# IRON OXIDE PIGMENTS

(Data in metric tons unless otherwise specified)

**Domestic Production and Use:** Iron oxide pigments (IOPs) were mined domestically by two companies in Alabama and Georgia. Mine production, which was withheld to avoid disclosing company proprietary data, was lower in 2023 compared with that in 2022. Six companies, including the two producers of natural IOPs, processed and sold about 34,000 tons of finished natural and synthetic IOPs with an estimated value of $70 million. End uses for IOPs include, but are not limited to, concrete and other construction products, paint and coatings, ferrites, plastics, and rubber.

| Salient Statistics—United States: | 2019 | 2020 | 2021 | 2022 | 2023[e] |
|---|---|---|---|---|---|
| Mine production, crude | W | W | W | W | W |
| Sold or used, finished natural and synthetic IOPs | 19,200 | 18,300 | 26,900 | 38,200 | 34,000 |
| Imports for consumption | 159,000 | 174,000 | 192,000 | 225,000 | 110,000 |
| Exports, pigment grade | 17,500 | 15,800 | 12,500 | 13,800 | 13,000 |
| Consumption, apparent[1] | 161,000 | 177,000 | 206,000 | 249,000 | 130,000 |
| Price, average unit value, dollars per kilogram[2] | 0.69 | 0.72 | 1.03 | 2.02 | 2.00 |
| Employment, mine and mill, number | 55 | 47 | 55 | 46 | 42 |
| Net import reliance[3] as a percentage of apparent consumption | 88 | 90 | 87 | 85 | 75 |

**Recycling:** None.

**Import Sources (2019–22):** Natural: Cyprus, 55%; France, 21%; Austria, 18%; and other, 6%. Synthetic: China,[4] 43%; Germany, 33%; Brazil, 8%; Canada, 6%; and other, 10%. Total: China,[4] 42%; Germany, 33%; Brazil, 8%; Canada, 6%; and other, 11%.

| Tariff: Item | Number | Normal Trade Relations 12–31–23 |
|---|---|---|
| Natural: | | |
| Micaceous iron oxides | 2530.90.2000 | 2.9% ad valorem. |
| Earth colors | 2530.90.8015 | Free. |
| Iron oxides and hydroxides containing 70% or more by weight $Fe_2O_3$: | | |
| Synthetic: | | |
| Black | 2821.10.0010 | 3.7% ad valorem. |
| Red | 2821.10.0020 | 3.7% ad valorem. |
| Yellow | 2821.10.0030 | 3.7% ad valorem. |
| Other | 2821.10.0040 | 3.7% ad valorem. |
| Earth colors | 2821.20.0000 | 5.5% ad valorem. |

**Depletion Allowance:** 14% (domestic and foreign).

**Government Stockpile:** None.

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**Events, Trends, and Issues:** In the United States, residential construction, in which IOPs are commonly used to color concrete block and brick, ready-mixed concrete, and roofing tiles, decreased by 13% during the first 9 months of 2023 compared with that in the same period in 2022. IOPs are also used in paints and coatings for the aerospace, automotive, and marine industries. Vehicle production in the United States through August 2023 was 9.2% higher than that in the same period in 2022. IOPs' characteristics of chemical and thermal stability, color strength, low cost, and weather resistance make IOPs a primary choice for colorant for coatings and construction materials.

Less than 2% of IOP imports were natural pigments, similar to all other years in the past decade. Imports of natural and synthetic pigments were estimated to have decreased by 53% in 2023, owing to the decrease in synthetic pigments imports from China. Global exports of synthetic pigments from China during the first 7 months in 2023 decreased by 73% and exports to the United States decreased by 53% compared with those during the same period in 2022. Exports of pigment-grade IOPs were estimated to have decreased by 5% in 2023 compared with those in 2022. Approximately 47% of pigment-grade IOPs exports went to Mexico; the other leading destination countries for exports were China (15%), Belgium (11%), and France (6%).

One IOP-producing company based in Singapore acquired the iron oxide business of a company based in the United Kingdom. The acquisition was completed in 2023 and included eight manufacturing sites and one administrative site across six countries.

**World Mine Production and Reserves:**

| | Mine production[e] | | Reserves[5] |
|---|---|---|---|
| | 2022 | 2023 | |
| United States | W | W | Moderate |
| Cyprus (umber) | 3,500 | 3,500 | Moderate |
| France | 5,000 | 5,100 | NA |
| Germany[6] | 323,000 | 330,000 | Moderate |
| India (ocher) | 3,100,000 | 3,200,000 | 37,000,000 |
| Italy | 30,000 | 31,000 | NA |
| Pakistan (ocher) | 100,000 | 110,000 | Large |
| Spain (ocher and red iron oxide) | 12,000 | 13,000 | Large |
| World total (rounded) | [7]NA | [7]NA | Large |

**World Resources:**[5] 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 thought to be 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.

[e]Estimated. NA Not available. W Withheld to avoid disclosing company proprietary data.

[1]Defined as sold or used, finished natural and synthetic iron oxide pigments + imports – exports.

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

[3]Defined as imports – exports.

[4]Includes Hong Kong.

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

[6]Includes natural and synthetic iron oxide pigments.

[7]A significant number of other countries, including Austria, Azerbaijan, Brazil, China, Honduras, Iran, Kazakhstan, Lithuania, Paraguay, Russia, South Africa, Turkey, Ukraine, and the United Kingdom, may produce iron oxide pigments, but available information was inadequate to make reliable estimates of output.