

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 2017 from that of 2016. Six companies, including the three producers of natural IOPs, processed and sold about 55,000 tons of finished natural and synthetic IOPs with an estimated value of \$85 million, significantly below the most recent sales peak of 88,100 tons in 2007. About 54% of natural and synthetic finished IOPs were used in concrete and other construction materials; 20% in coatings and paints; 9% in foundry sands and other foundry uses; 4% in industrial chemicals; 3% in animal food; 2% in glass and ceramics; 1% in fertilizer; 1% in plastics, rubber, and cosmetics combined; and 6% in other uses.

Salient Statistics—United States:	2013	2014	2015	2016	2017^e
Mine production, crude	W	W	W	W	W
Sold or used, finished natural and synthetic IOP	47,200	45,300	53,500	52,500	55,000
Imports for consumption	165,000	175,000	176,000	179,000	190,000
Exports, pigment grade	8,170	8,790	8,930	15,800	13,000
Consumption, apparent ¹	204,000	212,000	221,000	216,000	232,000
Price, average value, dollars per kilogram ²	1.60	1.58	1.46	1.57	1.54
Employment, mine and mill	50	50	55	60	60
Net import reliance ³ as a percentage of reported consumption	>50	>50	>50	>50	>50

Recycling: None.

Import Sources (2013–16): Natural: Cyprus, 49%; Spain 27%; France, 12%; Austria, 11%; and other, 1%. Synthetic: China, 52%; Germany, 27%; and Brazil, Canada, and other, 7% each.

Tariff: Item	Number	Normal Trade Relations 12–31–17
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 2017, domestic mine production of crude natural IOPs decreased somewhat owing to a major producer reducing mining output this year to use stockpiled feedstock from excess crude production in 2016. Production and sales of finished natural and synthetic IOPs increased by about 5%. Domestic production of crude natural IOPs and production and sales of synthetic IOPs are expected to increase in 2018. This is partly owing to an increase in construction and refurbishment projects resulting from significant damage to structures and infrastructure that took place in 2017 as the result of extensive hurricanes along the Gulf Coast and the southeastern United States and extensive wildfires in some Western States.

Residential construction, in which IOPs are commonly used to color concrete block and brick, ready-mixed concrete, and roofing tiles, increased in the first 9 months of 2017 compared with the same period in 2016; housing starts and completions rose by about 3% and 11%, respectively. Spending on residential construction increased by 11% during the first 9 months of 2017 compared with the same period in 2016. Spending on nonresidential construction, which accounted for 57% of construction expenditures, increased slightly in the first 9 months of 2017 compared with those of 2016.

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Exports of pigment-grade IOPs decreased by about 20% during the first 9 months of 2017 compared with the same period in 2016, mostly owing to a significant decrease in exports to Belgium; more than 87% of pigment-grade IOPs went to Mexico, China, Belgium, Germany, Taiwan, and Chile, in descending order of quantity. Exports of other grades of iron oxides and hydroxides, more than three times those of pigment grade, decreased by about 10% during the first 9 months of 2017 compared with the same period in 2016. About 98% of exports of other grades of iron oxides and hydroxides went to Spain, China, Canada, Mexico, South Africa, Australia, and Israel, in descending order of quantity. Total imports of natural and synthetic IOPs increased by 6% in 2017 compared with those in 2016.

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, and it established contracts with two specialty chemical materials distributors to sell its natural IOP products in most of the Midwestern and Western States, especially to the paints and coatings industries. The company also 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, acquired a U.S. company that historically was a significant producer of crude and synthetic IOPs. The U.S. company, which ceased crude and synthetic IOP production several years ago, continued to produce a variety of IOPs and ecofriendly, transparent IOP products by the processing of waste materials from current and closed coal and iron ore mines, especially in the Eastern States.

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

World Mine Production and Reserves:

	Mine production		Reserves ⁴
	2016	2017 ^e	
United States	W	W	Moderate
Austria (micaceous IOP)	3,500	3,500	NA
Cyprus (umber)	3,500	3,500	Moderate
France	1,000	1,000	NA
Germany ⁵	200,000	200,000	Moderate
India (ocher)	2,200,000	2,000,000	55,000,000
Pakistan (ocher)	40,000	40,000	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 iron oxide pigment.

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 is not reported and no basis is available to make reliable estimates of production.