NIOBIUM (COLUMBIUM)

(Data in metric tons of niobium content unless otherwise noted)

Domestic Production and Use: Significant U.S. niobium mine production has not been reported since 1959. Domestic niobium resources are of low grade, some are mineralogically complex, and most are not commercially recoverable. Companies in the United States produced niobium-containing materials from imported niobium minerals, oxides, and ferroniobium. Niobium was consumed mostly in the form of ferroniobium by the steel industry and as niobium alloys and metal by the aerospace industry. Major end-use distribution of reported niobium consumption was as follows: steels, about 80%; and superalloys, about 20%. In 2016, the estimated value of niobium consumption was $300 million, as measured by the value of imports.

Salient Statistics—United States:	2012	2013	2014	2015	2016[e]
Production, mine	—	—	—	—	—
Imports for consumption[e, 1]	10,100	8,580	11,100	8,520	9,150
Exports[e, 1]	385	435	1,110	1,430	5,220
Government stockpile releases[2]	—	—	—	—	—
Consumption:[e]					
Apparent	9,730	8,140	10,000	7,080	3,930
Reported[3]	7,460	7,500	8,210	7,510	7,350
Unit value, ferroniobium, dollars per kilogram[4]	27	27	25	24	20
Net import reliance[5] as a percentage of apparent consumption	100	100	100	100	100

Recycling: Niobium was recycled when niobium-bearing steels and superalloys were recycled; scrap recovery, specifically for niobium content, was negligible. The amount of niobium recycled is not available, but it may be as much as 20% of apparent consumption.

Import Sources (2012–15): Niobium ore and concentrate: Brazil, 38%; Rwanda, 25%; Australia, 8%; Canada, 8%; and other, 21%. Niobium metal and oxide: Brazil, 80%; Canada, 14%; and other, 6%. Total imports: Brazil, 80%; Canada, 14%; and other, 6%. Of the U.S. niobium material imports, 94% (by gross quantity) was ferroniobium and niobium metal and oxide.

Tariff: Item	Number	Normal Trade Relations 12–31–16
Synthetic tantalum-niobium concentrates	2615.90.3000	Free.
Niobium ores and concentrates	2615.90.6030	Free.
Niobium oxide	2825.90.1500	3.7% ad val.
Ferroniobium:		
Less than 0.02% P or S, or less than 0.4% Si	7202.93.4000	5% ad val.
Other	7202.93.8000	5% ad val.
Niobium:		
Waste and scrap[6]	8112.92.0600	Free.
Unwrought, powders	8112.92.4000	4.9% ad val.
Niobium, other[6]	8112.99.9000	4% ad val.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile: In the annual materials plan for FY 2017, the Defense Logistics Agency (DLA) Strategic Materials announced the 2017 maximum acquisition limit of 209 tons for ferroniobium. No disposals were planned.

Stockpile Status—9–30–16[7]

Material	Inventory	Disposal Plan FY 2016	Disposals FY 2016
Ferroniobium	39	—	—
Niobium metal	10	—	—

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NIOBIUM (COLUMBIUM)

Events, Trends, and Issues: Niobium principally was imported in the form of ferroniobium. Based on data through July of 2016, U.S. niobium apparent consumption (measured in contained niobium) was estimated to be 3,930 tons, 40% less than that of 2015, owing to increased exports. Brazil was the world's leading niobium producer with 90% of global production, followed by Canada with 9%.

One domestic company was working toward development of the only primary niobium deposit in the United States at its Elk Creek project in Nebraska, where it planned to begin production in 2017.

The DLA Strategic Materials acquired ferroniobium for the U.S. stockpile, substantially increasing the amount of niobium in the stockpile.

World Mine Production and Reserves:

	Mine production		Reserves[8]
	2015	2016[e]	
United States	—	—	—
Brazil	58,000	58,000	4,100,000
Canada	5,750	5,800	200,000
Other countries	570	200	NA
World total (rounded)	64,300	64,000	>4,300,000

World Resources: World resources of niobium are more than adequate to supply projected needs. Most of the world's identified resources of niobium occur as pyrochlore in carbonatite (igneous rocks that contain more than 50%-by-volume carbonate minerals) deposits and are outside the United States. The United States has approximately 150,000 tons of niobium in identified resources, most of which were considered subeconomic at 2016 prices for niobium.

Substitutes: The following materials can be substituted for niobium, but a performance loss or higher cost may ensue: molybdenum and vanadium, as alloying elements in high-strength low-alloy steels; tantalum and titanium, as alloying elements in stainless- and high-strength steels; and ceramics, molybdenum, tantalum, and tungsten in high-temperature applications.

[e]Estimated. NA Not available. — Zero.
[1]Imports and exports include the estimated niobium content of niobium and tantalum ores and concentrates, niobium oxide, ferroniobium, niobium unwrought alloys, metal, and powder.
[2]Government stockpile inventory reported by DLA Strategic Materials is the basis for estimating Government stockpile releases.
[3]Includes ferroniobium and nickel niobium.
[4]Unit value is mass-weighted average unit value of gross quantity of U.S. ferroniobium trade. (Trade is imports plus exports.)
[5]Defined as imports – exports + adjustments for Government and industry stock changes.
[6]This category includes materials other than niobium-containing material.
[7]See Appendix B for definitions.
[8]See Appendix C for resource and reserve definitions and information concerning data sources.