

Going Platinum



At this year's Salon International de la Haute Horlogerie in Geneva, several members of the *QP* team found themselves drawn to Vacheron Constantin's Excellence Platine collection - so much so that one contributor placed an order there and then. But even the simplest, time-only model carries a price tag of £16,450. So what's the big deal with platinum? *QP* donned its hardhat and went to the source of Vacheron's supply in South Africa to find out...

Simon de Burton

Reading the safety warning outside the entrance to number 12 shaft at South Africa's Rustenburg platinum mine makes one feel grateful for one's lot as a humble hack: "What have you got to lose? Your hearing, your sight, your hands, your feet... your life!" Crikey, even delivering late copy to the *QP* office isn't quite that risky.

The doom-laden notice made the prospect of squeezing into an eight-by-eight foot cage with 22 other people to descend more than a kilometre beneath the earth's surface even less palatable than it had done a few minutes earlier. It was then that we were told how to use our self-contained survival apparatus - a head-mounted torch and a respirator supplied by a rubber bag containing 22 minutes of your own breath. Just in case.

This is all in a day's work for the Rustenburg miners who don't see natural light for a full eight hours after they clock-on at the cage, sink through the earth and travel horizontally for another 1.5 km into its heart to work the 12,000 million-year-old reef, which helped generate \$3 billion last year for Implats, the company licensed to mine it. No tea breaks, no lunch and definitely no smokes (officially at least). Just an hour to get to the reef, an hour to get back again and six hours of solid graft in between, amidst a labyrinth of caves and tunnels putatively cooled by giant fans to a horribly humid 40°C.

But before guilt puts you off contemplating the purchase of a platinum Vacheron, remember that it's not just for life's big

Needless to say, security is tight: "There are 160 CCTV cameras on the refinery, in addition to a further network of cameras trained on the cameras, to prevent tampering."

luxuries that this is going on, because nowadays 40% of the world's platinum is used in the production of catalytic converters to green-up internal combustion engines. (Never mind that coal gets burnt at the rate of 50 tons per hour to extract sufficient metal to make just a handful of 'cats'.)

In its element

What we're interested in, however, is the recent extraordinary increase in the demand for platinum to create jewellery products and watches in particular: while in 1987 just 1,200 Swiss watches were produced using platinum, there were 20,000 produced in 2004, selling for an average price of SFr.22,000, against SFr.6,000 for a piece made from 18 carat gold.

Vacheron's first 'Excellence Platine' collection - comprising the Patrimony Contemporaine, the Chronographe Malte, the Malte Open Face perpetual calendar and a skeleton minute repeater - marks the start of an ongoing project to produce a limited series of 'collector's editions' of all the brand's future platinum pieces. The aim is to grow demand for its platinum-cased watches (which, in 'Excellence Platine' guise, have platinum dials too) to the point where they account for as much as 15% of output within the next five years, partly to take advantage of China's current appetite for a metal 30 times rarer than gold.

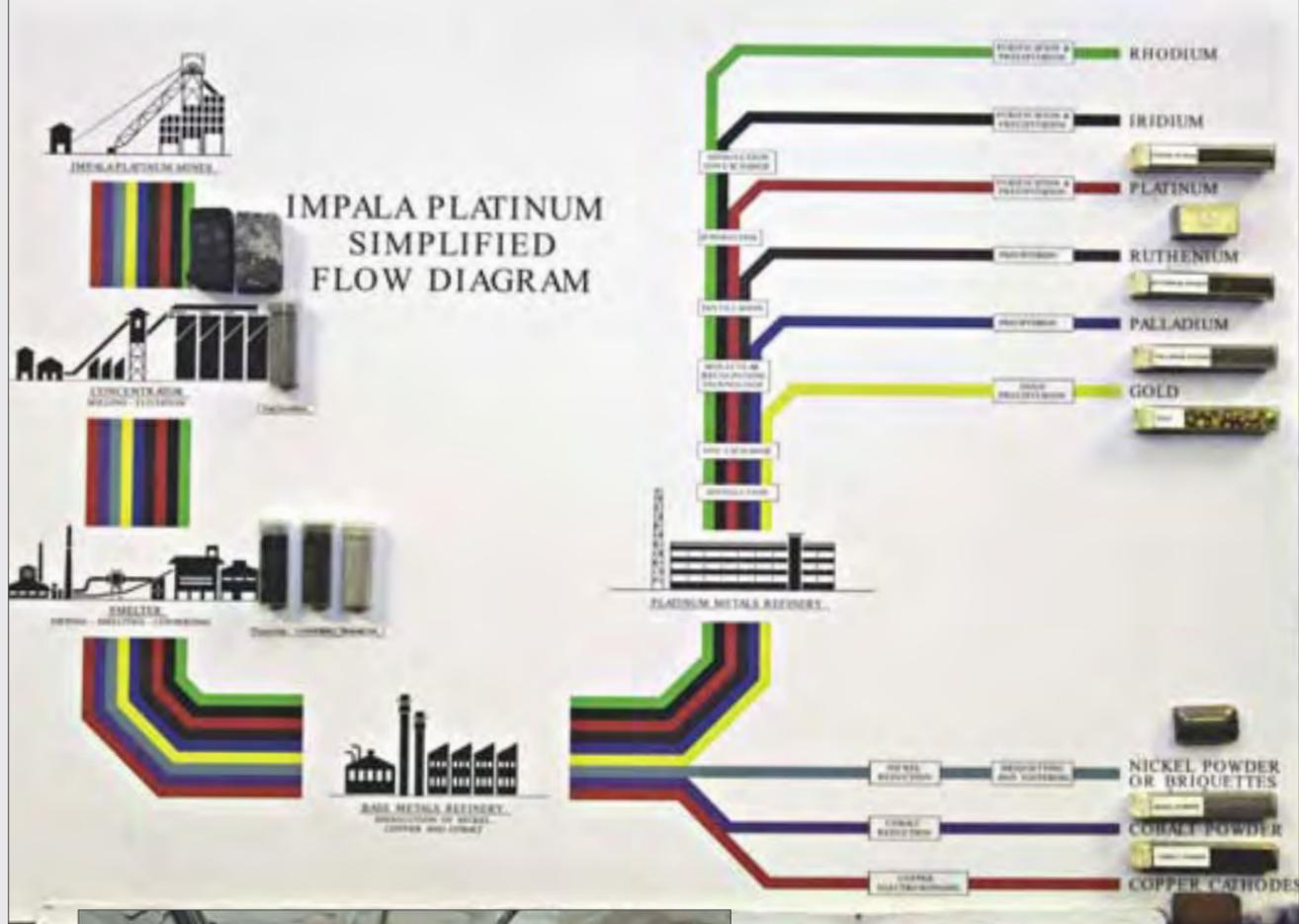
"We forget that, despite its rarity, platinum dominated jewellery during the 1920s and 1930s and enjoyed a great revival in Japan during the 1960s," explained James Courage, Chief Executive of Platinum Guild International. "In 2000, China became the most important jewellery market for platinum and now accounts for 1 million ounces of the metal with Japan, the US and Europe following on behind."

The fact that a platinum wristwatch looks very much like steel to the untutored eye has partly accounted for the metal's return to popularity with wealthy but discreet types, who gain a certain sense of satisfaction from knowing that the case of their wristwear is currently worth more than \$1,000 an ounce in its raw state.

That means that the basic lump of material required to produce the platinum dial (8 g), case (26 g) and buckle (6 g) for a Patrimony



Simplicity at its most elegant: the Patrimony Contemporaine from Vacheron Constantin's new Excellence Platine collection (€16,450), limited to just 150 pieces. As if you needed reminding, the dial bears a 'PT 950' label, meaning both the dial and case are made from 95% pure platinum. Like all the Excellence Platine watches, the metal's ethereal hue is complemented by a dark-blue alligator strap.



(Above) Paying attention, class? The stages of the platinum group metals (PGMs) extraction and refinement at Implats' Rustenburg mine.

Contemporaine costs Vacheron Constantin more than \$2,000 before its watchmakers even begin the notoriously difficult task of working it into a thing of beauty.

Going underground

Complex as the case-maker's art is, the tasks appear relatively straightforward compared to the mind-bogglingly complex business of actually extracting the platinum in the first place.

More than 14 tons of rock has to be blasted out of the reef and brought to the surface in order to produce a single ounce of platinum, but among those 14 tons are the other platinum group metals (PGMs) that also have value, such as palladium, ruthenium and - probably most valuable of all - rhodium.



The extraordinarily thorough refining process, which takes between three and six months from reef rock to polished platinum ingot, sees to it that every last gram of any valuable metal is extracted. Numerous forms of alchemy result in useful, if not especially valuable, by-products such as fertilisers. Indeed, the refining is so thorough that if concrete is dug up during building work at the processing plant, it too is crushed and refined to recycle any trace of platinum that might have fallen by the wayside.

(Right) The Malte Perpetual Calendar 'Open Face' in platinum (£49,500), with a remarkably bold (for Vacheron at least) chequered retrograde date display. Apparently drawing inspiration from Pininfarina's transparent hood over Ferrari's V8 engines, VC's 'engine' (the calibre 1226) is on display through the sapphire dial, offset nicely against its rose-gold baseplate.



Needless to say, security is tight throughout the process; no more so than during the latter stages when the smelted and dried powder known as 'matte', containing very high concentrations of pure platinum, is transported 30-odd miles to a town called Springs, where it goes through the final refining stage before being formed into ingots. The transportation is carried out during daylight hours, always at different times, using a fleet of AK47-proof armoured vehicles equipped with satellite tracking systems.

The refinery itself is surrounded by a 30-foot perimeter fence, with two internal walls topped with razor wire. Staff leaving and entering the plant must pass through air-locked doors and wear only specified garments.

Platinum Facts

- Platinum is a chemical element with the symbol 'Pt' and atomic number 78.
- Platinum was used in jewellery-making by the Pharaohs as long ago as the 14th century BC.
- The first sample of platinum was brought to England from Jamaica in 1741.
- Vacheron Constantin made its first platinum watch in 1820 - a rectangular ring watch.
- Aside from jewellery, platinum is used: as a catalyst in automobile catalytic converters; in the manufacture of computer hard disks; in chemotherapeutic drugs (DNA crosslinkers and alkylators); for micro-machined surgical components.
- South Africa harbours 76% of the world's platinum resource. There are sufficient reserves there to increase supply by up to 5% per year for next 50 years.
- Demand for platinum grew by 2% to 6.7m oz in 2005. Use in autocatalysts continued to rise but purchases for jewellery weakened.
- In 2005, approx. 3m oz of platinum was used for autocatalysts, 2m for jewellery and 1.5m for industrial applications.
- The platinum price ranged between \$860 and \$880 per ounce for most of the first half of 2005. During the second half, a surge of speculative investment propelled the price to a 25-year peak of \$1,012.
- The Rustenburg mine is on land belonging to the Bafokeng tribe. The tribe earns millions of pounds each year by permitting Impala Platinum (Implats) to work the reef.
- Mining began at Rustenburg in 1965 and the site is expected to remain productive until beyond 2035.
- The leftovers have been retained on a giant spoil heap in case more effective refining techniques are discovered that might enable the elusive platinum to be extracted.



(Above) Vacheron makes the thinnest minute-repeater movement in the world, squeezing the two hammers and gongs into 3.30 mm of depth. Only 15 examples, with completely skeletonised movement, will be made for the Excellence Platine collection (£297,500).



Platinum mining and production is an expensive and difficult process, which can take up to six months from extraction to concentration to refining:

- 1 Extracting the ore: Mill-head grades of BIC (the measure for the PGM content for the ore) are between 4 and 7 grams per ton.
- 2 Milling: Ore is crushed and milled in order to obtain smaller rock particles and to expose the PGM minerals.
- 3 Flotation: In a 'froth flotation' process the particles are mixed with water and special reagents, before air is pumped through the liquid. The PGM-containing particles adhere to the bubbles and float to the surface. This flotation concentrate is removed as a soapy froth. PGM content now varies between 100 and 1,000 grams per ton.
- 4 Smelting: The flotation concentrate is smelted in an electric furnace at temperatures over 1500°C. Then, a matte containing the valuable metals (>1400 g/t) is separated and transported to a base-metal refinery, where electrolysis, solvent extraction, distillation and ion-exchange all take place, and the soluble metals, which dissolve in hydrochloric acid and chlorine gas, are obtained: first gold, then palladium and platinum.

"There are 160 CCTV cameras on the site, in addition to a further network of cameras trained on the cameras to prevent tampering," explained Springs refinery boss Keith Rumble. "We have caught six people this year with metal on them or inside them, and anything that could possibly be used to conceal metal is forbidden on the site - that includes tennis balls, which could be cut open to hold a slug of platinum and thrown over the fence, condoms or shoes with separate heels. In addition, we ask every prospective employee to take a polygraph test and, once they are on the payroll, we can ask them to take the tests at random."

I can understand their concerns, because there is something strangely beguiling about an ingot of 99% pure platinum that fits into the palm of one hand yet needs two hands to pick up.

Perhaps it's the fact that it's worth \$150,000? ○

(Right) Like the Patrimony Contemporaine, Excellence Platine's Malte Chronograph (limited to 75 pieces; £29,500) features a micro-grain-finished platinum dial. It conceals the hand-wound, column-wheel calibre 1141 chronograph movement.

Further information: Vacheron Constantin UK, Tel: 020 7312 6830, www.vacheron-constantin.com



Making a platinum case

It takes three times longer to produce a platinum watch case than a gold one, as slower tool speeds and lower pressures are required, to minimise friction and tool wear. Platinum watches, like those pictured here, are usually made from 95% pure platinum alloy (compared with 18 ct gold, which is 75% pure), usually alloyed with ruthenium. The raw material is homogenised by hammering and annealing, as even the minutest porosity might cause indentations or an 'orange-peel' effect on the surface.

A platinum sheet is rolled to the required thickness and stamped out to form shaped blanks. These are machined into the final configuration by computer-controlled lathes, using up to 15 different tools to turn, mill and drill the case and other parts (e.g. buckle and bracelet links).

Having different properties to gold, platinum is usually hand-polished - an intricate process that involves eliminating all the machining marks by applying successively finer grades of abrasive paste to achieve that lunar lustre so characteristic of platinum.

