1,100	1,100	2,200	1,800
Price, average value, dollars per ton:					
Feldspar only, marketable production,	66	73	69	64	64
Nepheline syenite, import value	127	150	128	61	70
Employment, mine, preparation plant, and office, number <sup>e</sup>	270	270	250	240	240
Net import reliance <sup>3</sup> as a percentage of apparent consumption:					
Feldspar	E	17	6	39	22
Nepheline syenite	100	100	100	100	100

**Recycling:** Feldspar and nepheline syenite are not recycled by producers; however, glass container producers use cullet (recycled container glass), thereby reducing feldspar and nepheline syenite consumption.

**Import Sources (2014–17):** Feldspar: Turkey, 99%; and other, 1%. Nepheline syenite: Canada, 100%.

<b><u>Tariff: Item</u></b>	<b><u>Number</u></b>	<b><u>Normal Trade Relations</u></b>
		<b><u>12–31–18</u></b>
Feldspar	2529.10.0000	Free.
Nepheline syenite	2529.30.0010	Free.

**Depletion Allowance:** 14% (Domestic and foreign).

**Government Stockpile:** None.

**Events, Trends, and Issues:** In 2018, domestic production and sales of feldspar decreased by 8% and the average unit value of sales was virtually unchanged from that of 2017. Although remaining uncharacteristically high, imports of feldspar and nepheline syenite decreased in 2018 following substantial increases to each in 2017 compared with those of 2016. A company based in Canada continued development of a feldspar-quartz-kaolin project in Idaho that contained high-grade potassium feldspar, with production expected to be about 45,000 tons per year of potassium feldspar during a 25-year mine life. For several years, the operation has produced a low-iron and trace-element feldspathic sand product from old mine tailings that it has marketed to ceramic tile producers.

## feldspar and nepheline syenite

Domestic feldspar consumption has been gradually shifting toward glass from ceramics. A growing segment in the glass industry was solar glass, used in the production of solar panels. Glass, including beverage containers (more than one-half of the feldspar consumed by the glass industry), plate glass, and fiberglass insulation for housing and building construction, continued to be the leading end use of feldspar in the United States.

In the United States, residential construction, in which feldspar is a raw material commonly used in the manufacture of plate glass, ceramic tiles and sanitaryware, and insulation, increased during the first 9 months of 2018 compared with the same period in 2017; housing starts and completions each rose by about 6%. Use of feldspar and nepheline syenite from all sources was expected to increase in 2019, in part owing to an increase in construction and refurbishment projects resulting from the destruction of homes, buildings, and infrastructure that took place in 2017 and 2018 during active hurricane seasons along the Gulf Coast and the Southeastern States, and to a second consecutive year of significant wildfires in some Western States.

A company based in Canada continued development of its White Mountain high-purity calcium feldspar (anorthosite) deposit in southwestern Greenland; the construction of all necessary facilities was nearly finished in October 2018. Upon completion of the electrical components and the road to the port facility, the company expected to begin shipping products to customers during the first half of 2019. Owing to the feldspar's purity and tests, which indicate an alumina recovery of greater than 90%, the company is targeting its product as a replacement for bauxite as a primary source of alumina; kaolin in the production of electrical-grade glass (E-glass) fiberglass; and kaolin and premium nepheline syenite in the filler market for paint and clear-coating formulations and polymers.

**World Mine Production and Reserves:**<sup>4</sup> Reserves data for Brazil, Czechia, India, the Republic of Korea, and Thailand were revised based on Government information.

	Mine production (Feldspar)		Reserves <sup>5</sup>
	2017	2018 <sup>e</sup>	
United States <sup>1</sup>	440	450	NA
Brazil (beneficiated marketable)	400	400	150,000
China	4,000	4,000	NA
Czechia	460	460	23,000
Egypt	400	400	1,000,000
India	1,500	1,500	320,000
Iran	1,000	1,000	630,000
Italy	3,500	3,000	NA
Korea, Republic of	600	600	240,000
Malaysia	350	350	NA
Poland (processed; includes imports)	500	500	16,000
Spain (includes pegmatites)	600	600	NA
Thailand	1,390	1,500	960
Turkey	7,150	7,500	240,000
Other countries	2,400	2,500	NA
World total (rounded)	24,700	25,000	Large

**World Resources:** Identified and undiscovered resources of feldspar are more than adequate to meet anticipated world demand. Quantitative data on resources of feldspar existing in feldspathic sands, granites, and pegmatites generally have not been compiled. Ample geologic evidence indicates that resources are large, although not always conveniently accessible to the principal centers of consumption.

**Substitutes:** Imported nepheline syenite was the major alternative material for feldspar. Feldspar can be replaced in some of its end uses by clays, electric furnace slag, feldspar-silica mixtures, pyrophyllite, spodumene, or talc.

<sup>e</sup>Estimated. E Net exporter. NA Not available.

<sup>1</sup>Rounded to two significant digits to avoid disclosing company proprietary data.

<sup>2</sup>Defined as production + imports – exports.

<sup>3</sup>Defined as imports – exports.

<sup>4</sup>Feldspar only.

<sup>5</sup>See Appendix C for resource and reserve definitions and information concerning data sources.