

NICKEL

(Data in metric tons of nickel content, unless otherwise noted)

Domestic Production and Use: The only nickel smelter in the United States closed in April 1998 because of low nickel prices. The smelter, near Riddle, OR, had been producing ferronickel from ores imported from New Caledonia. The adjoining mine on Nickel Mountain has been idle since 1996. On a monthly or annual basis, 158 facilities reported nickel consumption. The principal consuming State was Pennsylvania, followed by West Virginia and Ohio. Approximately 44% of the primary nickel consumed went into stainless and alloy steel production, 38% into nonferrous alloys and superalloys, 14% into electroplating, and 4% into other uses. Ultimate end uses were as follows: transportation, 31%; chemical industry, 14%; electrical equipment, 11%; construction, 8%; fabricated metal products, 8%; petroleum, 7%; machinery, 7%; household appliances, 6%; and other, 8%. Total estimated value of apparent primary consumption was \$740 million.

Salient Statistics—United States:	1994	1995	1996	1997	1998^e
Production: Mine	—	1,560	1,330	—	—
Plant	—	8,290	15,100	16,000	4,290
Imports: Ore	—	8,200	15,000	17,600	1,420
Primary ¹	127,000	149,000	142,000	147,000	155,000
Secondary ¹	6,070	7,930	8,060	11,000	9,780
Exports: Primary	7,420	9,750	13,100	16,400	8,940
Secondary	34,500	41,800	33,600	40,200	34,600
Consumption: Reported, primary	107,000	125,000	119,000	122,000	121,000
Reported, secondary	58,600	64,500	59,300	68,800	66,400
Apparent, primary	134,000	151,000	147,000	154,000	159,000
Price, average annual, London Metal Exchange:					
Cash, dollars per metric ton	6,340	8,228	7,501	6,927	4,648
Cash, dollars per pound	2.876	3.732	3.402	3.142	2.108
Stocks: Government, yearend	26,800	19,800	15,900	8,530	2,830
Consumer, yearend ²	10,300	12,400	13,100	16,200	13,300
Producer, yearend ³	10,200	12,700	13,300	12,600	12,500
Employment, yearend, number:					
Mine	1	17	8	7	—
Smelter	22	253	253	264	10
Port facility ⁴	3	25	23	22	3
Net import reliance ⁵ as a percent of apparent consumption	64	60	59	56	65

Recycling: About 66,000 tons of nickel was recovered from purchased scrap in 1998. This represented about 35% of reported consumption for the year.

Import Sources (1994-97): Canada, 37%; Norway, 15%; Russia, 14%; Australia, 10%; and other, 24%.

Tariff: Item	Number	Normal Trade Relations (NTR)	Non-NTR⁶
		12/31/98	12/31/98
Nickel oxide, chemical grade	2825.40.0000	Free	Free.
Ferronickel	7202.60.0000	Free	6.6¢/kg.
Nickel oxide, metallurgical grade	7501.20.0000	Free	Free.
Unwrought nickel, not alloyed	7502.10.0000	Free	6.6¢/kg.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile:

Material	Stockpile Status—9-30-98⁷				
	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1998	Disposals FY 1998
Nickel	1,960	805	1,960	9,070	1,830

Events, Trends, and Issues: Stainless steel accounts for 40% of primary nickel consumed in the United States and two-thirds of world primary consumption. U.S. production of nickel-bearing stainless steel was down 6% from 1997's near-record 1.36 million tons. Demand for nickel-free grades of stainless steel remained strong because of robust automotive sales, decreasing the nickel-bearing share of stainless steel production from 63% to 59%. Imports of stainless steel continued to grow and accounted for 33% of U.S. stainless steel consumption in 1997, which triggered a series of countervailing duty and antidumping investigations by the Federal Government.

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The world nickel supply grew faster than demand in 1998. In August, the London Metal Exchange (LME) cash price dropped below \$4,300 per metric ton (\$1.95 per pound)—the lowest level in more than a decade. A sharp rise in exports of cathode and stainless steel scrap from Russia to the European Union contributed to the oversupply situation and offset cutbacks in world ferronickel production. For the week ending November 20, 1998, the LME cash price for 99.8%-pure nickel averaged \$4,163 per metric ton (\$1.89 per pound). The oversupply situation is expected to continue for 4 or 5 years because of mine and smelter capacity additions in Australia, Canada, Indonesia, and Venezuela. The long-term outlook is more positive from a producer's standpoint. Since 1975, world demand for stainless steel has grown at an average rate of 4.5% per year. This growth rate is projected to continue for the next 20 years. Exploration teams have identified additional resources in the Canadian Shield since the discovery of the huge Voisey's Bay deposit in 1993. Most of these resources are in Labrador or on the Ungava Peninsula. The proposed mine and mill complex at Voisey's Bay is now scheduled to begin production in 2002. Authorities are holding hearings on the project's environmental impact, aboriginal land claims, and the issuance of mining leases.

Automotive manufacturers in the European Union, Japan, and the United States have begun mass producing electric vehicles powered by nickel-metal hydride, nickel-cadmium, or sodium metal-nickel batteries. At least one Japanese manufacturer is producing a hybrid automobile that uses an electric motor to power the vehicle in low-speed, stop-and-go city driving and switches to an internal combustion engine for higher speeds. Nickel metal powder production facilities in the United Kingdom are being expanded to meet growing demand from battery manufacturers.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁸	Reserve base ⁸
	1997	1998 ^e		
United States	—	—	43,000	2,500,000
Australia	124,000	145,000	3,700,000	7,300,000
Botswana	20,157	21,300	780,000	830,000
Brazil	25,300	31,500	670,000	6,000,000
Canada	190,529	225,000	5,300,000	15,000,000
China	44,000	40,000	3,700,000	7,900,000
Colombia	31,230	31,800	560,000	1,100,000
Cuba	59,000	66,000	5,500,000	23,000,000
Dominican Republic	52,000	32,000	1,000,000	1,300,000
Greece	18,419	12,900	450,000	900,000
Indonesia	72,200	76,400	3,200,000	13,000,000
New Caledonia	137,068	137,000	4,500,000	15,000,000
Philippines	18,132	17,000	410,000	11,000,000
Russia	260,000	265,000	6,600,000	7,300,000
South Africa	34,830	34,700	2,500,000	11,800,000
Zimbabwe	11,000	11,600	240,000	260,000
Other countries	<u>21,300</u>	<u>20,100</u>	<u>450,000</u>	<u>12,000,000</u>
World total (may be rounded)	1,120,000	1,170,000	40,000,000	140,000,000

World Resources: Identified land-based resources averaging 1% nickel or greater contain at least 130 million tons of nickel. About 60% is in laterites and 40% in sulfide deposits. In addition, extensive deep-sea resources of nickel are in manganese crusts and nodules covering large areas of the ocean floor, particularly in the Pacific Ocean.

Substitutes: With few exceptions, substitutes for nickel would result in increased cost or some tradeoff in the economy or performance of the product. Aluminum, coated steels, and plastics can replace stainless steel to a limited extent in many construction and transportation applications. Nickel-free specialty steels are sometimes used in place of stainless steel within the power generating, petrochemical, and petroleum industries. Titanium alloys or specialty plastics can substitute for nickel metal or nickel-based superalloys in some highly corrosive chemical environments.

^eEstimated.

¹Imports for consumption as reported by the U.S. Bureau of the Census.

²Combined stocks of primary and secondary materials.

³Stocks of producers, agents, and dealers held only in the United States.

⁴Employment at port facility in Coos Bay, OR, used exclusively for drying and transshipping imported nickel ore.

⁵Defined as imports - exports + adjustments for Government and industry stock changes.

⁶See Appendix B.

⁷See Appendix C for definitions.

⁸See Appendix D for definitions.