

# WIRE DRAHT

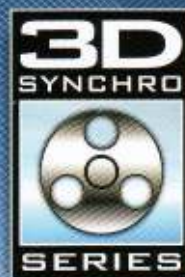
www.wire-magazine.de

6/2013

September

With a special section  
on Wire Southeast Asia

English edition of the  
magazine for the spring,  
wire and cable industry



Third consecutive year



America's fastest growing  
private companies



PATENT No EP 2257915 B

Synchro  
AFM 3D S



## Synchro AFM 3D S



FORMING OUR FUTURE WITH YOURS

WWW.AIMMACHINES.COM

Wire welding

Joining in front of extruders

page 30

Spring materials

Raised fatigue resistance

page 36

Industry report

Springs jump back into life

page 44

# Springs jump back into life

It was near impossible to absorb the worldwide economic crisis at the last decade's end. The automobile industry was especially affected and saw its growth dwindle away in the rear view mirror. So spring makers took a hard hit. Yet the situation has turned for the better: ever since car makers witnessed a record last year, suppliers are receiving an influx of orders.

The spring industry's well-being is highly dependent from the automobile sector. According to German industry association VDFI 62% of buyers can be found in the sector, alongside suppliers. The current outlook and figures thus are a reason for joy. Last year, automobile production grew 11.5% to 12.98 million in Germany and rose 3.5% to 80.27 million automobiles worldwide. "Never before have so many cars been produced

lion Euros. In Germany, total spring production is nearly 500,000 tons a year. Around 180 companies account for a turnover of two billion Euros. Without springs in various shapes and sizes, cars wouldn't be able to function. Whether upholstery or suspension – this component is always on the road. Suspension, for instance, is part of the chassis. Springs allow tires to stay in contact with the road, despite bumps and unevenness, whilst

being surpassed by the sector. Engineering is the third-largest market for the springs sector. 10% of goods are shipped to engineering companies. Where machines have to resist force, technical springs are not far away. Last year, production volume grew by 14%. "Capacity utilisation has risen from an absolute low of 67.5% in July 2009 to 88.7%", explains Thomas Lindner, president of mechanical engineering association VDMA. Production volume is expected to grow additional 4% this year. Diverse sectors such as medical technology, the food, building and rail industry, optics, toys, watches and office equipment are also large buyers. Demand is high for cold- and hot-formed springs, such as compression springs, parabolic and trapezoidal springs, conical springs, pressure, tension, torsion and leg springs, as well as disc and flat spiral springs. A technical spring is designed to withstand pressure and force, balance them or pass them on. By contrast, a spring in a ballpoint pen hardly has to cope with such mechanical stresses at all. At the other end of the scale is the manufacturing industry, where components have to withstand tremendous forces. Yet they not only have to withstand force. Temperature fluctuations, such as those found in the steel industry, can also add stress to the materials used for a spring.



The spring industry highly depends from the automobile sector. 62% of buyers can be found in this line. In 2012, the production grew to over 80 million automobiles worldwide. Asia and North America are the largest markets for car makers. For suppliers such as spring makers this is a boon.

Photo: J.P. Grueber, Hagen/Germany

in Germany, never before have so many been exported. The domestic market is also growing", exults Matthias Wissmann, president of car maker association VDA. Here, Germany is one of the worldwide leading countries. Asia and North America are the largest markets for car makers. Western Europe is currently playing a different role. By 2015, car sales in Western Europe may account for less than 20% of global sales. Nonetheless, the signs of the times all show towards growth: for the current year, the "CAR University Duisburg-Essen", forecasts worldwide automobile production growth of 5.1% – another new record for the sector. This naturally is a boon for suppliers such as spring makers: trailing the car industry, turnover of car parts, components and accessories last year climbed 12.3% to 12 bil-

lion Euros. In Germany, total spring production is nearly 500,000 tons a year. Around 180 companies account for a turnover of two billion Euros. Without springs in various shapes and sizes, cars wouldn't be able to function. Whether upholstery or suspension – this component is always on the road. Suspension, for instance, is part of the chassis. Springs allow tires to stay in contact with the road, despite bumps and unevenness, whilst the rest of the vehicle is kept steady. And only a well-sprung seat is comfortable. Thousands of springs can be found in a car. Valve springs hold and open inlet valves for the fuel-air mixture and the exhaust valves for exhaust fumes and combustion products. In addition, the spring market is also jump-starting developments in the electronics industry, which accounts for 13% of shipments and is the second-largest buyer of springs in Germany, according to the VDFI. Springs are an important part of turbines and isolators used to generate electricity. The electronics industry is also heading towards new records. "Adjusted for price effects, the production output of electronics companies improved by 10% in January 2012 year over year", reports German electronics association ZVEI. Even the record levels of 2008 are

## Facing temperatures and force

In terms of high-tech, flat wire springs help satellites perform their tasks. Even the human body itself needs springs. Dr. Werner Roehrs KG is developing a spring for bone lengthening. "After the bone has been artificially split, the space between the two segments has to be pushed apart by a spring, in order to support the bone's lengthening process", explains Philipp Koepff, CEO of Roehrs. Apart from the size and strength, the material used for such a spring is of utmost importance, "so that the body has no natural immune response".

As numerous as the applications, so diverse are a spring's properties. Not only does a spring have to live up to its dampening behaviour. Customers often ask for corrosion and temperature resistance, as well as per-

haps electrical conductivity. A standard spring, as manufactured by Dr. Werner Roehrs KG, is used in environments with temperatures of up to 80°C. The company, based in Sonthofen, Germany, also manufactures valve springs for the automobile sector out of oil hardened and tempered spring steel wire for use in applications with temperatures of up to 120°C. Springs made from stainless spring steel will withstand corrosion.

### A boon for suppliers

Spring wires made from copper or copper alloys have good electrical conductivity, making them predestined to be used in electronics. Springs made from nickel-based alloy are especially resistant against high temperatures and corrosion. In the best of cases, springs not only have numerous favourable characteristics, but also differ in size and form. Flat wire springs are often demanded for small installation spaces, as they offer higher energy absorption than round wire compression springs. Companies that want to jump upwards in the market need to outdo their competition and offer high-quality products. A broad machinery base is essential. Fortuna Federn Austria is a supplier of machines for manufacturing springs. The company develops spring lathe coilers, its model "WIM CNC" is controlled by an automatic servo and can be equipped with a wire catching system for the first coil. It can be used for the cold or hot production of right and left coiled cylindrical and one-sided conical compression, extension and torsion springs, different wire forms and double torsion springs. According to Fortuna Federn, the machine pulls in, coils and cuts automatically. Semiautomatic hydraulic looping machines are needed to produce German and English loops on extension

springs. Semiautomatic servo-controlled wire bending machines are used to make various bending parts from wire. Wire trimming machines are also important. They cut springs, springs ends and spring legs. Grinding is a cost-intensive part of the manufacturing process. One method to reduce grinding is to cut a wire diagonally, thereby reducing costs and workload. One trend is towards an analysis of the entire value chain. VDF Vogtland Federntechnik is placing its bets on "lean spring production". "Processes have to be looked at and optimised", states the firm's project manager Thorsten Schrotsberger. All quality-relevant processes can be continuously planned, controlled and evaluated during production. "On the one hand, one of the important elements is flow-production, which avoids waste of resources due to overly high inventory levels or standstills due to low volume production. On the other hand, the zero-error strategy comes to grip, which detects errors and helps avoid them, if possible before they even occur", adds Schrotsberger. This enables a continuous production flow, even in the case of short production cycles and low volumes. Integrated complaints management is also part of VDF Vogtland's process optimisation. Here, the system delivers up-to-date analysis and figures, which help detect common mistakes and avoid them in the future. Customer complaints can be prioritised, so that "not only faulty shipments, but also the entire process can be globally optimised", says Schrotsberger. The defect rate can be minimised for the long-term. Introducing a quality management system was a worthwhile investment for VDF Vogtland Federntechnik, especially in view of its customer structure, as car makers, which account for half of all orders, change their models in an increasing rate.

### Buyer expects sustainable process

Efficient production processes are one formula for success. In the last few years, another formula has established itself. Buyers are increasingly paying attention if a supplier is utilising an eco-friendly and sustainable production process. Manufacturers who react accordingly are set to profit, not only in view of the customer. Rising prices for energy and raw materials demand sustainable production – apart from the fact, that the environment is kept clean. These were all good reasons for Renzing GmbH and Vogtland Federntechnik to have themselves certified. TUEV-NRW certified the group with the environmental standard Norm ISO 14001. It is now especially important "to train employees and that all superiors set an example", underlines Klaus Halverscheidt,

who worked closely on the project for the management. Companies that want to stay on the road of success can't take a shortcut past the environment. Business and ecology are increasingly growing together. Here, the spring industry is another case in point.

#### Fortuna Federn GmbH

Brunn 23  
8455 Pöfing Brunn/Austria  
Phone: +43 3465 2949  
e-mail: info@fortunafedern.com  
www.fortunafedern.com

#### Dr. Werner Röhrs KG

Oberstdorfer Strasse 11-15  
87527 Sonthofen/Germany  
Phone: +49 8321 614-0  
e-mail: info@roehrs.de  
www.roehrs.de

#### Messe Düsseldorf GmbH

Messeplatz, Stockumer Kirchstrasse 61  
40474 Düsseldorf/Germany  
Phone: +49 211 4560-01  
e-mail: info@messe-duesseldorf.de  
www.messe-duesseldorf.de

#### VDA – Verband der Automobilindustrie e.V.

Behrenstrasse 35  
10117 Berlin/Germany  
Phone: +49 30 897842-0  
e-mail: info@vda.de  
www.vda.de

#### VDFI – Verband der Deutschen Federindustrie e.V.

Goldene Pforte 1  
58093 Hagen/Germany  
Phone: +49 2331 958851  
e-mail: kontakt@vdfi.wsm-net.de  
www.federnverband.de

#### VDF Vogtland Federntechnik GmbH

Alemannenweg 25-27  
58119 Hagen/Germany  
Phone: +49 2334 801-0  
e-mail: info@vdf-federn.de  
www.vdf-federn.de

#### VDMA – Verband Deutscher Maschinen- und Anlagenbau e.V.

Lyoner Strasse 18  
60528 Frankfurt a.M./Germany  
Phone: +49 69 6603-0  
e-mail: vdma@vdma.org  
www.vdma.org

#### ZVEI – Zentralverband Elektrotechnik- und Elektronikindustrie e.V.

Lyoner Strasse 9  
60528 Frankfurt a.M./Germany  
Phone: +49 69 6302-0  
e-mail: info@zvei.org  
www.zvei.de



Newest product are WIM-H CNC spring lathe coilers for hot coiling. These machines are custom made, so the industry is getting exactly what's needed. Photo: Fortuna Federn, Pöfing Brunn/Austria