IRON AND STEEL SLAG

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: Ferrous slags are valuable coproducts of ironmaking and steelmaking. In 2001, about 19 million tons of domestic iron and steel slag, valued at about $165 million[1] (f.o.b.), were consumed. Iron or blast furnace slag accounted for about 65% of the tonnage sold and was worth about $127 million. Steel slag, produced from basic oxygen, electric arc, and open hearth furnaces[2] accounted for the remainder. There were 18 slag-processing companies servicing either iron and steel or just steel facilities at about 100 locations, iron slag at about 30 sites in a dozen States, and steel slag at about 90 sites in about 30 States. The north-central region (Illinois, Indiana, Michigan, and Ohio) accounted for 58% of blast furnace slag sold or used in the United States, and the mid-Atlantic region (Maryland, New York, Pennsylvania, and West Virginia) accounted for 30% of the sales.

The major uses of iron slag were for road bases, 33%; asphaltic aggregates 23%; cement and concrete applications, 22%; and fill, 7%. Steel slags were mainly used for road bases, 37%; fill, 22%; and asphaltic aggregates, 22%. About 79% of iron and steel slag shipments was by truck, generally to customers within approximately 80 kilometers of the plant. Waterway and rail transport accounted for about 15% and 6% of shipments, respectively; these shipments were to more distant markets.

Salient Statistics—United States:	**1998**	**1999**	**2000**	**2001**	**2002[e]**
Production, marketed[3]	18,400	17,000	16,300	16,900	16,500
Imports for consumption	700	920	1,200	2,600	2,500
Exports	10	12	20	([4])	([4])
Consumption, apparent[5]	19,000	18,000	20,200	19,500	19,000
Price average value, dollars per ton, f.o.b. plant	8.00	8.80	8.60	8.05	8.10
Stocks, yearend	NA	NA	NA	NA	NA
Employment, number[e]	2,700	2,750	2,750	2,700	2,700
Net import reliance[6] as a percentage of apparent consumption	4	5	10	8	6

Recycling: Ferrous slags are viewed as valuable byproducts of ironmaking and steelmaking. Apart from the large outside markets for slag in the construction sector, some iron and steel slags are used in the furnaces as ferrous and flux feed. Entrained metal, particularly in steel slag, is routinely recovered during slag processing for return to the furnaces. However, data for such furnace feed uses are unavailable.

Import Sources (1998-2001): Year-to-year import data for ferrous slags show variations in both tonnage and unit value; most of the data contain unresolved discrepancies. Slag was imported from 1998 to 2001 mainly from Italy, Japan, Canada, and Brazil; prior sources were mainly Canada and Japan. Data, estimated for 2002 only, are Italy, 37%; Japan, 27%; Canada, 14%; and other, 22%.

Tariff: Item	**Number**	**Normal Trade Relations 12/31/02**
Granulated slag	2618.00.0000	Free.
Basic slag	3103.20.0000	Free.
Ferrous scale	2619.00.9000	Free.
Slag, dross, scalings, from manufacture of iron and steel	2619.00.3000	Free.

Depletion Allowance: Not applicable.

Government Stockpile: None.

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Events, Trends, and Issues: In the construction sector, natural aggregates are the main competitors of iron and steel slag. Where crushed stone or sand and gravel are readily available and reasonably priced, iron and steel slag typically are not preferred. Demand for granulated blast furnace slag (as a pozzolan or cement additive) has been increasing steadily in the United States. This material makes up the bulk of slag imports. The future availability of iron slag in the United States may show a decline owing to closing of aging blast furnaces. No new blast furnaces are under construction or planned. Domestic decline, if it takes place, will be balanced by increased imports. Iron and steel slag has been proposed for regulation under various waste classifications by Federal and State agencies. Citing slag's widespread marketability and chemical inertness, the industry has thus far succeeded in keeping iron and steel slag exempt from such regulation. No new Government regulation is pending.

World Mine Production, Reserves, and Reserve Base: Slag is not a mined material. Production data for the world are unavailable, but it is estimated that annual world iron and steel slag output is on the order of 250 to 275 million tons, based on typical ratios of slag to crude iron and steel output.

World Resources: Not applicable.

Substitutes: Crushed stone and sand and gravel are common aggregate substitutes in the construction sector. Certain rock types, as well as silica fume and fly ash, are pozzolan substitutes in blended cements and concrete. Fly ash represents the bulk of the substitutes; about 2 million tons of fly is ash used in cement manufacture, either as raw feed or cement additive.

[e]Estimated. NA Not available.

[1]The reported value of $157 million (obtained from annual survey of processors) represents the quantities sold rather than processed; it excludes the value of any entrained metal that may be recovered during slag processing and returned to iron and, especially, steel furnaces. Value data for such recovered metal were unavailable.

[2]Sales of open hearth furnace steel slag were from stockpiles; there was no domestic open hearth steel production in 2002.

[3]Data for actual production of marketable slag are unavailable, and the data shown are for sales, largely from stockpiles. Production may be estimated as equivalent to 25% to 30% of crude (pig) iron production and 10% to 15% of crude steel output.

[4]Less than ½ unit.

[5]Defined as production + imports - exports.

[6]Defined as imports - exports. Data are unavailable to allow adjustments for changes in stocks.