PLATINUM-GROUP METALS

(Platinum, palladium, rhodium, ruthenium, iridium, osmium)
(Data in kilograms, unless otherwise noted)

Domestic Production and Use: The Stillwater and East Boulder Mines in south-central Montana are the only primary platinum-group metals (PGM) production sites in the United States. These mines produced about 820,000 metric tons of ore and recovered more than 18,000 kilograms of palladium and platinum in 2003. Small quantities of PGM were also recovered as byproducts of copper refining by companies in Texas and Utah. Catalysts for air pollution abatement continued to be the largest demand sector for PGM. In the United States, more than 100,000 kilograms of PGM was used by the automotive industry in the manufacture of catalytic converters. Catalysts were also used in other air-pollution-abatement processes to remove organic vapors, odors, and carbon monoxide. Chemical uses include catalysts for organic synthesis, production of nitric acid, and fabrication of laboratory equipment. Platinum alloys, in cast or wrought form, are commonly used for jewelry. Platinum, palladium, and a variety of complex gold-silver-copper alloys are used as dental restorative materials.

Salient Statistics—United States:	**1999**	**2000**	**2001**	**2002**	**2003[e]**
Mine production:[1]					
Platinum	2,920	3,110	3,610	4,390	4,100
Palladium	9,800	10,300	12,100	14,800	14,600
Imports for consumption:					
Platinum	125,000	93,700	84,200	160,000	111,000
Palladium	189,000	181,000	160,000	117,000	73,000
Rhodium	10,300	18,200	12,400	9,890	8,630
Ruthenium	11,400	20,900	8,170	10,800	9,940
Iridium	2,270	2,700	3,110	2,100	1,800
Osmium	23	133	77	36	25
Exports:					
Platinum	19,400	25,000	31,300	27,800	15,900
Palladium	43,800	57,900	37,000	42,700	17,000
Rhodium	114	797	982	348	290
Price,[2] dollars per troy ounce:					
Platinum	378.94	549.30	533.29	542.56	590.00
Palladium	363.20	691.84	610.71	339.68	290.50
Rhodium	904.35	1,990.00	1,598.67	838.88	750.25
Ruthenium	40.70	129.76	130.67	66.33	55.60
Employment, mine, number	954	1,290	1,320	1,420	1,400
Net import reliance as a percentage of apparent consumption:[e]					
Platinum	96	78	90	93	96
Palladium	92	84	87	69	74

Recycling: An estimated 6,000 kilograms of PGM was recovered from new and old scrap in 2003.

Import Sources (1999-2002): Platinum: South Africa, 30%; United Kingdom, 19%; Germany, 16%; Canada, 13%; Russia, 8%; and other, 14%. Palladium: Russia, 50%; South Africa, 15%; United Kingdom, 11%; Belgium, 5%; Germany, 5%; and other, 14%.

Tariff: All unwrought and semimanufactured forms of PGM can be imported duty free.

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

Government Stockpile:

Stockpile Status—9-30-03[3]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2003[4]	Disposals FY 2003
Platinum	650	—	650	1,560	—
Palladium	1,823	—	1,823	10,900	5,213
Iridium	631	—	631	187	153

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PLATINUM-GROUP METALS

Events, Trends, and Issues: South Africa's PGM producers were in the process of reevaluating their ambitious expansion plans announced in 1999 and raised the prospect that their production targets will not be met within the allocated timeframe. The expansions were deemed necessary to meet anticipated growth in demand for PGM from the automobile catalyst and jewelry sectors. However, the volatility of the South Africa rand against the U.S. dollar has forced producers to put some of the expansion plans on hold.

Domestic imports for consumption of PGM declined sharply as end users worked off stocks and reduced their requirements for the metals through thrifting and substitution. Russia and South Africa accounted for most of the imports. U.S. exports decreased sharply. Switzerland received most of the exports, followed by Germany and Canada.

Palladium and platinum prices were at near record highs in the first quarter of 2002, but began to diverge in the fourth quarter when palladium prices sank to near record lows. The price of platinum however, continued to climb, trading between $590 and $600 per ounce in 2003 compared with $543 in 2002. Market conditions carried the price of platinum to an 12-month high of $605 per ounce in mid-November, 2002, subsequently falling back and stabilizing at around $590 in the first half of 2003. Palladium prices firmed in the second quarter of 2003, trading in the $200 to $230 per ounce range.

World Mine Production, Reserves, and Reserve Base:

	Mine production				PGM	
	Platinum		Palladium		Reserves[5]	Reserve base[5]
	2002	2003[e]	2002	2003[e]		
United States	4,390	4,100	14,800	14,600	900,000	2,000,000
Canada	7,000	7,000	11,500	11,000	310,000	390,000
Russia	35,000	36,000	84,000	74,000	6,200,000	6,600,000
South Africa	134,000	135,000	64,000	64,800	63,000,000	70,000,000
Other countries	3,400	5,000	6,900	7,000	800,000	850,000
World total (rounded)	184,000	187,000	181,000	171,000	71,000,000	80,000,000

World Resources: World resources of PGM in mineral concentrations that can be mined economically are estimated to total more than 100 million kilograms. The largest reserves are in the Bushveld Complex in South Africa. In 2003, there were 10 producing mines in the Bushveld Complex; of these, 9 produced from the Merensky Reef and the UG2 Chromite Layer and 1 produced from the Platreef, on the northern limb of the Complex.

Substitutes: Some motor vehicle manufacturers have substituted platinum for the more expensive palladium in catalytic converters. In addition, electronic parts manufacturers are reducing the average palladium content of the conductive pastes used to form the electrodes of multilayer ceramic capacitors by substituting base metals or silver-palladium pastes that contain significantly less palladium.

[e]Estimated. — Zero.
[1]Estimates from published sources.
[2]Handy & Harman quotations.
[3]See Appendix B for definitions.
[4]Actual quantity will be limited to remaining sales authority or inventory.
[5]See Appendix C for definitions.