



VALK MAILING

a publication of Valk Welding

21th year - 2021-1

***"First commercial
application WAAM"***

Vallourec

***"Maref takes welding
to the next level"***

Maref



Colofon

‘Valk Mailing’ is a six-monthly publication of Valk Welding that is sent free of charge to all of our contacts. Would you prefer to receive a hard copy of this publication? If so, send an email to: info@valkwelding.com

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WAAM special



Dear reader,

2020 was a very special year for you as our customer. The health of ourselves and of loved ones, the ever-changing measures and the hope for improvement tested our adaptability. A test that we, as a company and as people, have passed very well together.

Our local presence in the various countries has proven to be of great importance to our customers. The establishment of Valk Welding Sweden in uncertain times, we have therefore taken with full conviction.

The technology we have been marketing for years with calibrated robot systems, offline programming and monitoring production from a to z, have also brought us great benefits. Customers who were looking for support were perfectly helped by our people at their home office.

In recent months, our confidence in the future has only increased. The European industry is putting extra emphasis on local production in order to be stronger. In order to make this possible, we have an important task to fulfil here with our highly flexible welding-robot systems.

You will certainly notice this confidence by the new developments in the field of welding torches with the VWPR MIG II series and the new Valk Welding ARP software for automatic programming of your welding robots. And last but not least: our new website with numerous concrete examples that will inspire you!

On March 22, we also celebrated our 60th anniversary fully digitally with more than 200 people. Under the motto “if we do something, we do it well”, we hope to celebrate this special occasion later this year as it should be: all together! The Strong Connection!

We wish you lots of fun and confidence while reading this first edition of 2021!

Peter Pittomvils (CCO)

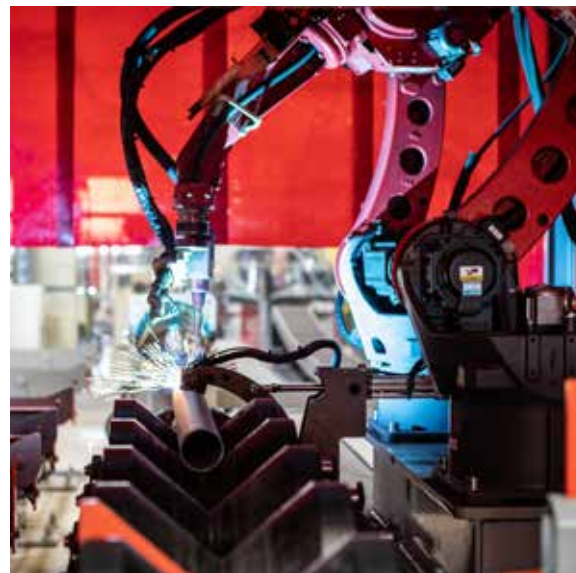


Rosenbauer is leading manufacturer of firefighting technology

Rosenbauer is the world's leading manufacturer of firefighting technology for defensive fire protection and disaster management. The company develops and produces vehicles, extinguishing technology, equipment and digital solutions for fire departments, as well as systems for preventive fire protection.

The listed family company is in its sixth generation and has been in existence for more than 150 years. In Mogendorf (Westerwald), Rosenbauer produces, among other things, sprinkler systems and pipes for water extinguishing systems. Tore Novak and Ralf Freitag manage Rosenbauer Brandschutz Deutschland GmbH, a subsidiary of Rosenbauer International AG.

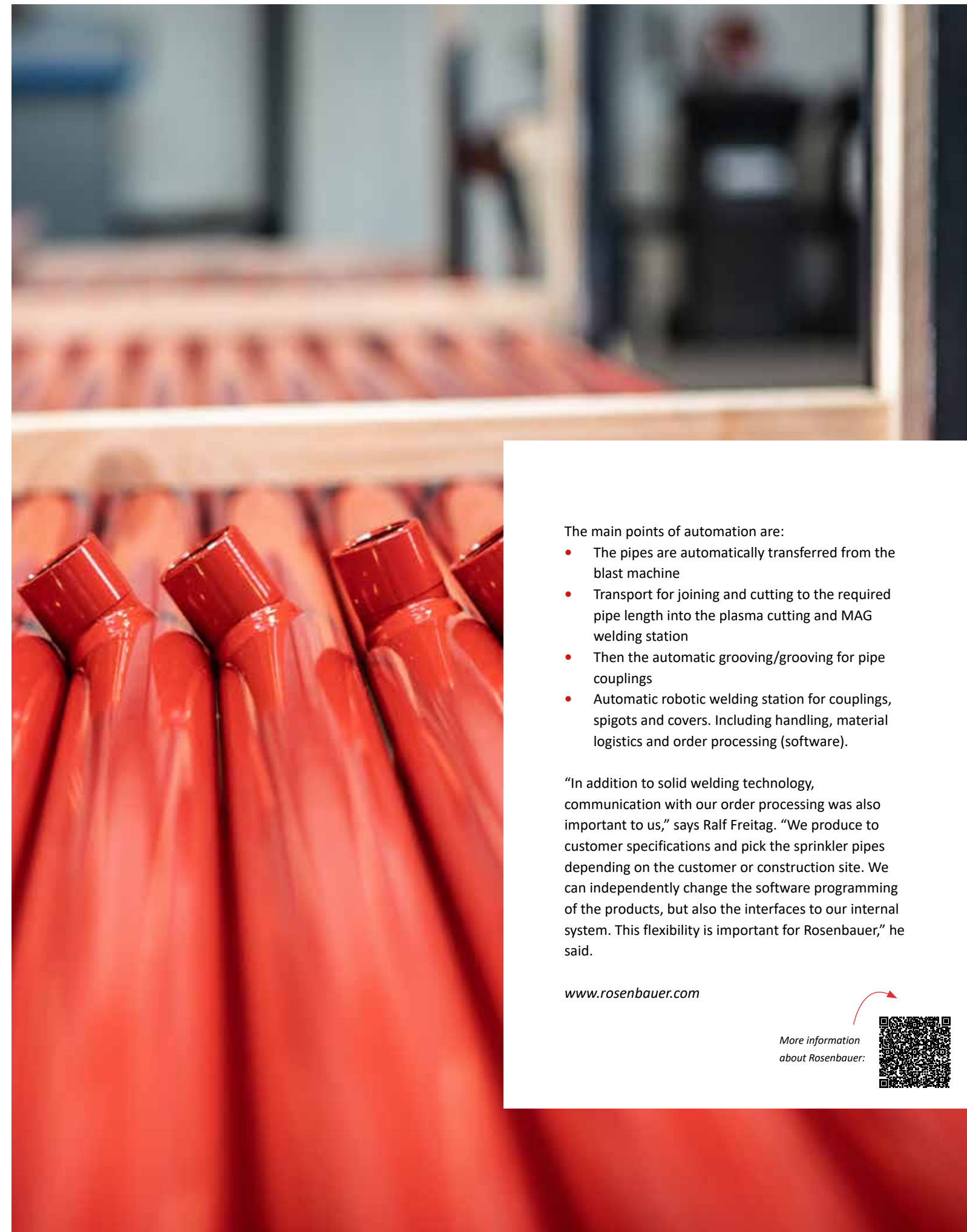
"When we decided in favor of independent prefabrication, in addition to a fully automated production line, the compactness of the plant and the associated low space requirement were extremely important," explains Tore Novak, technical managing director. In the project-related production of sprinkler pipes, steel pipes in nominal sizes from DN 25 to DN 250 are processed. "The decisive factor for choosing a Valk Welding production line, apart from the good advice, was also the will to implement all our technical specifications. In our case, it was necessary to be able to produce the sprinklers completely automatically and according to individual requirements," says Tore Novak.



© Rosenbauer: Welding robot in operation



© Rosenbauer



The main points of automation are:

- The pipes are automatically transferred from the blast machine
- Transport for joining and cutting to the required pipe length into the plasma cutting and MAG welding station
- Then the automatic grooving/grooving for pipe couplings
- Automatic robotic welding station for couplings, spigots and covers. Including handling, material logistics and order processing (software).

"In addition to solid welding technology, communication with our order processing was also important to us," says Ralf Freitag. "We produce to customer specifications and pick the sprinkler pipes depending on the customer or construction site. We can independently change the software programming of the products, but also the interfaces to our internal system. This flexibility is important for Rosenbauer," he said.

www.rosenbauer.com

More information
about Rosenbauer:



In sprinkler systems, the pipe networks are equipped with closed nozzles, which open individually when heated and distribute the extinguishing water specifically to the source of the fire.



Welding robot in steel construction



With the deployment of the welding robot, we save a lot of man hours that we can now spend on our core activities.

That the steel construction sector also sees opportunities in welding robot automation is proven by the deployment of a welding robot installation at Verdo Staalconstructies B.V. in Bergambacht the Netherlands. With the focus on assembly, the company wanted to spend less time on welding activities. Large welding lengths are therefore now done by a welding robot. "With this, we now relieve our employees of monotonous welding work and see this as a good investment for the long term," explains owner Gerard Verdood.

Verdo Staalconstructies specializes in the production and construction of sheds and halls and all the steelwork for stairs, landings and fencing that goes with it. Last year, more than 1,200 tons of steel were processed for this purpose. For production, the company has CNC-controlled machines for cutting, sawing and drilling. "To make the growth of the company possible with a limited availability of skilled workers, you have to look critically at the time allocation of the individual activities. Welding is not one of our core activities. If you can leave that to a welding robot, you can spend more time on assembly and installation on the building site," is the vision of the entrepreneur who started the company 21 years ago.



Purchase of welding robot

In addition to the usual construction work for halls, Verdo has built a number of liquid containers. "A typical assembly job that involves a lot of welding. After we had manually welded the first one, we noticed that the welding work put a heavy strain on the company and our employees. That was the deciding factor for us to buy the welding robot.

Large YZ system

Valk Welding supplied a welding robot on a hanging YZ construction, which moves together with the support for the welding wire and robotcontrol on a 15 m long track. Because sufficient hoisting facilities are present, the workpieces can be turned without manipulator. A rail system anchored to the floor is sufficient for positioning and clamping. The liquid containers, which used to be welded manually in 60 hours, are now welded in 25 hours on the welding robot installation. "Not only a substantial time saving of over 40%, but also a saving of 60 man hours that we can now devote to our core business."

Composite beams on the welding robot

In addition to the liquid containers, Verdo also welds other products with large welding lengths on the welding robot installation. A 15-metre-long SFB composite corner beam is a regularly recurring product, the welding of which can easily take a full day. Moreover, monotonous work for a manual welder," Gerard Verdood explains. "The welding robot now does the job in three hours, using Touch Sensing to locate the weld every meter on either side, and the robot then applies the weld in a weaving pattern. The same quality in a weaving pattern is hardly achievable by a manual welder."

Learning period of 1 year

All products that have been welded with the robot so far have been programmed offline with the DTPS software of Valk Welding. "That goes many times faster than with a teach pendant on the product itself. We have been working with the welding robot and offline programming for a year now. You need this period to learn how to work with the system properly, before we start acquiring other products on a large scale. All in all, we see the investment as a broadening of our possibilities and an investment in the future of the company," concludes Gerard Verdood.

www.verdo.nl



The robot now welds 15 m long SFB composite corner beams in 3 hours





MACFAB

Dane Mc Mahon:
*“Without the robot
 we would have
 missed a lot of sales”*

First robot, high benefits

When you sell your products successfully worldwide, but the competition is strong and a shortage of skilled welders causes capacity problems, the step to welding robot automation is obvious. The Irish baler manufacturer MACFAB took that step and increased production of the most popular model by 250%. “Without the robot, we would have missed a lot of sales,” says Dane Mc Mahon.

Together with his father, mother and brother, Dane Mc Mahon is a co-owner of the family-owned MACFAB company which, with 50 employees, produces up to 1,800 balers a year and is a serious player in the global market. “In order to be able to give our suppliers a better competitive price, we wanted to reduce the production time. To this end, we invested in a Valk Welding robot installation with 2 workstations in an E-frame setup. Despite a tough learning curve, the benefits are high”.

Invest in good jigs

First of all MACFAB improved the existing welding jig for the most popular model in order to ensure that the robot is offered perfectly closing seams. “The advantage of this is that we were able to weld the complete housing of the baler directly without tacking. Clamping the housing and doors takes 45 minutes, after which the robot is doing the welding job in 50 minutes. This allowed us to increase the capacity from 2 to 5 balers in one day”.



High repeat accuracy

MACFAB also welds the hydraulic tanks for the balers with the welding robot. “Previously, each tank had to be checked for leak-tightness. Now we carry out this test random and the repeating accuracy is so high that all the tanks are leak-free”.

Further scaling up

With the commissioning of the welding robot, more space has been created to further improve production efficiency. Most balers are now produced in a one-piece-flow concept. The next step is to further scale up production without compromising quality. “While the welding robot installation on the E-frame setup can be used universally and flexible, we are now looking together with Valk Welding at a multi-axis system for larger models. But all that step by step!

www.macfab.com

The robot system can be seen on following link:



Clinical support products on the welding robot

LECKEY

The world of clinical support products is a custom-made world. What a welding robot can do to increase efficiency and improve quality, was proven by the use of a welding robot at the Northern Ireland manufacturer Leckey. A world player in the field of development, production and distribution of clinical support products for special needs children.

Two years ago Wesley Henderson, Technical Manager Operations at Leckey, implemented automation of the welding of steel and aluminium parts. He said, “We expect to increase consistency and efficiency in production and weld quality. Without welding robot experience and small batch sizes, this was quite a challenge,” explains Wesley Henderson.

Low volume, high variety

Leckey specialises in the development and manufacture of medical devices that support the daily lives of special needs children as they sleep, walk, sit or play. To this, the company supplies a range of over 30 products that are specifically tailored to each child. For the production, the series sizes are therefore small. A typical low volume, high variety situation, where the total solutions of Valk Welding offer a solution.

Nice tight weld

To enable the growth to some 1,000 products per

month, Leckey is dependent on production resources that can be used flexibly and that can deliver high accuracy to make the step to welding robot automation. “With the sheet laser, tube laser and bending machines, the accuracy is so high that we can now achieve a high welding quality with the robot. A nice smooth weld seam is very important in this sector,” says Mr. Henderson.

Welding robots are used more and more intensively

On the 2 working stations of the welding robot system on an H-frame, Leckey is now welding several frame parts in one setup using the MIG-process for steel and aluminium parts. “We deliberately program with a teach-pendant to gain as much experience with the welding robot as possible. The operator is an experienced welder who was took very well to the new learning after only a few months. What was more complex was the design, development and construction of new robot specific welding jigs. As a result, the overall implementation of the process was complex and even now we are still learning every day. Gradually, more and more product components run on the welding robot. The step to offline programming is therefore also coming ever closer”, says the Technical Manager looking forward.

www.leckey.com



New welding robot systems for Maref

While writing and publishing this article, Maref has confirmed the purchase of another 2 welding robot systems. These are two identical Frame-E setups with both two workstations. These robot systems will be put into operation in 2021.



optimally also from a logistical point of view, we had a new hall of 4,000 m² built for this purpose, which was put into use last year together with the welding robot installation. All welding and construction work is now accommodated there.

Height-adjustable positioners

The large welding robot installation consists of two working stations, both suitable for maximum product dimensions of 7.5 x 5 m, so that workpieces can be welded at one station while workpieces can be changed at the adjacent station. "Workpieces of such large dimensions can now be welded on both sides in one set-up. For this purpose, the stations are equipped with height-adjustable positioners with a capacity of 5 tonnes each. Whenever one side is welded, the positioners lift 2.5 m so that the workpiece can be rotated, after which the second side can be welded. This saves an enormous amount of time when it comes to unrigging, rotating and aligning after welding" explains the entrepreneur.

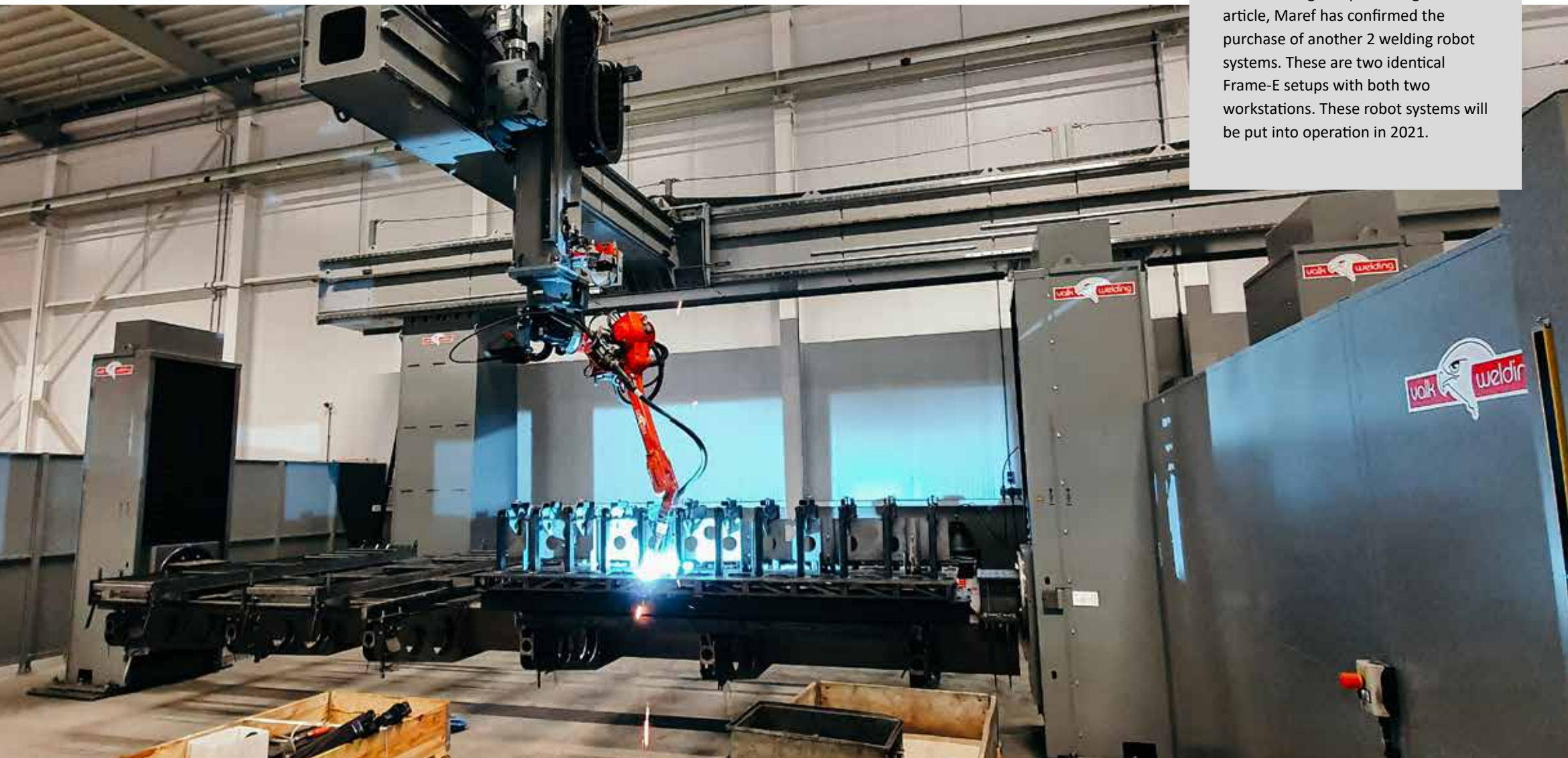
Professionals move to the office

Both the laser cutting cells with automatic feeding and sorted stacking and the welding robot installations are programmed by educated professionals in the office. But the rest of the work preparation has also undergone the same efficiency drive as production. The ERP system is linked to the Trumpf systems, giving status and material management direct insight into delivery times and allowing data to be converted directly into production. This digitisation has led to a shift of activities from the shop floor to the office.

Sheet-metal work and welding and construction work now perfectly geared to each other

Investments in sheet-metal work and welding technology in recent years mean that the two processes are now perfectly aligned in terms of accuracy and efficiency. "Perfectly aligned work makes it possible to use welding robots to produce high-quality welding. The large cell is currently still manned for 1.5 shifts but is expected to be optimally manned in a 2-shift operation soon. Later this year, we want to expand further with 2 welding robot cells in an E-frame set-up. Despite Covid, we will continue with our investment plans", concludes Marcel van den Bosch.

www.maref.nl



Maref takes welding to the next level

High quality and efficiency give Maref strong competitive position

To be able to supply high-quality sheet metal parts at a good price, Maref Metaalbewerking BV only invests in state-of-the-art technology in the areas of cutting, bending and welding. After investing in fully automatic laser cutting and bending systems, a large welding robot installation was put into operation last year, which will enable Maref to serve a high segment in the welding field as well.

Owner Marcel van den Bosch wants to succeed with sheet metal processing and welding and construction work with high quality and delivery reliability in order to be able to enter into a long-term partnership with his customers. In the past 30 years, the company has built up a large customer base in a large number of sectors, including Agri, food, automotive, mechanical engineering and environmental technology. To this end, over the past five years significant investments have

been made in the latest Trumpf press brake and laser cutting technology, software and angle measurement systems. "In addition to the high level of efficiency, these systems deliver semi-finished products in very close tolerances, which is a required for high-quality welding. As a result, the demand for welding and construction work has also grown enormously and we have taken the step of expanding into welding robotisation," explains Marcel van den Bosch.

New building for welding production

In addition to the possibility of welding workpieces up to 3.5 m on the existing Valk Welding welding robot cells, Marcel van den Bosch also wanted to be able to weld larger products up to a maximum of 7.5 x 5 m on the robot. "At the end of 2019, Valk Welding started building an XYZ cell for this purpose, which is controllable and programmable offline in all axes using the DTPS off-line programming system. In order to be able to use it



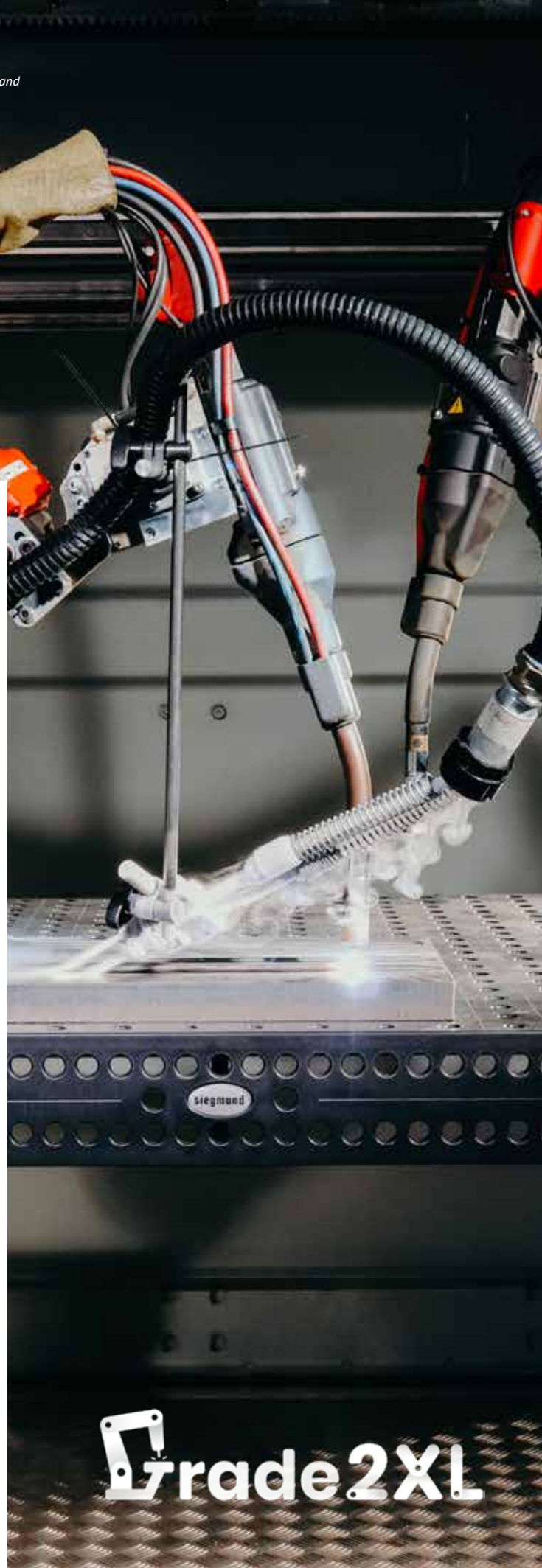
This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 862017.

Grade2XL, next step in Wire Arc Additive Manufacturing (WAAM)

RAMLAB has been active as a field lab for 4 years now to develop the technology of WAAM (Wire Arc Additive Manufacturing) together with its partners. RAMLAB is approached by more and more European companies to investigate the possibilities of various applications with WAAM to reduce production time as well as production costs. This has led to the first 3D printing cell that will be used commercially for industrial applications by the French concern Vallourec. Valk Welding supplied the 3D printing cell, in which workpieces are built up drop by drop by a robot using welding technology.

Besides the possibility of producing large workpieces locally with WAAM technology, multi-material printing is also an important unique selling point. WAAM is not limited to one material, but can build workpieces from multiple materials. This offers the possibility of building a large product with only the shell in a more expensive corrosion or wear-resistant material and the core in a cheaper material. To investigate what you could do with all these possibilities on a larger level, WAAM is now being further developed together with 20 partners (including Valk Welding) from all over Europe in the Grade2XL project. With financial support from the EU, WAAM will be further developed over the next 4 years as an economically viable and sustainable alternative to conventional technologies.

For the Grade2XL project, the 3D printing container from Autodesk is now set up at Valk Welding. With 2 welding robots in one system, multi-material parts with new applications such as cooling channels will be printed there. The Cryo Easy solution from Air Products will be used which makes it possible to print with more kilos per hour without the risk of overheating.



Vallourec France will produce industrial components on site using Valk Welding's 3D printing cell, combined with RAMLAB's MaxQ system.

First commercial application of WAAM supplied by Valk Welding. (Wire Arc Additive Manufacturing)

Valk Welding, in close cooperation with RAMLAB, has supplied a 3D printing cell to Vallourec. This French group, whose production sites are spread around the world, aims to shorten its supply chain by producing industrial parts on site and on demand. This cell, based on WAAM (Wire Arc Additive Manufacturing) technology, is the first 3D printing cell from Valk Welding and RAMLAB to be marketed for industrial applications. Commissioned as part of a project in Singapore, it should enable Vallourec to print industrial components on demand at all its production sites worldwide.

Vallourec, a recognized supplier to the oil and gas industry, manufactures, among other things, pipe components such as connectors, which are designed to connect pipes of different types and diameters. All components are currently produced in stock and shipped to the various locations worldwide. That entire route from the steel manufacturer to the oil and gas platforms, involves 10 steps. "In the entire value chain, each link costs money and time. In addition, there is a risk that products will not be available from stock," explains product owner Jonathan Moulin. "Printing on location offers the solution for that. The WAAM technology (Wire Arc Additive Manufacturing), developed by RAMLAB in collaboration with Valk Welding.

A unique collaboration between RAMLAB and Valk Welding.

RAMLAB, Europe's first Fieldlab for WAAM Technology, has proven that it can print important parts for industrial applications with WAAM technology, such as the certified ship's propeller of a tugboat from Damen. The initial tests carried out by RAMLAB on Vallourec's behalf led to the contract being awarded to Valk Welding for the construction of the 3D printing cell.

Vincent Wegener, Managing Director of RAMLAB, says: "Our product, MaxQ, consists of a suite of sensors and a software module that we have developed to ensure maximum quality to obtain a certified printed part. The advanced monitoring and control software monitors the process parameters in real time. In addition, the workflow from Autodesk PowerMill CAD files to a program for the Panasonic welding robot is now controlled at the touch of a button. The MaxQ system is fully integrated into the Valk Welding cell. It is precisely in this cooperation that our strength lies and that makes us unique in Europe".

Super Active Wire

Valk Welding has built a cell with 2 workstations, one with a fixed Siegmund table and a second with a five-axis manipulator. Both workstations are equipped for workpieces up to 2 m high, Ø 800 mm and a capacity of 500 kg.

In addition, the challenge for Valk Welding was to be able to increase the welding speed without running the risk of damaging the material. For this purpose, a Panasonic welding torch with an integrated servo motor was used, which also supports the Panasonic Super Active Wire process.





In the SAW process, the welding wire moves back and forth at high frequency, allowing more material to be melted per hour with limited heat input.

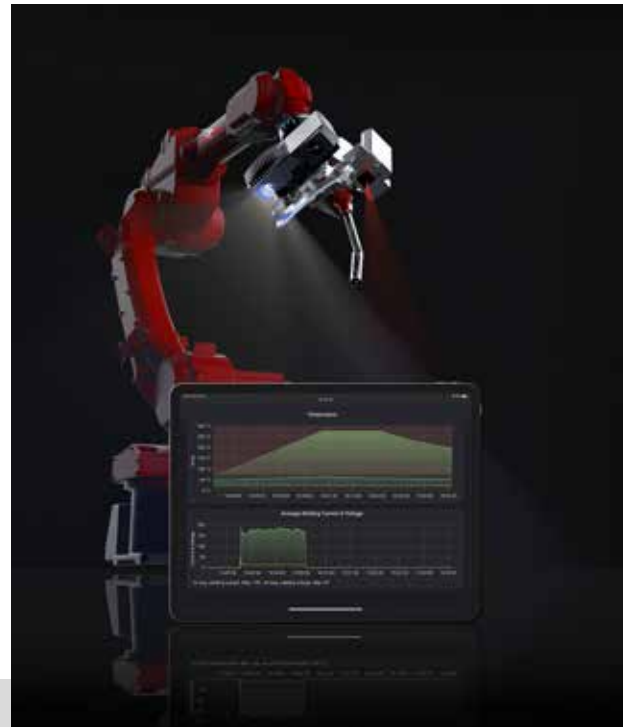
Proof of concept

"The advantage of the WAAM technology is that only a standard wire is needed as a base material, as opposed to the machining process which requires a specific tool. Regardless of the technology, whether 3D printing or traditional machining, our customers in the oil and gas industry expect a certified product that meets the highest quality standards. Our challenge is to convince them that we can supply their parts that meet these expectations. For this, we count on our pioneering customers who want to be part of this innovation.

www.vallourec.com



Watch the video



RAMLAB's MaxQ monitor & control system



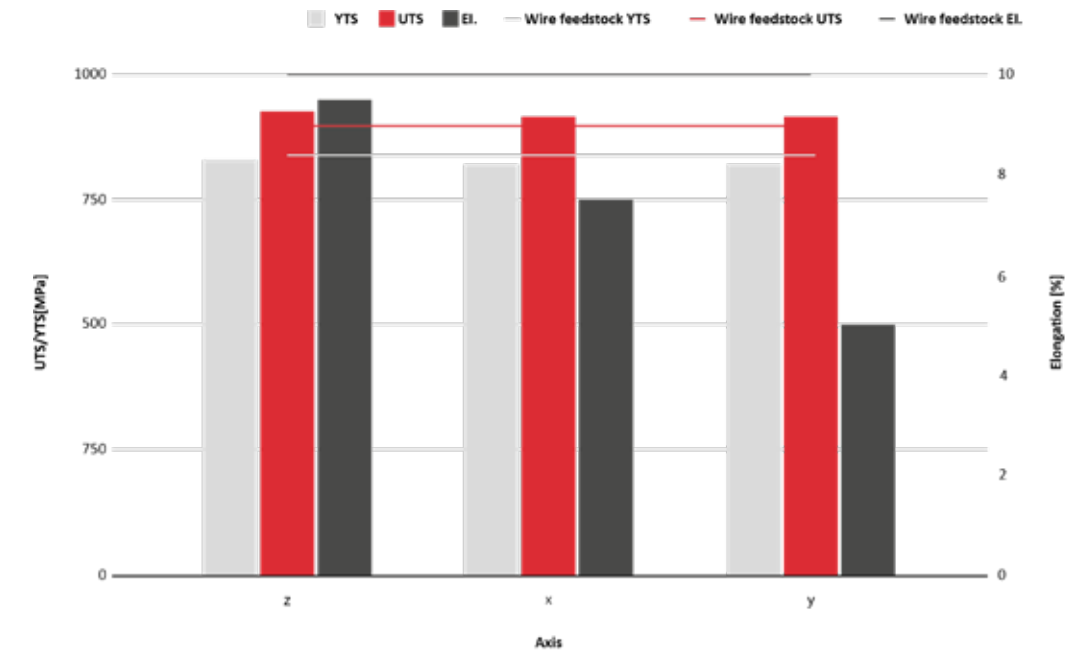
Figure 1. Scale up process from single beads to 3D printed block

The WAAM process parameter optimization that is executed before manufacturing a part, allows for tailoring material properties. In combination with Panasonic's Super Active Wire Process (SAWP), a stable arc and minimum spatter were achieved. A welding enclosure and extra protective argon (Ar) ensured an inert environment with low level of contaminants.

After the process parameter optimization, the printing was physically scaled up by printing mock-ups for strategy investigation (Figure 1). The experimental phase concluded with manufacturing a solid block (or 'pre-build') for tensile testing in the x-y-z directions. Prior to the mechanical testing, the pre-build underwent solution treatment and ageing.

Figure 2 shows the results of the mechanical testing of the pre-build. A typical anisotropic behaviour is visible in the elongation results. This can be caused by the preferential grain growth induced by the heat source. The overall result shows that the WAAM material has comparable mechanical properties with the 3Dprint AM Ti-5 wire feedstock.

Figure 2. Tensile test results on WAAM Ti6Al4V pre-build compared with 3Dprint AM Ti-5 wire feedstock in the x-y-z directions



Following the mechanical testing, the near-net-shape CAD model was generated by redesigning the original component. During this operation, additional material was added to allow for the machining of the final net-shape design.

Figure 3 shows the resulting component. Interesting to note the absence of discoloration on the entire part, a sign of a contaminants free environment. During the printing, process parameters were logged using our MaxQ monitoring and control system for further data analysis. The part was finally sent for final finishing to the net-shape design. Compared to obtaining the component from a forged block, RAMLAB saved 50% of material and with further improvements it is possible to reach 70% reduction.

With this project RAMLAB showed the potential of the GMAW-WAAM system in printing Ti6Al4V metals parts. We are collaborating with several institutions to further research this topic. We made a small but important breakthrough in the GMAW-WAAM of Ti6Al4V parts, getting a step closer for our customers to print Ti6Al4V parts.

Special thanks to our partners: Hittech, AirProducts, Valk Welding, Autodesk, Cavitar, Element, TWI, Voestalpine Böhler Welding and the AMable initiative. If you are interested to learn more about Wire Arc Additive Manufacturing of titanium parts, get in contact.

www.ramlab.com

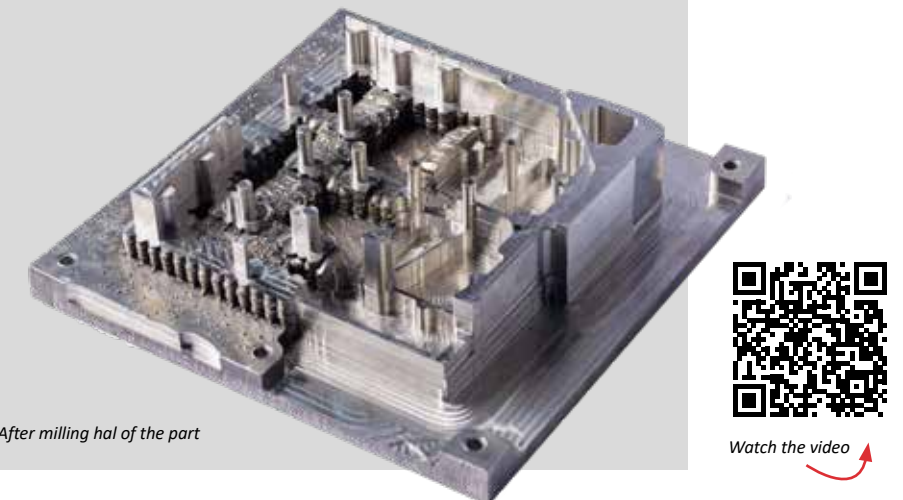


Figure 3. After milling half of the part



Watch the video

AMable: RAMLAB delivers its first Ti6Al4V part

RAMLAB

RAMLAB has successfully delivered its first manufactured titanium (Ti6Al4V) part together with Hittech for the AMable initiative, cutting down on material waste significantly. Traditional manufacturing processes, such as forging, require a machining process to reach the final shape, wasting up to 90% of material. RAMLAB developed a WAAM solution (GMAW-based) for the Ti6Al4V alloy and was able to reduce the buy-to-fly-ratio with 50%. Furthermore, the research showed the potential to reduce delivery time with several weeks.

Ti6Al4V is a titanium alloy with widespread use in many industry sectors thanks to its great material properties. With its high strength to weight ratio, corrosion resistance and biocompatibility, it is found in many aerospace, high tech, medical applications and in the chemicals processing industry.



www.ks-metaalwerken.be | www.limeparts-drooghmans.be



Increasing output by deploying the latest technology

That you can significantly increase productivity by using the latest technology is proven by two projects at the Belgian companies Limeparts-Drooghmans and KS Metaalwerken, where Valk Welding supplied a welding robot in a standard setup last year. Although the applications were very different, the similarity between the two projects is the low threshold with which the welding automation could be used in practice. “The welding robot has become more of an operator function, simple to program and easy to operate,” judges Koen Vandersmissen, managing director of Limeparts-Drooghmans.

A hot item during the first wave of the Corona pandemic was the disinfection pole with hand dispenser. Many

entrepreneurs responded to this sudden acute market demand. KS Metaalwerken received an order to make 25,000 foot pedals for it. A part that required turning, milling and bending as well as welding. Owner Kris Swerts: “A monotonous job that would take us far too long to complete manually. Deploying a welding robot was the only way to get the numbers up in a short time, but how do you get that done so quickly? Outsourcing turned out not to be an option, because of the long delivery times. A colleague advised to contact Valk Welding. Thanks to their quick intervention, a welding robot could be delivered within 3 weeks, including programming”, says Kris Swerts. “In the meantime, we received training at Valk Welding and made the welding jig and shielding ourselves.”

Ready for other applications

“From day 1, we were able to deploy the welding robot immediately, which meant that we had the order ready within 2 weeks of full-scale production. This gives us the opportunity to now look at other applications. Although welding is not one of our core activities, we see an opportunity to broaden our market. In any case, we no longer have to outsource welding work. If something comes our way, we can weld it with the robot”, Kris Swerts looks ahead.

Supply chain activities support own product

Koen Vandersmissen of Limeparts-Drooghmans also saw the productivity of the welding production rise sharply after the introduction of a Valk Welding welding robot according to the latest technology. The company, which specializes in facade construction, spends half of its business on subcontracting. “However, our current Valk Welding welding robot was technically behind after 20 years. As a company in which we prepare everything in 3D, we also wanted to be able to program the welding robot offline. Given the good

experiences in recent years with their service and support in general, Valk Welding is among our preferred suppliers. The service is close by and the response time is short”, says the CEO.

Trade-off between manual and robotic welding

Koen Vandersmissen continues: “For us, the series size always determines whether the product can be put on the welding robot. Since we program offline with DTPS, the work preparation takes less time, so that we can also run smaller series sizes on the welding robot. Another aspect that has accelerated the innovation is the limited availability of skilled workers. This has forced us to focus more on automation, but it must be low-threshold. We therefore leave the programming to our CAM specialists. They control the basic process parameters with which they can make the offline programs for the welding robot. The operators are welders we have trained internally. They can assess the welding quality and solve minor problems themselves. The welding robot has thus become more of an operator function, easy to program and easy to operate”.

Supply and facade construction

“We weld all products on two Sigmund tables, so basically an H-frame but with fixed tables. The frames we weld with the robot are a recurring product, of which we produce 25,000 to 30,000 annually. Because of the supply, we are able to use production power for the construction of facades as well. As a result, we are also competitive in this area and can deliver a high standard of quality. Thanks to the use of the latest technology in the field of welding robotization, we have seen a sharp increase in overall productivity over the past year,” Koen Vandersmissen reiterates.



KÖGEL

Welding of Kögel chassis frames

- faster, better and completely automatically

The German company Kögel has been producing superstructures for commercial vehicles, trailers and semi-trailers for trucks since its founding in 1934. The Kögel subsidiary in Chocen, Czech Republic, manufactures chassis frames for all product models of the brand Kögel. In order to meet the strict production standards and high quality standards of the parent company in Germany, state-of-the-art welding technology from Valk Welding plays a key role in the production of chassis frames. Kögel's long-term cooperation with the robotic welding specialist - Valk Welding - has already had several results. Last year, however, it resulted in an extraordinary and largest of them, the implementation of an 85-meter-long, fully robotic welding line for the production of complete chassis frames.

Chassis frames for semi-trailers and trailers of trucks are not

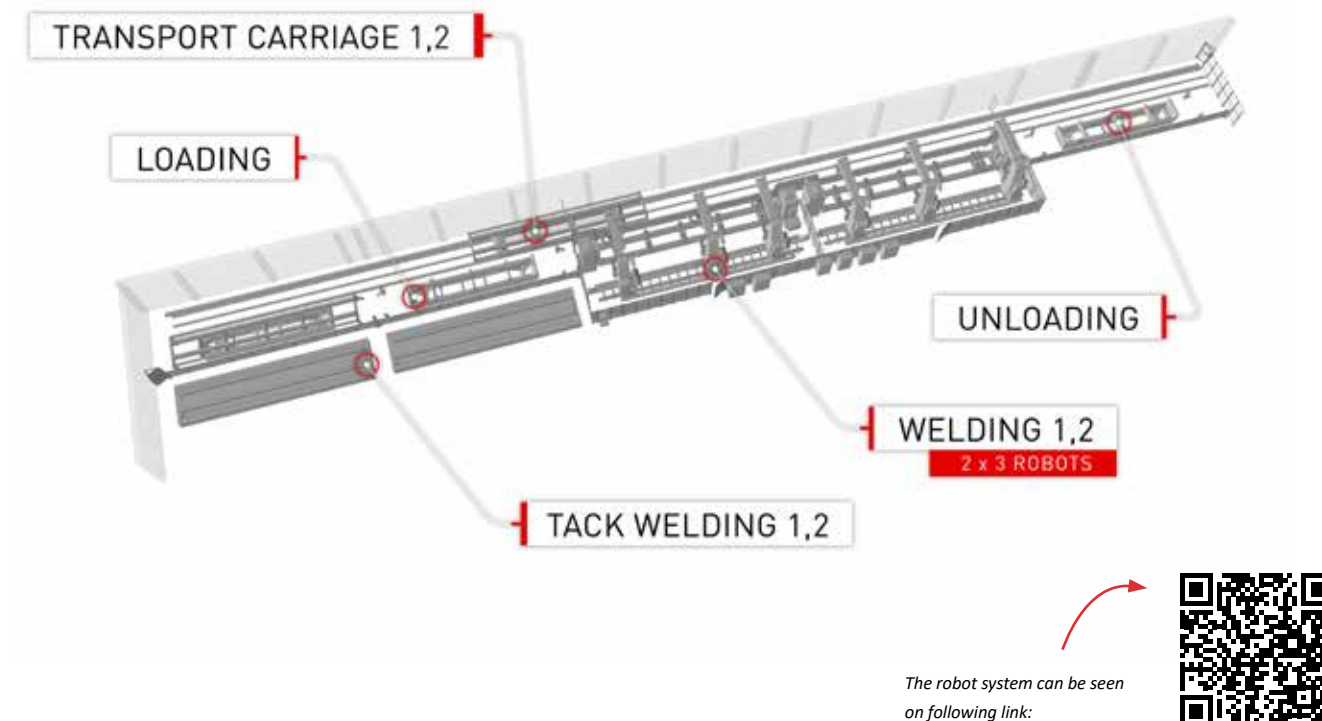
exactly the simplest components of engineering and production. With a total length of up to 14 meters, a weight of over a ton and extremely high demands on the strength and quality of the entire welded structure, their production requires truly advanced know-how and corresponding progressive production technology, which is no longer possible without robotic welding.

First, three robotic workstations from Valk Welding

The Chocen plant with more than 80 years of tradition, which has been part of the Kögel Group since 1996, meets all the above-mentioned attributes of progressivity precisely because its production reflects current trends and is constantly being modernized. In Chocen, they have over 15 years of experience with robotic welding, when in 2006 they bought the company's first small welding robot, which started the era of robotic welding.

According to Aleš Hájek, head of production at Kögel in Chocen, the path of robotization of welding at Kögel is largely linked to Valk Welding, although the first oldest robot was from a competing brand. "In 2006, Valk Welding only started to establish itself in the Czech Republic, when we chose a robot from another company, but in the meantime Valk Welding gradually grew and took the lead. Therefore, when we chose a partner for another robotic workplace in 2015, Valk Welding have already included Welding in the tender. "

The result was the purchase of a medium-sized robotic welding station located on the carriage and designed for welding larger subassemblies of chassis frames. The fact that in 2017 Kögel bought another identical workstation from Valk Welding and in 2019 even the third the same one proves that the company's choice of robotic station and cooperation with Valk Welding proved successful. "The mutual cooperation developed very positively, the result was three robotic workplaces for welding subassemblies of chassis frames," A. Hájek summarizes the situation until 2019.



After the subassemblies, the complete chassis

A few years ago, Kögel arose the need to increase production capacity. "The Kögel company is growing, we produce a larger number of products every year, we are able to reach more and more customers, which has created the need to increase production capacity," explains A. Hájek. As the Czech plant produces chassis frames as the only one for the entire Kögel Group, this would not be possible without the investment in expanding production capacity in Chocen. Due to the previous experience with the operation of robotic workplaces, the possibility of robotics and automation once again came to the fore. "We also solved it by increasing the number of welders in production. However, the problem was the lack of qualified welders in the Czech Republic, we had to find foreign staff, which was not good for the company. Communication, but especially the ability to read technical and production documentation. And what is especially important: we need to adhere to the high quality of welds, a set quality standard. This is a key priority for Kögel. explains the production manager and adds that, based on these facts, they decided to develop a project for an automatic line for welding complete chassis frames.

Valk Welding met the criteria the best

The automatic welding line project was launched in early 2019 and the line was set for June 2020. "We contacted three robotic welding suppliers for the project. After providing the tender conditions, one of the companies immediately

resigned due to the size and size of the project and so two companies remained, "says A. Hájek. He adds that the choice of supplier had precisely defined criteria and the spatial possibilities were a significant limiting factor in the design of the technology. They did not build a new hall in Chocen for this purpose, they wanted to use the existing one, which of course they reconstructed. They renovated the high-load floors, the electrical installation and gas distribution were completely replaced to meet the high demands of the automated line, and a completely new LED lighting was also implemented.

In the preparatory phase of the project, a very intensive verification of the quality of welds from both potential suppliers on the chassis frame itself took place, together with a verification of the percentage availability of welds by specific robots. The service network, spare parts warehouses, speed and availability of service in the event of a breakdown were also important in the decision-making process, and training of operators, operators and programmers was another factor. Kögel also considered whether the bidding companies had sufficient experience to handle a project of this size as a general contractor. After evaluating all the set criteria, Valk Welding emerged as the winner of this tender.

Timely implementation despite the pandemic

The implementation of the project began in 2019. The implementation team that built the line was completely Czech, which was a nice bonus. "The cooperation was at a high level and without the language barriers that a competing supplier





would face,” says the production manager of Valk Welding, adding that this proved to be a great advantage during the outbreak, when delivery and completion dates seemed unattainable, but Thanks to the fact that the team was Czech, it was able to continue working under strict security measures even when the borders were closed. He also appreciates Valk Welding’s role as a general contractor. “Even when awarding the project, we wanted to have the guarantee of one general contractor so that we could communicate with a representative of one company in future negotiations. Valk Welding really proved itself to us in this respect as well.” The first test operation of the automated welding line began in May 2020 and standard operation was launched at the turn of August and September.

Offline programming and modular concepts

Currently, the line in Choceň operates in two shifts. The three-shift operation has not yet come into play, due to the global economic slowdown and sales due to the pandemic and the fact that Kögel is using this time to improve the logistics of the line’s inbound supply. “At the moment, we are not going to full capacity yet, but we are ready for it. In three-shift operation, the line will allow us to produce 44-45 frames a day in 24 hours. We can operate the line with one person per shift. All six robots and all automatic processes running on it are supervised by one production operator,” explains Aleš Hájek. Labor savings are welcome, he said, but even more important is the issue of weld quality.” The output from the welding robotic line is as for welds, of constant high quality, there are no fluc-

tuations in the quality of welds as in manual human welding, and that is the most important thing for us. It has been confirmed to us that we can increase our production capacity while maintaining or even improving the quality standard. “ With the implementation of the line, Kögel has moved to a new level in the field of robotic welding. While so far it has been able to robotically weld only partial subassemblies of frames, the new line allows it to weld complete chassis frames of semi-trailers and trailers. The overall efficiency of the production process is further enhanced by the offline programming of robotic stations offered by Valk Welding. Unlike previously implemented robotic workstations, where the program for a new product had to be programmed directly on the robot, the line has the option of offline programming. So there is no downtime for programming, because the programmer prepares a program for welding a new type of chassis frame on his computer and transfers it to the line - deployed only after its completion.

And how does Kögel’s production manager see the future of robotics and cooperation with Valk Welding? “When entering the project, we thought ahead and with our partner Valk Welding we designed a modular line. This means that if we need to further increase our production capacity, we can add another workstation with three robots. We have a pre-prepared hall, the possibility of extension they also have conveyors, we can easily expand the line with another module. We are ready to grow,” concludes Aleš Hájek.

www.koegel.com

MET-CHEM chooses to cooperate with Valk Welding

MET-CHEM, a recognized Polish manufacturer of welded steel structures for the rail, machine and agricultural industries, has chosen to cooperate with Valk Welding.

With a workforce of more than 300 and the production of steel constructions for many demanding customers in the rail, machine, agricultural and construction industries, MET-CHEM in Plzen has taken the first step towards the robotization of its welding processes.

Last year, the decision was made to purchase a robotized station for welding excavator frame structures for one of the construction machinery manufacturers. It was decided to take this step in order to speed up the frame welding production process, but also to test the suitability of the robotized welding technology for use in the production of other parts of the railway and machinery industry. A versatile system based on the E-frame was chosen, which allows welding of multiple components, either on a single-axis manipulator or on a two-axis manipulator.

The front frame of the excavator is welded on one workstation and the rear frame is welded on a second workstation.

In addition, the robotized system is equipped with a third workstation for special applications.

The robotized workstation was installed at MET-CHEM in August 2020, and production of the front and rear frames started on it as early as September. Such a fast production start-up was possible thanks to the involvement of Valk Welding’s programmers, who programmed both components.

The jigs to hold the welded component were made by MET-CHEM based on their vast experience in building complex jigs for very demanding customers.

To facilitate the programming of the new components and the making of the fixtures to hold these components, the station is equipped with DTPS, an off-line virtual robot programming program.

With this program, new implementations can be worked on without stopping the robot. The programmer technician designs the new tooling (checking the robot’s accessibility to the part to be welded) and programs the new part while sitting in the office, while the robot on the shop floor performs existing production.

The station is now running in two shifts, and productivity is so high that at this point they have started to perform process trials to weld other parts to fully occupy the robot.

www.met-chem.eu



At GMM the robots also welds studs

Flexible and fast, the latest welding cell, acquired at GMM, combines two robots, one of which is equipped with automatic changeover of a stud welding head or a welding torch.

Located between Chartres and Le Mans, GMM is a company specialized in mechanically welded assemblies. The company has been growing steadily for three decades, processing 10,000 tons of sheet metal per year and generating a turnover of over 28 million euros with 140 employees.

For greater flexibility, speed and therefore savings in welding, the company has commissioned a Valk Welding cell with two robots in 2019. The second performing traditional welding and stud welding.

GMM is an expert in sheet metal work for construction steels (from S235 to S700, Hardox, galvanized steels) in thicknesses from 1.5 mm to 25 mm, supplying components to a wide range of sectors. It supplies players in the construction and agricultural sectors such as John Deere, Claas, Manitou, Bobcat or Kuhn-Huad.

The company also present in the energy sector, creates components for transformers for railway engines and supplies Otis elevators, as well as certain equipment for automobile lines (Renault).

It also designs welded assemblies for the entertainment industry (Acoustics), as well as structures for truck-mounted refrigeration units (Carrier Transicold).



“What makes us strong and responsive is that we are at the heart of three complementary entities working together. JMC paint and assembly (43 employees) has 6,800m² of workshops including a shot-blasting cell and two automated paint lines, plus finishing/assembly. Another partner, MGM Transports, has 15 tractors, 25 semi-trailers and 14 drivers with a platform of 400 pallets. Thus, all the logistics between customers, suppliers and assembly plants is controlled. This strategy simplifies circuits and reduces lead times,” explains Yves Marcel, the group’s Industrial Director.

To execute the hundreds of references (beams, chassis, covers, casings, frames, arms, cradles, supports, ploughshares, etc.), the means are muscular. An FMS line for storage and automated distribution of Stopa sheets, with a capacity of 740 tons, feeds four Trumpf laser cutting centres and a Trumpf T7000 laser punching machine.

For heavy thicknesses, GMM has a Ficep HD plasma cutting combination equipped with a punching machine combined with a milling, drilling and tapping capacity. After cutting, five Trumpf and Jean Perrot robotic bending centres plus three Trumpf manual bending centres and a rolling machine shape the sheets.

In addition, six Spiertz stamping presses ranging from 40 to 400 tons with their own tooling and decoiling lines handle larger production runs. All tooling and machining fixtures are made in the machine shop, which is equipped with milling centres (Haas and Forest Liné), turning centres (Doosan dual-spindle centre with bar feeder), grinding machines and two Charmilles wire EDM units.

In addition to an intermediate storage warehouse for components before welding, the assembly combines two Aro manual spot welders, an Aro robotic spot welding cell, three Fanuc welding robots, seven Panasonic welding robots with positioners and 16 manual welding islands.

In 2007 Valk Welding delivered its first robotic welding system operating in pendulum mode with one operator. Continuing this partnership, the integration of the latest two-robot cell mounted on an E-frame has, as a special feature, a second robot equipped with an automatic changer capable of working alternatively in Mig/Mag or with a stud welding head fed by a vibrating bowl.

“Fast, reliable, flexible to use and economical, this principle allows us, for example, to adapt ventilation grids, which are then mounted on the engine hoods of machines, an aesthetic assembly that appeals to our customers,” explains Yves Marcel.

Highly integrated in terms of IT, GMM has an ERP system, with real-time monitoring of each workstation, a general CAD system and several CAD/CAM software programs for specific trades.

All the equipment is PHL (offline programming) and has a fibre optic network and Wi-Fi. Naturally, welding programming is carried out offline with Panasonic’s DTPS software, an approach that serves to visualize movements and positioning while avoiding any risk of collision. Finally, the management of customer orders is done in EDI language, which allows the integration of modifications in time.





Kverneland DK optimises welding robot use

The Danish branch of the Kverneland Group (agricultural machinery) has been using Valk Welding welding robots for 15 years. In that period, the number of welding robot installations has been increased and much has been done to increase the productivity of welding production. This has resulted in an improved workflow and an increase in the duty cycle from 40% to 70%.

"To be able to increase productivity, we will not only have to automate but also further optimize the production flow," explains Ezgi Karadas, Kaizen specialist and as production engineer responsible for investments in production equipment.

Taking a critical look at programming time

Offline programming definitely saves a lot of time. Ezgi Karadas: "But we also look critically at the programming time and especially at the ease with which we can create welding programs. Because DTPS has been developed specifically for the welding process, we experience DTPS as very user-friendly and less complicated than other systems".

Welding seam search takes time

"All in all, 25% of the time is spent on weld seam searches. If you make sure in the

preliminary process that the typesetting is within the tolerances, you can limit the search routine to only the first piece in the batch. To save even more time, we are considering using the Arc-Eye laser camera system. This corrects the trajectory of the welding robot in real time, so that it always follows the weld exactly.

Reducing changeover times

"In addition, Kverneland is also taking a critical look at changeover times. "By clamping the assemblies on the welding fixture outside the welding robot and placing them as a complete frame in the manipulator with a quick-clamping system, you can reduce the changeover time by about 20 minutes. We are still looking for the right systems to do this".

Performance monitoring

"In order to measure the effect of all measures, we can monitor the performance and duty cycle of the welding robots with an IO connection. After all measures we have now been able to increase this to 70%. With this we have already largely achieved our goal, because 30% downtime is acceptable to us", says Ezgi Karadas.

www.kvernelandgroup.com

Tradeshows 2021

Vision & Robotics
16.06 - 17.06 (NL)

Sepem Colmar
15.06 - 17.06 (FR)

Machineering
08.09 - 10.09 (BE)

Nederlandse Metaaldagen
13.09 - 17.09 (NL)

Metavak
05.10 - 07.10 (NL)

Sepem Nord Douai
12.10 - 14.10 (FR)

Hi Tech & Industry Scandinavia
5.10 - 7.10 (DK)

MSV Brno
08.11 - 12.11 (CZ)

4Innovatordays
17.11 - 19.11 (NL)

Sepem Angers
23.11 - 25.11 (FR)

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