

IODINE

(Data in metric tons elemental iodine unless otherwise noted)

Domestic Production and Use: Iodine was produced from brines in 2017 by three companies operating in Oklahoma. U.S. iodine production in 2017 was withheld to avoid disclosing company proprietary data. The average cost, insurance, and freight value of iodine imports in 2017 was estimated to be \$20 per kilogram.

Because domestic and imported iodine were used by downstream manufacturers to produce many intermediate iodine compounds, it was difficult to establish an accurate end-use pattern. Organic iodine compounds, which included ethyl and methyl iodide, ethylenediamine dihydroiodide, and povidine iodine were estimated to account for more than 50% of domestic iodine consumption in 2017. Iodine and its compounds are primarily used in x-ray contrast media, pharmaceuticals, liquid-crystal-display (LCD) screens, and iodophors, in descending order.

Salient Statistics—United States:	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017^e</u>
Production	W	W	W	W	W
Imports for consumption	5,960	5,360	5,630	4,320	4,300
Exports	1,130	1,240	1,210	1,050	1,100
Consumption:					
Apparent ¹	W	W	W	W	W
Reported	4,050	3,740	3,620	4,530	4,500
Price, average c.i.f. value, dollars per kilogram, crude	42.77	37.04	27.74	22.71	20.00
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 (2013–16): Chile, 88%; Japan, 11%; and other, <1%.

Tariff:	Item	Number	Normal Trade Relations
	Iodine, crude	2801.20.0000	<u>12–31–17</u> Free.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

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Events, Trends, and Issues: According to trade publications, spot prices of iodine crystal averaged about \$20 per kilogram at the beginning of 2017 and increased to an average of about \$23 per kilogram in September 2017. However, iodine prices were still considerably less than the historically high levels of \$65 to \$85 per kilogram in late 2012 and early 2013. Price increases were attributed to reduced iodine production in South America combined with steady demand. Demand for x-ray contrast media led market growth for iodine, especially in developing countries, where access to healthcare continues to increase.

As in recent years, Chile was the world's leading producer of iodine, followed by Japan and the United States. Excluding United States production, Chile accounted for about 65% of world production in 2017. Most of the world's iodine supply comes from three areas: the Chilean desert nitrate mines, the oil and gas fields in Japan, and northwestern Oklahoma.

World Mine Production and Reserves: Reserves for Chile were revised based on company and Government reports.

	Mine production		Reserves ³
	2016	2017 ^e	
United States	W	W	250,000
Azerbaijan	210	200	170,000
Chile	21,200	20,000	700,000
Indonesia	15	15	100,000
Japan	10,600	10,600	5,000,000
Russia	—	—	120,000
Turkmenistan	500	500	70,000
World total (rounded)	⁴ 32,500	⁴ 31,000	6,400,000

World Resources: In addition to the reserves shown above, seawater contains 0.06 parts 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.

^eEstimated. W Withheld to avoid disclosing company proprietary data. — Zero.

¹Defined as production + imports – exports.

²Defined as imports – exports.

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

⁴Excludes U.S. production.