World Refractories

Industry Study with Forecasts for 2012 & 2017

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A recovery is expected by 2012, restoring gains for the refractory industry. Longer-term growth will be supported by the increasing use of better performing, more expensive refractories.

Global demand to rise 3.5% yearly through 2012

World demand for refractories is forecast to rise 3.5 percent annually through 2012 to 45.2 million metric tons. In the short term, refractory demand will be negatively impacted by the effects of the global economic downturn that began in the latter half of 2008, with declining manufacturing activity and global trade pushing demand below 2007 levels in most countries. However, recovery is expected by 2012, restoring gains for the refractory industry. Longer-term growth will be supported by the increasing use of better performing, more expensive refractories. Tonnage advances will be limited by slowing growth in steel production. In addition, the world’s steel industry will continue to utilize less refractories per ton of steel produced.

Best prospects in markets other than iron, steel

Iron and steel production is by far the largest market for refractories. Refractory usage per ton of steel will continue to decline, adversely affecting the outlook for refractory suppliers. Refractory demand in the production of other metals will rise, benefitting from increased output of materials such as aluminum. Gains are also expected in the nonmetallic mineral products market, spurred by growth in the production of ceramics, cement and other mineral products, fueling demand for associated refractories. Other markets, including petroleum, chemicals, paper and aerospace, will benefit from rising production by end users.

China to continue Asia/Pacific market dominance

China accounted for over 50 percent of the world refractories market in 2007. This is due to the nation’s strong rise in industrial production. In 2007, the country manufactured 36 percent of the world’s steel, 49 percent of the world’s cement, and 44 percent of the world’s flat glass. In addition, China utilizes a higher rate of refractories per ton of steel than developed nations due to its less efficient manufacturing processes. China will claim over 80 percent of new demand in 2012.

Due primarily to China, Asia will continue to be the fastest-growing region in the world through 2012. While China will account for much of the region’s gains, India will exhibit advances above the world average as well. Like China, India has a rapidly growing steel industry, the product of a rising level of industrialization. Eastern Europe will have solid growth prospects due to its rising steel production. Multinational manufacturers have shifted production of steel-consuming goods such as household appliances and motor vehicles to Eastern Europe, creating demand for steel. Opportunities will also exist in Latin America and the Africa/Mideast region.
China: Refractory Outlook & Suppliers

Demand for refractories in China is projected to grow at a 6.3 percent annual pace through 2012 to $12.2 billion. Annual gains noticeably from the 2002-2007 period, reflecting a moderation in key end-use markets, most notably steel production. Despite the deceleration, the country will continue to outpace the average rate of increase worldwide.

In volume terms, refractory demand will rise 5.4 percent to 25.9 million metric tons in 2012. Advances will lag value gains, as end users such as the steel industry are lowering their refractory usage per ton of production. As Chinese steel production continues to modernize, refractory efficiency will rise.

Refractory production by facilities in China is forecast to rise 6.6 percent annually through 2012 to $13.5 billion, outpacing projected advances for demand and leaving the country with an expanded trade surplus. Healthy domestic market conditions will help boost domestic industry output. Exports will continue to show strong gains, but will decelerate from the 2002-2007 pace due to mature markets in the US, Japan and Western Europe.

The Chinese refractory industry is extremely fragmented, with over 1,500 local producers, virtually all of which are small or medium-sized enterprises. China is home to refractory producers such as China Gengsheng, Haicheng Houying, Haicheng Xiyang, Liaoning Jinding Magnesite, Shandong Refractories and Yingkou Qinghua. Multinational refractory and raw material producers with facilities in China include Allied Mineral Products, Almatis, Clayburn, DSF Refractories & Minerals, Imerys, Krosaki Harima, LWB Refractories (Magnesita), Materis, Minerals Technologies, Morgan Crucible, Orind, Orkla, RHI, Saint-Gobain and Vesuvius (Cookson Group).
Sample Profile, Table & Forecast

COMPANY PROFILES

Resco Products Incorporated
Two Penn Center West, Suite 430
Pittsburgh, PA 15276
412-494-4491
http://www.rescoproducts.com

Annual Sales: over $200 million (estimated)
Employment: 910 (estimated)
Key Products: monolithic castable refractories; plastic ramming mixes; and refractory bricks

Resco Products primarily manufactures specialty refractory castables and bricks, and raw refractory materials. The privately held company is owned by private equity firm Hancock Park Associates (Los Angeles, California) and Company management.

The Company’s refractory offerings comprise premium, low-cement, extreme service and insulating castables; unfired plastic refractories; and varying brick types. These products are suitable for use in steel ladle, glass, aluminum, basic oxygen furnace, iron charging ladle, electric arc furnace, cement, hot metal car lining and other applications.

Products – Resco Products’ premium castables, which are marketed under the RESCOBOND AA-22S brand name, are resistant to abrasion and corrosion, and can be used in thin, metal-anchored and metal-reinforced linings. These castables are also suitable for use as a permanent patch for worn refractory linings. The Company’s low-cement castables, which include ultra-low-cement and no cement types, are grain-sized and available in vibration-only mix, self-flow castable, shotcrete and combination varieties. These materials are sold under the KRICON, VIBROCAST, SUREFLOW, EZ CUBE and EZ CAST.

TABLE VI-3

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Domestic Product (bil 2006$)</td>
<td>2741</td>
<td>4072</td>
<td>6800</td>
<td>10400</td>
<td>14850</td>
</tr>
<tr>
<td>% GFI</td>
<td>29.5</td>
<td>34.1</td>
<td>40.7</td>
<td>41.3</td>
<td>41.1</td>
</tr>
<tr>
<td>Gross Fixed Investment (bil 2006$)</td>
<td>809</td>
<td>1390</td>
<td>2766</td>
<td>4295</td>
<td>6105</td>
</tr>
<tr>
<td>Steel Production (mil metric tons)</td>
<td>108.9</td>
<td>182.2</td>
<td>489.2</td>
<td>725.0</td>
<td>1062.0</td>
</tr>
<tr>
<td>m ton refractory/mil $ GFI</td>
<td>4.41</td>
<td>4.45</td>
<td>7.19</td>
<td>6.02</td>
<td>5.49</td>
</tr>
<tr>
<td>m ton refractory/000 m ton steel</td>
<td>32.8</td>
<td>33.9</td>
<td>40.7</td>
<td>35.7</td>
<td>31.6</td>
</tr>
<tr>
<td>Refractory Demand (000 metric tons)</td>
<td>3570</td>
<td>6180</td>
<td>19895</td>
<td>25875</td>
<td>33535</td>
</tr>
<tr>
<td>$/m ton</td>
<td>400</td>
<td>415</td>
<td>450</td>
<td>475</td>
<td>495</td>
</tr>
<tr>
<td>Refractory Demand (mil $)</td>
<td>1420</td>
<td>2550</td>
<td>9000</td>
<td>12235</td>
<td>16570</td>
</tr>
<tr>
<td>net exports</td>
<td>10</td>
<td>295</td>
<td>840</td>
<td>1300</td>
<td>1595</td>
</tr>
<tr>
<td>Refractory Shipments (mil $)</td>
<td>1430</td>
<td>2845</td>
<td>9840</td>
<td>13535</td>
<td>18165</td>
</tr>
</tbody>
</table>

“The nation consumed 19.9 million metric tons of refractories in 2007, over 50 percent of world demand. This large demand stems from the nation’s massive steel industry, which produced 36 percent of global output in 2007. Furthermore, the Chinese steel industry consumes a higher per ton rate of refractories than developed nations.”

--Section VI, pg. 131-2
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