COBALT

(Data in metric tons of cobalt content unless otherwise noted)

Domestic Production and Use: Significant U.S. cobalt mine production has not been reported since 1971, and production of refined cobalt from imported nickel-copper-cobalt matte ceased in 1985. U.S. supply comprised imports, stock releases, and secondary (scrap) materials. The sole U.S. producer of extra-fine cobalt powder, in Pennsylvania, used cemented carbide scrap as feed. Seven companies were known to produce cobalt compounds. About 48% of the cobalt consumed in the United States was used in superalloys, mainly in aircraft gas turbine engines; 9% in cemented carbides for cutting and wear-resistant applications; 16% in various other metallic applications; and 27% in a variety of chemical applications. The total estimated value of cobalt consumed in 2013 was $250 million.

Salient Statistics—United States:	2009	2010	2011	2012	2013[e]
Production:					
Mine	—	—	—	—	—
Secondary	1,790	2,000	2,210	2,160	2,200
Imports for consumption	7,680	11,100	10,600	11,100	10,800
Exports	2,440	2,640	3,390	3,760	3,700
Shipments from Government stockpile excesses[1]	180	-8	—	—	—
Consumption:					
Reported (includes secondary)	7,470	8,030	9,100	8,420	8,400
Apparent[2] (includes secondary)	7,580	10,300	9,230	9,520	9,300
Price, average, dollars per pound:					
Spot, cathode[3]	17.86	20.85	17.99	14.07	12.90
London Metal Exchange (LME), cash	XX	XX	16.01	13.06	12.30
Stocks, yearend:					
Industry	780	880	1,040	970	1,000
LME, U.S. warehouse	XX	23	43	51	50
Net import reliance[4] as a percentage of apparent consumption	76	81	76	77	76

Recycling: In 2013, cobalt contained in purchased scrap represented an estimated 26% of cobalt reported consumption.

Import Sources (2009–12): Cobalt contained in metal, oxide, and salts: China, 21%; Norway, 13%; Russia, 11%; Finland, 9%; and other, 46%.

Tariff: Item	Number	Normal Trade Relations[5] 12–31–13
Cobalt ores and concentrates	2605.00.0000	Free.
Chemical compounds:		
Cobalt oxides and hydroxides	2822.00.0000	0.1% ad val.
Cobalt chlorides	2827.39.6000	4.2% ad val.
Cobalt sulfates	2833.29.1000	1.4% ad val.
Cobalt carbonates	2836.99.1000	4.2% ad val.
Cobalt acetates	2915.29.3000	4.2% ad val.
Unwrought cobalt, alloys	8105.20.3000	4.4% ad val.
Unwrought cobalt, other	8105.20.6000	Free.
Cobalt mattes and other intermediate products; cobalt powders	8105.20.9000	Free.
Cobalt waste and scrap	8105.30.0000	Free.
Wrought cobalt and cobalt articles	8105.90.0000	3.7% ad val.

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

Government Stockpile:

	Stockpile Status—9–30–13[6]			
Material	Uncommitted inventory	Authorized for disposal	Disposal plan FY 2013	Disposals FY 2013
Cobalt	301	301	—	—

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Events, Trends, and Issues: In recent years, global cobalt production has been higher than consumption, resulting in a market surplus and downward pressure on prices. This trend is expected to continue in the near-term as production from new projects and expansions to existing operations add to supply. China was the world's leading producer of refined cobalt and the leading supplier of cobalt imports to the United States. Much of China's production was from cobalt-rich ore and partially refined cobalt imported from Congo (Kinshasa). In recent years, China has been drawing down significant stocks of cobalt feed that had accumulated from 2009 through 2011.

During the first 6 months of 2013, world availability of refined cobalt (as measured by production) was 11% higher than that of the same period in 2012. China showed a large increase in production and an operation in Madagascar that began production during the second half of 2012 ramped up production.

Worldwide cobalt inventories in London Metal Exchange (LME) warehouses increased to 527 tons in late November 2013 from 429 tons at yearend 2012.

World Mine Production and Reserves: Reserves for Australia were revised based on Government information. Reserves for Canada, Morocco, New Caledonia, and the United States were revised based on company reports.

	Mine production		Reserves[7]
	2012	2013[e]	
United States	—	—	36,000
Australia	5,880	6,500	[8]1,000,000
Brazil	3,900	3,900	89,000
Canada	6,630	8,000	260,000
China	7,000	7,100	80,000
Congo (Kinshasa)	51,000	57,000	3,400,000
Cuba	4,900	4,300	500,000
Morocco	1,800	2,100	18,000
New Caledonia[9]	2,620	3,300	200,000
Russia	6,300	6,700	250,000
Zambia	4,200	5,200	270,000
Other countries	8,820	13,000	1,100,000
World total (rounded)	103,000	120,000	7,200,000

World Resources: Identified cobalt resources of the United States are estimated to be about 1 million tons. Most of these resources are in Minnesota, but other important occurrences are in Alaska, California, Idaho, Missouri, Montana, and Oregon. With the exception of resources in Idaho and Missouri, any future cobalt production from these deposits would be as a byproduct of another metal. Identified world terrestrial cobalt resources are about 25 million tons. The vast majority of these resources are in sediment-hosted stratiform copper deposits in Congo (Kinshasa) and Zambia; nickel-bearing laterite deposits in Australia and nearby island countries and Cuba; and magmatic nickel-copper sulfide deposits hosted in mafic and ultramafic rocks in Australia, Canada, Russia, and the United States. More than 120 million tons of cobalt resources have been identified in manganese nodules and crusts on the floor of the Atlantic, Indian, and Pacific Oceans.

Substitutes: In some applications, substitution for cobalt would result in a loss in product performance. Potential substitutes include barium or strontium ferrites, neodymium-iron-boron, or nickel-iron alloys in magnets; cerium, iron, lead, manganese, or vanadium in paints; cobalt-iron-copper or iron-copper in diamond tools; copper-iron-manganese for curing unsaturated polyester resins; iron, iron-cobalt-nickel, nickel, cermets, or ceramics in cutting and wear-resistant materials; iron-phosphorous, manganese, nickel-cobalt-aluminum, or nickel-cobalt-manganese in lithium-ion batteries; nickel-based alloys or ceramics in jet engines; nickel in petroleum catalysts; and rhodium in hydroformylation catalysts.

[e]Estimated. XX Not applicable. — Zero.
[1]Negative numbers are the result of inventory adjustments.
[2]The sum of U.S. net import reliance and secondary production, as estimated from consumption of purchased scrap.
[3]As reported by Platts Metals Daily (formerly Platts Metals Week).
[4]Defined as imports – exports + adjustments for Government and industry stock changes.
[5]Tariffs for certain countries and items may be eliminated under special trade agreements.
[6]See Appendix B for definitions.
[7]See Appendix C for resource/reserve definitions and information concerning data sources.
[8]For Australia, Joint Ore Reserves Committee (JORC)-compliant reserves were about 520,000 tons.
[9]Overseas territory of France.