The driving force of the refractory industry

A new company - a world market leader emerges

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Head of raw material support
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Refractories are critical to all high-temperature industrial processes

- Refractories are critical consumable or investment goods for high-temperature manufacturing processes
- Fireproof materials consumed whilst protecting clients’ production processes, retaining physical and chemical characteristics when exposed to extreme conditions
- Critical, yet represent less than 3% of COGS in steel manufacturing and less than 1% in other applications
- Material resisting to temperatures above 600 °C are generally called refractory material
Refractory industry overview

**Refractories are continuously consumed during finished goods production**

<table>
<thead>
<tr>
<th>Key industries</th>
<th>Applications</th>
<th>Replacement</th>
<th>Costs</th>
<th>Refractory characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steel</strong></td>
<td>Basic oxygen-, electric arc furnace casting ladles</td>
<td>20 minutes to 2 months</td>
<td>~3.0%</td>
<td><strong>Consumable product</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Systems and solutions for complete refractory</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>management</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Demand correlated to output</td>
</tr>
<tr>
<td><strong>Cement/Lime</strong></td>
<td>Rotary Kiln</td>
<td>Annually</td>
<td>~0.5%</td>
<td><strong>Investment goods</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Longer replacement cycles</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Customized solutions based on the specific</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>requirements of various industrial production</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>processes</td>
</tr>
<tr>
<td><strong>Nonferrous metals</strong></td>
<td>Copper-converter</td>
<td>1 – 10 years</td>
<td>~0.2%</td>
<td><strong>Complete lining concepts including refractory</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>engineering</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Wide areas of application</td>
</tr>
<tr>
<td><strong>Glass</strong></td>
<td>Glass furnace</td>
<td>Up to 10 years</td>
<td>~1.0%</td>
<td><strong>Project driven demand cycles</strong></td>
</tr>
<tr>
<td><strong>Energy/Environmental/Chemicals</strong></td>
<td>Secondary reformer</td>
<td>5 – 10 years</td>
<td>~1.5%</td>
<td></td>
</tr>
</tbody>
</table>
Refractory industry overview

A complex range of tailored refractory products are required for each application

<table>
<thead>
<tr>
<th>Bricks</th>
<th>Example of refractory application for steel ladle</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Brick Image]</td>
<td>![Ladle Image]</td>
</tr>
<tr>
<td>1 Permanent lining</td>
<td>2 Non-basic, ex. Alumina</td>
</tr>
<tr>
<td>2 Non-basic, ex. Alumina</td>
<td>3 Basic, ex. Mag-Carbon</td>
</tr>
<tr>
<td>3 Basic, ex. Mag-Carbon</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monolithics and pre casts</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Monolith Image]</td>
</tr>
<tr>
<td>4 Mixes</td>
</tr>
<tr>
<td>5 Pre Castables</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Functional products</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Functional Image]</td>
</tr>
<tr>
<td>6 Slide Gates</td>
</tr>
<tr>
<td>7 Nozzles</td>
</tr>
<tr>
<td>8 Purge Plugs</td>
</tr>
<tr>
<td>9 ISO</td>
</tr>
</tbody>
</table>

+Systems and machinery
As an example: a car needs refractories materials

- A car weights some 1.3 t
- For steel, glass, aluminium, copper, plastics, cable jackets, panels etc. you consume some

  10 kg refractory material in form of bricks and mixes
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<tr>
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<th>Title</th>
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<td>5</td>
<td>Financials</td>
</tr>
</tbody>
</table>
Refractory market – an overview

Main end markets
€20 billion worldwide industry

- Steel
- Energy, chemicals
- Nonferrous metals
- Cement
- Glass

Source: Company estimates

Global refractory industry

- RHI Magnesita
- 4-6 segment companies
- 10-20 regional companies
- 100-200 small local companies
- 1000+ Chinese companies

Source: Company estimates of market share in US$
Challenges for the refractories industry

Before merger

- Reduced global market growing regionally different
- Increasing standardisation and high competition and price pressure
- Transfer of volume & increased volatility
- Exponential increase of digitalisation and automation
- Existing overcapacities in the refractories industry

<table>
<thead>
<tr>
<th>GDP Global</th>
<th>~3.5 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>EURO Zone</td>
<td>~1.6 %</td>
</tr>
<tr>
<td>USA</td>
<td>~2.5 %</td>
</tr>
</tbody>
</table>

- Chinese producers are some 20–30 % cheaper
- Steel production [mt]
  - China 702 (´11) → 809 (´16)
  - EU 178 (´11) → 162 (´16)

- Industrie 4.0 and Ladle to Mould
- Utilisation RHI production lower than 70 %
### Key Highlights RHI

- largest refractory producer and no. 1 player in Europe and North America
  - Strong in steel in Europe and North America
  - Strong in cement in Europe and North America

- More than 10,000 customers in approx. 180 countries
- 32 Production and mining operations in 8 countries
- Revenues of US$ 1.7 billion
- Headquartered in Vienna, Austria and listed on the Vienna stock exchange

### Key Highlights Magnesita

- 3rd largest refractory producer and no. 1 player in South America
  - Strong in steel in South America
  - Strong in cement in South America

- No. 1 in dolomite products in North America and Western Europe

- More than 1,000 customers in approx. 100 countries
- Production and mining operations in 8 countries
- Revenues of US$ 1.0 billion
- Headquartered in São Paulo, Brazil and listed on the BM&FBovespa stock exchange
A merger with Magnesita supports the strategy of RHI

<table>
<thead>
<tr>
<th>RHI Strategy 2016</th>
<th>Merger RHI-Magnesita</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Selective expansion with focus on regions with high potential and attractive market niche</td>
<td>Much better global presence and complementary portfolio</td>
</tr>
<tr>
<td><strong>2</strong> Differentiation by technology-leadership and first-class service in strategic segments</td>
<td>High standing service offer with focus on customer performance and R&amp;D</td>
</tr>
<tr>
<td><strong>3</strong> Optimisation of operational set-ups against competitors from cheap-wage countries</td>
<td>Local production in all important regions worldwide</td>
</tr>
<tr>
<td><strong>4</strong> Balanced consumption of raw materials from captive production and purchasing</td>
<td>Global raw material network to avoid volatility and reduce logistic costs</td>
</tr>
</tbody>
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Doing everything, for everyone, everywhere

€2.7bn
2017 adjusted pro-forma revenue

€304m
2017 adjusted pro-forma EBITA

1.06
Lost time injury rate

10,000
Customers served globally

180
Countries shipped worldwide

€25m
Annual investment in Research

10
Main raw material sites in 4 continents

35
Main production sites across 16 countries

14,000
Employees spread over 37 countries
The refractory world of RHI Magnesita
RHI Magnesita overview

Serving blue chip clients in every industry

<table>
<thead>
<tr>
<th>Steel</th>
<th>Cement</th>
<th>Glass</th>
<th>Metals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severstal</td>
<td>ArcelorMittal</td>
<td>Ternium</td>
<td>Schott</td>
</tr>
<tr>
<td>Nippon Steel &amp; Sumitomo Metal</td>
<td>posco</td>
<td>NUCOR</td>
<td>Vale</td>
</tr>
<tr>
<td>NLMK</td>
<td>Outokumpu</td>
<td>ThyssenKrupp</td>
<td>Araglia Glass</td>
</tr>
<tr>
<td>USS</td>
<td>Tata Steel</td>
<td>CEMEX</td>
<td>BHP Billiton</td>
</tr>
</tbody>
</table>

Serving 1060 of 1250 plants¹  
Serving 1376 of 1537 plants¹  
Serving 800 of 900 plants¹  
Serving 650 of 2000 plants¹

¹ex-China
Optimally positioned to reach clients everywhere

- North America: 22%
- Europe: 28%
- MEA-CIS: 13%
- South America: 20%
- APAC: 17%

More than 70 sales offices worldwide

Source: RHI Magnesita
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A strategic combination that captures synergies and drives efficiencies

Establish leading market position
- Complementary asset portfolio
- Transaction to support regional growth in several markets, especially in South America, the United States and Asia
- Strengthening competitive position against consolidating Chinese refractory industry

Leverage technology capabilities
- Enhanced value-added products and solutions best fitting customer needs
- Strong, globally recognized brands associated with high-quality products and services
- Innovative technology and best in class R&D

Strengthen geographic cluster
- Valuable assets enhancing combined global footprint
- Economies of scale in important operational areas
- Increased proximity to customers and shorter lead-times

Retain raw material integration
- Global raw material network to smooth out demand volatility and reduce capital requirements and logistic costs
- Highest level of vertical integration in the industry with unique raw material sources
Captive raw material: Unrivalled competitive advantage through vertical integration, in multiple sites

- 1.6 million tonnes of raw materials produced per year
- 70%+ vertical integration in basic raw materials and 50%+ for all raw materials

Certainty of supply
High quality materials
Cost competitiveness
R&D: The industry’s largest dedicated research team, pushing the boundaries of what is possible

We drive innovation in every aspect of our business, from materials, robotics and Big Data, to bespoke new business models and efficient new processes, under extreme conditions.

**Refractories**
- Development and optimization of refractory products and manufacturing processes
- Market driven project portfolio
- Plant technical support and quality control

**Mineral**
- Increase ore recovery, maximize mine useful life and minimize environmental impacts
- Development of high quality, low cost raw material sources

**Basic research**
- Basic research ensuring technology leadership
- Strong focus on innovation

**Recycling**
- Green technology applied to reprocessing, sorting and reutilization of recycled raw material

Global research team of 270+ employees, of which 98 have masters and PHDs, working out of 2 research hubs and 3 centers
Sales:
On-site technical experts consult, develop and deliver innovative solutions directly to clients

340+ technical engineers across 90 countries, working on-site with clients to provide custom-made solutions, installation support, recycling, post-mortem analysis and more

A combination of...

- High quality raw materials
- Continuous investments in R&D
- World-class products
- On-site technical consulting

...ensures customers

- Improve efficiency
- Improve quality
- Increase productivity
- Reduce costs
- Reduce working capital
- Reduce energy and other raw materials consumption
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Build a global refractory leader with a distinctive customer proposition based on technology and cost competitiveness to ensure manufacturing of essential materials for the world.

**Strategy**

**Markets**
Worldwide presence with strong local organizations and solid market positions in all major markets.

**Portfolio**
Comprehensive refractory product portfolio including basic, non-basic, functional products and services in high performance segments.

**Technology**
Top solution provider in the refractory industry with an extensive portfolio based on innovative technologies and digitalization.

**Competitiveness**
Cost competitive and safe production network supported by lowest cost G&A services.

**People**
Hire, retain and motivate talent and nurture an achievement-oriented, performance-driven, client-focused friendly culture.
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</tbody>
</table>
Pro-forma financials

€2.7bn 2017 adjusted pro-forma revenue

Revenue\(^1\) by Industry

- 72% Industrial
- 28% Steel
- 42% Cement / Lime
- 27% Non Ferrous Metals
- 31% Other Process Industries

Total Revenue by Geography

- South America: 17%
- North America: 20%
- Europe: 22%
- MEA-CIS: 13%
- Asia Pacific: 28%

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\(^1\) Revenue split considers only refractory segments and does not take into account the effect of any divestitures.
### Adjusted pro-forma results

#### Revenue (€m)

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue (€m)</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2,409</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>2,677</td>
<td>+11%</td>
</tr>
</tbody>
</table>

#### EBITA (€m)

<table>
<thead>
<tr>
<th>Year</th>
<th>EBITA (€m)</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>219</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>304</td>
<td>11.4%</td>
</tr>
</tbody>
</table>

#### Leverage (€m)

<table>
<thead>
<tr>
<th>Year</th>
<th>Leverage Ratio</th>
<th>Net Debt</th>
<th>EBITDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2.4</td>
<td>733</td>
<td>309</td>
</tr>
<tr>
<td>2017</td>
<td>1.9</td>
<td>751</td>
<td>389</td>
</tr>
</tbody>
</table>

#### Working Capital Intensity (€m)

<table>
<thead>
<tr>
<th>Year</th>
<th>Working Capital Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>668</td>
</tr>
<tr>
<td>2017</td>
<td>610</td>
</tr>
</tbody>
</table>
Get in touch

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