

# **Forging Trends in Europe**

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### **1. Introduction**

If we look at the development of the forging business in Europe, we have to look at the developments within our customers. The main customers of the forging industry are the car and truck producers – nearly 60 % of the forging production is consumed by this industry branch. This applies not only for Europe; therefore, lots of the following statements are valid worldwide. But beside the worldwide developments there are some special situations in Europe which have to be considered.

Usually, during the opening ceremonies of this conference the production numbers of all the countries are presented. But we feel that it is more important to give some background information instead of showing lots of figures – therefore only the most important production data of the year 2001 of the European countries organized in Euroforge will be presented; on the other hand this paper will concentrate on actual developments within the forging business and its main customer, which is the vehicle industry. But at first we would like to give a general view over some trends and developments within the forging business and its related economy in Europe.

### **2. General Trends in the European Forging Industry**

Since the last forging conference in China, the forging industry in Europe and especially in Germany experienced strong sales until mid of 2001. In all European countries, the year 2000 was very successful.

But due to a still booming economy in the first half of 2001, even this year gave to some countries within Euroforge a record production. However, the worldwide recession reached Europe in the second half of 2001; I do not want to blame the terroristic attacks of September 11 for the economical slow down – this was not causal, but it was an additional negative input to the low spirits.

But, in spite of the fact that forging business in Europe was running on a high level and 2001 offered a production record to Euroforge, we had to suffer on the cost side dramatically. All the European steel-mills increased their prices by a concerted action with an amount of approximately 10 %; the consequence was that the financial results of the European forgers had been reduced drastically in 2001. The further consequence was that throughout Europe several insolvencies of forging shops occurred. The main customers, who are the car and truck producers and their system suppliers, but also the mechanical engineering as the second biggest customer, had

been under the same pressure of the slow down of the economy and therefore they refused to accept price adaptations; furthermore, additional price reductions had been requested with the above mentioned consequences.

<b>Euroforge Closed Die Production Data 2001</b>				
<b>(Independent Forging Companies)</b>				
<b>Country</b>	<b>shipments (1000 metr. Tons)</b>	<b>Change to 2000 (%)</b>	<b>Sales (Mio. Euros)</b>	<b>Change to 2000 (%)</b>
Belgium	15	4,5	23	10,0
Czech Rep.	110	4,8	130	4,5
France	360	1,0	980	2,0
Germany	1119	3,6	2331	5,0
Italy	573	-1,2	775	-1,8
Poland	132	-4,3	175	-13,1
Spain	216	-1,4	317	-0,9
Sweden	71	-8,9	114	-13,1
UK	220	-3,0	419	-3,0
<b>Total</b>	<b>2816</b>	<b>0,75%</b>	<b>5264</b>	<b>1,5%</b>

table 1

Table 1 presents an overview about the performance of the European forging industry in the year 2001. It can be recognized that the countries with a strong vehicle industry like France and Germany are showing still some growth, while the other Euroforge countries show slight decreases in their production numbers. Therefore, a closer look at the car and truck industry as mentioned above, seems to be helpful in order to realize the latest developments in the forging world and to find some background information.

### **3. Developments in the vehicle industry**

During the last three years – or in other words - since the last forging conference in China in 1999, some substantial changes within the automotive industry occurred. The following statements are not complete, but they show the most important trends

within the strategy of these customers:

- The **concentration** and the **globalization** process in-between the OEMs is accelerating; the latest example is the engagement of General Motors within Fiat and Daewoo.
- The OEMs are buying more and more **systems and sub-assemblies** instead of components and parts.
- The **system production plants are spun-off** – like Visteon for example with regard to Ford or Magneti Marelli with regard to Fiat.
- The **platform-strategy** within the automotive industry leads to higher volumes for certain components.
- **E-business** is becoming common in the purchasing departments with Internet-auctions as a dangerous tool.
- System- and component-development is shifted to the supplier by the **simultaneous engineering** process.

Beside these strategic and economical trends also some important developments on the technical field took place – this applies for new products as well as for new production processes. With regard to new products I would like to mention:

- Due to high pressure injection systems, like the common rail technique, **Diesel engines** are experiencing a boom in Europe.
- In the transmission branch we can see in Europe the **cvt** (continuous velocity transmission) succeeding.
- Due to several new sport utility vehicles **four-wheel-driven cars** are selling excellent and are produced with increasing numbers.
- In big SUV's and in light trucks rigid axles are replaced by **half shafts with cv-joints**.
- In Europe **light weight cars** become more popular due to the high energy prices.

Regarding the production processes of our automotive customers we can observe that they are concentrating on their core business, which means engine development and production, sheet metal forming for the car body and final assembling. Therefore

there are only a few forging operations left within the European automobile industry – one of them will be visited during the “Germany South Tour”. But not only forging is getting obsolete within the big car production plants; also the various machining operations are sourced out: the more ready-to-assemble components, sub-assemblies and systems are purchased, the more machining is not necessary any longer.

These economical, strategic and technical trends within the automotive industry have significant consequences for the suppliers in general and for the forging industry which supplies 58 % of their production in Europe to this branch (table 2), in special.

Size of the Forging Companies organized in Euroforge	
< 50 employees	47%
50 - 199 employees	30%
200 - 400 employees	14%
> 400 employees	9%

table 2

#### 4. Consequences for the European Forging Industry

The economic-strategical trends mentioned above lead to the following consequences:

- The **globalization** and **concentration** of the car-makers ask also for a globalization of their forging suppliers – therefore some of the European forgers already invested in international subsidiaries; but also some concentration processes happened. Especially between forging shops of steel mills several mergers have taken place.
- The increasing number of **system-supplies** as well as the **spin-off of automotive system- and module-plants** with own purchasing departments lead to the fact that forgers are shifted from tier one to tier two or three supplier. This goes hand in hand with higher price pressures, because the system suppliers experience the same pressure and they are magnifying this strain.

- The **platform strategy** leads to higher volumes – and higher volumes normally are used for price reductions; so again the price pressure on forgings is increasing.
- **E-business** can be a very helpful assistant for the communication between customer and supplier. However, the first big enthusiasm is replaced by a more realistic estimate of the possibilities; especially the dangerous tool of internet auctions should be used very carefully.

On both sides an excellent preparation is necessary for leading these auctions to a success: one important item is the comparability of the bids; this has to be investigated in advance of the auction – we feel that this is especially for forgings with different shapes and different machining allowances a crucial point. But also the rules of these auctions should be clearly defined: it cannot be accepted for example that out of different details of several quotations a new “theoretical bid” is constructed. Furthermore it would be helpful if the purchasing platforms would have the same format.

- **Simultaneous Engineering** is on the one hand side asking for a certain technical competence and know-how of the forger and is therefore cost-intensive, because the forging company needs the specialists who understand the product. On the other hand it leads to a closer relationship between customer and supplier – and simultaneously engineered forgings cannot be so easily subject of internet auctions.

If we consider the technical trends we also can recognize some considerable effects on the European forging business:

- The boom of **Diesel engine** powered cars leads to an increase in the demand for forgings. The crankshaft of Diesel engines has to be a forging and not a casting; the conrods are also forgings, manufactured by the cracking technology. And finally, the Diesel injection equipment parts are also forgings: due to the high pressures up to 2000 bar the pump bodies, the rail itself for the common rail system as well as the injector bodies have to be forgings.
- The **continuous velocity transmissions** ask for different forgings than conventional manual transmissions: heavy conical wheels replace shafts and gears of the conventional gearbox. The volume of the forgings will be approximately the same – however, production processes and press loads will be different.
- The **four-wheel driven suv’s** ask for more forgings than normal cars – this means, an increasing number of this car-type grants us more forgings: this is

due to the additional half shafts and the transfer-case.

- The ongoing replacement of rigid axles by **half shafts with cv-joints** for bigger SUV's and for light trucks in Europe has two effects on the forging business: the cv-joints have to become bigger and therefore higher press loads are necessary. As most of these parts are produced by a combination of warm and cold forging, especially the warm forming machines have to become bigger. The other effect is that the hot up setters, which used to make flange shafts, have become obsolete.
- The next important trend in Europe is the production of small **light-weight cars** with low energy consumption. This leads to weight-saving design, which can lead to a replacement of heavy steel-forgings. But, on the other hand, this gives the forging industry the chance to expand their business into the direction of non-ferrous forgings. This is the reason, why several European steel-forgers started with the forging of aluminum alloys.

## 5. The Response of the European Forgers

When discussing the consequences of the trends and demands of the automotive industry, we already made some statements about some answers and reactions of the forging shops to these challenges. But beside the "reaction" there also has to be the "action" – this means we should try to be ahead of our big customers. This is rather difficult, as we are a small industrial branch compared with our big customers. And furthermore, there are lots of small forging companies in Europe – table 3 gives an idea about the structure of this industry.

Therefore it becomes quite clear that the small "100 employee shop" is not in a position to withstand to the requests of the big automotive customer. The solution only can be that these companies are organizing themselves in their national forging associations; and that these national associations are also trying to act globally – and this is what we began three years ago in Europe.

We transformed Euroforge from a loose "once a year meeting club" to an organized association in which every member country is responsible for a certain task. We also formed within Euroforge for example the automotive group, which deals with all the basic problems that are coming up to the forger and for which he never finds the time to cope with.

It is important to understand that the French, the Italian, the German forger, etc. are confronted with the same problem – and by discussing such a problem not only a solution could be found, but also the mutual understanding can grow.

<b>Customer Profile of the European Forging Industry (percentage share by weight)</b>	
Cars/Trucks/First Tier suppl.	58%
Others	18%
Mechanical Construction	11%
Agriculture Machinery	8%
Mining Machinery	2%
Railways	2%
Aerospace Equipment	1%

table 3

But not only within Euroforge we made significant alterations – also the German forging association IDS is in a reorganization procedure. One of the answers to the permanent price pressures of our customers was the specialization of the forgers. This means that in Germany’s forging shops today you will find very often specialists for certain parts – for example for crankshafts or for conrods or for transmission shafts; these companies are supplying these parts to customers worldwide and are competitive due to the high volumes and the special product know-how. Beside that, there are the forging shops with smaller volumes and with a wide range of products and with a special process know-how. Due to the different interests of these two orientations, the German forging association decided to build sub-groups in order to give the optimum of consultation to its “customers”, the forging companies: today there exists a product-oriented sub-group and a process-oriented sub-group; within these groups forging companies collaborate closely.

## **6. Summary**

The forging industry today is worldwide under pressure, because our customers themselves are under the permanent pressure of competition. The more the production of components and systems is outsourced, the more purchasing is responsible for our customers success, and the rationalization has to be realized by the suppliers. The forging industry is a classical subcontracting industry without a final product – therefore the only solution for satisfactory results can be on the one hand side to be the specialist, but, on the other hand to cooperate and to exchange experiences worldwide – and this is the reason, why we are meeting here in Cologne.