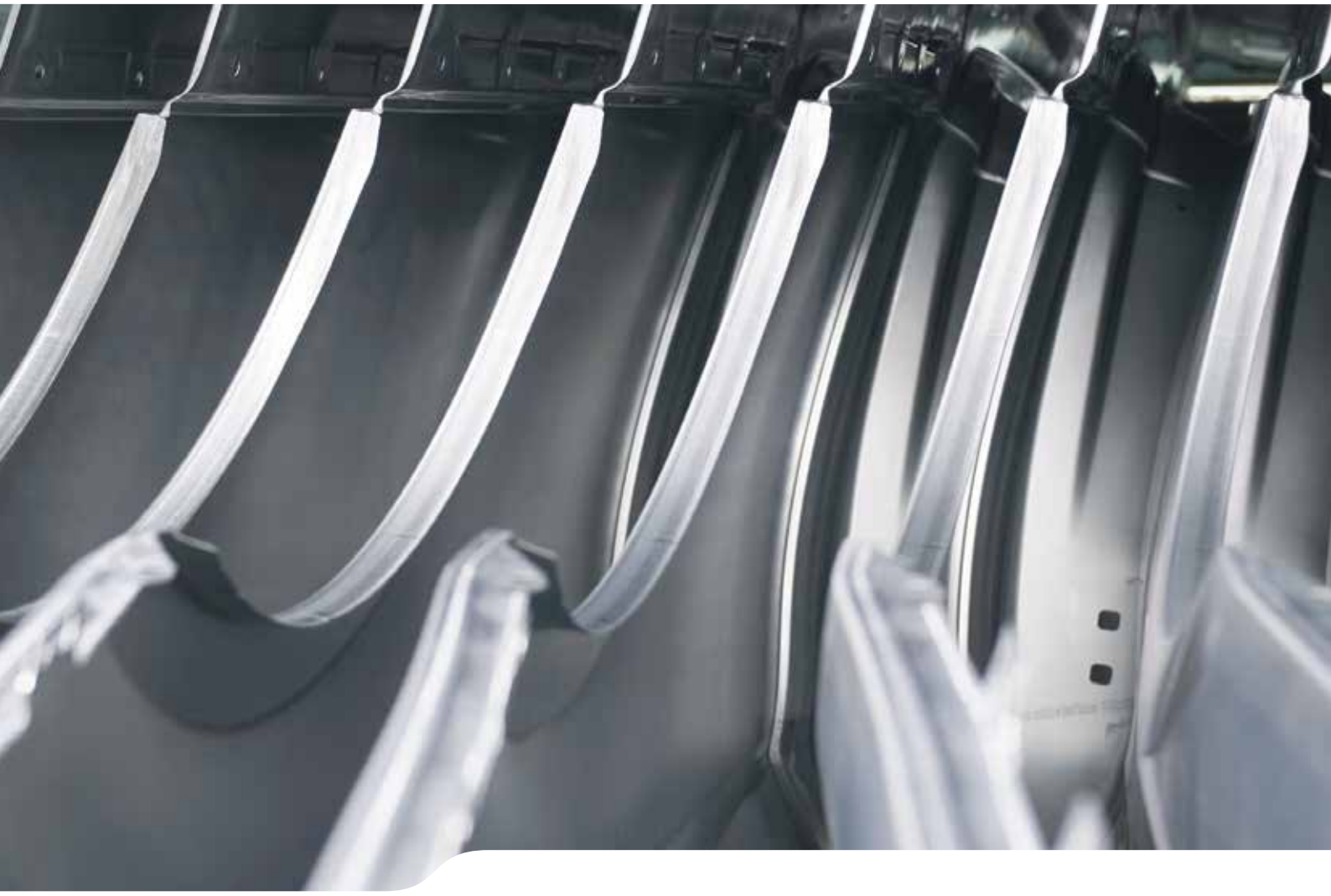


THE ENTIRE WORLD OF METAL FORMING

SCHULER

Member of the ANDRITZ GROUP

Components for sheet metal forming.

CONTENT.
THE WHOLE WORLD OF SHEET METAL FORMING.

WELCOME TO THE PRESS PLANT.
WELCOME TO SCHULER.

Hot stamping press at the Göppingen location.

As the technological and global market leader for forming technology, we supply presses, automation solutions, dies, process know-how and services for the entire metalworking industry and lightweight automobile construction. Our customers include automotive manufacturers and suppliers, as well as companies in the forging, household appliance, packaging, energy and electronics industries. Schuler is a leading supplier of minting presses and implements system solutions for a wide range of different high-tech sectors. Our company has a presence in approximately 40 countries with roughly 6 600 employees. Schuler is majority-owned by the Austrian ANDRITZ Group.

We support you in all phases of a project - from planning new press shops to the integration of forming systems in existing structures. We implement the installation, commissioning and production launch for the systems and automation components in close coordination with your Planning departments, technical Purchasing, press shop and Maintenance. You thereby benefit from the comprehensive knowledge of our project teams from installations across the world. We will also be in daily communication with you, the users of mechanical and hydraulic press technology, for modernization, remodeling, transfer and performance increase of existing forming systems. Together, we implement solutions to increase economic efficiency in the press shop.

Obtain an overview of our performance spectrum: We are at home where top parts quality, maximum system availability and safe press technology are required day by day - from cutting the blanks via the forming process to destacking of finished components. Our solutions provide the right answers for the requirements of the future - e.g., the increased use of high and higher strength steel or the integration of further process steps in the forming process.

Challenge us.

MORE INFORMATION

www.schulergroup.com

01

AT A GLANCE

BLANKING LINES

Schuler blanking lines offer the complete process chain - from coil to blank stack - from a single source. They work with state-of-the-art safety and control concepts. Their modular design makes customized solutions for the individual user possible. All system components have been proven in practice, are precisely aligned with each other and stand for top availability and reliability. Expansions for processing aluminum and high-strength steel can be retrofitted easily. No matter where the Schuler system will be used - our Service is available worldwide.

MORE INFORMATION

www.schulergroup.com/automotive

BLANKING LINES

INDIVIDUAL SOLUTIONS, FLEXIBLE IN ITS APPLICATION

Blanking line with servo press.

MAXIMUM OUTPUT WITH SERVODIRECT PRESSES

In addition to the use of conventional presses (mechanical or hydraulic), systems for the manufacture of form blanks are nowadays preferably equipped with servo presses. But thanks to the Schuler ServoDirect technology, the movement sequences of the press can be individually adapted to the diverse blanking dies. On one hand, this significantly increases the output performance and service life of the dies. On the other hand, the systems are designed with this technology for processing a broad variety of materials such as aluminum or high-strength steel. Even surface-sensitive material can be processed gently with a press blanking line at top output performance.

All upstream and downstream automation components, such as the roll feed unit powered by servo motors or the flexible Stop2Drop stacker, support the high press performance and ensure high-performance dynamics in blank cutting. A high degree of automation ensures the quick product change and smooth production process.

Blanking line with cross-cut shear.

Blanking line with laser cell.

BLANKING LINE WITH CROSS-CUT SHEAR - THE SOLUTION FOR SIMPLE CUTS

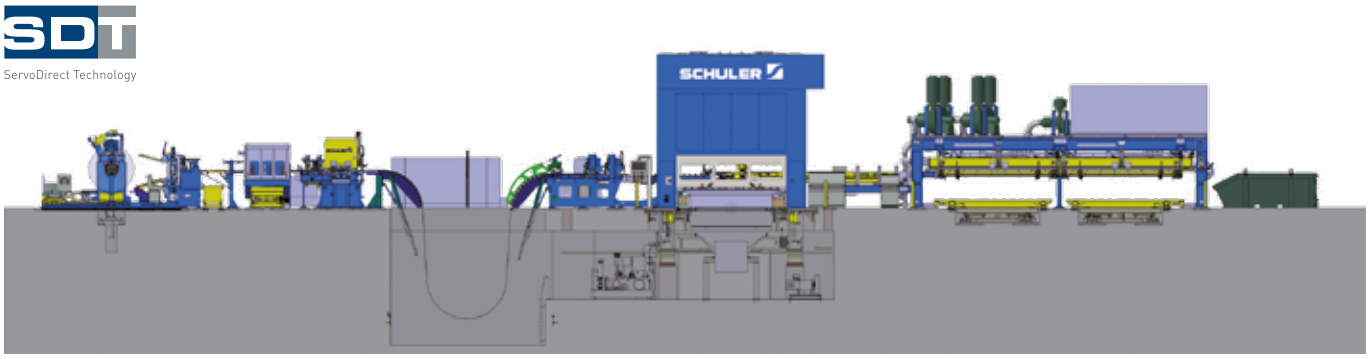
Schuler offers blanking lines that are equipped with cross-cut shears for the manufacturing of rectangular, trapezoid or arc cutting blanks. When the manufacturing process is limited to simple cuts, cross-cut shears are the perfect solution - not only with respect to their acquisition costs but also with respect to their output performance. The shears can be equipped with an optional automatic die change.

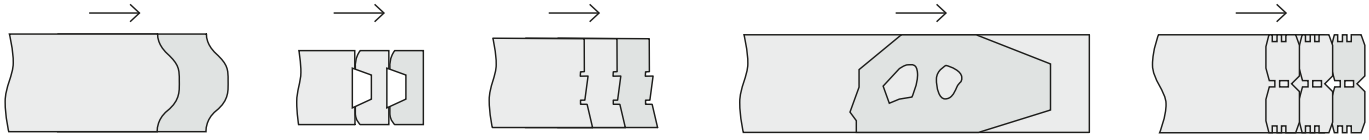
LASER CUTTING: FLEXIBLE PRODUCTION, COMPACT SYSTEM DESIGN

Blanking lines with laser are especially suitable for production processes involving frequent product changes because no dies are used for laser cutting. This completely eliminates an investment in dies, die maintenance and die storage. Because of its compact design, the system can be used in tight spatial conditions and low hall heights. With its innovative DynamicFlow Technology, it offers highly flexible production conditions at comparably low investment costs. The laser cutting system processes a broad variety of materials such as aluminum and high-strength steel and also ensures a high level of productivity even with surface-sensitive external panel blanks.

BLANKING LINES

BLANKING LINE WITH PRESS





Cuts when using a press with dies (stroke rate max. 105 min^{-1}).

PRODUCTION RATE OF BLANKING LINE WITH SERVO PRESS

Figures based on stacking unit version
STOP 2 DROP & FLY 2 DROP

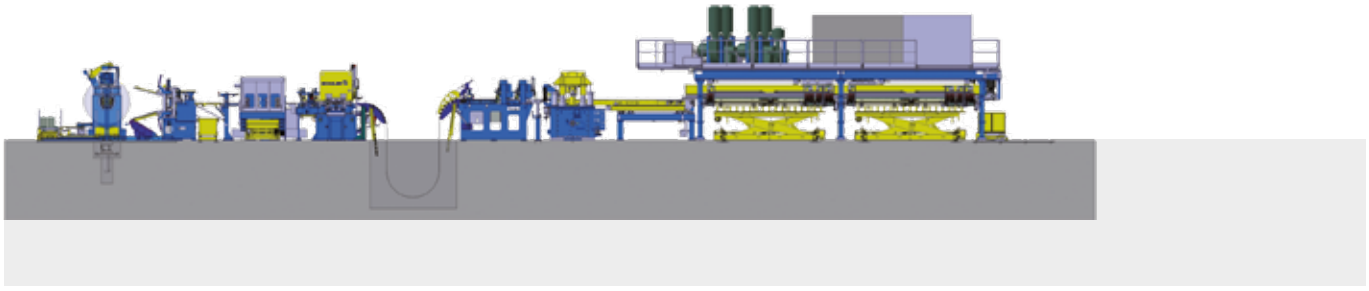
Feed length [mm]	300	500	750	1 000	1 500	2 000	2 500	3 000	3 500	4 000	4 500
Servo press basic version [stroke / min]	75	73	66	61	51	43	38	31	28	27	24
Servo press with higher motorization [stroke / min]	93	82	73	67	51	43	38	31	28	27	24

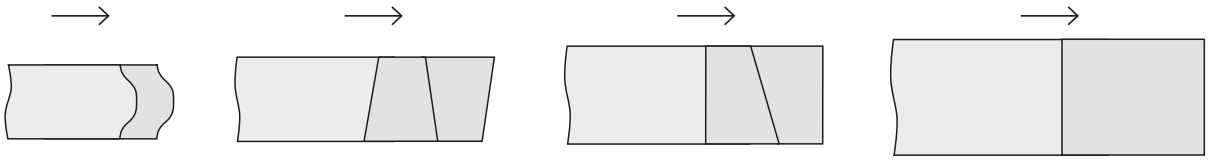
THE ADVANTAGES

- Perfect for the production of contoured blank production
- High production rate
- High degree of automation
- Gentle on dies through ServoDirect Technology
- Proven technology

BLANKING LINES

BLANKING LINE WITH CROSS-CUT SHEAR





Cuts when using cross-cut shear (stroke rate max. 120 min^{-1}).

PRODUCTION RATE OF BLANKING LINE WITH FOUR-PILLAR CROSS-CUT SHEAR

Figures based on stacking unit version
STOP 2 DROP & FLY 2 DROP

Feed length [mm]	300	500	750	1 000	1 500	2 000	2 500	3 000	3 500	4 000	4 500
Cross-cut shear [stroke / min]	108	90	77	68	51	43	38	31	28	27	24

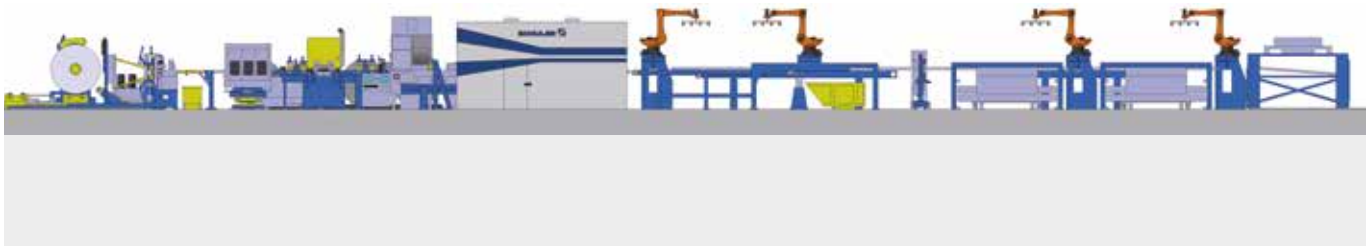
THE ADVANTAGES

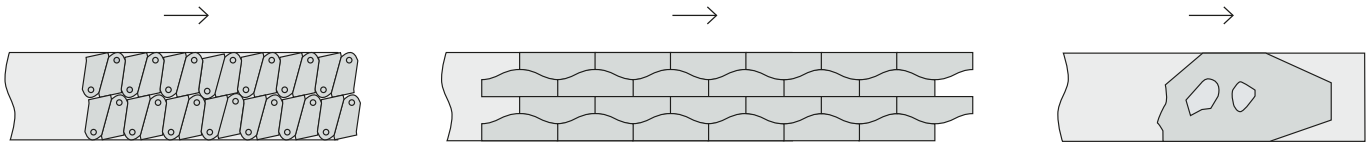
- Perfect for the production of rectangle, trapezoid or arc cut blanks
- Attractive price-performance ratio
- High production rate
- High degree of automation
- Proven technology

BLANKING LINES

BLANKING LINE WITH LASER CELL

DynamicFlow Technology





Cuts with use of laser cutting heads.

PRODUCTION RATE
BLANKING LINE WITH LASER

The production rate of a laser system must always be viewed depending on the sheet thickness, blank contour and laser output. We will be happy to determine the possible production rate based on your product data.

MORE INFORMATION

www.schulergroup.com/laserblanking

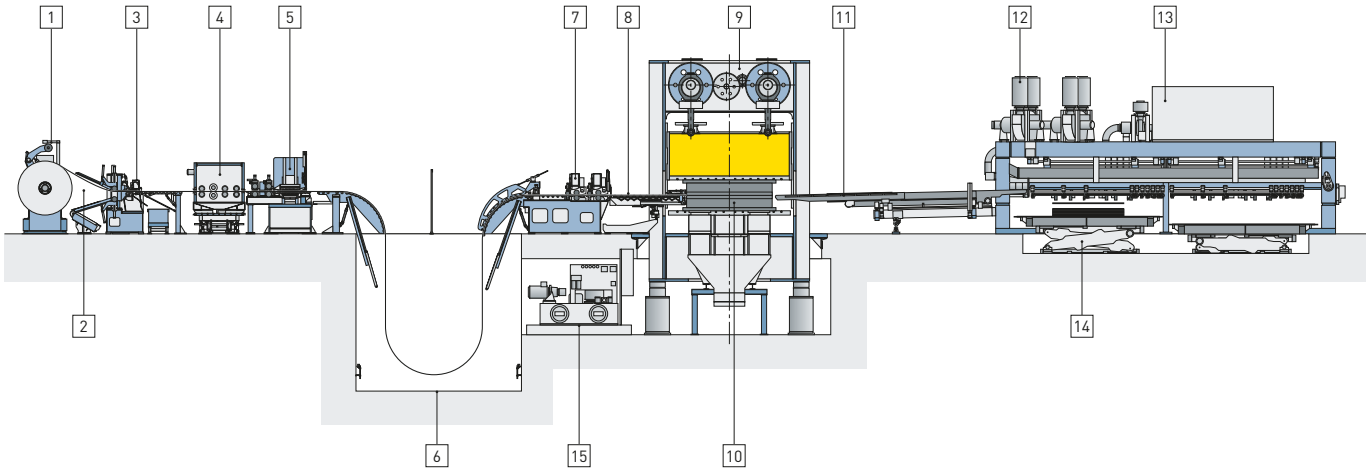
THE ADVANTAGES

- Suitable for all shapes of blanks
- No costs for dies and die storage
- Faster product change resulting in a high degree of availability
- Adjustment of blank contours after production start-up
- Simultaneous production of different blank shapes
- Reduced material costs
- High energy efficiency
- Reduced investment volume
- Space-saving system design

BLANKING LINE WITH SERVODIRECT TECHNOLOGY

IN PRACTICE

CUSTOMER: AUTOMOTIVE SUPPLIER, PEOPLE'S REPUBLIC OF CHINA



1. *Decoiler*
2. *Coil infeed*
3. *Crop shear*
4. *Coil washing machine*
5. *Straightener*
6. *Loop pit*
7. *Roll feed unit*
8. *Telescopic roller train with left-over coil feed*
9. *Blanking press with ServoDirect Technology*
10. *Blanking die*
11. *Telescopic conveyor*
12. *Vacuum blower for stacking aluminum blanks*
13. *Blank stacker*
14. *Stack cart*
15. *Hydraulic unit*

THE REQUIREMENTS

Delivery of a blanking line for the production of contoured blanks with the shortest possible downtimes during coil change.

- Cutting steel, aluminum and high-strength steel up to 1 200 Newton / square millimeter
- Coil width: 2 150 millimeters
- Coil thickness: 0.5 to 2.5 millimeters
- Coil weight: 35 tons

THE SOLUTION

Fully automated blanking line with cutting press in ServoDirect Technology.

- Coil loading cart for two coils
- Movable decoiler for 35 tons
- Inserting device with dirt and cleaning rolls
- Cropping station
- Coil washing machine
- Embossable straightener with two cassettes (17 rolls)
- Loop equipment
- Roll feed unit with weld seam detection
- Blanking press with 8 000 kN in ServoDirect Technology
- Forklift in Fly2Drop and Stop2Drop forklift technology (energy efficient vacuum production through blower)

02

AT A GLANCE

HYDRAULIC PRESSES

They must be flexible. We have the machines for that. Schuler hydraulic press systems are impressive with their extraordinarily versatility, which provides you with the efficient series production of a broad spectrum of components - from the blank to the finished part. Innovative hydraulic solutions thereby ensure increased output, production reliability and top quality. Whether in classic sheet metal forming, die tryout, die hardening, in internal high-pressure forming, fine blanking or processing fiber-reinforced plastics: Schuler hydraulic presses withstand any challenge - seven days a week, 24 hours a day.

MORE INFORMATION

www.schulergroup.com/hydraulic_press

HYDRAULIC PRESSES

FLEXIBLE USE WITH HIGH PRODUCTION RELIABILITY

Automated production cell for the manufacture of automotive parts.

ECONOMICAL, FLEXIBLE AND PRODUCTION RELIABLE

Because of their versatility, hydraulic presses offer a broad range of applications in the press shop. They can be used as an individual press, automated press system, transfer press or tryout press. A combination with coil line, blankloader or three-axis transfer system results in turnkey system solutions for economical parts manufacturing. Their design is modular and they offer a broad range of expansion options to the user.

Equipped with hydraulic bed cushion, cutting impact reduction, slide parallelism and step operation, hydraulic presses offer all requirements for efficient production at the supplier press shop. A data analysis system supports the press operator with the simple fault diagnosis of the complete system and increases the productivity by optimizing the process.

THE ADVANTAGES

- Can be used as individual press, press system or as transfer press
- Production alternative for a wide range of parts
- Increased production rate through dynamic step operation
- User-friendly user interface
- High flexibility through cutting impact reduction and hydraulic bed cushion
- Parallel control increases part quality and protects the dies
- Precise eight-way slide guidance

HPX press.

HPX presses for a wide range of parts.

MODEL OVERVIEW OF HYDRAULIC PRESSES

Model	HPX-250	HPX-400	HPX-630	HPX-800	HPX-1000	Side clearance [mm]	
Press force [kN]	**2 500**	**4 000**	**6 300**	**8 000**	**10 000**		
Bed length [mm]	**Bed width [mm]**					**Standard**	**Optional**
1 000	1 300	–	–	–	–	600	800
	1 600	1 600	–	–	–		
1 300	2 000	2 000	2 000	–	–	850	1 100
	–	2 500	2 500	2 500	–		
1 600	–	–	2 500	2 500	2 500	1 000	1 300
	–	–	3 000	3 000	3 000		
Stroke/shut height [mm]	600 / 900		800 / 1 200		800 / 1 200		
	900 / 1 200		1 000 / 1 500		1 000 / 1 500		

Upon request, HPX presses are available with alternative bed sizes and press forces as special design.

HYDRAULIC DRAW PRESS FOR THE MANUFACTURE OF DOOR SILLS

IN PRACTICE

CUSTOMER: AUTOMOTIVE SUPPLIER, CZECH REPUBLIC

Hydraulic press for the manufacture of side sills and roof braces.

The maximum production rate of the system is 12 strokes/minute.

Semi-automatic die change in 15 minutes.

THE REQUIREMENTS

Delivery of a production system for finishing preformed side sills and roof braces.

- Acceptance of the preformed blank
- Transfer of the components through the press
- Punching and forming specified contours

THE SOLUTION

Hydraulic stamping and coining press with three-axis gripper transfer system, stamping and forming dies.

- Press force: 2 500 kN
- Bed size: 2 500 x 1 300 millimeters
- Slide parallelism with spindle adjustment
- Acceptance of the roll molded semi-finished material from a robot
- Transfer of the parts into the press and through the die stages
- Semi-automatic die change in 15 minutes
- Maximum production rate: 12 strokes/minute

HYDRAULIC PRESSES

PRESSES FOR THE NON-AUTOMOTIVE INDUSTRY

Automated hydraulic press line for manufacturing stainless steel sinks.

HYDRAULIC PRESSES FOR THE NON-AUTOMOTIVE INDUSTRY

Hydraulic presses are also an economic solution for a broad range of manufacturing tasks for the household appliance industry and for manufacturers of stainless components. Not only individual presses but also automated manufacturing systems strengthen the users competitiveness. The systems are characterized by optimal reproducibility, high availability, fast die changes and the easy adjustment to changed production conditions.

Predefined press configurations in combination with a broad range of automation components and die change concepts make it possible to address individual manufacturing needs. In addition, the systems are marked by high operating comfort.

THE ADVANTAGES

- Reliable systems with high availability
- Maximum flexibility
- Optimal system configuration from tested components
- Highly easy to maintain through good accessibility to all components
- High parts quality because of robust design
- Process analyses with integrated data analysis system

HYDRAULIC PRESS FOR THE MANUFACTURE OF HEAT EXCHANGER PLATES

IN PRACTICE

CUSTOMER: MANUFACTURER OF HEAT EXCHANGER PLATES

Hydraulic coining press. Press force: 25 000 kN.

Fully automated production system for the manufacture of heat exchanger plates.

Heat exchanger plates in different sizes.

THE REQUIREMENTS

The demands for the fully automated forming of heat exchanger plates: high pressing forces, broad range of plate geometries, tight tolerances in the stamping depth, process reliable production and high system availability.

THE SOLUTION

The hydraulic coining press with multi-cylinder system in short stroke technology is in the center of the fully automated manufacturing system. The system permits a flexible adjustment of press force ranges to the various geometries and a uniform stamping depth without shimming through an evenly distributed application of force.

THE MANUFACTURING SYSTEM

- Blanking line system with coil line
- Lifting bar transfer system for the parts transport in the press
- Loading and unloading feeder
- Foil winding units
- Fully automated die change system
- Master control
- Press for trimming the edge and fluid openings

THE ADVANTAGES

- Flexible automatic adjustment of the pressure circuits depending on the various plate geometries
- Optimal press force distribution through planar application of force and individual press pressure setting
- Bending and underlay of dies no longer required
- Deflection deviation between bed and slide is reduced to a minimum

HYDRAULIC PRESSES

HYDRAULIC TRANSFER PRESSES

Hydraulic transfer press. Press force: 25 000 kN.

Feeder loading station with blank separation.

ECONOMIC EFFICIENCY STEP-BY-STEP

Hydraulic transfer presses allow part manufacturing with progressive dies. Hydraulic solution such as the Schuler ring valve technology or the dynamic step operation ensure high production rates.

Designed as individual or multi-slide presses (with one or more bed and/or slide cushions as option), the press force ranges from 5 000 kN to 30 000 kN.

The active electrohydraulic slide parallelism control and the hydraulic cutting impact reduction ensure high component quality and reliable forming processes. It is possible to integrate additional options directly in the die.

THE ADVANTAGES

- Simple adaptation to different dies
- Freely programmable slide kinematics
- Pressure time programmable in UT
- High availability
- Deep components can be manufactured in return
- Nominal force available throughout the complete stroke
- Simple running in of the dies

03

AT A GLANCE

MECHANICAL PRESSES

Schuler stamping and forming systems are successfully used in any number of industries. They allow the flexible and efficient production of top quality metal parts and master challenges such has high batch sizes, complex part geometries and processing of high-strength materials. Our range of products for the efficient series production of high-quality components is as broad as the diversity of requirements in the different industries. Whether C-frame press, automatic blanking press, knuckle-joint press, servo press or conventional mechanical multi-die or multi-slide press, we will work with you to find the right solution for your success.

MORE INFORMATION

www.schulergroup.com/stamping_Cutting

SCHULER LIVE

Your direct contact to the Servo TechCenter:
Erfurt, Germany | Phone: +49 751 401-2606 | E-Mail: stc-erfurt@schulergroup.com

Schuler TechCenter
Explore Technology

MECHANICAL PRESSES

C-FRAME PRESSES

SERIES C-*BASE*LINE AND C-*FLEX*LINE

C-*BASE*line 400 kN.

RELIABLE, COMPACT, ROBUST

The C-*BASE*line (CBL) presses are ideal for the cost-effective production of even the smallest batches. The C-frame presses with a press force of 250 and 400 kN impress with their compact size and the robust and stable design. The presses require very little maintenance and have a long service life due to their time-controlled recirculating oil lubrication.

The C-*BASE*line (CBL) presses are optionally available for manual inserting operations (250 and 400 kN) or for automated operation (400 kN). Thanks to the standardized and modular design, the presses are quickly installed and ready for operation. The components, which have continuously been optimized over the years, ensure reliability and component quality.

MODEL OVERVIEW OF C-FRAME PRESSES

Model	CBL 25	CBL 40	CFL 63	CFL 100	CFL 160	CFL 250
Press force [kN]	**250**	**400**	**630**	**1 000**	**1 600**	**2 500**
Bed dimensions [mm]	465 × 360	650 × 480	820 × 590	950 × 660	1 250 × 750	1 400 × 860
Slide dimensions [mm]	220 × 160	370 × 300	470 × 415	540 × 515	850 × 630	1 000 × 742
Shut height [mm]	270	240	320	370	440	470
Slide stroke [mm]	5 – 75	5 – 100	8 – 120	10 – 130	12 – 180	19 – 250
Slide adjustment [mm]	50	70	100	100	110	130
Dimensions h × w × d [mm]	2 125 × 1 180 × 1 200	2 440 × 1 270 × 1 480	3 070 × 1 310 × 1 600	3 225 × 1 400 × 1 910	3 734 × 1 740 × 2 460	4 413 × 2 070 × 2 882
Stroke rate [1 / min]	150	60 – 140	30 – 120	30 – 90	20 – 70	20 – 60

C-*FLEX*line 630 kN with Touch-Panel.

MODULAR, FLEXIBLE, ERGONOMIC

The C-*FLEX*line (CFL) presses have a modular design and can be adapted to changed production conditions at any time. Whether manual loading or automatic operation, the presses can be converted quickly and ergonomically.

With two different control concepts, the presses can meet a wide range of requirements. The "eco" version has an easy-to-use controller with a text display integrated in the control cabinet. The "comfort" model is equipped with a 12-inch multi-function touch panel with a swivel arm. It also has an Internet connection which makes remote diagnostics possible.

THE ADVANTAGES

- Modular presses for greater production flexibility
- Durable, stress relief annealed press frame
- Ergonomic design of the press takes leg room and working height into consideration
- Back gears allow for a high production capacity even at low stroke rates
- Fast and safe changeover process with manual or motor-powered stroke and slide adjustment, brake resistance, and set-up mode with forward and reverse drive
- Hydraulic overload protection system for the press and die
- Frequency converter allows for a continuously variable slide speed
- Electronic cam switch gives precise control of the angle of peripheral devices combined with a process monitoring function ("comfort" variant)
- Pretensioned, low-maintenance, wear-resistant roller guides prevent the slide from tilting, which results in more accurate parts and a longer die service life

MECHANICAL PRESSES

PRESSES WITH FLYWHEEL DRIVE

MC AND MCF SERIES

Automatic blanking press: the economical solution for a wide range of parts.

MC SERIES - WIDE VARIETY OF PARTS AND A HIGH PRODUCTION RATE

Automatic blanking presses (MC series) are standard machines with a comprehensive selection of standard equipment for stamping conventional sheet metal parts from coils. In the 1 250 to 5 000 kN range, they are a cost-effective solution for manufacturing parts at a high production rate.

THE ADVANTAGES

- Minor bending thanks to a rigid welded structure
- Long sliding guides absorb off-center forces perfectly
- Two transverse shafts compensate rotational forces without counterweights
- Quiet drive with gearwheel with helical toothing
- Quick conversion for new die
- Hydraulic overload protection system protects the machine and die

MODEL OVERVIEW OF AUTOMATIC BLANKING PRESS (MC)

Model	MC 125	MC 200	MC 300	MC 400	MC 500
Press force [kN]	**1 250**	**2 000**	**3 000**	**4 000**	**5 000**
Bed length [mm]			**Bed width [mm]**		
1 400	1 000				
1 800		1 100			
2 200			1 300		
3 000				1 300	1 400
Shut height [mm]	450	550	650	750	800
Slide adjustment [mm]	150	150	150	200	250
Slide stroke [mm]	20 – 180	20 – 220	40 – 315	40 – 315	40 – 315
Stroke rate [1 / min]	30 – 150	30 – 130	25 – 100	20 – 80	20 – 70

High-speed automatic blanking press with up to 300 strokes per minute.

MCF SERIES - FOR SMALL PARTS WITH NARROW DIE CLEARANCE

The high-speed automatic blanking press (MCF series) is designed for manufacturing components at production rates of up to 300 strokes per minute. Pretensioned rollers without play are used to guide the slide and thereby guarantees that the process has the required level of precision, creating the perfect conditions for manufacturing small components with a minimal die clearance.

THE ADVANTAGES

- Fast and stable press type
- Production rate up to 300 strokes/minute
- Stress relief annealed upright
- Long die service life
- Longitudinal shaft machines with rotational slide mass balancing
- Roller guides for the slide
- The planetary gear train ensures high capacity even at low speeds
- Fully automatic stroke and slide adjustment shortens changeover times
- The press and the die are protected by a continuously adjustable overload protection system

MODEL OVERVIEW OF HIGH-SPEED AUTOMATIC BLANKING PRESS (MCF)

Model	MCF 63	MCF 80	MCF 100	MCF 125
Press force [kN]	**630**	**800**	**1 000**	**1 250**
Bed length [mm]	**Bed width [mm]**			
1 000	700	700		
1 300			800	800
Shut height [mm]	350	350	400	400
Slide adjustment [mm]	70	70	100	100
Slide stroke adjustable [mm]	9 – 80	9 – 100	11 – 100	11 – 120
Stroke rate [1 / mm]	30 – 300	30 – 300	30 – 280	30 – 280

MECHANICAL PRESSES

PRESSES WITH FLYWHEEL DRIVE

TMK SERIES

These versatile knuckle-joint presses are easy to operate and change over, which guarantees high availability and cost-effectiveness.

The machines in the TMK series are genuine all-rounders that can be used to emboss, calibrate, bend, pierce, draw, and stamp a variety of components.

TMK knuckle-joint presses are all-rounders with press forces from 3 000 to 15 000 kN and bed lengths from 3 000 to 3 660 millimeters. The modular design of these presses means that they can be combined with a range of automation components and die change systems, making them the ideal solution for a variety of different production tasks.

EFFICIENT AND MODULAR – FOR THE BEST RESULTS THROUGHOUT THE ENTIRE LIFE CYCLE

The knuckle-joint presses from the TMK series are ideally suited to a wide range of forming jobs. The systems can cost-effectively blank, draw, emboss, punch, and calibrate parts in a single sequence of operations. The different stages in the process can also be combined with one another.

The knuckle-joint presses can be used with transfer or progressive dies. Accompanying coil feed lines consisting of a decoiler, straightener, and roll feed unit are also available. Mechanical or electronic transfer systems ensure that the materials and parts are transported safely.

DIE CHANGE SYSTEMS

The systems available include hook-in brackets, mechanical or motor-driven die change brackets, automatic die change frames, and tandem die change carts. This ensures that the right solution can be provided to meet every requirement.

MODEL OVERVIEW OF KNUCKLE-JOINT PRESSES (TMK)

Model	TMK 250	TMK 400	TMK 800	TMK 1 000
Press force [kN]	**2 500**	**4 000**	**8 000**	**10 000**
Bed depth [mm]	**Bed width [mm]**			
1 500	1 000			
2 500		1 100		
1 500			1 500	
1 500				1 500
Shut height [mm]	575	700	900	1 000
Slide adjustment [mm]	50	150	200	300
Slide stroke [mm]	120	200	300	300
Stroke rate [1/min]	20–110	20 – 80	10–60	15–40

BENEFITS

- The movement that is characteristic of knuckle-joint drives ensures an ideal impact velocity and results in high-precision components and a long die service life.
- The widely positioned pressure points make the press highly resistant to tilting.
- The extreme rigidity of the overall system guarantees a high level of repeatability, even if there are variations in the thickness and strength of the material.
- The presses are ideal for processing high-strength steels.
- A reduction in the cutting impact protects the die and lowers the noise level.
- The pneumatic counterbalance system ensures that all the drive components and bearings have a long service life
- Two counter-rotating drives compensate for the lateral forces and reduce the stress on the slide guide system
- The pretensioned eight-fold roller guide for the slide guarantees a narrow die clearance.
- The dry-running roller guides with lifetime lubrication ensure that there is no oil in the die installation area
- A careful choice of materials, a special surface finish, and a dispensing system for the lubrication result in a highly efficient slide bearing design

MECHANICAL PRESSES

PRESSES WITH FLYWHEEL DRIVE

RMK, EMK, BMK AND EMKH SERIES

Flat radiator with different embossing stages.

Typical components are engine and gearbox components, locks and fittings, hand tools, cutlery as well as insignias and medals.

RMK SERIES – THE RADIATOR SPECIALISTS

The RMK series knuckle-joint presses are the specialists when it comes to the manufacture of flat radiators. They are available with press forces of 3 550 or 15 000 kN as individual equipment versions or complete system solutions – for fast, highly efficient processes.

THE ADVANTAGES

- High stroke rate of up to 85 strokes/min
- High rigidity of the overall system
- Impressive stability
- Nearly impact-free contact of dies

EMK SERIES – THE PROBLEM SOLVERS

The EMK series knuckle-joint presses with press forces from 3 600 to 10,000 kN provide fast and cost-effective production and are the problem solvers for manufacturing high-precision and complex embossing and calibration parts.

THE ADVANTAGES

- Low center of gravity
- Low die wear thanks to almost shock-free contact with the workpiece
- High rigidity and stability of the system
- Low construction height
- Highly smooth running through matured bottom drive technology

EMKH 300 with noise protection cabin for further processing of disc blanks - manufactured on a BMK high-speed automatic stamping press.

Typical components are technical discs, shims, blanks, shaft retaining rings, link plates and locking washers.

BMK AND EMKH SERIES –THE HIGH PERFORMERS

BMK and EMKH series high-speed automatic blanking presses deliver quality from the first to the last part. They have a long service life with low wear and ensure reliable production of large volumes.

Typical components are technical discs, shims, blanks, shaft retaining rings, link plates and locking washers.

The BMK delivers up to 3 000 parts per minute with high-quality parts from the conveyor. The dynamic slide mass balancing compensates the vibration of the press and guarantees exceptionally smooth running. The horizontal structure supports the compressed air-controlled parts removal.

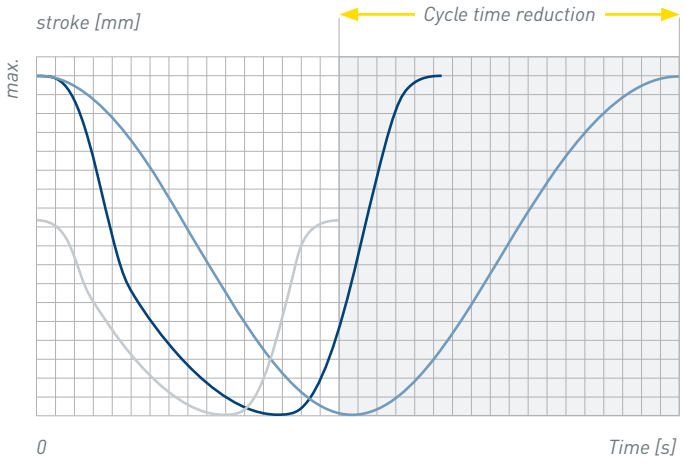
The EMKH uses a slope conveyor that individually positions the blanks for embossing. The knuckle-joint bottom drive is directly connected to an active part in the die, permitting stroke rates of up to 750 parts per minute, depending on the component.

THE ADVANTAGES

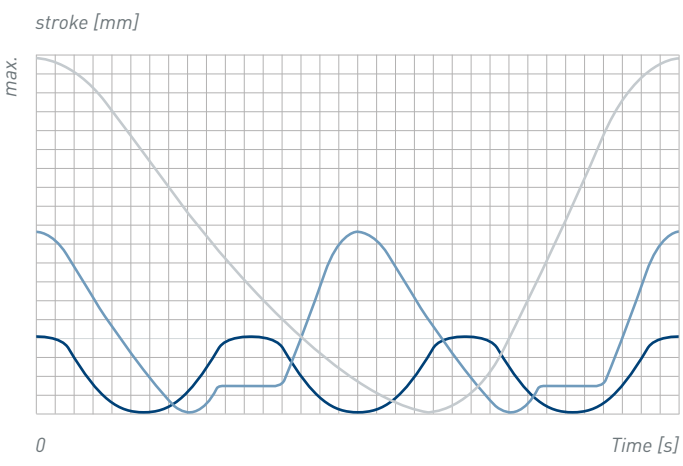
- Compact, space saving press drive
- High rigidity and stability of the systems
- The almost shock-free contact with the workpiece of EMHK series presses results in very low die wear

MECHANICAL PRESSES

PRESSES WITH SERVO DRIVE



The ability to program the slide movement reduces the cycle time while leaving the forming speed unchanged.



The ServoDirect technology enables the slide movement to be individually programmed.

Schuler ServoDirect Technology stands for maximum economic efficiency: The individual programming of the slide movement reduces the cycle time at the same or lower forming speed.

PROGRAMMABLE SLIDE MOVEMENT CURVES

The use of highly dynamic torque motors facilitates easy and fast programming of various motion sequences in a press cycle. The slide kinematics can thus be adapted easily and quickly to the process parameters of the die and the automation, and optimized for a fast operating speed.

OSCILLATING STROKE MODE

Oscillating stroke mode allows the slide stroke heights to be programmed freely. Through the reversing movement of the torque motor, the eccentric drive of the slide moves in a pendulum motion, alternating with a stoke forwards and then a stroke backwards. This significantly increases the clock rate and energy efficiency.

DIE LIFE SPANS AND COMPONENT QUALITY

The die life span can be significantly increased by optimally adjusting the forming speed in the critical process range. In addition, it is possible to reduce the influence that fluctuating coil quality has on the forming process, and thereby on the quality of the component.

ENERGY MANAGEMENT

Optional energy management systems store energy released during the regenerative braking phase of the press cycle. This energy is then available for the following motor-driven acceleration phase. This results in a reduction of the connected load and smooths current peaks.

Free programming of the slide movement curves on a servo press with monoblock design and 8 000 kN press force.

THE ADVANTAGES

- Significant increase in output in comparison with conventionally driven mechanical presses
- Programmable stroke heights and movement sequences allow for maximum production flexibility
- Perfectly adjusted movement sequences lead to improved part quality and a longer die service life
- Maximum availability for production mode
- Ideal for machining high-strength steels
- The efficient drive solution reduces energy costs
- Maintenance-friendly in comparison to conventionally driven mechanical presses, as there are fewer mechanical components

MECHANICAL PRESSES

PRESSES WITH SERVO DRIVE

CSP / MSP SERIES

Single-rod automatic blanking press with
CSP100 ServoDirect technology.

Dual-rod automatic blanking press with
MSP 200 ServoDirect technology.

AUTOMATIC BLANKING PRESS WITH SERVODIRECT DRIVE

Automatic blanking presses with the latest generation of ServoDirect Technology are considerably more cost-effective. The option of adjusting the stroke height, together with the reversing movement of the torque motor (oscillating stroke), leads to a significantly higher production rate. At the same time the adjustment of the slide kinematics to the process parameters results in high-quality components and a long die service life.

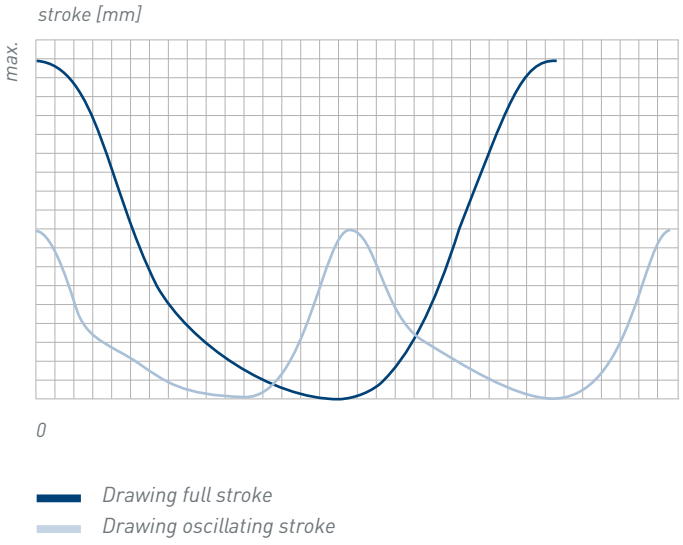
The drive system, which requires no lubrication and has no play, consists of two electrically connected, freely programmable drive units with torque motors and knuckle joints.

This significantly increases the reliability of the processes because there is no possibility of the process lubricants and press lubricants becoming mixed. This press generation is therefor also perfect for the packaging and food industry.

The pre-programmed slide movement curves are designed for different processes: Whether blanking, forming, cutting, embossing, bending or drawing – the presses can be adapted quickly and flexibly to any requirement. An optional curve generator is available to freely program the slide movement.

Experience the quality you expect from Schuler in a new press concept with an attractive purchase price!

Economical manufacturing at an attractive price.

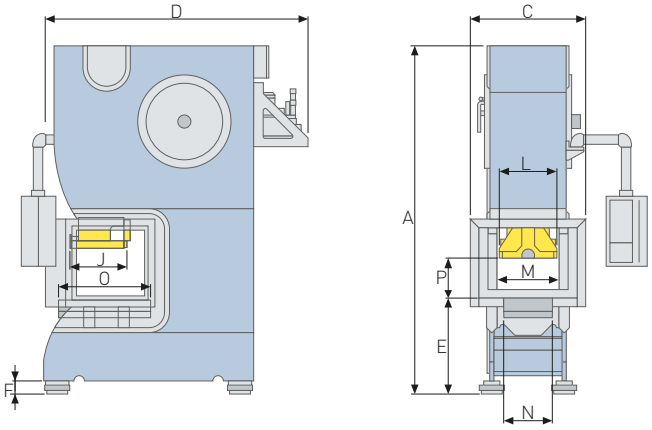


Examples for preprogrammed slide movement curves.

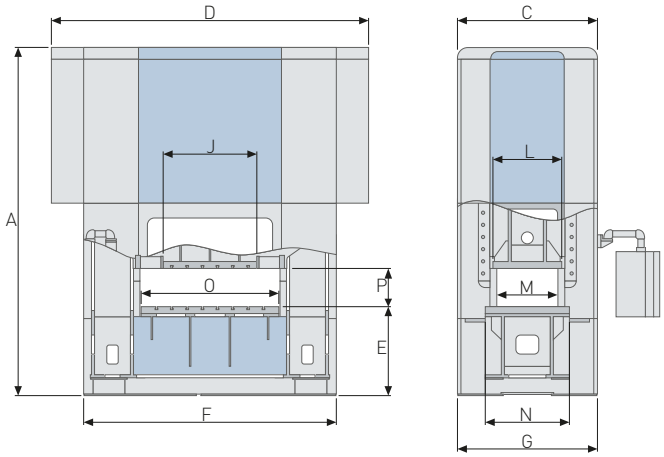
THE ADVANTAGES

- Significant increase in output in comparison with conventionally driven mechanical presses
- Five preprogrammed slide movement curves and an optional curve generator allow for maximum flexibility in the production process
- Touch screen with a configurable menu, shopping cart, and favorites functions ensures easy and intuitive operation
- A drive train without play and widely positioned pressure points, which allow for a smaller die clearance, result in more accurate components
- Effective adjustment of the slide movement to the process parameters leads to a longer die service life
- Intelligent energy management system and high energy efficiency: the electric power consumption is reduced by up to 50%
- Condition-based maintenance concept with integrated maintenance plan and innovative condition monitoring system
- The drive system requires no lubrication, which leads to more reliable processes and greater efficiency
- Attractive purchase price

DATA AND FACTS



CSP 100 single-rod automatic blanking press



MSP 200 Dual-rod automatic blanking press

MODEL OVERVIEW OF AUTOMATIC BLANKING PRESS WITH SERVODIRECT DRIVE (CSP / MSP)

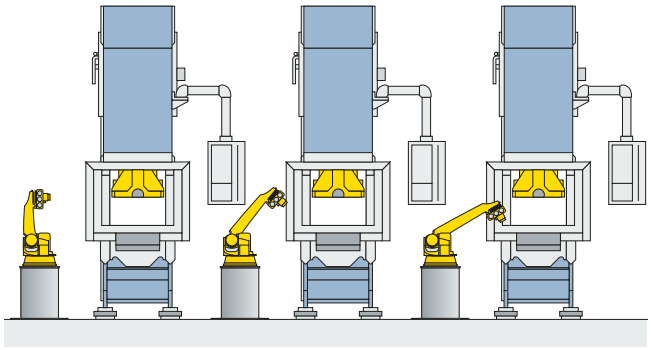
MODEL	CSP 100	MSP 200	MSP 400
Press force [kN]	**1 000**	**2 000**	**4 000**
Nominal power [kW]	30	2×47	–
Slide dimensions, L×J [mm]	550×460	900×1 797	2 500×1 200
Clamping plate, N×O [mm]	950×660	1 100×1 800	1 600×300
Opening in the bed (to the bottom) [mm]	280×590	200×380/200×400/200×380	200×380/200×400/200×380
Passage in the upright (to the back), M [mm]	410	–	–
Slide adjustment [mm]	80	150	200
max. stroke rate (oscillating stroke) [1/min]	130	130	55
Oscillating stroke [mm]	20–160	20–160	60–300
Shut height, P [mm]	370	500	600
Weight with basic equipment [kg]	7 500	26 000	67 000

DIMENSIONS OF AUTOMATIC BLANKING PRESS WITH SERVODIRECT DRIVE (CSP / MSP)

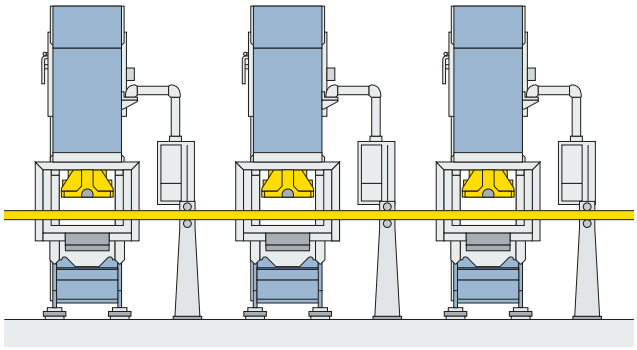
MODEL	CSP 100	MSP 200	MSP 400
Press height, A* [mm]	3 320	4 553	6 048
Press width, C [mm]	1 222	4 148	2 610
Press depth, D [mm]	2 519	1 841	5 240
Bed height (including plate), E* [mm]	925	1 163	1 735
Width of press upright, F [mm]	85	3 296	5 240
Depth of press upright, G [mm]	–	1 841	2 610

*Incl. damping elements.

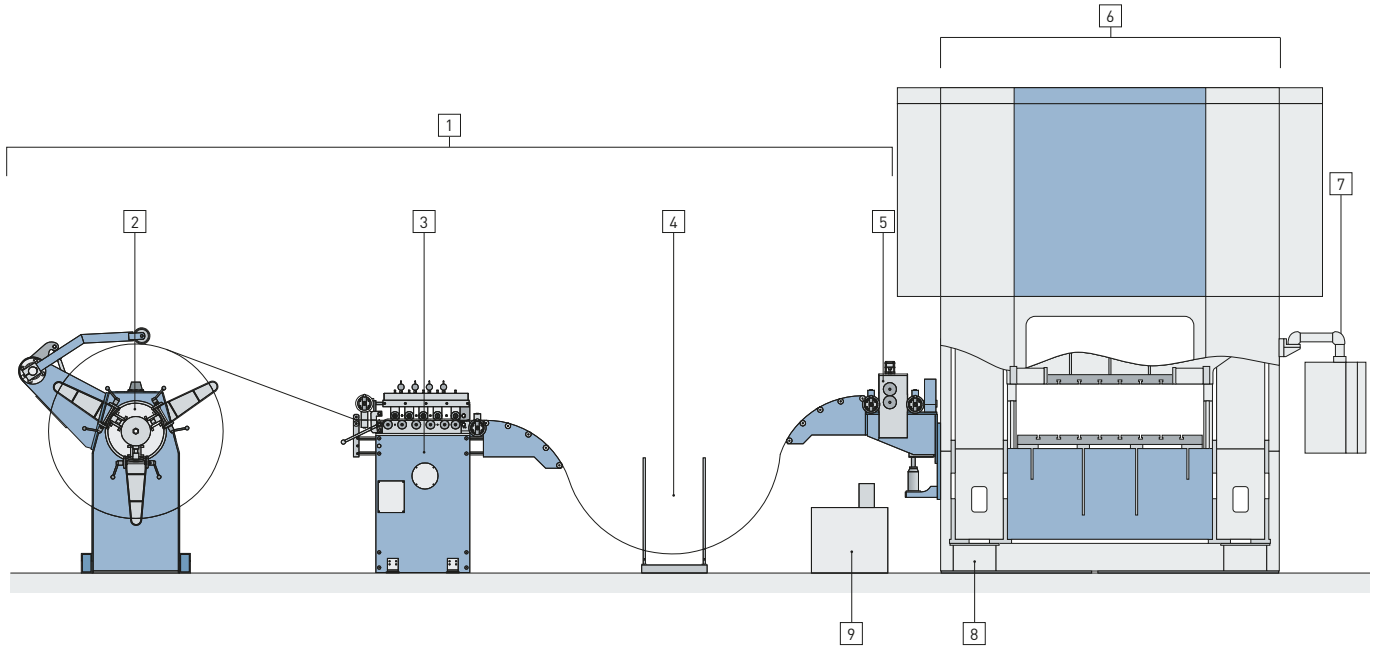
CSP 100 WITH ROBOT AUTOMATION



CSP 100 WITH TRANSFER AUTOMATION



MSP 200 WITH COIL FEED LINE



1 *Coil feed line*
2 *Decoiler*
3 *Straightener*
4 *Loop control*
5 *Roll feed unit*
6 *Automatic blanking press*
7 *CCS control panel (Compact Control System)*
8 *Damping element*
9 *Hydraulic unit*

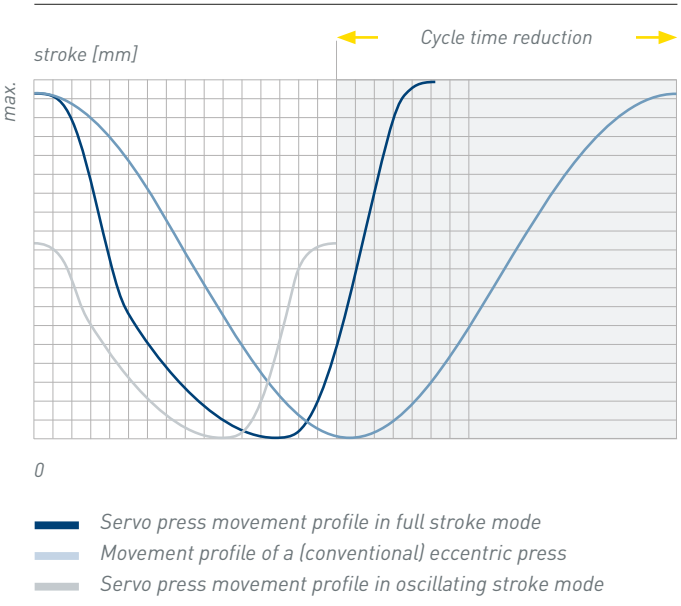
Convince yourself. We will be happy to consult you with respect to the layout of the systems and demonstrate the performance of our presses for you with a live test.

MECHANICAL PRESSES

PRESSES WITH SERVO DRIVE

MSD SERIES

Servo presses in monoblock design with a press force of 400 kN.



The ability to program the slide movement reduces the cycle time while leaving the forming speed unchanged.

RELIABLE COMPONENTS

The monoblock press frame is made as a stress-free annealed welded structure. Double helical eccentric gears are used for improved axial guidance and reduced noise. The slide roller guide is pretensioned without play. These components ensure a high level of system availability.

TRYOUT

Maximum flexibility is required when trying out new dies. The set-up speed can be changed using a hand wheel. The slide can be stopped in any position and its direction of travel can also be reversed if necessary. The quick lift function enables the slide to travel to top dead center at any point during the setup process.

SETUP

A number of die change systems, such as tandem change carts and an extending bed plate, are available to keep changeover times to a minimum.

MODEL OVERVIEW OF SERVO PRESS IN MONOBLOCK DESIGN (MSD)

Model	MSD 250	MSD 400	MSD 630	MSD 800	MSD 1000
Press force [kN]	**2 500**	**4 000**	**6 300**	**8 000**	**10 000**
Bed length [mm]	**Bed width [mm]**				
2 000	1 100				
2 500					
3 050		1 400			
4 000			1 800	1 800	1 800
Shut height [mm]	550	700	1 000	1 000	1 000
Slide stroke [mm]	32 – 160	60 – 300	80 – 400	80 – 400	80 – 400
Slide adjustment [mm]	150	250	300	300	300
Stroke rate [1/min]*	3 – 160	3 – 90	3 – 60	3 – 60	3 – 60

All the information relates to systems with a two connecting rod design.
* The stroke rate depends on the programmed stroke height and kinematics.

THE ADVANTAGES

- Significant increase in output in comparison with conventionally driven mechanical presses
- Short delivery times and efficient spare part management as a result of standardized modules
- Programmable stroke heights and movement sequences allow for maximum production flexibility
- Perfectly adjusted movement sequences lead to improved part quality and a longer die service life
- Die tryout times are reduced because of the set-up and tryout functionality with a hand wheel
- The efficient drive solution reduces energy costs

VIDEO

Servo press with monoblock design with 2 500 kN press force, coil line and roll feed unit live in production with 137 strokes per minute.

PLAY VIDEO

www.schulergroup.com/youtube

MECHANICAL PRESSES

PRESSES WITH SERVO DRIVE

TSD SERIES

Servo presses in tie rod design.

FLEXIBLE, RELIABLE, EFFICIENT

Servo presses in tie rod design can process a wide variety of components and materials from simple stamped parts to highly complex structural parts made of materials ranging from aluminum to high-strength steel. The material is supplied from or with blankloader.

The user interface developed by Schuler includes a curve generator, called the "Optimizer", which carefully coordinates the slide kinematics and automation parameters to give highly reliable processes.

The tryout functions with a hand wheel and intelligent die change systems with semi- or fully automatic die changes lead to short set-up and changeover times.

THE ADVANTAGES

- Programmable stroke heights and movement sequences allow for maximum production flexibility
- Significant increase in output in comparison with conventional mechanical presses
- Movement sequences that are perfectly adjusted to meet the forming requirements lead to improved part quality and a longer die service life
- Ideal for processing high-strength steels because the installation system is resistant to cutting impacts
- Maximum availability as a result of the long service life and low maintenance requirements
- The set-up and tryout functions lead to shorter die tryout times

MODEL OVERVIEW OF SERVO PRESS IN TIE ROD DESIGN (TSD)

Model	TSD 800		TSD 1000	TSD 1100	TSD 1250		TSD 1600		TSD 2000	TSD 2500	TSD 3200
Press force [kN]	**8 000**		**10 000**	**11 000**	**12 500**		**16 000**		**20,000**	**25 000**	**32 000**
Bed length [mm]	**Bed width [mm]**										
4 000	1 800										
4 600	1 800	2 200*	1 800								
5 000				2 200*							
5 100				2 200*	1 800	2 200*	1 800				
6 000								2 500*			
6 100					1 800	2 200*	1 800	2 500*	2 500*	2 500*	2 500*
7 000									2 500*	2 500*	2 500*
Shut height [mm]	1 100	1 100	1 100	1 200	1 100	1 200	1 100	1 300	1 400	1 400	1 400
Slide stroke [mm]	120 – 450	120 – 500	120 – 450	150 – 600	120 – 450	150 – 600	150 – 450	200 – 600	200 – 700	230 – 700	230 – 700
Slide adjustment [mm]	300	300	300	300	300	300	300	300	300	300	300
Stroke rate [1/min] TSD**	3 – 60	3 – 50	3 – 50	3 – 45	3 – 45	3 – 40	3 – 40	3 – 36	3 – 34	3 – 30	3 – 30

All the information relates to systems with a two connecting rod design. Further sizes upon specific request.
* Four rod design. ** The stroke rate depends on the programmed stroke height and kinematics.

VIDEO

Servo press with 16 000 kN press force and cross-cut shears for upstream blank cutting. Production of components from chromium steel and galvanized sheets in transfer and progressive mode.

PLAY VIDEO

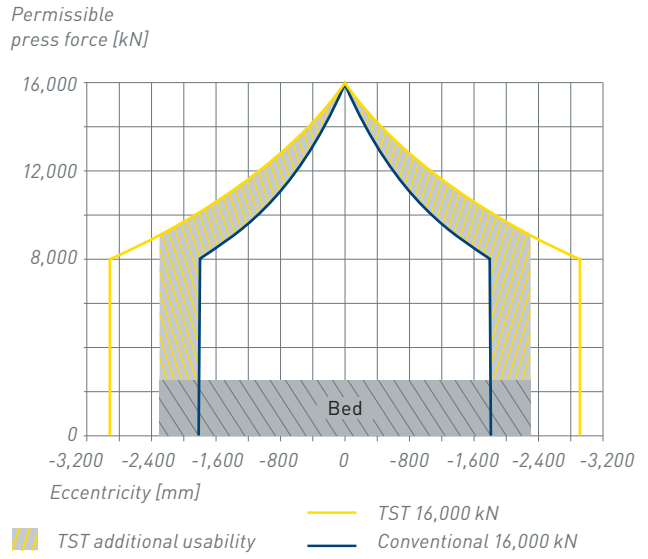
www.schulergroup.com/youtube

MECHANICAL PRESSES

PRESSES WITH SERVO DRIVE

TST SERIES

Transfer press with TwinServo technology.



The higher eccentric load capacity of the TST series provides additional flexibility for method planning.

TAKING SERVO TECHNOLOGY TO THE NEXT LEVEL

Presses with TwinServo technology feature a drive concept consisting of two separate torque motors in the press bed. Synchronization is carried out electronically and its arrangement leaves sufficient room for drawing cushions and scrap chutes.

The concept allows for highly flexible die design: the increased single stage forces and the much higher eccentric load capacity of the presses open up new possibilities for method planning. The extremely high tilt resistance, combined with the reduction in deflection, leads to an improvement in the quality of the parts, reduces stresses on the die, and shortens the die tryout times.

TwinServo presses are only 6 m high, which is considerably shorter than conventional models. The total area needed is reduced by around 30%.

The first transfer press with TwinServo technology at the Schuler Forming Center in Erfurt, Germany has a press force of 16 000 kN and is fully automated with components from Schuler.

MODEL OVERVIEW OF TRANSFER PRESS WITH TWINSERVO TECHNOLOGY (TST)

Model	TST 1000	TST 1250	TST 1600	TST 2000	TST 2500
Press force [kN]	10 000	12 500	16 000	20,000	25 000
Bed length [mm]					
4 600	1 800				
5 100		2 200			
6 100		2 200	1 800 2 500	2 500	2 500
7 300				2 500	2 500
Number of pressure points	4	4	4	4	4
Slide stroke [mm]	150 – 450	200 – 600	150 – 600	200 – 700	200 – 700
Slide adjustment	300	300	350	400	400
Shut height* [mm]	1 100	1 200	1 400	1 400	1 400
Stroke rate [1/min]**	3 – 40	3 – 40	3 – 40	3 – 30	3 – 30

* Largest stroke at the bottom, with clamping plate. ** The stroke rate depends on the programmed stroke height and kinematics.

THE ADVANTAGES

- Innovative drive concept with two electronically synchronized torque motors in the press bed
- A larger eccentric load with the same press force
- A 30% reduction in deflection
- Active parallel positioning of the slide
- A better view of the work area
- Sound insulation reduces noise levels for operating staff
- No oil in the work area
- A smaller footprint

MECHANICAL PRESSES

STAMPING AND FORMING SYSTEMS

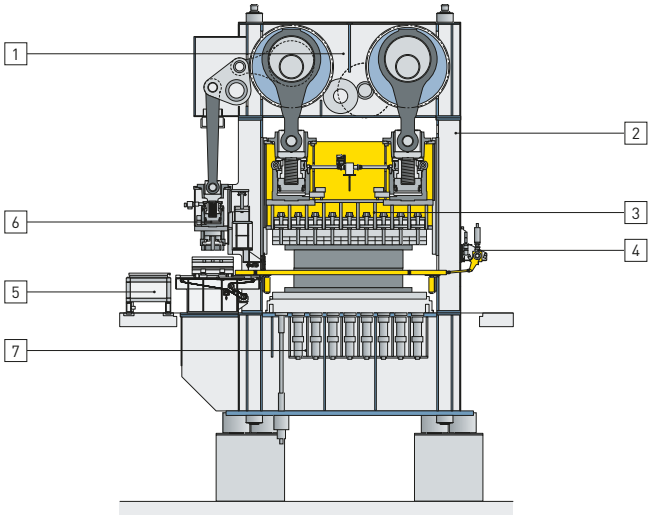
SLICE PRESSES

Mechanical slice press.

CUSTOMIZABLE FORMING STAGES

Slice presses are especially different from transfer presses because of the individual adjustability of the individual forming stages. Another differentiation criterion of slice presses is the external blanking slide for integrated blank production. Slice presses are built as single-slide and also multi-slide machines in a press force range from 2 500 to 60 000 kilonewton. Mechanical or electronic rail transfer systems are used for the parts transport. The advantages are a high production rate and high availability, the individual stage adjustment in every stage and, if needed, the external blanking slide for integrated blank production.

SLICE PRESS WITH EXTERNAL BLANKING SLIDE



1. *Crown with press drive*
2. *Press upright*
3. *Drawing slide*
4. *Transfer system*
5. *Change cart*
6. *Blanking slide*
7. *Drawing cushion*

MECHANICAL PRESSES

STAMPING AND FORMING SYSTEMS

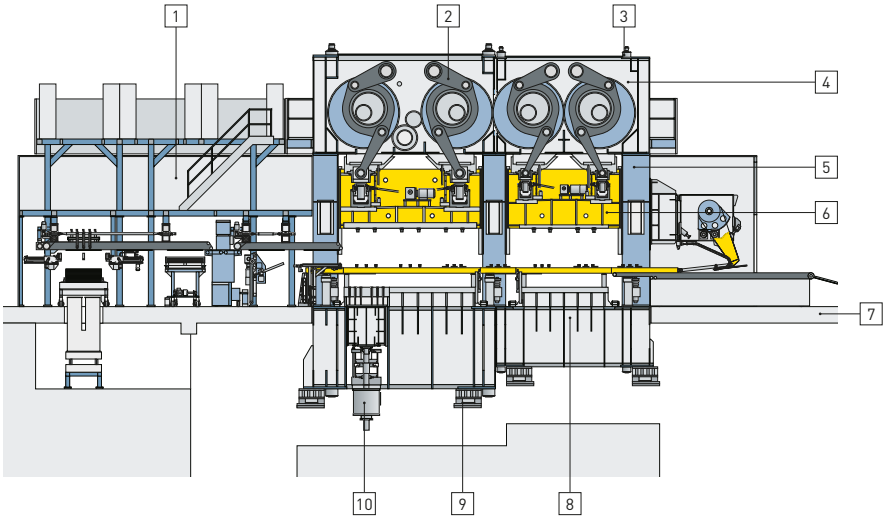
MULTI-SLIDE TRANSFER PRESSES

Multi-slide transfer press.

MULTI-FUNCTIONAL MASS PRODUCTION

Multi-slide transfer presses are impressive in practice as functional unit of press, transfer and material feed. The design is guided by the range of parts, die size and the forming process. In accordance with the range of parts, which also determines the size and number of dies, single-slide, dual-slide or three-slide machines are used. The parts are transported via a rail transfer system, which is optionally equipped with a curve bound or electronic drive.

MULTI-SLIDE TRANSFER PRESS

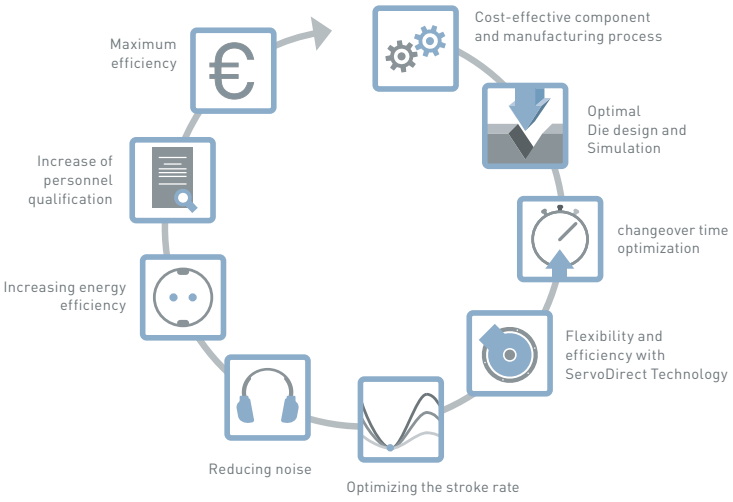


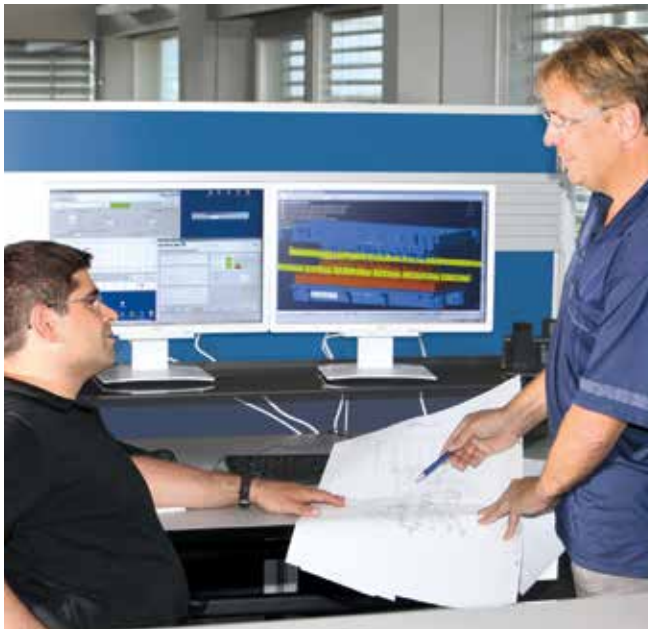
1. *Blank feeder*
2. *Transfer press*
3. *Tie rods*
4. *Crown*
5. *Upright*
6. *Slide*
7. *End of line belt*
8. *Sliding bed*
9. *Damping element*
10. *Drawing cushion*

MECHANICAL PRESSES

PROCESS MANAGEMENT – TRAINING

FOR BLANKING AND FORMING SYSTEMS





Digital simulation for efficient die designs.

From component simulations to individual training concepts, it is essential to focus on the entire production process in order to achieve the maximum cost savings in the long term.

INDIVIDUAL PROCESS CONSULTANCY

When it comes to improving the efficiency of your production process and reducing the costs, having the best production systems is simply not enough. To fully exploit all economic opportunities, the entire process must be analyzed and optimally harmonized.

Schuler is a highly competent provider of training, services, and intelligent software solutions that will help you to achieve your goals. We cover the entire process chain and all our offerings are designed to boost your company's profits.

Our courses help you to exploit the potential of your system to the full.

A PRACTICAL APPROACH

Since the company's very early days Schuler has focused on performance and quality. We apply the same high standards to our training courses. because even the best system is of little use if you do not fully exploit its potential. We show you how the right training courses can help you optimize your entire production process.

Our experts provide practical knowledge to improve the efficiency of your production processes.

A BIG STEP AHEAD

Our highly skilled staff, who undergo ongoing training, will put you in the position to impress your customers with your high-quality services. Our seminars are run by expert trainers, who provide practical expertise and use the latest teaching methods. We offer training courses both at your site and in our TechCenters.

MORE INFORMATION

www.schulergroup.com/stamping_Cutting

04

AT A GLANCE

AUTOMATION OF PRESSES

Our automation combines press, automation devices and dies perfectly and impresses with precision and process reliability. With Schuler automation components, you profit from higher production rates, even when processing higher-strength steel or aluminum.

MORE INFORMATION

www.schulergroup.com/automation

AUTOMATION OF PRESSES

BLANKLOADER

Blankloader with transfer system to destack the blanks.

Integrated system solution. Blankloader and coil line on a servo press. Press force: 16 000 kN.

In addition to the blankloaders, which have proved successful in practice, Schuler also offers a special solution for the automation of transfer presses. It consists of a movable combination of coil line in compact design and blankloader. For the press operator, this option opens up a wide range of possibilities with respect to the range of materials and he can respond to all requirements of efficient parts production with flexibility. The control system is compatible with press and transfer.

AUTOMATION OF PRESSES

COIL FEED LINES

Coil feed line in compact design.

COIL FEED LINES IN COMPACT DESIGN

Our coil feed lines in compact design were developed specifically for the demands of customers from the supplier industry. They provide process reliability for the highest material demands. The coil feed lines are optimally suited for the manufacture of structural parts and for processing high-strength materials - including in the higher coil thickness range. Additionally, they are the perfect solution for use in smaller spaces. Our product portfolio includes coil feed lines in different basic equipment versions and is designed for all press types.

The modular concept allows the flexible configuration of the systems, for which we offer a comprehensive option package. This allows you to respond to new requirements at any time - with manageable investments.

BASIC DATA OF THE BASIC EQUIPMENT VERSIONS

Coil width max. [mm]	1 850
Coil thickness max. [mm]	12
Coil weight max. [t]	27

Schuler Power Line.

COIL FEED LINES IN LONG DESIGN:

COMPACT LINE PRODUCT LINE

The Schuler Compact Line was specifically developed for small coil widths and tonnages. It comprises coil widths up to 800 millimeters and tonnages up to 7.4 tons for requirements with a manageable degree of automation.

POWER LINE PRODUCT LINE

In the expansion of the Compact Line product line, the coil feed lines of the Product Line stand for large coil widths and tonnages. As material feed with optionally high degree of automation for high-speed, progressive die and transfer presses, these Schuler coil feed lines meet the demands from the automotive and supplier industry. Coil widths of up to 1 850 millimeters and coil weights of up to 27 tons allow the processing of coil material for structural and shell parts including blanks.

THE ADVANTAGES

Flexibility

- Quick availability of systems and components
- Scalable weight classes: Light > Medium > Heavy
- Wide range of retrofittable options
- Can be configured for the manufacture of structural and shell parts
- Implementation of customer-specific requirements
- Rapid retrofitting
- Flexible connection to existing press systems

Variable degree of automation

- Manual or motor-driven adjustment of the upgrade axes
- Visualization

Attractive price-performance ratio

- Significant cost advantage because of the modular system structure and pre-configured components
- Energy-efficient through optimal drive design
- Very low maintenance effort

Comfortable system operation

- Intuitive operating concept
- Online diagnostics

TECHNICAL DATA OF THE COMPACT LINE

COMPACT LINE	L-BS 0450	L-BS 0650	M-BS 0800
Coil weight max. [t]	3	5.5	7.4
Coil width min. [mm]	110 [40]	110 [40]	110
Coil width max. [mm]	450	650	800
Coil width min. [mm]	0.5	0.5	0.5
Coil thickness max. [mm]	4	4	6
Straightening rolls Ø [mm]	70	70	70
Loop radius [mm]	1 000	1 000	1 300

MODEL OVERVIEW AND TECHNICAL DATA OF THE POWER LINE

BASIC EQUIPMENT VERSIONS OF THE COIL FEED LINES IN LONG DESIGN

Coil data for weight class "Light"

POWER LINE	L-BS 0650	L-BS 0800	L-BS 1050	L-BS 1300	L-BS 1600
Coil weight max. [t]	5.5	12	12	14.5	17
Coil width min. [mm]	110 [40]			110 [80]	
Coil width max. [mm]	650	800	1 050	1 300	1 600
Coil width min. [mm]	0.5				
Coil thickness max. [mm]	4				
Straightening rolls Ø [mm]	53				
Loop radius [mm]	1 000				

Coil data for weight class "Medium"

POWER LINE	M-BS 0650	M-BS 0800	M-BS 1050	M-BS 1300	M-BS 1600	M-BS 1850
Coil weight max. [t]	13.5	11.5	12.5	13.5	16	22
Coil width min. [mm]	110		120	160	205	
Coil width max. [mm]	650	800	1 050	1 300	1 600	1 850
Coil width min. [mm]	0.5					
Coil thickness max. [mm]	6				4	4.5
Straightening rolls Ø [mm]	70					
Loop radius [mm]	1 300					

Coil data for weight class "Heavy"

POWER LINE	H-BS 0650	H-BS 0800	H-BS 1050	H-BS 1300	H-BS 1600
Coil weight max. [t]	10	15	15	17	23
Coil width min. [mm]	120			205	
Coil width max. [mm]	650	800	1 050	1 300	1 600
Coil width min. [mm]	0.5				
Coil thickness max. [mm]	8				6
Straightening rolls Ø [mm]	96				
Loop radius [mm]	1 600				

AUTOMATION OF PRESSES

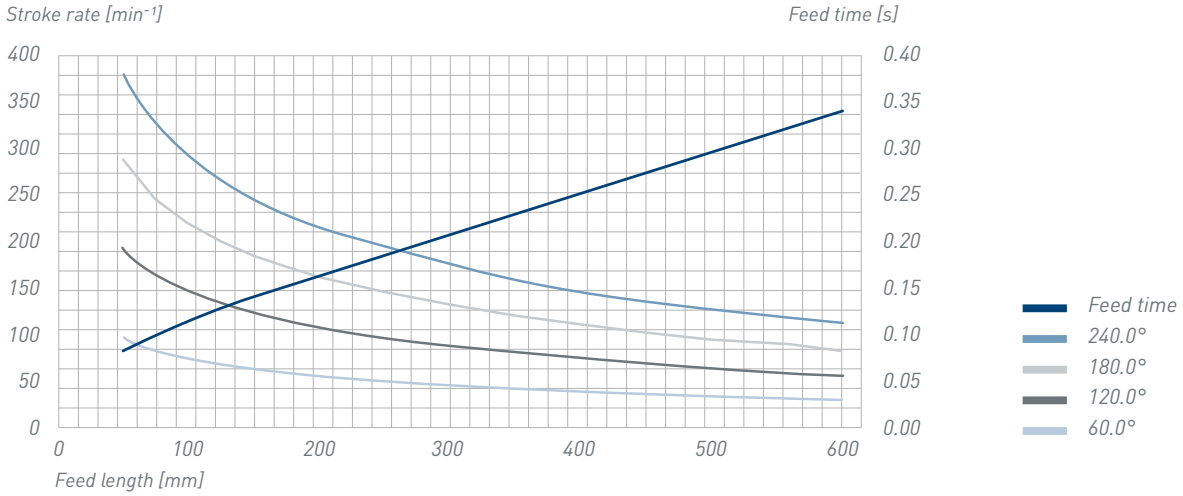
ROLL FEED UNIT

Power Feed.

POWER FEED ROLL FEED UNIT

The Power Feed roll feed unit shortens the automation time, especially with highly dynamic presses. ServoDirect drives, along with play and maintenance-free planetary gear trains, provide more dynamics and system accuracy. A system accuracy of ± 0.05 millimeters can be reached long-term this way. Additionally, the optimally designed roller coating transfers fast accelerations to the material. In accordance with the mass to be moved, the Schuler Power Feed is assigned to different weight classes: Weight class "L" (Light) with up to 100 kilograms of movable mass, "M" (Medium) with up to 180 kilograms of movable mass or"H" (Heavy) with up to 300 kilograms of movable mass.

FEED PERFORMANCE DIAGRAM FOR POWER FEED (EXAMPLE)



MODEL OVERVIEW OF ROLL FEED UNITS

COIL DATA								
POWER FEED	L-BP 0300	L-BP 0450	L-BP 0650	L-BP 0800	L-BP 1050	L-BP 1300	L-BP 1600	
Coil width min. [mm]	40	40	40	40	40	80	80	
Coil width max. [mm]	300	450	650	800	1 050	1 300	1 600	
Coil width min. [mm]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Coil thickness max. [mm]	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Coil diameter max. [mm]	750	1 125	1 300	1 600	2 100	2 600	3 200	
Loop radius [mm]	1 000	1 000	1 000	1 000	1 000	1 000	1 000	
POWER FEED	M-BP 0300	M-BP 0450	M-BP 0650	M-BP 0800	M-BP 1050	M-BP 1300	M-BP 1600	M-BP 1850
Coil width min. [mm]	40	40	40	40	40	80	80	80
Coil width max. [mm]	300	450	650	800	1 050	1 300	1 600	1 850
Coil width min. [mm]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Coil thickness max. [mm]	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Coil diameter max. [mm]	1 350	2 025	2 600	2 800	3 150	3 900	4 800	7 200
Loop radius [mm]	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300
POWER FEED			H-BP 0650	H-BP 0800	H-BP 1050	H-BP 1300	H-BP 1600	
Coil width min. [mm]			40	40	40	80	80	
Coil width max. [mm]			650	800	1 050	1 300	1 600	
Coil width min. [mm]			0.5	0.5	0.5	0.5	0.5	
Coil thickness max. [mm]			8.0	8.0	8.0	8.0	8.0	
Coil diameter max. [mm]			3 250	4 000	5 250	6 500	6 400	
Loop radius [mm]			1 600	1 600	1 600	1 600	1 600	

THE ADVANTAGES

- Connection to all press types
- Ideal application in highly dynamic processes
- ServoDirect drive
- System accuracy of ± 0.05 millimeters
- Scalable in weight class and performance
- Short-term availability
- Low maintenance effort
- Can be retrofitted at any time

AUTOMATION OF PRESSES

THREE-AXIS TRANSFER SYSTEMS

Schuler Transfer Pro Trans.

A new modular transfer system generation is a high-performance supplement to presses used in sheet-metal forming. Designed in three sizes, the transfer system covers a wide range of applications. The active anti-vibration mount AVD guarantees a reliable parts transport even at maximum dynamics and full loads for all transfer solutions.

PRO TRANS

With its three different motors“L” (Light), “M” (Medium) and “H” (Heavy), the Schuler Pro Trans covers low, medium and high part weights and stroke rates. The Heavy version thereby has twice the capacity of the Light version, the Medium version is in between. All transfer systems can attribute their considerably increased production rate to the motorization with direct feed drive, in which highly dynamic servo drives are used. Overall, the Schuler Pro Trans follows the modular principles: The three defined standard models “AT1”, “AT2” and“AT3” can be adapted easily and quickly to changed requirements. Schuler offers a large selection of options for this purpose.

POWER TRANS

With the Schuler Power Trans and motorization “S” (Speed), Schuler offers a high-end transfer solution for high-performance presses. Its application can once again significantly increase the production result. The production rate of the Power Trans is thereby up to 30 percent higher than that of the Pro Trans motorizations. This performance boost is especially achieved by the use of newly developed carbon rails with aluminum profile functionality in combination with the ServoDirect drive. The rails are very light and rigid and therefore extremely vibration resistant. This makes them ideal for applications in highly dynamic production processes.

THE ADVANTAGES

- Press independent retrofitting
- Optimal adaptability to different applications
- Easy and cost-efficient increase of production rate
- High production rate
- High rigidity in the overall system
- Low vibration tendency
- Short changeover times
- Generous spatial conditions for adding components for material feed and material disposal
- Material independent rest coil processing

INTRA TRANS

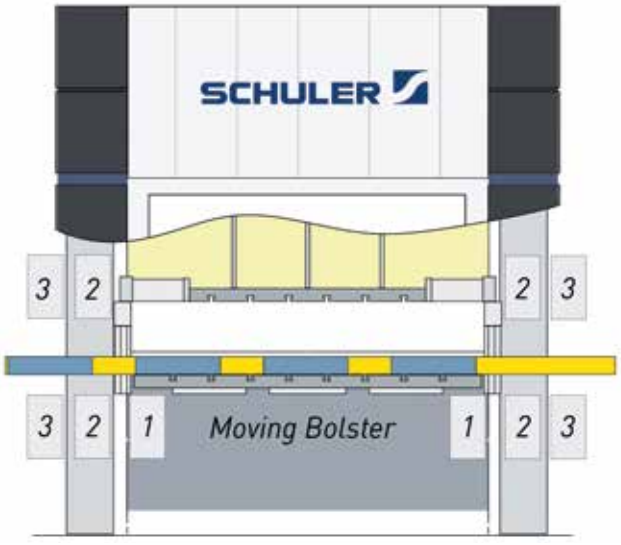
The Schuler Intra Trans can be equipped with all motorizations from "L" (Light) to "S" (Speed) and thereby suitable for use in conventional presses to high-speed presses. With the Intra Trans, the transfer rails do not operate through the press window but are mounted between the press uprights. The parts feed in the direction of flow is handled by movable carriages that are located on the transfer rails and for which the servo drives are integrated in the rail. Every carriage of the Intra Trans can be moved individually so that, for example, centered joining of parts or different increment distances are possible. By using this compact transfer, larger parts can be manufactured with the same transfer press. The new transfer solution is also a true alternative for progressive die manufacturing. Where conventional transfers with the same maximum part size require a larger press, the Intra Trans, thanks to its compact design, does not need any more space than the progressive die. The transfer can thereby demonstrate its complete advantage: less material usage because the parts are transported further by the carriages and not the coil material itself. This requires additional material for the progressive manufacturing which must be separated from the finished press part as scrap at the end. In the retrofit area, the Intra Trans is therefore perfectly suitable for the unit cost reduction with existing progressive presses. The die and die change can be accessed without restriction as always and are not different to the operator from the Schuler Pro Trans and Power Trans series transfers.

SIZE OVERVIEW

Size	Support width [mm]	Press window / clamping box width [mm]
AT1	3 000	Up to 1 600
AT2	6 000	Up to 2 500
AT3	10 000	Up to 5 500

MODULAR UNIT

All models of the Pro Trans, Power Trans and Intra Trans series have clamping boxes that can be mounted in the press (1) between the press uprights (2) or externally on the press upright (3). In addition, they can be mounted above (hanging) or below (standing) of the transport level, which leads to maximum flexibility for project planning and also when retrofitting existing presses.



Mounting variants of the clamping boxes of the Schuler transfer system on the press upright.

05

AT A GLANCE

PRESS LINES

The future starts with Schuler: With high-quality design and technology of tomorrow, we already ensure maximum productivity in the mass production of the automotive industry even today. The results meet even the highest demands and convince our customers worldwide. Because flexibility and quality are of utmost importance to us. With extraordinary and practice oriented innovations, we are giving the market critical input time and time again. Ground-breaking new developments, such as the ServoDirect Technology, press automation with the crossbar feeder or crossbar robot ensure top quality parts, high availability and high output.

MORE INFORMATION

www.schulergroup.com/automotive

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Automation TechCenter Gemmingen

PRESS LINES

HYDRAULIC PRESS LINES

Fully automatic hydraulic press line.

Press automation with crossbar robot.

RELIABLE, FLEXIBLE AND ECONOMICAL

Hydraulic press lines are mainly used for manufacturing a wide range of parts in small to medium batch sizes. In accordance with the forming operations, the lines consist of four to six individual presses. The production process is fully automated from the blank to the finished part. The crossbar robot developed by Schuler is thereby used more and more. The system and visualization system of hydraulic press lines provides the operator with uniform and comfortable operation, efficient diagnostics and management of all process and die data for all presses and the automation systems.

THE ADVANTAGES

- Flexibility in the forming process
- Energy efficient drive systems
- Dynamic step operation and ring valve technology increase the production rate
- Fast changeover with automated die and tooling change
- Precise slide guide and rigid press frame
- Continuous control concept
- Comfortable operation and efficient diagnostics
- Fast transfer of new tool sets

HYDRAULIC PRESS LINES

IN PRACTICE

CUSTOMER: TRUCK MANUFACTURER, FRANCE

Existing and newly developed dies are used.

Automation with crossbar robot, a blankloader and two exit conveyors.

THE REQUIREMENTS

With the Euro 6 emissions standard, the permissible nitrogen oxide emissions are lowered for trucks weighing more than 3.5 tons by 80 percent. This prompted our customer to completely overhaul his entire range of models. In the future, important components of the new trucks will be manufactured on a Schuler hydraulic high-speed press line. High productivity in combination with high flexibility was persuading.

THE SOLUTION

- Hydraulic lead press with a press force of 20 000 kilonewton
- Three hydraulic downstream presses with a press force of 10 000 kilonewton each
- Blankloader
- Press automation with crossbar robots
- Removal with crossbar robot
- Two exit conveyors

PRESS LINES

HYBRID PRESS LINES

Hybrid press line with hydraulic lead press and mechanical downstream presses.

LEAD PRESS HYDRAULIC - DOWNSTREAM PRESSES MECHANICAL

Hybrid press lines are comprised of a hydraulic lead press and mechanical downstream presses. They are an economical alternative when single and double action dies will be used on the same system. Because of modern hydraulic slide drives, the production rate of hybrid lines is within the range of mechanical press lines. With hydraulic lead presses, the slide cycle can be programmed freely and the nominal press force of the press is fully available at any stage of the press stroke.

THE ADVANTAGES

- A forming system for single and double action dies
- Flexible manufacturing alternative
- Modern bed cushion technology makes it suitable for complex drawing parts
- Easy and fast running in of new tool sets

PRESS LINES

MECHANICAL HIGH-SPEED PRESS LINES

Mechanical high-speed press line with crossbar feeder automation.

CROSSBAR FEEDER INCREASES THE PRODUCTION RATE

Schuler has developed the crossbar feeder for increased economic efficiency of mechanical press lines. In press lines with crossbar feeder automation, the parts are transported without intermediate storage directly from press to press. If necessary, the parts can be repositioned prior to placement in the dies. With mechanical press lines with robot or feeder automation, production rates of up to 15 strokes/minute are possible.

With mechanical press lines with crossbar feeder automation, the crossbar feeder can not only load Press 1 but also place the finished parts.

THE ADVANTAGES

- Production rate up to 15 strokes/minute
- Crossbar feeder with seven degrees of freedom
- No intermediate storage required
- One tooling per press gap
- Short press gaps
- Quick die and tooling changes

MECHANICAL HIGH-SPEED PRESS LINES

IN PRACTICE

CUSTOMER: AUTOMOTIVE MANUFACTURER, PEOPLE'S REPUBLIC OF CHINA

Mechanical high-speed press line.

End-of-Line-System.

THE REQUIREMENTS

Delivery of a fully automated mechanical high-speed press line.

THE SOLUTION

Schuler high-speed press line.

- Blankloader
- Loading Press 1 with crossbar feeder
- Rapid die change
- Crossbar feeder press automation
- End-of-Line-System with Crossbar Feeder and Robot
- Control room

PRESS LINES

SERVO PRESS LINES

ServoLine18 XL.

FAST, COMPACT AND FLEXIBLE

Equipped with the Schuler blankloader, crossbar feeder and end-of-line-system, the press lines are marked by their high production rate and quality with short die and tooling changeover times at the same time. With this combination, Schuler makes an important contribution to the reduction of costs per part and thereby the total-cost-of-ownership of press shops. For the optimal adaptation to sizes and specific requirements of parts, Schuler offers the press lines with ServoDirect technology in two designs in line with the demand: the Schuler ServoLine L and the Schuler ServoLine XL.

The complete thereby gains even higher performance - while reducing the demand for energy at the same time. The production rate ranges from 16 to 23 strokes/minute. Other highlights are a new, even more efficient line control for an additional plus for speed as well as the integration of further manufacturing processes, such as welding or riveting in the press line.

THE ADVANTAGES

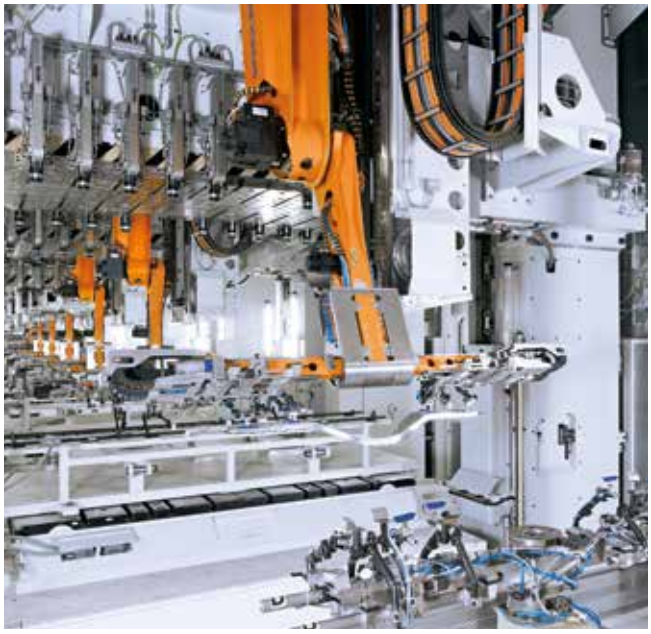
SDT
ServoDirect Technology

- Very high production rate
- High degree of flexibility
- Lowering of cost per part
- Slide movement can be programmed freely
- Optimum adaptation to the different forming processes
- Automation with blankloader and crossbar feeder of the latest generation
- Compact design of the press line
- Fully automated die and tooling changeover in three minutes
- Only one tooling per press gap
- Easy die tryout with handwheel function
- Precise jog mode with slow defined speed
- User-friendly user interfaces
- Ergonomic end of line
- Maintenance-friendly technology because the flywheel, clutch and brake are eliminated

SERVO PRESS LINES

THE MODELS OF THE SCHULER SERVOLINE

Five-stage press line with ServoDirect Technology and crossbar feeder automation.



Faster and safer transport of the parts.

SERVOLINE23 L – THE FASTEST PRESS LINE IN THE WORLD

It is convincing in practice through flexibility, high productivity, low unit costs and energy efficiency. This model is not only suitable for manufacturing steel and aluminum parts but also facilitates the process reliable and fast processing of high-strength steel.

SERVOLINE16 XL – GAINING FLEXIBILITY

With a maximum production rate of 16 strokes/minute, the ServoLine16 XL facilitates the entry into the servo technology. Compared to a conventional system, it offers more flexibility through the free programming of the slide movements. Any number of parts can thereby always be manufactured with optimal quality.

SERVOLINE18 XL – INCREASING EFFICIENCY

The Schuler ServoLine18 XL promises a very high production rate and a fast launch of the series production of large parts made from a broad variety of materials.

DIGISIM 2.0 – PRECISE SIMULATION RIGHT FROM THE START

Flexibility brings complexity with it. With the help of an exact simulation, this complexity can be mastered so that all parameters are precisely aligned with each other in the end. The simulation thereby already starts during method planning and accompanies the entire process to the optimization of the system. This saves running in time and money.

SERVO PRESS LINES

IN PRACTICE

CUSTOMER: AUTOMOTIVE MANUFACTURER, GERMANY

ServoLine 23 L with six die stages.

Blankloader.

Control room.

THE REQUIREMENTS

Delivery of five servo press lines for the mass production of a broad range of parts at three plants. Production rate: 23 strokes/minute. With this production rate, the ServoLine23 L is the fastest press line in the world.

THE SOLUTION

Fully automated servo press line with six die stages.

- Blankloader with oiler and optical centering station
- Loading Press 1 with crossbar feeder
- Crossbar feeder press automation
- End-of-Line-System with robot and crossbar feeder
- Control room
- Crossbar feeder simulator
- Die change in three minutes

06

AT A GLANCE

AUTOMATION OF PRESS LINES

From the individual press to the complete press line: As a system supplier, we automate your forming systems intelligently and practice-oriented. You thereby increase the performance of your production efficiently and economically. Whether a wide range of parts, high production rate or low spatial requirement: Schuler automation solutions guarantee high efficiency and reliable production processes. We also offer tried and tested solutions for the efficient manufacture of top quality parts for the modernization of existing systems. Schuler automation solutions are convincing in all areas of forming technology.

MORE INFORMATION

www.schulergroup.com/automation

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Schuler TechCenter
Explore Technology

AUTOMATION OF PRESS LINES

BLANKLOADERS FOR PRESS LINES

Optical centering station.

The modular blankloader concepts for mechanical and hydraulic press lines are customized for the requirements of the downstream forming systems. Depending on the part size and design, material type, blank weight and loading speed, Schuler offers a selection of standardized models. From the simplest loader with a robot without centering station for small parts and simple operations to blankloaders with two destack station, optical or mechanical centering station, washing unit and oiler as well for large and heavy blanks. The blanks in the loader are destacked by robots or feeders. To utilize the capacities of large press lines, two or four blanks can be processed at the same time. With press lines with crossbar mechanization, the loading of the first press stage can also be performed through a crossbar robot or crossbar feeder. In addition to conventional sheet metal, blankloaders also process aluminum or sheet metal-aluminum mix blanks and high-strength steel.

THE COMPONENTS

- One or two destack station for blank separation with double blank check
- Optical or mechanical centering station
- Washing unit
- Oiler
- Loading unit with robot, crossbar robot or crossbar feeder

AUTOMATION OF PRESS LINES

BLANK WASHERS AND OILERS

Blank washer, oiler and loading robot in front of hydraulic press line for manufacturing aluminum parts.

Blankloaders with washing unit.

BLANK WASHER AND OILERS

For the best possible manufacture of shell and structural parts, blanks are not only washed with washing units to remove dirt and deposits prior to the forming process, but also subsequently defined homogeneously oiled. A consistent cleaning efficiency and constant remaining oil quantities thereby prevent downtimes in the overall process. Additionally, the use of washing units in the downstream operations body shell and paint shop ensure a significant reduction of rework and costs. Blank washers are part of modern blankloaders and can be integrated in existing systems by retrofitting, if necessary. Depending on the requirement, the blank washers are designed for variable blank lengths and widths. The defined oiling after washing prepares the blanks optimally for the downstream forming processes. Flexibly programmable spray nozzles in the oiler guarantee high-quality parts when forming with strong drawing forces.

THE ADVANTAGES

- High, consistent surface quality of the parts
- Top part quality even with high drawing forces
- Productivity is increased
- Cost reduction in the overall process
- Extension of the die cleaning intervals

AUTOMATION OF PRESS LINES

ROBOT

Press line with robot automation.

Load robots position the blanks accurately fitting in the die of the first press.

In addition to the modern mechanization solutions with crossbar technology, conventional solutions with robots are still used like before. They are more flexible because only one robot is used for each press gap. An automatic changeover of the robot tooling can be implemented easily.

AUTOMATION OF PRESS LINES

CROSSBAR ROBOT 4.0 – CONNECT FOR SUCCESS!

At the Automation TechCenter Gemmingen, the crossbar robot combines the advantages of robot technology with the crossbar technology in the innovative design.

The crossbar robot combines tried and tested robot technology with the advantages of the crossbar technology. This includes the use of a conventional industry robot. This industry robot is expanded with two additional axes through a longitudinal axis and the crossbar hand.
The horizontal movement occurs along the longitudinal axis that is mounted on the press upright. The programming occurs on the robot control panel. The crossbar robot can be installed in new systems and retrofitted on existing press lines.

CONNECTION TO INDUSTRY 4.0.

Because of its process data interface, the new crossbar robot 4.0 is already optimally prepared for the age of Industry 4.0. Components like customization, networking and resource efficiency will play an even more important role in the future. Central are intelligent system components, which, as information carrier, actively intervene in the control of the production process.

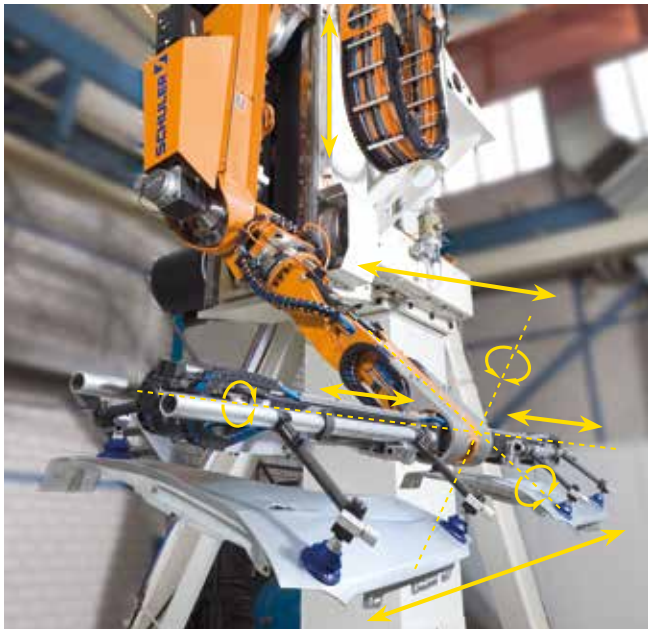
THE ADVANTAGES

- 20% more energy-efficient through innovative energy management
- 50% weight reduction of the robot including the manual axis from approximately 2 800 to 1 400 kg
- 20% more dynamic, inter alia through modified traction drive with two motors for high speed
- Easy to program with new robot controllers
- Lighter, faster, higher performance
- Customer-specific tooling interface
- Direct parts transport from die to die
- Press gaps of 4.5 to 10 meters without intermediate storage
- Flexible part orientation from die to die
- No turning of parts from die to die
- Change of part position freely programmable
- Full tooling compatibility with crossbar feeder
- Complete solution including blankloader and end-of-line
- Can be used as loader and unloader
- Single, double and four-fold part production possible
- Suitable for steel and aluminum
- One tooling per gap
- Faster automatic tooling change
- Maintenance-friendly with free access to the press gap

AUTOMATION OF PRESS LINES

CROSSBAR FEEDER

Crossbar feeder within the press line.



Three rotation axes and four linear axes.

The crossbar feeder is the automation technology for mechanical high-speed and servo press lines. It increases the system and process efficiency of mechanical press lines. The crossbar feeder offers seven degrees of freedom, three rotary and four linear axes and increases the productivity in the press shop.

The components are transported from die to die without intermediate storage and, if necessary, re-positioned. The short and compact design makes the crossbar feeder extremely rigid.

THE ADVANTAGES

- Seven degrees of freedom
- Production rate up to 23 strokes/minute
- No intermediate storage required
- Optionally with longitudinal crossbar for large press gaps
- One tooling per press gap
- Variable press gaps
- Free access to the press gap
- Compact design possible
- Rapid die changes

AUTOMATION OF PRESS LINES

PART RACKING SYSTEMS

Press line with ServoDirect Technology and automatic part racking system.

Part racking systems operate fast and reliably with maximum part quality. A special suction cup technology protects the highly sensitive surfaces of outer skin panels during further processing and the staging of the parts for the upstream body shell construction.

AUTOMATIC PART RACKING SYSTEM FOR SERVO PRESS LINES

The newly developed automatic flexible part racking system by Schuler works with suspended robots, which can also be moved on rails. The position of the finished parts is optically detected by a camera system. Next, the correction data is transmitted to the robots. The robots now receive the correctly positioned finished parts and stack them in parts containers. The automatic part racking system can be used to stack single, double and four-fold parts. With single parts, up to four robots, with double and four-fold parts up to eight robots are in use, whereby two robots each alternate to stack in the same container to guarantee the high production rate. As an option, the part racking system can be equipped with an automatic quality control.

THE ADVANTAGES

- Stacking of single, double and four-fold parts
- Stacking rate up to 68 parts / minute with four-fold production
- Compact, short design
- Automatic quality control can be integrated

07

AT A GLANCE

TRYOUT SYSTEMS

Tryout systems offer maximum flexibility for tool making and press shop. Depending on the requirements, they contain various hydraulic or mechanical press types, die change devices and rotary tables. The time consuming processing of the dies occurs outside of the tryout presses. The individual components of the tryout system are connected through moving bolsters on a rail system.

MORE INFORMATION

www.schulergroup.com/hydraulic_press

TRYOUT SYSTEMS

HYDRAULIC SPOTTING AND TRYOUT PRESSES

Tryout systems offer maximum flexibility.

DIE TESTING BEFORE THE PRODUCTION LAUNCH

To keep the start-up costs of new tool sets as low as possible, they must be optimally prepared for series production. Hydraulic tryout presses ensure short running in phases under close to production conditions. They are suitable for deployment with die testing and running in before the production launch. The system operator has access to the full press force at any time and can set down the upper die gently on the lower die, if necessary. With respect to sizes, performance data and equipment details, the spotting and tryout presses are designed for the requirements in die testing and zero series production.

THE ADVANTAGES

- Programmable speeds and forces
- Slide return possible at any time
- Sensitive slide movements with joystick
- Maximum force available throughout the complete stroke
- Easy setup of different die heights
- Double and single action operation possible with double action presses
- Rigidities like production presses
- Bed cushion technology as in production systems ensures an optimal running in result

MODEL OVERVIEW OF HYDRAULIC TRYOUT PRESSES

Model	Basic	Basic	Basic	Speed	Basic	Speed
Press force [kN]	**12 500**	**16 000**	**20,000**		**25 000**	
Bed size [mm]	4 600 × 2 500	5 000 × 2 500	5 000 × 2 500		5 000 × 2 500	
Slide stroke [mm]	1 700	1 700	1 700		1 700	
Installation space [mm]	2 300	2 300	2 300		2 300	
Bed cushion						
Size* [mm]	3 900 × 1 800	4 200 × 2 100	4 200 × 2 100		4 200 × 2 100	
Force [kN]	3 500	4 000	6 000		6 000	
stroke [mm]	300	300	380		380	
Slide cushion (optional)						
Size* [mm]	3 600 × 1 500	3 900 × 1 800	4 200 × 2 100		4 200 × 2 100	
Force [kN]	2 000	2 000	3 000		3 000	
stroke [mm]	200	200	200		200	
Speeds						
Vmax (mm/s)	~ 50	~ 44	~ 70	~ 330	~ 58	~ 265
V at Fmax (mm/s)	~ 25	~ 20	~ 30	~ 45	~ 25	~ 35
Parallel control						
	–	–	Optional	Yes	Optional	Yes

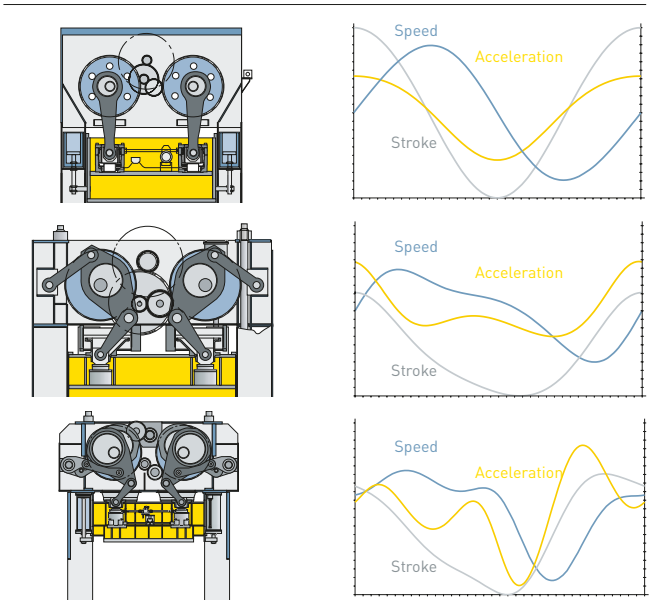
Further sizes upon request.

*Center distance of the external pressure pin rows.

TRYOUT SYSTEMS

HYDRAULIC MULTICURVE PRESSES

Multicurve presses with moving bolster and die change device.



Simulation of various slide kinematics.

PRECISE SIMULATION OF FORMING PROCESSES

Hydraulic Multicurve presses are used to run in die sets in tool making, tryout centers, in the press shop and for verification of the method under production conditions. Equipped with a hydraulic accumulator drive, they simulate the slide kinematics of different hydraulic and mechanical production presses. For mapping of the forming processes of mechanical production systems, the hydraulic Multicurve press facilitates operating speeds of up to 500 millimeters / second. The various freely programmable slide kinematics are available to the user at any time for any adjustable stroke rate. The multi-point draw cushion - ideally identical with the draw stage of the production line - ensures optimal run in results.

THE ADVANTAGES

- Precise simulation of the slide kinematics of all press types
- Drawing speeds of up to 500 millimeters/second
- Comfortable management of the programmed kinematics
- Reduction of run in times on production systems
- Bed cushion identical with production press

HYDRAULIC SPOTTING AND TRYOUT PRESSES IN DIE MAKING

IN PRACTICE

CUSTOMER: AUTOMOTIVE MANUFACTURER, GERMANY

Tryout center with hydraulic tryout presses.

The slide can be moved up and down gently with the joystick.

THE REQUIREMENTS

Tryout center for die run in of series dies.

THE SOLUTION

Tryout center with a total of twelve hydraulic tryout presses.

- Bed and slide sizes: 4 500 × 2 500 millimeters
- One forward extending bed each, hydraulic drawing cushion, hydraulic slide cushion and hydraulic cutting impact reduction

One hydraulic Multicurve press,
press force: 25 000 kilonewton

- With multicurve accumulator technology
- Drawing cushion in drawing cushion in eight-point design

Three hydraulic Multicurve presses,
press force: 21 000 kilonewton each

- With multicurve accumulator technology
- Drawing cushion in drawing cushion in eight-point design

Four hydraulic tryout presses,
press force: 16 000 kilonewton each

Four hydraulic tryout presses,
press force: 12 000 kilonewton each

TRYOUT SYSTEMS

TRYOUT PRESSES WITH SERVODIRECT TECHNOLOGY

Tryout presses increase the availability in the press shop.

ServoDirect Technology

INCREASE AVAILABILITY OF PRODUCTION PRESSES

Tryout presses with ServoDirect Technology are designed as duplicate of mechanical production systems.For slide drive, pressure point arrangement, upright spacing and bed cushions, the bending and suspension behavior of the system is consistently simulated. The availability of the production operation can thereby be increased even more. Especially the handwheel functions offers the press operator new options for running in new dies. The servo drive facilitates the optimal simulation of the kinematics of different press types.

THE ADVANTAGES

- Simulation of the production conditions of mechanical presses
- Increased availability in production operation
- Parts cost per stroke is lowered
- Slide tilting identical with production presses
- Die data is transferred

TRYOUT SYSTEMS

DIE TURNOVER DEVICE AND SIMULATORS

Die turnover device for easy turning of upper dies.

Simulator facility for crossbar feeder.

DIE TURNOVER DEVICE – ERGONOMIC DIE PROCESSING

For the ergonomic processing of upper dies in the tryout phase, is recommended to turn it into an ergonomically favorable position. The die change devices are used for secure opening and turning, which can be connected with the tryout presses through moving bolsters. Die turnover devices simplify the handling of dies, which then are available faster for the production presses.

THE ADVANTAGES

- Simple opening and turning of the dies
- Ergonomic processing of the turned dies
- Integration in Tryout centers via rail systems and moving bolsters

SIMULATORS - PRECISE PREPARATION OF AUTOMATION FACILITIES

At the interface between die making and press shop, not only tryout presses but also simulation facilities contribute to the preparation of dies and automation facilities for series production while production is running. The parts transport is simulated and optimized to reduce cost intensive run in phases on the production presses.

THE ADVANTAGES

- Simulation of the automation in parallel to the running production
- Shortening of setup and run in times
- Increase of machine running times
- Training of employees with running production

TRYOUT SYSTEMS

MAXIMUM FLEXIBILITY WITH DIE RUN IN

Tryout systems facilitate a highly efficient die run in.

Tryout systems offer maximum flexibility for die making and press shop. Depending on the requirements, they contain various hydraulic or mechanical press types and die change devices.

SEPARATE DIE PROCESSING

The time consuming processing of the dies occurs outside of the tryout presses. The individual components of the tryout center are connected through moving bolsters on a rail system.

The die can be transported directly out of the tryout press on a moving bolster to a die turnover device arranged at the side. Because a crane is not used for the transport, this solution not only offers time savings but also increases occupational safety. In the die turnover device, the upper die can be processed in an ergonomically favorable position. In parallel to the reworking in the die turnover device, another die set can be run in in the tryout press.

THE ADVANTAGES

- Efficient running in of multiple dies at the same time
- Occupational safety
- Simple opening and turning of the dies
- Ergonomic processing of the turned dies
- Higher capacity utilization of the tryout presses

SCHEMATIC STRUCTURE OF TRYOUT SYSTEMS

1. + 4. Die turnover device
2. Moving bolster
3. Tryout press

08

AT A GLANCE

LIGHTWEIGHT TECHNOLOGIES

Nowadays, it is technically possible to build a light and safe car. The deciding factor are the manufacturing costs. A few especially light and fuel-efficient car models did not draw enough buyers in the past because they were too expensive for the customer. Therefore, the one basic solution for more efficiency can no longer be applied in the future. There is a demand for different concepts based on the individual customer demand and vehicle class. Only the interplay of multiple processes and the use of different materials will return the desired success in lightweight technology. Every material has specific thicknesses and is suitable for different installation areas in the car accordingly.

MORE INFORMATION

www.schulergroup.com/forming_systems

SCHULER LIVE

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Canton, MI USA | Phone: +1 734 207-7279 | E-Mail: hytc-canton@schulergroup.com
Your direct contact to the Hot Stamping TechCenter:
Göppingen, Germany | Phone: +49 7254 988-220 | E-Mail: hstc-goeppingen@schulergroup.com

Schuler TechCenter
Explore Technology

LIGHTWEIGHT TECHNOLOGIES

DIE HARDENING WITH PCH TECHNOLOGY

PCH Line Hot Stamping TechCenter.

Die hardening of safety components in mass production.

SUCCESSFUL LONG-TERM

Cars are getting lighter with Schuler. The result: low fuel consumption and lower CO_2 emissions. The greatest saving potentials offer themselves for today's passenger cars in the body and the drive gear, which, combined, make up approximately 65 percent of the car mass. But perfectly manufactured quality components for drive gear, engine and body not only make cars eye-catching, but also an epitome for comfort and safety. Die hardening with Pressure Controlled Hardening (PCH) is the basis for higher body rigidity – and thereby a significantly improved crash behavior. In die hardening, high-strength safety components are manufactured through a combination of heat treatment and forming technology. The result are components with a tensile strength of 1 500 – 2 000 N/mm². In the meantime, up to 40% of the structural components of some cars are manufactured with this process.

THE RANGE OF COMPONENTS FOR DIE HARDENING

- Side impact carriers and B-pillars
- Sills
- Roof frames
- Supporting parts
- Tunnel
- Door frame reinforcements
- Bumper

THE ADVANTAGES

- Higher strength and lower part weight
- High body rigidity
- Improved crash characteristics
- New possibilities for part design
- Excellent repeatability with no deflection
- Material is more cost-effective than high-strength steel
- No press forces necessary

MORE PRODUCTIVITY WITH THE SCHULER LINE CONCEPT

	SCHULER SPEED LINE CONCEPT (Conventional Technology)	SCHULER PCH FLEX LINE CONCEPT (PCH flex Technology)	
Max. possible production rate	6.0 strokes/min.	7.5 strokes/min.	
Average production rate	3.8 strokes/min.	5.2 strokes/min.	
Availability	75%	80%	Planned downtimes (no production due to breaks, die change, etc.) are reduced by less die run in time and shorter die changes.
Production rate	90%	95%	Higher production rate because of the reliable system. Les die run in time with PCHflex.
Quality	95%	98%	More OK parts because of uniform cooling and less warming nests.
OEE = V × L × Q	60%	75%	OEE = Availability × Production rate × Quality
Strokes/year	1 036,800	1 872,000	Production = 20 Shifts / Week × 8h/ Shift × 50 Weeks/ Year = 8 000 h/Year

Multiple factors lead to your ability to work significantly more productive with the Schuler PCH flex line.

The higher initial investment amortizes in a very short period of time and from then on you have a significant competitive advantage that improves your position in the market. In addition to the economic aspects, the system offers further advantages. The processes are becoming more stable and reproducible, run in times and wear of the die hardening dies are reduced.

Two common press sizes have established themselves for different part sizes, which can both be equipped with the PCH technology:

- 12 000 kilonewton press force with 3.0 × 2.4 m bed size
- 16 000 kilonewton press force with 3.6 × 2.9 m bed size

SPECTRUM OF SERVICES FOR DIE HARDENING

PROCESSES AND DIES

- Forming simulation
- Feasibility studies
- Method planning
- Die hardening dies

DIE HARDENING SYSTEMS

- System engineering and installation
  - Blankloader
  - Hydraulic press technology
- Robot or transfer automation
- Integration of furnace technology
- Master control

ADDITIONAL PROCESSES

- Blanking line
- Blank welding systems
- Finished part handling

LIGHTWEIGHT TECHNOLOGIES

ALUMINUM HOT STAMPING

Aluminum B-pillar.

NEXT GENERATION OF HOT STAMPING APPLICATIONS

The use of die hardened boron steel permits a significant reduction of the weight of the vehicle body compared to cold formed steel. A further weight reduction can be achieved by using high-strength aluminum alloys.

High-strength aluminum alloys that are difficult to form cold show a significantly better formability at higher temperatures and have a strength of up to 600 N/mm² after the heat treatment. With Aluminum Hot Stamping, even complex components made of high-strength aluminum alloys can be series produced with process reliability. In the coming years, aluminum hot stamping parts will significantly expand the range of structural parts that are manufactured in the hot stamping process.

Therefore, Schuler has developed a series concept for the manufacture of aluminum hot stamping parts. In addition to the process management and the die, the system technology was also adapted to the requirements of the aluminum alloys.

THE ADVANTAGES

- Cost-efficient method for further weight reduction
- Improved crash performance
- Short cycle times and high output
- Manufacture of complex components possible

LIGHTWEIGHT TECHNOLOGIES

COLD FORMING OF HIGH-STRENGTH STEEL

ServoDirect press for cold forming of high-strength steel.

Innovative vehicle lightweight technologies is no longer imaginable without high-strength steel and the applications in mass series production will continue to grow in the coming years. With unchanged component properties it is possible to further reduce the sheet thicknesses by using new, high-strength and higher-strength steel. This involves lower weight and reduced costs.

THE SERVODIRECT TECHNOLOGY SHOWS US THE PATH TO THE FUTURE

Press lines, transfer and progressive die presses as well as cutting systems with ServoDirect Technology have significantly changed the press shops. They are marked by maximum flexibility, high production rate and short die change times. The slide movement of each press can be adapted individually for each component to the forming process, the die and the automation. This opens up new possibilities in the cold forming of high-strength steel.

NEW PROCESSES – NEW POSSIBILITIES

Utilizing the advantages of the ServoDirect Technology, Schuler develops new manufacturing concepts for the manufacture of lighter components. Interdisciplinary teams analyze, for example, the possible integration of follow-on processes or new ways for the manufacturing of hybrid components. The goal is the development of new manufacturing processes that can fulfill all requirements in series production in the stress field “reduced component weight – efficient manufacturing – high safety requirements”.

LIGHTWEIGHT TECHNOLOGIES

ALUMINUM FORMING

Hydraulic press lines for the manufacture of aluminum components.

In the area of the hang-on-parts, aluminum has become the standard for many vehicle models in the meantime. The material can greatly reduce the weight of a body shell even if it rarely completely formed from it. Nowadays, approximately 40 percent of the total mass of a passenger car are in the body. Because of the trend toward an increased variety of materials, aluminum is increasingly used in automotive manufacturing.

From the shell to the front fender to the engine hood - aluminum is used more and more frequently in modern weight reducing vehicle manufacturing because it is the preferred selection for heavier materials. Thanks to its unique energy absorption capability, it can save lives in the event of a collision. In addition to the higher level of safety, lower fuel consumption, improved comfort and driving performance are further arguments that speak for the material aluminum.

Schuler develops mechanical and hydraulic press lines as turn-key solutions for the processing of aluminum shell parts. We offer suitable retrofit equipment for existing manufacturing systems. With our turn-key solutions, all components that are used from automation to press and die are adapted to the materials to be processed.

LIGHTWEIGHT TECHNOLOGIES

FORMING OF FIBER-REINFORCED PLASTICS

Hydraulic plastic presses for series production.

Fiber-reinforced plastics offer a lot of design freedom and high functionality with minimal component weight. They stand for new light concepts in vehicle architecture and body construction. Schuler realizes fully automated hydraulic press systems for efficient and production reliable series production of fiber-reinforced components that meet even the most demanding component and production requirements.

Schuler hydraulic press systems are suitable for the series production of SMC components (Sheet Molding Compound), GMT components (Glass Mat Thermoplastics), LFT components (Long Fiber Reinforced Thermoplastics) and RTM components (Resin Transfer Molding). Various systems are used depending on the component requirements and the manufacturing process.

The result: top part quality and maximum production reliability - for more economic efficiency and maximum productivity.

As system and process specialist, we can make you a turn-key offer. This way, we not only support you with the press shop and process planning but also with the selection and running in of the right dies up to a shortened production launch.

HYDRAULIC PRESSES FOR FIBER-REINFORCED PLASTICS

Press force [kN]	< 10,000	10 000	18 000	25 000	36 000
Press force at max. parallel control force [kN]	Upon request	8 500	16 000	22 000	32 000
Bed size [mm]		2 000 × 1 600	2 800 × 1 800	2 800 × 2 000	3 600 × 2 400
Slide stroke [mm]		1 700	1 800	1 800	1 900
Shut height [mm]		2 200	2 400	2 400	2 500

Further sizes upon request. Subject to technical modifications.

LIGHTWEIGHT TECHNOLOGIES

HYDROFORMING

Automated IHU system of an American automobile manufacturer.

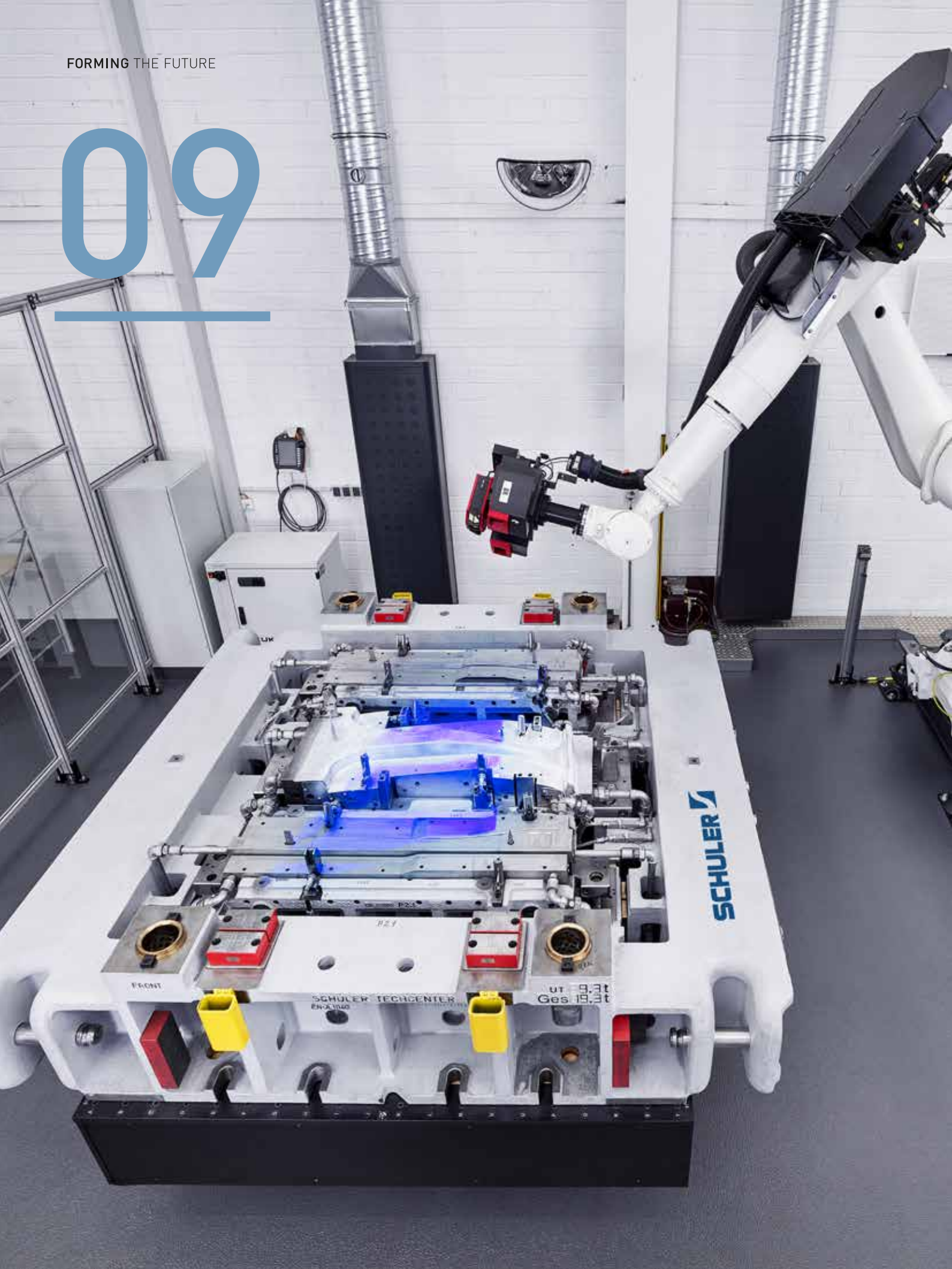
Internal high-pressure forming of roof frames.

The possibilities of internal high-pressure forming (IHU) are many. However, it is primarily used in the automobile series production because special requirements for component properties and component design must be solved in this case. Especially the calibration of aluminum extrusion press profiles continues to gain more and more importance. Inter alia, the process is used for forming exhaust, drive gear and structural parts. In addition to complex systems and integration solutions, Schuler also offers its partners component analyses, feasibility studies, prototype and die construction from a single source.

THE ADVANTAGES

- High component rigidity and stability
- Low component weight through optimized design without material reinforcements
- Best material utilization
- Integration of additional functions in the components
- Maximum repeatability
- High component quality and long service life through avoidance of weld seams and function optimized geometry
- High design freedom for complex components

09



CONSISTENT PERFORMANCE

DIE AND FORMING TECHNOLOGIES

With Schuler dies, complex component geometries can be realized - including aluminum.

FROM SIMULATION TO SERIES PRODUCTION

Our die making handles complex development work in the field of die and process technology. Its range of services covers the entire product development process—from simulation to the finished part.

WE KNOW YOUR PROCESSES

Thanks to our many years of experience and our comprehensive knowledge, we at Schuler know the entire process chain: In die making, press construction and at our own press shops, with which we can support you with your production.

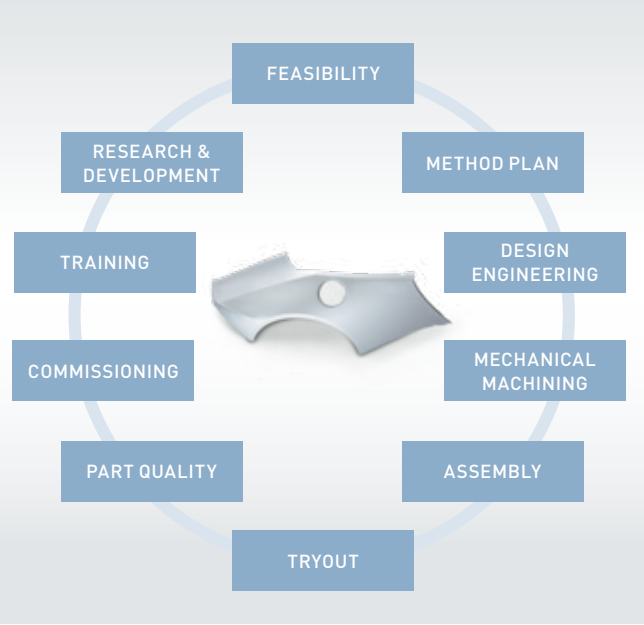
EVEN MORE EFFICIENCY: SCHULER AND AWEBA JOIN FORCES

AWEBA
Member of the SCHULER GROUP

By acquiring the AWEBA Group, Schuler was able to round up its portfolio in die making. As customer, you will profit from the synergies of both companies. For example, orders that have been subcontracted externally until now can be subcontracted internally. We thereby offer our entire die competence to you from a single source.

DIE AND FORMING TECHNOLOGIES

DIE COMPETENCE FOR BODY AND HOT STAMPING PARTS



Comprehensive competence in cold and hot forming - from simulation to the finished part.

At the Göppingen location, we manufacture dies for cold and hot forming.

ENGINEERING & INNOVATION

- Feasibility studies
- Simultaneous engineering
- Simulation and method planning
- Design engineering
- Technological further development

COLD FORMING DIES

- Mechanical machining
- Assembly
- Tryout
- Finishing
- Quality optimization
- Startup support
- Training and maintenance
- Project management

HOT FORMING DIES

- Mechanical machining
- Assembly
- Tryout
- Finishing
- Quality optimization
- Startup support
- Training and maintenance
- Project management
- Aluminum forming (semi-hot and hot)
- Magnesium hot forming

PARTS MANUFACTURING

- Press shop Göppingen
  - Temporary transfers
  - Series change including parts manufacturing
  - Series production
- Hot Stamping TechCenter Göppingen

DIE AND FORMING TECHNOLOGIES

DIE COMPETENCE FOR GEARBOX COMPONENTS

Transfer die for the manufacturing of precise gearbox components.

Stage set of a disk carrier.

MAXIMUM PRECISION WITH THE MANUFACTURING OF GEARBOX COMPONENTS.

Because of the high quality standards, Schuler dies offer an especially long die service life. At the Weingarten location , our experts not only develop dies for the manufacture of gearbox components but also concepts for small batch production.

OUR SERVICES

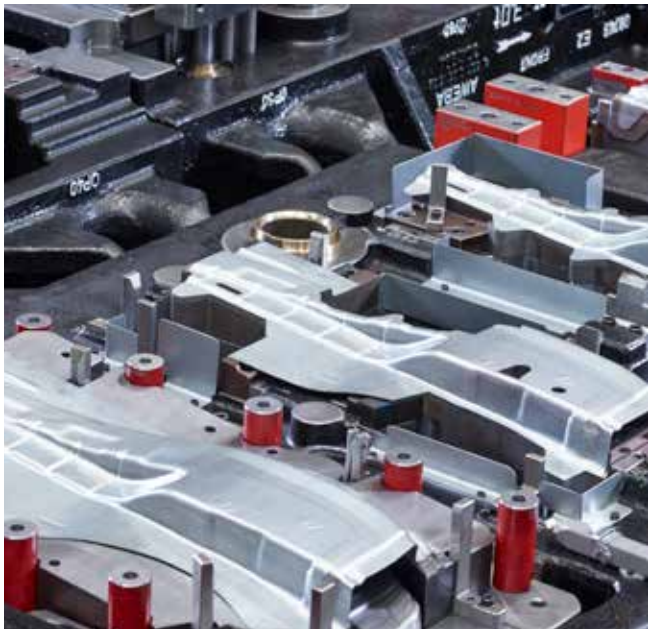
- Feasibility studies and simulation
- Process technology and small batch production concepts
- Design engineering
- Mechanical machining
- Assembly
- Tryout
- Experience in the press shop and small batch production
- Training and startup support

PARTS MANUFACTURING

- Servo TechCenter Erfurt

AWEBA GROUP

DIES AND DEVICES



Complex transfer dies for structural parts.

Fine-blanking die for seat components.

WE ARE SHAPING YOUR SUCCESS.

AWEBA engineers and produces forming dies for gearbox components and complex transfer dies for structural parts with maximum precision. Thanks to the technologies that were developed in-house, and the mastering of machining processes in the micrometer range, AWEBA continues to be able to overcome the limits of what is feasible in die making.

A wide variety of forming and prototype dies as well as 3D structural parts made of sheet metal, higher-strength sheet metal, aluminum and magnesium from AWEBA have been tried and tested in numerous applications in the international automotive industry.

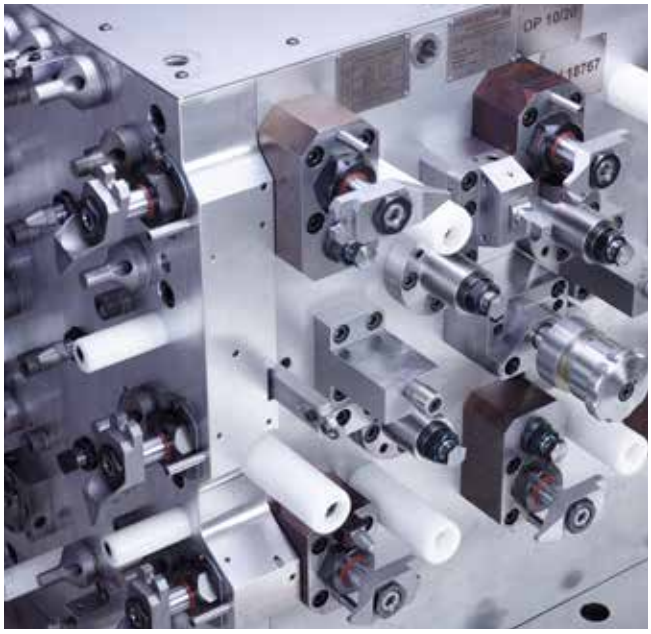
PERFECTLY CUSTOMIZED.

Fine-blanking dies that are partially equipped with pneumatic or electromechanical discharge and step installation units take up a large share of AWEBA's knowledge.

Precision and top surface quality across the entire cutting contour mark these dies and permit the cutting of sheet metal with a maximum thickness of twelve millimeters with up to 100 percent straight cuts.

AWEBA
Member of the SCHULER GROUP

Die casting mold for a valve housing.



Hydraulic equipment.

INDIVIDUALLY SERIAL.

Special knowledge at AWEBA is found in the development and manufacture of die casting molds for mechatronics components. Special attention is paid to process reliability and a long service life of the molds already during the casting layout of the item data.

EVERYTHING UNDER PRESSURE.

The WVL Werkzeug- und Vorrichtungsbau Lichtenstein GmbH develops"exciting" solutions for your manufacturing process: Clamping devices for the mechanical processing of engine and transmission components, drive gear and mounted parts as well as structural parts. The efficient chipping of workpieces requires an optimal voltage.

IN-HOUSE MANUFACTURING IN THE THREE-SHIFT SYSTEM

More than 150 state-of-the-art CNC processing centers guarantee precision and speed in every manufacturing phase. The processing of materials up to a hardness of 63 HRC is just as common as the manufacture of components in the µ-range. The in-house hardening shop - equipped with vacuum hardening and tempering furnaces, a salt bath hardening system, various annealing furnaces and a burnishing facility - rounds up the manufacture of precise die components of various types of steel.

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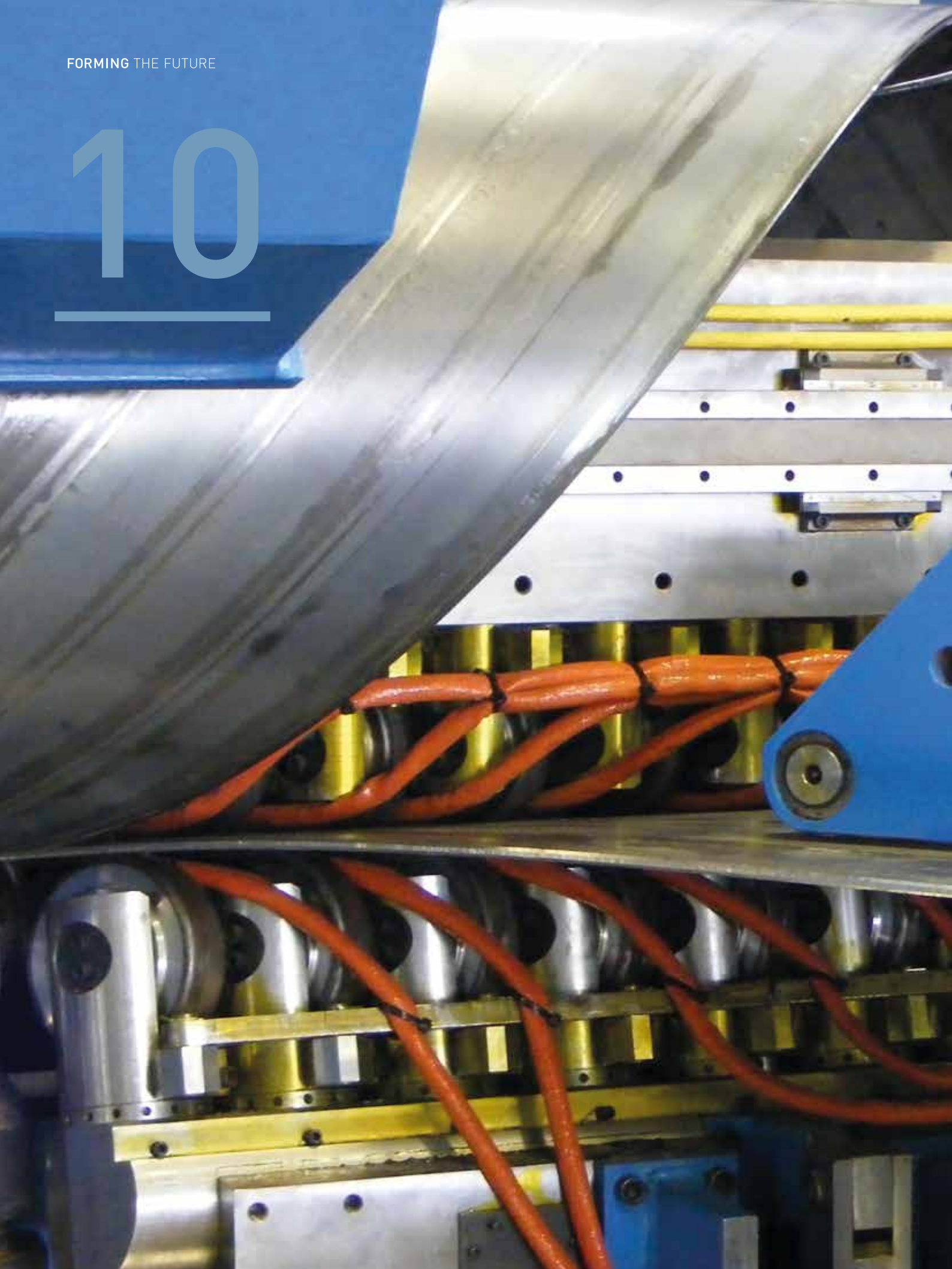


AT A GLANCE

SYSTEMS FOR LARGE DIAMETER PIPE PRODUCTION

With Schuler, you are laying the success foundation for an economical, efficient and high-performance production of spiral-welded large diameter pipes. We are developing turn-key production lines for you for large diameter pipes - whether pipelines for crude oil, natural gas, water or large pipes in the petrochemical industry, with wind energy plants or in the construction industry. We not only offer the necessary experience for every requested solutions and projects of all sizes, but also provide the corresponding worldwide service. We are securing our decisive advantage when it comes to quality through permanent innovations and investments in research and development.

At Schuler, we look at turn-key solutions for the production of large diameter pipes as a highly integrated overall concept: from innovative layouts and constructions to intelligent production principles. Our objective is to enable you to produce environmentally friendly and conserving resources. You thereby profit in every phase from our groundbreaking knowledge of large diameter pipe production and our competence.

MORE INFORMATION

www.schulergroup.com/large_pipes

SYSTEMS FOR LARGE DIAMETER PIPE PRODUCTION

SPIRAL PIPE PRODUCTION SYSTEMS

Spiral pipe production system.

The key to your success: We are planning and realizing complete production plants for the manufacture of spiral welded large diameter pipes - turn-key ready for you. The systems meet the most demanding requirements for diameter tolerances or welding gap and also shine with top availability and production rate. Schuler offers progressive and high-performance solutions, precisely customized for your requirement profile and custom tailored for your specific needs - from planning to consultation to commissioning.

ONLINE PROCESS

Combined forming and welding system

Submerged arc welding from the inside and outside occurs directly following the pipe forming.

OFFLINE PROCESS

Separate forming and welding system

After the pipe forming followed by tack welding, the submerged arc welding from the inside and outside follows on separate welding stands; speeds up to 12 meters/ minute.

MODERNIZE

Conversion of existing online systems to the offline process

The objectives of such a conversion of existing systems are the raising of quality and production rate and an improvement of occupational safety and energy efficiency.

TECHNICAL DATA

Suitable for spiral pipes with

- a length of up to 24 meters
- 450 to 3 500 millimeters (18"–140") diameter
- 6 to 25 millimeters (1/4"–1") wall thickness

Other dimensions available upon request.

THE ADVANTAGES

- Automation of important work steps
- Increased occupational safety
- Short downtimes
- High process reliability
- Reproducible high product quality
- Planning and realization of complete production systems

Hydrotester.

HYDROTESTER

- Ball bearing supported internal seal or head seal
- Water hydraulic control system
- Variable stop time
- Connected with PID data system
- Automatic pipe positioning
- Automatic test procedure
- Visualization with database for all pipe diameters
- Fully automatic pipe transport

Pipe diameter [inch]	18 – 140
Pipe length [m]	8 – 24
Clamping force max. [kN]	50,000*
Water pressure max. [bar]	400
High pressure control range [l / min]	33 – 300

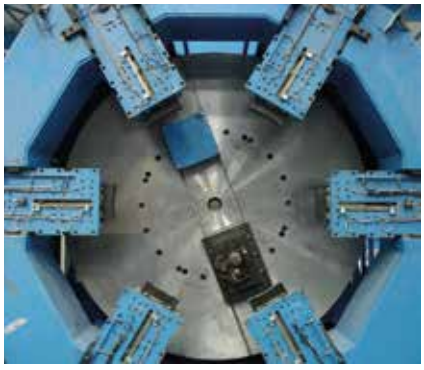
*Higher clamping forces upon request.

Coil-Preparation-Stand.

COIL-PREPARATION-STAND

Schuler provides a significant simplification of handling during a coil change - with increasing the quality and optimization of the processes. With that, you not only reduce unproductive downtimes, but you also ensure higher efficiency throughout in the entire production process. In addition, you increase the occupational safety at the stand long-term.

Coil weight max. [t]	45
Coil outer diameter [mm]	1 300 – 2 200
Coil inner diameter [mm]	720 – 800
Coil width [mm]	1 000 – 2 050
Coil thickness [mm]	6 – 25.4
Coil unwind [m / min]	0.3 – 6.0
Plasma cutter [m / min]	0.1 – 3.0



End forming system.

END FORMING SYSTEM

- Automatic clamping and diameter dependent adjustment of the clamping force
- Continuous cover of the entire diameter range
- Short setup time
- Concentric clamping
- Energy recovery through use of state-of-the-art inverter technology

Cutting speed max. [m / min]	90
Feeder face plate [mm / min]	5 – 50
Drive face plate Servomotor max. [kW AC]	200

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SCHULER **SERVICE**

STATE-OF-THE-ART SERVICE FOR MORE PERFORMANCE.

Over 900 service employees worldwide provide expert support 24/7 in close cooperation with you – our partners. Our main priority is always to ensure the maximum productivity and safety of your production equipment in order to secure your company's continued success.

With over 175 years of experience and expertise, we can guarantee the best possible support for the operation of your machines – and not only those supplied by Schuler, but by all other manufacturers. Whatever the situation, Schuler Service has the right solution for your specific needs.

OUR SERVICES FOR YOU.

Technical Customer Support:
- Machine inspections
- Safety inspections
- Preventive maintenance
- Repair
- Repair welding
- Production support

Components and Accessories:
- Spare parts and spare part packages
- Maintenance kits
- Repair parts
- Replacement parts

Project Business:
- Modernization
- Retrofits
- Refurbishment
- Machine relocations

Special Services::
- Service contracts
- Hotline and remote service
- Training
- Tailored customer training
- Optimizing plant & processes
- Consulting

Used Machinery:
- Purchase and sale
- Evaluation

MORE INFORMATION

www.schulergroup.com/service_en

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SCHULER LOCATIONS AND TECHCENTERS

PRODUCTION SITES, SERVICE LOCATIONS, TECHCENTER AND REPRESENTATIVES

Schuler technologies, systems and machines are at home in the industries Automotive, Tier 1 – 3, Drives & Generators, Railway, Aerospace, Appliances, Minting, Packaging, Industrial Applications and Large Pipe.

Developing industry solutions for them means that we have to bring good concepts in line. With the goal of getting even closer to our customers and to take the different industry requirements into account. Therefore, we deliver more than just press technology, instead we deliver system solutions that meet the demands in the global competitive environment. Our focus is on the individual requirements of the operators in the respective market environment. This helps us to translate technology leadership into concrete customer benefits and utilize technological and growth opportunities together with you.

For this purpose, the Schuler Group is present with about 6 600 employees and its own locations / representatives in 40 countries. We are your partner who supports you reliably worldwide. Benefit from the comprehensive knowledge of our project teams from installations across the world.

We are here for you.

SERVICE LOCATIONS

Everything from a single source – worldwide: Our service network around the globe with more than 900 Service employees is available to you at all times.This way, we ensure the efficient parts production for you - everywhere and at any time.

TECHCENTER

With the opening of the Schuler TechCenter, we have redefined the presentation of systems and technologies. Utilize the unique offer, which makes cutting-edge technology a live experience for you and cannot only show you new approaches for your production but also ensure the optimization of workflow and production rate or be available as backup for the running production.

MORE INFORMATION

www.schulergroup.com/techcenter

SCHULER LOCATIONS AND TECHCENTERS

INNOVATIVE FORMING TECHNOLOGY AND CUTTING-EDGE TECHNOLOGY – LIVE EXPERIENCE

Transfer press with TwinServo technology at the TechCenter Erfurt.

Experience exchange on the automated transfer press with ServoDirect technology.

Welcome to the future. Welcome to the Schuler TechCenter.

Tread new paths with Schuler, and engage in an intensive dialog with us. We have equipped our TechCenters in Germany and the USA with state-of-the-art machines and systems for you – to handle and to try out, for production optimization and employee qualifications, for the short-term job order production or for an intensive training. This allows us to adapt our selection even more directly to your individual requirements.

Visit us at one of our TechCenters.
We look forward to seeing you and many exciting experiences - around the world of forming technology.

This is how you know Schuler: As technology and world market leader in forming technology, the company is present at all important trade shows, conventions and symposiums as well as university fairs - national and international. Regularly conducted symposiums, workshops and technology days also set the stage for the direct and personal dialog.

The next step follows: At certain locations in Germany and the USA, the new Schuler TechCenters significantly expanded the opportunities for intensive communication. With individual and needs based demonstrations, trials and training - directly on the newest presses and automation devices.

Crossbar Robot 4.0 at the Automation TechCenter Gemmingen.

Flexible, efficient, productive – PCH flex Technology, live presentation at the Hot Stamping TechCenter Göppingen.

In intensive contact with the Schuler exports this makes it possible - even before the series production starts - to clarify specific questions and develop efficiency increases that are precisely customized for your own production. Other focal points are topics such as process and stroke rate optimizations, die run ins, stamping and die tests and also process and module developments. This ensures that Schuler systems utilize their full performance potential and optimal output right from the start.

The Schuler TechCenters offer even more: Depending on the system, there is an option for backup or startup production. This opens up the opportunity to continue with the production in the event of a machine failure or before commissioning a new machine.

Technology events, training and workshops on-site make the Schuler TechCenters centers of knowledge and knowledge transfer. Making a significant contribution to the success of the company - including forming technology - highly competent employees.

Groundbreaking industry solutions can be seen here from now on. Experience the technology of the world market leader in forming technology live and stay connected to the future!

ADDRESSES

PARTNER FOR SHEET METAL FORMING

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Schuler Service
www.schulergroup.com/service

MORE INFORMATION

www.schulergroup.com/plant_locations

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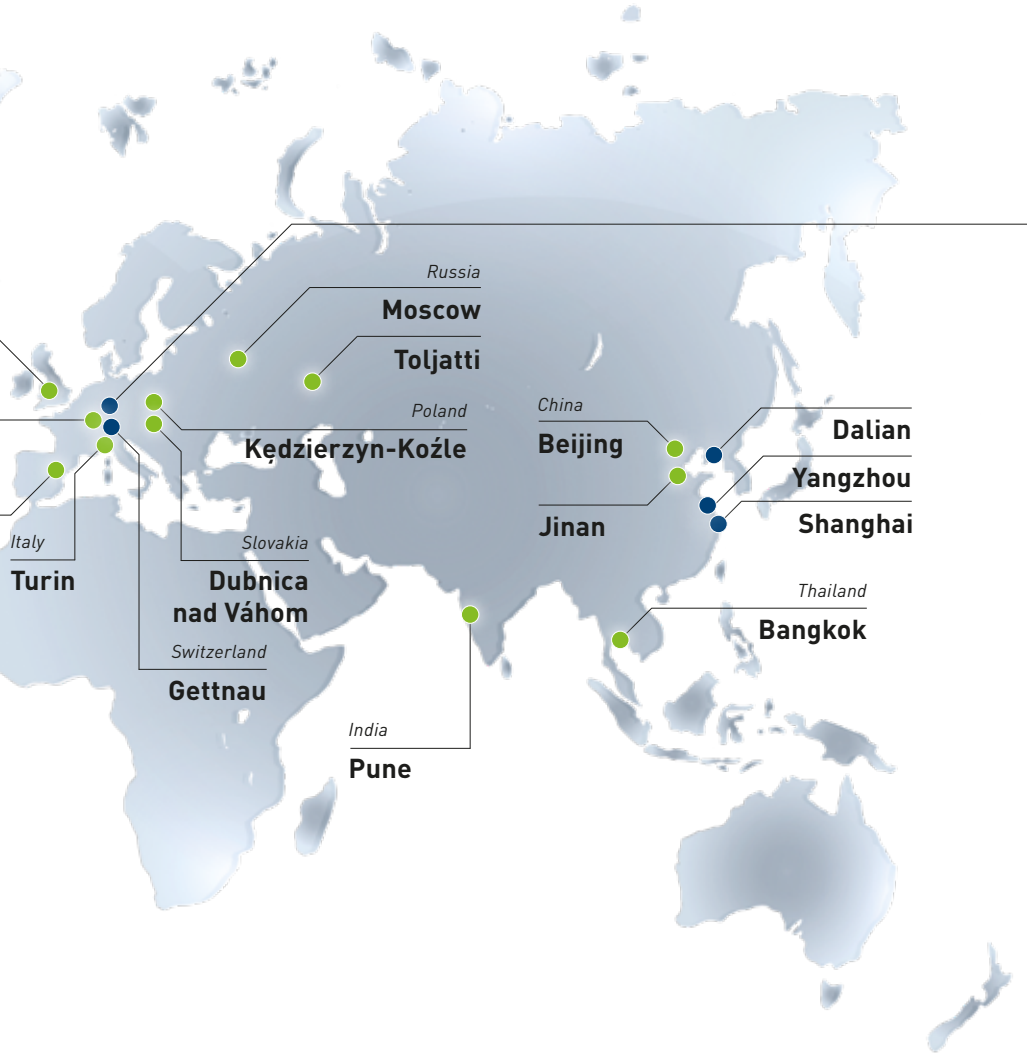

- Germany
- **Göppingen**
- **Aue**
- **Eislingen**
- **Erfurt**
- **Gemmingen**
- **Heßdorf**
- **Netphen-Wertenbach**
- **Remscheid**
- **St. Egidien**
- **Waghäusel**
- **Weingarten**

- *Schuler Service and Schuler production facilities*
- *Schuler Service*

THE WHOLE WORLD OF SHEET METAL FORMING

NOTES

ABOUT THE SCHULER GROUP – WWW.SCHULERGROUP.COM

Schuler is the technological and global market leader in the field of forming technology. The company provides presses, automation solutions, dies, process expertise and service for the entire metalworking industry and for lightweight automobile construction. Its customers include automotive manufacturers and suppliers, as well as companies in the forging, household appliance, packaging, energy and electronics industries. Schuler is a leading supplier of minting presses and implements system solutions for a wide range of different high-tech sectors. The company has a presence in approximately 40 countries with roughly 6 600 employees. Schuler is majority-owned by the Austrian ANDRITZ Group.

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