



# up grade

Newsletter for customers, employees and partners  
volume 23, issue no. 44, December 2020

## ■ LASCO NEWS

### Acid test for digital methods

Hirschvogel relies on digital modeling from LASCO for the retrofit of a 25-year-old system and expects significant added value.

Page 3

## ■ LASCO KNOW-HOW

### Preforming methods upsetting and bending

In the third and final part of our series on **proven preforming methods** in die forging, we present the advantages of upstream upsetting and bending operations.

Pages 4-5

## ■ LASCO PRAXIS

### Retrofit at ZF meets highest demands

ZF Friedrichshafen AG has invested in an ultra-modern and efficient new press system and also used LASCO retrofit for existing presses.

Page 8



## Editorial



### Recognize and use grant possibilities

The pandemic has dramatic consequences for the global economy. But every crisis has an end and there are opportunities for those who act with determination now.

In many countries, politicians have taken measures to minimize the economic consequences. Economic stimulus packages have been put together worldwide, support programs launched and tax incentives created. Thus not only in Germany but also in many other countries there are special state aid programs for the capital goods industry as well. Wisely act those who now inform themselves in detail about which options are available and which conditions must be kept in order to prevent investment backlogs through support programs.

Often the programs are aimed at energy and resource efficiency and the reduction of emissions such as CO<sub>2</sub>. For a long time, LASCO has developed and successfully implemented technologies that have enabled significant advances in all three areas. This also applies to practical expansion solutions for the digital networking in production processes. Such measures are particularly promising because they can also be used for increasing the efficiency of production facilities that have been in operation for some time already. In this way, even with limited investment volumes, grant possibilities can be used to efficiently revive the existing production.

I wish you a peaceful festive season. Stay healthy, confident and economically successful!

Yours Lothar Bauersachs  
CEO



Mechanical engineer Michael Schnabel at the digital twin of a forging line from LASCO, whose operating data is used for the "DizRuPt" research project.

## Data-driven retrofit and generation planning

# RESEARCH PROJECT

**The "DizRuPt" research project initiated by the German government is intended to provide new features and functions for the planning of product generations in mechanical and systems engineering.**

The Karlsruhe Institute of Technology (KIT), the Excellence and Research University of Baden-Württemberg in the Helmholtz Association, is the responsible body for the project that started one and a half years ago. At the invitation of KIT, LASCO belongs to a group of eight selected companies that cooperate in „cross-sectional projects“ and combine the knowledge, methods, and tools gained in pilot projects.

The latest LASCO machines already have – up-to-date - interfaces for the acquisition of operating and production data. Thousands of forming machines of different origin on the market also offer great potential for retrofit

solutions. The aim of the pilot project is the prototypical retrofitting of existing systems with sensor technology and EDGE device. The data is stored and evaluated via an IoT platform (e.g. Axoom). This is done using the example of machines of a LASCO customer. The findings will be used for further planning of retrofit and generations. The focus of the development work is on increasing the overall system efficiency (GAE or OEE) so that the operating data can provide decisive indications for optimization.

Results of the project are expected at the turn of the year 2021/22.



# FUTURE NOW

**LASCO products can also be subsequently integrated into digital networks.**

The interface is a gateway that supports the modern protocols for data exchange according to international standards. Hardware and software can be retrofitted so that older units can also be integrated into future-oriented systems for digital visualization, monitoring, control and analysis of manufacturing processes. The retrofit meets the conditions of many current funding programs for digital transformation. The compact flyer "Smart Integration Ready", which is available on our LASCO website, provides information about advantages and options.

## Pilot project with Hirschvogel Umformtechnik GmbH in Denklingen

# BACK TO THE FUTURE

**Existing equipment is transferred to the virtual world, where it is re-configured, virtually commissioned and finally transferred to the real world and incorporated into the production process.**

The modernization of an automated forging line for drive shafts commissioned by the automotive supplier and long-standing LASCO business partner Hirschvogel Umformtechnik GmbH (based in Denklingen) is a practical test for a new generation of digital tools and their users. The challenges for this test are the age and history of the production facility: 25 years after commissioning, meantime individual conversions and extensions as well as relocations, the technical documentation is only fragmentary.

The veteran works reliably in 3-shift operation with a high press force (25,000 kN). However, the risk of failure increases due to the aging wear parts, availability problems of replacement components as well as not performed backups. The necessary retrofit therefore includes replacement of media connections, replacement and optimization of wear parts, integration of the latest control components with customized HMI (Human Machine Interface) and replacement of the robot systems.

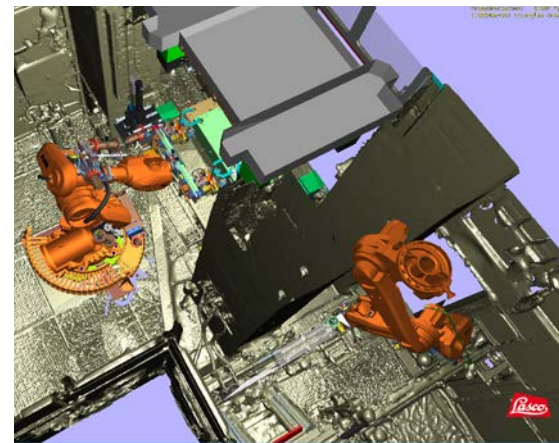
The system was measured with highest precision using a 3D scanner and, on the basis of data points (530 million) obtained in this way, was virtually reconstructed "post-processing" in a few days. With conventional methods, this task would have taken months and would have failed because of the long interruption of operation.

With the help of digital twins, it is now possible to develop spare and additional parts exactly as if the engineers had direct access to the real system. In addition, all process

steps can be simulated using the production parameters, control and interfaces can be programmed, robots can be taught and the interaction of all components can be tested. Immediately afterwards, parts are procured and assembled and the system can be used in production.

The aim is therefore smooth commissioning in record time, planned for the end of the first quarter of 2021. The innovative approach is already considered a major step into the future.

Screenshot of the virtual image of the Hirschvogel production line (detail): Robots with optimized gripper systems integrated into the data grid of the real existing plant generated by 3D scanners.



## Soraluce FXR-Q 5000 milling & drilling center adds to production equipment

# DIVISION OF LABOR

**Division of labor is a success principle of our economic system. LASCO also supports its business partners as a contract manufacturer and has further expanded its state-of-the-art production technology.**

For more than 30 years, LASCO has also been on the market as an extended workbench in the area of contract manufacturing. Continuous investment in modern production facilities and optimized processes make the company an attractive partner for the metalworking industry. Customers appreciate LASCO's high quality, professional competence and adherence to delivery dates.

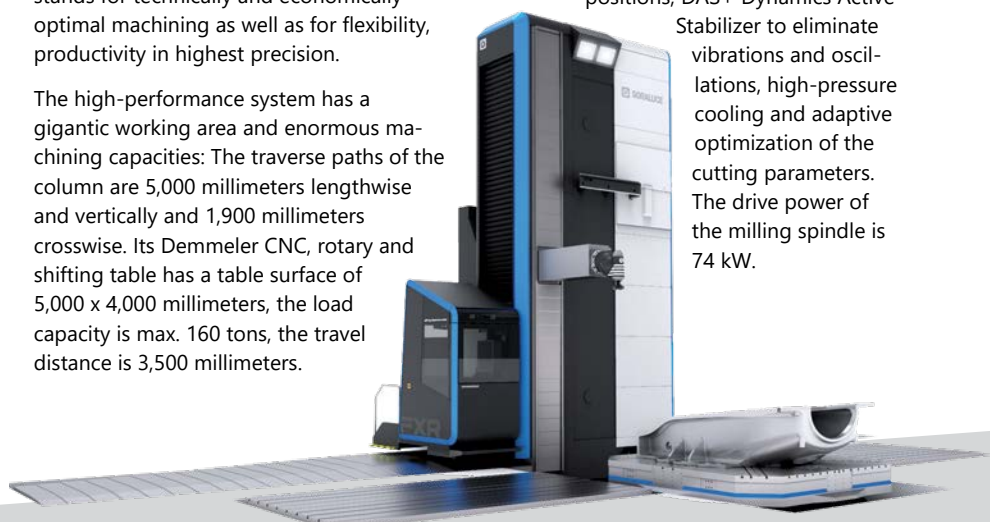
With the recently commissioned traveling column-type milling, turning and drilling center FXR-Q 5000 of the manufacturer BIMATEC SORALUCE, the machining possibilities for large parts with high part weights in Coburg were further expanded. The new,

innovative technology of the machine tool stands for technically and economically optimal machining as well as for flexibility, productivity in highest precision.

The high-performance system has a gigantic working area and enormous machining capacities: The traverse paths of the column are 5,000 millimeters lengthwise and vertically and 1,900 millimeters crosswise. Its Demmeler CNC, rotary and shifting table has a table surface of 5,000 x 4,000 millimeters, the load capacity is max. 160 tons, the travel distance is 3,500 millimeters.

The unit with a total installed power of 188 kW has features such as: an AQC spindle sleeve/milling head change system, dynamic milling compensation to increase the accuracy of the orthogonal head

positions, DAS+ Dynamics Active Stabilizer to eliminate vibrations and oscillations, high-pressure cooling and adaptive optimization of the cutting parameters. The drive power of the milling spindle is 74 kW.



## Preforming processes for die forgings - Part 3

# UPSETTING AND BENDING

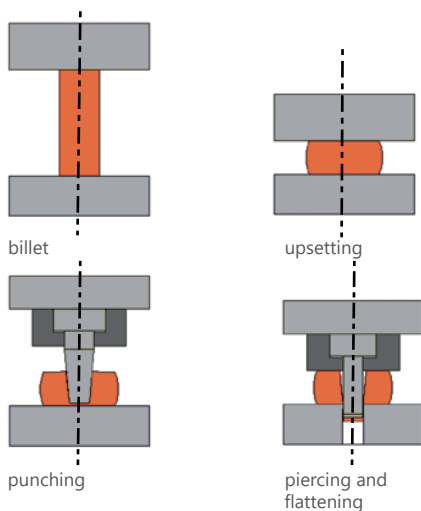
In the third and last part of our series “Preforming processes for die forgings”, we will take a closer look at upsetting and bending processes.

### 1. Process steps upsetting

Upsetting processes in hot forging are divided into edge breaking, flattening, free upsetting, form upsetting and center upsetting. In the following we will concentrate on the so-called free upsetting and form upsetting. The starting material of die forgings is preferably round material. Depending on the geometry of the finished forging, the heated billets are preformed.

If the billet is placed vertically in the preform-

Picture 1: Process stage



ing tool and is not subject to any expansion limits in the horizontal direction, this is referred to as free upsetting. A typical application for free upsetting is the preforming of rolled rings.

- Another well-known example of form upsetting is coning in the manufacturing process of screws with shank diameters from 30 mm and screw lengths from 300 mm.

Free upsetting is indispensable for the preforming of rings to be rolled. Both round and square material can be used as starting material, cut to the required length according to the required volume. When round material is used, the upsetting operation takes place between two upsetting plates, which are adapted to the press ram and

the press table. The upsetting process is mainly performed on hydraulic presses. The starting position of the upsetting process is determined by the height of the heated billet and ensures descaling of the workpiece during the preforming process.

Downstream punching, piercing and flattening operations are also carried out on hydraulic presses. For the latter operations, shifting tables with multiple tools adapted to the ram are used.

Fully automated, directly driven LASCO screw presses are predestined for the upsetting of larger screws with shank diameters between 30 and 90 mm. They are the optimum choice in terms of process and economy.

For the typical process on a LASCO system, see Figure 2

Bar material is cut to exact length. The sections then pass through the induction system, in which the bar heads are heated either partially or along their entire length. In the die of the screw press, a screw head is forged by max. two forming operations.

For special screws with long shank, it is advisable to precede die upsetting with a coning operation due to the risk of buckling. In this case, the forming unit is equipped with a shifting table on the press ram, which accommodates two different upper dies.

In the first operation, the screw head is coned, and then in the second operation the screw head is finish-forged. Both operations take place in the same lower



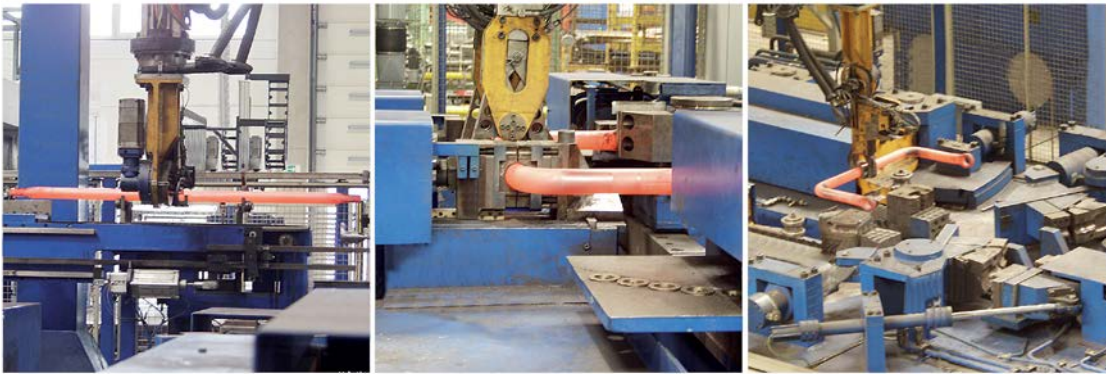
Picture 2: Simulation representation of a coning and finish-forming operation

die. Moving the shifting table moves the respective upper die into the first or second operation.

The workpiece is lifted out with a hydraulic ejector. A manipulator takes over unloading and reloading.



Picture 3: Shifting slide with two upper dies



Picture 4:  
Fully automatic  
bending line for stabi-  
lizers for commercial  
vehicles

## 2. Process steps bending

In the die forging industry there are basically two types of bending:

1. the bending operation upstream of the main forging unit, performed on hydraulic presses,
2. the bending operation carried out e. g. directly on the LASCO die forging hammer (main forming unit) at low forming energies.

Already 15 years ago, LASCO realized a highly efficient, fully automatic hydraulic bending system for truck stabilizers, on which the following operations are performed: cranking, bending, center bending and calibration. A computer-controlled loading device picks up the stabilizer blanks from the furnace outlet and transports them to and between the forming stations. Between the individual operations, the loading device turns the stabilizers to the required angular position for hydraulic clamping. During cranking, bending or calibrating, the tools are moved by hydraulic cylinders. The preforming of the stabilizer is carried out against fixed bending or calibrating tools which can be easily exchanged.

In the first two stations, cranking and bending operations are performed symmetrically to the center of the stabilizer. If central bending is required, this is done in a separate station. In the last operation, the stabilizer is calibrated to size (LASCO patent number DE 10 2004 015 073 B3). (Picture 3)

Another automated system for bending, calibrating and coining shackles was recently realized by LASCO. Partially heated billets with a maximum diameter of 140 mm are bent into shackles fully automatically. The shackle eyes are calibrated fully automatically and then coined. The system is designed for shackle sizes of max. 300 kg, whereby the stretched length is max. 2100 mm. (Picture 4)



Picture 5: LASCO system for bending, calibrating and coining

In principle, preforming processes are used for better mass distribution of the material to be used. Optimum charge weight, near-net-shape material pre-distribution and thus longer die service life are only some of the advantages that make these processes so attractive. In the production chain from

steel production to trimming, the optimum preforming process has a positive effect on CO<sub>2</sub> reduction.



LASCO apprentices with newcomers, trainers and the CEO, Lothar Bauersachs (front, 2nd from right)

## NO CUTBACKS IN PROMOTION OF YOUNG TALENTS

**44 apprentices have been joined by 12 newcomers, 6 of them industrial-technical and one dual business studies student.**

Among the new trainees are also five participants in the integration project „1+3“ for refugees from war zones, which was initiated by IHK President Friedrich Herdan, Chairman of the Management Board of LASCO Langenstein & Schemann Holding.

Not only does LASCO's training ratio currently stand at 16 percent, it has been significantly above the industry average for decades. The quality of the training is excellent, this is generally acknowledged and regularly confirmed by the performance of the trainees in final examinations.



## STRONG QUALIFICATIONS

Among the 725 commercial business graduates in the district of the Chamber of Commerce and Industry of Coburg, the following LASCO trainees stood out in particular

- industrial mechanic Sina Heß
- industrial clerk Nico Hildebrandt
- information technology officer Daniel Fink

They were awarded as the best of the year in their respective professions. The industrial clerk Margarita Iaremenco was also honored for her excellent performance.

André Höllein (mechatronics technician), Florian Greiner (electronics technician), Luis Flurschütz (industrial mechanic), Paula Lehmann (industrial clerk), Larissa Gregor (industrial clerk), Niklas Wöhner (electronics technician) and Janik Kurth (cutting machine operator) as well as Pavlo Pastukhov (electronics technician) also successfully completed their examinations. Our picture shows (from right to left) in the front row Lothar Bauersachs (CEO), Daniel Fink, Sina Heß and Luisa Wachsmann (commercial training supervisor) and in the back row Georg Pfeuffer (industrial training supervisor), Margarita Iaremenco, Nico Hildebrandt and Peter Wache (Works Council Chairman).

## Spotlights

**VDI award for LASCO engineer:** Our junior engineer Moritz Schilling, B. Eng., is this year's winner of the "Verein Deutscher Ingenieure (VDI) Coburg". He



received the award for his bachelor thesis with the topic "Evaluation of a data monitoring application on a hydraulic forging hammer based on a system-independent measurement data

processing system". The thesis, supported by LASCO, documents the development of an automatic process acquisition and recording system for the highly loaded steel casting machine frame and the high pressure hydraulic system. The thesis is also part of a LASCO research project in the context of potential Industry 4.0 applications.

### LASCO donates to the Red Cross:

LASCO has donated an emergency vehicle for the rescue dog squadron to the Red Cross, Coburg District Association (BRK). "This squadron makes an important contribution to the rescue of people through volunteer work," emphasized Robert Welsch, LASCO Managing Director Production, at the handover of the Volkswagen Golf VII Variant. The vehicle is a prerequisite for the realization of the so-called "two-vehicle strategy", through which the dog team wants to increase flexibility and efficiency. The dogs are specially trained and must receive continuous training at changing locations. In the last eight years, the dogs have tracked down 98 missing and/or injured people, including eight children.

### WE CONGRATULATE YOUR ANNIVERSARY:

#### 10 years with LASCO

Daniel Hanff	16.08.2020
Christoph Schad	01.10.2020

### SADLY MOURNED:

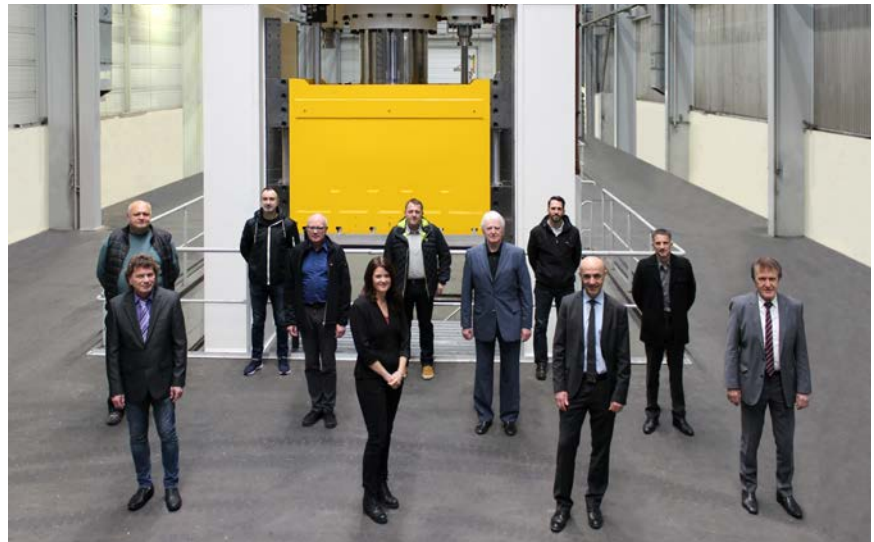
Bachmann, Horst	+ 20.05.2020
Hegner, Helmut	+ 15.08.2020

**Nine job anniversaries - including two with 40 years of service**

**THANKS FOR PERFORMANCE AND LOYALTY**

**LASCO honors the performance and loyalty of employees who have worked for the company for many decades. Two job anniversaries already look back on 40 years of company membership.**

In a ceremony, the managing directors Lothar Bauersachs, Thomas Götz and Robert Welsch honored the company loyalty of Roland Hahn and Günther Zetzmann (40 years) as well as Romy Musbach, Klaus Bischoff, Alexander Grasmück, Matthias Kreppel, Oliver Lange, Stefan Plenert and Waldemar Simon (25 years). As a sign of recognition, the company management handed over certificates and loyalty bonuses as well as the Badge of Honour of the Board of Trustees of the Bavarian Employers' Association and IHK certificates of honour in the presence of the Deputy Chairman of the Works Council, Thomas Koppitz.



In the picture from left to right – Back row: Waldemar Simon, Oliver Lange, Matthias Kreppel – Middle row: Klaus Bischoff, Thomas Koppitz (Deputy Chairman of the Works Council), Günther Zetzmann, Alexander Grasmück – Front row: Roland Hahn, Romy Musbach, Lothar Bauersachs (CEO), Friedrich Herdan (Chairman of the Management Board of LASCO Langenstein & Schemann Holding) – Missing: Stefan Plenert

**40<sup>th</sup> anniversary**

**Günther Zetzmann** began his professional career after joining the company in 1980 in the commercial administration, which he managed responsibly just two years later due to his achievements. From 1981 he was responsible for the development and expansion of IT (ERP systems) and also took over the management of this department. From 1987 to 1995 he was also data protection officer and deputy purchasing manager, a position in which he found his calling.

**Roland Hahn** was employed as a cutting machine operator in 1980 and was also active in the field of tool setting for a time. Further CNC training and his qualification as a control programmer allow the highly specialized operator of drilling, milling and grooving machines to carry out highly demanding work on his own responsibility - from the choice of tools and the respective programming of the machine to the inspection of the finished parts.

**25<sup>th</sup> anniversary**

**Romy Musbach** joined LASCO in 1995 as an apprentice industrial clerk. She soon

discovered her preference for media design. After remote studies at the graphic academy and the CCI vocational qualification as a media designer digital/print, she took over the project management of LMS (LASCO Multimedia Services) and shortly afterwards became deputy head of the graphics and design department. Since 2019, Ms. Musbach has proven herself in the marketing department - design division.

**Klaus Bischoff** joined LASCO in 1995 as a technical draftsman (mechanical engineering) with several years of professional experience already. With his broad expertise, he supports a wide variety of projects in press construction in the design department. Bischoff has specialized in individual machine designs, hydraulic and customized constructions.

**Alexander Grasmück** began his vocational training as an industrial mechanic at LASCO in 1995. The main focus of the highly specialized mechanic is in the field of sand lime block presses. His Kazakh roots predestine him to be used for complex service tasks especially in Russian-speaking countries.

**Matthias Kreppel** also joined the company in 1995 as a trainee industrial mechanic. Since then, he has been involved in

assembly and commissioning work both in Germany and abroad and can apply his enormous knowledge to the entire product range of LASCO, both in the field of forming technology and in the field of sand-lime blocks for customer applications.

**Oliver Lange** joined LASCO in 1995 as a machine fitter and since then has been responsible for the assembly, installation and commissioning of machines and systems both internally and for customers worldwide. His specialization in large installations with complex automation systems makes him a highly sought-after expert.

**Stefan Plenert** trained as an energy electronics engineer specializing in industrial engineering at LASCO from 1995 to early 1999. He then worked as a fitter in the electrical department and now supports LASCO customers worldwide as a service technician with many years of experience.

**Waldemar Simon** already had several years of professional experience before he joined LASCO in 1995 as a cutting machine operator. Since then, he has worked on various cutting machines and completed internal training courses in the field of machine controls in order to keep up to date.

### Interview

Stefan Zauner, Head of Sheet Metal Forming,  
Senior Manager Powertrain Technology,  
ZF Friedrichshafen AG, Schweinfurt

### Leap in performance

**up grade:** Mr. Zauner, is ZF now operating a modernized or a new forging system in Schweinfurt?

**Stefan Zauner:** Four of the five key units, i.e. the presses, are new. However, a number of components of the former system have also been modernized. Therefore, both are true.

**up grade:** The original press line for thick sheet metal did not come from LASCO. Nevertheless, ZF commissioned LASCO with the revision of the ZMS1. What was the reason?

**Zauner:** Our companies have known each other for many decades already. Ultimately, it was the advantages promised by the concept presented and LASCO's reputation for reliably fulfilling technical performance commitments. We were recommended to use the "LASCO hydraulic servo direct drive®". The higher investment compared to traditional hydraulic drives is overcompensated by energy efficiency and output. Using the latest generation of control and automation technology, we are able to reach a stroke rate in completely new performance dimensions. Optimum energy use, lower tendency to develop faults, lower maintenance requirements and higher output are the key arguments for this advanced overall solution.

**up grade:** How intensive must the cooperation between customer and machine manufacturer be in such a project?

**Zauner:** Such a complex project can only be realized through know-how on both sides and cooperation. Between the first inquiry and the commissioning of the plant, there were more than 20 months, during which experts from both companies repeatedly exchanged ideas in order to achieve the greatest possible progress. In addition, the project had to be implemented in the shortest possible time during ongoing operations, as the supply of our customers' product lines with components from our company could under no circumstances be jeopardized.



Panoramic picture of the press system ZMS 1

## ZF Friedrichshafen AG

# AMBITIOUS RETROFIT

**When ZF Friedrichshafen AG planned the renewal and partial revision of the fully automated ZMS1 press line for damped flywheels at its Schweinfurt plant, the focus was not only on doubling the life cycle of the system. The desired higher utilization potential was rather in output, accompanied by efficient energy use. ZF commissioned LASCO with this task in mind and with the knowledge that LASCO already successfully carried out new systems and retrofits in the past, even on machines and systems of foreign origin.**

ZF is a globally operating technology group and supplies systems for the mobility of passenger cars, commercial vehicles, and industrial technology. The production facilities of the automotive supplier are designed for large series with the highest reproducible quality and within the narrowest tolerances. The lifetime of machines and tools must guarantee the ability and reliability to supply for years to come in "just-in-time sequence". Even for modern mechanical engineering, it is not trivial to fulfill this requirement in terms of system technology.

The press line for damped flywheels in Schweinfurt was approaching its capacity limit and was also at the end of its life cycle when the company approached LASCO in 2016 with an initial inquiry. The advanced material fatigue process on the main forming units caused failure and maintenance costs to rise to dimensions that prompted ZF to make fundamental economic considerations.

The requested revision concept was not only aimed at reducing costs and avoiding risks of downtime, but also focused on significantly increasing output with optimum energy efficiency.

Since 2018, the new press line with five main forming units has been forming thick sheet metal with wall thicknesses of 8 mm into damped flywheels six days a week in a three-shift system. Two new LASCO TZP 1250 (12,500 kN press force), equipped with the energetically highly efficient "LASCO hydraulic servo direct drive®", as well as two LASCO TZP 400 (4,000 kN press force) and a retrofit press with 2,500 kN press force are the forming units of the new efficient production line. Peripheral system components were replaced or subjected to an extensive retrofit, e. g. the transfer equipment, such as the conveyor feeding system, etc. The length of the line is 20 m. The main forming units with 500 t are the heavyweights.

Based on past experience, ZF's project managers placed particular emphasis on material optimization of press frames in order to efficiently counteract the material fatigue process. LASCO engineers provided the basis for this with extensive FEM calculations. ZF Friedrichshafen AG with its headquarters in Friedrichshafen is the fifth largest automotive supplier worldwide. Represented at around 260 sites in 41 countries, the Group generated total sales of more than 36 billion Euros in the last business year.