



Bending to perfection.

Automatic bending cells for the automotive industry

Efficient production of tube and profiled semi-finished products

In order to be able to cope with the current and future demands of modern motorcars and commercial vehicles, the automotive supply industry depends on efficient processes and technical innovations. The rational production of hollow profiles for body and chassis construction, exhaust gas technology and many other fields of application benefit decisively from automatic bending cells. They simplify the manufacturing process, offer a high degree of occupational safety, withstand nonstop operation effortlessly, and thus increase productivity.

Stricter threshold values for CO₂ emissions, more efficiency in fuel consumption, higher demands on safety and comfort – these and many other aspects force manufacturers and suppliers to build ever more components and to produce them smaller, lighter and more robust at the same time. The use of hollow profiles plays an important role in the fields of body and chassis construction as well as in exhaust gas technology in the meantime: In order to be able to ensure compact construction of future vehicle generations, pipes and tube profiles have to provide evermore complex geometries and smaller bending radii. At the same time, new high-strength and especially light-weight materials as well as reduced wall thicknesses make completely new demands on the machining of hollow profiles.

Automobile industry suppliers, who have to ensure precise, speedy and economical mass production despite exacerbated conditions, have to rely more than ever on tailor-made tube bending cells. They permit a completely automatic production of tube and profiled semi-finished products – from



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tube separation and weld seam positioning via bending process to integrated quality control, reshaping or separation systems and unmanned further transport of the semi-finished products. Among other things, they offer special advantages in the rational series production of injection pipes, coolant and axle tubes, tie rods as well as several body, exhaust gas system and chassis components.

Mandrel bending machine for the automotive supply industry

The centre piece of an automatic bending cell is usually a mandrel bending machine. In contrast to warm bending, the cold bending process of this machine guarantees especially fast and energy efficient machining processes and hardly changes the microstructure of the material. Moreover, the use of a bending mandrel permits the reliable production of very small radii even in case of thin-walled tubes. For the automotive supply industry especially, the Cologne-based tube bending machine manufacturer Schwarze-Robitec offers various mandrel bending machine series for rational mass production. Without exception they are freely programmable CNC controlled plants which can be integrated into the existing production processes without any problems. The machines of the CNC MR series, for example, have been optimised for the efficient production of tubes with different radii or bend-in-bend geometries. Fitted with stacked bending tools, they ensure minimal set-up times. "For every plant we offer a modular configurable accessory programme which we adapt flexibly to the specific project demands and user needs," says Schwarze-Robitec Managing Director Bert Zorn. "In such a way we develop an ideal production solution together with the customer." Moreover, the high level of automation of the individualised manufacturing cells ensures a maximised occupational safety.

Automatic bending lines

The integration of the bending plant into the existing manufacturing chain is decisive for output and competitiveness of a company primarily: Storage,



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transport and manufacturing techniques have to interlock like gear wheels. Schwarze-Robitec integrates machines into existing manufacturing cells, but they also supply completely harmonised fully-automatic tube bending machines – depending on demand and specification profile. If a high degree of automation is required, the fully-automatic machines will produce the best results. In order to ensure that fault-free bent tubes are further processed exclusively, the Cologne-based company also integrates measuring systems for quality control upon request. As a sought-after development partner of the automotive supply industry the bending specialist escorts its customers in the creation and implementation of new ideas and technologies. In this way, the freeform bending process was developed, among other things. It permits the efficient machining of large radii and complex geometries with different bending radii as well as high-strength materials. After all, hollow profiles with radii of more than 6 x D are fitted in motorcars and commercial vehicles.

Rewarding investments

Despite the individual equipment of every individual bending machine and automatic bending cell – the solutions share one advantage: They are well prepared for the increasing demands of the automotive industry. High speeds, short cycle times, maximum precision, ideal set-up times as well as long service life are natural features for all high-performance machines of Schwarze-Robitec.

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Pictures:

(1) CNC 100 E TB MR VA

(2) CNC 60 E TB MR VA

(3) CNC 80 E TB MR VA



Caption of picture (1) – CNC 100 E TB MR VA

Equipped with stacked bend tooling, the machines of the CNC MR series have been optimised for the efficient production of tubes with different radii or bend-in-bend geometries and ensure minimum set-up times.

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Caption of picture (2) – 60 E TB MR VA

Customised solutions – Schwarze-Robitec integrates machines in existing manufacturing cells, but also supplies fully-automatic machines for entire bending lines according to individual specifications of the customer.

Caption of picture (3) – CNC 80 E TB MR VA

The mandrel bending machines of Schwarze-Robitec designed for rational mass production are invariably freely programmable and CNC controlled.

Schwarze-Robitec GmbH – The Company

Having been founded in 1903, Schwarze-Robitec is among the international leading experts in the area of pipe bending machines. At the head office in Cologne, the cold-bending machine specialist currently employs 120 staff. The company is represented worldwide through long-standing partners. As early as in 1977, Schwarze-Robitec produced the world's first CNC pipe bending machine. Over 2,300 machines have been sold to date, many of which have been in unlimited use in production for over 30 years. In addition to pipe bending machines and bending tools, the range supplied by Schwarze-Robitec also includes pipe perforating machines, measuring systems and solutions in special engineering. Without exception, the Schwarze-Robitec list of references includes all of the prestigious manufacturers from the automotive industry, energy sector and shipbuilding. Furthermore, the company's solutions are used in aerospace and many other industries. More information about Schwarze-Robitec can be found online at www.schwarze-robitec.com.

Company Contact Schwarze-Robitec GmbH

Bert Zorn • Schwarze-Robitec GmbH

Olpener Straße 460 - 474 • 51109 Köln • Germany

Phone: +49 (0)221-89008-0 • Fax: +49 (0)221-89008-9920

E-mail: sales@schwarze-robitec.com • Internet: www.schwarze-robitec.com



Advertising Contact

Corinna Hellwig • Schwarze-Robitec GmbH

E-Mail: marketing@schwarze-robitec.com

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Press Contact

Susanne Unmack • additiv pr GmbH & Co. KG

Public relations for logistics, steel, investment goods and IT

Herzog-Adolf-Straße 3 • 56410 Montabaur • Germany

Phone: +49 (0)2602-950 99-12 • Fax: +49 (0)2602-950 99-17

E-mail: su@additiv-pr.de • Internet: www.additiv-pr.de