

IRON OXIDE PIGMENTS

(Data in metric tons unless otherwise noted)

Domestic Production and Use: Iron oxide pigments (IOPs) were mined domestically by three companies in three States. Production, which was withheld to avoid disclosing company proprietary data, decreased in 2018 from that of 2017. Six companies, including the three producers of natural IOPs, processed and sold about 52,000 tons of finished natural and synthetic IOPs with an estimated value of \$74 million, significantly below the most recent sales peak of 88,100 tons in 2007. About 55% of natural and synthetic finished IOPs were used in concrete and other construction materials; 20% in coatings and paints; 5% in foundry sands and other foundry uses; 3% each in animal food and industrial chemicals; 2% each in cosmetics and plastics; 1% in glass and ceramics; and 9% in other uses.

Salient Statistics—United States:	2014	2015	2016	2017	2018^e
Mine production, crude	W	W	W	W	W
Sold or used, finished natural and synthetic IOP	45,300	53,500	48,500	47,900	52,000
Imports for consumption	175,000	176,000	179,000	179,000	180,000
Exports, pigment grade	8,790	8,930	15,800	13,500	12,000
Consumption, apparent ¹	212,000	221,000	212,000	213,000	220,000
Price, average value, dollars per kilogram ²	1.58	1.46	1.46	1.44	1.41
Employment, mine and mill	50	55	60	60	60
Net import reliance ³ as a percentage of reported consumption	>50	>50	>50	>50	>50

Recycling: None.

Import Sources (2014–17): Natural: Cyprus, 46%; Spain, 27%; France, 13%; Austria, 12%; and other, 2%. Synthetic: China, 52%; Germany, 27%; Brazil, 7%, Canada, 6%, and other, 8%.

Tariff: Item	Number	Normal Trade Relations 12–31–18
Natural:		
Micaceous iron oxides	2530.90.2000	2.9% ad val.
Earth colors	2530.90.8015	Free.
Iron oxides and hydroxides containing 70% or more by weight Fe ₂ O ₃ :		
Synthetic:		
Black	2821.10.0010	3.7% ad val.
Red	2821.10.0020	3.7% ad val.
Yellow	2821.10.0030	3.7% ad val.
Other	2821.10.0040	3.7% ad val.
Earth colors	2821.20.0000	5.5% ad val.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: In 2018, domestic mine production of crude natural IOPs decreased slightly owing to a major producer reducing mine output to draw down stocks after excess crude production in 2016 and 2017. Production and sales of finished natural and synthetic IOPs increased by about 9%. Domestic production of crude natural IOPs and production and sales of synthetic IOPs are expected to increase in 2019, owing in part to an increase in construction and refurbishment projects, resulting from the destruction of buildings, homes, and infrastructure that took place in 2017 and 2018 during hurricane seasons along the Gulf Coast and in southeastern States, and to a second consecutive year of significant wildfires in some Western States.

In the United States, residential construction, in which IOPs are commonly used to color concrete block and brick, ready-mixed concrete, and roofing tiles, increased during the first 9 months of 2018 compared with the same period in 2017; housing starts and completions each rose by about 6%. Spending on residential and nonresidential construction increased by 7% and 5%, respectively, during the first 9 months of 2018 compared with the same period in 2017.

Exports of pigment-grade IOPs decreased by about 13% during the first 9 months of 2018 compared with the same period in 2017, mostly owing to a significant decrease in exports to Belgium and China; more than 87% of pigment-grade IOPs went to Mexico, China, Belgium, Chile, Brazil, Thailand, the United Kingdom, and Germany, in

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descending order of quantity. Exports of other grades of iron oxides and hydroxides, nearly double those of pigment grade, decreased by about 40% during the first 9 months of 2018 compared with those of the same period in 2017. About 97% of exports of other grades of iron oxides and hydroxides went to Spain, Canada, China, Mexico, Israel, Australia, Argentina, and Belgium, in descending order of quantity. Total imports of natural and synthetic IOPs decreased slightly in 2018 compared with those in 2017.

A company in Utah continued to ramp up production and marketing of its high-purity “advanced natural” iron oxides, mostly composed of goethite and hematite. The company sold its natural IOP products to the paints and coatings industries, promoted its transparent IOP products to the woodstains market, and marketed IOP products to the energy and biogas industries as desulfurization catalysts to compete with costly synthetic iron oxide catalysts commonly used in scavenging the highly corrosive hydrogen sulfide gas produced in the anaerobic conversion of biomass.

A major international IOP-producing company, with production facilities in many countries, completed the acquisition of a U.S. company that historically was a significant producer of crude and synthetic IOPs. The U.S. company produced a variety of natural and blended IOPs and ecofriendly, transparent IOP products, mostly by recovering iron oxide from waste streams and drainage and iron-bearing waste piles from current and closed coal and iron ore mines, especially in the Eastern States. The same company, partnering with the State of Virginia, donated 100 hectares, including a site for walking and biking recreational use as an extension to an adjacent State park; newly constructed trails with naturally colorful cliffs opened in 2018.

A major iron-oxide-producing company based in Germany was planning to expand its synthetic IOP production capacities of black and red pigments in Germany; black, red, and yellow pigments in China; and yellow pigments in Brazil, reaching a total global production capacity of more than 400,000 tons per year by 2019.

World Mine Production and Reserves: Reserves data for India were revised based on Government information.

	Mine production		Reserves ⁴
	2017	2018 ^e	
United States	W	W	Moderate
Austria (micaceous IOP)	3,500	3,500	NA
Cyprus (umber)	4,000	4,000	Moderate
France	1,000	1,000	NA
Germany ⁵	200,000	200,000	Moderate
India (ocher)	2,200,000	2,300,000	37,000,000
Pakistan (ocher)	80,000	80,000	Moderate
Spain (ocher and red iron oxide)	16,000	16,000	Large
World total	⁶ NA	⁶ NA	Large

World Resources: Domestic and world resources for production of IOPs are adequate. Adequate resources are available worldwide for the manufacture of synthetic IOPs.

Substitutes: Milled IOPs are probably the most commonly used natural minerals for pigments. Because IOPs are color stable, low cost, and nontoxic, they can be economically used for imparting black, brown, red, and yellow coloring in large and relatively low-value applications. Other minerals may be used as colorants, but they generally cannot compete with IOPs because of their higher costs and more limited availability. Synthetic IOPs are widely used as colorants and compete with natural IOPs in many color applications. Organic colorants are used for some colorant applications, but many of the organic compounds fade over time from exposure to sunlight.

^eEstimated. NA Not available. W Withheld to avoid disclosing company proprietary data.

¹Defined as sold or used finished natural and synthetic IOPs + imports – exports.

²Average unit value for finished iron oxide pigments sold or used by U.S. producers.

³Defined as imports – exports.

⁴See Appendix C for resource and reserve definitions and information concerning data sources.

⁵Includes natural and synthetic IOP.

⁶A significant number of other countries, including Azerbaijan, Brazil, China, Honduras, Iran, Italy, Kazakhstan, Lithuania, Paraguay, Russia, South Africa, Turkey, Ukraine, and the United Kingdom, are thought to produce IOPs, but output was not reported and no basis was available to make reliable estimates of production.