IRON AND STEEL SLAG

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: Ferrous slags are valuable coproducts of iron- and steelmaking. In 2001, over 18 million tons of domestic iron and steel slags, valued at about $157 million[1] (f.o.b.), were consumed. Of this, iron or blast furnace slag accounted for about 69% of the tonnage sold, and was worth about $134 million. Steel slags, produced from open hearth,[2] basic oxygen, and electric arc furnaces accounted for the remainder. There were 15 slag-processing companies servicing either iron and steel or just steel facilities at about 100 locations, iron slags at about 30 sites in a dozen States, and steel slags at about 90 sites in about 30 States. The mid-Atlantic region (Maryland, New York, Pennsylvania, and West Virginia) accounted for 45% of blast furnace slag sold or used in the United States, and the North-Central region (Illinois, Indiana, Michigan, and Ohio) accounted for 41% of the sales. The major uses of iron slag were for road bases, 37%; asphaltic aggregates 19%; cement and concrete applications, 16%; and fill, 9%. Steel slags were mainly used for road bases, 33%; fill 20%; and asphaltic aggregates, 18%. About 78% of iron and steel slag shipments was by truck, generally to customers within approximately 80 kilometers of the plant. Rail and waterway transport accounted for about 6% and 16% of shipments, respectively. These included destinations farther afield.

Salient Statistics—United States:	**1997**	**1998**	**1999**	**2000**	**2001[e]**
Production, marketed[3]	18,900	18,400	17,000	16,300	18,000
Imports for consumption	663	700	920	1,200	1,100
Exports	9	10	12	20	20
Consumption, apparent[4]	19,600	19,000	18,000	20,200	19,000
Price average value, dollars per ton, f.o.b. plant	7.70	8.00	8.80	8.60	8.60
Stocks, yearend	NA	NA	NA	NA	NA
Employment, number[e]	2,500	2,700	2,750	2,750	2,700
Net import reliance[5] as a percentage of reported consumption	3	4	5	10	8

Recycling: Ferrous slags are viewed as valuable byproducts of iron- and steelmaking, and are among the highest quantities of recycled materials. Apart from the large outside markets for slag in the construction sector, some iron and steel slags are used internally being recycled to 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 (1997-2000): Year-to-year import data for ferrous slags show variations in both tonnages and unit values; most of the data contain unresolved discrepancies. Slag was imported from 1997 to 2000 mainly from Canada, Italy, and Brazil; prior sources were mainly Canada and Japan. Data, for 2001 only, are: Canada, 27%; Italy, 23%; Brazil, 15%; France, 10%; other, 25%.

Tariff: Item	Number	Normal Trade Relations 12/31/01
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.

Prepared by **Rustu S. Kalyoncu [(703) 648-7720, rkalyonc@usgs.gov, fax: (703) 648-7722]**

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Events, Trends, and Issues: Sales of iron and steel slags depend mostly on the price and availability of natural aggregates, which are slag's main competitor in the construction sector. Demand for granulated blast furnace slag (as a pozzolan or cement additive) has steadily been increasing in the United States. This material makes up the bulk of slag imports, as reflected in the import reliance for 2001 (7.7%). 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 occurs, will be compensated for by increased imports. Iron and steel slags have 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 slags 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 current 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, with about 2 million tons of the total 9 million tons of fly 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, and excludes the value of any entrained metal that may be recovered during slag processing and returned to the 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 2001.
[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]Defined as production + imports - exports.
[5]Defined as imports - exports. Data are unavailable to allow adjustments for changes in stocks.