

PLATINUM-GROUP METALS

(Platinum, palladium, rhodium, ruthenium, iridium, osmium)
(Data in kilograms,¹ unless noted)

Domestic Production and Use: Ore containing the platinum-group metals (PGM) was mined, concentrated, and smelted in Montana, and the resultant PGM matte was exported to Belgium for refining and separation of the individual PGM. In addition, refined PGM were recovered as byproducts of copper refining by two companies in Texas and Utah. Secondary metal was refined by about 20 firms, mostly on the east and west coasts. PGM were sold by at least 90 processors and retailers, largely in the Northeast, and were used primarily by the following industries: automotive, electrical and electronic, chemical, and dental and medical. The automotive, chemical, and petroleum-refining industries used PGM mainly as catalysts. The other industries used PGM in a variety of ways that took advantage of their chemical inertness and refractory properties. Domestic mine production of platinum and palladium was valued at \$60 million in 1995.

Salient Statistics—United States:	1991	1992	1993	1994	1995^e
Mine production: ² Platinum	1,490	1,650	2,050	1,960	2,000
Palladium	5,190	5,440	6,780	6,440	6,000
Imports for consumption: Refined					
Platinum	51,500	57,600	57,200	56,500	70,000
Palladium	60,600	61,100	78,900	92,500	110,000
Rhodium	6,570	7,750	7,210	7,820	9,000
Ruthenium	2,590	2,740	4,490	9,880	6,000
Iridium	520	207	896	926	1,000
Osmium	46	57	130	55	100
Exports: Refined					
Platinum	12,900	12,100	16,100	15,500	16,000
Palladium	13,600	17,700	26,200	29,900	30,000
Rhodium	592	834	767	791	1,000
Price, average, New York, dollars per troy ounce:					
Platinum	377.02	360.90	374.77	406.19	430.00
Palladium	89.06	89.07	122.97	144.15	160.00
Rhodium	3,916.33	2,465.24	1,137.36	762.57	510.00
Employment, mine	469	500	400	445	400

Recycling: Processing recycled material, including both new and old scrap, resulted in the recovery of an estimated 60 metric tons of PGM during 1995.

Import Sources (1991-94): Platinum: South Africa, 64%; United Kingdom, 10%; Belgium, 4%; Germany, 4%; and other, 18%. Palladium: Russia, 31%; South Africa, 29%; United Kingdom, 14%; Belgium, 13%; and other, 13%.

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

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

Government Stockpile:

Stockpile Status—9-30-95

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposals Jan.-Sept. 95
Platinum	13,700	—	—	—
Palladium	39,300	—	—	—
Iridium	920	—	—	—

In addition to these quantities, the Stockpile contains 406 kilograms of nonstockpile grade platinum and 69 kilograms of nonstockpile grade palladium.

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Events, Trends, and Issues: Domestic mine production of platinum and palladium remained essentially unchanged from the previous year, despite slight improvements in the average price of both metals. It was believed that domestic PGM consumption declined slightly, owing in part to lower sales of new cars and trucks.

In 1995, the average platinum price increased for the third consecutive year. Through the first 9 months, the price ranged between \$404 and \$462 per troy ounce. Similarly, the average palladium price increased for the fourth consecutive year. During the first 9 months of 1995, palladium prices ranged between \$154 and \$179. Analysts attributed the higher prices in part to problems in the South African mining industry, and to new technology developments.

World Mine Production, Reserves, and Reserve Base:

	Mine production				PGM	
	Platinum		Palladium		Reserves ³	Reserve base ³
	1994	1995 ^e	1994	1995 ^e		
United States ²	1,960	2,000	6,440	6,000	250,000	780,000
Canada	6,000	6,000	7,000	7,000	250,000	280,000
Russia	15,000	15,000	40,000	40,000	5,900,000	6,000,000
South Africa	102,000	100,000	44,000	44,000	50,000,000	59,000,000
Other countries	2,700	3,000	1,800	2,000	31,000	31,000
World total (rounded)	128,000	130,000	99,200	100,000	56,000,000	66,000,000

World Resources: World resources of PGM are estimated to be 100 million kilograms. U.S. resources are estimated to be 9 million kilograms.

Substitutes: Some automotive companies have substituted palladium for the higher priced platinum in catalytic converters. Palladium is less resistant to poisoning by sulfur and lead than platinum; however, palladium may be useful in controlling emissions from diesel-powered vehicles.

^eEstimated.

¹Multiply by 32.1507 to convert kilograms to troy ounces.

²Estimates from published sources.

³See Appendix C for definitions.