Titanium back in reckoning

But technical hurdles make processing difficult, though India has 21 per cent of global deposits

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It's as strong as steel, more durable than aluminium and has a higher fashion quotient than platinum when it comes to avant garde jewellery. It's titanium, nicknamed the "space-age metal" for its widespread use in airlines and defence because of its lightweight and durable nature. Only a handful of countries boasts of titanium deposits and India is one of them, with 21 per cent of the global deposits along its 7,000-km coastline.

Over the past decade, many companies have set out to mine the metal. Tata Steel had planned a ₹2,500-crore titanium dioxide project in Tamil Nadu, but was forced to put it on the back burner in 2007 after it ran into land problems. More recently in 2013, SAIL signed a memorandum of understanding with Kerala Minerals & Metals for a ₹5,000-crore joint venture to make titanium sponge. That project too is languishing. But with a $150-billion window of opportunity in defence equipment with the government's 'Make-in-India' push, titanium is back in the reckoning.

Last week, representatives from the Aditya Birla group attended a pre-bid meeting of the Andhra Pradesh Mineral Development Corporation, or APMDC, to develop heavy mineral sands, or deposits of the metal along the beach. So did Dubai-headquartered, Trimex group, and eight other companies, says APMDC Consultant P Panduranga Rao.

Among the other major groups interested in titanium is Sajjan Jindal-controlled JSW Steel. "It's a project we are studying," says Jindal, chairman and managing director of the steel major.

Bharat Forge has already inked a multi-year contract with Boeing Commercial Airplane to supply titanium forgings for Boeing's next generation 737 and 737 MAX airplanes. The Indian company's facilities in Pune and Baramati are expected to start supplying the parts to be used in the wings of the plane from the first quarter of 2016. The titanium parts will be heat treated, shaped in a forging press and machined by Bharat Forge before being shipped to Boeing Portland for machining into components. The source of the titanium parts for the project, however, is not known and Bharat Forge didn't respond to questions sent by *Business Standard*.

The stages in titanium mining include extracting ilmenite from beach sand and upgrading it to titanium slag, which then is purified into sponge, and cast into ingots before being processed in mills to make various items. The price increases staggeringly after each step of value addition; if ilmenite is around $600 a tonne, titanium sponge could cost as much as $15,000 a tonne.

Around 95 per cent of the titanium-bearing compounds (titanium dioxide) mined finds use in the paints, paper and plastic industries, and the rest is converted into titanium metal which is used in the aerospace and defence sectors. Despite its many advantages, one problem with the metal is its cost of production. Research reports indicate that the cost of producing titanium metal is around $6 a kg, compared to less than a $1.5 for steel and $2 for aluminium. In India, mining titanium is doubly challenging due to technological bottlenecks.

NOT SO SHINING

- India has 21 per cent of the world's titanium bearing minerals
- Extant along the Indian coastline
- Of the 7,000km, only 2,500km has been explored
- India's installed capacity is 1 per cent; 75 per cent is met through imports
- Per capita consumption is 0.15 kg compared to 5 kg in developed countries

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SAJAN JINDAL
Chairman, JSW Steel

"The titanium market is oligopolistic in nature. The joint efforts of SAIL, Kerala State Industrial Development Corporate and Kerala Minerals and Metals to obtain technology from leading global suppliers/manufacturers of titanium sponge is not yet successful and have not been very encouraging," admits a SAIL spokesperson.

Most of the titanium slag plants currently operate in Canada, South Africa and Norway. While Russia, Kazakhstan, Ukraine and Japan, too, produce slag, their production is mainly for captive consumption.

Indian companies find themselves hamstrung by lack of technological know-how. "We were approached by a Russian company a couple of years back. The Russian project was in Odisha. But the main stumbling block is technology," says Srei Infrastructure Finance Chairman and Managing Director Hemant Kanoria.

Too many pitfalls

APMDC's Rao, who is inviting companies to participate in an integrated project that includes exploration and mining of titanium, agrees with the cost and technology challenges. APMDC has proposed to develop three heavy mineral beach sand leases. For the project, the private investor would have majority stake, says Rao. Yet more than half the companies that turned up for the pre-bid meeting were local companies based in south India, possibly because others were anxious about the uncertainties involved.

Jindal, however, is more enthusiastic about titanium's future. "A sound titanium dioxide and metal industry is essential to ensure optimum utilisation of these resources and to develop a vibrant industry. Large investment, research and development and know-how would be extremely essential to develop a world class titanium industry. Moreover, beach sand minerals have been kept out of the auctioning process in the Mines and Minerals Development Act. They need to be allowed as in the case of bulk minerals," he says.

India has a head start with 21 per cent of the global deposits compared to 10 per cent in the case of coal and less than 10 per cent for iron. Still when it comes to mining, India has just 1 per cent of the installed capacity globally.

Much of this is accounted for by Kerala Minerals and Metals which started construction of titanium dioxide plant in 1979 and commissioned it in 1984. In 2011, it set up a titanium sponge plant and has been a strategic supplier to India's space missions.

Titanium's global story took a while to take off. Discovered in 1791, small amounts of the first titanium metal were produced in 1910 and on a commercial basis from 1948. Is India Inc now ready to take a leap of faith?