



India's refractories industry: Ready to recover?

India's economy and steel sector have been among a select few worldwide to post healthy levels of growth amid stagnant global GDP rates, but Chinese steel dumping and overcapacity have curtailed growth in the country's refractories industry, *Sunder Singh, IM Correspondent*, explains.

Driven primarily by steelmaking activity, India's refractories industry has had a mixed period over the past two years. Domestic steel production has broadly matched the growth of India's GDP, but the slowdown in the Chinese economy around the middle of 2015 has had a negative impact on the country's domestic refractories producers, as China has sought to dump its excess steel on the Indian market.

The situation started to improve in the first half of 2016 and refractories producers are expecting steady growth in the short-to-medium term, but these expectations are based on the assumed success of political measures to stimulate the economy and steel production.

The refractories sector has already made some progress. Besides capacity expansion and modernisation by domestic companies, international refractories producers including Austria's RHI AG, UK-based Vesuvius Plc and Japan's Krosaki Harima Corp., have entered the Indian market and set up manufacturing

bases in the country. Other large industry players like China's Pohang Refractories and South Korea's Chosun Refractories have established Indian trading offices.

"As with other countries, the steel sector in India accounts for the lion's share of total refractory consumption," A Dasgupta, senior executive officer at the Indian Refractory Manufacturers Association (IRMA), told *IM*. IRMA estimates that India's steel industry accounts for around 75% of total domestic refractories demand, in volume terms.

Cement making consumes a further 15% while glass accounts for 5% of the market and other industries, including copper, aluminium and foundry, make up the remaining 5% share.

Although specific consumption of refractories in the steel industry has gone down by about 30-35% over the last two decades, future demand prospects are still dependent on the growth of the steel industry. Crude steel production in India has grown at a compound annual growth rate of 10% over the last 10 years and the long-term demand outlook for refractories remains favourable, given the government's focus on domestic infrastructure and economic development. However the sector remains susceptible to fluctuations in the global steel market.

Capacity pressure

India's refractories needs are catered for by 13 large, 40 medium-sized and around 300 small

Table 1: Indian refractory production 2011-2015

	2014-15	2013-14	2012-13	2011-12	2010-11
Production (tonnes)	1.2m	1.16m	1.28m	1.42m	1.35m
Volume growth	3.5 %	-9.8%	-9.2%	5.1%	6.2%
Value growth	7.6%	6.7%	4.3%	12.3%	26.1%

Source: IRMA

Table 2: Indian monthly crude steel production (tonnes)

	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2016	7.39m	7.46m	8.06m	7.64m	8.04m	7.79m						
2015	7.51m	7.2m	7.8m	7.51m	7.67m	7.5m	7.64m	7.41m	7.24m	7.36m	7.27m	7.26m

Source: World Steel Association

manufacturers. The Indian refractory industry has added huge capacity in recent years in anticipation of rising demand from the steel and other consuming segments. However, a stagnant to weak global economy and lower than expected growth in domestic GDP, together with the influx of steel and refractories from China, has rendered idle a large proportion of India's refractory-making capacity.

An executive at IFGL Refractories, one of India's leading refractories producers, told **IM** that current capacity utilisation in the industry is around 55%. "Imports have surged and occupy more than 35% of the domestic market," they said. "Many projects have stalled, particularly in the silica brick segment. In addition to low capacity utilisation, the industry is also facing negative price pressure as cheap imports have affected the market dynamics."

The election of Prime Minister Narendra Modi in 2014 brought with it high expectations in the Indian refractory industry that promised economic reforms would encourage industrial growth.

India's economy has shown some signs of accelerated expansion, but there is still a gap between expectation and what has been achieved. The steel industry in particular has lagged government targets, leaving refractories suppliers disappointed.

The Indian government has begun taking steps to curb steel imports, including proposed anti-dumping duties on a number of steel products, but it will take some time for the impact of these measures to be felt in the domestic steel and refractories sectors.

Speaking in the country's parliament, Indian Steel Minister, Narender Singh Tomar, said recently that as well as anti-dumping duties the government will set a minimum import price on steel.

But this policy has its work cut out to undo the huge growth in Chinese steel volumes received by India in recent years. Total Chinese steel exports reached 110m tonnes in 2015, 22% above the previous year.

Falling specific consumption

Advances in steelmaking technology have led refractory consumption per tonne of steel produced in India to shrink to around 12kg from 30kg a decade ago and some of the most modern steel mills are using as little as 7-8kg

of refractory per tonne. The aluminum industry is an exception to this trend, broadly maintaining its specific refractory consumption over the last 10 years, although this is a much smaller consumer of refractories than steel.

Hirdesh Sehgal, vice president of operations at TRL Krosaki, told **IM** that, in the face of falling consumption and rising competition, the steel industry is moving towards higher productivity at reduced costs. "This is pushing refractories companies to supply high performance products," he says. "Indian refractories manufacturers have done little in terms of product technology improvement in the majority of application areas. Therefore, the growth of the steel industry is likely to lead to growth of imported refractories from established international suppliers in the medium term."

Sehgal notes that if this forecast proves correct, this will further dent capacity utilisation within India's refractories industry, where many manufacturers are already operating at extremely low margins.

"The positive aspect of this is that the international suppliers are moving to India for manufacturing cost advantages. The desire of foreign companies to reduce their outlays and of Indian companies to improve their technological expertise is leading to tie-ups between domestic and international businesses, creating win-win situation for suppliers and customers," Sehgal adds.

In two-to-three years from now, Sehgal expects Indian steelmakers' use of high performance products will have further significantly reduced refractory consumption per tonne of metal, meaning that the proportionate rate of growth in refractories consumption will be lower than that of steel production.

If India succeeds in becoming a low-cost centre for producing high-performance refractories, it could carve out lucrative export markets, Sehgal points out.

IRMA's Dasgupta blames a lack of research and a failure to develop high quality domestic raw materials sources as one of the chief barriers to progress in the Indian refractories industry. "Indian refractory producers will have to offer high value added and customised services to end users in order to stay competitive," he says.

Access to high quality raw materials is one of the most important competitive advantages in the refractories industry, due to their significant influence on the performance of finished products.

The decline in refractory raw material prices from their 2011 peaks, driven by weaker consumption in China, yielded some positive results for Indian refractories producers up until mid-2014, but since then, price volatility has been a cause for concern.

India's refractories industry is dependent on imports of key raw materials like alumina, bauxite, magnesite and silicon carbide to sustain manufacturing. China is the major supplier of these minerals and has been imposing heavy taxes on its exports in the last two years, which has sharply increased imported raw material costs for Indian refractory producers.

The slowdown in refractories demand is being felt most acutely by medium-sized and small scale manufacturers. M V R Rao, managing director of Medak, Telengana-based MPR Refractories, told **IM** that weak demand growth and negative price pressure have made it difficult for companies like his to survive.

"The next two years will be the toughest test for many refractories producers in India," he said, hinting that much depends on the success of Modi's economic reforms.

India's leading refractories companies

TRL Krosaki Refractories

A subsidiary of Japanese Krosaki Harima

Table 3: Indian steel production 2011-2016

Year	Steel production (tonnes)	Growth year-on-year
2015-16	96m	8.7%
2014-15	88m	1.1%
2013-14	87m	7.4%
2012-13	81m	5.2%
2011-12	77m	5.2%
2010-11	73m	6.5%

Source: World Steel Association

Corp., TRL Krosaki is among the top three refractories producers in India. Krosaki entered the market in 2011 after acquiring a 51% stake in locally-based Tata Refractories from leading Indian steel producer, Tata Steel.

Both government-owned Steel Authority of India Ltd (SAIL) and Tata Steel are stakeholders in TRL Krosaki, while Japan's Nippon Steel & Sumitomo Metal Corp. has a 42.9% stake in the company's main Japanese business.

TRL Krosaki has three manufacturing plants at Belpahar in the state of Orissa, Salem in Tamil Nadu and Jamshedpur in Jharkhand. Besides refractory products for steel, copper, cement, aluminum, glass, petrochemicals and other non-ferrous industries, the company also offers refractory management and engineering services. It is one of the largest manufacturers of dolomite refractories in the world and is the leading supplier of silica refractories for coke ovens and the glass industry.

SAIL Refractory Co. Ltd

SAIL Refractory Co. Ltd is a subsidiary of the country's largest steel maker, SAIL. Located at Salem in the southern state of Tamil Nadu, the company has a capacity of 1,500 tpm calcined magnesite, 1,200 tpm basic bricks,

500 tpm magnesite-carbon bricks, 3,000 tpm bulk and monolithics and 2,000 tpm dunite.

With 1,718.3 acres (6.95km²) of leasehold mining land spread over three locations, SAIL Refractory Co. has estimated magnesite reserves of about 10m tonnes and about 9m tonnes dunite.

Calderys India

Calderys, the foundry division of France-based minerals group, Imerys, entered India by acquiring domestic producer ACE Refractories in 2007. The company has its manufacturing units at Katni in the state of Madhya Pradesh and Nagpur in Maharashtra. Calderys produces a range of monolithic, high-alumina and insulating bricks and has an installed capacity of 170,000 tpa refractory products. Its product portfolio includes dense castables, binders, grouts, basic masses, pre-cast shapes, refractory bed support, taphole clays and refratherm.

Calderys also has a further capacity of around 67,000 tpa refractory products from its franchised operations.

Orient Refractories (RHI)

Orient Refractories, which is 69.6% owned by Austria-based RHI, operates its main manufacturing facility in Bhiwadi in the state

of Rajasthan. The plant is divided into three independent subdivisions for the production of slide gate plates, continuous casting refractories and castables and pre-cast shapes. The company has the capacity to produce 70,000 pieces of slide gate plate per month, 30,000 pieces of continuous casting refractory and over 2,000 tpm of castables and mortars. Orient also has a monolithics plant in Salem.

RHI is the second biggest global supplier of refractories after UK-based Vesuvius with revenues of €1.75bn (\$1.95bn*) in 2015. It has two other unlisted subsidiaries in India – RHI India Pvt Ltd and RHI Clasil Pvt Ltd, which are engaged in manufacturing and trading refractory bricks and linings. RHI's key Indian customers are SAIL, Bhushan Steel, Mukund, RINL-Vizag, Sunflag Iron, Lloyd Steel, Usha Martin and the Jindal Group.

RHI expects Orient Refractories to achieve revenues of around €100m in the financial year 2020, up from around €61m for the year ended 31 March 2016, on back of the anticipated acceleration in Indian economic growth and a corresponding rise in steel demand, assuming that the government's keeps its word to reduce Chinese steel imports.

**Conversions made August 2016*