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NetShape

01 | 2021



Customer story

CELO S.A., Spain 10–13
Fit for the future with Carlo Salvi machines

Focus

Servo direct drive 16–17
The time is right

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HATEBUR

Personal



Dear business friends,

The times we live in are still more virtual than live.

It is therefore with great enthusiasm that we have developed digital “tools” to maintain customer contact in spite of travel restrictions and canceled trade fairs. We have reached two important milestones on our journey toward digitalization with a virtual showroom and the opportunity to connect our service engineers to our experts in Reinach using interactive helmet cameras. We’re looking forward to telling you more about these developments in this issue.

The success story of our customer CELO in Spain will allow you to gain a fascinating insight into how this company has used Carlo Salvi machines successfully in production for the automotive industry.

In the article about the servo direct drive, you can read about the incredible expansion of possibilities on a Hatebur COLDmatic CM 725.

Lastly, replacing a press body on the AMP 70 at Tier 1 supplier GKN Driveline shows how, more than thirty years later, this machine can once again achieve – and even exceed – its previous performance data: A great example of how a large plant can be kept in long-term operation with targeted measures. After one and a half years of project preparation, the base element was replaced, with the first series test run following six months later – a perfect example of comprehensive collaboration between various teams of experts.

I am delighted to present our latest issue of Netshape and hope you enjoy reading this range of informative stories.

Wishing you health and confidence,
Kind regards

A handwritten signature in black ink, appearing to read 'T. Christoffel'.

Thomas Christoffel, CEO

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Imprint

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Current

Sustainability at Hatebur

Responsible conduct and financial success are not mutually exclusive; rather, they complement and foster each other. We expect our business partners, upstream suppliers and our employees to understand this and act accordingly.

With this attitude together with willingness on our part, we have taken on the topic of sustainability at Hatebur and have already put the first steps into action.

We have firmly embedded our approach to sustainability in the Code of Conduct for our suppliers, business partners and employees. Furthermore, we have already been able to complete an audit successfully through one of our customers on the topic of sustainability.

"Knowing is not enough; we must apply. Wishing is not enough; we must do."

Johann Wolfgang von Goethe

35 years working at Hatebur



Name: **Andreas Matt**
Position: **Head of Strategic Projects**
At Hatebur: **Since March 1986**

At the end of April 2021, Andreas Matt brought his 35-year career at Hatebur to a close. He began his career at Hatebur as a young engineer in sales consulting. Uncompromising dedication, openness and enjoyment when dealing with customers meant that he was soon able to take numerous trips abroad. What's more, he quickly gained a vast amount of technical expertise through specific additional training alongside his work. He researched and implemented innovations and developments in forming processes and machines with great enthusiasm.

Andreas Matt managed various departments in the company and was a member of senior management and the management team. Over the years, thanks to the variety of his tasks in Sales, Development and Purchasing, he gained a comprehensive overview of the whole company and provided an important boost for each of his teams.

He has been involved with, supported and encouraged many important topics, and has therefore contributed significantly to the success of the company. We wish Andreas Matt all the best and good health for the next chapter of his life.

30 years working at Hatebur



Name: **Guy Pfendler**
Position: **Employee in Electrical Engineering**
At Hatebur: **Since March 1991**

Guy Pfendler has been working in Hatebur's Electrical Engineering department since 1991. His main task, soon after joining, was to program the electronic bar end

eliminator. He optimized the hardware and has regularly developed the software. The system now helps to optimize processes and show important diagnostics data for the machine's infeed system. In this way, the electronic bar end eliminator contributes to the increase in process reliability and economic efficiency of Hatebur hotformers. Guy Pfendler has traveled across the world to visit our customers and has been involved on site with retrofitted attachments, given training and developed solutions to problems.

25 years working at Hatebur



Name: **Serge Maillard**
Position: **Employee in Electrical Engineering**
At Hatebur: **Since February 1996**

Serge Maillard began his career at Hatebur in Electronic Engineering. Over the past 25 years, he has commissioned most large *HOTmatic* machines, both in the assembly plant and for customers across the globe. In addition, he is also responsible for the development and continuous replacement of outdated control components. Currently, the focus of his work is the Workpiece Transfer Monitoring System for the *HOTmatic* AMP 50 and AMP 70 machines, as well as a new generation of control systems. He shares his broad base of knowledge with his colleagues daily.

Congratulations to our colleagues and we are looking forward to many more years of working together!

Facts and figures Spain

2.6%
agriculture

23.2%
industry

74.2%
services

Spain at a glance

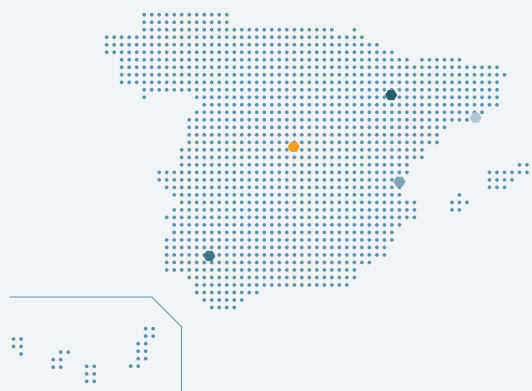
- Capital city: **Madrid** Territories: **Mainland Spain, Balearic Islands, Canary Islands, enclaves in North Africa (Ceuta and Melilla)**

Area:
505,970 km²

Inhabitants:
47.1 million



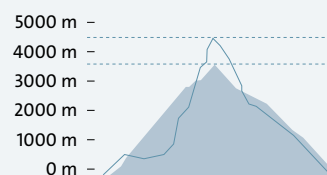
1 figure = 5 million



Largest cities: ● Madrid 3.2 million ● Barcelona 1.6 million
● Valencia 0.79 million ● Seville 0.69 million ● Saragossa 0.68 million

Highest mountain

Spain's highest mountain is the **Pico del Teide in Tenerife** at 3715 m above sea level. By way of comparison, the **Matterhorn** is 4478 m above sea level.



Famous Spaniards

Rafael Nadal (tennis player)
Salvador Dalí, Pablo Picasso, Francisco de Goya (painters)
Plácido Domingo (opera singer)
Don Quixote (fictional character from a novel by Miguel de Cervantes)

Culture

Typical Spanish cultural traditions include **bullfighting** and **flamenco dancing**.



Cuisine

Spanish specialties include

Paella
Gazpacho
Tortilla
Tapas
Sangria



Tourist destinations



Sagrada Família Basilica (Barcelona), **Alhambra** (Granada), **Museo del Prado** (Madrid), various islands, **Costa Brava**, **Costa del Sol**

Economy

Top four exports

- Vehicles and machines
- Wine
- Petroleum products
- Fruit and vegetables

1394
GDP, in billions of USD

Language

Spanish
Catalan
Galician
Basque

HOLA
HOLA
OLA
KAIXO



Welcome to the Virtual Showroom

Text: Reinhard Bühner
Images: Hatebur/cueconcept

Reinach Across the world for more than a year now, important trade fairs have been postponed or canceled completely. This has meant losing a key platform to talk to customers and interested parties and to present the latest products and developments. Hatebur has taken this as an opportunity to create a new, innovative platform, which has now been available since this spring. In a virtual room, the comprehensive portfolio of machines and services from Hatebur and Carlo Salvi can be seen and experienced in a highly impressive way.

Since the beginning of the pandemic, almost all important trade fairs across the world have been postponed or canceled. At best, individual events, such as seminars or conferences, could be held digitally – but here too, there was no scope for personal contact with participants. Yet it is precisely these personal exchanges and discussions about markets, developments and trends that make these events so important and enriching.

In autumn 2020, instead of waiting for the pandemic to end, Hatebur decided to create a platform which facilitates personal exchanges and presentations of products and services – if not in person, then at least in a shared virtual room. And so, over a period of six months, a small project team came up with an innovative solution, which combined the digital trade fairs already familiar to many with a conference platform. Like the platforms that have become indispensable during the pandemic such as WebEx, Teams, GoToMeeting, etc., the Hatebur Virtual Showroom also has the capability to attend a personal meeting via a link and to present products and

services, or to discuss projects. The broad-ranging machine portfolio from Hatebur and Carlo Salvi is therefore impressively brought to life.

We are convinced that real trade fairs will continue to be important after the pandemic too. Yet with the Hatebur Virtual Showroom, we are creating a new instrument for effective exchanges with customer and interested parties without the need for time-consuming travel to trade fairs and specialist conferences.

Make an appointment now for your shared visit to our Virtual Showroom.

sales@hatebur.com/Tel. +41 (0) 61 716 21 11



Demo Center in Japan – Carlo Salvi CS 001 RF

Text: Hatebur

Images: Hatebur

Tokyo Employees at Hatebur Japan K.K. have set up a new Demo Center in Tokyo, Japan. Our customers and interested parties in Japan and its surrounding countries now have the opportunity to experience the Carlo Salvi 1-die 2-blow header CS 001 RF in operation – without having to travel to Italy to do so.

There have been travel restrictions in place for months. As a result, our team in Japan has used this time to set up a new Demo Center, where a Carlo Salvi CS 001 RF machine is also exhibited for the first time.

The 1-die 2-blow header offers maximum productivity in cold forming. The header is particularly suited to very small parts and has been developed with the latest and most advanced technologies. It enables the production of solid components at very high speeds, i.e. up to 660 parts per minute.

Due to COVID-19 restrictions, we have sadly not been able to welcome visitors, but we hope that the situation will return to normal soon. We will keep you up to date and hope to welcome visitors on site soon.

Would you like to have the machine shown and explained to you? Then make an appointment and come to visit our Demo Center when it is possible to do so.

info.jp@hatebur.com, Tel.: +81 (0) 3 5843 7445

Specifications of the Carlo Salvi CS 001 RF:

Min./max. wire diameter ¹	0.6–2.2 mm
Max. shank length	22 mm
Max. cut-off length	35 mm
Max. head diameter	65 mm
Max. speed for two semitubular parts ²⁾	600 parts/min
Max. speed for two solid parts ²⁾	660 parts/min
PLM stroke	6.5 mm

1) 3 mm with special kit

2) Depending on material and part used



With new control systems – Ready for I4.0

Text: Stefan Götz, Oliver Maritz

Images: Hatebur

Reinach — The core of every Hatebur forming machine is the PLC, the programmable logic controller.

The first Hatebur machine with a Siemens S5 control system was delivered in 1994. The changeover to the Siemens S7-300 and S7-400 control systems began in 1999. We are now changing to the latest generation of Siemens control systems, the S7-1500.

Changing the control system always comes with a great deal of work and a certain level of technical uncertainty, yet also offers new possibilities. Now we have taken the opportunity to integrate the safety technology into the control system, meaning an external safety control system is no longer needed. This saves space in the electrical cabinet, simplifies programming, increases flexibility and facilitates support.

The Siemens TIA framework is used for the programming. TIA stands for “Totally Integrated Automation”, offering a single interface for functionalities such as control, safety, security and visualization.

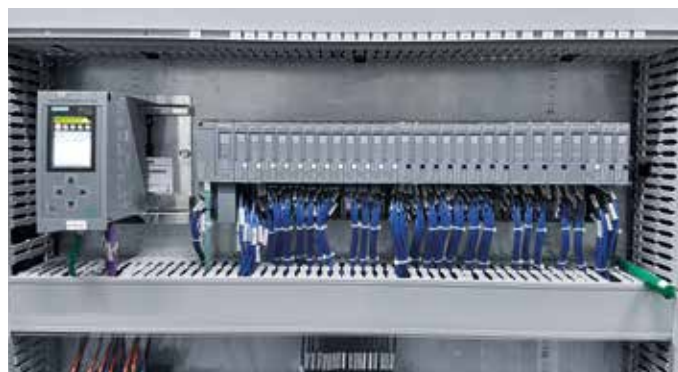
Consequently, all equipment is networked with PROFINET and sensors are connected via IO-Link, which ensures advanced data exchange with the control system at all times and forms the foundation for connecting to machine data logging.

Our machines are ready for the future with the Siemens S7-1500. The control system provides common interfaces for tasks such as measuring and production data logging, BDE connection or predictive maintenance. Energy management is possible too.

Secomea is used for remote access, as before. Thanks to consistent networking with PROFINET and IO-Link, it is possible to provide efficient support for the machines with Secomea.



Networking of all devices with PROFINET and Ethernet.



The current Siemens PLC in the electrical cabinet of Hatebur forming machines.

CELO – fit for the future with Carlo Salvi headers

Text: Bernhard Hagen

Pictures: CELO



Castellar del Vallès

Company: **CELO S.A.**
 Location: **Castellar del Vallès, Spain**
 Employees: **nearly 400**
 Annual sales: **EUR 67 million**
 Machines: **14 Carlo Salvi headers – CS 001, CS 002, CS 003**
 Lot sizes: **between 1,000 and several million pieces**
 Main markets: **Spain, Germany, the United States, China, France, Hungary, Poland and Mexico**

Spain When experts from the Spanish high-precision technical screw manufacturer CELO visited the Carlo Salvi booth at the WIRE trade show in 2018, they saw the super-fast one-die two-blow header CS 001 in action. After discussions, evaluations, and in-depth tests, CELO decided to replace their old machines with state-of-the-art Carlo Salvi headers to increase productivity, quality, and work ergonomics. It was the start of a cooperation with excellent results.

CELO was founded in 1963 by two young engineers. In the early years, the Spanish company offered high-precision fasteners to television, electronics, and household appliance manufacturers. “The idea was to create special fasteners, manufactured to the highest quality standards for very demanding products and installations,” recounts Ramón Ceravalls, who joined the company in 1989 and now serves as General Manager of CELO.

Since then, the company has followed these standards of highest precision and highest quality in the production of fixing and fastening solutions and has grown into an international player. CELO runs manufacturing plants in Spain, Germany, China, and the United States, as well as ten logistics centers on four continents. The company has become a main supplier to the world’s leading enterprises in the automotive, electrical material, electronics, and household appliance sectors. Mr. Ceravalls explains: “We specialize in thread forming screws with a diameter from 1.5 mm to M8. Additionally, in the United States

we can produce screws in the range of 8 to 16 mm.” CELO designs and manufactures its customized components from various materials – steel, fiber-reinforced plastic, and light alloys.

On the expansion track

Over the past two decades, CELO experienced strong growth and expanded into new markets: First the logistics and sales were expanded to France, followed by Eastern Europe, Turkey, and Mexico. In 2006, a factory for small screws was opened in China. In 2009, CELO acquired the German MEA Befestigungssysteme GmbH, five years later the company inaugurated a new logistics center in Mexico. Further expansion steps were the acquisition of Trident Fasteners in Michigan (USA) and the opening of new logistics centers in Santiago de Chile and Miami.

Since the 1990s, the family enterprise has been divided into two divisions: The industry division specializes in small technical screws for plastics and metals. The construction division initially sold small screws for wood, aluminum, and metal constructions, but later expanded the portfolio to include fixing and support systems.



Some of the most representative parts of CELO's production range.

Innovation leader

Today, the company with headquarters in Castellar del Vallès, a small town 40 km northwest of Barcelona, employs nearly 400 people and generates annual sales of more than 61 million euros. In 2021, CELO aims to increase its sales volume to more than 67 million euros. CELO products are delivered to more than 5,000 customers in over 100 different countries around the globe. Continuous improvement, a strong focus on details and an innovative spirit are cornerstones of CELO's success. The company holds various patents and is a world technology leader. Ramón Ceravalls summarizes: "Most of our customers are in the automotive industry and our products can be found really everywhere in automotive applications. The main markets are Spain, Germany, the United States, China, France, Hungary, Poland and Mexico."

Building the fundament

At the WIRE trade show in Düsseldorf in 2018, decision makers from CELO visited the Carlo Salvi booth. On display: the "Ferrari" among Carlo Salvi machines, the CS 001 one-die two-blow header, which can produce up to 660 pieces per minute. This outstanding technology and speed raised the interest of the CELO experts. "We had the plan to replace all of our old one-die two-blow machines and we were looking for solutions that help us to build a fundament for the future – increased productivity, quality, and ergonomics," says Mr. Ceravalls. More than 15 people were involved in this strategy process – from the General Manager and the Plant Manager all the way to engineers and the production team in the workshop.



CELO plant in Castellar del Vallès.



The production hall with 15 machines (14, the 15th is coming soon).

After two years of preparations, the decision was made to invest in Carlo Salvi machines and upgrade the production processes. Ramón Ceravalls: “We set ambitious goals to reduce set-up times and machine downtimes, increase the speed and improve the ergonomics for our employees.”

90% of output on Carlo Salvi machines

“Today, we have 14 Carlo Salvi machines, and the 15th is coming soon,” says Ramón Ceravalls. Working in three eight-hour shifts, CELO produces ten million parts per month on one CS 001 machine, seven million on the CS 002, and three million on the CS 003. Altogether, more than 90% of the company’s overall output is produced on the Carlo Salvi headers. The lot sizes are anywhere between 1,000 pieces and several millions. After the forming process, the CELO technicians perform other production processes such as rolling, heat treatment, organic coating, and packaging. State-of-the-art intelligent inspection technology, both laser and optical, guarantees a high-quality standard of the products.

Training is key

When the decision to purchase Carlo Salvi headers was made, a detailed training plan was established for a smooth transfer from the old machines to the new. “The majority of these trainings were conducted in our facilities, and additionally our employees made many trips to Italy to visit

the Carlo Salvi specialists. Unfortunately, the trainings could not be fully finalized face-to-face due to Covid-19 restrictions. The deliveries of many of the machines started in March 2020 when the pandemic hit both Italy and Spain,” recounts Mr. Ceravalls. Nevertheless, the trainings were continued remotely.

After only a relatively short time in use, the Carlo Salvi machines already made a lasting impression: “Needless to say, Carlo Salvi is on top of the one-die two-blow technology. For us, the quick change and the very fast production speed were important advantages. But the most crucial factors were the easy and effective training for new operators and the cross-functionality,” underlines the General Manager. One of the main benefits, according to Ceravalls, is the outstanding stability. “That means better quality, lower tool consumption and less manual adjustment.”

Fit for the future!

With the new production setup, the CELO decision makers feel ready for the future. The challenge for CELO is to provide very stable parts that fit into the assembly lines in the plants of the customers. Assembly lines are getting more and more sensitive to small differences in the screws, and therefore stability and efficiency are of key importance. "We believe that with the Carlo Salvi headers we are very well equipped to provide this maximum stability."

When asked about potential future challenges, the General Manager sees E-mobility not as a threat to his business, but as a chance: "In electric cars, many big bolts are replaced with small fasteners, and several mechanical components using big screws are also replaced by electronics using small parts. It seems that e-mobility will require fasteners from our production range, even more so than combustion engine vehicles!"

Other challenges ahead include Industry 4.0. Mr. Ceravalls: "The fastener industry is a very traditional industry. Everything we do with Industry 4.0 must be done from scratch. Our advantage is that we have a team that is eager to improve – but we need focus and training. First steps, such as a fully automated OEE (Overall Equipment Effectiveness) control, are already in place, but there is a long way to go."

From the start of the cooperation until today, the team spirit, technological know-how, trust, and transparency were the pillars of the successful partnership between CELO and Carlo Salvi. The expert teams at both companies regularly share their know-how and develop ad-hoc solutions together. The results speak for themselves.



The CELO team (left side) and the owners of CELO (right side), Mrs. Núria López and Mr. Ramon Ceravalls.

Smart helmets – for innovative technical support

Text: M. Meyer

Pictures: Hatebur

Reinach An example of us overcoming obstacles related to the pandemic and current travel restrictions has been the recent use of smart helmets.

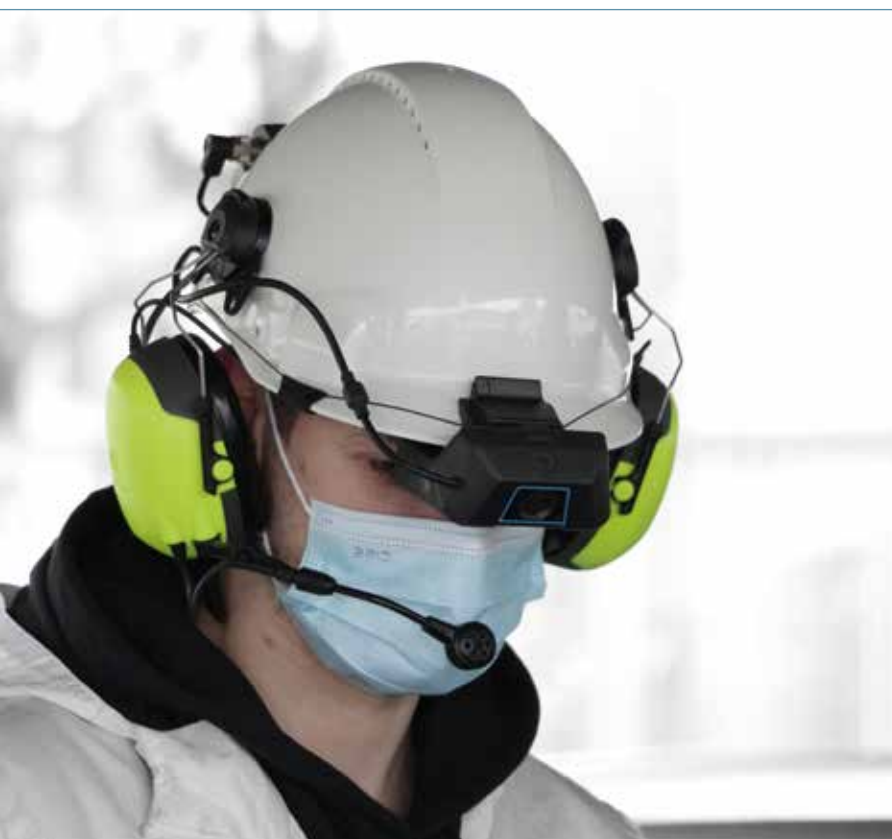
The smart helmet is a wearable device for delegated engineers that, combined with communication software, connects them with technical staff based in Reinach in Switzerland. In this way, it is possible to see what the engineer, wearing the helmet is seeing in real time at the

customer's site. The helmet equipment includes a headset with a microphone, cameras, wireless connectivity, sensors to perceive orientation and temperature, and a smart battery system.

This fully integrated, intelligent, augmented-reality equipment enables innovative technical support. It will provide smart assistance connecting engineers with instructions using text, icons, images, and drawings to complete their tasks. For instance, the smart helmet system allows the engineers to access and send digital data (photos or files) about the activity in real time. It enables high-resolution image capture and real-time mark-up of images and permits support sessions with multiple participants, including, with video recording and playback.

Since March 2021, two units have already been on duty at Hatebur. These are currently used at the customer's site during machines commissioning.

We believe that, after successful experiences, later on the smart helmets could be also used for service works and tool trials. The smart helmet is one more step made by Hatebur towards a digital world.





The helmet kit has been prepared for easy and fast use at production sites. The service engineers just need to unpack and start using – a plug-and-play system to connect with remote users.

The smart helmet is obviously used only after customer approval and following the local data protection regulations. In addition, the collected data are for a specific purpose only and are not published.

During the installation of a new Hatebur *HOT-matic* AMP 20 N at a customer production plant, the helmet has been used by Hatebur Service Engineer Peter Weissheim. His colleagues in Reinach, Switzerland, assisted during the inspection and check of the machine.

Your Advantages:

- Modern and fast solution
- Professional remote support from Swiss specialists
- Avoids expensive and time-consuming travel by experts to customer's site
- Immediate intervention at customer's site
- Instructions using text, icons, images, and drawings for easier understanding
- Accessing and sending digital data in real time
- High-resolution image capture
- Permits several people to take part and support during a session
- Additional portable camera provides a practical second viewpoint

Servo direct drive – The time is right

Text: Andreas Maritz and Carsten Sieber

Images: Siemens AG and Hatebur

Reinach Hatebur has laid the foundations for the development of the servo direct drive with experience in servo-driven functions over the last 20 years. This means it is possible to combine a high level of dynamics with excellent performance, where the mechanically stored energy of all machine components in motion is taken into account. This type of design enables servo technologies to be used for the main drive, thereby opening up a new field in press technology.

A disadvantage of mechanical drives is that it is very laborious to adapt the sequences of movements. For local drive technologies, such as servo motors, machines can be upgraded and improved with new functions, even after years of operation. The prerequisite for this is selecting components that take into account possible future requirements. The Hatebur COLDmatic CM 725 with direct drive offers the same forming performance as the standard machine, yet the

movement of the pressram can be adapted to the process in a large area. The press can be used in a more universal way and can be adapted more accurately to the requirements of the customer and the respective processes.

Advantages for operators

Some of our operators have already been up close and personal with the new drive. Their experiences are overwhelmingly positive. Many advantages become clear as soon as the machine is set up. The direct drive can be moved more easily and subtly, and behaves more predictably in its response characteristics than the conventional main drive.

A further highlight is the hand wheel. It gives a better feeling for the machine, whereby positioning and exactly setting the timing is further improved.

Saving tooling time

An additional advantage of the drive concept is that parts can be formed in set-up mode whilst the punching positions and timing are being fine-adjusted. The time-consuming acceleration and deceleration of the flywheel is also no longer necessary, saving tooling time when setting up a new part.



The manual control panel facilitates accurate positioning of the machine, where the timing can be set precisely.

Image source: Copyright Siemens AG.

The direct drive is more than simply a replacement for the conventional drive. With this option, all local drives relate to a virtual guiding axis, which prevents the movements negatively impacting each other by overlapping. The advantage here is that the movements of all locally driven assemblies are executed cleanly and accurately.

Reducing energy loss

With the direct drive, the required energy is stored in capacitors instead of a flywheel. This not only keeps the machine's connected load low, but also significantly reduces energy loss during set-up. While the total stored energy is lost when the flywheel shuts down, with the direct drive it remains stored in the capacitors and is available again immediately.

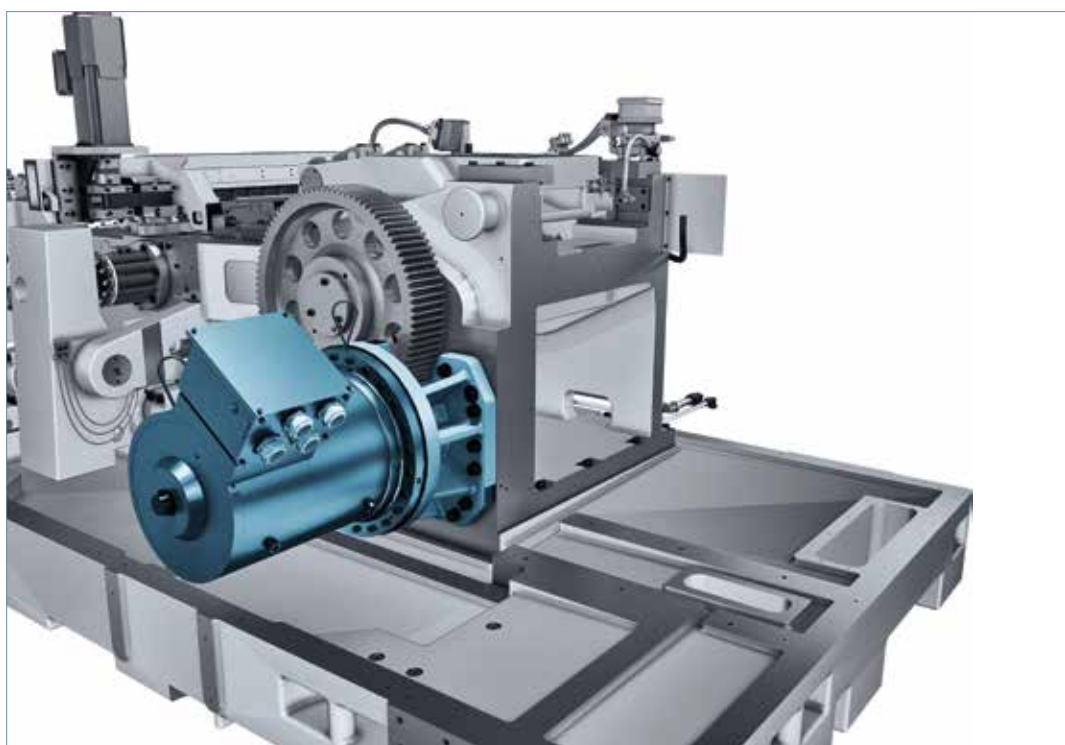
Your advantage:

1.	Process-related sequences of movements
2.	Continuous optimization
3.	Fast set-up when forming at the setting speed
4.	Hand wheel for intuitive machine operation
5.	Improved position accuracy
6.	Better ergonomics when setting up

“Thanks to the direct drive, the timing of the machine can be individually adapted, meaning tool design is more flexible and the part spectrum is increased. In addition, the improved positioning accuracy facilitates set-up.”

Sotirios Andriopolous, process developer.

The servo direct drive (colored in blue) enables a high level of dynamics to be combined with high performance.



Open heart surgery – Body exchange on the Hatebur AMP 70 HFE

Our performance. Your advantage.

Refurbishment of a Hatebur
HOTmatic AMP 70 HFE after
30 years' full-time use.

An unusual view into the very heart of the AMP 70 HFE: The drives for the four forming stations (right), which work with a total of 15,000 kN press load.

Text: Jürgen Fürst, SUXES GmbH
Images: GKN Driveline Trier

Trier. As even long-lasting forging presses like a Hatebur AMP 70 HFE reach their output limits after 20 years, in 2011 GKN Driveline in Trier commissioned a new Hatebur HOTmatic HM 75 XL as a replacement. Since the company was simultaneously swamped with a flood of orders, the old machine had to continue producing for almost ten years. Now, the whole machine body of the tried-and-tested AMP 70 HFE quality press has been renewed – a major feat, which demanded top performance by all involved. Since spring 2021, the now thirty-year-old machine has been shining like new.

In 2010, the managers at GKN Driveline in Trier decided that 20 years was enough: The time had come to replace the existing Hatebur AMP 70 HFE hot forging press. So, the largest Hatebur press, a new HOTmatic HM 75 XL, was ordered and in-

stalled. That was ten years ago. What no one had predicted was the strong economic recovery after the financial crisis and a high demand for orders from the automotive industry, which meant that the old press had to continue working. It was a surprise to everyone that it kept working so brilliantly until recently. "Up until the end, the trusty AMP 70 kept producing high-runner parts in 20 weekly shifts with weekly quantities of up to 165,000 parts, and has earned our utmost respect," says Dominik Gangolf, responsible project manager at GKN Driveline in Trier.

Decision taken for drastic measures

However, signs of wear from 30 years' heavy use became apparent in the base element of the press too, where tiny cracks were visible. To replace or to repair? That was the key question, and after thorough costing and consideration of all aspects, the decision was made to repair. But this called for a drastic measure: Replacing the machine body. "A replacement like this is almost like open heart surgery," says Gangolf. GKN Driveline Trier had never experienced this before. "This isn't something that happens every day for us either," confirms Stefan Bühler from the machine manufacturer Hatebur, which has been servicing the customer GKN Driveline for many years.



Ferrari fans in a frenzy

GKN Automotive is a globally active Tier 1 automotive supplier, which has specialized in components for vehicle drives for many well-known automotive manufacturers, such as BMW, Mercedes, Porsche and Ferrari. In a Porsche, for example, a drive shaft from Trier transmits the gigantic torques from the engine to the axles. And there's nothing like a project to make the automotive world prick up its ears. Currently, the drive shaft for the first SUV in Ferrari's history, the F175 Purosangue (which translates as 'thoroughbred'), is being produced – a revolution which will put Ferrari-lovers in a frenzy in 2022. GKN Drive-line has already proven that it can play in this league with the Ferrari GTC4Lusso (F151).

With close to 450 employees, the plant in Trier is one of 54 sites with a total of over 27,000 employees of GKN Automotive, which has a correspondingly long history. As early as 1964, Rheinmetall was running a forging and pressing plant over 135,000 square meters, which GKN took over in 1993.

High-runner parts for premium automotive manufacturers

Today, around 80 million precision forgings leave the plant in the old Roman city every year, which are formed out of almost 80,000 metric tons of steel on 12 presses. This is primarily made up of components for the drivetrain such as universal shaft parts, i.e. pins, shafts and rings, ranging from cold-formed parts under 100 grams to hot-forged parts weighing several kilograms. High-runner parts include joint pins, for example, the variants of which are between 1.5 and 3.5 kilograms. Customers are generally other GKN plants such as those in Offenbach am Main or Mosel in Sachsen, both in Germany, which process the parts further. But many OEMs also form a direct part of the customer base.

Reliable everyday presses for high parts output

The Hatebur HOTmatic AMP 70 HFE is a reliable hotformer for a broad range of parts. In a fully automated way in four forming stations and with 15,000 kN total press capacity, it produces 50 to 80 forgings per minute with diameters up to 145 millimeters with workpiece weights of between 400 grams and five kilograms. The highly precise infeed ensures the proven excellent process reliability and repeat accuracy. In this way, the machine can be fed bar material with diameters from 36 to 75 millimeters.

The HFE equipment facilitates the manufacture of extruded parts at forging temperature. "Our customers use it primarily to forge automotive and bearing parts, such as wheel hubs, gear blanks, bearing rings and universal shaft parts," explains Stefan Bühler. "It has probably produced over 350 million parts for us over the years. Probably no one can say for sure," says Gangolf.



30 years of full-time use leaves its mark. So that the old machine body could be exposed, all the attachments had to be removed.

1.5 years of preparation required until retrofitting started

The task was as follows: Disassemble a 85-ton hotformer body. Remove it from the hall. Bring in the new machine body. Install all the attachments and install software. Finally, commission the refurbished press. Before work began in September 2020, the project managers had already done around a year and half's work, in which everything was clarified, planned and debated. This only served to increase their delight as the old machine body was uncovered and removed from the hall in early October. In the same cycle, the new body was brought into the hall and positioned beside the foundation.

Foundation thoroughly inspected and straightened

After the old machine body had been extracted, the foundation was also thoroughly inspected and repaired. Thirty years' daily use of the *HOTmatic AMP 70 HFE*, forging precision parts with up to 35,000 press impacts and 15,000 kN press load, also left its mark on the foundation. In early November, the managers then positioned the brand new machine body on the foundation.

Smooth teamwork – hand in hand without a hitch

So that the old machine body could be exposed, all the attachments had to be removed. This affected, amongst others, the complete piping, the entire electronic installation including cabling and control system, as well as of course entire assemblies such as the shearing, transfer unit and ejector and the downstream part discharge. Service technician Marcus Kasel praises the process: "It was impressive how all the teams worked hand in hand."

Eagerly anticipated: The new machine body for the HOTmatic AMP 70 HFE arrives.





Over one and a half years of planning and concerted teamwork led up to this moment.

Schedule helped by the coronavirus and automotive crises

Throughout the entire duration of the project, three Hatebur service engineers were supported by task-focused staff, both in-house at GKN and external. Up to 24 people spent time on the project. "The coronavirus and automotive crises played into our hands, of course," explains Gangolf. Yet on the other hand, there were coronavirus-related delays because parts from Italy were not able to be supplied on time. Lastly, and importantly, hygiene concepts to contain the risk of infection had to be created.

Trial start of production after six months of retrofitting

When the new machine body was set onto the foundation, the critical phase of the project began, which excited everyone involved: Now it was time to see whether everything had been planned and prepared correctly. Hopefully, everything would work. And it did! The feelings of euphoria were immense when the first trial series parts came off the production line in February 2021, after around six months of retrofitting. Everyone was relieved – and happy, too, that an unwelcome, 150-nanometer virus was not able to prevent a refurbished, 135-ton Hatebur press starting its work at GKN Driveline in Trier.



Up to 24 specialists worked on the project between September 2020 and February 2021.



After a successful overhaul, the HOTmatic AMP 70 HFE is once again producing components for drivetrains, such as universal shaft parts, pins and rings.

When users take the initiative

Text: Jürgen Fürst, SUXES GmbH



Björn Alexander Hesse
Forging process optimization
Volkswagen AG, Kassel plant

Baunatal — It is not uncommon for users of our presses to provide important ideas for new developments. This was the case for our monitoring system for the parts transport on the AMP 50 and AMP 70, introduced in 2020. Thanks to in-house development, a similar system at VW is already resulting in increased process reliability.

Is anyone ever perfect all the time? Even the parts transport systems on Hatebur presses aren't. Parts have sometimes gone missing, remained attached to the punch or been inserted at an angle, incompletely or two at a time. At VW, Björn Alexander Hesse, responsible for process optimization in Baunatal, Germany, took on the challenge and developed a part monitoring system as part of his diploma in 2012 which makes the forging process more reliable. We had a chat to him.

What was your motivation for developing a system like this?

On the one hand, as a manufacturer of gear blanks, we are careful to supply our customers with high-quality parts. As regards the forging presses, this means that the weight, geometry and fiber course of the parts must be absolutely correct. On the other hand, it is also up to us as operators to run the systems as efficiently and as cost effectively as possible. Here, downtime or maintenance expenses due to faults in the parts transport must be ruled out as far as possible.

Can you explain the function of your system in layman's terms?

The idea was to detect the motion of the gripper arms using simple XOR evaluation logic. To do this, we connected the electronic bar end eliminator on the control side to a Brankamp X7. The presence of blanks in the forming stations, as specified by the ESA, is compared with the effective/real situation of the transfer grippers. Instead of binary sensor functions, we use analog inductive displacement sensors. These do not react to overlap and switch, but instead do continu-

ously record the opening stroke of the grippers, without influence of the axial play.

In the event of a fault, the clutch/brake is not immediately triggered. Instead, only after a comparison with the machine angle is the decision taken as to whether to stop the machine immediately or whether the press comes to a stop after the forward dead center is exceeded in the backward dead center.

How can workpieces be precisely tracked through the individual forming stations?

The monitoring system receives information from the machine control system, amongst others, about the switching status of the electronic bar end eliminator alarm outlets (cut-off drop function). As long as these signals are present, the envelopes of the grippers are turned off precisely in stages and passed through all operations. The shard limit engages simultaneously in order to detect potential material still present. The functionalities are stored in formulas relevant to the sequence of forming stages. In this way, we only have to teach-in a part once within four strokes with regard to the grippers used and press load required. For subsequent forgings, full monitoring then occurs from the first stroke.

What did you have to be aware of when introducing the system into the production environment?

Initially, I and the staff working with me in the preliminary stages had to rely on our intuition. Little by little, we have learned more and more, optimizing the settings to suit our requirements. The system is considered to be a useful aid because it is also possible to detect what the problem in the process is.

Thank you, Mr. Hesse.

Interview



Name: **Daniel Krieg, Project manager**
 Position: **Project and Product Management**
 At Hatebur: **Since 1996**

Reinach In which departments at Hatebur have you already worked?

My 25 years at Hatebur, which have been enormous fun, can be summarized like this: After eight years as a service engineer worldwide – three years of which I spent stationed in Japan – I was responsible for the After Sales Service for a variety of countries, and then worked in sales for new machines. From 2009, back with Hatebur Japan K.K. in Tokyo, I was responsible for Sales and the After Sales Service. Since returning to Switzerland, I have been working as a new machine project manager in Project and Product Management globally.

What tasks form part of your work in your current role?

Supporting our sales of new machines. Taking on projects after signing a contract and being a contact partner for the customer. Project responsibility regarding technical and commercial contract compliance. In the Product Management team, we develop our machine portfolio in line with the market.

Can you use your knowledge from your previous roles for your current work?

Once you have learned something from scratch, it stays in your toolkit your whole life long. Furthermore, I have personally got to know well over 100 global Hatebur customers face-to-face over all these years. This network of relationships is of great value to the customers, as well as to us as suppliers. We also talk about a global Hatebur family, which really is the case.

What tasks take you to customers abroad these days?

Our sophisticated product requires a great willingness to learn on the part of the customer. I support customers in getting to know the basics of the forging systems and build up and expand their skills when dealing with the system. This ranges from building the machine foundation to product-specific topics in the forming process.

Is there a Hatebur machine model you particularly like?

While working as a new service engineer, I preferred working on the smaller COLDmatic machines to the large HOTmatic machines – this enabled me to help more customers. During my time in Japan, I very much enjoyed carrying out repairs, inspections and overhauls on all machine types. I appreciate the diversity of our machine portfolio.

What task or what project are you spending most of your time on at the moment?

Currently, I am working on the following active machine projects in Asia: HM75XL, AMP20S, CM725WS, CM4-5^{ECO} and AMP30S. I am just as concerned with achieving Swiss origin status for individual machines as I am with sending commissioning specialists to far-off countries. The latter has become incredibly challenging due to the constantly changing requirements because of the pandemic.

What effect has your collaboration with culturally diverse customers had on you?

Different cultures, languages and corporate cultures have been enriching for me. I feel at ease with customers from all over the world, especially our Asian customer base. It was in Japan that I met my wife. Learning both Japanese scripts, Hiragana and Katakana, meant that I was able to read the control panels of our machines, as well as read menus in restaurants, order food and travel independently from customer to customer. I could talk about anecdotes like that – and more – for hours.

Hobbies:

Traveling across Switzerland and Europe in a self-refurbished camper van.

Skiing, walking, talking philosophy around the campfire, cultures, traveling and soon my own garden.

What I particularly enjoy about my work for Hatebur:

Our machines, which are at the cutting edge of technology.

Satisfied customers thanks to good communication and projects that are handled in a customer-oriented and contract-compliant manner.

Close networks with international customers and the Hatebur team.

See us live!



July 27–30, 2021

MetalForm China

Location: **Shanghai, China**
Company: **Hatebur Umformmaschinen AG**

October 26–28, 2021

Forge Fair USA 2021

Location: **Detroit, USA**
Company: **Hatebur Umformmaschinen AG**

November 10–11, 2021

Fastener Fair Italy 2021

Location: **Milan, Italy**
Company: **Carlo Salvi S.p.A.**

**We look forward to seeing
you there!**

Owing to the many event postponements, please check the event's status on the respective website shortly before the event. Thank you for your understanding.

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