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December
2017

Kurtz Ersa Magazine

For Customers and Business Partners of Kurtz Ersa Corporation

kurtz ersa

Magnificent!

Rainer Kurtz,
Chief Executive Officer
of the Kurtz Ersa Corporation

If, like Kurtz Ersa, you have the fortune of having the world's best companies as customers in your target markets, this is a permanent and great challenge. The Kurtz Ersa Magazine again offers highlights on product innovations and successful projects and casts interesting light on the interior of our group in this issue.

We are particularly proud of the fact that we have again been awarded prizes for our products, our personnel management, our possibilities of training and further training by external juries this year. A highlight in this regard was the award for "Bavaria's Best 50", which was given to us by the Minister of Economics of the Free State of Bavaria.

The fact that things were not only technical and analytical, despite all the superlatives of the previous year, but also quite human, pleasant and enjoyable can be confirmed by the people who were at our events where there was music, dancing and laughter. That is also a part of Kurtz Ersa.

On behalf of the shareholders, the management and all the employees at Kurtz Ersa, I thank you for your cooperation in the year which is now drawing to a close and wish you contemplative days and much success, joy and health in 2018.

GOOD LUCK!
Your Rainer Kurtz

GREAT PROGRESS IN THE CONSTRUCTION OF THE NEW KURTZ ERSA CENTRAL WAREHOUSE

Kurtz Ersa Logistik GmbH founded

The building site of the new Kurtz Ersa central warehouse is making impressive progress: the brickwork for the large logistics halls has been finished and they are currently being provided with the basic technical equipment and interior fittings. Kurtz Ersa is investing around 15 million Euros in this large project.

Alongside the challenges of a large building site, it is above all the organisational subjects which are concerning the responsible people at Kurtz Ersa in this phase. The operator of the central warehouse will be the newly founded group company Kurtz Ersa Logistik GmbH. Behind the backdrops, hard work is being done on the set-up of the new company. Contracts are being concluded, numerous employees' discussions are being held, the foundation for the operation of the central warehouse is being created.

HIGH DEGREE OF AUTOMATION FOR MORE LOGISTIC QUALITY

Even before the building companies leave the site, the first logistic workers will be active in the new building in order to start the commissioning of the plant technology. In the central warehouse, Kurtz Ersa is staking on a high degree of automation and is thus re-aligning its logistic processes in a fundamentally new way. In future, around 85 per cent of the goods movements will be in the automatic small part warehouse (AKL), which is connected to various work stations by means of complex conveying technique. Up to now, the fundamental principle "man to goods" has applied – i.e. manual picking of goods in shelves. The AKL inverts this principle and offers the picking articles to the logistic employees at pick workplaces (principle: "goods to person"). With the highly available system, essential improvements of the logistic quality are possible. This can be seen with shorter run-through times and improved supply precision. Kurtz Ersa supplies the producing factories with materials for assembly of machines and systems and handles worldwide provision of replacement parts for the customers from the new central warehouse. The productive start is planned for the summer of 2018. ■

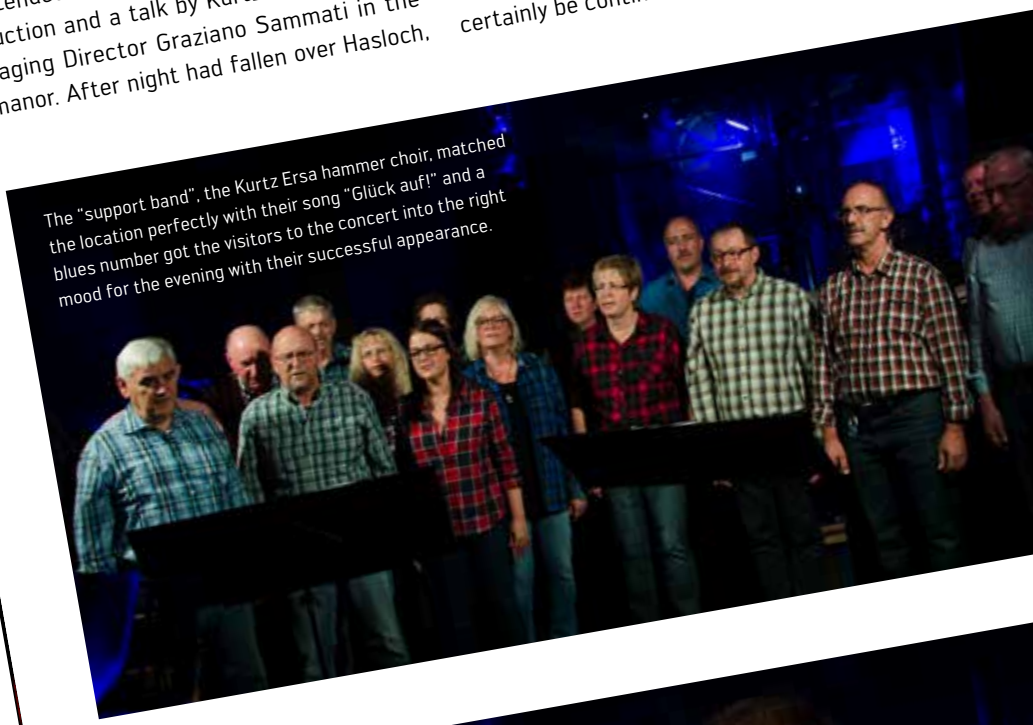
The Würzburg blues band **MUCHO MOJO** delighted the audiences of the two concerts on 12. and 13.10 in the unique surroundings of the Kurtz Ersa Iron Hammer in Hasloch with sometimes earthy, sometimes dirty electric blues by blues stars such as B. B. King, Eric Clapton and Muddy Waters, but also made the place "smoke" with some of their own blues numbers.

Smoky Blues

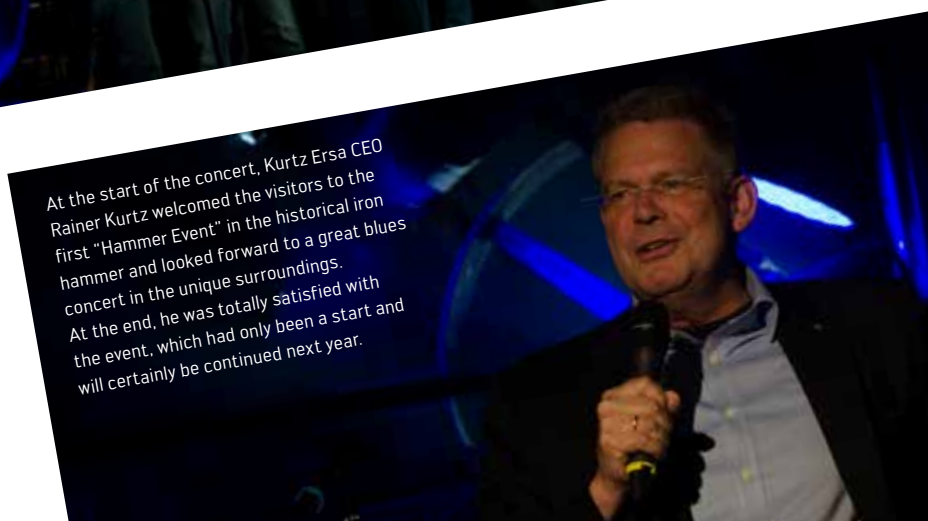
at the Iron Hammer

Historic Iron Hammer Works first used as a Event-Location

Without proximity to customers, no corporate success, this motto applies all the more so in a globalised business world. A company like Kurtz Ersa, which was founded in Hasloch in 1779 as a simple iron hammer works and is active all over the world nowadays, knows how important this proximity to the customer is. If you are not in a dialogue with your clients, you can possibly develop your products away from market requirements. For this reason, customer events are part of everyday life at Kurtz Ersa – but what took place at the iron hammer on 12 October was nothing less than a first night. Kurtz Eisenguss GmbH & Co. KG had invited customers and interested parties to the customer event: to start with, the attendees immersed into the more than 238 years of the success story of Kurtz Ersa in the Hammer Museum. After this, the production portfolio of the SMART FOUNDRY iron casting works for hand-mould casting was presented to the attendees – with a guided tour through production and a talk by Kurtz Eisenguss Managing Director Graziano Sammati in the manor. After night had fallen over Hasloch, the visitors and employees saw an iron hammer in a way never seen before – the iron hammer was dipped in reddish light, which quite easily brought about the connection to glowing iron. After a joint evening meal, the visitors to the customer event again went to the iron hammer, where the 20 members of the "hammer choir" gave a musical introduction to the evening. Then, hammer miller Otto Hamann showed how iron is put into shape on the water-driven lift-hammer. The absolute highlight was the performance by the five blues musicians of MUCHO MOJO: with their electric blues, sometimes played in an earthy, sometimes in a dirty kind of way, they inhaled life into the iron hammer. With their two-hour gig, MUCHO MOJO brought blues classics such as B. B. King, Eric Clapton, Muddy Waters to small Hasloch, but also made it "smoke" with their own blues numbers. Both guests and musicians were visibly impressed by the unique surroundings of the iron hammer, Kurtz Ersa CEO Rainer Kurtz was totally satisfied with the event, which was just a start and will certainly be continued. ■



The "support band", the Kurtz Ersa hammer choir, matched the location perfectly with their song "Glück auf!" and a blues number got the visitors to the concert into the right mood for the evening with their successful appearance.



At the start of the concert, Kurtz Ersa CEO Rainer Kurtz welcomed the visitors to the first "Hammer Event" in the historical iron hammer and looked forward to a great blues concert in the unique surroundings. At the end, he was totally satisfied with the event, which had only been a start and will certainly be continued next year.

During the blues concert inside the iron hammer works drinks and catering are provided by Isabel Cortes and her team from the Schwarzer Bock, which is located directly opposite.

Not only the concert in the iron hammer, also from the outside, the origin of the Kurtz Ersa Group was particularly able to impress on Thursday and Friday. With complicated lighting, the building shone in a light which nobody had seen in this way before.

Christian John
Managing Director
globalPoint

Viktoria Rawinski
Engineer
Ersa GmbH

globalPoint ICS – new Kurtz Ersa enterprise

For many years now, globalPoint ICS based in Heiligenhafen has been developing and distributing intelligent systems for temperature profile determination in soldering systems. After foundation in 1999 by Christian John, the enterprise in Schleswig-Holstein quickly gained a foothold in electronic production and has been active for the complete world market for some time. The basis of globalPoint's success is profound knowledge in precise measurement technology combined with a deep understanding of the natural science foundations in the soft soldering processes. For this, the PTP® software of globalPoint contains an optimisation tool which enables system operators with less experience to guarantee the profile sequences prescribed by standards, soldering pastes and components on a lasting basis. Some years ago, Ersa had a specific shuttle developed by globalPoint and has successfully sold it under its own brand name. ■

From 01.01.2018, globalPoint GmbH & Co. KG will be moving its registered office to Wertheim. Christian John will continue to be available as Managing Director. Ersa engineer Viktoria Rawinski and a team of employees will be at his side to ensure the further development, supply, handling of replacement parts and calibration service necessary for the complete continuation of the business.

Competitive advantage: personnel qualification

ERSA TRAINING CATALOGUE 2018 PUBLISHED

With the **Ersa Training Catalogue 2018** electronics manufacturer have access to a wide training offer for all aspects of professional soldering and can effectively plan their demands for the coming twelve months. The "Service and Maintenance" courses introduced in 2014 were very well received by customers and have become a fixed component within the range of training in the "process techniques and optimisation" section. As are the tried-and-tested Technology Days, which are designed as an exclusive event for one customer with a practical and hands-on part at the machines, and are often booked by international companies. ■

Successful cooperation: Reinhard Foegelle, CEO of the Dr. Farassat-Stiftung (middle), with Ersa Head of Development Michael Schäfer (left) and Ersa CEO Rainer Kurtz.

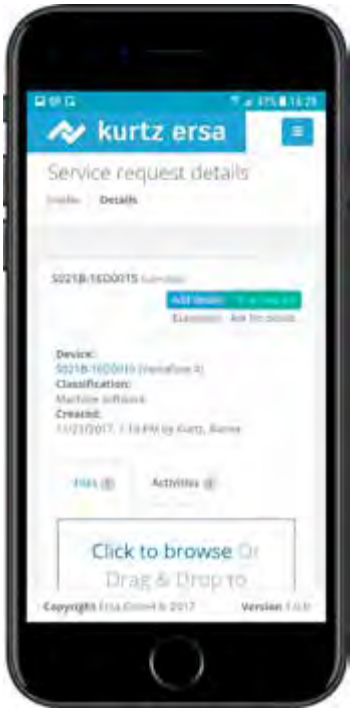
Successful project between Dr. Farassat-Stiftung and Ersa

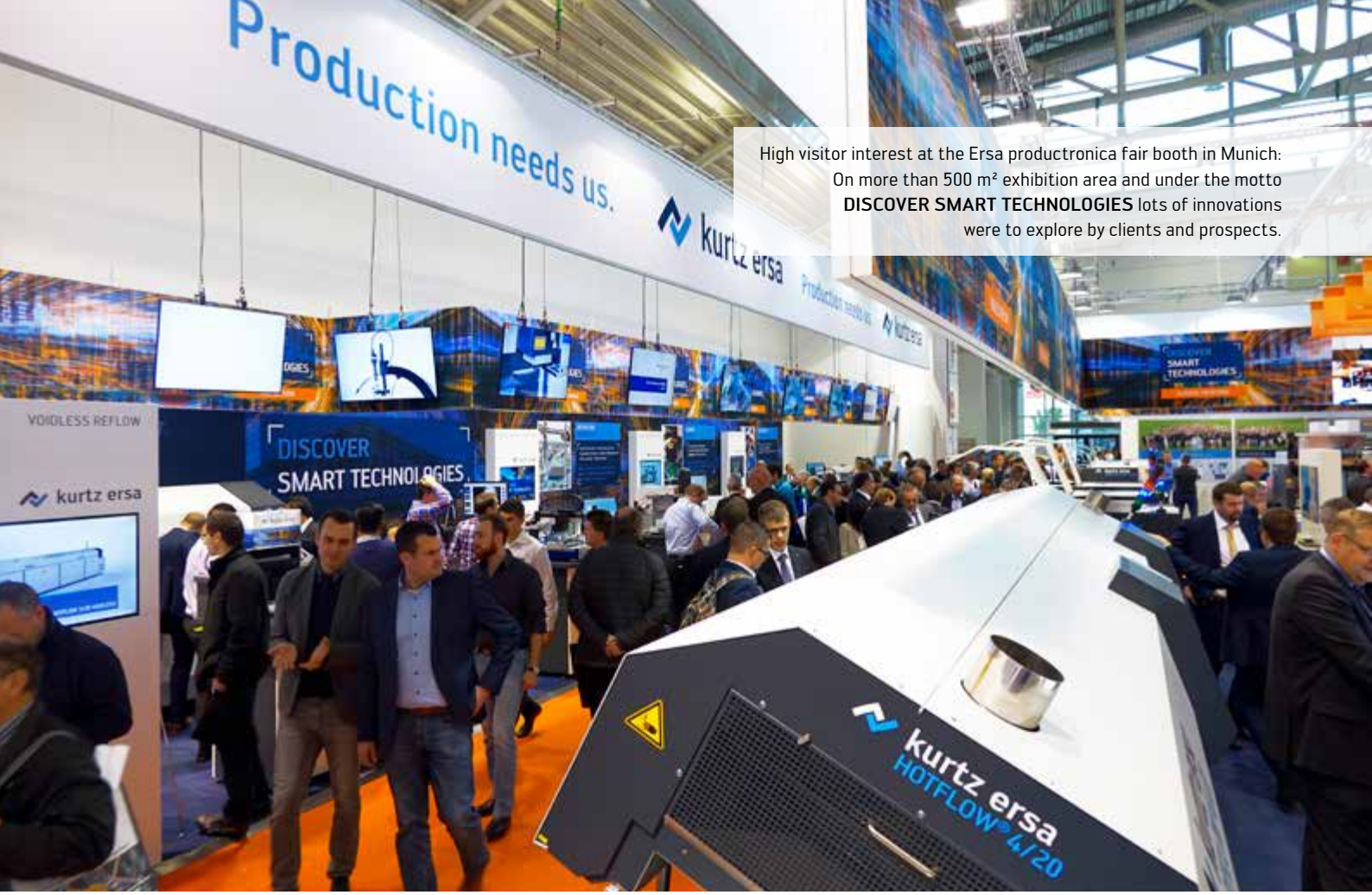
The Dr. Farassat-Stiftung (Foundation) located near Würzburg dedicates itself to the integration of the highly gifted into professional and business life. After a meeting, the Kurtz Ersa management recognised the potential connected with it and commissioned a project on the subject of "Digitalisation of knowledge".

"The objective of the foundation's work is to get highly gifted people, who fail in their studies without any apparent reason or who do not have any success at the start of their professional lives, out of the situation so that they can make use of the skills for themselves and for society's benefit," says Reinhard Foegelle, Managing Director of the Dr. Farassat-Stiftung. What does that look like specifically? To start with, the beneficiaries research the limits of their capability together with trainers during a three-month personality training. By means of individual support, a holistic learning approach and psychological help, the participants learn how to develop their extraordinary potential. In addition, learning and working conduct, strategies for crisis situations and motivation are taught, with the result that the participants build up a positive self-concept and increase their social competence. The personality training is followed by a project phase in real surroundings in the second part.

PROJECT PHASE WITH THE SOLDERING SPECIALIST ERSA

And that's how it is with the joint "Digitalisation of knowledge" project between the foundation and Ersa – in the two-month project phase, the four participants were to put what they have learned into practice in the company. Starting point: despite ultra-modern engineering and a high degree of automation, the specific soldering know-how for optimum production of electronics is often only in the specialists' heads. For Ersa, the question was: how can this knowledge be secured and extended in order to be able to access and distribute it purposefully? That was where the team of four from the foundation got involved: customers and employees from various Ersa departments were interviewed – with great empathy, design thinking resulted in various approaches to solutions in order to make the employees' existing knowledge visible. The result: an app which makes it possible to record, to channel and to provide answers to questions of the soldering process easily and without complications. In this way, this specific knowledge can be accessed in an automated way and the communication with customers and service employees can be simplified. The concept convinced all those who were involved, with the result that a further project started (nozzle changer for selective soldering machines) and has also been completed successfully in the meantime… ■





High visitor interest at the Ersa productronica fair booth in Munich: On more than 500 m² exhibition area and under the motto **DISCOVER SMART TECHNOLOGIES** lots of innovations were to explore by clients and prospects.

Fulminant performance in Munich – Ersa impresses at the productronica

After four great days at the fair, the productronica in Munich ended on 17 November. The 2017 edition of the world's leading trade fair for development and production of electronics once again confirmed its status as a global innovation platform, enticing 20 per cent more visitors to the Bavarian state capital with 1,200 exhibitors from 42 countries.

System supplier Ersa was also pleased about outstanding attendance of the 500 m² trade fair stand, forming an ideal backdrop for technologically demanding discussions. "Customers and interested parties who were very well prepared had specific tasks with them, for which we then find the solutions. The interest in our **SMART TECHNOLOGIES,** which dominated at least every other discussion, was very pleasing – and we are not talking of future possibilities, but of genuine options for realisation," emphasised Rainer Krauss, Overall Head of Sales at Ersa. The dynamism of worldwide electronics production was noticeable in all areas – be it with the hand-held soldering tools only a few grams in weight or the fully grown high-end soldering system metres in length. "The productronica confirmed the positive growth forecast for the branch. The great interest in Smart Technologies shows that digitalisation has finally arrived in electronics production – it's now a question of making use of the impetus," said Rainer Kurtz, Chairman of the Advisory Board of the productronica and Kurtz Ersa CEO.

Thanks to **SMART TECHNOLOGIES,** Ersa is perfectly prepared for using the chances of digitalisation connected with Industrie 4.0 – the visitors to the Ersa stand were impressed, for example, by the possibilities of interlining the intuitive ERSASOFT 5 soldering software and the completely integrated CAD Assistant 4. As part of its extensive programme presentation, Ersa showed an automation solution with handling robot, and innovations such as the VERSAPRINT 2 stencil printer series with four different mo-

productronica 2017
innovation all along the line

dels were a great hit and led to direct sales. It was the same picture with the technological leaders in selective soldering systems with modules such as VERSAFLEX and VERSAFLUX and in the HR 600 XL rework system for big boards, with which printed circuit boards up to 625 x 625 mm in size can be processed – in these dimensions, there is nothing comparable on the market.

Despite digitalisation and **SMART TECHNOLOGIES** as the dominant topic at the productronica 2017, there were a number of orders by handshake, which were signed in an analog form on paper, like in the good old days. The great internationality of the customers and interested parties was faced by an Ersa trade fair team which was composed of all the branches and thus made optimum support possible. There was a great atmosphere at the stand party on the Thursday evening with live music, which splashed over from the Ersa fair team to customers and business friends.

Also this year once again the Ersa booth party was an highlight.

The Global SMT Award conferred at the productronica for the new POWERFLOW S full-tunnel wave soldering machine completed the totally successful appearance at the fair. "Our leading motto **SMART TECHNOLOGIES** had an outstanding reaction with the customers – and a number of interested parties directly became new customers. After the productronica, we can look at a very good project situation and are more than confident of being able to extend our market position further – amongst other things with trade fair presentations at the NEPCON Japan and IPC APEX in the USA. Experience has shown that the Munich trade fair is a good indicator for the development of the next two years. At this point I would like to thank the entire Ersa team for their commitment and a really outstanding trade fair presentation," said Ersa Overall Head of Sales Rainer Krauss at the end of the productronica. ■

The head of trade fair Munich Falk Senger (2nd f.l.) and Ministerial Director Dr. Bernhard Schwab (right) visiting the Ersa productronica booth. From Kurtz Ersa CEO Rainer Kurtz (left), in addition to a short introduction to electronic soldering technology, a chronic of the company was offered to the head of the bavarian State Ministry of Economy, Media, Energy and Technology.

Awarded at the productronica: The Global SMT award for the new full-tunnel wave soldering machine POWERFLOW S.

In addition to the exhibited innovations the focus of interest were the **SMART TECHNOLOGY** solutions, which Ersa offers its customers, in order to grab the chance of industry 4.0.

VERSAPRINT 2: Next Generation!

PRINTER PLATFORM WITH FULLY INTEGRATED INSPECTION – PARTIAL, 100% 2D OR 3D AND "FEATURES ON DEMAND"-FLEXIBILITY

The stencil printer has long left the stadium of the "simple printer" – currently, the **VERSAPRINT 2 series** handles the automatic cleaning of the underside of the stencil and inspection of the printing result and many more functions and processes along the production line. The **VERSAPRINT 2 series** comprises four different types: **VERSAPRINT 2 ELITE** is the sturdy basic version which uses an area camera to align the substrate to the stencil and can use this to carry out optional inspection tasks. The **VERSAPRINT 2 ELITE plus** can be adjusted without tools for frame sizes from 450 to 740 mm and can be upgraded or retrofitted with all options available for the **VERSAPRINT 2 series,** including 2D and 3D-camera.

The **VERSAPRINT 2 Pro²** with its fast 2D-LIST camera (LIST = Line Scan Technology) is particularly suited for products with a high inspection requirement (upgradable/retrofittable with all options for **VERSAPRINT 2**). The **VERSAPRINT 2 ULTRA³** is for operators who pay special attention to the small print. The **ULTRA³** model uses the very latest measuring technology provided by the 3D-LIST camera. The shape of the smallest solder paste depots plays a major role in the printed volume and ultimately for the shape of the solder connection. Is the height of the paste depot consistent or does it drop towards the edges? The **ULTRA³** can answer this question for you. It is both a stencil printer and 3D-SPI in one (upgradable/retrofittable with all options).

With the new **VERSAPRINT 2** system supplier Ersa continues the proven stencil printer series. The new printer sets standards in communication with the operator and with regard to drive technology and asset addition. The higher accessibility of the system allows optional retrofitting in terms of "features on demand" so that the plant grows with the requirements of the production. Further, with its fully integrated 3D inspection the **VERSAPRINT 2** meets the demands of the market for enhanced process quality. Last, not least, the **VERSAPRINT 2 –** in contrast to an independent downstream SPI – does not need additional shop floor or further programming work. The results of the inspection directly feed into the current printing process: The cleaning of the underside of the stencil starts automatically and the print offset is autonomously adjusted. Personnel workload is reduced while the line throughput is simultaneously maximized. ■

Hybrid Rework System HR 600 XL: automatic repair for big boards.

HR 600 XL: Big Board Rework!

PROFESSIONAL REWORK OF LARGE PCBS

On the occasion of productronica 2017 Ersa introduced its automated rework platform for large and heavy printed circuit boards: the **HR 600 XL hybrid rework system.** Providing a heatable area of 625 x 625 mm and the capability to handle board thicknesses of up to 10 mm, the **HR 600 XL** offers for the first time a professional repair of high-channel components on big boards, as they occur in telecommunications, networks and infrastructure. The lower IR Matrix Heater™ consists of 25 heating elements that can be controlled individually and has a total power of 15 kW. In this way it is possible to obtain an ideal heat distribution on every application during the preheating process.

The highly efficient 800 W hybrid heating head manages the desoldering and soldering of the smallest components to large Ball Grid Arrays measuring up to 60 x 60 mm, in the familiar Ersa quality and reliability. Just like its smaller brother HR 600/2, the **HR 600 XL** incorporates an automatic and precise component alignment (+/- 0,025 mm). The process control and documentation with the HRSoft 2 user guidance guarantees reproducible repair results. The HR 600 XL can be used in fully automatic or half-automatic mode to ensure maximum flexibility. It is compatible with the usage of the Ersa Dip&Print station for the preparation of the components with flux or solder paste before soldering.

MAINTAIN VALUES,
MINIMISE REJECTS,
AVOID ELECTRONIC SCRAP

Repair is Back!

Repair is back! – this slogan summarises the current development in the field of assembly repairs. It is becoming ever clearer that the finite resources of planet earth have to be used more intelligently. Daniel Calleja Crespo, the General Director for the Environment in the EU Commission, summed the situation up as follows: It is true that we have discovered other planets similar to earth, but until these can be used we have to manage with the one earth we have!

Rework out of the Box!
Ersa Hybrid Rework System HR 200 –
this is how easy rework can be today.

In line with this, the European Economy and Social Committee (EWSA) demands the avoidance and reduction of electronic scrap, while the service life of products should be extended. Thus the EWSA advises manufacturers to make repairs to their products easier. Amended guidelines (RoHS and WEEE) aim to reduce pollutants in products and to recuperate materials. The EU Commission supports new business models related to circular economy processes, private organisations such as "Repair Cafés" are picking up on the initiative and offering support with repairs of a wide range of different products. Some manufacturers have recognised the trend and are offering durable and repair-friendly products.

*Report by the EWSA on the subject "For sustainable consumption: the service life of industrial products and consumer information in favour of new trust", Thierry Libaert, Jean Pierre Haber, Brussels, 17.10.2013.

REPAIR OF ELECTRONIC ASSEMBLIES

Within assembly production or the repairs of electronic products, it is often economic interests that motivate companies to repair their boards or systems. During production, rejects occur again and again – faulty components, insufficient solder paste printing or equipping errors can never be completely avoided. In many cases, it is little things such as jumpers, an open solder connection or wrong resistor or capacitor that prevent an assembly from working properly. In order to maintain the value of the produced assemblies, professional and qualified repair processes pay off. For this, Ersa offers its customers a balanced package of products and services related to repair soldering. The

portfolio ranges from the entry-level soldering station i-CON PICO through the multi-channel soldering and desoldering station i-CON VARIO 4 to partly and fully automatic rework systems. In addition, Ersa offers soldering training and seminars in order to guide users purposefully to a successful soldering result.

BGA REPAIRS IN JUST A FEW MINUTES

Integrated components can only be soldered and desoldered using classic manual soldering tools to a limited extent. In the case of SMDs with concealed component connections (BTC), the use of a rework system is essential in order to remove the faulty microcontroller safely from the board and solder a new one in its place, for example. In the most straightforward case and up to a component size of 30 x 30 mm, this can be carried out using the rework system HR 200: the assembly is preheated using an IR heater from below, while a 400 W hybrid overhead emitter supplies the preset soldering energy from above. Depending on the board and presetting, such a soldering process takes between one and three minutes. The most well known component in professional repairs is the BGA (ball grid array). These components often present a challenge particularly for new products. Thermally imbalanced solder profiles, component features or aspects of the board or auxiliary materials create faults during processing. Soldering faults on BGAs can only be discovered with X-ray systems or optical inspection. in addition, these components are comparatively expensive and are used in complex, high-grade electronic circuits. This makes successful repairs all the more attractive. This is where HR 550 and HR 600/2 come in – they offer partly automated or fully automated desoldering, positioning and soldering processes for BGAs and practically all other SMD designs. Thanks to the temperature control in the closed loop control circuit, a soldering result comparable to the series process can be achieved on every assembly during the first process.

AVOIDANCE OF ELECTRONIC SCRAP

Highly developed process chains and specialised companies for the recycling of electronic scrap do now exist, but the methods used require a lot of energy, need special materials (metals) to be used and always leave an unusable residue behind. The mountains of electronic scrap being "further processed" in Asia and Africa have hardly been reduced either. Accordingly, repairs not only offer advantages in terms of cost, they also reduce the volume of rejects and thus avoid electronic scrap. If the mentality that repairs are worth it manages to prevail, this will go easy on the energy and material resources of planet earth long-term. ■

Ersa i-CON VARIO 4 – parallel processing of up to four rework tools with just one station. From extremely precise soldering/desoldering tweezers or THT desoldering and hot air irons.

Ersa HR 600/2 VOIDLESS Hybrid Rework System – automatic desoldering, placement and soldering of SMT components. Flexible and safe.

FANTASTIC FACTORY IN THE FOREST

The Paramit Corporation is the California-based "zero-defect" manufacturer of high-end medical equipment. In November 2016, the US company opened its second facility in Malaysia, doubling its capacity in Southeast Asia. Like the headquarters, the "factory in the forest" strives for a quality "better than best-in-class". For uncompromising quality in soldering, Paramit now calls on five Ersa systems.

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Customers who have their medical devices manufactured by Paramit from California get products which comply with the criteria of the US Food and Drug Administration (FDA) – and more. Paramit founder and CEO Billoo Rataul puts it like this: "The motor for our corporate culture is the passion for constant improvement and smart problem-solving approaches. We consistently supply our customers with superb performance and peace of mind." Paramit has developed an outstanding production standard by concentrating on PCB production at Six-Sigma quality levels, combined with the patented vPoke system which enables defect-free mechanical assembly. This computer-directed system breaks down assembly and testing of a complex product into thousands of process steps, each of which is validated, verified and documented. In assembly, Paramit comes close to the zero-defect ideal – at a rate of under 1 DPMO (defects per million opportunities)! With a sophisticated 100% inline soldering process layout, 3D inspection of the soldering paste application, fast machine set-up and multiproduct-single-setup algorithms, Paramit achieves a quality level of 10 DPMO!

ZERO-DEFECT APPROACH, EXTREME PERFORMANCE

In addition to the current product range, Paramit will increasingly focus on medical devices. From the ground up, the facility in Penang Science Park replicated design, concept and function – of course with seamless integration of the company's own performance processes in terms of quality, adherence to delivery schedules and customer service. The idea of an environment-friendly

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1
The forest factory of Paramit Malaysia in Penang Science Park.

2
An unusual industrial facility – Paramit's "factory in the forest" in Malaysia.

3
Kurtz Ersa POWERFLOW N_2 wave soldering plant in the Paramit production hall.

4
A glimpse into the Paramit production hall.

factory originated with Paramit CEO Billoo Rataul – the design of the building was supplied by a French architect. Everything addresses environment-friendly energy efficiency – from the water-based cooling system to the climate-regulating effect of the shade created by the canopy of trees. The numerous plants are irrigated using rainwater collected in huge tanks located under the car parks. In addition, energy-saving LED lamps are used and the production facility supplied primarily with natural light through large-scale windows. The Malaysian facility combines this approach with an open office concept with gardens and waterfalls on multiple levels and numerous meeting spaces. "Our expansion in Asia allows us to provide more tailored offerings to our regional customers – bringing new levels of speed-to-market and peace of mind to our customers," says the Paramit CEO.

THE GREENEST PRODUCTION IN MALAYSIA

Back to the core of the factory: "We were familiar with the concept of our new factory. But moving our 50 plant systems within just one day was still a major challenge. Nonetheless, we succeeded in setting up very quickly – with everything running smoothly within just one week," says Chong Chit Leon, Section Manager Equipment Engineering. More and more, Paramit Malaysia is relying on the support of Ersa – since entering the market in 2011, those responsible for production have ordered soldering systems through the Singapore-based Ersa representative Long Shine. "For us, the greatest benefit of the Ersa equipment is that it permits high-mix in every direction – this gives us great flexibility in our manufacturing," says Chong Chit Leon. With the strategic focus at Paramit Malaysia increasingly moving to medical devices, more attention was paid to selective soldering. Because this high-performance technology fulfils all the criteria laid down for the high quality standards applying in medical devices. Three companies were shortlisted during the purchasing process; in the end, the contract went to Ersa – specifically, the order was for a VERSAFLOW 3/66 selective soldering system. In addition to the performance capacity of the plant, the link-up to corresponding service and support was a significant deciding factor – in addition, the Paramit team had already seen and thoroughly tested the systems in the Ersa showroom in Penang. The Paramit team knows that, with the comprehensive process solution as offered by Long Shine and Ersa, they are always on the safe side! ■

Even faster! Kurtz Trimming Press KPS 2000/25-12 SKT

With the new trimming press the developers of Kurtz realized numerous goals. For example:

- Speed/cycle time
- Parallel movements
- Noise development/ volume lower than 72 dB(A)
- Toolless quick-changing system for trimming tools including automatic coupling of all media
- Condition Monitoring
- Consumption measurement
- Maximum energy efficiency thanks to speed-controlled motor-pump drives
- Straightforward maintenance
- Intelligent machine controller
- Wizard function for guided operator activities e.g. tool change and maintenance
- Central position for all consumption media

Kurtz has been building trimming presses since 2009; in 2011 trimming presses with a sliding-tilting table were added, and in 2014 Kurtz launched the trimming press KPS 2000/25-12 SKT – the largest and fastest system on the market at that time. Now the press, which was presented at the Kurtz Ersa in-house fair for the first time surpasses this standard – it is even faster!

There has been rapid development in the field of die casting over the past few years, which means in-cell trimming presses have become more and more important. Whereas in the past the die casting process was the crucial factor for possible cycle time, it is currently the trimming process. To ensure the press is no longer "slowing" the cell down, Kurtz is now launching this new development on the market.

Compared with the presses built in 2014, for example, the new high-speed press is twice as fast, in other words requires only half the cycle time, and outperforms all previous models from Kurtz and other manufacturers. But even if speed is becoming more and more important, this was not the only reason for the new development.

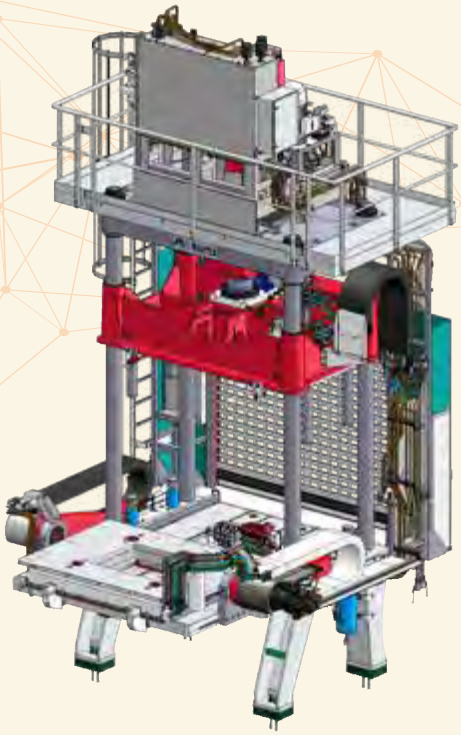
OPTIMUM ACCESS TO COMPONENTS AND DURING MAINTENANCE

The accessibility of the components for the operator and for maintenance work has been further improved. One highlight is the media cabinet, which has not only been attached outside the safeguard but also contains the pneumatic automatic control devices, as well as the central lubrication system and minimum quantity lubrication as options. The maintenance platform surrounds the hydraulic unit from three sides so that all the fittings are easily accessible for servicing work. The new maintenance platform provides more room and space for tool changing, automation and the addition of gantries directly at the press, for example.

The hydraulic concept has been given a thorough makeover, performance and speed increased, energy consumption reduced. The press is equipped with a low-noise rotary drive with high torque, so that tools can be turned through 180° in a maximum of six seconds – despite the lower part of the tool weighing up to eight tonnes! Up to four consumers/rams can be actuated and moved at the same time. This allows real parallel movements to be carried out. Toolless, fast and safe changing of the trimming tools is available as an optional automatic, safe clamping system. Equally, all media (hydraulic, electric, air, electrical signals) can be connected via multi-couplings. This makes work easier and the system safer, since incorrect coupling is thus impossible.

USER-FRIENDLY WIZARD TOOL CHANGE

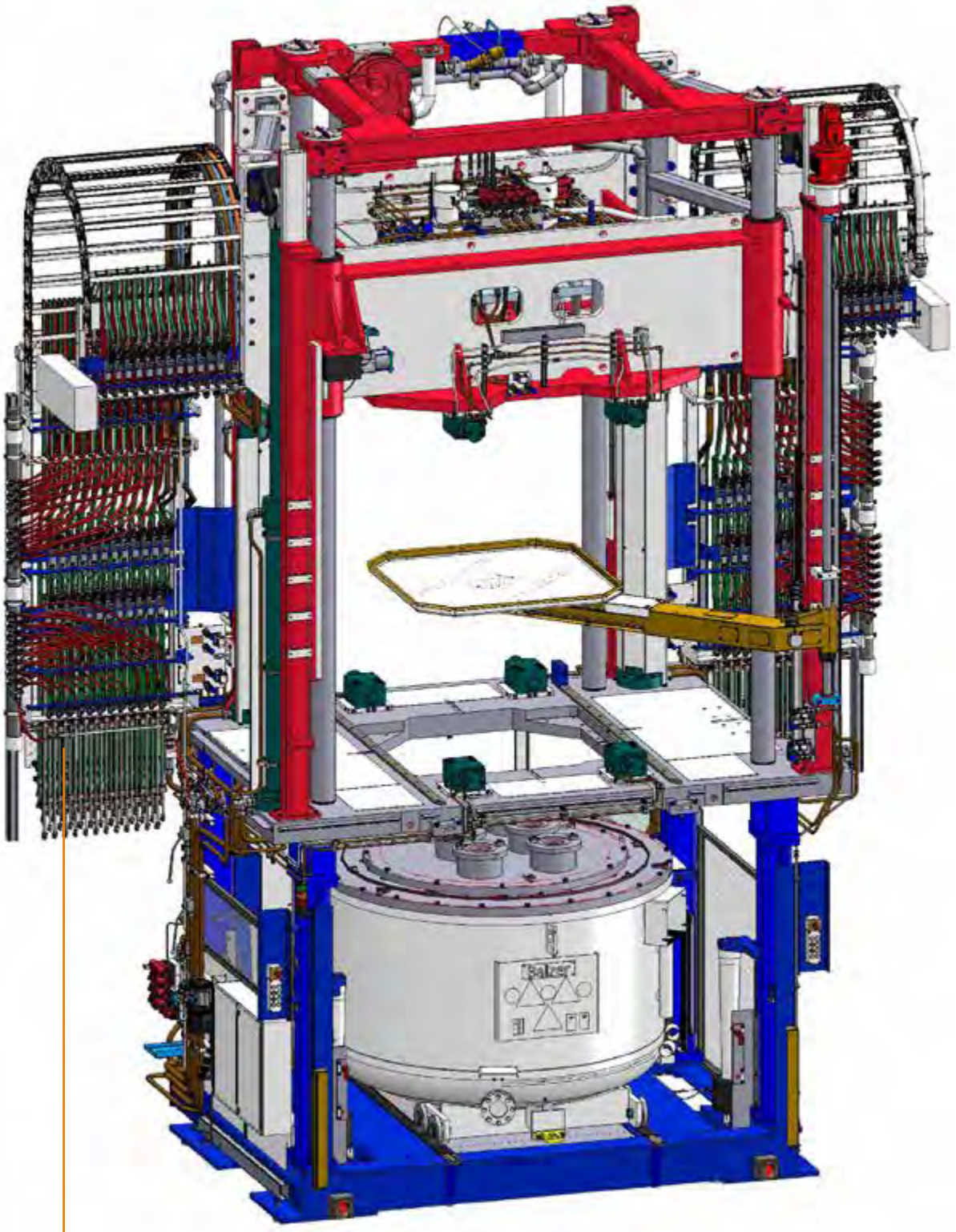
The newly developed wizard makes tool change easier – in other words the operator is guided step by step through the change process via the visualisation. The innovative user-friendly and web-based software interface makes machine analysis possible for both process engineers and maintenance staff. Thanks to the server-client solution, several users can access the machine at the same time, view data and operate the machine via tablets or other devices. The "condition monitoring" option allows the condition of the press to be monitored at all times, enabling possible stoppages or downtimes to be detected early and any resulting maintenance work to be planned, for high availability of the Kurtz press KPS 2000/25-12 SKT. Numerous sensors and monitoring devices are added to the process-related assemblies and components in order to retrieve the respective component status via software. Examples include leak detection, filter service lives, pressure monitoring and tool wear indicators. ■



LIVE AT THE EUROGUSS 2018

With this generation of the KPS 2000/25-12 SKT, Kurtz is setting a further milestone in press history.

Come and see for yourself at the EUROGUSS in Nuremberg, the international trade fair for die casting, from 16.01.–18.01.2018, hall 7A, stand 7A-650.



Focussed on Innovation – Low-Pressure Casting Machine AL 28-18-18 FSC

The new AL 28-18-18 FSC extends the portfolio of the Kurtz low-pressure casting machines with even more clamping area and hydraulic power. The AL 28-18-18 FSC relies on proven Kurtz low-pressure die casting technology in order to achieve even greater benefits for users through newly optimised assemblies and components. In addition to the targets set for the trimming press, this new development also aims to achieve innovative and efficient casting, smaller overall height, a toolless quick-change system for casting dies including coupling systems for casting die cooling, a tilting option for the movable clamping plate for better accessibility during blacking, for example, as well as higher opening, closing and discharge forces.

TOOL FORMAT 2,800 x 2,000 (W x D)

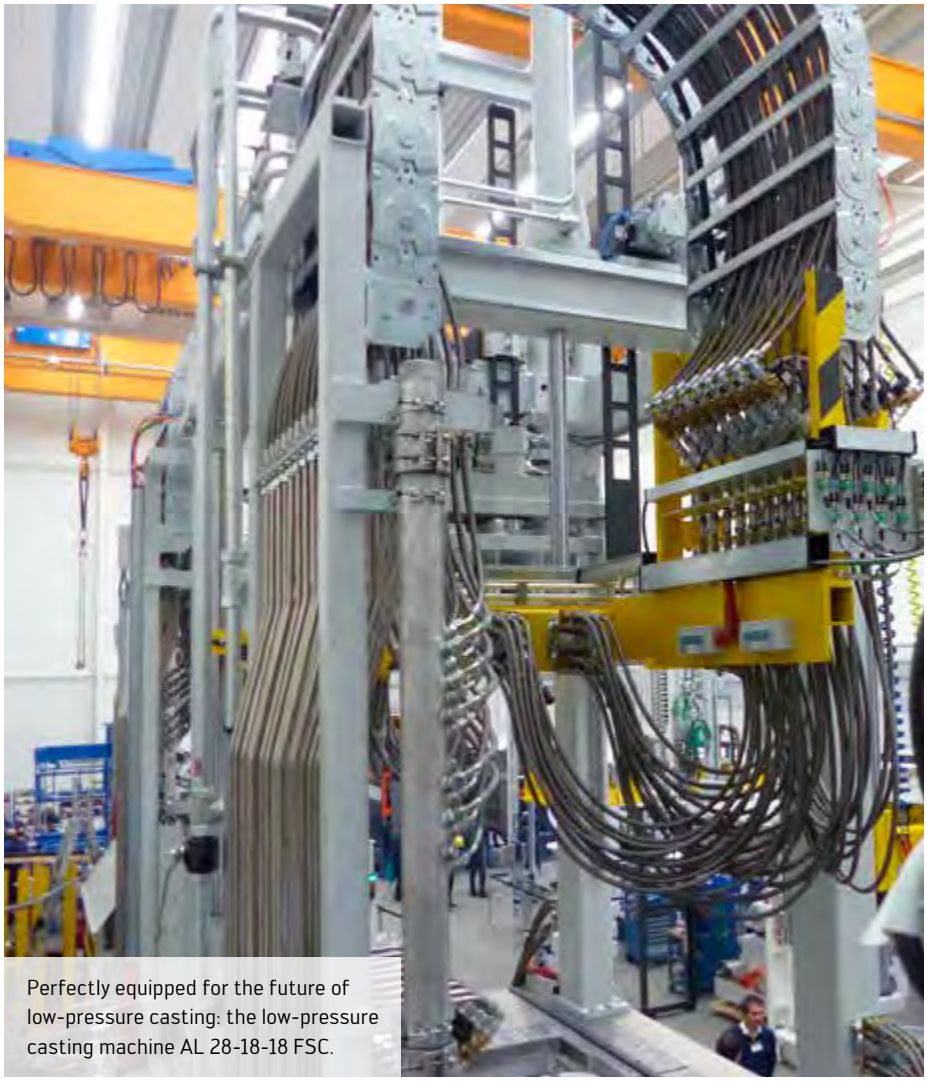
Thanks to the innovative trapezoidal arrangement of the guide columns, tool formats with max. 2,800 mm width and 2,000 mm depth can be clamped in place. The optional hydraulic clamping system allows casting dies to be fitted faster and without aids. A stroke of 1,800 mm with 2,600 mm clear width at the closing unit permits simple removal of the components by means of the added removal unit and also provides excellent preconditions for robot automation. Milestone and highlight is without doubt the die gap detection function, which prevents aluminium leaking if the casting die is not completely closed and avoids production downtime. The redesigned furnace exchange system allows the furnace to be changed even faster. Plane-parallel docking of the furnace to the casting die makes the use of multiple riser tubes possible on a very large divided circle. Up to twelve riser tubes have been used in practice so far, although this is certainly not the limit as far as the technology is concerned. Low-pressure furnaces with a filling volume of up to 3,000 kg are the preferred standard for series production at Kurtz GmbH.

The completely new hydraulic system of the AL 28-18-18 FSC makes faster travel speeds possible with higher forces. With this system, greater clamping forces are achieved during casting, the demoulding forces can be up to 100 tonnes. The low-noise hydraulic pumps can be switched on individually in order to achieve the necessary pressures and flows – with increased energy efficiency.

Up to eight additional ejector cylinders which can be positioned flexibly on the movable clamping plate support the central ejector cylinder with up to twelve additional dies in order to make safe ejection of the components possible at any time for large-format cast or structured parts and to prevent or minimise component distortion. As an option, the central ejector cylinder can also be connected automatically to the tool ejector plate. The operator is supported by the newly developed wizard and guided through the tool change process step by step.

The cooling system of the AL 28-18-18 FSC has 96 mixing circuits available which can be connected to the tool through smooth multi-couplings. An extension to 128 mixing circuits is possible. The newly designed, web-based software interface makes the process of inputting cooling parameters for individual cooling circuits much easier, and the new user-friendly visualisation offers the user unbeatable convenience for day-to-day work. Thanks to the new server-client solution, several users can access the machine at the same time, view data and operate the machines via tablets or other devices. In order to guarantee high availability of the Kurtz casting machine AL 28-18-18 FSC, the “condition monitoring” option allows the condition of the casting machine to be monitored at all times, enabling possible stoppages or downtimes to be detected early and any resulting maintenance work to be planned.

Sensors and monitoring devices make it possible to display machine status and retrieve this at any time via software. Some examples of this: Display of energy consumption, leak detection, filter service lives, pressure monitoring as well as spindle and guide wear. Kurtz is perfectly equipped for the future of low-pressure casting – are you? ■



Perfectly equipped for the future of low-pressure casting: the low-pressure casting machine AL 28-18-18 FSC.

RECORD NUMBER OF VISITORS AT KURTZ ERSA IN-HOUSE FAIR!

Over 500 guests interested in Innovations in the Area of Foundry and Foam Machines

Planned well in advance, the two-day Kurtz Ersa in-house fair for the Moulding Machines business unit saw an absolute record number of visitors. With 500 people registered for the first day alone, the programme of lectures, vivid live demonstrations in the machine factory and the general programme of events really hit the mark in terms of visitor interest.

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On 16 and 17 November Kurtz Ersa presented innovative highlights from the fields of particle foam machines and foundry machines for guests from at home and abroad, and illustrated ways of linking the individual systems intelligently to one another in this era of digital networking.

Lectures on both subject fields started every hour between 10:30 AM and 3:30 PM on the first day, and provided the theoretical base for the exhibits in the machine factory.

The end of the lectures was by no means the end of the event – after a short break, the legendary Kurtz Ersa Treppenhausparty ("Stairwell Party") began at 7 PM, with musical entertainment provided by the "Kleine Salonorchester" ("Small Salon Orchestra") and a range of delicious food on offer. After changing to a smaller line-up with tuba, cajon, guitar and accordion, the four-piece band even managed to fit into the lift and took the music up to the higher floors. On Friday morning, the focus was back on engineering topics, lectures missed first time round could be visited. The lunch break was accom-

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1 Also for the physical well-being was well taken care of.

2 Some of the exhibited low-pressure casting machines at the Kurtz Ersa in-house exhibition.

3 Service station with Kurtz Ersa B-JET blue filling injectors.

4 The machine demonstration of the **BOX FOAMER** was very well attended.

panied by music from the Group's own Hammerchor ("Hammer Choir"), in the afternoon customers were invited to an optional tour of Wertheim including the castle. "We are very pleased with the fantastic reception given to the 2017 in-house fair by our customers and the positive feedback on the event. There was an enormous effort involved in giving our business partners a hands-on demonstration of the broad performance spectrum of Moulding Machines at Kurtz Ersa with regard to digital networking in the form of future-oriented and competitive solutions. It was a lot of work, but a lot of fun as well! In the name of the Management Board I would like to thank all customers, partners and employees who contributed to the success of the Kurtz Ersa in-house fair," said Kurtz Managing Director Uwe Rothaug. ■

New KUI machine software: Valve control at the shape moulding machine **PANEL FOAMER** via tablet.

The increasing requirements on functionality and features of the machine software at Kurtz GmbH were only able to be implemented to a limited extent with the present system – in some cases this is no longer possible at all. For this reason, the "KUI" project was started at the beginning of the year.

It's Intuitive – New Kurtz User-Interface-Machine Software

This is a standardised platform for visualisation and control software for particle foam and casting machines with an enhanced user concept, web technology independent of the terminal used, a backend system with high-level language programming and modular PLC structure. The three-stage system structure of the KUI is centred around the backend of the machine which communicates with the PLC and the visualisation. The high-level language backend with its databases includes functions such as the control service, recipe administration, user/plausibility management, PLC coupler and a standardised OPC-UA interface for data exchange with other machines or systems. Thanks to the high-level language programming, complex algorithms and thus smart software functions can now be implemented and visualised in a browser-based user interface.

NEW KUI: EASY HANDLING, WIZARDS FOR TOOL CHANGE AND MAINTENANCE

The Kurtz developer team was able to demonstrate first new functions of the new intuitive KUI software to visitors on foaming and casting machines during this year's in-house fair. Some of the highlights included offline recipe creation, the operation of machine functions using a mobile terminal and wizards for tool change and maintenance. The tool change wizard, for example, now guides set-up technicians through the tool change process step by step and thus prevents mistakes being made. Thanks to the offline recipe creation feature, the settings for a new product can be prepared while the machine is still busy with the current order. The prepared recipe can then be opened at the machine and production started immediately. Operation of machine functions via tablet, for example, allows larger systems to be set up and monitored using fewer staff.

Before the rollout of the next KUI machine generation in 2018, even more features will be implemented, making it easier for Kurtz GmbH customers to handle the machines and offering new possibilities. ■

Successful Presentation at the Fakuma

For the first time, the particle foam machines business unit was represented at the international plastics processing fair Fakuma in Friedrichshafen on Lake Constance. Kurtz Ersa exhibited the new **THERMO FOAMER** at the joint stand with business partner Krallmann. Background: driven by E-mobility and the resulting lightweight engineering solutions, processors of plastics must achieve new solutions for new requirements. Kurtz Ersa has developed a method of combining particle foam and injection moulding, making the **THERMO FOAMER** an interesting option for injection moulding companies.

The 25th Fakuma – with 1,889 exhibitors on an area of 85,000 m² the second largest plastics fair in the world for injection moulding machines, extrusion systems, thermoforming technology and tool systems – was the perfect platform for this. A total of 48,375 expert visitors from 128 countries visited the five-day trade fair in mid-October at the Bodensee.

PATENTED METHOD FOR EPP SHAPE MOULDED PRODUCTION

The new particle foam machine uses a method patented by Krallmann for producing foamed EPP shaped parts in combination with a tool made by T. Michel Formenbau. In the first step, a foamed part is produced from EPP that can then be overmoulded with polypropylene (PP) without the particle foam collapsing. This technique combines the advantages of light foam with the higher strength of injection moulding. The in-house developed **THERMO FOAMER** allows shaped parts to be produced within a very tight tolerance window. These can then be overmoulded directly in a downstream injection moulding machine. Here, the steam required for bonding the EPP beads is reduced to 30 percent of the amount required by the conventional process. Since injection moulding companies do not usually have a central steam supply available, this steam can be produced by a small steam generator next to the processing machine. A simulation of the **THERMO FOAMER** was on show, promoting the live demonstration during the in-house fair in mid-November at the Kreuzwertheim-Wiebelbach site. Numerous successful talks took place with positive feedback from customers and potential customers who wished to sound out the benefits of using this new particle foam machine. These talks are certain to lead to a number of concrete projects. This allows us to take a positive view of the future – linked with the conviction that Kurtz Ersa will make a long-term contribution to the fulfilment of climate targets with this new development. ■

Fakuma

INTERNATIONAL
TRADE FAIR
FOR PLASTICS
PROCESSING

Moulding Machines VR

Experience Foundry & Foam Machines at the "joystick"

As a company that leads the way in technology, Kurtz Ersa constantly strives to enhance its customers' experience. To ensure that it presents its users with ever newer, smarter features and an optimum customer journey, the Moulding Machines division has decided to enter the virtual realm. At the in-house exhibition by Moulding Machines in November, the division for the first time presented its particle foam and foundry machines not only by means of real exhibits in the factory, but also with virtual applications.

At first, handling through a VR headset may seem unfamiliar, but it soon becomes intuitive. There is much to be discovered, including aspects that are often not so easily perceived in the real world. Every detail can be explored, and every stage of the process examined at close hand. It is also useful for actual turnkey projects, for which physical distance is no longer a barrier to tours and inspections. Whether observing a tool change behind the light barrier, an otherwise inaccessible space, furnace changeover with shuttle during non-productive time, or even emergency stop situations, in the virtual world the process continues uninterrupted. Our work with a regional partner from the Spessart region will ensure that, in future, we will include many more machines and processes, enabling customers to experience our smart solutions for themselves before implementing them. Further applications are planned, once they have been input into the CAD system, reduced in size and animated. Fixed stations in the Kurtz GmbH premises have been set aside for both divisions and will be opened soon. This means that even customers who visit at short notice will be able to gain access to our systems, either with a presentation or hands-on practical experience. The demand at other Kurtz Ersa locations is already high – enquiries have been received from China, Mexico and the USA. Virtual reality applications could be used, for example, to promote the exchange of information on special machinery between Kurtz Ersa branches and representatives worldwide, in order to optimise products and adapt them to the requirements of specific markets. In future, it is also likely that virtual reality will be used for customer advice meetings, at trade fairs, and as an intelligent expansion of our service provision. For example, VR applications with desktop sharing could be used for remote maintenance and repair, depending on complexity and level of detail. There is a lot still to be learned about the virtual world, but this step into the unknown is already proving worthwhile! ■

Kurtz
KISS STATION

Kurtz
i-Cap

Intelligent Filler Maintenance Relies on Prevention!

Kurtz
B-JET blue

KISS STATION INCREASES SYSTEM AVAILABILITY AND REDUCES COSTS

One of the most neglected areas of particle foam processing has got to be the maintenance of filling injectors – a little liked yet essential measure for the production of good quality and repeatable moulded parts. Everyone needs it, it often requires a large investment. Yet hardly anyone has time and a feasible possibility of carrying out monitorable and preventative maintenance. With the world´s first i-Cap, Kurtz Ersa has developed the basis for incorruptible and intelligent maintenance: it counts and saves all filling strokes performed and takes these as a basis to carry out maintenance as it is due in the actual maintenance station (**Kurtz KISS STATION**). All the values and cycles determined can be saved digitally for further processing and management, and can be retrieved at all times with relation to the individual fillers.

Having carried out a filler leak test, the **Kurtz KISS STATION** guides maintenance staff through the maintenance step by step using visualised maintenance instructions. Once the work has been completed, i-Cap is reset and flashes positively in green to indicate that it is ready for further filling tasks.

Advantages related to **KISS STATION:**

- Always shows the current maintenance status of each individual filler
- No production faults through lack of/poor filler maintenance
- Greater system availability and lower costs

All the modules together – B-JET blue, i-Cap and **KISS STATION –** result in a complete solution for our customers which will take filler maintenance safely on into the next decade.

SMART FOUNDRY

continues to develop – optimum preconditions for full-mould casting

SMART FOUNDRY doesn't stop after moulding and casting. In summer 2017, the cast treatment facility was finally completed following eco-friendly emptying with newly designed surface blasting technology and ergonomic cleaning stations.

The optimisation of the process workflows led not only to a pioneering improvement of working conditions for the employees, but also to a major increase in production capacities. This makes us perfectly equipped to venture further in new fields of foundry technology. While in conventional foundries "full-mould casting" (lost foam) is almost unacceptable due to the emissions caused, we can protect our employees from emissions and create optimum setting and cooling conditions through consistent separation of the individual production workflows and modern aeration and ventilation concepts. In addition, the waste heat from the process is put to optimum use without straining the environment.

Patterns made of EPS (polystyrene) with its process-related disadvantages or PMMA (polymethylmethacrylate) can be used for full-mould casting. The raw material costs are higher for PMMA patterns, but on the other hand PMMA burns without residue at over 800 °C. This results in process advantages, since the pattern does not have to be removed before the second cast. We would be delighted to discuss optimum customised uses with you!

Blocks made of PMMA will be available soon, too. And we know where, because they are being produced on Kurtz Ersa machines and we have optimised the working process for them. **SMART FOUNDRY,** because we are not alone! ■

Guided tour through the **SMART FOUNDRY** as part of the Kurtz Eisenguss customer event.

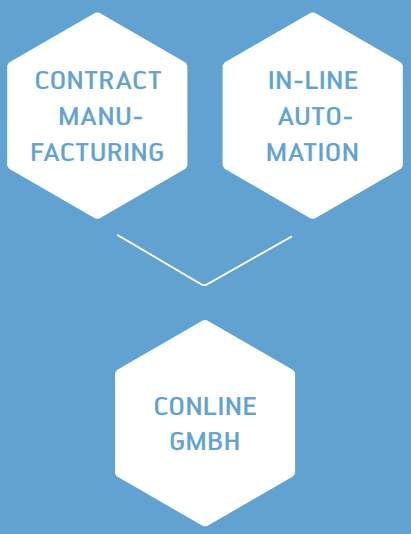
Guest speaker Prof. Dr. Claus Mattheck, Head of Biomechanics at the Institute for Applied Materials of the Karlsruhe Institute of Technology (KIT), while his lecture on extraordinary mental tools.

CUSTOMER EVENT EISENGUSS:

Completion of the cast treatment facility with its blasting house and cleaning stations was the perfect occasion to celebrate the conclusion of **SMART FOUNDRY** modernisation with our customers. Numerous customers followed our invitation to Hasloch on a sunny afternoon at the beginning of October. Following a welcoming speech and a guided tour through the Hammermuseum, guests were able to see the complete end-to-end process under cutting-edge production conditions for the first time during a tour of the plant.

Then guest speaker Prof. Dr. Claus Mattheck, Head of Department for Biomechanics at the Institute for Applied Materials at the Karlsruhe Institute of Technology (KIT), captured his audience's full attention. The sixty minutes during which the Dresden-born speaker presented unusual thinking tools such as thrust rectangles and pull triangles which can be used to consider our surroundings in a different light – possibly including the iron foundry business – just flew by. Dinner and a blues concert in the historic hammer mill rounded off a very successful day which our customers are sure to remember for a long time to come (cf. page 4-5).

Always spectacular: Casting process inside of the Kurtz Iron Foundry.

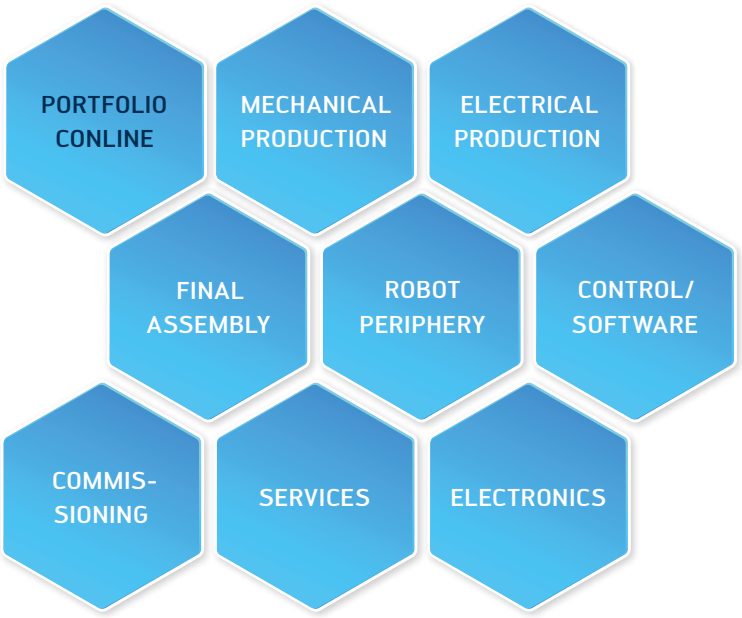


Metallbearbeitung Wertheim GmbH becomes Conline GmbH from 01.01.2018.

MBW becomes Conline machine builder

Since the middle of the year, **MBW Metallbearbeitung Wertheim** has been in a restructuring phase, which will have been concluded by the end of the 2017 fiscal year. The objective of the Kurtz Ersa Group is to focus its range of performances on mechanical engineering and automation technique more strongly in future. In this context, prefabrication of sheet metal is being ceased and the contract manufacturing business is being pushed. This specifically means: sheet metal parts will no longer be produced at the Wertheim-Reinhardshof location in future, but purchased as processed metal sheets.

In order to strengthen the appearance as a stem supplier for ready-to-install sheet metal components down to complete machines even further, MBW GmbH will be changing its corporate name as per 01.01.2018 to the new **Conline GmbH.** It will act on the market as a system supplier in future and will supply external customers as well, alongside Ersa GmbH and Kurtz GmbH. With the centralisation of the business activities in the automation areas, Kurtz Ersa is sharpening its profile and providing an attractive offer of automation solutions to do with the handling for soldering machines, foam and casting machines under the roof of **Conline GmbH.** Conline GmbH is thus starting as an independent enterprise in the Kurtz Ersa Group with 82 employees – more than 50 of them in the automation area – and can look back on years of experience with various automation systems and solutions. Further growth has been planned for the future. ■



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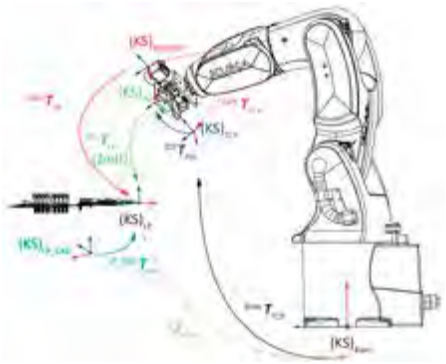
CONLINE: AUTOMATION & CONTRACT MANUFACTURING

Let´s automate industry!



In digital mechanical engineering applications of the future, the comprehensive use of intelligent, robot-based automation solutions will be quite natural – combined with smart handling systems for demand-oriented use. For this growing sector of industry, Kurtz Ersa has defined the new "Automation & Contract Manufacturing" business field, which achieves perfect solutions for the Industry 4.0 era.

Rising personnel costs and increasing price pressure are causing difficulties for manufacturing companies all over the world. High-precision production automation offers a way out of this dilemma; it reduces the costs per manufactured part in the long-term and can be used at manufacturing locations all over the world. All things considered, automated, flexible solutions lead to greater process reliability and reproducibility, reduce costs and increase not only output but quality, too.

In order to be able to provide expert support to customers during the complex transition from manual to automated workflows, Kurtz Ersa is working continually and intensively on extending its product portfolio for automated handling and transport. The General Manager of the Automation Business Unit, Ralf Koppitz, a graduate electrical engineer (UAS) who has been in the company since May 2017, will be shaping and developing the vision and structure of the new Kurtz Ersa division together with his team.

SEAMLESS INTEGRATION IN SYSTEM CONCEPTS

The Automation division supplies the Electronics Production Equipment business unit with handling systems which can be integrated seamlessly in existing or projected machine and system concepts for electronics production. One thing is perfectly clear: in addition to the soldering processes, perfectly timed board handling contributes to greater process stability and production efficiency – a target every production manager would agree with.

For Moulding Machines, Kurtz Ersa Automation is contributing semi to fully automatic parts handling systems. The design of the moulded parts, such as contour, surface quality, weight, integration of inserts or room height, influences the possible use of handling equipment – stacking and insertion ability of moulded parts, ventilation of the stacks and stack height must all be taken into account in advance. Optimum handling concepts which ensure a short return on investment are drawn up and implemented in intensive cooperation with the customer. Automation experts are also helping Kurtz Foundry Machines to sharpening their profile as a system supplier – the customer receives well thought-out complete solutions from a single source: from cast part and process development through mould construction, installation and putting into operation through to overall responsibility as a general contractor. ■

Numerous customers from industries such as woodworking, automation technology, food industry, textile and sports industry as well as the plastics processing industry are banking on the long years of Kurtz Ersa experience for the automation of their processes. **Where are you going to apply leverage for automation?**

O FREUNDE, PERFECT HARMONY!

This is where we introduce selected Kurtz Ersa employees and their diverse hobbies. In this issue we are proud to present a very special group that works together as seamlessly as one of our castings – the **Kurtz Ersa HAMMERCHOR,** our choir founded in 1979 for our 200-year celebrations, which for the last two years has been expertly led by state-qualified music teacher and choir conductor Petra Röhrig of Röttbach.

The **HAMMERCHOR** is in great demand whenever there is a special occasion at Kurtz Ersa – company celebrations, Christmas parties, birthdays, anniversaries or, as last October, as a support act for the blues concert we staged at the Eisenhammer. The choir's organisation is in the capable hands of Margit Freudenberger, who has worked in Purchasing for Kurtz Maschinenfabrik since early 1980, and who has herself been an active member of the **HAMMERCHOR** for at least fifteen years. When she receives a definite enquiry about a performance, she first agrees the date with choir conductor Petra Röhrig, who, in addition to the **HAMMERCHOR,** also leads choirs for children and young people, as well as male voice and women's choirs. Once the date has been confirmed, the 25 active members of the in-house **HAMMERCHOR** are rounded up and rehearsals begin in the canteen at the Wiebelbach site.

The passion and enthusiasm of Petra Röhrig is clear to anyone who has ever seen the **HAMMERCHOR** perform live – her belief that "If you want to set others alight, you need to burn with fire in your own belly", based on a quote by church father Augustine, says it all. And all the choir members clearly experience the joy of singing, of bringing together individual voices as one. Petra Röhrig has played the piano since the age of six, and after finishing school she studied piano, music teaching and choir and orchestral conducting at the Würzburg Konservatorium; she is a state-qualified music teacher. She thus has a broad musical background on which she can draw, bringing creative inspiration to the ever-expanding **HAMMERCHOR** repertoire. Of course, the "Hammerschmied", the old favourite about the thirsty hammer mill smith, is an essential part of every performance, but the programme also includes plenty of rock, pop and blues songs. The

1 **HAMMERCHOR** during their performance at the Hammerschmiede.

2 The former choirmaster Adolf Benz with his **HAMMERCHOR.**

3 The recent choirmaster, Diploma Music Teacher Petra Röhrig during rehearsal.

4 **HAMMERCHOR** during their performance at this year's Kurtz Ersa in-house fair.

HAMMERCHOR'S version of *"Tage wie diese" (Days Like These),* by German band *Die Toten Hosen,* is a firm favourite at all events and occasions. Petra Röhrig called on all her musical talent to arrange it perfectly for the choir, and with other pieces she also adds a third harmony part. The choir's organiser, Margit Freudenberger, is delighted by the support the **HAMMERCHOR** gets in every respect from Kurtz Ersa. The members all agree that the choir provides a perfect antidote to the stressful working environment – it should not be forgotten that rehearsals and performances take place in employees' valuable free time. But with hand on heart, all who have ever been a part of the choir, and experienced the power that is gained from many voices melting into one, know just how rewarding it is.

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Technology fan? Passionate interest in industrial history?

The story of Kurtz Ersa comes to life in the HAMMERMUSEUM – let yourself be infected with the enthusiasm for technology that still marks us out in the 21st century.

We're looking forward to your visit!

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