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The Lightweight Forging Initiative –
A cooperation between the steel association, Stahlinstitut VDEh, and the forging association, Industrieverband Massivumformung e. V.

Stahl

DEUTSCHE MASSIVUMFORMUNG

Press Release

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Weight Savings of 42 Kilograms in Passenger Cars

The Lightweight Forging Initiative: Significant Reduction in CO2 Emissions Possible

With forged steel parts, considerable weight savings can be achieved in vehicle construction. The latest research results from The Lightweight Forging Initiative reveal that the weight of a middle class vehicle may be reduced by 42 kilograms when using state-of-the-art steel and forging technology. “These results show the sheer extent of innovation available in the steel and forging industries,” says Dr. Hans-Willi Raedt, Vice President Advanced Engineering, Hirschvogel Automotive Group, and Chairman of The Lightweight Forging Initiative.

For the study entitled “Lightweight Design Potential of Forged Components in Passenger Cars”, scientists of the automotive engineering research institute, Forschungsgesellschaft Kraftfahrwesen mbH Aachen (fka), disassembled a modern middle class vehicle from a German manufacturer. The Lightweight Forging Initiative commissioned the fka to document each one of the 3,500 or so parts in the powertrain, chassis and other selected areas of the vehicle. In workshops, experts from steel manufacture and forging worked on weight savings potential, taking an integrated approach which covers alternative material selection, production technology and part design. Currently, the 400 ideas developed so far for achieving lightweight design are undergoing feasibility checks. The proposals under scrutiny encompass material, design and conceptual solutions.

From a forging perspective, it is primarily parts from the powertrain (injection, engine, transmission, transfer gearbox, input shafts) and the chassis which lend themselves to lightweight design ideas. “Using the latest steel materials and forging technology, the costs per kilogram lightweight design lie below those incurred for some new types of technology. Some lightweight design potential even promises cost neutrality,” explains Dipl.-Ing. Frank Wilke, Vice President Technical Customer Service, Deutsche Edelstahlwerke GmbH, and Vice-Chairman of The Lightweight Forging Initiative. Such lightweight design thus has a broad impact and can contribute significantly to reducing the total CO_2 emissions.

To utilize these lightweight design ideas, The Lightweight Forging Initiative believes it is necessary to include material and forging potential in the early phases of system and part development. Here, there are tried-and-tested simultaneous engineering processes. However, these need to be used for considerably more components than is the case at present. “The purchasing process should take place in earlier phases of development, namely when the lightweight design proposals of the supplier can still flow from material or production engineering into part design,” urges Dr. Raedt.

“With respect to lightweight design potential, the areas of powertrain and chassis are just as important as the car body,” continues Dr. Raedt. The Lightweight Forging Initiative shall present further results in November 2014 as part of a large conference event.

The Lightweight Forging Initiative
15 forging companies and 9 steel manufacturers joined forces in **The Lightweight Forging Initiative** at the beginning of 2013 under the auspices of the German forging association, Industrieverband Massivumformung e. V., and the steel association, Stahlinstitut VDEh. Without drawing on public funding, the companies in the consortium are financing the study entitled “Lightweight Design Potential of Forged Components in Passenger Cars”, which is being carried out by the automotive engineering research institute, Forschungsgesellschaft Kraftfahrwesen mbH Aachen (fka). This institute is analysing which forged steel parts are currently being assembled in cars today and how these may be optimized with respect to lightweight design. The goal is to achieve weight savings in cars using innovative components made of steel. This is by far the largest pre-competitive joint project of these two industries. Additional information may be found at www.massiverLEICHTBAU.de

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Caption
The Lightweight Forging Initiative is assessing each of the 3,500 or so parts in the powertrain, chassis and other components in order to determine the weight-savings potential in vehicles.

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Industrieverband Massivumformung e. V. (German Forging Association)
Industrieverband Massivumformung e. V., with its 120 members, represents the interests of the industry with sales of 6.5 billion euros and almost 30,000 employees. A core task is organising collaboration across the member companies, most of which are medium-sized businesses, with the aim of working together to increase the competitiveness of the individual firms. Germany is the technology leader when it comes to forging and, after China, is the world’s largest producer of forged parts.

Stahlinstitut VDEh (VDEh Steel Institute)
The association promotes cooperation among engineers on projects of a technical or scientific nature, or a combination of both, with the aim of further developing steel technology and the material steel. Stahlinstitut VDEh focuses on collaborative research and information exchange. In international collaborative work, system manufacturers and suppliers are also involved. Today, Stahlinstitut VDEh members include around 6,600 university graduates in technical, scientific and commercial subjects or those in leading positions in industry and trade. Besides this, 150 companies have joined the association from the areas of iron, steel and associated materials.