



up grade

Newsletter for customers, employees
and partners
volume 25, issue no. 46, May 2022

■ LASCO TRENDS

Revival of exhibitions

Some of the recent metalworking exhibitions have far exceeded expectations. After all those months of paralysis caused by contact restrictions, the industry wants to get back to normal.

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■ LASCO KNOW-HOW

Advantages of servo asynchronous drives

With their high precision and energy efficiency, direct servo drives are optimal for screw presses. Among the available variants, servo asynchronous motors are advantageous in many respects. In the know-how article we explain why.

Pages 4-5

■ LASCO PRACTICE

Third forging line - MVO expands position

With the installation of the third fully automated LASCO forging line, MVO is now expanding its market position as a renowned manufacturer of components in the steering and chassis area of vehicles.

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Extreme burden from increase in raw material and energy costs

The development of energy prices has known only one direction in recent times: steeply upward. For example, one megawatt hour (MWh) electricity on the futures market still cost an average of 48 euros in January 2019. At the end of December last year, the price of electricity on the stock exchange jumped to a new record high of 325 euros per MWh. The significant increase is now causing major problems for large parts of the economy. Regardless of which business survey you currently look at - almost all industrial companies describe energy and raw material prices as the greatest risk to their economic prosperity. Unfortunately, the expansion of renewable energies is expected to make electricity even more expensive in the future.

At the same time, our companies are burdened by massive price increases for raw materials and intermediate goods as well as ongoing disruptions in supply chains. Since it is seldom possible to pass on cost increases in full to customers, the idea of compensating for the additional costs and cutting back on investments is an obvious one. But if this makes it no longer possible to invest in modernization and increase in efficiency, then, in turn, it massively damages competitiveness.

The better answer to the extreme sporting challenges of these days is to invest in technology right now to improve energy efficiency. This is paying off thanks to government subsidy programs, still historically low interest rates on the capital market and due to high energy prices. Many LASC0 forming machines are already equipped with four-quadrant converters and thus offer the possibility of recuperation. Professional solutions for energy recovery and savings are not new to us and have been used successfully, for example, in screw presses, forging and cross wedge rolls, as well as hydraulic presses for decades. This technology is not only available for new equipment, but also for retrofit and conversion projects. Of course, we as designers and equipment manufacturers, also have ideas and suggestions for the individual optimization of production equipment. Please contact us!

Yours Lothar Bauersachs
CEO

LASC0 TRENDS + MARKETS



LASC0 booth at the EMO 2021 in Milan

Revival of the international exhibitions

BACK IN THE LIMELIGHT

After months of global economic paralysis due to government mandates to contain the COVID-19 pandemic, the world of metalformers started to turn faster again. LASC0 witnessed a real sigh of relief from the industry at three key exhibitions.

From early 2020 into the fall of 2021, exhibitions were cancelled in rows and business operations disrupted e. g. due to travel and contact restrictions. Against this background, the expectations in the run-up to EMO in Milan (Italy), Forge Fair in Detroit (USA) and MSV in Brno (Czech Republic) were mixed, but the hope for personal meetings was high.

EMO Milano 2021, the leading international exhibition for the manufacturing industry, was held from October 4 to 9, 2021 at the Fieramilano exhibition center in Rho (Italy) under the motto "The Magic World of the Metal Industry." Organized by Cecimo (European Association of the Machine Tool Industry) and Ucima-Sistemi per Produrre (Association of Italian Manufacturers of Machine Tools, Robots and Automation), the event attracted more than 60,000 visitors from 91 countries. Products of more than 700 companies were exhibited in an area of around 100,000 m².

With a robotic forging cell LASC0 demonstrated the interaction between the virtual world and real system automation. For this



Concrete possibilities for digitizing production were also discussed at MSV.

purpose, a computer model of our new innovative aluminum forging line was controlled with authentic software and cooperation with industrial robots was demonstrated in real time at the exhibition booth. This aroused great interest among many visitors and inspired numerous conversations about automation, digitalization and aluminum forging lines. A lot of projects of current and future cooperation both with long-standing customers and numerous new business contacts were discussed in detail against this background.

At the Forge Fair in Detroit (Michigan, USA) from October 26 to 28, around 2,000 professionals came together to learn about new products, make purchasing decisions and establish contacts. At this largest event for the forging industry in North America, LASC0, through its subsidiary LASC0 Engineering Services (LES), acted as one of the three main sponsors.

Mike Gill, CEO and President of LES, gave a well-received presentation on the new aluminum forging line of Bharat Forge Aluminum USA Inc., among other things.

The exhibition MSV in Brno (Czech Republic) started a few days later. From November 4 to 11, the focus was on "Industry 4.0" and the path to the digital factory. Progress in the digitalization of production processes is proving to be the most important trend in the innovation process. This is reflected not least in the high level of interest in current funding opportunities for digitization investments. Visitors to the LASC0 booth obtained information particularly about automation options for their production facilities.

US forging company produces for the mining, off highway, agricultural, hydraulic, green energy, and rail industries.

SCREW PRESS FOR ENGEL TOOL & FORGE

17 years after commissioning its first LASC0 screw press, the U.S.-based solid forming company Engel Tool & Forge Co., Inc. (Milwaukee, WI) has now once again opted for LASC0 technology.

The choice fell on the direct-driven LASC0 screw press type SPR 1000 with a maximum impact force of 20,000 kN at 160 kJ gross energy. One of the advantages of the LASC0 precision forging unit is the forging accuracy due to exact controllability of the impact speed at high energy efficiency.

Engel Tool & Forge is known for special tools for the mining industry, bevel gears for heavy engineering among many other forgings produced. The forging processes required for this necessitated the adaptation of a number of machine components. The process-oriented adaptation possibilities of LASC0 machine components are generally appreciated by our customer and led to the development of the SPR 1000 in special design tailored to the product range of Engel Tool & Forge.



The new SPR 1000 So for Engel Tool & Forge in the assembly hall: almost ready for acceptance and shipment.

Ambitious retrofit completed

PREVENTIVE RETROFIT

For more than 20 years, a reputable world market leader in Scotland has been manufacturing turbine blades using LASC0 precision screw presses.



Turbine blades are produced with precision screw presses from LASC0.

Currently a retrofit was due with regard to control and drive technology. Precision screw presses of the types SPR 630, SPR 1250 and SPR 2000 received the latest versions of **LASC0's four-quadrant converter technology** with the possibility of recuperation (see know-how article p. 4/5). Machine control and HMI were also upgraded to the latest state of the art.

A particular challenge was the implementation of the individual retrofits without major production downtime within the narrow time corridor specified by the customer. **LASC0's virtual commissioning** carried out in advance once again proved its worth.

NEW CUSTOMER

DreBo Werkzeugfabrik GmbH (Altshausen, Germany), world market leader in the field of drilling and chisel tools, is expanding its production capacities and has purchased a LASC0 screw press SPR 500 So for this purpose.

The unit has 50 kJ gross energy and realizes a continuously permissible press force of 8,000 kN. DreBo has so far only operated friction wheel presses. In order to be able to manufacture products of even higher quality, a screw press was now needed that provides precisely reproducible forming energies.

This led to the decision for LASC0 engineering. Decisive factors were energy efficiency and the option of subsequent automation.

Founded in 1979, the family-owned company DreBo, with about 500 employees, is one of the top manufacturers of carbide-tipped rock drilling and chisel tools for professional users.

Advantages of the servo asynchronous drive

DRIVE TECHNOLOGY OF THE LASCO SCREW PRESS

Electric drives are classified as servo technology by definition if the exact position of the rotor shaft, speed and/or acceleration can be controlled and influenced, i.e. regulated, by means of appropriate sensor and control technology. Among the classic forming units, the screw press benefits particularly from this.

Asynchronous motors as well as separate-excited and permanently excited synchronous motors and DC machines - in other words, any type of electric motor - can be used as servo technology. Servo motors are explicitly not defined by the drive principle, but exclusively by the type of controllability.

For example, there are synchronous and asynchronous servo motors. The operation in electronic position, speed or torque control is the common feature of both of them. The quality of the control is determined solely by the four-quadrant frequency converter and the associated software with which it is operated.

LASCO's preference for **servo asynchronous motors** as drives for screw presses was based on a number of **objective advantages** over alternative concepts:

- **Optimal for the safe control of high inertias**, as is the case with screw presses;
- **extremely robust rotor** due to classic squirrel cage design;
- **permanent magnets on the rotor**, as with permanently excited synchronous motors, **not necessary** for system reasons;
- **extremely durable**, as insensitive to concussions caused by relatively high impact velocities;
- **no hermetic sealing against (especially magnetic) dirt particles in the air necessary**;
- **water cooling unnecessary**, simple air cooling sufficient;
- **largely maintenance-free**, also no special tools required for assembly;
- **optimal for the motion sequence when forging on screw presses**, can be deactivated at any time. Free-wheeling shortly before the upper die touches the forging possible without switching off the control.

Using LASCO know-how, drives, system components and automation peripherals

are optimally matched to each other. This maximizes the economic advantages.

Significant energy savings through recuperation

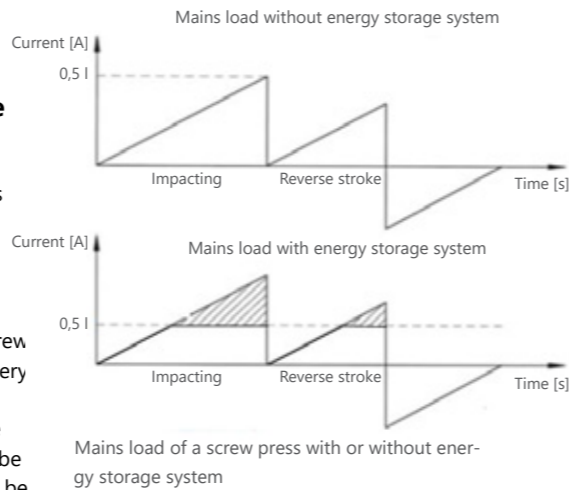
Regardless of the motor principle, any screw press can be equipped with energy recovery in regenerative operation (braking). Depending on the type of application of the press, up to 30% of electrical energy can be recovered. The recuperation function can be retrofitted on request.

Storage facilities reduce the mains load

In addition, power peaks (current peaks) can be strongly damped via energy storage devices or capacitor banks, which reduces the connected load. All LASCO screw presses can be equipped with energy storage systems - even retrofitted if necessary.

High precision - the operating principle of the screw press

In the direct drive, the stator is part of the machine body and the rotor is part of the rotating masses. The rotation of the motor is transmitted **directly** to the screw without intermediate links. The screw thread translates the rotation of the drive into a linear ram movement.



Mains load of a screw press with or without energy storage system

At the beginning of the press stroke, the motor generates torque and provides rotational energy to the rotating masses. Shortly before the upper die hits the workpiece, the motor is switched off. During the subsequent constant travel, the ram reaches exactly the speed corresponding to the selected energy. This way, the kinetic energy of all moving parts is converted into forming and spring energy upon impact with the workpiece.

After forming, part of the spring force accelerates the ram back up. The motor, which reverses in the meantime, pulls the ram further up and brakes it to the upper target position (top dead center). The electrical energy generated during braking is fed either into the mains or into an energy storage system by the regenerative module of the converter system. The mechanical brake itself only serves as a holding brake or emergency stop brake.

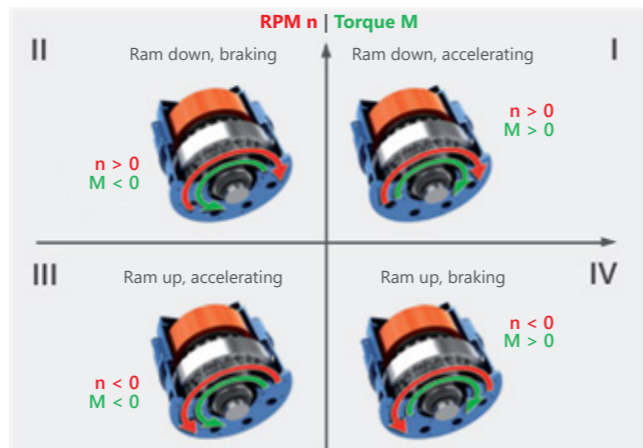


Illustration of a four-quadrant operation motor used in regenerative mode for energy recovery

Energy is predefined, force is generated in the process

In simplified terms, the screw press can be regarded as a physical spring-mass system. Due to the spring characteristics of the machine, the energy conversion, i.e. the impact efficiency η_S is a function of the force.

Important in practice: The energy-force diagram

This is illustrated in the energy-force diagram: The standardized diagram of a screw press with slipping clutch is shown opposite. The gross energy of the machine is shown as a percentage on the vertical and the force on the horizontal axis. As an example, the net energy graphs are shown for the energy levels 10 %, 30 %, 50 %, 70 %, 80 % and 100 %.

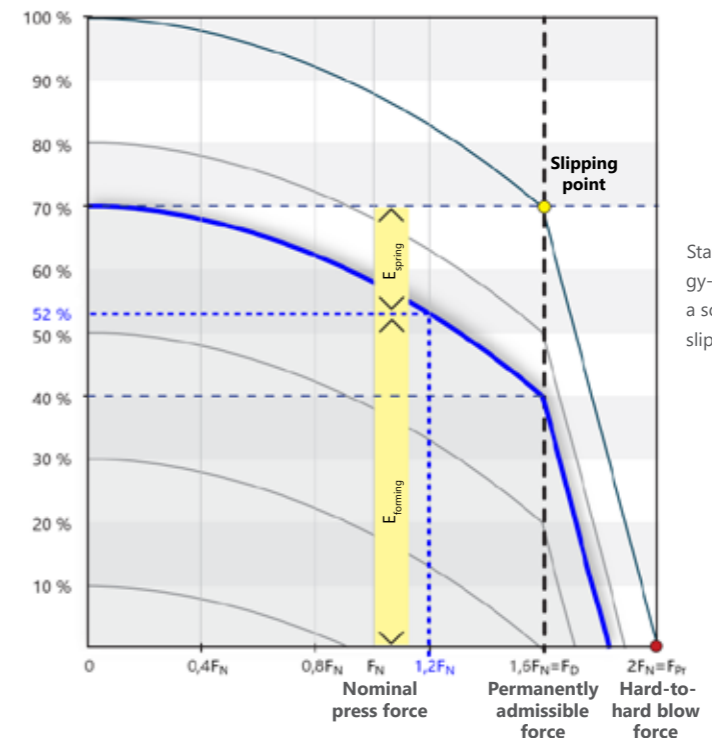
Between the two borderline cases $F=0$ and $F=F_{pr}$ are the relevant cases for practice.

With a force of $F=0$ set at 100 % energy preselection, the entire kinetic energy would have been converted into forming energy ($E_{forming}$). The net energy corresponds to the gross energy, the efficiency factor would be 100 %.

With a force of $F=F_{pr}$ set at 100 % energy preselection, the entire kinetic energy would have been converted into spring energy (E_{spring}), and the efficiency factor would be 0.

In the highlighted example, the press is operated with 70 % of the gross energy. During forging, a force of $F=1.2F_N$ is generated. 52 % of the energy is used for forming, 18 % is converted into spring energy.

It also becomes obvious that forging with forces between F_D and F_{pr} does not make sense from an energetic point of view.



Standardized energy-force diagram of a screw press with slipping clutch



Basic design of the drives of LASCO screw presses of types SPR (with slipping clutch as overload protection - above) and SPP (below) in schematic view.

Vocational training remains constant at LASCO CAREER START

10 school leavers started their vocational training in industrial-technical and commercial professions at LASCO in fall 2021.

This brought the number of apprentices in the company back up to 52 - a constant level for years.

LASCO has always seen it as an important task to cover its own medium and long-term needs for highly qualified specialists, with the aspect that young motivated people receive first-class company-related vocational training and thus see their professional future at LASCO. For this reason, the ratio of apprentices at LASCO, which currently stands at 15 percent, has been significantly higher than the industry average for machine tool manufacturing for decades.

LASCO is currently providing vocational training in the following professions: Elec-

tronics technician (operating technology), mechatronics technician, cutting machine operator (milling machine systems), technical product designer (machine and plant design), industrial clerk, clerk for digitalization management.

In addition, committed young people are offered the opportunity to take dual courses of study, i.e. to combine classic vocational training with a recognized course of study, currently in the combination "BE Mechanical Engineering & Industrial Mechanic for Mechanical and Plant Engineering", "BE Electrical Engineering & Electronics Technician for Industrial Engineering" and "BA Business Administration & Industrial Clerk".



Our apprentices with new recruits, training supervisors, works council and CEO Lothar Bauersachs (left)

STRONG TEAM

Fitness, stamina and discipline were demonstrated by our relay team at the "DATEV Challenge Roth Triathlon" on the first weekend of September 2021. Swimmer Nora Reinhardt (left), runner Harald Barnickel (3rd from left) and cyclist Michael Schnabel (2nd from left), all LASCO, are passionate recreational athletes and participated for the first time in the top event of the triathlon sport. With a total time of 9:58:06 hours, the successful trio finished second in the team relay. The DATEV Challenge Roth, an annual event since 2001, is one of the largest and most charismatic triathlon competitions in the world. The latest event offered excellent competition conditions, an illustrious starting field and perfect late summer weather.



Spotlights

New engineer in charge of sales for NRW: Nicklas Trier, M. Sc. Business Administration and Engineering, has been responsible for our domestic sales area of North Rhine-Westphalia since January 1,



2022. The 32-year-old contributes a great deal of know-how and experience to his new position. Prior to his studies, he already trained as a mechatronics technician at LASCO. After successfully completing his master's degree at the Pforzheim University of Applied Sciences, the native of Upper Franconia returned to LASCO in 2019 and expanded his expertise by successfully participating in a number of projects abroad. We would like to ask our customers to place their trust in Mr. Trier, and we wish him and us good success.

FAIRS + DATES

- IMTEX**
Bangalore, India
16 – 21 June 2022
- automatica**
Munich, Germany
21 – 24 June 2022
- Euroforge conFair**
Bilbao, Spain
28 – 29 September 2022
- Euroblech**
Hanover, Germany
25 – 28 October 2022
- MSV**
Brno, Czech Republic
4 – 7 October 2022
- MetalForm China**
Shanghai, China
8 – 11 December 2022

LASCO honors the achievements of long-serving employees LONG-TERM CONTRIBUTION TO SUCCESS

Once again, LASCO had the opportunity to honor the achievements and loyalty of its employees. Four employees have been with the company for 40 and 25 years, respectively, and actively contribute to the success of the machine tool manufacturer.

WE CONGRATULATE

10 years with LASCO

Pavel Benner	01.01.2022
Robert Feder	06.02.2022
Tobias Fiedler	19.03.2022
Martin Marterer	01.07.2022
Daniel Leicht	16.07.2022
Stephan Kuhn	15.08.2022
Markus Geiger	01.09.2022
Stefan Paul	01.09.2022
Fabian Schütt	01.09.2022
Robert Bätz	01.09.2022
Peter Wache	01.10.2022
Stefan Powalla	01.10.2022
Kai Krzyzanowski	01.10.2022

25 years with LASCO

Michael Erbstößer	01.01.2022
Harald Barnickel	01.08.2022
Gerald Marx	01.09.2022
Matthias Goer	01.09.2022
Simone Großmann	01.09.2022
Sabine Bauer	01.10.2022
Marek Hadyk	20.10.2022

40 years with LASCO

Jürgen Trucks	01.09.2022
Frank Dismar	01.09.2022
Gernot Losert	16.12.2022

50 years with LASCO

Heiderose Höfler	13.03.2022
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SADLY MOURNED

Werner Völk	+ 11.07.2021
Peter Reißberger	+ 15.08.2021
Elisabeth Dekorsy	+ 09/2021
Klaus Bischoff	+ 15.10.2021
Herrmann Müller	+ 22.11.2021
Marianne Jung	+ 14.12.2021
Manfred Wagner	+ 10.01.2022

In a ceremony, Friedrich Herdan, Chairman of the Board of Management LASCO Langenstein & Schemann, Holding as well as CEO Lothar Bauersachs and the Managing Directors Thomas Götz and Robert Welsch thanked the long-serving employees Michael Kessel (40 years) as well as Andrea Streicher, Mathias Taubmann and Tanja Appenrodt (all 25 years) for their work and loyalty to the company. As a sign of recognition, certificates and loyalty bonuses as well as the Badge of Honor of the Board of Trustees of the Bavarian Employers' Association and CCI honorary certificates were presented in the presence of Peter Wache, Chairman of the Works Council.

Michael Kessel began his professional career as a machine fitter at LASCO in 1981. He subsequently acquired profound specialist knowledge in numerous further training measures and advanced to the position of service technician. His high qualification enables him to independently carry out assembly, acceptance and commissioning of complex mechanical engineering systems at home and abroad. LASCO customers around the globe appreciate his personality as well as his technical know-how.

Andrea Streicher joined the company in 1996 with a qualification and profession-

al experience as a paralegal and further training as a certified secretary. Initially, she worked as a sales clerk for the customer division in Germany and other European countries. In 2001, she was promoted to the position of personal assistant and has since been responsible for the correspondence of the company's management as a professionally qualified key employee.

Mathias Taubmann (graduate physicist) has been working as an experienced machine designer in technical planning and development since 1996. As an expert especially in the field of mechanical presses and electric upsetting systems, Mathias Taubmann develops highly technical system concepts for customers in the automotive, energy and medical technology areas. In addition, his expertise is particularly in demand for the mathematical-physical design of new system/machine concepts with regard to energy efficiency.

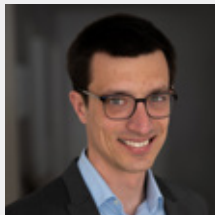
Tanja Appenrodt trained as an industrial clerk at the company from 1996 to 1999 and then worked in the purchasing/material requirements planning department as a clerk. Since completing her part-time degree in business administration (VWA) in 2008, she has been a qualified specialist in the area of contract management.



Management and employee representatives congratulated long-serving employees. In the picture (from right): Friedrich Herdan, Chairman of the Board of Management LASCO Langenstein & Schemann, Holding, Lothar Bauersachs, CEO, Mathias Taubmann, Andrea Streicher and Michael Kessel (long-serving employees) as well as Peter Wache, Chairman of the Works Council. Tanja Appenrodt is missing.



Interview



Dr. Gernot Eggbauer
Head of Construction
MVO GmbH Metallverarbeitung Ostalb,
Schwäbisch Gmünd

Experienced team

up grade: Dr. Eggbauer, how is your new forging line going?

Dr. Gernot Eggbauer: Just as you would expect when the customer and the supplier have been working together in a spirit of trust for more than a decade with regard to the process to be implemented, and the experience goes back even further: in other words, like clockwork.

up grade: That sounds more like routine than innovation.

Dr. Eggbauer: The innovation can be found in the details, for example in the control system, the drive technology and the tool technology. For competitive reasons, only this much can be said: We achieve outstanding precision with specific gear profiles, can produce variable as well as constant gears highly efficiently, realize Y, D as well as U and V cross sections for racks, and equally use heat-treatable steels as well as steels without heat treatment.

up grade: As project manager of the plant, did anything particularly impress you in your cooperation with LASCO?

Dr. Eggbauer: The speed of realization. Well aware that there are currently difficulties with supply chains and capacities in the international economy, we nevertheless had to make five months delivery time from order placement a condition because of our own delivery requirements. Hand in hand, we actually completed the project in four months. Normally, such a plant has a delivery time of eight to ten months.

MVO GmbH Metallverarbeitung Ostalb

DYNAMICS WITH A SYSTEM

The steering systems of motor vehicles are subject to high safety aspects. Virtually no car manufacturer can do without steering systems that react dynamically to the steering angle and speed of the vehicle in its model development. What was reserved for upper-class models in earlier generations of vehicles is now state of the art.

The dynamic steering technology is based on mechanics that are as refined as they are robust: Sophisticated gearing geometry ensures variable transmission ratios for the steering gear. In the forming process, high demands are placed on precision and dimensional accuracy. The patented Bishop warm forging process is used as the state-of-the-art solution. In this process, bar steel stock is partially heated to temperatures of 700-850° C and, is given the so-called "variable" toothing in a patented forging process by coordinated closing of several die parts in just one press stroke.

The process originated with the Australian Bishop Group, which was later acquired by the German Georgsmarienhütte (GMH Group). This has been used by the GMH subsidiary MVO GmbH Metallverarbeitung Ostalb (Schwäbisch Gmünd, Germany) since 2011 and special know-how makes a significant contribution to the market success of the internationally renowned manufacturer of high-quality components for the steering and chassis sector.

The enormously high demands on the accuracy of variably forged gear racks and comparable components require, in addition to decades of proven know-how in the use of special materials and manu-

facturing processes, in particular high-performance precision machines as a basic prerequisite. LASCO provided state-of-the-art process-optimized precision screw presses already in the development phase of the above-mentioned process and in the following years for the application up to today's market success. Together with MVO/Bishop Australia, it was possible to implement the process fully automatically in LASCO forging lines. Five robots - die loading and unloading, die maintenance and transfer, as well as a transfer station with pneumatic gripper systems - harmoniously operate the forming process on the LASCO SPR 1250 So screw press. The line is designed for continuous operation in 3 shifts of 8 hours each for 300 days a year.

To date, MVO has been operating two LASCO forging lines at full capacity. The large number of electric vehicle models that also use this steering system now triggered additional demand. This market development encouraged MVO to acquire a third production line in a newly built production hall in Schwäbisch Gmünd specifically for this purpose. The new system has been successfully running in production mode since last fall.

The SPR 1250 So in MVO's new production hall in Schwäbisch Gmünd

