

Put it into motion.



**Forging** with Schuler.



**11,000 meters:  
The Temperature outside is  $-50\text{ }^{\circ}\text{C}$ . Flying speed is Mach 0.85.  
And you are comfortable.**

Modern passenger jets are safe, comfortable and economical. The latest generation of jet engines are a major contribution to this. Advanced engine technology with forged components that withstand the highest stresses – manufactured on Schuler forging equipment.

PUT IT INTO MOTION – FORGING WITH SCHULER.

## Tradition, experience and progress – our foundation



For over 150 years, the name Schuler has been synonymous with innovative technologies, quality and customer-oriented service in forging technology. Today, you can find us everywhere that forging systems are used safely and efficiently in production. This claim is backed by more than 5000 employees at our sites in Europe, the USA, Mexico, Brazil, India, China and Russia. Integration of Müller Weingarten AG and the Bêché brand continue to build on our position of technological leadership in global competition.

As a leading supplier of cold, warm and hot forging systems, we offer everything from a single source. From component development and process planning through to die making and turnkey installation of efficient production systems. Schuler forging technology offers you a decisive advantage over your competitors for productivity and quality. When you need high part quality, maximum production availability and reliable process engineering, we are ready to put it into motion for you.



**Drive forces. Steering forces. Acceleration forces.  
And you are comfortable.**

Modern wheel suspension systems ensure stable driving properties, comfortable damping, low vibration and noise transmission, long service life and light weight. Advanced automotive technology with forged components that withstand the highest stresses – manufactured on Schuler forging equipment.

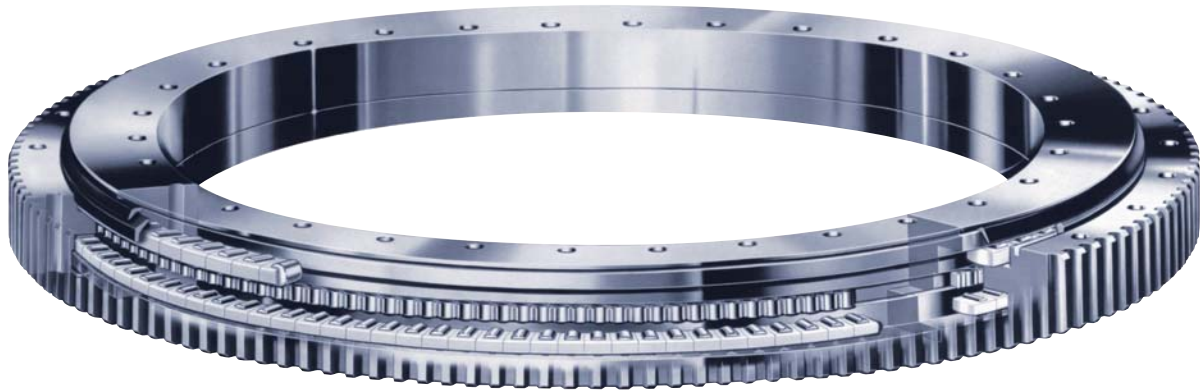
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## Development expertise, professional implementation, global service – for a future together



Whether in renewable energies, transportation engineering or in crude oil and natural gas extraction: the demand for forged components is rising in many future-oriented industries. Forging owes its growing importance to the technical innovations that have been achieved in recent years. Thanks to today's process reliability, forging can be used for manufacturing a wide range of components – tailor made to your requirements. In forging, production quality and efficiency depend heavily on the design of the forged part,

development of the forging process, material handling and, it goes without saying, the die equipment. Schuler offers you complete process development from a single source. For many years now, we have placed great importance on offering our customers advice and support in all areas relating to process and die technology. You can be sure of successful implementation with the service, training and project management that we offer.



**The capacity of wind increases with the third power of speed.  
And you benefit from it.**

Today's wind farms are extremely efficient in their ability to convert the kinetic energy of the wind into electrical energy.

Precise extreme sized bearings from German manufacturer Rothe Erde play a crucial role in this.

Advanced energy technology based on highly stressed ring blanks – manufactured on Schuler forging machines.

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## Your ideas and energy – the challenge we seek



We measure ourselves against the yardstick of the ideas and challenges of our customers. There is a wide variety of forged parts that can be produced, and a wide range of forging technologies to meet these challenges. Regardless of the size of your company, Schuler has experience with an extensive range of custom equipment concepts to give you the most efficient solution to meet your individual needs in cold, warm or hot forging, as well as in precision forging.

At its heart, the forging business is based on experience. Therefore, when developing machines, we believe in synergy – by working on developments jointly with our customers to achieve optimum performance.

Put it into motion. Let's get things moving.

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## We offer full system process expertise

### Cold forging


- Extrusion
- Ironing
- Upsetting/setting
- Reducing
- Piercing



A collection of cold-forged metal parts, including a dark blue handle, several silver-colored shafts and pins of varying lengths and diameters, and a large, dark, multi-pointed gear or sprocket.

### Warm forging

- Extrusion
- Upsetting/setting
- Piercing



A collection of warm-forged metal parts, including several dark grey gear-like components with multiple teeth and a large, dark, flanged ring or flange.

### Hot forging

- Closed die forging
- Forging of ring blanks
- Upsetting
- Open die forging
- Extrusion
- Piercing/trimming



A collection of hot-forged metal parts, including a dark grey gear-like component, a large, dark, flanged ring, a glowing orange-red hot-forged ring blank, and a long, glowing orange-red hot-forged shaft with a threaded section.

Increasing degree of deformation

Increasing dimensional accuracy

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## Systems for cold forging

Cold forging allows components to be manufactured with very high dimensional accuracy combined with impressive output rates. By the very nature of the process, there is no scale formation or shrinkage, and the die wear is also very low. The material is not heated prior to forging in this process. The strain-hardening resulting during forging makes it possible to achieve elevated component strength levels while using low-cost raw materials.

Cold forging machines are suited to a wide range of components. This range includes components for engines, gearboxes and suspension systems that have small length/diameter ratios as well as long-shaft components such as drive shafts, gearbox shafts and axles with large length/diameter ratios. Our customers from all over the world manufacture CO<sub>2</sub> cartridges, shock absorbers and hollow shafts on ironing presses.



Hydraulic cold extrusion presses



Hydraulic ironing presses



Hydraulic presses for manufacturing CNG gas cylinder tanks



Multi-station mechanical presses with link drive

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## Systems for warm forging

Systems for warm forging offer advantages to produce components with large shape changes and high precision. Prior to the first forging station, the components are heated to a temperature between 700 °C and 950 °C, depending on the application. The flow stresses are much lower than in the case of cold forging. Also, there is less distortion and scale formation than in hot forging.

Mechanical presses with eccentric or link drives are used in this temperature range. The most advantageous position for hot forging is when the die is almost entirely closed, which

means that no flash is formed. The tight tolerances and lack of surface decarburization allow net-shape geometries or very small machining allowances to be achieved, thereby reducing the amount of material that needs to be used. The lower temperature compared to hot forging permits major energy savings.



Multi-station mechanical presses  
with link drive



Multi-station mechanical presses with  
eccentric drive

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## Systems for hot forging

Short-stroke hammers



Counterblow hammers



Screw presses



Crank forging presses



Multi-station mechanical presses with eccentric drive



Hydraulic forging presses



Hydraulic presses for forging ring blanks



Hydraulic presses for forging aluminum wheels

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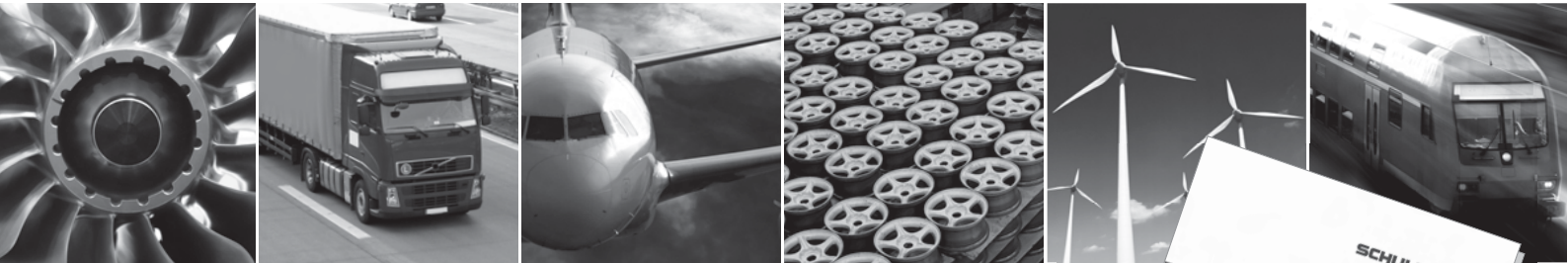
Schuler offers a wide range for hot forging that includes hammers, screw and crankshaft forging presses, as well as hydraulic forging presses for an extremely wide range of applications. In hot forging, the starting material is heated to a temperature at which recrystallization proceeds in parallel with forging.

The material does not undergo work hardening, and can be formed almost without restrictions. The choice of forging process enables the grain profile in the component to be adapted to the requirements. This leads to improved dynamic component properties.

Put it into motion.  
Let's get things moving.

## Forging with Schuler.

Please send the fax to: +49 751 401-2694



- Please send me further information.
- Please contact me to arrange a meeting.
- Please send me the new comprehensive brochure **"The entire world of forging"**.
- Please send me information about Schuler trade shows.



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Company, department

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Surname, first name

Function

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Street address

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Town, post code

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Telephone, fax

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E-mail

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