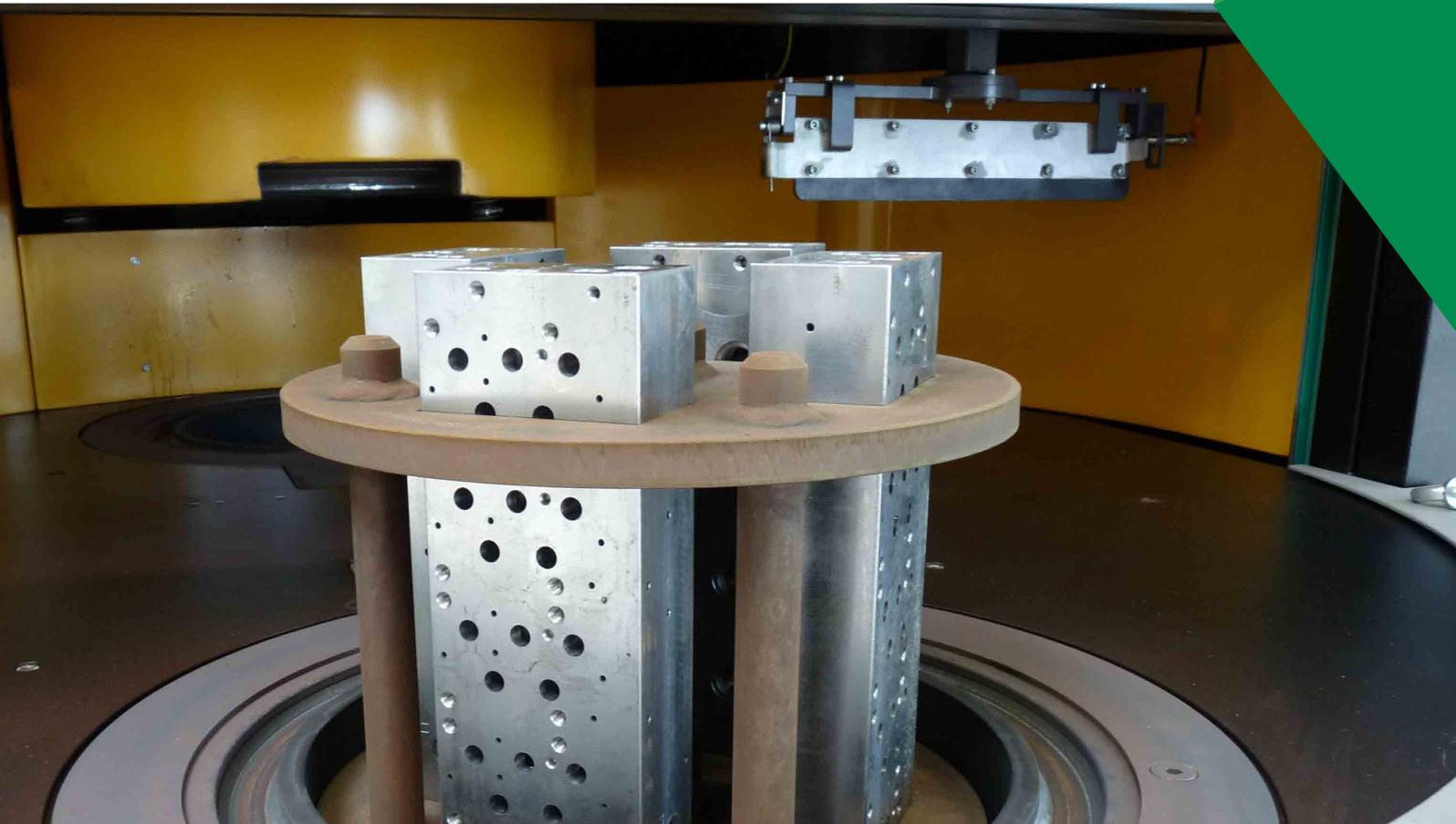


EN

THERMAL DEBURRING
PROJECTS / REFERENCES

TEM





LEEMAN HYDRAULIC TECHNOLOGY CO., Ltd



DANIA

BENSELER

Valeo



DREBELOW UND JAHN
HYDRAULIK GMBH

BASIN
PRECISION MACHINING



Roland Fleischer GmbH



u-shin



ASCO
numatics

ACTROS

World-class and advanced
TEM-TECHNOLOGY





HYDRAFORCE, USA

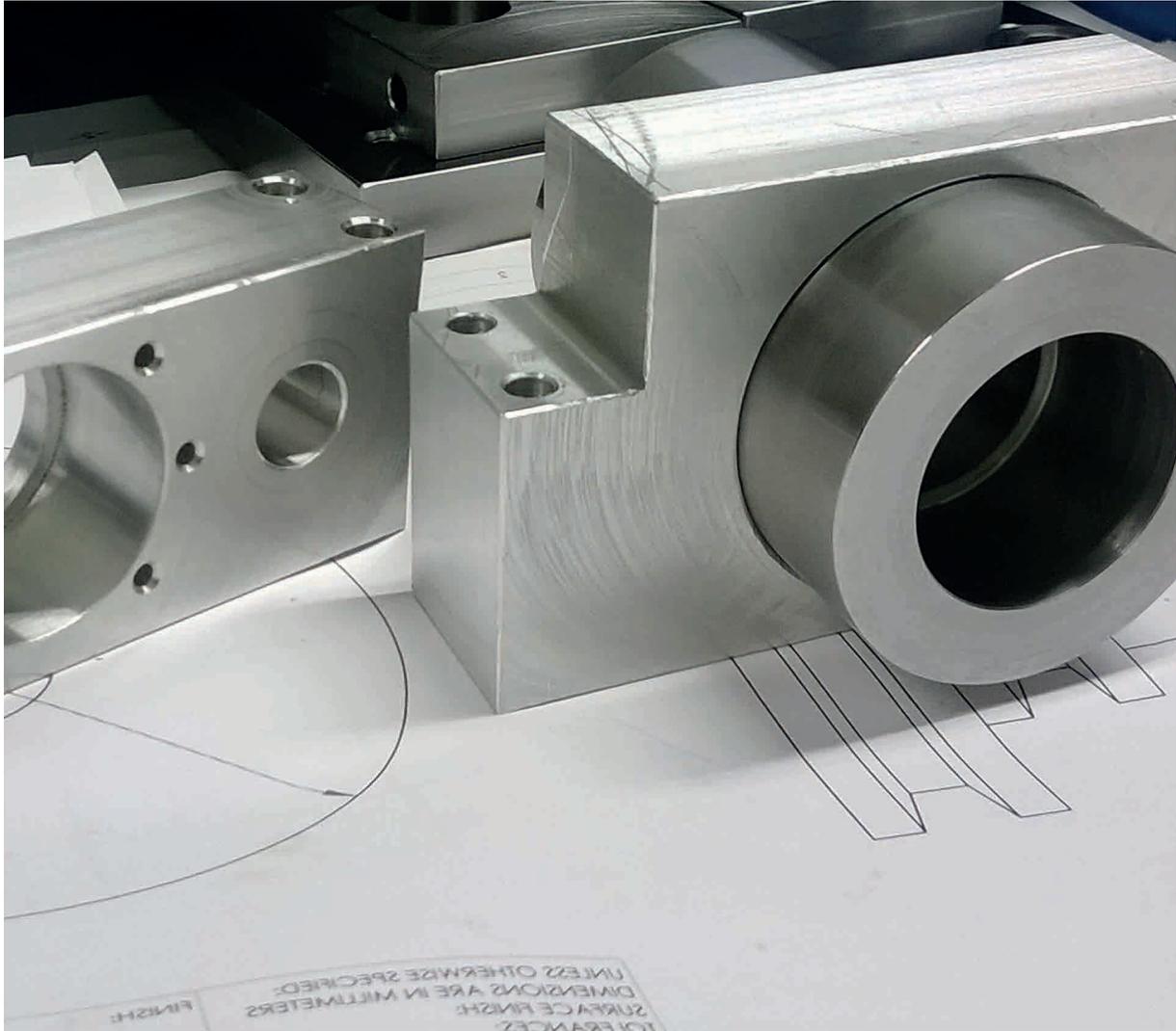
The HydraForce story began in 1985 when the company was founded near Chicago by several partners who saw the mobile equipment industry's need for quality hydraulic cartridge valves. They also saw the potential for engineering innovation and design flexibility offered by cost

effective and space-saving cartridge valves and hydraulic integrated circuits.

Since its founding, HydraForce continues to be a privately held company as it has grown to several manufacturing locations in North America, Europe and Asia, with a network of 120 stocking distributors who can offer local support across the globe.



To maintain their core competency of speed to market, HydraForce has invested in application technical support tools including i-Design. In 2018 an *iTEM400/600*, 2 Station has been installed to once again improve its standards.



SUN HYDRAULICS, USA

Sun Hydraulics is a leading designer and manufacturer of high-performance screw-in hydraulic cartridge valves and manifolds that control force, speed and motion as integral components in fluid power systems.

In business since 1970 and a public company since 1997, Sun sells its products globally, primarily through independent distributors to diverse markets of mobile and industrial equipment and machinery manufacturers. From its inception, Sun has been committed to be the leader in its field.

They offer products that advance their customers' businesses, improving the safety and per-

formance of the machinery they use. Sun invests in equipment and processes to ensure the operations are efficient and profitable. The latest acquisition is an *ITEM400/600*, 2 Station.

For over 40 years, they have pioneered the advancement of fluid power with products that exceed industry performance standards and also provide research support and internships to students of all ages, from all over the world, and are active in professional organizations like the National Fluid Power Association, American Society of Mechanical Engineers, British Fluid Power Association and the German Engineering Federation, or VDMA.

Whitewater & Jefferson, Wisconsin, USA

BASIN PRECISION MACHINING

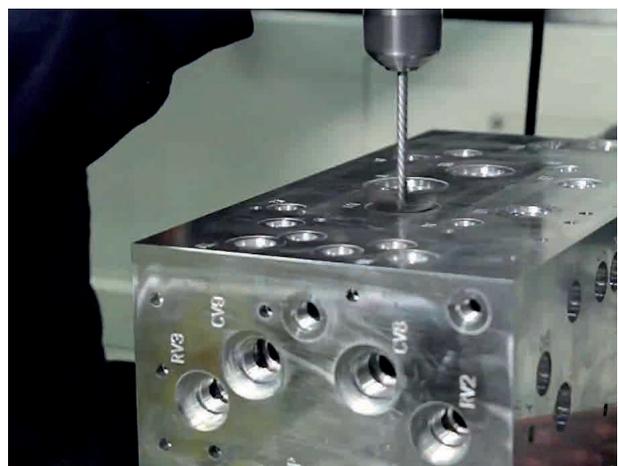
BASIN Precision Machining, formerly Anderson Machining Service, is a Precision CNC Contract Machine Shop, specializing in machined components and assemblies, and is run on a lean, just-in-time basis. The two facilities of BASIN Precision are located in Whitewater (WI) and in Jefferson (WI), near Milwaukee, USA.

BASIN acquires and operates small- to mid-size industrial equipment and equipment components for manufacturers serving OEMs and their TIER-1 suppliers in the following capital goods markets: heavy construction and off-highway, material handling and process automation, agriculture, aerospace, and hydraulics.

A focus of production is manifolds for the hydraulic industry and a wide product range of parts for the worlds-famous motorcycle manufacturer, Harley-Davidson, located in Milwaukee.

Erik Anderson (President of BASIN Precision) mentioned: "We offer our operating companies world-class manufacturing expertise, emphasizing efficiency improvements and cross-platform strategic growth. As part of our value-proposition to our operating businesses, Basin Industries provides a proprietary, modular-based Production System specifically designed to facilitate operational improvements and maximize production efficiencies in lower- to middle-market equipment manufacturing businesses".

In these kind of industries the preparation of the parts before the manufacturing process and cleaning after the manufacturing process plays a leading role. Impurities and particles for example may cause extensive damage in hydraulic systems should they not be removed completely. The requirements for cleanliness in this industry, but also in other industries like in the automotive industry are, of course, increasing more and more.





A forward looking enterprise like BASIN is always anxious to optimize its manufacturing processes. In 2015 the idea came up to introduce a new technology for deburring. This technology would need to improve the cleanliness of the parts, work with a repeated accuracy and push the product quality to a new level.

Erik Anderson and his team learned about the existence of a process that meets the requirements of the highest standards of cleanliness and deburring, the TEM deburring (Thermal Energy Method).

To get an impression of how this would work for his parts, Erik Anderson looked for suppliers of

this technology and ATL company from Germany, who is a leading manufacturer of machines for thermal deburring caught his attention.

Joern Struckmann (ATL GmbH, CEO): "Erik Anderson contacted us regarding his deburring requirements and our idea was to show him some successful installations here in Germany, to give him a good impression of the whole process, the technology of TEM but also of the cleaning process after TEM. So he met us in Germany and visited several customers in the hydraulics industry, and got an overview about the TEM deburring and cleaning solutions that are successfully established here in Germany for several years already."

WEAPONS INDUSTRY INTERNATIONAL

The defense industry developed quickly during the 19th century. The world leading suppliers of weapons are the United States of America, followed by Russia, Germany, France, China and Great Britain.

All nations host highly developed arms factories. In order to remain globally successful, competitive and sustainable in growth, investments of tremendous resources in technology, talent and

finances are made continuously. Between 2013 and 2017 the global arms trade increase in terms of profit scored 10 percent. This is mainly accounted to importers like Saudi Arabia and India.

To always be a stretch ahead of others, some resourceful companies discovered thermal deburring as a great advantage, to improve the quality of their products and started using an *iTEM400/250*, 5 Station from ATL.



Does the process reaction impair the workpieces?

The process does not impair the workpieces. Small workpieces are placed and fixed in jigs to avoid minor nicks and dings. Bigger workpieces, such as hydraulic manifolds, do not need to be fixed in the majority of cases.

What effect does thermal deburring have on small bored holes?

Small bored holes will be deburred as safe as other areas, too.

Is it possible to remove burrs and flashes from plastics?

Yes. As the gas pressures and process temperatures of the various plastics are much lower than those of metals and melting points are low, the process demands specific process parameters for small energy densities. Our machines are equipped with high-quality management and feedback control systems. This enables us to set the process parameters for plastics as well as to control them sensitively and reproducibly.

U-SHIN (VALEO), FRANCE

Within the framework of production modernization, the French group of companies Valeo decided to invest in a thermal deburring system from ATL Anlagentechnik Luhden GmbH.

The machine is operated at Valeo Sécurité Habitacle, Business Group "Comfort and Driving Assistance Systems" in Nevers, France. An *ITEM400*, equipped with 5 stations, was chosen by Valeo. From now on, workpieces made

of zinc diecasting will be thermally deburred. With cycle times of approximal 35 seconds, up to 6,000 kg of workpieces can be deburred every day.

The machine is additionally equipped with a handling system for adaptation to the production line. Upon customer request, the control panel is not installed on the equipment, but is placed separately.



What are the key benefits of TEM deburring?

Achievement of high quality and repeatability; a reliable removal of burrs, adherent particles, and deposit. Furthermore, it is one of the cheapest and fastest abrasive processes. The treatment of one complex or many smallish workpieces is possible after a short changeover time at low tool and set-up costs.

Is it possible to chamfer edges?

A minimal rounding of edges can be achieved, but a specific rounding is not feasible. Unlike other methods, the TEM process is not selective controllable to particular edges.

What effect does thermal deburring have on small bored holes?

Small bored holes will be deburred as safe as other areas, too.

Which combustion gases can be used?

Methane, hydrogen and natural gas are applicable. Natural gas may not contain more than 2% of inert gas and in addition, a natural gas compressor is needed.





ZHEJIANG SKS HYDRAULIC CO., LTD., CHINA

Zhejiang SKS is located in Yuxin Town, Nanhu District, Jiaxing in China. SKS Hydraulik is a domestic high-tech company founded in 1985 with its main business in hydraulic piston pumps, engines and assembly parts.

The Company has a surface of 66.000 m² with roughly 500 employees working in multiple fields. The balance sheet total is remarkable with RMB 300 Million a year. A significant 42.000 m² of the production lines are occupied by lines conforming to international standards.

SKS always dedicate to make the best to be the excellent complete unit and spare parts manufacturer in China and globe. In order to this in 2017 SKS invested in an *ITEM400/600*.

ELIMAG HSF GROUP VIMMERBY, SWEDEN

HSF Group is a group of contract manufacturers, specializing in mechanical manufacturing and assembly. It was launched in its current form in 2011 through the merger of six companies into a single group.

Manufacturing capacity, technology and resource optimization are the three main competitive advantages of the Swedish company. In

2011 they invested in an *ITEM250 SC* system for thermal deburring made by ATL GmbH.

The products manufactured have been sold worldwide for over 30 years. New technologies, such as thermal deburring, ensure and improve quality and are an investment in the future in order to continue offering time- and cost-efficient products.

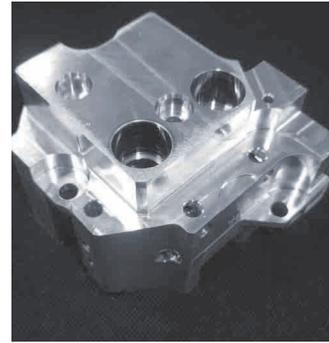


ABB AUTOMATION PRODUCTS GMBH, GERMANY

ABB Automation Products GmbH (ABB Group) is a leading manufacturer of components for electro-pneumatics. These are parts from aluminium which show a variety of difficult access burrs after machining.

Since 2014, the TEM-job-shop-deburring is performed at ATL GmbH in Luhden with an *ITEM400* system for thermal deburring. Cleanliness, absence of burrs and dimensional accuracy are the highest priority for these products.

The TEM-method provides a cost-effective and repeatable deburring process that satisfies the highest quality requirements. ATL GmbH offers a full service regarding logistics, TEM process and cleaning after TEM.



FABRYKA BRONI, RADOM IN POLAND

For more than 70 years, Fabryka Broni has supplied equipment to the Polish Armed Forces and the worldwide export.

Since 2014, parts of handguns are thermally deburred in an *ITEM250 SC* system. Fabryka Broni maintains active collaborations with technical colleges and research institutions.

The introduction of thermal deburring to the manufacturing process is used for the optimization and further development of products.

The goal is to produce safe and high-quality components. Here, the process-reliable deburring machine makes an important contribution to quality assurance in manufacturing.



WEICHAI POWER CO. LTD., CHINA

The Chinese company Weichai Power Co. Ltd. was founded by the Weifang Diesel Engine Factory, together with domestic and foreign investors (including Linde). Weichai Power is a modern company, specializing in research and development, as well as the manufacturing and sales of diesel engines.

In 2015 they invested in an *iTEM400/400-350* system for thermal deburring. This system was designed to deburr parts of high-pressure piston pumps and multi-way control valves, mee-

ting the highest standards of quality, as well as being cost-effective. The components are primarily required for the production of excavators.

Weichai Power is ranked as one of the top ten level suppliers of the 500 largest companies in the People's Republic of China.

Because of the great success with the first iTEM system, in 2018 Weichai purchased another installation, the *iTEM400/600*, to provide the possibility of processing large parts too.





DREBELOW AND JAHN HYDRAULIK GMBH, GERMANY

Drebelow and Jahn Hydraulik GmbH, a company located in Nordholz, has been manufacturing hydraulic and control blocks for more than 40 years. All requests concerning regional, national and international customers are fulfilled quickly and with the utmost precision.

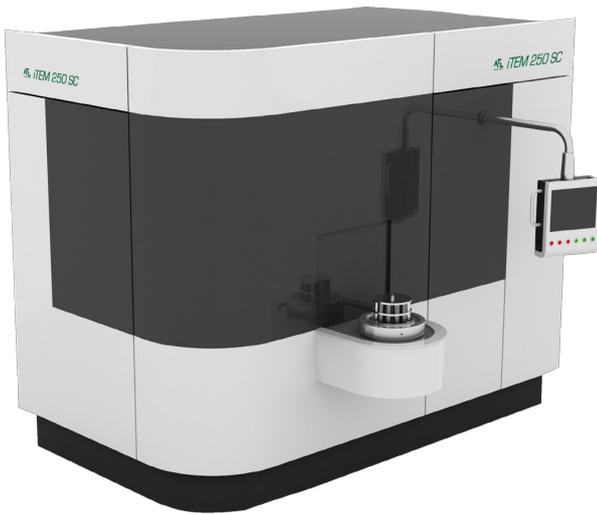
Quality requirements for customized, single and small series of production, requested by customers and the market, can only be ensured by using modern machinery. Equipment and machinery are regularly expanded to guarantee technically flawless work flows. The thermal deburring system *ITEM400/600* with 2 stations has recently been used for this purpose.

Drebelow und Jahn Hydraulik GmbH assigns great importance to the fastest possible delivery service (24 hour service). The acquisition of our TEM system will increase and guarantee this standard of delivery.



FACTS AND FIGURES

- 20 employees, partly trained in-house
- Working hours (including telephone access for our clients): 24 hours a day!
- Hall size: 2007 it was extended to 975 m², in 2014 it was expanded to 1,475 m²
- 6 CNC machining centers
- 6 conventional universal milling machines
- 2 surface grinders
- 3 radial drilling machines
- Thermal deburring machine and cleaning system



DANIA A/S, POLAND

The company DANIA A/S (Warschau/Poland) is constantly striving to introduce technical improvements that will provide high quality, flexibility and short delivery times. Since the beginning of 2014, Dania A/S uses a thermal deburring machine *iTEM250 SC* for the deburring of many mechanically machined castings.

Ongoing investments in new equipment and technology serve the ultimate objective to consistently guarantee the customer high quality. The *iTEM* deburring system of ATL provides reliable deburring process results that can be achieved more quickly, cheaply and flexibly compared to any other method.

TAIYUAN HEAVY INDUSTRY CO. LTD. YUCI, CHINA

The Chinese heavy industry group is located in the northeast of China in Shanxi Province. Even in China, the manufacturers of high quality products have adjusted to the ever-increasing quality demands of the global market. This makes it increasingly necessary to use new technologies and processes that ensure a highly reproducible quality in the final products.

In 2014 an *iTEM400/500* system was commissioned for the deburring of components for the hydraulic industry. It is a *iTEM400/600* system, customized and modified for the customer to provide reduced chamber heights. It is the first time that a deburring system of this size has

been equipped with a 5 station rotary table. The customer has received a very efficient solution, allowing him to optimally handle the complete range of products.



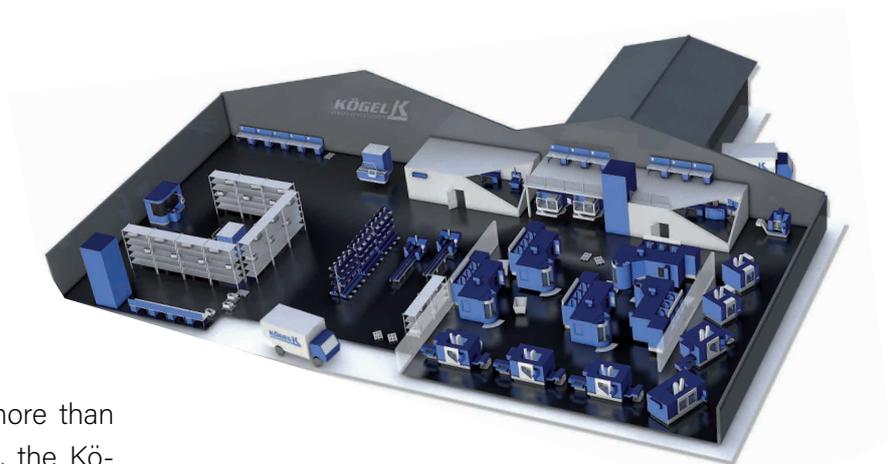
KÖGEL GMBH, GERMANY

As a medium-sized company with more than 20 years of experience in machining, the Kögel GmbH provides professional and economic production of components for the hydraulic and pneumatic industry.

Increasing requirements of cleanliness and the absence of burrs are important factors for the final manufacturing of these components.

The *iTEM250 SC* allows Kögel to reliably and cost-efficiently deburr a complex spectrum of components.

The products of Kögel meet the highest requirements of cleanliness and absence of burrs.



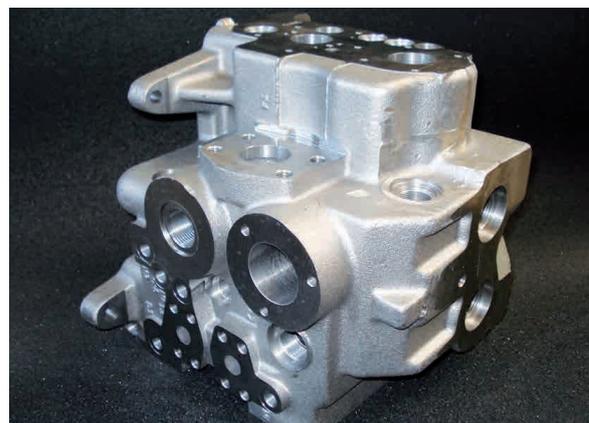
PARKER HANNIFIN, FINLAND

Parker Hannifin Corporation, founded in 1918, is today a global company. In 2014 their annual sales income was 11 billion Euro.

The world's leading manufacturer of motion and control technology is located in Tampere, Finland. Since the beginning of 2015 they have been using an *iTEM400/600* deburring system from ATL GmbH, which is perfect for the deburring of its components.

ATL has developed a specially customized system for Parker, which includes the world's first integrated process cooling unit in the TEM system. Multiple modifications of the machine housing

made it possible to install the system in a recess. Nevertheless, maintenance from all sides of the machine is possible and a platform for the operator is now unnecessary.



WABCO GRONAU, GERMANY

Wabco is a leading global supplier of technologies and control systems for the safety and efficiency of commercial vehicles. Founded 150 years ago, Wabco leads the way in the development of electronic, mechanical and mechatronic technologies for braking, stability and automated driving systems, aimed at leading commercial truck, trailer and bus manufacturers.

With 11,000 employees in 34 countries and annual sales of \$ 2.7 billion in 2013, Wabco has developed a unique culture of innovation and diversity, which is tailored to the needs of customers worldwide. Since 2013, the technology leader Wabco has been using an *ITEM320 SC*



system for deburring numerous products for the automotive industry.

Fast processing times and consistent high quality play a prominent role here. The TEM process provides a cost effective solution and enables unrivalled cleanliness of components, which is impossible to achieve with other methods.



THERMAL DEBURRING OF ENGINE COMPONENTS

For a leading company in the automotive industry, the technicians from ATL Anlagentechnik Luhden GmbH developed the biggest long chamber machine so far including a semi-automatic handling system.

For the factory in the border triangle, the manufacturer extended its machinery by an *iTEM400* to thermally deburr further motor components made of aluminium and stainless steel. This German internationally leading engine technology group is an accredited systems supplier for the most prestigious manufacturers. Specifically for this field, the group relies on a specially developed TEM machine from Luhden.



The *iTEM200/1200 LC* (Long Chamber) is specially developed for the thermal deburring of shafts for rocker arms (truck engines). The task that is to be performed is both simple and challenging: repeatable removal of removable burrs.





GOURUI HYDRAULIC MACHINERY CO., LTD., CHINA

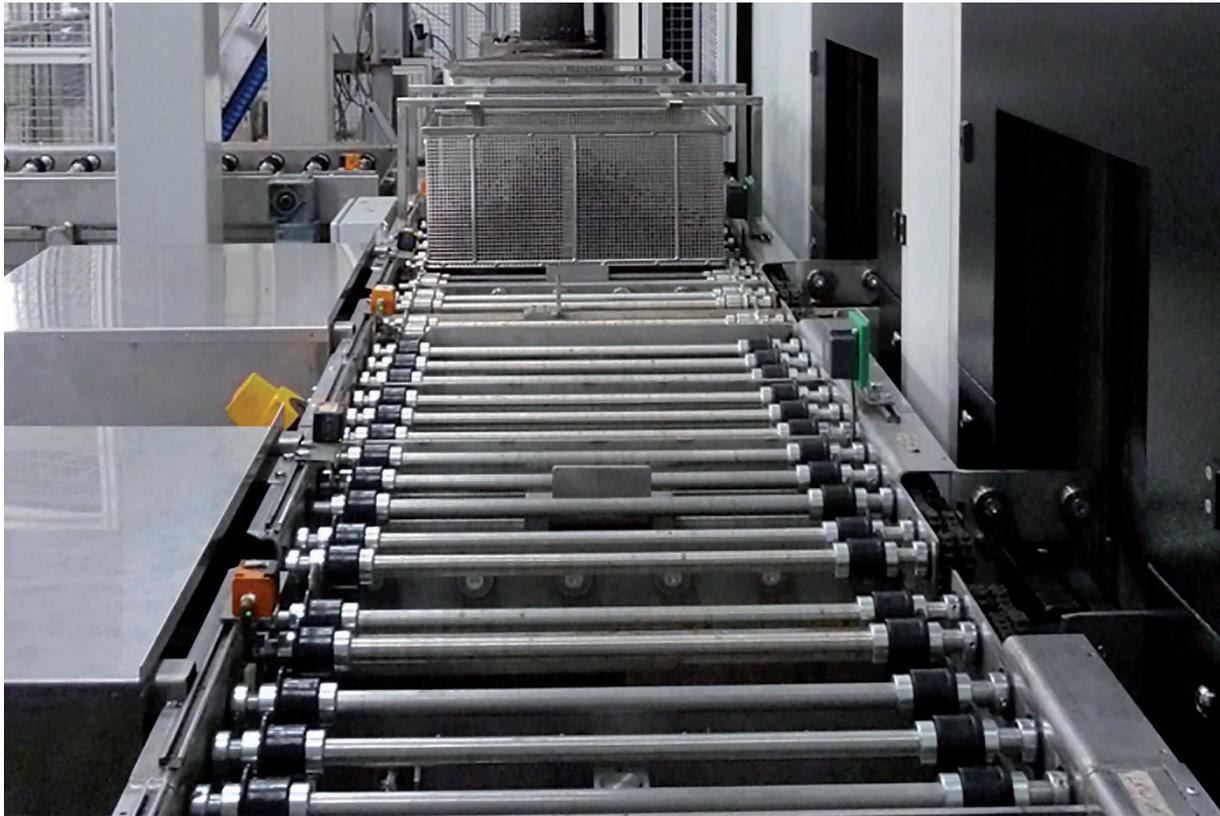
Thermal deburring is on the advance worldwide. Among other things, ATL was able to place, or rather already successfully realize projects in Asia recently. One of them was an *ITEM400* for Jiangsu Guorui Hydraulic Machinery Co., Ltd.

The Chinese manufacturer of carbon steel hydraulic components primarily produces parts for industrial and construction machinery and the agriculture industry.

One key benefit of an *ITEM400* is its flexibility. It allows the operation of different sizes of deburring chambers with different maximum gas filling pressures. This is a unique advantage which currently does not exist to the same extent elsewhere.

The machine from ATL Anlagentechnik Luhden's standard range is equipped with 5 stations and a deburring chamber of the size $\text{Ø } 400 \times 300 \text{ mm}$. The maximum gas filling pressure of this machine is 12 bar. The average cycle time in single shot operation is approximately 45 seconds. Components with a maximum size of $\text{Ø } 395 \times 280 \text{ mm}$ can be deburred within this short time.





JOHANNES STEINER GMBH & CO. KG, GERMANY

In collaboration with one of the leading suppliers of high-quality systems and process technologies for the industrial cleaning of parts, ATL Anlagentechnik Luhden GmbH realized a collaborative project and with it, created a globally unique deburring and purification center. The concept for fully automatic deburring, cleaning, and long-term conservation of steel and stainless steel components was developed for the Johannes Steiner GmbH & Co. KG. A total of 1.2 million steel and stainless steel nuts for the common rail system as well as 220,000 cutting rings and 30,000 sewing machine spools are produced daily.

A proactively producing company like Steiner is constantly anxious to optimize its manufacturing processes. It is not only about standing out from the competitors, but also offering the customers "quality on a new level".

To meet the requirements of Steiner, the TEM technicians constructed a customized machine on the basis of an *ITEM400*. The tailored cleaning system also met the customer's demands. Burr-free components are the prerequisite for tough requirements regarding residual dirt. The capabilities of the current TEM process manage these requirements in a very efficient manner.



EUROPTec KFT, HUNGARY (MEDICAL TECHNOLOGY, PLASTIC JOB-SHOP-DEBURRING)

The EuroPTec Kft in Zalaegerszeg, Hungary, is one of eight subsidiaries of the Swiss EuroPTec AG. The modern site in Hungary specializes in plastic machining. Special attention is paid to deburring and surface processing, which are particularly crucial in the fields of medical and laboratory technology.

For this, highest precision and a burr-free finish are of paramount importance. Due to its repeatability, reliability, and individual parameter adjustment, thermal deburring fulfills these factors in the best possible way.

With its test and demonstration center, ATL acts as job-shop-deburrer for EuroPTec Kft. Since mid-2012, various workpieces made from thermoplastics have regularly been sent from Hungary to Germany and back again.

As a result of the short cycle and changeover times of the iTEM systems, the machined components are on their way back quickly (1-2 working days). These advantages enable ATL to react even to urgent orders as quickly as possible.

B. BRAUN MELSUNGEN, GERMANY THERMAL DEBURRING OF THERMOPLASTICS FOR MEDICAL TECHNOLOGY

Just as metals, thermoplastics have burrs after production which generally must be removed in a cumbersome and time-consuming way. Apart from the thermal deburring machines for metals, ATL Anlagentechnik Luhden GmbH offers the so-called *iTEM-Plastics* which allows processing of multiple plastic materials.

Due to production- and quality-related constraints, the well-known German medical and pharmaceutical company B. Braun Melsungen AG has now decided to invest in an *iTEMPlastics*. Especially in the field of medical technology, a reliable subsequent processing of the components is of central importance.

The TEM method does not only deburr thermoplastics effectively and in a repeatably accurate fashion; additionally a significant improvement of the surface roughness is achieved. Because of this effect, further handling expenses can be reduced.

The operating gases are oxygen and hydrogen. All thermoplastics like PA, PMMA, PUR, PE, PP, and injection molding parts without fiberglass content are processable.





RULISA, SPAIN

For more than a quarter-century Rulisa has been growing and expanding both in terms of size and employees. Because of their expertise and experience in producing valves and hydraulic components, they are on the best possible path to become the biggest supplier for the Spanish market.

Rulisa owns 12 high-performance processing centers and a diverse inventory of equipment for individual production. Because of the company's size, it can respond to customer demands very quickly. The ultimate goal is the highest possible flexibility, responsiveness as well as the highest qua-



lity standards. For this reason, no product leaves the center without being thoroughly examined, cleaned and pre-assembled.

In order to achieve the maximum self-sufficiency in an increasingly demanding market, Rulisa has expanded its range of machines with an *ITEM400/600* in 2017.

SHANDONG CHANGLIN, CHINA

Another project in Asia was brought to life in cooperation with DMG (Deckel Maho Gildemeister). For this project, ATL Anlagentechnik Luhden acted as a subcontractor and completed the new production line of the Gildemeister AG for its Chinese



customer Shandong Changlin Machinery Group Co., Ltd. with an *ITEM400/600*.

Shandong Changlin is a manufacturer of machines for construction and agriculture as well as for diesel engines. The thermal deburring machine from ATL is very versatile for a product range of this size.

The deburring chamber with a size of \varnothing 400 x 600 mm allows thermal deburring of large workpieces up to a maximum size of \varnothing 395 x 580 mm. The *ITEM400/600* is equipped with 2 stations (closing plates) and can generate a maximum gas filling pressure of 16 bar.

RUDOLF-ERICH MÜLLER GMBH & CO KG (REMOG), POLAND

For many years already, the Rudolf-Erich Müller GmbH & Co KG (REMOG) relies on thermal deburring.

The accumulated know-how and the high competence in the fields of aviation technology, hydraulics, and machine construction causes well-known affiliated groups

flexibly, we decided to use TEM at our site in Poland, too," says Markus Müller, production manager of Rudolf-Erich Müller GmbH & Co KG and managing director of the Polish REMOG Polska Sp. z o.o.

The choice fell on an *ITEM400 HP* where- at the HP stands for "high pressure". The



like DaimlerChrysler, Siemens, Bosch Rexroth, Linde, Liebherr Aerospace and Embraer to trust REMOG.

Starting with safety-relevant flight control components and landing gear control systems up to hydraulic assemblies in the areas of industrial and mobile hydraulics, REMOG delivers highest quality.

"TEM offers maximum safety and is also very cost-effective. Furthermore, this procedure is prescribed by some of our customers for quality aspects. To operate more

maximum gas filling pressure of 20 bar emphasizes that the marking has a reason. Thanks to this high energy, parts of a large volume made of cast iron and stainless steel can be thermally deburred. These components require a much higher energy than aluminium parts for example.

The deburring intensity can be finely adjusted via filling pressure and oxygen excess inside the deburring chamber. The usage of latest management technology guarantees highest process reliability at optimal performance.



DANSK AFGRATNINGSTEKNIK A/S, HYDRA-GRENE AA/S, DENMARK

For many years, the Danish company Dansk Afgratningsteknik A/S has been using thermal deburring (TEM) to process metal components. With the purchase of an *iTEM400/600* from ATL Anlagentechnik Luhden GmbH, the contract deburrer has more than expanded its machinery.



Dansk Afgratningsteknik A/S is a subsidiary of Hydra-Grene A/S, another Danish company which is specialized in trading and production of hydraulic systems for wind turbines.

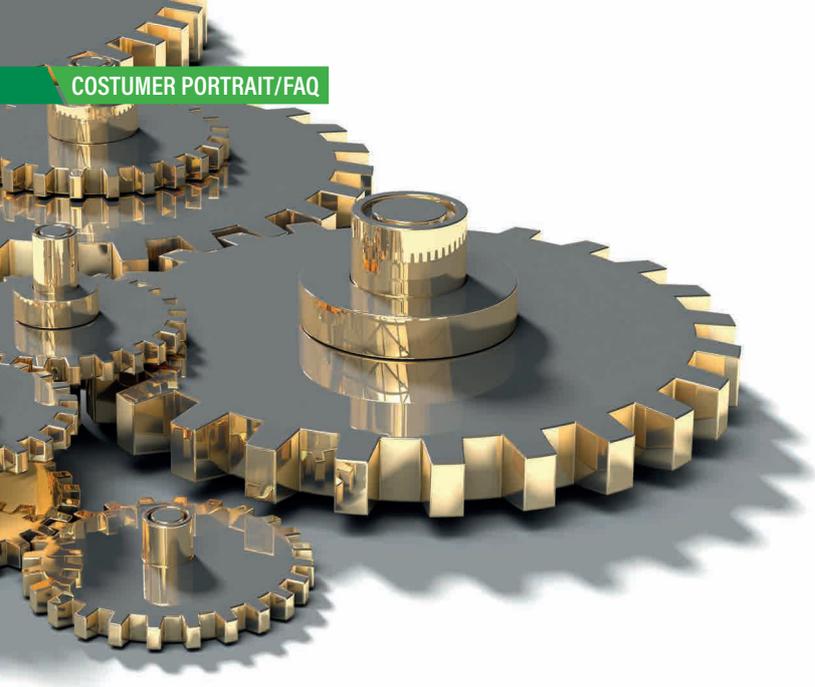
The requirements concerning "Green Technology" are rising continuously and likewise for every workpiece. Especially in the field of hydraulic systems, deburring with high accuracy is of great importance. A small dissolved burr or chip could disable a hydraulic system.

The acquisition of the machine enables Dansk Afgratningsteknik A/S to thermally deburr large hydraulic manifolds up to a maximum component size of 275 x 275 x 580 mm. With regard to cleanliness, nonexistence of chips, and high accuracy concerning the removal of burrs, the machine achieves optimal results.

In addition to large hydraulic manifolds, hydraulic oil-filter housings, which are made of aluminium, can be thermally deburred now, too. Both are workpieces from Hydra-Grene A/S, particularly for use in wind turbines.

Previously, the large hydraulic manifolds had to be deburred manually, which was very time-consuming. Now, the thermal deburring process only takes 1-2 minutes per component. The maximum gas filling pressure of an *iTEM400/600* is - unlike other TEM machines - 16 bar. It is the first machine of this magnitude on the market which is designed for such a pressure. Mass flow meters on the *iTEM400/600* enable a very high, repeatable accuracy of the process. Constant and high-quality results can therefore be ensured.

"The continuous expansion of our know-how enables us to meet the growing requirements of our customers concerning the TEM process, even with competent advice - and not only in the field of wind energy", said Jörn Struckmann, CEO of ATL Anlagentechnik Luhden GmbH.



WILHELM KÖNIG MASCHINENBAU GMBH, GERMANY

König-mtm GmbH, Spanntechnik has been one of the most innovative companies in the sector of high-precision clamping elements for modern CNC-controlled machine tools. To even top their own high standard an *ITEM250 SC* has been installed lately.

The product range covers, among other things, Workpiece clamping devices such as clamping mandrels and clamping chucks in hydraulic, mechanical or hydro-mechanical design, which are sold under the Königdom® product brand to leading mechanical and industrial companies.

The workpieces of the customers, which are processed on these precision products, range from aircraft components to components for automobiles and construction machines as well as to gears for wind turbine power plants.

Is it possible to keep up the sharp edges after deburring?

Yes. It is possible to regulate the process to keep up the sharp edges after deburring.

Is a subsequent treatment of the workpieces necessary after the TEM process?

Yes, as a rule. The ferric oxide constitutes a visual and functional flaw and must be removed. One can only do without, if the parts are subject to a subsequent galvanic treatment.

Which are the main areas of application?

Main application areas of the TEM process are castings and turned parts as well as manifold blocks. Substantial savings can be achieved on, e.g. bodies for hydraulic and pneumatic valves, and castings with bore intersections. The process also removes treatment and casting burrs of zinc diecasting parts concurrently. Furthermore, turned and milled parts can be deburred in a matter of seconds.



faq

HAWE INLINE HYDRAULIK GMBH, BERLIN, GERMANY

The HAWE InLine hydraulic pumps are axial piston pumps for high pressure applications. Some product lines are specially tailored for the mobile market: V60N pumps, which can be fitted directly to truck gearboxes, also, the V30E pumps. The product line V30D serves in various industrial systems. The pumps are well established on the market for high-performance applications with improvements being developed continuously.

In 2015, HAWE Hydraulik SE and Jiangsu Hengli Highpressure Oil Cylinder Co., Ltd. agreed on a strategic partnership in the areas of development, purchasing, production and sales. For the customers of HAWE InLine Hydraulik, this means excellent consulting and service, with greater expertise and a wider product range at the same time.

In June 2016 the machinery park at HAWE in Berlin was extended by an ATL *ITEM400* deburring system.

The machine is equipped with a 5 station rotary table to deburr different parts and materials. This is another big step forward to guarantee outstanding quality and underlines the high technology standard of HAWE InLine.





ASCO NUMATICS SP.Z O.O., POLAND

ASCO is a traditional company founded in 1888 as a manufacturer of elevator, compressor, and generator controls. Nowadays the main focus are comprehensive solutions in fluid automation for a variety of industry-oriented applications.

The product range includes more than 50,000 solenoid valves, a wide range of compressed air preparation and control equipment and a complete range of actuators. To be one step ahead with the competitors, ASCO added an *iTEM320 SC* to their machinery in 2018.



INDO SCHÖTTLE PVT. LTD., INDIA

On the basis of common ideologies Mr. Vijay Pusalkar from India and Mr. Wolfgang Schottle from Germany became partners and formed a new company named Indo Schöttle Pvt. Ltd. in 1986. The company was founded to manufacture and supply motor

valve clamping tongues to the Indian OEMs. This was pioneering work in the country since it represented a technological advantage over the slow and obsolete manufacturing system that existed in India then. They purchased an *ITEM400/320-300* in 2016.





LEEMAN HYDRAULIC TECHNOLOGY CO., LTD., CHINA

Leeman Hydraulic Technology Co., Ltd. is a world-leading hydraulic technology company specializing in the production of hydraulic operating mechanisms for high-voltage switchgear, multi-channel valve for mechanical engineering and oil pressure damping for high-speed railway.

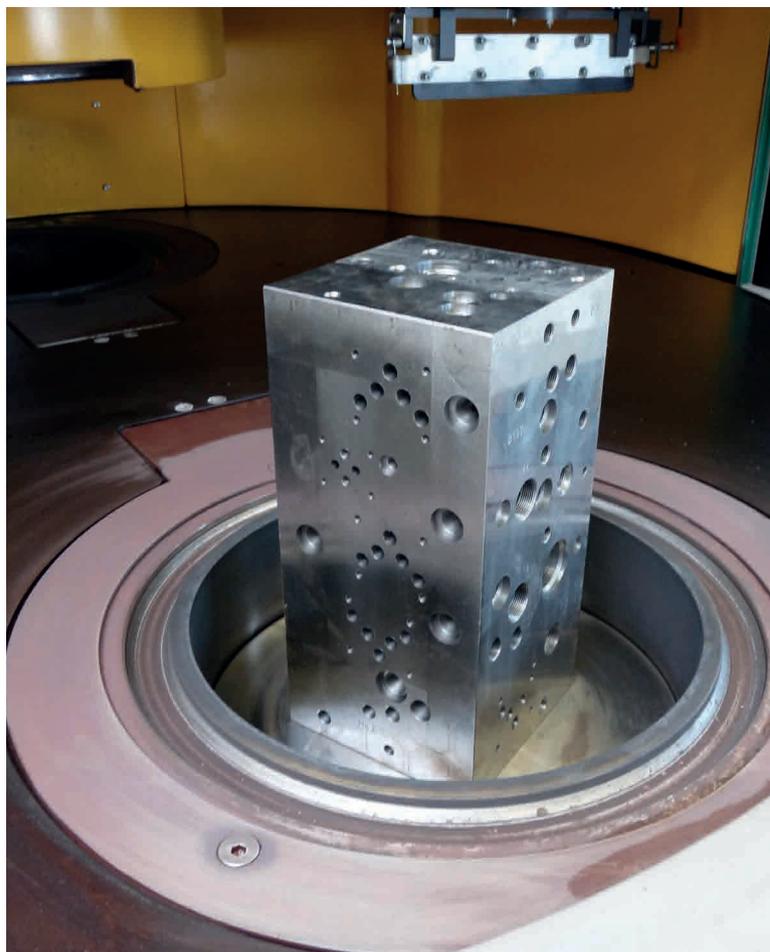
All high precision machining and testing equipments were purchased from Japan, US, Switzerland and Germany (as an *iTEM400/600 2 Station* in 2018) and other countries since its foundation.

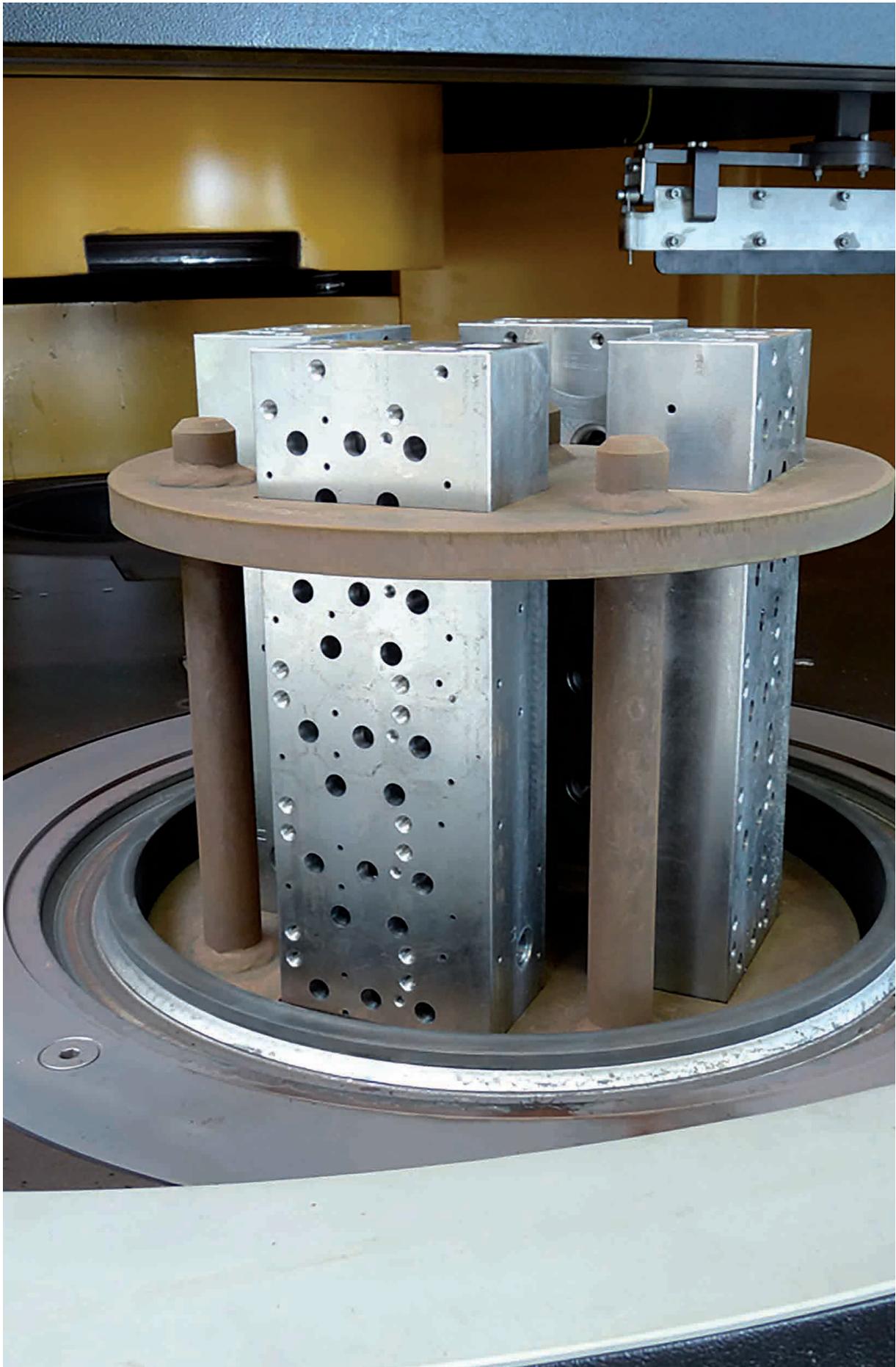
ROLAND FLEISCHER GMBH, GERMANY

The Roland Fleischer GmbH in Kleinostheim (near Aschaffenburg) specializes in the custom manufacturing of hydraulic blocks and panels of aluminum as well as cast materials from the drawing board. Since the end of 2013, the machinery has been expanded by ATL GmbH to form a thermal deburring system.

The *iTEM400/600* allows the company to deburr large and complex hydraulic blocks reliably and cost-effectively. The chamber volume of the two workstations can be flexibly adapted to allow fast and efficient processing of different components.

As a complete solution the Roland Fleischer GmbH offers the TEM deburring combined with a cleaning of the components as a service now.





BENSELER, GERMANY

Differently to other mechanical deburring methods, burrs at inaccessible areas can be effectively removed via TEM. And even with this process, the contract deburrer Benseler from Marbach reached the limits. This was caused by the size of the deburring chamber with a maximum batch size of Ø 320 mm. But the first machine of the series *ITEM400* with a chamber size of Ø 400 mm put things right and enabled Benseler Entgratungen GmbH to extend its component spectrum.

With nine thermal deburring machines in Marbach and 15 systems across the group, Benseler sees itself as biggest contract deburrer in Europe, also because other processes like ECM and high-pressure water jet deburring are applied as well. The customers come from the fields of automotive and machine construction as well as of plastics processing. For these areas, micro-deburred workpieces for hydraulic and pneumatic components are prerequisites.

Due to the new chamber size, new aspects arose with regard to batch size and cost effectiveness. Both facts make the thermal deburring more attractive for bulk goods. As evidence of this, Benseler quotes deburring results, which nobody suspected to be feasible with thermal deburring in such a deburring chamber. Even workpieces which would actually not be assigned to thermal deburring have caused a surprise.

In Marbach, where approximately 70 million parts are yearly deburred in a two shift operation, it is their competitive advantage being the first company working with this system. Benseler is considered a specialist on the market for difficult deburring tasks. Due to a gentle treatment of thin-walled parts for fuel injectors, Benseler could establish itself in the automotive industry. The basis for this is the fixture technology, which must be generally tailored to the respective components to reach optimal results.

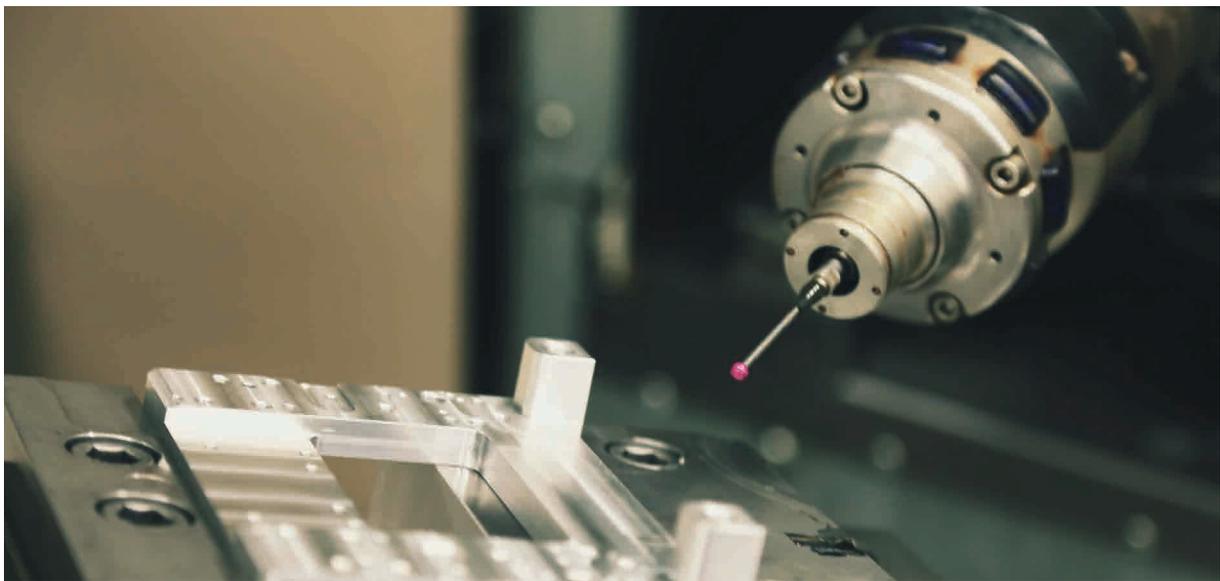
„SIM“ GDYNIA, POLAND

Since the foundation in 1978 is “SIM” Gdynia is a family-owned business. As a specialist for mechanical components they offer the highest quality of production for all industry sectors.

Almost 70% of the manufacturing is exported to world-renowned costumers in West-Europe, North and South America and the Far East.

With more than 50 machine tools and measuring instruments of leading companies this business is on the highest level of technology.

As the company motto proclaims ‚the costumers returns but not the product‘, an *ITEM320 SC* embarks its services at “SIM” in 2017 to increase the Costumer satisfaction.



What effect does thermal deburring have on threads?

The leading edge, which could damage seals caused by breaking or lifting, will be deburred and finest burrs will be removed. Pitches won't be chamfered, flattened or affected on the surfaces. The result of the process is a clean, tight and easy mountable thread.

What temperatur do the workpieces reach?

Workpieces made of steel can reach temperatures in the range of 150-180 °C (302-356 °F). Workpieces made of aluminium heat up to temperatures in a range of 60-90 °C (140-194 °F).

Which areas of a workpiece can be deburred?

All areas! The energy source for this process is gas which distributes evenly throughout the deburring chamber and the workpiece. For gas, there is no opening too small for it to penetrate - particularly if it is under pressure. Therefore, every burr, edge, flash, and particle is covered.

Do all metals work equally well?

There are some characteristics, but in general, yes. It depends on the thermal conductivity and the specific thermal absorption of the metal. Ferrous metals, aluminium and zinc alloys work well. Treatment of stainless steel is limited possible.



faq



WE ARE YOUR PARTNER

We gladly welcome you at our headquarter in Luhden and since 2011 also at our new final assembly. Convince yourself of the advantages of the TEM process at the ATL test and demonstration center.

We are also represented at international exhibition. You can find the current dates on our website:

www.atl-luhden.de/contact/exhibitions



**„We did not invent thermal deburring -
but we turned it into something special.“**

Publisher

ATL Anlagentechnik Luhden GmbH,
Planung - Fertigung - Montage
Hainekamp 2
D-31711 Luhden
Tel.: +49 5722 99219-0
Fax: +49 5722 81801
Email: info@atl-luhden.de
Web: www.atl-luhden.de
Jörn Struckmann, CEO

Editor

Text reference
Picture credits

Martin Köllner, Sales and Marketing
ATL Anlagentechnik Luhden GmbH
ATL Anlagentechnik Luhden GmbH,
iStockPhoto, pixabay, pexels,
Shutterstock

Reproduction

Only permitted with expressed
permission of the content
ATL Anlagentechnik Luhden GmbH
Subject to change

Version

07/2018