


Titanium prices are falling, but the long-term outlook is rosy



The Hotel Marqués de Riscal, designed by Frank Gehry. The building's exterior is clad with pink titanium panels reflecting the colour of the local rioja wine. Photo: Hotel Marqués de Riscal, The Luxury Collection.

Prices of titanium have continued to fall, but continuing demand from aerospace, as well as from the process industries, is likely to provide price support or even a price increase. Titanium manufacturers everywhere are gearing up to meet demand, and demand for the super-metal is likely to remain tight in the foreseeable future. Stainless Steel World investigates the current state of the market.

By James Chater

Market conditions

The price of titanium continued its decline over this summer: ferro-titanium spiked at around USD 30 per kg in May 2005 and around USD 27 in October 2005 before declining to just below USD 8 in August of this year, more or less the level they were at in February 2004.¹ The price slide may have been caused by delays in the launch of one of the two next-generation airliners. A series of technical problems has delayed production of EADS's Airbus A380, with the result that nine deliveries sched-

uled for this year had to be postponed to next year. However, the long-awaited first delivery, to Singapore Airlines, took place on 15 October 2007. But scarcity of titanium supply is itself causing delay in the aerospace industry. In September 2007 Boeing announced that its Boeing 787 Dreamliner would be delayed by three months, then on 10 October a further delay of six months was announced. Slower-than-expected output of titanium fasteners was cited as one cause. The Dreamliner is now ex-

pected to make its first flight around the end of first quarter 2008, with first deliveries starting in late November or early December 2008 instead of May 2008 as originally planned.

However, the effect of the delays is likely to be short-lived, and demand for the "21st-century" metal is likely to remain tight until about 2010 as orders for the new-generation airliners, or parts thereof, pile in. The light-weight, highly corrosion-resistant metal is irreplaceable in certain

titanium production, and the state of Kerala has signed agreements with Russia's Rosoboronexport and VSMPO-Avisma for a titanium sponge facility in Chertala. In China, a number of projects are under way which, if all completed, could increase the country's annual titanium capacity from roughly 15,000 tonnes today to about 120,000 tonnes by 2010 - more than



Detail from a titanium "painting" for a café by Anthony Eckelberry

current world production! The recent surge in output has been so marked that the China Nonferrous Metals Industry Association has warned of over-production. In the last two years, 30 new titanium sponge smelters have been planned; seven or eight of these have already started production. In August 2007 it was announced that Baoji Titanium Industry, China's largest producer of titanium, plans to expand its annual production capacity of titanium products to 10,000 tons by 2010. Also, Panzhihua Iron and Steel Group will build a vanadium titanium steel production facility in Xichang, in Sichuan province. At the moment China's production is mainly limited to lower-grade titani-

um of the sort used in bicycle frames, golf clubs, or anti-corrosive pipes for the chemical industry, but it hopes to acquire the technology to produce aerospace-grade titanium within three years.

In Japan, Sumitomo Titanium Corp. had announced it will double production of high-grade titanium used in semiconductor target materials by adding a second distillation system at its main plant in Amagasaki. Based on all these projects, John Mothersole has predicted that capacity will increase by 14% annually between 2006 and 2010 to 220,000 metric tons; however, he believes world demand will surge by about 40 per cent in the same period, keeping pressure on supply and prices.³

Substitutes for titanium

If the price of titanium returns to the high levels of 2005-6 or if supplies tighten, end users will again be considering ways of replacing titanium. Composites have gradually replaced titanium in some aerospace applications, and it is possible that intermetallic and composite materials could continue to displace some titanium in future military aircraft. Alcoa has proposed replacing Ti with aluminium-lithium in certain aircraft parts.⁴ In other industries, high-nickel steel, zirconium, and superalloy metals could be substituted for titanium alloys.⁵ In golf clubs, scandium, which has a 36 per cent strength-to-weight advantage over titanium, has been used.⁶ Carpenter Technology's martensitic alloy Custom 465 (0.004 C, 11.70 Cr, 11.00 Ni, 1.00 Mo, 1.6 Ti, Bal. Fe) has been proposed as a replacement for titanium in aircraft landing gear.

The US government has a strong interest in bringing down the cost of titanium production and through its DARPA initiative is sponsoring various research projects to develop less polluting, less energy-intensive ways of processing the metal.⁷

Rosy outlook

While aerospace is the strongest driver behind the growth in demand for titanium, other industries, buoyed up by a dynamic world economy, are playing their part. Heat exchanger tubes in chemical, petrochemical and above all power generation applications require titanium. Because of its resistance to saltwater corrosion and bacterial decay titanium has been replacing other metals in feedwater pipes in (nuclear) power plants. The material's light weight is of increasing interest to auto makers because of its potential for increasing fuel efficiency. Finally, titanium continues to be important in the lifestyle statements of the rich, whether it be in yachts, the pink confectionary of Frank Gehry's Hotel Marqués de Riscal in southern Spain (see photo), or in the signature watches and clocks that the architect has started to make for Tiffany.

For all these reasons, demand for titanium is likely to remain high and to keep the price buoyed up: good news for miners, less good news for end users. As always with commodities, China is a "swing" country that will affect supply and demand patterns world-wide. If China cannot or will not rein in its current over-expansion, the price could slump. However, in the long term, titanium has a bright future, both literally and figuratively.

1 Stainless Steel World News, September, "Market outlook".

2 <http://www.purchasing.com/article/CA6482987.html>

3 <http://www.purchasing.com/article/CA6482987.html>

4 http://www.ainonline.com/news/single-news-page/article/alcoa-busy-with-metals-in-an-age-of-composites/?no_cache=1&cHash=4dbbcc0e7

5 http://findarticles.com/p/articles/mi_m3MKT/is_v92/ai_3143015;http://www.springerlink.com/content/rhw441210t635042;http://minerals.usgs.gov/minerals/pubs/commodity/titanium/timcs04.pdf

6 <http://www.torontogolfnuts.com/archive/index.php/t-1620.html>

7 http://www.designnews.com/article/CA6483934.html?industryid=43654;http://www.carttech.com/products/wr_products_stainless_cust465.html