The driving force of the refractory industry

Company presentation
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Table of contents

1. Refractory industry overview
2. RHI Magnesita overview
3. Building a global leader in refractories
4. Strategy
5. Financials
Refractory industry overview

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.

### Main end markets
€20 billion worldwide industry

- **Steel**: 60%
- **Energy, chemicals**: 15%
- **Nonferrous metals**: 10%
- **Cement**: 8%
- **Glass**: 7%

Source: Company estimates

### Global refractory industry

- **RHI Magnesita**: 37%
- **4-6 segment companies**: 15%
- **10-20 regional companies**: 15%
- **100-200 small local companies**: 13%
- **1000+ Chinese companies**: 20%

Source: Company estimates of market share in US$
### 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 management</td>
</tr>
<tr>
<td><strong>Cement/Lime</strong></td>
<td>Rotary Kiln</td>
<td>Annually</td>
<td>~0.5%</td>
<td><strong>Demand correlated to output</strong></td>
</tr>
<tr>
<td><strong>Nonferrous metals</strong></td>
<td>Copper-converter</td>
<td>1 – 10 years</td>
<td>~0.2%</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 requirements of various industrial production processes</td>
</tr>
<tr>
<td><strong>Glass</strong></td>
<td>Glass furnace</td>
<td>Up to 10 years</td>
<td>~1.0%</td>
<td><strong>Complete lining concepts including refractory engineering</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Wide areas of application</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><strong>Project driven demand cycles</strong></td>
</tr>
</tbody>
</table>
Refractory industry overview

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

Bricks

1. Permanent lining
2. Non-basic, ex. Alumina
3. Basic, ex. Mag-Carbon

Monolithics and pre casts

4. Mixes
5. Pre Castables

Functional products

6. Slide Gates
7. Nozzles
8. Purge Plugs
9. ISO

Example of refractory application for steel ladle

+Systems and machinery
# Table of contents

| 1 | Refractory industry overview |
| 2 | RHI Magnesita overview       |
| 3 | Building a global leader in refractories |
| 4 | Strategy                     |
| 5 | Financials                   |
RHI Magnesita overview

RHI Magnesita is the world leader in refractories and a truly global company

<table>
<thead>
<tr>
<th><strong>€3.1bn</strong></th>
<th><strong>10,000</strong></th>
<th><strong>14,000</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2018 revenue</td>
<td>Customers served globally</td>
<td>Employees spread over 40 countries</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>35</strong></th>
<th><strong>+100</strong></th>
<th><strong>&gt;€37m</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Main production sites across 16 countries</td>
<td>Countries shipped worldwide</td>
<td>Annual investment in Research</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>13</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Main raw material sites in 4 continents</td>
</tr>
</tbody>
</table>
Adding value through a full suite of products and services

- Technology Solutions
  - Iron Ore
  - Coal Injection
  - Natural Gas
  - Direct Reduction
  - Scrap

- Linings
  - Coke Oven
  - Limestone

- Flow Control
  - Coal
  - Electric Arc Furnace
  - Steel Refining Facility
  - Continuous Casting

- Full Line Service
  - Iron Ore
  - Natural Gas
  - Direct Reduction
  - Scrap
  - Basic Oxygen Furnace
  - Blast Furnace
  - Continuous Casting
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>LafargeHolcim</td>
<td>SCHOTT</td>
<td>VALE</td>
</tr>
<tr>
<td>ArcelorMittal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ternium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIPPO STEEL &amp; SUMITOMO METAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>posco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUCOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Votorantim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NLMK</td>
<td>HEIDELBERGCEMENT</td>
<td>ArdaghGlass</td>
<td></td>
</tr>
<tr>
<td>Outo Kumpu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ThyssenKrupp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USS</td>
<td>TATA STEEL</td>
<td></td>
<td>bhpbilliton</td>
</tr>
<tr>
<td>GO GERDAU</td>
<td>CEMEX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEMEX</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rigolleau</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rio Tinto</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Serving 1060 of 1250 plants\(^1\)  Serving 1376 of 1537 plants\(^1\)  Serving 800 of 900 plants\(^1\)  Serving 650 of 2000 plants\(^1\)

\(^1\)ex-China
Optimally positioned to reach customers everywhere

- North America: 22% revenues
- South America: 15% revenues
- Europe: 29% revenues
- MEA-CIS: 14% revenues
- APAC: 20% revenues

More than 70 sales offices worldwide

Source: RHI Magnesita
# Driving client performance improvements

<table>
<thead>
<tr>
<th>Equipment/Application</th>
<th>Service</th>
<th>Starting point</th>
<th>End game</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Client A (Integrated)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic Oxygen Furnace (B.O.F.)</td>
<td>Refractories</td>
<td>1,900 heats</td>
<td>7,200 heats</td>
<td>+385%</td>
</tr>
<tr>
<td></td>
<td>Assembly</td>
<td>145 h</td>
<td>40 h</td>
<td>3.8X faster</td>
</tr>
<tr>
<td>Blast Furnace</td>
<td>Runners</td>
<td>1,600 h</td>
<td>330 h</td>
<td>4.8X faster</td>
</tr>
<tr>
<td>Torpedo Cast</td>
<td>Casting</td>
<td>230 kton metal</td>
<td>640 kton metal</td>
<td>+280%</td>
</tr>
<tr>
<td><strong>Client B (Mini Mills)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAF</td>
<td>Roof</td>
<td>300 heats</td>
<td>2,100 heats</td>
<td>+600%</td>
</tr>
<tr>
<td></td>
<td>Assembly</td>
<td>27 h</td>
<td>8 h</td>
<td>3.4X faster</td>
</tr>
<tr>
<td></td>
<td>Working Line</td>
<td>360 heats</td>
<td>1,200 heats</td>
<td>+200%</td>
</tr>
<tr>
<td>Slide Gate</td>
<td>Refractory</td>
<td>3 heats</td>
<td>9 heats</td>
<td>+200%</td>
</tr>
<tr>
<td><strong>Client C (Stainless)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AOD</td>
<td>Working Line</td>
<td>55 heats</td>
<td>70 heats</td>
<td>27%</td>
</tr>
<tr>
<td>EAF</td>
<td>Working Line</td>
<td>200 heats</td>
<td>300 heats</td>
<td>50%</td>
</tr>
<tr>
<td>Ladle</td>
<td>Working Line</td>
<td>50 heats</td>
<td>65 heats</td>
<td>30%</td>
</tr>
</tbody>
</table>

Source: RHI Magnesita
A single basic oxygen furnace (BOF) demands different types of refractories designed according to their distinct physical and thermo-chemical properties.

One key objective for Full Line Service clients is to develop refractories that last longer and are consumed homogeneously within each equipment for each customer in each plant.

Refractory consumption on the converter walls was diagnosed as heterogeneous, potentially leading to premature disposal of other refractories within the converter. Replacing an entire wall would lead to higher downtime of the equipment and more refractory use.

The solution consisted of:

- Identifying the compromised area in the BOF converter
- Applying lower-cost gunning mixes in order to increase the lifetime of still-good refractories
- Higher refractory efficiency led to higher margins for both RHI Magnesita and the customer
- Finally, refractories were sent for post-mortem analysis and allowed for adjustments to customer process and refractory composition to increase homogeneity
Tailor-made products and services that drive performance and cost savings
Example: implementing gas purging in electric arc furnaces for high-alloyed steelmaking

Stainless steel production has significantly different EAF process conditions compared to low-alloyed steelmaking due to the oxidation characteristics of Chromium during decarburization of the molten metal.

Benefits of gas purging
- Decreased melting time of scrap and DRI
- Increased heat transfer during the superheating period
- Decreased specific electrical energy demand
- Enhancing mixing of the steel melt and increasing homogeneity
- Avoidance of unwanted skull formation or debris
- Decreased deviation between the measured steel temperature in the EAF and the ladle furnace

Immediate process improvement and client cost savings

As a result, the vast majority of customers in high-alloyed and stainless steelmaking now use EAF gas purging as standard technology.

Source: RHI Magnesita
# Experienced management team with solid financial and strategic background

<table>
<thead>
<tr>
<th>Executive Management Team</th>
<th>Joined</th>
<th>Background</th>
</tr>
</thead>
</table>
| **Stefan Borgas**<br>CEO | 2016   | ● Former CEO of Israel Chemicals Ltd and Lonza Group  
● Several management positions at BASF |
| **Luis R. Bittencourt**<br>CTO | 1989   | ● Former R&D and raw material VP of Magnesita  
● BA in mining engineering (UFMG), MS degree in metallurgical engineering (University of Utah) and PhD in ceramic engineering (University of Missouri) |
| **Ian Botha**<br>CFO | 2019   | ● Former Finance Director of Anglo American Platinum  
● Several management positions at Anglo American plc, including CFO Ferrous Metals, CFO Coal and Group Financial Controller |
| **Gustavo Franco**<br>CSO | 2019   | ● Former Global Sales & Marketing VP at Magnesita  
● 18 years of experience in Sales for the Refractory Industry, being based in South America, North America and Europe |
| **Thomas Jakowiak**<br>Integration | 2000   | ● Former CSO Industrial Division of RHI  
● Several leadership positions at RHI |
| **Jacqueline Knox**<br>General Legal Counsel | 2019   | ● Former Associate General Counsel M&A at VEON, an international telecoms and technology business  
● Former General Counsel and Company Secretary at Ophir Energy plc, a FTSE listed upstream oil and gas business |
| **Simone Oremovic**<br>Human Resources Corporate Communications | 2017   | ● 19 years of experience in leadership positions in HR, among other fields at GE, Telekom Austria, IBM and Shire/Baxter |
| **Luiz Rossato**<br>Corporate Develop. | 2008   | ● Former Legal Council, M&A and Institutional VP of Magnesita  
● General Counsel of the Year 2012 by International Law Office |
| **Gerd Schubert**<br>COO | 2017   | ● Former COO of Pfleiderer S.A.  
● Global Operations Director at Ferro Deutschland GmbH and Ferro Spain |
Table of contents

1. Refractory industry overview
2. RHI Magnesita overview
3. Building a global leader in refractories
4. Strategy
5. Financials
## Building a global leader in refractories

### A strategic combination that captures synergies and drives efficiencies

<table>
<thead>
<tr>
<th>Establish leading market position</th>
<th>Leverage technology capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Complementary asset portfolio</td>
<td>- Enhanced value-added products and tailored solutions best fitting customer needs in every market</td>
</tr>
<tr>
<td>- Transaction to support regional growth in several markets, especially in the United States and Asia</td>
<td>- Strong, globally recognized brands associated with high-quality products and services</td>
</tr>
<tr>
<td>- Strengthening competitive position against consolidating Chinese refractory industry</td>
<td>- Innovative technology and best in class R&amp;D</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strengthen geographic cluster</th>
<th>Retain raw material integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Valuable assets enhancing combined global footprint</td>
<td>- Global raw material network to smooth out demand volatility and reduce capital requirements and logistic costs</td>
</tr>
<tr>
<td>- Economies of scale in important operations</td>
<td>- Highest level of vertical integration in the industry with unique raw material sources ensures best product quality</td>
</tr>
<tr>
<td>- Increased proximity to customers, shorter lead-times, and lower inventory in the chain</td>
<td></td>
</tr>
</tbody>
</table>

Capture synergies and drive cost efficiencies
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 as an opportunity**
- Green technology applied to reprocessing, sorting and reutilization of recycled raw material

Global research team of 250+ employees, of which 98 have masters and PHDs, working out of 2 research hubs and 3 centers

Investing €33m p.a. into technology-based solutions
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
Table of contents

1. Refractory industry overview
2. RHI Magnesita overview
3. Building a global leader in refractories
4. Strategy
5. Financials
Strategy

A clear and compelling strategy

Enabling us to add value through a full suite of products & services

People
Hire, retain and motivate talent and nurture a meritocratic, performance-driven, customer-focused and friendly culture

Business model
Leading service and solution provider in the refractory industry with an extensive portfolio based on leading material science, innovative technologies and digitalisation

Markets
Worldwide presence with strong local organisations and solid market positions in all major markets

Competitiveness
Low-cost producer of technically advanced refractory materials with safe production network

Progress in 2018
- Integration of c.14,000 employees worldwide
- Roll out of cultural values and international career programmes in place
- Diversity targets in place
- Strong leadership team in place across regions and key functions

- Exploring new business models focused on new customer requirements
- Application of automation and product differentiation
- Developing new services beyond refractory materials

- 15% global market share (30% ex-China)
- Continued to strengthen leading position across established markets,
- Strong growth and market share increases in India & China

- €70 million synergies realised in 2018 (€110m overall target)
- Established global business services team & Supply Chain Management department
- c.€63 million expenditure on R&D and Technical Marketing in 2018
Revenue

Revenue\(^1\) by Industry

- **Cement / Lime**: 37%
- **Non Ferrous Metals**: 25%
- **Other Process Industries**: 39%
- **Industrial**: 72%
- **Steel**: 28%

Total Revenue by Geography

- **South America**: 15%
- **North America**: 22%
- **Europe**: 29%
- **MEA-CIS**: 14%
- **Asia Pacific**: 20%

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

## Revenue (€m)

2017: 2,549.6
2018: 3,081

+21%

## Adjusted EBITA (€m)

2017: 235.9
2018: 428

+81%

## Working Capital Intensity (% of Revenue)

2017: 22.2%
2018: 15.4%

Notes:
1) Adjusted pro-forma numbers at constant currency.
2) Working capital for 2017 measured as a % of adjusted pro-forma second half annualised revenues.
3) Working capital for 2018 based on annualised last 3 months revenues.
Significant revenue growth of 21% driven by:
- Robust end markets
- Continued high raw material pricing
- Growth in Steel and Industrial Divisions

Adjusted EBITA up 81% from:
- Improving gross margin +190bps
- Some deterioration in H2 due to identified operational problems
- Reducing SG&A with successful implementation of the synergies

### Financials

#### Selected financial highlights

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2017¹</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>3,081.4</td>
<td>2,549.6</td>
<td>21%</td>
</tr>
<tr>
<td><strong>CoGS</strong></td>
<td>(2,344.5)</td>
<td>(1,989.1)</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Gross Profit</strong></td>
<td>736.9</td>
<td>560.5</td>
<td>31%</td>
</tr>
<tr>
<td><strong>SG&amp;A</strong></td>
<td>(337.3)</td>
<td>(350.4)</td>
<td>(4%)</td>
</tr>
<tr>
<td><strong>Other Inc/Exp</strong></td>
<td>(0.9)</td>
<td>14.2</td>
<td>(106%)</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td>398.6</td>
<td>224.2</td>
<td>78%</td>
</tr>
<tr>
<td><strong>Amortization</strong></td>
<td>(28.6)</td>
<td>(25.9)</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Adjusted EBITA</strong></td>
<td>428.1</td>
<td>235.9</td>
<td>81%</td>
</tr>
</tbody>
</table>

¹: Adjusted pro-forma numbers at constant currency
**Solid credit profile and commitment to de-leveraging current business**

During 2018 RHIM refinanced c.€800 million of its capital structure, including the redemption of Magnesita’s legacy Bonds, achieving funding costs commensurate with its stronger credit profile.

### Capitalisation table

<table>
<thead>
<tr>
<th></th>
<th>€m</th>
</tr>
</thead>
<tbody>
<tr>
<td>OeKB Term Loan</td>
<td>306</td>
</tr>
<tr>
<td>US$ Term loan + RCF</td>
<td>358</td>
</tr>
<tr>
<td>Other loans &amp; facilities</td>
<td>502</td>
</tr>
<tr>
<td><strong>Total gross indebtedness</strong></td>
<td><strong>1,166</strong></td>
</tr>
<tr>
<td>Cash, equivalents &amp; marketable securities</td>
<td>527</td>
</tr>
<tr>
<td><strong>Net debt</strong></td>
<td><strong>639</strong></td>
</tr>
</tbody>
</table>

### Amortisation schedule (€m as of 31 December 2018)

<table>
<thead>
<tr>
<th>Cash</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>527</td>
<td>149</td>
<td>98</td>
<td>73</td>
<td>218</td>
<td>574</td>
<td>54</td>
</tr>
</tbody>
</table>

**Financials**
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