NIOBIUM (COLUMBIUM)

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

Domestic Production and Use: Significant U.S. niobium mine production has not been reported since 1959. Companies in the United States produced niobium-containing materials from imported niobium concentrates, 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. In 2021, there was an increase in apparent consumption of niobium for high-strength low-alloy steel and superalloy applications. Major end-use distribution of domestic niobium consumption was estimated as follows: steels, about 80%, and superalloys, about 20%. The estimated value of niobium consumption was $340 million, as measured by the value of imports.

Salient Statistics—United States:	2017	2018	2019	2020	2021[e]
Production, mine	—	—	—	—	—
Imports for consumption[1]	9,330	11,200	10,100	7,200	8,000
Exports[1]	1,490	955	668	785	1,000
Shipments from Government stockpile[2]	−66	−76	−84	−88	−1
Consumption:[e]					
Apparent[3]	7,780	10,100	9,370	6,330	7,000
Reported[4]	7,640	6,850	6,680	5,120	5,700
Price, unit value, ferroniobium, dollars per kilogram[5]	20	21	23	21	20
Net import reliance[3] 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 (2017–20): Niobium and tantalum ores and concentrates: Austria, 36%; Rwanda, 34%; Congo (Kinshasa), 7%; Mozambique, 6%; and other, 17%. Niobium oxide: Brazil, 60%; Thailand, 15%; Russia, 11%; Estonia, 6%; and other, 8%. Ferroniobium and niobium metal: Brazil, 67%; Canada, 31%; Germany, 1%, and other, 1%. Total imports: Brazil, 65%; Canada, 27%; and other, 8%. Of the U.S. niobium material imports (by contained weight), 89% was ferroniobium, 10% was niobium oxide, 1% was niobium ores and concentrates, and <1% was niobium metal.

Tariff: Item	Number	Normal Trade Relations 12–31–21
Synthetic tantalum-niobium concentrates	2615.90.3000	Free.
Niobium ores and concentrates	2615.90.6030	Free.
Niobium oxide	2825.90.1500	3.7% ad valorem.
Ferroniobium:		
Less than 0.02% P or S, or less than 0.4% Si	7202.93.4000	5% ad valorem.
Other	7202.93.8000	5% ad valorem.
Niobium:		
Waste and scrap[6]	8112.92.0600	Free.
Powders and unwrought metal	8112.92.4000	4.9% ad valorem.
Niobium, other[6]	8112.99.9000	4% ad valorem.

Depletion Allowance: 22% (domestic), 14% (foreign).

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NIOBIUM (COLUMBIUM)

Government Stockpile:[7]

Material	Inventory as of 9–30–21	FY 2021 Potential acquisitions	FY 2021 Potential disposals	FY 2022 Potential acquisitions	FY 2022 Potential disposals
Ferroniobium (gross weight)	544	—	—	—	—
Niobium metal (gross weight)	10	—	—	—	—

Events, Trends, and Issues: In 2021, U.S. niobium apparent consumption (measured in niobium content) was estimated to be 7,000 tons, an 11% decrease from that in 2020. One domestic company developing its Elk Creek project in Nebraska announced that it acquired a key land parcel in April, affording ownership of 90% of the project's mineral reserves and resources. The project would be the only niobium mine and primary niobium-processing facility in the United States, with construction to begin after financing was obtained.

Brazil continued to be the world's leading niobium producer with approximately 88% of global production, followed by Canada with about 10%. Global niobium production and consumption were thought to have increased in 2021 as steel production in most countries began to recover from the global COVID-19 pandemic. According to international trade statistics under the Harmonized Tariff Code 7202.93 (ferroniobium), Brazil's total exports were 69,400 tons from January through September 2021, 31% greater than through the same period in 2020. Most of Brazil's exports were sent to China, followed by the Netherlands and the Republic of Korea.

A leading niobium producer in Brazil completed its most recent capacity upgrades which increased the original capacity by 50% to 150,000 tons per year of niobium products (approximately 98,000 tons per year of niobium content). Further, two additional producers in Brazil entered the funding stages for new capacity upgrades. The completion of those projects could provide a potential significant increase in production in Brazil over the next decade.

World Mine Production and Reserves:

	Mine production 2020	Mine production 2021[e]	Reserves[8]
United States	—	—	170,000
Brazil	59,800	66,000	16,000,000
Canada	6,500	7,400	1,600,000
Other countries	1,350	1,400	NA
World total (rounded)	67,700	75,000	>17,000,000

World Resources:[8] 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.

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

[e]Estimated. NA Not available. — Zero.

[1]Imports and exports include the estimated niobium content of ferroniobium, niobium and tantalum ores and concentrates, niobium oxide, and niobium powders and unwrought metal.

[2]Change in total inventory from prior yearend inventory. If negative, net increase in inventory.

[3]Defined as imports – exports + adjustments for Government stock changes.

[4]Only includes ferroniobium and nickel niobium.

[5]Unit value is weighted average unit value of gross weight of U.S. ferroniobium trade (imports plus exports.)

[6]This category includes niobium-containing material and other material.

[7]See Appendix B for definitions.

[8]See Appendix C for resource and reserve definitions and information concerning data sources.