



U.S. Department of the Interior • Bureau of Mines

MINERAL INDUSTRY SURVEYS

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Platinum, Quarterly

PLATINUM-GROUP METALS IN THE FOURTH QUARTER 1989

Refined production of platinum and palladium were up significantly in the fourth quarter 1989, according to the Bureau of Mines, U.S. Department of the Interior. In the third quarter 1989, imports of palladium from Belgium exceeded imports of palladium from the U.S.S.R. This is significant because the U.S.S.R. is generally a large supplier of palladium to the United States. The growing importance of Belgium as a supplier of palladium to the United States results from the fact that U.S. exports of platinum-group metals concentrates to Belgium are being reimported in the form of palladium metal, and to a lesser extent, platinum metal.

The dealer price of rhodium began increasing sharply in November and continued increasing in December, with spot prices approaching \$2,000 per troy ounce. Johnson Matthey's Rustenburg refinery in South Africa reported technical difficulties at its newly commissioned refinery in Bophuthatswana. Also contributing to the price rise was the absence of rhodium sales by the U.S.S.R., the second largest supplier of rhodium after the Republic of South Africa. About three-fourths of the world's production of rhodium is used in catalytic converters for emissions control. There is presently no substitute for rhodium in this application.

A bill authorizing the minting of a palladium commemorative coin was not approved by the House. The U.S. Mint testified that the coins would be difficult to produce. In addition, domestic sources of palladium are limited and it is possible that some of the metal for the coin would have to come from sources originating in the U.S.S.R. or the Republic of South Africa.

Nippon Mining Co. announced that it has developed a new corrosion-resistant platinum magnet that contains 70% platinum and 30% iron. Its major application is expected to be in precision motors for use in ultra-vacuum and ultra-clean environments. (American Metal Market, 12-27-89, p. 5.).

Platinum-silicide is a material that can substitute for cadmium-mercury-telluride in infrared detectors. Platinum-silicide performs better and is cheaper to produce than traditional cadmium-mercury-telluride. Platinum-silicide detectors are made by depositing a layer of platinum only a few molecules thick over silicon integrated circuits. Infrared detectors made with platinum-silicide are used in military applications such as heat-seeking missiles. (Lasers & Optronics, 10-89, pp. 63-67; Aviation Week & Space Technology, 3-27-89, pp. 51-62).

Table 1. - Platinum-group metals 1/ refined in the United States 2/
(Kilograms)

Period	Platinum	Palladium	Iridium	Osmium	Rhodium	Ruthenium	Total
1988:							
Nontoll-refined:							
First quarter--	210	826	(3/)	---	26	---	1,063
Second quarter--	314	1,575	3	(3/)	45	(3/)	1,937
Third quarter--	309	1,040	1	(3/)	10	(3/)	1,360
Fourth quarter--	344	675	3	(3/)	29	1	1,052
Total 4/-----	1,178	3,793	6	---	104	2	5,084
=====							
Toll-refined:							
First quarter--	6,190	4,716	43	6	667	46	11,668
Second quarter--	5,474	5,406	37	1	568	252	11,737
Third quarter--	6,046	5,207	70	8	536	86	11,953
Fourth quarter--	5,229	4,683	102	---	525	111	10,649
Total 4/-----	22,884	20,923	252	19	1,826	499	46,403
=====							
1989:							
Nontoll-refined:							
First quarter--	279	638	2	---	17	1	937
Second quarter--	r/253	r/780	r/3	---	13	r/12	r/1,060
Third quarter--	282	662	---	---	13	7	964
Fourth quarter--	290	818	---	---	45	15	1,169
Total -----	1,103	2,898	6	---	88	35	4,130
=====							
Toll-refined:							
First quarter--	6,164	4,973	128	1	443	45	11,754
Second quarter--	5,492	5,621	39	---	415	84	11,651
Third quarter--	5,481	4,022	8	---	396	135	10,043
Fourth quarter--	7,392	8,362	44	---	586	108	16,493
Total -----	24,529	22,979	219	1	1,841	373	49,941

r/Revised.

1/Typically, about 99.8% of the platinum and 99% of the palladium are secondary metal; the other metals are entirely secondary.

2/Data may not add to totals shown because of independent rounding.

3/ Less than 1/2 unit.

4/Includes data for companies reporting annually; quarterly figures not adjusted.

Platinum & Palladium Production Toll-Refined Plus Nontoll-Refined

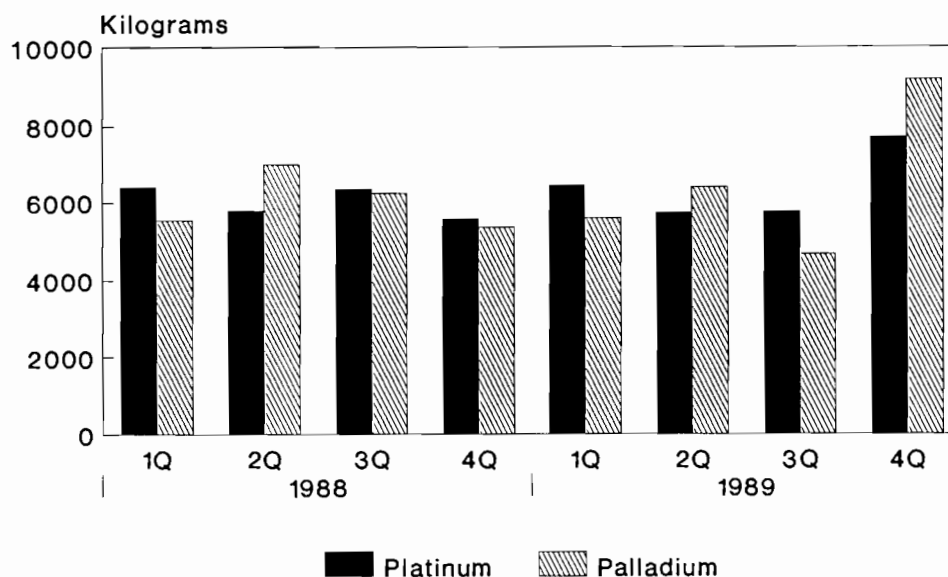


Table 2. - Stocks of platinum-group metals held by refiners, importers,
and dealers in the United States 1/
(Kilograms)

Period	Platinum	Palladium	Iridium	Osmium	Rhodium	Ruthenium	Total 2/
1988:							
Mar. 31-----	16,217	17,442	468	(3/)	839	623	35,590
June 30-----	16,040	18,084	480	2	928	946	36,481
Sept. 30-----	14,228	18,022	523	4	924	591	34,291
Dec. 31-----	18,249	15,510	428	8	1,070	615	35,881
Yearend 4/----	18,438	14,837	432	8	1,165	634	35,515
1989:							
Mar. 31-----	13,497	13,908	449	8	1,031	699	29,592
June 30-----	12,434	12,318	424	9	1,092	853	27,130
Sept. 30-----	13,396	12,657	475	36	r/1,118	899	28,581
Dec. 31-----	11,610	12,299	520	36	942	912	26,319

r/Revised.

1/Includes metals in depositories of the New York Mercantile Exchange; on December 31, 1989 this comprised 5,152 kilograms of platinum and 2,815 kilograms of palladium.

2/Data may not add to totals shown because of independent rounding.

3/Less than 1/2 unit.

4/Includes data from companies reporting annually; quarterly figures not adjusted.

Table 3. - Platinum-group metals sold to consuming industries in the United States 1/
(Kilograms)

Period and industry	Platinum	Palladium	Iridium	Osmium	Rhodium	Ruthenium	Total
1988:							
Automotive 2/--	19,346	5,101	(3/)	---	2,084	---	26,532
Chemical-----	3,184	3,669	117	---	109	604	7,683
Dental and medical-----	581	6,622	2	21	2	3	7,231
Electrical-----	3,494	13,049	190	---	123	1,067	17,923
Glass-----	681	11	(3/)	---	85	1	779
Jewelry and decorative---	385	196	20	---	177	14	792
Petroleum-----	1,072	1,438	75	---	1	---	2,587
Miscellaneous--	2,383	4,156	89	2	710	132	7,471
Year-----	31,125	34,242	495	23	3,292	1,821	70,998
1989:							
First quarter:							
Automotive 2/--	5,179	1,337	---	---	552	---	7,068
Chemical-----	546	766	6	---	38	10	1,365
Dental and medical-----	181	2,121	7	17	---	3	2,329
Electrical-----	1,142	4,088	18	(3/)	20	575	5,843
Glass-----	571	171	---	---	101	(3/)	843
Jewelry and decorative---	136	518	2	---	41	(3/)	696
Petroleum-----	996	629	---	---	---	---	1,624
Miscellaneous--	835	991	17	---	177	26	2,046
Total-----	9,585	10,620	49	17	928	614	21,814
Second quarter:							
Automotive 2/--	5,319	1,369	---	---	560	---	7,248
Chemical-----	727	517	13	---	63	25	1,345
Dental and medical-----	117	2,116	---	13	---	5	2,251
Electrical-----	1,045	4,195	66	---	19	540	5,865
Glass-----	352	163	---	---	41	---	556
Jewelry and decorative---	97	528	1	---	40	2	669
Petroleum-----	882	230	---	---	---	---	1,112
Miscellaneous--	582	899	16	---	53	---	1,550
Total-----	9,120	10,017	96	13	776	572	20,595
Third quarter:							
Automotive 2/--	r/3,935	r/1,036	---	---	r/414	---	r/5,384
Chemical-----	621	442	60	---	40	5	1,169
Dental and medical-----	182	2,159	4	11	---	6	2,362
Electrical-----	775	3,741	7	---	33	460	5,017
Glass-----	87	163	---	---	30	---	281
Jewelry and decorative---	91	519	2	---	40	1	652
Petroleum-----	688	526	---	---	27	---	1,241
Miscellaneous--	729	1,136	34	---	43	25	1,966
Total-----	r/7,107	r/9,722	107	11	r/627	497	r/18,072

See footnotes at end of table.

Table 3. - Platinum-group metals sold to consuming industries in the United States (continued)
(Kilograms)

Period and industry	Platinum	Palladium	Iridium	Osmium	Rhodium	Ruthenium	Total
Fourth quarter:							
Automotive 2/--	4,342	1,145	---	---	456	---	5,943
Chemical-----	597	552	16	---	48	5	1,217
Dental and							
medical-----	136	1,345	---	16	---	1	1,498
Electrical-----	908	3,928	20	---	175	202	5,233
Glass-----	124	337	---	---	5	---	466
Jewelry and							
decorative---	89	517	3	---	36	2	646
Petroleum-----	294	505	---	---	---	---	798
Miscellaneous--	1,066	685	39	---	4	10	1,804
Total-----	7,556	9,012	79	16	725	218	17,606
Year-to-date-----	33,368	39,371	331	57	3,056	1,901	78,087

r/Revised.

1/Data may not add to totals shown because of independent rounding.

2/Platinum, palladium, and rhodium sales to the automotive industry are estimated based on U.S. light truck sales and U.S. automobile production.

3/Less than 1/2 unit.

Platinum & Palladium Consumption Sales to Industry

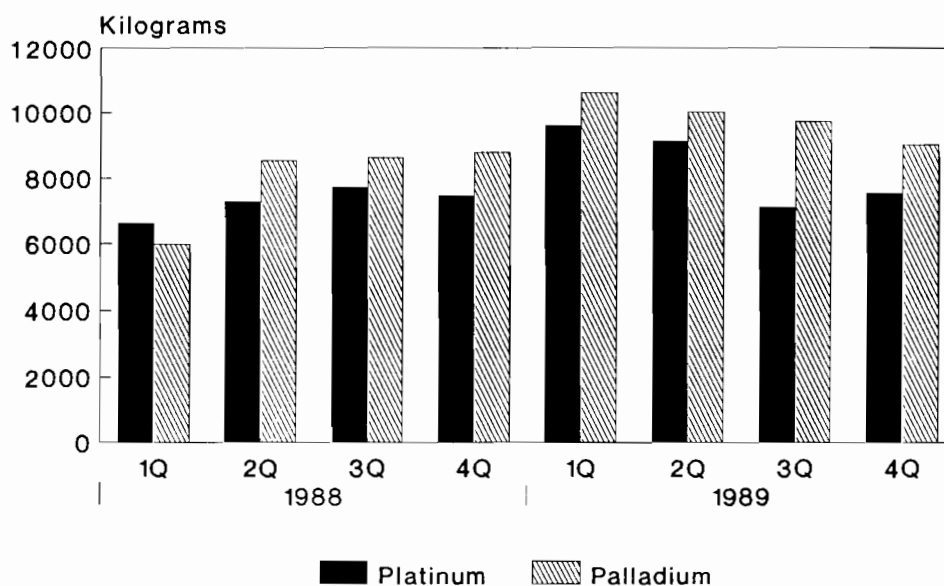


Table 4. - Monthly average producer and dealer prices of platinum-group metals 1/
(Dollars per troy ounce)

	Platinum		Palladium		Rhodium		Iridium		Ruthenium	Osmium
	Pro- ducer	Dealer	Pro- ducer	Dealer	Pro- ducer	Dealer	Pro- ducer	Dealer	Dealer	Dealer
1988:										
January-----	600	492	150	124	1,275	1,187	420	333	67	602
February-----	600	452	150	119	1,275	1,238	420	326	65	610
March-----	600	491	150	121	1,275	1,235	420	310	62	603
April-----	600	492	150	124	1,275	1,230	420	315	62	509
May-----	600	545	150	122	1,275	1,231	420	310	60	580
June-----	600	576	150	127	1,275	1,266	420	309	61	590
July-----	600	543	150	124	1,275	1,185	420	304	65	625
August-----	600	529	150	124	1,275	1,214	420	302	45	625
September-----	600	506	150	119	1,275	1,218	420	305	67	625
October-----	600	522	150	120	1,275	1,191	420	286	63	580
November-----	600	566	150	125	1,275	1,232	420	287	60	580
December-----	600	557	150	131	1,275	1,190	420	287	60	580
Average-----	600	523	150	123	1,275	1,218	420	306	61	592
1989:										
January-----	600	528	150	135	1,275	1,247	420	295	64	580
February-----	600	530	150	141	1,275	1,254	420	293	62	580
March-----	600	534	150	145	1,275	1,271	(2/)	295	62	580
April-----	600	538	150	166	1,275	1,274	(2/)	300	62	570
May-----	600	515	150	152	1,275	1,280	(2/)	303	62	550
June-----	600	494	150	152	1,275	1,275	(2/)	305	61	550
July-----	600	500	150	150	1,275	1,269	(2/)	305	61	550
August-----	600	483	150	134	1,275	1,247	(2/)	305	61	550
September-----	600	476	150	137	1,275	1,265	(2/)	305	62	550
October-----	600	483	150	137	1,275	1,269	(2/)	305	63	529
November-----	600	504	150	138	1,275	1,302	(2/)	307	63	500
December-----	600	502	150	137	1,275	1,644	(2/)	313	63	500
Average-----	600	507	150	144	1,275	1,300	NA	303	62	549

NA Not available.

1/Average prices calculated at the low end of the range and rounded to the nearest dollar.

2/Producer price discontinued March 22, 1989.

Source: Metals Week.

Table 5. - U.S. imports for consumption of platinum-group metals
(Kilograms and thousand dollars)

Period and country	Platinum	Palla- dium	Rhodium	Ruthen- ium	Iridium	Os- mium	Waste and scrap	Ores	Total	
									Quantity	Value
1989:										
First quarter r/-----	12,870	13,743	1,699	246	174	23	583	8	29,346	\$364,080
Second quarter r/-----	12,956	13,037	1,988	1,104	181	5	916	1	30,188	382,450
Third quarter:										
Belgium-----	535	2,525	40	---	---	---	6	1	3,107	21,063
Canada-----	61	189	---	---	---	---	69	---	319	3,308
France-----	10	---	---	---	---	---	---	---	10	21
Germany, Federal Republic of-----	951	28	97	33	62	---	---	---	1,171	20,515
Hong Kong-----	---	---	---	1	---	---	110	---	111	2,451
Japan-----	59	483	1	---	---	---	---	---	543	2,675
Mexico-----	1	---	---	---	---	---	14	---	15	98
Netherlands-----	---	114	5	---	---	---	---	---	119	879
South Africa, Republic of-----	7,996	4,226	650	513	125	5	---	---	13,515	173,573
Switzerland-----	439	230	76	---	---	---	---	---	745	11,768
Taiwan-----	---	119	---	---	---	---	---	---	119	1,442
U.S.S.R.-----	280	2,318	424	---	---	---	---	---	3,022	33,131
United Kingdom-----	1,367	1,594	277	208	19	---	68	---	3,533	42,454
Other-----	131	105	65	---	---	---	14	3	318	4,746
Total-----	11,830	11,931	1,635	755	206	5	281	4	26,647	318,124

r/Revised.

Source: Bureau of the Census and Bureau of Mines.

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Table 6.--U.S. exports of platinum-group metals
(kilograms and thousand dollars)

Period and country	Platinum	Palladium	Rhodium	Iridium, Osmium, Ruthenium	Waste and scrap	Quantity	Total 1/
1989:							
First quarter r/	2,440	4,020	327	75	2,849	9,711	\$102,896
Second quarter r/	1,403	2,664	197	147	2,438	6,846	79,474
Third quarter:							
Australia	19	5	---	6	---	30	338
Austria	---	49	---	---	---	49	244
Belgium	2	507	---	1	594	1,104	8,169
Brazil	2	3	---	---	---	5	46
Canada	480	245	47	---	100	872	11,148
France	7	17	---	6	52	82	1,161
Germany, Federal Republic of	20	78	1	---	875	974	10,406
Hong Kong	12	5	---	---	---	17	220
Italy	---	39	---	---	251	290	2,902
Japan	1,331	1,049	130	---	---	2,510	32,144
Korea, Republic of	191	21	34	---	---	246	4,451
Netherlands	---	140	---	---	---	140	1,116
Singapore	---	55	---	1	---	56	474
Sweden	---	4	---	29	38	71	545
Switzerland	94	33	11	---	100	238	3,331
Taiwan	7	121	---	---	---	128	828
United Kingdom	103	414	---	13	2,186	2,716	27,728
Other	21	425	4	3	---	453	2,566
Total	2,289	3,210	226	59	4,196	9,981	107,817

r/Revised.
1/Data may not add to total shown because of independent rounding.

Source: Bureau of the Census.