

# OTHER PLATINUM GROUP METALS

**Net rhodium demand will drop to 810,000 oz in 2008 due to a fall in autocatalyst purchases. Rhodium supplies are set to decline to 748,000 oz. Ruthenium demand will drop to 787,000 oz while iridium demand will rise to 132,000 oz. Iridium and ruthenium supplies will both fall.**

## RHODIUM

**Global rhodium supplies have been negatively affected by the problems in the South African mining industry and will fall by 76,000 oz to a total of 748,000 oz this year. Demand will shrink by a similar rate, to 810,000 oz, as thrifting in the autocatalyst sector starts to take effect. The rhodium market is therefore expected to be in a deficit once again in 2008, by a forecast 62,000 oz.**

## Autocatalyst

In the automotive sector, gross rhodium purchases are expected to fall for the first time since 2001. Demand will drop by an estimated 5.7 per cent to 829,000 oz, with decreases in Europe, Japan and North America because of thrifting. However, rhodium use will increase in China and the Rest of the World region as

strong growth and tightening legislation outweigh the impact of this thrifting activity.

All of the major auto makers have invested significant effort into reducing their rhodium usage as the price has risen during recent years. The impact of this work on rhodium thrifting is now being seen as new, lower-rhodium content catalysts are being fitted to gasoline vehicles everywhere. Average rhodium loadings will therefore fall in most regions this year, and demand will likewise decline.

Gross autocatalyst rhodium demand in Japan will fall to 228,000 oz, but this thrifting process will almost be balanced by the effects of tightening

legislation in some of the key Japanese export markets, which will require higher loadings on some catalysts for exported vehicles. In Europe, demand is set to drop by 2.0 per cent to 144,000 oz, despite some purchases of metal for car companies' strategic stocks.

The decline in rhodium purchases will be greatest in North America where they will fall to 222,000 oz this year. The automotive sector in this region has had a rocky year with light duty vehicle production falling throughout 2008 to an estimated 11.0 million units. There is also a trend away from large passenger vehicles towards smaller cars and trucks. These typically use less pgm in their catalytic aftertreatment and average rhodium loadings have thus fallen. There is also some evidence that the North American automotive industry has reduced its strategic stocks of rhodium, cutting further ounces from automotive demand this year.

Elsewhere, China, Russia and South America are still seeing firm growth in vehicle production. China and Russia have also introduced new, tighter emissions rules. Rhodium use will therefore rise in China and the Rest of the World region to a combined 235,000 oz.

## Other Demand

Rhodium purchases by the glass industry will rise to 57,000 oz in 2008. Glass makers have continued to expand their manufacturing capacity in Asia this year. The Chinese fibre glass industry will again grow strongly in 2008, with most of its output going into the construction sector, adding to rhodium demand. In Singapore, South Korea and Taiwan, LCD glass manufacturing is expanding, also driving rhodium demand higher in the Rest of the World region.

However, the glass industry in Europe and in North America will remain weak, with capacity still being transferred to Asia. Further, a high rhodium price has driven glass producers to use lower-rhodium alloys, allowing them to reclaim some metal which they have sold back to the market.

Demand for rhodium from other applications will increase slightly this year. Demand for many commodity chemicals remains strong and significant production capacity is being installed. For instance, demand for rhodium for the low-pressure production of oxo-alcohols will rise this year as more plants are constructed throughout Asia.

Rhodium Supply and Demand '000 oz		
	2007	2008
<b>Supply</b>		
South Africa	696	620
Russia	90	90
North America	20	19
Others	18	19
<b>Total Supply</b>	<b>824</b>	<b>748</b>
<b>Demand</b>		
Autocatalyst: gross	879	829
recovery	(172)	(184)
Chemical	66	72
Electrical	9	10
Glass	52	57
Other	24	26
<b>Total Demand</b>	<b>858</b>	<b>810</b>
<b>Movements in Stocks</b>	<b>(34)</b>	<b>(62)</b>



## Supplies

Rhodium supplies are forecast to fall by 9.2 per cent to 748,000 oz in 2008. Primary output of rhodium from South Africa will decrease in 2008. As importantly, last year's sales of refined metal from stocks seem unlikely to be repeated in 2008, accentuating the fall in supplies (metal sold to the market). Rhodium supplies from Russia, Zimbabwe and elsewhere will change little.

## RUTHENIUM & IRIIDIUM

**Ruthenium demand is forecast to weaken by 31.7 per cent to 787,000 oz in 2008, due to lower net purchases by the electrical sector. Supplies will drop, in line with the fall in output of platinum from South Africa. Ruthenium will therefore remain in surplus. Iridium demand will climb to 132,000 oz and the market will remain adequately supplied despite a fall in iridium production.**

## Demand

In the hard disk sector, the market share of perpendicular magnetic recording (PMR) disks – which utilise ruthenium – continues to grow. In fact, the transition to PMR technology is now almost complete at many manufacturers. 2008 has also seen increased demand for hard disks as consumer electronics sales have risen. However, high ruthenium prices in 2006 and 2007 encouraged the hard disk industry to reduce metal use. They can now apply thinner layers of ruthenium to their disks without compromising performance and this has constrained growth in gross metal usage.

Recycling of used ruthenium sputtering targets and production scrap has risen over this period, more than offsetting the growth in the total weight of metal

deposited on hard disks. The time taken to recycle this waste material has decreased and stocks held by the industry are falling. Net demand for ruthenium for hard disk manufacture will therefore fall in 2008.

The use of ruthenium in conductive pastes used in the manufacture of plasma display

panels (PDP) will decline in 2008. Manufacturers of these pastes have developed non-precious metal alternatives which are becoming more widely employed across the industry.

However, ruthenium demand from the production of chip resistors will rise this year. Manufacturing volumes of these components are growing and the physical properties of ruthenium make it difficult to thrift from these resistors, allowing metal demand to increase.

Ruthenium demand in the chemical sector will fall to 89,000 oz in 2008. Some new capacity for ammonia manufacture will be installed but high metal prices have driven a slow reduction in net annual ruthenium use at existing chemical plants and overall demand will decrease. In the electrochemical sector, ruthenium demand is forecast to rise to 122,000 oz in 2008 as an increase in the chlor-alkali industry's installed capacity outweighs the lower ruthenium content of membrane cells which are replacing mercury cells due to environmental legislation.

Iridium demand is likely to climb to 132,000 oz in 2008 with use in the electrical sector rising to 30,000 oz. Iridium is used to manufacture crucibles for the growth of crystals used in medical imaging equipment or in lasers. Demand for these is rising and iridium purchases will grow in 2008. The use of iridium in high-quality spark plugs will also increase.

However, the chemical and electrochemical sectors will both take less iridium this year: a combined 54,000 oz. Heterogeneous iridium catalysts are used in one major process for manufacturing acetic acid and less capacity will be installed in 2008 than in 2007 and demand will fall. Iridium is also used in some chlor-alkali plants and demand will drop as the flurry of new construction seen last year has slowed.

## Supplies

Iridium and ruthenium supplies will fall in 2008. Most of the production of these metals is by the South African mining industry. A decrease in the tonnes of ore mined and milled and a build-up in refined stocks will therefore reduce supplies of both metals substantially.

	2007	2008
Chemical	101	89
Electrochemical	119	122
Electrical	866	514
Other	67	62
<b>Total Demand</b>	<b>1,153</b>	<b>787</b>

	2007	2008
Chemical	24	21
Electrochemical	34	33
Electrical	25	30
Other	36	48
<b>Total Demand</b>	<b>119</b>	<b>132</b>