Technology Partners for Sustainable Foundry Strategies

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on behalf of
Gabriele Galante, President
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Technology Partners for Sustainable Foundry Strategies

Overview

- Macroeconomic situation
- Relevant industrial sectors
- CEMAFON statistics / foundry statistics
  - German foundries’ situation
- Process and technology support for the casting value chain
GDP by countries / regions

Real change against previous year in per cent

*Indonesia, Malaysia, Philippines, Thailand and Vietnam. Source: IMF (July 2015), VDMA
2015 European GDP growth forecasts

Source: European Commission
World regions: Development of industrial production

Development of industrial production
Change against previous year in percent

- World
- Euro Area
- Latin America
- Asia
- Central & Eastern Europe
- United States

Source: CPB (World Trade Monitor), VDMA
World industry production highlights

- World metal casting production
  - 103,229,774 metric tons (2013)

- World motor vehicle production
  - 89,747,430 units (2014)

- World crude steel production
  - 1,649 megatons (2013)

- World machinery turnover
  - 2,330 billion Euros (2014)

Source: Modern Casting (48th World Census); OICA; Worldsteel Association; VDMA estimate
World: Development of machinery turnover
Real change against previous year in per cent

Source: VDMA
Passenger car production 2000 – 2013

Passenger car production — international comparison, % share | 2000 – 2013

Source: ACEA
World machinery trade – major export nations for foundry machinery 2014 / 2013

World compared to previous year: -0.2%
2014: 2,301 Mio. Euro
2013: 2,306 Mio. Euro

Source: National Statistical Offices, VDMA
Export structure
CEMAFON 2014 / 2013

Europe (CEMAFON) – 604 mill.€

Europe (CEMAFON) – 634 mill.€

Source: National Statistical Offices, VDMA
Export structure
CEMAFON, USA, Japan and China 2014

Europe (CEMAFON) – 634 mill.€

USA – 98 mill.€

Japan – 427 mill.€

China – 358 mill. €

Source: National Statistical Offices, VDMA
CAEF casting production – top ten producers 2013 / 2014

Non-Ferrous - total production in 1000 t

Source: German Foundry Association (BDG), CAEF
Key data – 2014
Foundry trends – e.g. Germany

Production
- 5.248 mill. t
- Fe: 4.116 mill. t; NF: 1.132 mill. t

Turn-over
- ca. 13.295 bn. € *
- Fe: 7.307 bn. €; NF: 5.988 bn. €

Workforce
- 78,800 *
- Fe: 44,200; NF: 33,300
- 595 foundries

* (foundries with staff > 50)

Source: BDG – German Foundry Association
### Customer sectors 2014

#### Foundry trends – e.g. Germany

<table>
<thead>
<tr>
<th>Iron and steel castings (total)</th>
<th>4.116 mill. t / - 0.2%</th>
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<tbody>
<tr>
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<td>7.3 bn € / + 0.4%</td>
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**Vehicle manufacturing**

<table>
<thead>
<tr>
<th></th>
<th>2.290 mill. t</th>
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<tr>
<td></td>
<td>56% / + 1%</td>
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**Machinery**

<table>
<thead>
<tr>
<th></th>
<th>1.058 mill. t</th>
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<tr>
<td></td>
<td>26% / - 3%</td>
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**Other**

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<thead>
<tr>
<th></th>
<th>0.769 mill. t</th>
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<td>19% / + 1</td>
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<table>
<thead>
<tr>
<th>Non-ferrous castings (total)</th>
<th>1.132 mill. t / + 10.4%</th>
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<tr>
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<td>6.0 bn € / + 9.7%</td>
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**Vehicle manufacturing**

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<tr>
<th></th>
<th>0.875 mill. t</th>
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<tr>
<td></td>
<td>77% / + 17%</td>
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**Other**

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<thead>
<tr>
<th></th>
<th>0.258 mill. t</th>
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<tr>
<td></td>
<td>23% / - 8%</td>
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</table>

**Machinery**

|                          | 1%            |

Source: German Foundry Association (BDG)
Innovation and modernization
Foundry trends – e.g. Germany

Productivity

- continuous investment related to new processes / materials (appr. 500 – 600 mill. € / year)
- light-weight components
- resource and energy efficiency
- increased complexity of castings
- closer tolerances
- combined materials
- increased use of structural components
- increased share of non-ferrous metals
- continuous process networking (‘Smart Foundry’)

Photos: Kurtz, KUKA

Source: German Foundry Association (BDG), VDMA
Global casting value chain challenges
Business and economy

Foundries and foundry machinery suppliers need to cope with

- Competing technologies
- Competing materials
- Efficiency and sustainability issues
- Customer industries’ requirements
  - Globalisation / localisation
  - Market dynamics
  - Quality of services and logistics
- Macroeconomic developments
  - E.g. commodity prices
  - E.g. fluctuations of currencies
- \textit{Skills, efficiency, productivity and flexibility are key}

Source: VDMA, German Foundry Association (BDG), IKB Deutsche Industriebank
Global casting value chain challenges
Processes and technology

Efficiency improvement, resource conservation, productivity
- From component supplier to system partner
- Enabling technologies for
  - increased complexity of castings
  - closer tolerances
  - light-weight structures
  - high-quality metals
  - combined materials
- Energy-efficient components & processes
- Process simulation / optimisation
- Harmonization of resource flows (energy, water, consumables)
- Networked automation and data mining
- Integration of additive manufacturing technologies
- Full-service over complete life-cycle
- Innovative technology for sustainable production and increased productivity

Source: VDMA
Foundry partners – striving for excellence

Tailor-made solutions for business excellence
Thank you for your attention!

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