

CBI MARKET SURVEY

The castings and forgings market in Germany

Publication date: May 2008

Report summary

This CBI market survey discusses the following highlights for the castings and forgings sector in Germany:

- The German engineering and construction industries are major end-users of castings and forgings. Both the German engineering industry and the construction industry are the largest in the EU and are expected to show an increasing output in 2008.
- Production of metal castings increased by 4.5% per year in the period 2002-2006, while production of forgings increased by 3.8%. Both industries were the largest in the EU, far ahead of Italy and France. In 2006, Germany's ferrous metal foundries averaged a capacity-utilisation rate of 94%. The general medium- and long-term outlook is considered to be quite promising, with average annual volume growth forecast at 3% per year.
- Germany was the largest importer of castings and forgings in the EU, running trade surpluses for all product groups. The total import value annually increased by 9%.
- Imports from DCs annually increased by 24% in value and the total share of DCs in import value increased from 4% to 6.5% in 2006. The DCs' shares in imports of iron and steel products grew the fastest: from 0.9% to 4% in value.
- China accounted for 41% of all imports coming from DCs, followed by Turkey (16%), Mexico (11%), India (7%), Brazil (5%) and South Africa (3%). The DCs that saw the largest increase of their share to the country were Georgia, Chile, Bosnia and Herzegovina, Mexico, Kazakhstan and Peru.
- The price pressure on components and systems as a result of strong global competition, in combination with an ongoing strong demand for engineering and construction products, has made room for an increase of sourcing in DCs. However, DC exporters are still not capable of supplying the quality yet that is necessary for the EU market. Although DCs saw an increase in exports of castings and forgings to Germany, these parts are assembled into products that are directed to markets with lower quality standards, such as Africa and South America.

This survey provides exporters of castings and forgings with sector-specific market information related to gaining access to Germany. By focusing on a specific country, this survey provides additional information, complementary to the more general information and data provided in the CBI market survey 'The castings and forgings market in the EU', which covers the EU in general. That survey also contains an overview and explanation of the selected products dealt with, some general remarks on the statistics used as well as information on other available documents for this sector. It can be downloaded from <http://www.cbi.eu/marketinfo>.

1 Market description: industrial demand and production

Industrial demand

Because no data for the demand for castings and forgings are available, this survey puts a focus on two major end-user industries in Germany that offer good opportunities for developing country (DC) exporters: the engineering and the construction industry. Since both industries use many cast and forged parts and products, the production output of both industries is a good indication of the demand for cast and forged parts in these industries.

Engineering industry

The German engineering industry is a leading end-user of ferrous metal castings, accounting for 24% of locally produced ferrous metal castings. It is also a major end-user of forgings, consuming between 10-45% of all forgings. The German production in the engineering industry grew 4.9% per year in the period 2002-2006, totalling almost €265 billion in 2006. The German engineering industry was the largest in the EU, ahead of Italy and France. While production in the mechanical engineering industry grew 5.4% per year in the period 2002-2006, the production in the electrical engineering industry grew not as fast (3.8%). The year 2006 was a strong year for both the mechanical and electrical engineering industries with growth of 9.2% and 9.6% respectively. Production of domestic appliances declined by 1.8% per year, due to relocation of some production to low cost countries (LCCs). For the years to come, this trend is expected to continue. Electrolux for example, in 2007 closed its German plant (production of appliances such as washing machines, dishwashers and dryers; 1700 employees) with production relocated to Poland and Italy. Refer to Table 1.1 for more information on the market size of the several engineering categories, as well as the estimated shares of castings and forgings in these categories.

Table 1.1 German engineering production, by category and including the production value share of castings and forgings, 2002-2006, € million

| | Share of castings and forgings* | 2002 | 2006 | Annual change '02-'06 |
|---|---------------------------------|----------------|----------------|-----------------------|
| Total engineering | | 218,929 | 264,703 | 4.9% |
| Mechanical engineering | | 145,686 | 179,822 | 5.4% |
| Machine tools, woodworking mach., welding equipm. | ** | 18,143 | 21,735 | 4.6% |
| Bearings, gears, gearing and driving elements | 50% | 12,223 | 17,290 | 9.1% |
| Non domestic cooling and ventilation equipment | 10% | 10,121 | 14,373 | 9.2% |
| Lifting and handling equipment | 10% | 11,212 | 13,730 | 5.2% |
| Pumps and compressors | 50-70%*** | 8,979 | 12,795 | 9.3% |
| Valves and taps | 60-70% | 9,476 | 12,061 | 6.2% |
| Machinery for mining, quarrying and construction | 15-25% | 7,579 | 11,309 | 10.5% |
| Agricultural tractors and machinery | 30% | 6,306 | 7,639 | 4.9% |
| Engines and turbines | 40% | 4,857 | 6,751 | 8.6% |
| Machinery for textile, apparel and leather production | 60-70% | 5,074 | 4,839 | -1.2% |
| Machinery for food, beverage and tobacco processing | 25% | 3,503 | 4,135 | 4.2% |
| Industrial furnaces and furnace burners | 10% | 2,000 | 2,303 | 3.6% |
| Machinery for paper and paperboard production | 25% | 2,190 | 2,193 | 0.0% |
| Machinery for metallurgy | 20-25% | 1,564 | 2,014 | 6.5% |
| Electrical engineering | | 73,243 | 84,881 | 3.8% |
| Electric distribution and control apparatus | 5-10% | 24,466 | 28,611 | 4.0% |
| Electric motors, generators and transformers | 30-40% | 13,226 | 16,826 | 6.2% |
| Electric equipment for engines and vehicles | 5-25% | 8,322 | 10,189 | 5.2% |
| Other electrical equipment | 5-25% | 8,821 | 9,815 | 2.7% |
| Electric domestic appliances | 5-25% | 9,207 | 8,574 | -1.8% |
| Lighting equipment and electric lamps | 5-25% | 4,202 | 4,299 | 0.6% |
| Accumulators, primary cells and primary batteries | 5-25% | 1,302 | 1,451 | 2.7% |

Source: European Union Enterprise and Industry (2007)

* Based on estimations of industry experts and the German Foundry Association.

** While machine tools have a large share of castings and forgings (40-50%), woodworking machinery (10-20%) and welding equipment (5%) have a far smaller share of castings and forgings.

*** Pumps consist for about 70% of castings and forgings, while compressors consist for about 50% of castings and forgings.

As becomes clear from Table 1.1, several categories contain a relatively large production value share of castings and forgings. Of the most relevant categories, "pumps and compressors" (+9.3% per year), "bearings, gears and other driving elements" (+9.1%), "engines and turbines" (+8.6%) and "valves and taps" (+6.2%) performed the best. The demand for "machinery for textile, apparel and leather production" declined (-1.2%). The position of

Germany in the EU in these main castings and forgings consuming engineering categories was as follows:

- Bearings, gears, gearing and driving elements: Germany ranked first with 51% EU market share, ahead of Italy (18%) and France (9%).
- Valves and taps: Germany ranked first with 44% EU market share, ahead of Italy (22%) and France (10%).
- Pumps and compressors: Germany ranked first with 35% EU market share, ahead of Italy (14%) and France (13%).
- Machine tools, woodworking machinery, welding equipment: Germany ranked first with 50% EU market share, ahead of Italy (21%) and France (6%).
- Electric motors, generators and transformers: Germany ranked first with 35% EU market share, ahead of Spain (12%) and Italy (9%).
- Machinery for textile, apparel and leather production: Germany ranked first with 41% EU market share, ahead of Italy (26%) and France (8%).
- Engines and turbines: Germany ranked first with 28% EU market share, ahead of the UK (18%) and Italy (18%).
- Agricultural tractors and machinery: Germany ranked first with 26% EU market share, ahead of Italy (23%) and France (14%).

The year 2007 was a good year for the mechanical engineering industry (+7%) as a result of increasing investments in Germany as well as abroad, while electrical engineering grew not as fast (less than 4%). With regard to the coming years, the world, EU and German economic growth forecasts for 2008 (+3.8%, +1.7% and +1.9% respectively) and 2009 (+3.9%, +1.8% and +2.2%) lead to a substantial strong demand for engineering products in the country. Economic growth will stimulate industrial spending activity, the major determinant of engineering products demand. As a result, the German Engineering Association (VDMA) expects good growth in the German engineering production for 2008 (+4% for mechanical and a comparable growth for electrical engineering). Please also note that, although the EU is far from running the risk of recession, the EU and German economy are and will be clearly affected by the housing and credit crisis in the United States.

Construction industry

After a total decline of 7% in the period 2002-2005, the German construction industry amounted to €198.5 billion in 2005. Contrary to this decline, the European Network for Construction Forecasting (Euroconstruct) expects a total growth (4%) in the period 2006-2008 to more than €206 billion in 2008. While the year 2006 recorded slight growth for the construction industry, with similar expectations for 2007, the year 2008 is expected to show the largest growth figures (1.5%). In 2009 growth will slow down to 1.3%. The German construction industry is the largest in the EU, ahead of the UK, Italy, France and Spain. The German construction industry uses 4% of locally produced ferrous metal castings.

Market segmentation

As far as data are available, the market segmentation of some of the most important materials covered by this survey is discussed in this section.

Castings

As shown by the data in Table 1.2, iron castings largely go to the automotive industry and steel castings are mainly used in the engineering industry and in other industries. Please note that these data are only of domestically produced castings, as other data are not available. Compared to 2001, the automotive industry gained share in the use of iron castings, while the construction and engineering industry lost some share. With regard to the use of nodular iron, the share of the automotive and other industries grew at the cost of pipes and fittings – due to the relocation of a major pipe production facility to France – and the engineering industry.

Table 1.2 German ferrous* metal casting production, by segment, 2006, shares

| | Pipes and fittings | Construction ** | Engineering industry | Automotive industry | Railway industry | Other*** |
|----------------|--------------------|-----------------|----------------------|---------------------|------------------|------------|
| Total | 5% | 4% | 24% | 55% | - | 12% |
| Iron | - | 5% | 27% | 59% | - | 9% |
| Nodular iron | 13% | - | 19% | 56% | - | 12% |
| Malleable iron | - | - | 27% | 51% | - | 23% |
| Steel | - | - | 27% | 2% | 4% | 67% |

Source: Committee of European Foundries Associations (2007)

*data of non-ferrous metals are not available.

**including domestic goods

***This category includes several industries such as the aeronautics and the electronics industries.

While the share of the automotive industry for ferrous-metal castings is 55%, its share for non-ferrous metal castings is even more than 70%. In contrast, the engineering industry accounted for only 5-10% of all non-ferrous metal casting demand. The other major end-user of non-ferrous metal castings was the construction industry (17%).

Forgings

Unfortunately, no segmentation data for forgings are available. However, according to industry experts it can be assumed that the segmentation is as in the EU with the automotive (cars and trucks) industry as the major end-user of forged products, accounting for 58% of total forgings demand. Beside automotive, mechanical engineering (11%) and agricultural machinery (8%) are other important segments for the German forging industry. Mining machinery and railways both account for 2% and aerospace equipment accounts for 1% of the forgings market. The balance is for a range of segments such as construction, electrical engineering, maritime and the power generation industry.

Aluminium

The German aluminium market – the largest within the EU – is driven mainly by the automotive (more than 40% of the total market) and the construction sector (about 15%). Other major end-users are mechanical engineering and packaging (both about 10%), the iron and steel industry, and electronics (both about 5%).

Production

Castings

Table 1.3 shows an indication of the production of castings in Germany. In 2006 the German production of metal castings totalled 5.5 million tonnes, an increase of 4.5% per year since 2002. The annual growth in production value in the period mentioned was larger – 7.8% - to €12.2 billion in 2006. The German foundry industry was the largest in the EU, ahead of Italy and France. After several foundry closures in the period 2001-2004, the number of large ferrous metal foundries remained stable at 265. Only six foundries employ more than 500 people, while thirteen foundries employ between 200 and 499 people. In the period 2002-2006, the average turnover per employee increased by 7% per year to almost €163,000 – an amount which is the highest in the EU, ahead of France and Austria. According to the German Foundry Association (DGV), the volume output per employee was 102 tonnes, which was much higher than the efficiency in the UK (60 tonnes) and Spain (90 tonnes). The number of non-ferrous metal foundries decreased year after year, to 354 in 2006. Only 26 foundries employ more than 250 people.

Table 1.3 German production volume of castings by type, 2002-2006, 1,000 tonnes

| | 2002 | 2004 | 2006 | CAGR '02-'06 |
|-----------------------|--------------|--------------|--------------|-----------------|
| Total | 4,596 | 4,985 | 5,488 | 4.5% |
| Ferrous | 3,750 | 4,088 | 4,515 | 4.8% |
| Iron | 2,253 | 2,421 | 2,583 | 3.5% |
| Nodular iron | 1,277 | 1,428 | 1,661 | 6.8% |
| Malleable iron | 38 | 53 | 56 | 10.0% |
| Steel | 181 | 186 | 215 | 4.4% |
| Non-ferrous | 846 | 896 | 973 | 3.5% |
| Copper alloy | 90 | 89 | 98 | 2.2% |
| Light and ultra light | 685 | 743 | 803 | 4.1% |
| Zinc | 67 | 62 | 64 | -0.8% |
| Other alloy | 5 | 3 | 7 | 10.9% |

Source: Committee of European Foundries Associations (2007)

In the period 2002-2006, production of ferrous metal castings increased 4.8%, and of non-ferrous castings 3.5% per year. The year 2006 was marked by an increasing demand of both the automotive (+4%) and the engineering (+8%) industry. After the relocation of the centrifugal cast pipes production of Hobas (<http://www.hobas.com>) to France in 2005, production for the pipes and fittings industry went up again (+10%). The strong domestic demand (+7.2% to 3 million tonnes) was the major driver of production growth, although also exports did well (+6.6% to 1.4 million tonnes) again, after the dip in 2005 due to the relocation of the Hobas plant to France (mentioned earlier). With these figures, the export share of the German ferrous metal foundries can be calculated at over 30% of total production.

With regard to non-ferrous metal castings, the German automotive industry was the major driver of growth in the period 2002-2006, accounting for a large share of aluminium castings. The stable year 2005 was followed by a year in which production continued its growth trend (+11%). Although over the period 2002-2006 some types of non-ferrous metal castings did not perform well, the year 2006 saw strong results for all types. Production of copper and alloy castings, for example, increased by 17%, and zinc alloy castings by 14%. A major cause of these strong results was the increasing output in the construction industry as well as in the electrical engineering industry.

Capacity-utilisation and investments

In 2006, Germany's iron, steel and malleable foundries averaged a capacity-utilisation rate of 94%, remaining well ahead of the 85-90% range that is generally regarded as marking full employment. It was an increase compared to the year 2005, which was marked by a decreasing capacity-utilisation rate due to new investments and longer working times such as a third shift. By the end of the year 2006, the order backlog was 1.6 million tonnes, which was even 20% more compared to December 2005. With regard to investments, the total sum invested (€500 million) by German foundries in 2006 was up by around 25% compared to 2005. For 2007, investment patterns were expected to remain at the same level. Investment plans generally focus on equipment replacements and rationalisation measures, but sometimes on plant expansions as well.

Outlook

Most recent data show that the German foundry industry again experienced a good year, with growth at 9% in 2007. The demand from German customers even increased by 23% compared to 2006, but, on the other hand, export demand stagnated. Although there may be some concern regarding profitability, the general medium- and long-term outlook is considered to be quite promising. According to a study by the "Deutsche Bank", the foundry industry may be expected to grow 3% annually in volume (5% in value) in the period 2006-2015. With regard to the non-ferrous metal foundries, the fact that nearly every new car model contains more

light and ultra light castings than the previous model results in a positive market outlook. Another bright outlook concerns the electrical and electronics industry. Capital investment in the coming years into modernisation of electricity transmission grids and construction of new power stations will stimulate production of several – especially non-ferrous metal – German foundries. Furthermore, the mechanical engineering and construction industry, both with good growth forecasts, will stimulate production as well.

Forgings

Table 1.4 shows an indication of the volume of forgings production in Germany. In 2006, the members of the German Metal Form Association (Metalform) produced almost 2.7 billion tonnes of forgings, an increase of 3.8% per year since 2002. The German forge industry was the largest in the EU, ahead of Italy and France, accounting for 45% of the total production of the EU members of the European Forge Association (Euroforge).

Table 1.4 German production volume of forgings by type, 2002-2006, 1,000 tonnes

| | 2002 | 2004 | 2006 | CAGR '02-'06 |
|---|--------------|--------------|--------------|--------------|
| Total | 2,290 | 2,570 | 2,660 | 3.8% |
| Drop forging, press and upset forging | 1,673 | 1,936 | 1,900 | 3.2% |
| • Production of forging industry (subcontracting) | 1,113 | 1,359 | 1,317 | 4.3% |
| • In-house production of the automotive industry | 205 | 222 | 231 | 3.0% |
| • In-house production of the finished assembly (subcontracting) | 135 | 135 | 150 | 2.7% |
| • Forged catalogue items* | 220 | 220 | 202 | -2.1% |
| Cold forging | 203 | 230 | 250 | 5.3% |
| • Production of cold forging industry | 136 | 157 | 171 | 5.9% |
| • In-house production of consumer industries | 67 | 73 | 79 | 4.2% |
| Open die forging | 386 | 404 | 459 | 4.4% |
| • Ring rolling | 166 | 207 | 232 | 8.7% |
| • Other open die forging** | 220 | 197 | 227 | 0.8% |
| Close die forging for non-ferrous metal | 28 | - | 51 | 16.2% |
| Number of forge plants | 260 | 260 | 250 | -1.0% |

Source: Euroforge (2007)

* i.e. producers of flanges and fittings, piping, connectors, armatures, tools, machineries, etc.

** excluding forged steel bar, blanks and railway rolling stocks.

As shown by Table 1.4, in the period 2002-2006 drop forging, press and upset forging grew 3.2% per year, open die forging increased 4.4% per year and cold forging grew the fastest of all (5.3% per year). As total production increased 3.8% in 2002-2006, the decreasing number of forges of Metalform members since 2002 (-4%, although stable since a few years) implies a growing output per factory of almost 20% in this period. While in the period 2002-2005, the average number of employees per foundry decreased by 12%, in 2006 the number of employees per factory increased again, from 120 to 124. This trend shows that the German forge industry performed well, with full order books and high capacity utilisation rates.

Interesting players

Some examples of German foundries are:

- Deutsche Giesserei und Industrie-Holding Aktiengesellschaft - <http://www.dihag.com> - includes 8 foundries, among which is also Mecklenburger Metallguss (refer to trends)
- Görtz & Schiele - <http://www.goertz-schiele.de>
- Halberg-Guß GmbH - <http://www.halberg-guss.de>
- Sakthi Automotive Group - <http://www.sakthiauto.com> - a subsidiary of Sakthi from India (former Intermet).
- M. Busch – <http://www.mbusch.de>
- Silbitz Guß – <http://www.silbitz-guss.de>
- Stahlwerke Bochum - <http://www.stahlwerke-bochum.de>

Some examples of German forges are:

- Brück Ensheim - <http://www.bruck-forgings.com> - flanges
- Buderus Schmiedetechnik - <http://www.buderus-forging.com>
- Geniatec – <http://www.geniatec.de> - comprises several production facilities in Germany
- Hammerwerk Erft G. Diederichs - <http://www.hammerwerk-erft.de>
- Heyco-Werk - <http://www.heyco.de>
- Johann Hay – <http://www.hay.de> - two plants, the third largest privately held forging company in Germany, 2006 sales totalled €220 million.
- Karl Diederichs Stahl-, Walz- und Hammerwerk - <http://www.dirostahl.de>
- Leiber Aluminium Umform- und Bearbeitungstechnik - <http://www.leiber.com>
- Saarschmiede - <http://www.saarschmiede.com>
- Wickeder Westfalenstahl – <http://www.wickeder.de>

Most of the company websites offer comprehensive information on production capacity, products made as well as details of the production process and equipment.

Trends

The major trends that influence the casting and forging demand and production in Germany are:

- **Growing number of innovative applications of aluminium and magnesium.** This trend, confirmed by a strong production growth in 2006 (+11%), is expected to continue, as the automotive industry seeks new ways to save weight and gain fuel efficiency and performance. Moreover, other segments will benefit from these experiences.
- **Care for the environment has become a strategic political issue.** In the power generation industry, the search for energy efficiency and the limitation of CO₂ and NO_x emissions – which is sometimes called the “Kyoto Effect” – has led and should lead to the increased use of electric variable speed drives. The engines, turbines, motors and generators markets will also show good growth due to the Kyoto effect. As a result, prospects for cast and forged parts in such applications are bright.
- **German industry benefits from low-cost production in CEE countries.** The transformation of Central and Eastern European (CEE) countries into market-oriented economies is beneficial to the German engineering, foundry and forge industry. A division of labour has arisen which enables German firms to utilise a cheap labour supply to improve price competitiveness in international markets. One example of a company that has a production network in CEE countries is SRL (<http://www.slr-gruppe.de>). This company has two foundries in Germany and Austria, while the working and finishing of the castings is done at two locations in the Czech Republic and Hungary. Generally speaking, especially for end products that face quick price erosion, the price pressure on components and systems leads to relocation of production. However, since 2000, some German companies that decided to source cast parts from CEE countries decided to return to their original German supplier, mainly for reasons of quality and delivery times.
- **German companies import castings and forgings from DCs, but often not for engineering products destined for the EU market.** Also in Germany, engineering companies have been looking for new sources of castings and forgings. Because of the strong demand for their products, they have started to differentiate their sourcing policy. Although no company will officially admit that castings and forgings are imported from DCs, several German companies have started doing so. The castings and forgings they source from DCs are imported to Germany and assembled into the final product. However, in several cases these final products are directed to markets with lower quality demands, such as Africa and South America. For the products for the European market, these companies continue to use castings and forgings from Europe, due to the strict quality demands of EU customers.
- **“Made in Germany” still counts in the global market.** While for a growing number of German companies, the level of salaries and taxes as well as the limited flexibility of the labour market are reasons to offshore production, the label “Made in Germany” still counts in the global market. One example of German excellence in the foundry and forge industry

is Mecklenburger Metallguss (<http://www.mmg-propeller.de>), world market leader with a market share of 25% for ship propellers and even 60% for propellers with a weight above 80 tonnes. In 2006, the company cast the world largest ship propeller – with a diameter of about 10 meters – for the “Queen Mary 2”, the largest passenger ship in the world, built at the Samsung shipyard in South Korea. The Samsung shipyard awarded the German company the “Golden Q-mark” for being its best supplier, outstanding in quality and delivery service. MMG produces between 100-150 propellers per year, with a sales value of more than €50 million. That the future is bright for MMG is proven by the fact that the foundry is completely booked until 2010 and that the company recently received an order for 36 propellers from the large Chinese Dalian shipyard, although the Chinese have their own in-house propeller foundry.

- **Delivery reliability is important.** As can also be seen from Section 2 (text box “China is cheaper than India, but reliability compensates”), delivery reliability is of utmost importance to German customers. The result of supply problems can be seen from recent news on a production bottleneck in the Mercedes-Benz truck plant, caused by a short supply of mechanical parts. The workers of this factory had to take between 2-5 days holiday as a result of these supply problems caused by capacity problems at a German factory of the Georg Fischer Automotive group (<http://www.georgfischer.com>).
- **Forced to ‘share’ costs of materials.** The large end-users in the automotive segment try to force foundries to ‘share’ the rising costs of metal alloy, which means that the risk regarding raw material costs is passed from the customer to the supplier. The suppliers of the automotive companies have experienced difficulties with the pass on of material costs at a rate of 1:1 to the customer, a practice which they used in the past. To find a solution for this problem, these foundries try to improve their metal cost allocation system.
- **Margins in wind power equipment down.** While in 2006 the market for large ductile iron castings for wind-power applications was mentioned as having good prospects for iron foundries, the strong growing number of suppliers in this segment has led to a dramatic fall in margins in this segment.

Opportunities and threats

Trends and market developments offer opportunities and threats to exporters. A given trend can be a threat to some and an opportunity to others at the same time. The following trends should, therefore, always be analysed in relation to your specific circumstances. The main opportunities and threats for DC exporters are the following:

- + Growing engineering and construction markets lead to an increasing demand for castings and forgings. In the electric engineering segment there are good prospects for cast and forged parts in energy efficient applications.
- + The price pressure on components and systems (refer to Section 4) as a result of strong global competition, in combination with an ongoing strong demand for engineering products, has made room for increased sourcing in DCs.
- ± Rising demand for innovative applications of aluminium and magnesium, although this will be at the expense of ferrous metal castings.
- Often, DC companies are still not capable of supplying the desired quantity.
- In the past, some German customers that decided to source castings from CEE countries decided to return to their original German supplier, mainly for reasons of quality and delivery times.
- According to industry specialists, good quality castings from LCCs are at the same price level as castings of German origin.

Refer to Section 7 of the CBI market survey covering the EU market for more information on opportunities and threats.

Useful sources

- European Foundry Association - <http://www.caef-eurofoundry.org>
- European Network for Construction Forecasting - <http://www.euroconstruct.org>
- European Union Enterprise and Industry - <http://ec.europa.eu/enterprise>
- Federation of National Forging Associations - <http://www.euroforge.org>

- Association of German Engineering - <http://www.vdma.com>
- German Casting Association (non-ferrous) – <http://www.gdm-metallguss.de>
- German Foundry Association (ferrous) - <http://www.dgv.de>
- German Metal Form Association – <http://www.metalfarm.de>

2 Trade channels for market entry

Trade channels

The most common trade channels for DC exporters are direct sales to end-users, trade via traditional importers, supply agents, traditional agents, or subcontracting by EU foundries or forges. Although there are several options, supplying directly to end-users has some advantages and could be one of the most interesting trade channels, because there is a larger chance of a long-lasting relationship. DC exporters should therefore put efforts into building up supplier relationships with end-users. Refer to the CBI market survey covering the EU market for a detailed explanation of relevant trade channels in this market.

Siemens Transportation Systems (<http://www.transportation.siemens.com>; railway stock) is an example of a company that may be interesting to DC exporters. The company spends around €250 million on castings each year. Some other examples of companies in Germany that may be interesting to DC exporters are:

- Berger Lahr - <http://www.berger-lahr.com> - production; handling equipment
- Demag Ergotech - <http://www.dpg.com> - production; injection moulding machinery
- Deutz-Fahr - <http://www.deutz-fahr.de> - production; agricultural machinery. This company already sources machined/fabricated components as well as castings and forgings from DCs (India).
- Eisenwerke Düker - <http://www.dueker.de> - production; next to casting of iron also production of foundry machinery
- Siempelkamp - <http://www.siempelkamp.com> - production; machinery and plants for rubber, wood and metalworking.
- Homag - <http://www.homag.de> - production; woodworking machinery
- Motorenfabrik Hatz - <http://www.hatz.com> - production; diesel engines
- Partner für Technik - <http://www.pft-online.de> - import and distribution; cast articles and other metals
- Sudguss - <http://www.suedguss.de> - distribution and agency; castings

“China is cheaper than India, but reliability compensates” - is the experience of a German forgings importer who was interviewed by Facts Figure Future. In fact, it is a division of a German foundry that has developed into a so-called supply agent, matching demand from German customers with supply in DC countries. A spokesman of the company indicates that beside forges from India and China, also some Pakistani forges have been used as supply bases for German customers. This company also considered buying forgings from Indonesia and South Africa in recent years, but it did not manage to find the right suppliers in these countries. Beside price and reliability, quality of the product is of very high importance. An ISO certification (9001, 14001) also helps. According to the spokesman, the best opportunities for DC forges are for products in high volumes, while machining means added value. So far, the more sophisticated working and finishing is being done in Germany, and this is not set to change in the future. Exhibiting at trade fairs is the best way to enter the EU market, followed by trade missions and conventions.

Source: Interview Facts Figures Future (2007)

Price structure

It is very difficult to give a general idea of the price structure in this industry, as prices and margins differ to a great extent. They may depend on size of the order, length and type of distribution chain, terms of delivery, added value / finishing and materials concerned. Bearing this in mind, some rough indications of margins in the chain could be given. Agents work with margins between 3-7%, for importers this is 15–35%. The margin depends on the level of care

and attention an intermediary has to give to the process. Products that do not need much extra care, like finished and ready-to-use products as valves for example, will be sold with a smaller margin than product that needs extra handling or even need to be stored.

Selecting a suitable trading partner

There are many ways to find potential trading partners in Germany. The following country-specific websites may be very useful to find potential German trade partners:

- Association of German Engineering - <http://www.vdma.com> – click on ‘members’ and on ‘member companies’.
- German Chamber of Commerce - <http://www.ihk.de>
- German Trade Portal - <http://www.handelsvertreter.de>
- Member directory of the German Foundry Association “Wer gießt was?” - <http://www.dgv.de>
- Member directory of the German Metal Form Association - <http://www.metalform.de>. Click on ‘Hersteller von Massivumform-Produkten’.
- Members of the German Association of Machine Tool Industry - <http://www.vdw.de> – click on ‘English’ and ‘Supplier’.
- Members of the German Shipbuilders Association - <http://www.vsm.de> - click on ‘English’ and on ‘Member companies’.
- National Federation of German Commercial Agencies and Distribution - <http://www.cdh.de>
- Other portals where German trade partners can be found, such as <http://www.e-trade-center.com> and <http://www.kooperationsboerse.de>
- Sachon - <http://www.sachon-diedeutscheindustrie.de> - this database contains German suppliers. You can click on the market segment of your choice. For example, click on ‘9 Maschinen- und Anlagenbau’ for mechanical engineering companies.

Refer to Section 6 for main sales promotion tools.

3 Trade: imports and exports

Imports

In 2006, Germany was the largest importer of castings and forgings, ahead of France and Italy. Between 2002 and 2006, the total import value annually increased by 9% to €49.8 billion (30.3 million tonnes) in 2006. The product group shares were as follows:

- Iron and steel products: 32% of total. Annual increase in import value of 18%.
- Parts of machinery, railway equipment and vehicles: 29% of total. Annual increase in import value of 4%.
- Articles of iron, steel or base metal: 17% of total. Annual increase in import value of 7%.
- Light and ultra light products: 9% of total. Annual increase in import value of 7%.
- Plastic and rubber products: 9% of total. Annual increase in import value of 5%.
- Copper and zinc products: 5% of total. Annual increase in import value of 21%.

Of all intra-EU imports a small part may be re-exports, but the exact value of re-exports is unknown because Eurostat does not allow for such detailed analysis.

Table 3.1 Imports by and leading suppliers to Germany, 2002 - 2006, share in % of value

| Product | 2002 € mln | 2004 € mln | 2006 € mln | Leading suppliers in 2006 (share in %) | Share (%) |
|---------|---------------|---------------|---------------|---|--------------|
| Total | 19,986 | 28,268 | 35,988 | Intra-EU : France (11), Italy (10), Belgium (8), Austria (7), Netherlands (7) | 74 |
| | 12,191 | 9,337 | 8,913 | Extra-EU ex. DC : Switzerland (6), USA (5), Japan (1), Russia (1), Taiwan (1) | 19 |
| | 1,246 | 1,657 | 2,927 | DC : China (3), Turkey (1), Mexico (1), India (<0.5), Brazil (<0.5), South Africa (<0.5), Philippines (<0.5), Croatia (<0.5), Malaysia (<0.5), Indonesia (<0.5) | 7 |

| Product | 2002 € mln | 2004 € mln | 2006 € mln | Leading suppliers in 2006 (share in %) | Share (%) |
|--|---------------|---------------|---------------|--|--------------|
| Iron and steel products | 6,884 | 10,467 | 14,041 | Intra-EU : France (15), Belgium (14), Italy (9), Netherlands (8), Austria (8) | 87 |
| | 1,414 | 1,267 | 1,465 | Extra-EU ex. DC : Russia (2), Switzerland (2), Ukraine (1), USA (1), Japan (<0.5) | 9 |
| | 77 | 153 | 653 | DC : Mexico (2), China (1), India (<0.5), Brazil (<0.5), South Africa (<0.5), Turkey (<0.5), Bosnia and Herz. (<0.5), Indonesia (<0.5), Iran (<0.5), Thailand (<0.5) | 4 |
| Parts of machinery, railway equipment and vehicles | 4,976 | 6,962 | 8,139 | Intra-EU : Italy (8), France (8), Czech Republic (7), Austria (6), UK (6) | 62 |
| | 5,762 | 4,375 | 3,980 | Extra-EU ex. DC : USA (13), Switzerland (9), Japan (3), Canada (2), South Korea (1) | 31 |
| | 429 | 485 | 679 | DC : China (2), Turkey (1), Mexico (1), Philippines (<0.5), Brazil (<0.5), Croatia (<0.5), Indonesia (<0.5), India (<0.5), Malaysia (<0.5), South Africa (<0.5) | 7 |
| Articles of iron, steel or base metal | 2,927 | 4,473 | 5,637 | Intra-EU : Italy (11), Czech Republic (10), Poland (8), Austria (8), France (6) | 71 |
| | 2,587 | 1,733 | 1,356 | Extra-EU ex. DC : Switzerland (7), USA (2), Taiwan (2), South Korea (1), Japan (1) | 17 |
| | 430 | 632 | 1,000 | DC : China (8), Turkey (1), India (1), Malaysia (1), Brazil (<0.5), Bosnia and Herz. (<0.5), Philippines (<0.5), Vietnam (<0.5), Croatia (<0.5), Thailand (<0.5) | 12 |
| Light and ultralight products | 2,074 | 2,390 | 3,076 | Intra-EU : Austria (12), Belgium (10), France (9), Netherlands (7), Italy (7) | 71 |
| | 1,044 | 890 | 977 | Extra-EU ex. DC : Switzerland (10), Russia (6), USA (3), Norway (1), Taiwan (<0.5) | 22 |
| | 156 | 171 | 291 | DC : Turkey (3), China (1), Brazil (1), Croatia (<0.5), Egypt (<0.5), India (<0.5), South Africa (<0.5), Malaysia (<0.5), Bahrain (<0.5), Venezuela (<0.5) | 7 |
| Plastic and rubber products | 2,375 | 2,927 | 3,273 | Intra-EU : Italy (15), Netherlands (10), Belgium (9), France (8), UK (7) | 76 |
| | 1098 | 840 | 812 | Extra-EU ex. DC : Switzerland (8), USA (5), Japan (3), South Korea (1), Taiwan (1) | 19 |
| | 119 | 161 | 229 | DC : Turkey (2), China (2), India (1), Brazil (<0.5), South Africa (<0.5), Thailand (<0.5), Mexico (<0.5), Sri Lanka (<0.5), Indonesia (<0.5), Croatia (<0.5) | 5 |
| Copper and zinc products | 750 | 1,048 | 1,823 | Intra-EU : France (20), Belgium (14), Italy (10), Sweden (9), Netherlands (8) | 80 |
| | 286 | 232 | 324 | Extra-EU ex. DC : Switzerland (4), USA (2), Japan (1), Russia (1), Taiwan (1) | 15 |
| | 35 | 54 | 76 | DC : China (2), Chile (1), Turkey (1), Peru (<0.5), India (<0.5), Morocco (<0.5), Georgia (<0.5), Congo (<0.5), Vietnam (<0.5), Malaysia (<0.5) | 5 |

Source: Eurostat (2007)

Imports from DCs

Between 2002 and 2006, imports from DCs annually increased by 24% in value. Compared to 2002, the total share of DCs in import value increased from 4% to 6.5% in 2006. The DCs' shares in imports of some product groups showed better growth compared to other product groups, as can be seen below:

- Iron and steel products: growing from 0.9% to 4.0% in value.
- Articles of iron, steel or base metal: growing from 7.0% to 12.3% in value.
- Plastic and rubber products: growing from 3.3% to 5.3% in value.
- Copper and zinc products: growing from 3.5% to 5.2% in value.
- Parts of machinery, railway equipment and vehicles: growing from 4.6% to 6.6% in value.
- Light and ultra light products: growing from 4.8% to 6.7% in value.

China accounted for 41% of all imports coming from DCs, followed by Turkey (16%), Mexico (11%), India (7%), Brazil (5%) and South Africa (3%). The Chinese share of DC exports to Germany did not grow as fast as in the EU on average (45% compared to 57%). The DCs that

saw a larger increase of their share to the country were Georgia, Chile, Bosnia and Herzegovina, Mexico, Kazakhstan and Peru.

Exports

In 2006, Germany was the largest exporter in the EU, ahead of Italy and France. The total export value of Germany showed an annual increase of 10% in the period 2002-2006, totalling €81 billion in 2006. Exports consisted of:

- Parts of machinery, railway equipment and vehicles, accounting for 30% of total exports (€24.4 billion). Annual increase in export value of 7%.
- Iron and steel products, accounting for 23% of total exports (€18.9 billion). Annual increase in export value of 14%.
- Articles of iron, steel or base metal, accounting for 17% of total exports (€13.9 billion). Annual increase in export value of 10%.
- Plastic and rubber products, accounting for 12% of total exports (€10.1 billion). Annual increase in export value of 6%.
- Light and ultra light products, accounting for 9% of total exports (€7.5 billion). Annual increase in export value of 8%.
- Copper and zinc products, accounting for 8% of total exports (€6.2 billion). Annual increase in export value of 24%.

Probably a small part of exports consists of re-exports to other EU countries, but the exact value of re-exports is unknown because Eurostat does not allow such a detailed analysis.

Opportunities and threats

- + Germany was the largest importer of castings and forgings in the EU in 2006.
- + The total import value of all product groups increased in the period 2002-2006.
- + The Chinese share of DCs' exports to Germany did not increase as fast as in the EU on average. Several DCs saw a larger increase of their share.
- ± The DC share of total imports grew by 65%, which was slower than in the EU on average (81%).
- ± The import share of DCs was 6.5% in 2006, below the EU average (8.2%).
- In 2006, Germany was a net-exporter of castings and forgings, running trade surpluses for all product groups: parts of machinery, railway equipment and vehicles (€89 million), copper and zinc products (€580 million), light and ultra light products (€672 million), articles of iron, steel or base metal (€977 million), plastic and rubber products (€1.7 billion) and iron and steel products (€3.1 billion).
- China accounted for 41% of all imports coming from DCs, a slightly higher share than in the EU on average (39%).

Useful sources

- EU Expanding Exports Helpdesk - <http://exporthelp.europa.eu> → go to: trade statistics
- Eurostat - official statistical office of the EU - <http://epp.eurostat.ec.europa.eu> → go to 'themes' on the left side of the home page → go to 'external trade' → go to 'data – full view' → go to 'external trade - detailed data'.
- Understanding Eurostat: Quick guide to EasyComext - http://epp.eurostat.ec.europa.eu/newxtweb/assets/User_guide_Easy_Comext_20080117.pdf

4 Price developments

Major trends that affect the costs and revenues of German castings and forgings production are price pressure, increasing raw material and energy prices and wage costs:

- Prices and margins are and will continue to be under pressure. Global competition has placed severe pressure on the prices and, with this, on margins of intermediate goods in the supply chain. Therefore, importers/agents and OEMs as well as their suppliers keep on looking for opportunities to reduce costs of parts. This can best be seen from the fact that the import price of the product group 'parts of machinery, railway equipment and vehicles'

between 2002 and 2006 remained stable, whereas virtually all other imports saw a price increase due to the growing material costs.

- In recent years, rapidly increasing prices of among others, plastics, aluminium, steel and scrap steel, have caused problems in the industry, although German producers have tried to translate soaring raw material prices into material-cost surcharges as soon as possible. The year 2006 was characterised by a boom in the prices of copper and nickel, but there was also an indication that the worst was over, especially for pig iron and ferrous alloys.
- The rapid increase in electricity prices in Germany has affected the competitiveness of the industry as far as those price increases were higher than in other regions. Especially commodity production was badly hit by the high energy costs, as their prices are set globally and therefore increases in energy costs that occur solely in Germany can not be passed on to the customers without significant losses in their market share.
- Although raw material costs reached a share of about 20% of total production costs of a German metal foundry, wage costs still account for the largest share (almost 50%) of the average production costs in the industry. In 2005, former West Germany ranked second in the EU with regard to wage costs per man-hour in the metal industry (€27.87), less expensive than Denmark, but more expensive than Finland, Belgium and the Netherlands. Wages in former East Germany were much lower than the West German wages (only €17.36) and were at a level comparable to the wages in Italy and Spain.

Please refer to the CBI market survey covering the EU market for castings and forgings for a detailed explanation on these major trends.

Useful sources

Sources of prices include, among other things:

- CAEF Eurofoundry - <http://www.caef-eurofoundry.org>
- Eurofer – <http://www.eurofer.org/statistics/scrap.htm>
- European Engineering Industries Association – <http://www.orgalime.org>
- London Metal Exchange – <http://www.lme.co.uk>
- Eurostat - official statistical office of the EU - <http://epp.eurostat.cec.eu.int> - by comparing import value and volume, it is possible to get an idea of development of import prices.

5 Market access requirements

As a manufacturer in a developing country preparing to access Germany, you should be aware of the market access requirements of your trading partners and the German government. Requirements are demanded on legislation and on labels, codes and management systems. These requirements are based on environmental, consumer health and safety and social concerns. You need to comply with EU legislation and have to be aware of the additional non-legislative requirements that your trading partners in the EU might request.

For information on legislative and non-legislative requirements, go to 'Search CBI database' at <http://www.cbi.eu/marketinfo>, select castings and forgings and Germany in the category search, click on the search button and click on market access requirements.

Useful sources

- Additional information on packaging can be found on the ITC website on export packaging: <http://www.intracen.org/ep/packaging/packit.htm>
- Information on tariffs and quota can be found at <http://exporthelp.europa.eu>

6 Doing business

General information on doing business like approaching potential business partners, building up a relationship, drawing up an offer, handling the contract (methods of payment, and terms of delivery) can be found in CBI's export manuals 'Export Planner' and 'Your image builder'. Furthermore, cultural awareness is a critical skill in securing success as an exporter.

Sales promotion

For DC exporters, trade press, trade fairs and website promotion are among the most important promotional tools; they are briefly discussed below. For more information, also refer to CBI's Export Planner and Your Image Builder – <http://www.cbi.eu>, as well as the CBI market survey covering the castings and forgings market in the EU.

Trade fairs

Visiting and participating in a trade fair in the EU can be an efficient tool to communicate with prospective customers. It provides more facilities for bringing across the message than any other trade promotional tool. It can also be an important source of information on market development, production techniques and interesting varieties. Beside the Hannover Messe (<http://www.hannovermesse.de>, annually, April, Hannover), which is the most important trade fair in Germany for castings and forgings, other relevant trade fairs are:

- AMB - <http://www.messe-stuttgart.de> - metalworking - biennially, September, even years, Stuttgart
- Aluminium - <http://www.aluminium-messe.com> - aluminium industry; also conference - biennially, September, even years, Essen
- Bauma - <http://www.bauma.de> – construction industry, triennially, April, Munchen. Next event: 2010.
- Casttec - <http://www.casttec.de> - casting and information technology - triennially, October, Sindelfingen. Next event: 2010.
- Euroblech - <http://www.euro-blech.de> - metal forming - biennially, October, even years, Hannover
- Euroguss - <http://www.euroguss.de> - pressure die casting - biennially, March, even years, Nurnberg
- Gifa/Newcast/Metec - <http://www.messe-duesseldorf.de/newcast> - metalworking and casting - every 4 years, June, Dusseldorf. Next event: 2011.
- Metav Munchen - <http://www.messe-muenchen.de> - manufacturing Technology and Automation - biennially, April, even years, Munich
- Nortec - <http://www.hamburg-messe.de/nortec> - metalworking and plastics processing - biennially, January, even years, Hamburg
- Z - <http://www.zuliefermesse.de> - subcontracting fair for components and parts - annually, March, Leipzig

Find more trade fairs at <http://www.eventseye.com> and <http://www.auma.de>.

Trade press

An interesting story on your company or new product introduction will boost the company's image. In that respect, building up contacts with the trade press is very helpful. Some relevant German magazines are:

- Giesserei - <http://www.giesserei-verlag.de> - foundry magazine
- Heat Processing (forgings) – <http://www.oldenbourg.de>
- Konstruktion - <http://www.technikwissen.de>
- Konstruktion + Engineering - <http://www.k-e.de>
- Konstruktionspraxis (Electronics/Automation) - <http://www.konstruktionspraxis.de>
- Kunststoff Magazine- <http://www.kunststoff-magazin.de>
- MPT International (Metallurgy) – <http://www.mpt-international.com>
- Plast Verarbeiter (Plastic) - <http://www.plastverarbeiter.de>
- Schmiede Journal - <http://www.schmiede-journal.de> - forgings
- Steel Research International (Steel, Metalworking), Stahlmarkt and other steel magazines – <http://www.stahleisen.de> - choose for English and click on 'Magazines'.

Website promotion

These days, it is an absolute must to have a professional website, which is aimed at your main target groups. Make it interactive and promote it in the right way. More information can be

found in the CBI Export Manual 'Website Promotion', available at <http://www.cbi.eu/marketinfo>.

Business culture

Cultural awareness is a critical skill in securing success as an exporter. Information on cultural differences in the EU can be found in Section 3 of CBI's export manual 'Exporting to the EU'. These manuals can be downloaded from <http://www.cbi.eu/marketinfo> - go to search publications. Furthermore, refer to Kwintessential for practical tips on business culture and etiquette in Germany: <http://www.kwintessential.co.uk>. Click on 'Country Profiles' at the section 'Intercultural resources and tools' and click on 'Germany'.

Other useful sources

Next to a number of relevant sources already mentioned in previous sections, other useful sources that contain market information and information on doing business in Germany are:

- Association for Electrical, Electronic & Information Technologies - <http://www.vde.com>
- Central Association of Steel and Metal Treating Associations - <http://www.wsm-net.de>
- Electrical and Electronic Industry Association - <http://www.zvei.org>
- German Association of Construction Companies - <http://www.zdb.de>
- German Construction Industry Association - <http://www.bauindustrie.de>
- German Steel Construction Association - <http://www.deutscherstahlbau.de>

This survey was compiled for CBI by Facts Figures Future
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