BDG – German Foundry Association

Status and Challenges of (German and European) Foundries

SFSA Fall Leadership Meeting, Washington

September 14, 2015
Status and Challenges of (German and European) Foundries

Agenda

• CAEF foundry nations – review 2014
• Status Germany – first half 2015
• Driving forces and challenges for European foundries
• Material, a matter of image
• Conclusion
The European Foundry Association (CAEF)

unites 23 national foundry associations and represents

• 4,800 foundries (ferrous and non-ferrous)
• 41 billion Euro turnover
• 280,000 people employed
• a global share of 15% in casting production
CAEF Foundry Nations – Review 2014
European Producers of Castings 2014

Production volume 15.3 m tons (+5.7%)
Turnover 41.4 billion Euro

Source: CAEF
Washington, September 14, 2015
European Producers of Ferrous Castings 2014

Production volume 11.5 m tons (-0.5%)
Turnover 21.3 billion Euro

Trends
Positive incoming orders vehicle industry
Negative: slowdown in investments (engineering)

Source: CAEF (including steel castings)
European Producers of Steel Castings 2014

Production volume 0.9 m tons \((+0.8\%)\)
Turnover 4.4 billion Euro

Trends
Positive: Needs for steel castings in the automotive industry
Negative: Low level demand from raw material sector

Source: CAEF
Washington, September 14, 2015
European Producers of Non-Ferrous Castings 2014

Production volume 3.8 m tons (+5.7%)
Turnover 20.1 billion Euro

Trends
Positive: need for lightweight material in the automotive sector

Source: CAEF
Productivity in the European Foundry Industry 2014

• Ferrous castings average performance:
  63 tons (steel = 31 tons) per employee
  with a range up to nearly 100 tons (steel = 87 tons)

• Non-ferrous castings average performance:
  22 tons per employee
  with a range up to 34 tons

• Average company (as an example*):
  Gross Production Value (GPO) = 194 100 Euro per employee
  Amount of material (43.0% of GPO**) used = 83 500 Euro per employee
  Gross profit = 75 300 Euro per employee

Source: estimation by CAEF and BDG, * 2013, ** in percentage of GPO (raw materials and supplies, without energy)
Productivity European Ferrous Foundries 2014

Source: CAEF, including steel foundries

Average Production per Employee (t) vs. Average Employee per Foundry
Productivity European Steel Foundries 2014

Source: CAEF
Export quota European Foundry Industry 2014

- Export quota total, including deliveries inside Euro area 36% (steel > 40%)
- Export quota Euro area 22%
- Export quota outside Euro area 14%
- = castings are produced where castings are needed: >85% delivered directly within the Euro area!

Globalisation:
The end use of European castings is all over the world!

Source: estimation by CAEF
Washington, September 14, 2015
German Foundry Industry Review 2014
### German Casting Production 2014 by Material

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Ferrous complete</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4,116 m t</td>
<td>-0.2%</td>
<td>7.3 bn Euro</td>
<td>+0.4%</td>
<td></td>
</tr>
<tr>
<td><strong>Iron castings</strong></td>
<td>2,357 m t</td>
<td>+0.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ductile castings</strong></td>
<td>1,552 m t</td>
<td>-1.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Steel castings</strong></td>
<td>207 200 t</td>
<td>-3.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Non-ferrous complete</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,132 m t</td>
<td>+10.4%</td>
<td>6.0 bn Euro</td>
<td>+9.7%</td>
<td></td>
</tr>
<tr>
<td><strong>Aluminium</strong></td>
<td>993 900 t</td>
<td>+12.2%</td>
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<td></td>
</tr>
<tr>
<td><strong>Magnesium</strong></td>
<td>14 900 t</td>
<td>-9.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Copper</strong></td>
<td>72 100 t</td>
<td>+5.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zinc</strong></td>
<td>51 500 t</td>
<td>-6.6%</td>
<td></td>
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</tr>
</tbody>
</table>

Source: BDG, Stat. BA

Washington, September 14, 2015
# German Casting Production 2014 by Customer

**Ferrous complete**

- **4,116 m t**
- **-0,2%**
- **7,3 bn Euro**
- **+0,4%**

Therefore:

- **Vehicle industry (56% share)**
  - **2,290 m t, + 1%**
- **Engineering (26% share)**
  - **1,058 m t, - 3%**
- **Other (19% share)**
  - **0,769 m t, + 1%**

**Non-ferrous complete**

- **1,132 m t**
- **+10,4%**
- **6,0 bn Euro**
- **+9,7%**

Therefore:

- **Vehicle industry (77% share)**
  - **0,875 m t, + 17%**
- **Other (23% share)**
  - **0,258 m t, - 8%**

* Engineering (1% share)

**Source:** BDG, Stat. BA

**Washington, September 14, 2015**
German Foundry Industry Status First Half 2015
## German Casting Production – First Half 2015 by Material

<table>
<thead>
<tr>
<th>Material</th>
<th>Complete</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ferrous</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>2.120 m t</td>
<td>-2.8%</td>
</tr>
<tr>
<td>Iron castings</td>
<td>1,211 m t</td>
<td>-2.8%</td>
</tr>
<tr>
<td>Ductile castings</td>
<td>804 600 t</td>
<td>-3.4%</td>
</tr>
<tr>
<td>Steel castings</td>
<td>104 600 t</td>
<td>+1.6%</td>
</tr>
<tr>
<td><strong>Non-ferrous</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>607 700 t</td>
<td>+4.9%</td>
</tr>
<tr>
<td>Aluminium</td>
<td>533 500 t</td>
<td>+5.1%</td>
</tr>
<tr>
<td>Magnesium</td>
<td>6 800 t</td>
<td>-13.3%</td>
</tr>
<tr>
<td>Copper</td>
<td>40 000 t</td>
<td>+6.1%</td>
</tr>
<tr>
<td>Zinc</td>
<td>27 300 t</td>
<td>+3.6%</td>
</tr>
</tbody>
</table>

Source: BDG, Stat. BA
Germany Casting Orders: Currently no clear Trend!

- Vehicle industry: 1-12.2014 + 6.3%
- Engineering: 1-12.2014 + 2.3%
- Foundry industry: 1-12.2014 + 1.5%

- Vehicle industry: 1-6.2015 + 5.7%
- Engineering: 1-6.2015 + 2.8%
- Foundry industry: 1-6.2015 - 2.5%

Source: Stat. BA, Index 2010=100, seasonally adjusted, calculation BDG
Germany Steel Casting Orders - Under Pressure

Source: Stat. BA, Index 2010=100, seasonally adjusted, calculation BDG
Washington, September 14, 2015
Driving Forces for the Foundry Industry
Driving Forces: Globalisation

- Major part of the demand growth will occur in emerging markets

- Especially the automotive industry is increasingly demanding local presence outside of Europe (Castings are produced where castings are needed)

- Increases the need for a global footprint
Driving Forces: Margin Pressure

- Growing international competition in the vehicle manufacturing industry (OEMs)
- This limits the option of passing on cost increases to end consumers
- On the part of OEMs, this pressure will partially be passed through to suppliers’ industry
Driving Forces: Industry Consolidation

• Thus the industry consolidation is expected to continue

• Main reasons, besides the pressure for globalisation, are increasing investment requirements

• Also, many family businesses face succession-related problems

Source: BDG/Soschinski
From Driving Forces to Challenges
Challenges: Technological Leadership
e.g. Hubs for Windturbines

- Maintaining technological leadership is of great importance for European foundries
- Pressure on unit weights will continue (e.g. windturbines)
- This changes the material mix and increases the requirements for alloy competence
Challenges: Technological Leadership
e.g. Requirements for Pumps and Compressors

- Corrosion resistance
- Erosion /abrasion resistance
- Cavitation resistance
- Temperature resistance
- Strength / hardness
- Coating of castings

3rd International Rotating Equipment Conference
Pumps, Compressors and Vacuum Technology
Congress Center Düsseldorf, 14 – 15 September 2016
Challenges: Occupational Safety, Environment and Energy/Climate Regulations

- Review of Best Available Techniques
- CO$_2$ Emission Trading Scheme
- Renewable Energy
- e.g. Respirable Silica Dust
Challenges: Retain Qualified Personnel

- Many qualified foundry workers will retire during the next years
- Competition for staff intensifies due to changing age structure
- Requires new worker loyalty programs (pension schemes, profit-sharing, flexibility regarding family & job)
- It is up to the foundry associations to implement support programs
Retain Qualified Personnel: VDG Akademie
Raising Awareness: Powerguss Website
Impulses for Young Talents: Youth Magazine
Reaching Young People: Youtube Channel
Challenges: Investment Requirements

- Growing trend towards completely finished cast parts will necessitate respective investments
- Complexity of foundry materials will grow and consequently drive investment requirements
Challenges: Investment in Logistic Processes
Material, a Matter of Image

- **Non-ferrous**, especially aluminum and magnesium have a modern image: light, clean

- **Ferrous and steel** is often combined with attributes like old, dark, heavy

- **Ferrous and steel is in danger** of falling behind despite all advantages of optimised construction, lightweight, multifunctionality, costs for raw material, easy machining etc.
Material, a Matter of Image

- The market is asking for lightweight. but lightweight is not only light-metal!

- Change of image for ferrous and steel is absolutely necessary!

- Knowledge is the key
  Knowledge about lightweight competence, environmental advantages, backing of complexity requirements, easy machining quality etc. of ferrous and steel

- The customer needs to be instructed!
Conclusion

• **The key customer industries will grow** during the next years. Therefore foundry industry can make profit

• Despite price pressure, **foundries have to find ways to invest** continuously to hold technological leadership

• **Customers need to be instructed** of advantages of the different material and the different possibilities to find solutions for given questions

• **Foundries have to deal with hard competition** in material as well as processes

• **Aging workforce**: Foundries are competing for young employees, high potentials and experienced employees
BDG – German Foundry Association

Castings – A Strong Piece Of Future (lit.)