IODINE

(Data in metric tons of elemental iodine unless otherwise noted)

Domestic Production and Use: Iodine was produced from brines in 2021 by three companies operating in Oklahoma. U.S. iodine production in 2021 was withheld to avoid disclosing company proprietary data but was estimated to have been less than that in 2020. The average annual cost, insurance, and freight unit value of iodine imports in 2021 was estimated to be $32 per kilogram, a slight increase from that of 2020.

Because domestic and imported iodine was used by downstream manufacturers to produce many intermediate iodine compounds, it was difficult to establish an accurate end-use pattern. Crude iodine and inorganic iodine compounds were thought to account for more than 50% of domestic iodine consumption in 2021. Worldwide, the leading uses of iodine and its compounds were X-ray contrast media, pharmaceuticals, liquid crystal displays (LCDs), and iodophors, in descending order of quantity consumed. Other applications of iodine included animal feed, biocides, fluoride derivatives, food supplements, and nylon.

Salient Statistics—United States:	**2017**	**2018**	**2019**	**2020**	**2021[e]**
Production	W	W	W	W	W
Imports for consumption	4,170	4,930	4,300	4,570	4,100
Exports	1,230	1,190	1,230	1,130	1,200
Consumption:					
Apparent[1]	W	W	W	W	W
Reported	4,500	4,620	4,000	3,750	4,000
Price, crude iodine, average unit value of imports (cost, insurance, and freight), dollars per kilogram	19.55	22.46	26.38	31.57	32
Employment, number[e]	60	60	60	60	60
Net import reliance[2] as a percentage of reported consumption	>50	>50	>50	>50	>50

Recycling: Small amounts of iodine were recycled.

Import Sources (2017–20): Chile, 89%; Japan, 10%; and other, 1%.

Tariff: **Item**	**Number**	**Normal Trade Relations 12–31–21**
Iodine, crude	2801.20.0000	Free.

Depletion Allowance: 14% (domestic and foreign).

Government Stockpile: None.

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IODINE

Events, Trends, and Issues: According to trade publications, spot prices for iodine crystal averaged about $36 per kilogram during the first 9 months of 2021. This was slightly less than the 2020 annual average of $36.49 per kilogram. Prices were still considerably less than the historically high levels of $65 to $85 per kilogram in late 2012 and early 2013.

As in recent years, Chile was the world's leading producer of iodine, followed by Japan and the United States. Excluding production in the United States, Chile accounted for about two-thirds of world production in 2021. Most of the world's iodine supply comes from three areas: the Chilean desert nitrate mines, the gasfields and oilfields in Japan, and the iodine-rich brine wells in northwestern Oklahoma.

Following the global COVID-19 pandemic in 2020, global demand for iodine applications increased throughout 2021. One U.S. company was in negotiations with partners to build a new iodine plant with construction expected to begin by the end of 2021.

World Mine Production and Reserves: China and Iran also produce crude iodine, but output is not officially reported, and available information was inadequate to make reliable estimates of output.

	Mine production		Reserves[3]
	2020	2021[e]	
United States	W	W	250,000
Azerbaijan	180	200	170,000
Chile	20,200	22,000	610,000
Indonesia	31	30	100,000
Japan	8,880	9,000	4,900,000
Russia	3	3	120,000
Turkmenistan	600	600	70,000
World total (rounded)	[4]29,900	[4]32,000	6,200,000

World Resources:[3] Seawater contains 0.06 part per million iodine, and the oceans are estimated to contain approximately 90 billion tons of iodine. Seaweeds of the Laminaria family are able to extract and accumulate up to 0.45% iodine on a dry basis. Although not as economical as the production of iodine as a byproduct of gas, nitrates, and oil, the seaweed industry represented a major source of iodine prior to 1959 and remains a large resource.

Substitutes: No comparable substitutes exist for iodine in many of its principal applications, such as in animal feed, catalytic, nutritional, pharmaceutical, and photographic uses. Bromine and chlorine could be substituted for iodine in biocide, colorant, and ink, although they are usually considered less desirable than iodine. Antibiotics can be used as a substitute for iodine biocides.

[e]Estimated. W Withheld to avoid disclosing company proprietary data.

[1]Defined as production + imports – exports.

[2]Defined as imports – exports.

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

[4]Excludes U.S. production.