

Joop van Zanten Staalservice BV:

JOOP VAN ZANTENS DIGITAL JOURNEY

The Dutch steelworker breaks with standards and embarks on an exciting journey with Messer Cutting Systems towards Industry 4.0.

Veenendaal, Netherlands, 10/20/21. Bart Kroesbergen, Managing Director at steel service centre Joop van Zanten is a visionary. In ten years at the latest, the entire production should be automated. "To achieve this, we have to break with standards and need courageous partners who can join us on the extraordinary journey towards Industry 4.0," he claims. The following report shows why Messer Cutting Systems became the right travel partner and what "travel experiences" the team had.

The dawn of a new age

The family-owned company Joop van Zanten has been a full-service provider for plasma and oxyfuel cutting of steel since 1966. The steel service centre works in the segment from 2 to 350 mm including almost all finishing operations such as press braking, straightening, blasting, machining, and welding. With over 40 employees, a turnover of more than twelve million euros and a modern designed floor space of 10,000 m², the company is now one of the most modern in the Netherlands.

"When I joined the company in the summer of 2018, Joop van Zanten was a stable but very traditional company that focused on thick sheet metal and would certainly have survived with that for a while," recalls Bart Kroesbergen. "But in order to stand up to the high-cost pressure of the Asian markets, to compensate for the lack of skilled workers in the future and to meet the customers' demands for fast and high-quality one-stop shopping, a consistent break with the existing situation was necessary."

It soon became clear that individual actions, such as a new ERP system or optimising the hall layout, did not bring the desired strategical progress. For Kroesbergen, this meant that only the automation and digitalisation of the entire production process, including the business processes involved, could be an adequate solution. The idea of Joop van Zanten's "journey" to Industry 4.0 was born. The technology change from a traditional job shop to a high-tech company with completely automated 24/7 production within ten years was the new ambitious goal.

Too far ahead of the times

Having a vision is one thing, but finding the right partners is quite another. "We had to realise in many conversations that the providers of machine and/or software systems were stuck at the same, in our opinion, traditional approach as the entire industry. In terms of technology, they were not capable of embarking on the digitalisation journey with us. They believed our vision of fully automated production, for thicker steel up to 40 mm and larger plates up to 6mx3,5m, was impossible to implement," Kroesbergen sums up. Initial approaches with existing suppliers failed completely until Messer Cutting Systems was brought on board.

For years, Messer Cutting Systems had been a set supplier of cutting machines with complete solutions from a single source, including maintenance, service, and software. Due to the good relations with Messer's local staff in the Benelux countries, initial exploratory talks were held in which the company presented itself as innovative and flexible.

Messer was surprised by the nature and scope of the enquiry, as no customer had previously requested such a solution. "We wanted a supplier capable of delivering the full range of specialised machine equipment. This includes state-of-the-art technologies for laser and plasma processes as well as software and material handling experience," says Kroesbergen. "Above all, there was a clear willingness to go along the journey and do everything possible to find an innovative and working solution with us."

After extensive discussions and meetings with internal specialists, Messer Cutting Systems offered a completely new automation system that was previously unique to the manufacturer and its partners. "It was clear to all of us from the start that we were in for a long journey that would require staying power, a lot of energy and a high level of concentration," says Bas Sanders von Well, Business Unit Manager Benelux at Messer Cutting Systems, describing the initial discussions. "After all, this was a project that we admittedly had not yet implemented to this extent and degree of innovation."

Integration as a key component

The core of the solution is the software and 4.0 intelligence that links everything together. In workshops, a team with ERP manufacturer Ridder, the ISD Group as supplier of the 2D/3D CAD software HiCAD and Messer Cutting Systems with the digitisation solutions from MesserSoft

defined the integration of the various IT solutions. The goal was a process that maps and automates cutting and further processing in one workflow. The superordinate unit is the Ridder IQ ERP system. HiCAD functions as the CAD/CAM environment. MesserSofts OmniFab Software Suite digitises the processes as an integration and data refinement tool. "Integration was one of the most elementary steps towards digitalisation and complete automation. If we can implement the automation path consistently, the rest is as easy as baking cheesecake," Kroesbergen says with a wink.

OmniFab is thus the central element of automation. The suite connects the various software systems, the cutting machines, and the material handling system via various interfaces.

Digital transformation

As soon as Joop van Zanten receives step files from the customers with the 3D models of the components to be manufactured, HiCAD checks and analyses how the component is to be manufactured. The software recognises whether the components are to be cut, edged, drilled, or milled. The file is then imported into the design and nesting software OmniWin via OmniFab ERP Connect. OmniWin calculates the machining time with cutting times, drilling times and material consumption and sends back the results to the ERP system, which calculates the price from the data.

This fully integrated analysis and calculation software structure makes it possible to not only calculate the cost price for an offer but also the production preparation and machine programming has been done in the offer phase. If customers agree with the conditions, all preparations including planning are done and the production process can start immediately. This saves a lot of preparation time and creates the possibility for quick delivery.

At this moment the company is working with several customers in an EDI solution. This will connect the production capacity and production knowledge directly to the engineering and purchase departments of the customers.

If an order is placed, the data runs again via OmniFab ERP Connect to OmniWin, where the nesting plan is created. OmniFab generates the job from this, takes over the order control, process data selection and the automated production as well as loading and unloading processes. On the two new Messer machines, the scheduled jobs are displayed at the loading station. Here, the

operator selects the job to be cut, brings the appropriate panel to the loading station, which moves the panel on a shuttle to the storage tower. As soon as the scheduled machine is available, OmniFab Material Flow automatically steers the matching pallet to the machine and initiates the cutting process. After cutting, the pallet then automatically returns to the tower.

OmniFab reports to the ERP system all the information about the nesting plan and confirms that it has been successfully cut. At the unloading station, the operator sees all the finished jobs and requests them from the tower for unloading at the unloading station. From there it goes to further processing such as blasting, sanding, edging, etc.

Everything under control

Today, production is automated to the greatest possible extent and is controlled exclusively from a control room. The plant operators always have an overview of the entire plant, including an interior view of the enclosed machines, via control monitors. In addition to the transmission of the machine work screens, there is also an OmniWin programming station for nesting as well as for order, material, and job management.

"This way we always have an up-to-date overview of which jobs need to be cut, what is currently happening on the machines and which jobs have been cut and can be cleared," explains Johnathan Jacobus, head of purchasing and project manager for automation at Joop van Zanten.

At the loading station, a control terminal reads out the required material, which is loaded onto the pallet and fed into the process. At the unloading station, an operator uses a tablet to monitor the finished cut panels on the transport shuttles so that they can be removed. Via the tablet, he queries information about the individual components, books good and bad parts into the system and confirms manual work. The operating terminals directly at the machine housing are now only used for maintenance or testing purposes and for setting complex new programmes.

Investment in the latest cutting technology

An important part in the digitisation process are two new machines with the latest cutting technology: a PowerBlade® 6500 with laser, 6 KW bevel head, drilling unit with 24 tool changers and LNC nozzle changer, and an OmniMat 6500 with 2* HiFocus 360I, Skew Delta plasma bevel head, OmniScript and drilling unit with 24 tool changers.

With the fibre laser technology, extremely powerful drives, precise linear guides in both longitudinal and transverse directions and a multifaceted bevel head, the PowerBlade® is equipped for a wide range of applications. As well as vertical cuts, the widest range of bevel cuts can be combined in one part, for example to produce optimum weld seam preparations all that in one operation.

The PowerBlade is characterised by extreme dynamic performance and accuracy. With working widths of over 4 m and track lengths up to 50 m and more, the laser cutting machine is predestined for large format plates. The fibre laser is characterised by a high degree of efficiency as well as a robust and durable design. Guided by the Global Control, the PowerBlade® is thus extremely user friendly and economical.

OmniMat® is a large size CNC cutting machine with a heavy-duty structure and multi axis control, suitable for a wide field of applications and complicated cutting jobs. Whether oxyfuel, underwater or dry plasma, whether vertical or bevel cutting or with drilling, the OmniMat® is the ideal solution for the largest working areas and the toughest production conditions. A number of different tools are available, e.g., marking tools and drilling devices, strip cutting device, triple or rotating triple torch and plasma bevel unit.

"Both machines meet all our expectations for easy handling, low costs and high reliability," Kroesbergen explains the renewed decision for Messer Cutting Systems cutting machines.

Excellent teamwork

The overall solution is characterised by a particularly high level of complexity. Not only was the integration of the software systems, the machines, and the material handling system from Remmert complex. The solution was completed by the large gas tanks from Messer, the gas supply technology from Spectron and the cutting tables from Beuting. Matthias Breitwieser, Manager Advanced Engineering Global R&D from Messer Cutting Systems, therefore took on the role of project manager and coordinated the teams involved until approval in spring 2021.

"We formed a development partnership with Joop van Zanten and learned a lot from each other. Characteristic were the high motivation, perseverance and competence of everyone involved," Breitwieser sums up. Of course, there were always new challenges and some delays. Corona also made the work of the teams on site much more difficult. But all topics could be solved through joint commitment.

"It was an exciting journey with a few surprises. We knew that not everything would be perfect immediately. Setbacks have not affected us; they have advanced us. Things are developing and will work in the future," explains Kroesbergen. Realistic planning and timely countermeasures in the event of developments in the wrong direction are important. Meetings at which the right questions are asked are goal-directing.

"Especially the 3D model of the entire project in the production hall requested by Bart Kroesbergen gave us decisive insights," Breitwieser recalls. "It allowed us to see much better how we needed to optimally position the machine components, also in terms of cabling and gas supply."

Far-reaching development

Only in use for a short time, everyone in the company, from sales to work preparation, production to logistics, benefited very quickly from the automation. Routine tasks are completed automatically in a noticeably short time without media disruption and without errors. A production planner monitors two machines simultaneously and becomes the automation controller responsible for the entire system. His tasks thus become more demanding.

Several work steps are completed on one machine. The reduction of logistical steps speeds up the completion of orders. Today, Joop van Zanten is going to a 24-hour production, so that orders can be processed overnight without dedicated personnel and are ready in the storage tower when the factory opens in the morning. Digitalisation has led to a considerable reduction in the overall production throughput times, to greater utilisation of the machines and to lower costs for personnel, logistics and consumables.

Joop van Zanten has been able to significantly improve its market position with automation. Customers are pleased with the progress. "For some customers, we developed from a 3tier supplier to a full-fledged partner and in some cases even to a service partner. It seems that we are perceived as a modern supplier and are now recommended by customers. This has already

enabled us to win some new customers and bring back old customers we had lost due to our old-fashioned image," Kroesbergen is pleased to say.

Kroesbergen always received backing from the shareholders for his vision of digital transformation, in which everything is produced automatically in one go. Even if it was not always clear where the journey was going, Arie van Zanten assures: "I'm glad about the project so far."

Kroesbergen agrees: "We would certainly choose Messer Cutting Systems again. Even if we have not quite reached our final goal yet, we will push ahead and optimise digitalisation with this team. We have our strategic goal in mind and accepted from the outset that this is a transformation process instead of a >normal< investment project."

Breaking the rules

"We know where we want to be in ten years. To achieve that, we will continue to break existing industry rules and redefine standards if required for our strategical vision," Kroesbergen answers when asked about future developments at Joop van Zanten. "We have proven that cutting speed is not the main issue, but avoiding ways and achieving speed through process integration and optimisation as well as the use of smaller plates. In one shift we process a larger amount of "raw material" (plates) with extremely high flexibility during changeover and minimal time loss. This significantly shortens the total time compared to long large machines. The logistical goal for 2022 is to deliver at least eighty per cent of the orders within forty-eight hours after ordering."

In the future, he plans a completely integrated shop with all technologies for cutting, machining and material handling of larger parts. This includes system expansion with automated unloading including transport to the next production step, the deburring. Talks with Messer Cutting Systems are already underway.

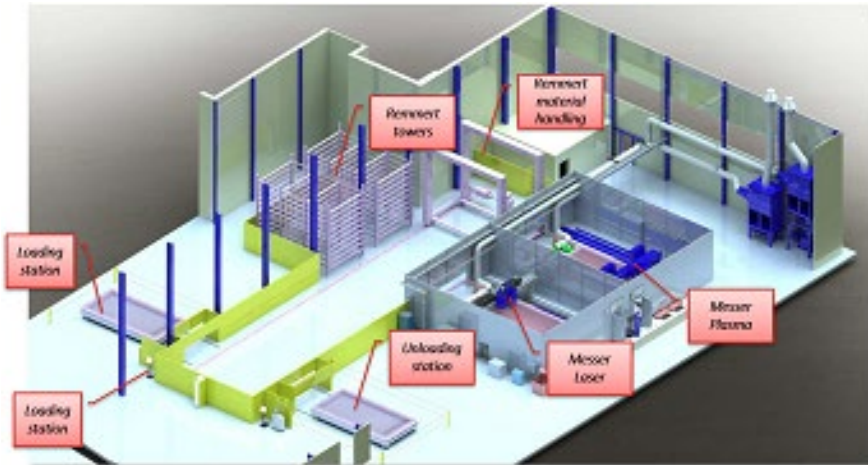


Fig. 1: Overview of the automation system in the production hall with Messer machines and Remmert material handling system

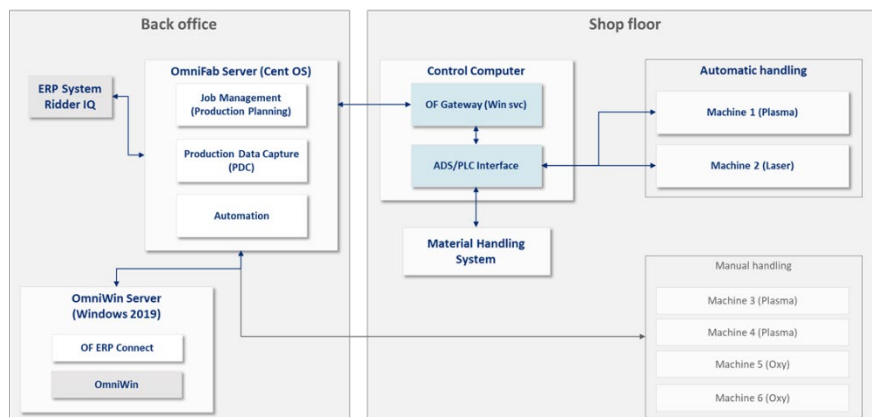


Fig. 2: Overview of OmniFab interfaces



Photo 1: Effective planning and scheduling of production orders with OmniFab Job Scheduling
© Messer Cutting Systems

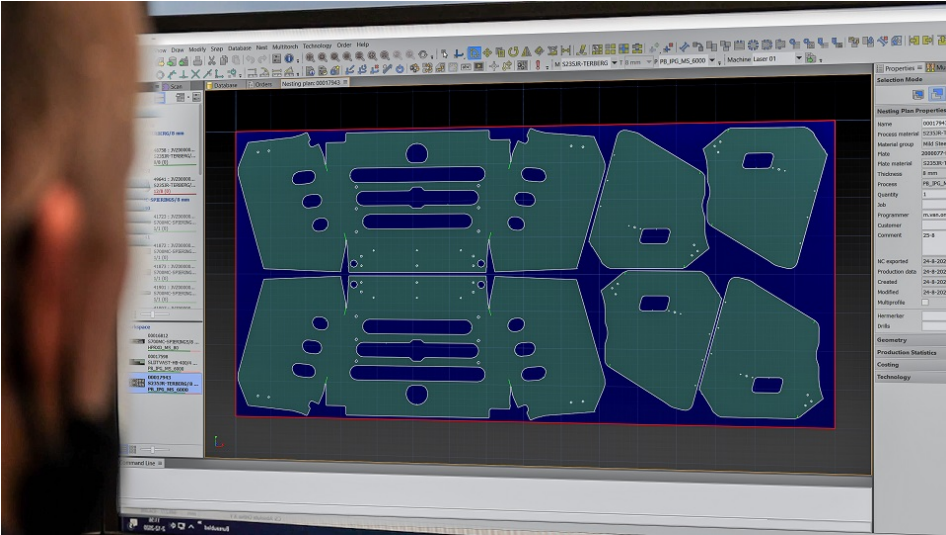


Photo 2: Efficient use of plates by automatic nesting in OmniWin © Messer Cutting Systems

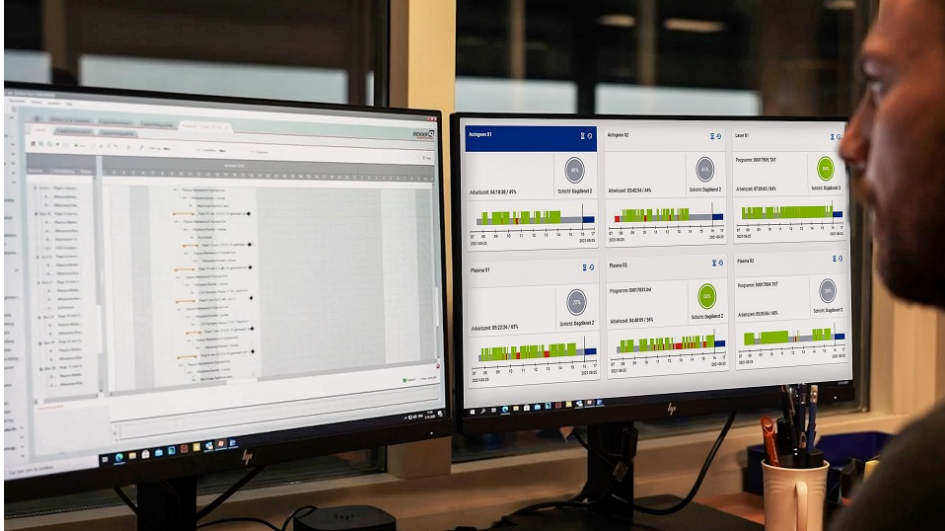


Photo 3: OmniFab Machine Insight provides real-time and retrospective insights into machine performance. © Messer Cutting Systems



Photo 4: Production is automated to the greatest possible extent and exclusively controlled from a control room. © Messer Cutting Systems

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Photo 5: The PowerBlade® fiber laser machine impresses with its dynamic performance and accuracy. © Messer Cutting Systems



Photo 6: OmniMat® cutting machine equipped with the Skew Delta plasma bevel unit for weld preparation © Messer Cutting Systems

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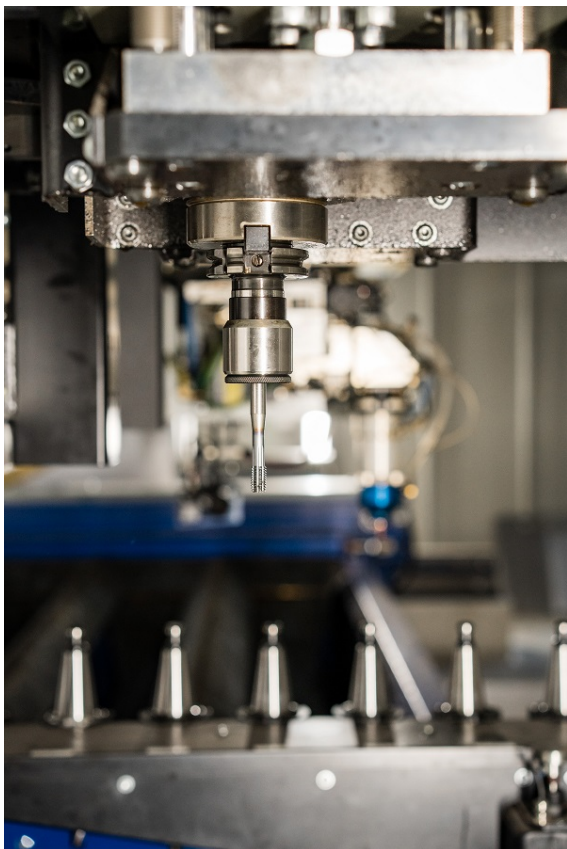


Photo 7 or 7b: Both machines are equipped with a drilling unit including 24 tool changer

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Photo 8: The software suite OmniFab connects the various software systems, cutting machines as well as the Remmert Material Handling System via various interfaces. © Messer Cutting Systems



Photo 9: Bart Kroesbergen, Managing Director, Joop van Zanten © Messer Cutting Systems

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Photo 10: Matthias Breitwieser, Manager Advanced Engineering Global R&D, Messer Cutting Systems GmbH © Messer Cutting Systems

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MESSEER CUTTING SYSTEMS:

Messer Cutting Systems is a global supplier of cutting edge technology for the metalworking industry. With over 900 employees worldwide in over 50 countries, we maintain a constant dialogue with our customers to achieve sustainable user oriented innovation.

Our portfolio embraces the themes PRODUCT, DIGITAL, SERVICES, AUTOMATION and KNOW HOW. We will live up to our claim “creating solutions beyond machines” not just with the most modern cutting systems and solutions for oxyfuel technology. Appropriate services and training, our own software applications as well as the integration of solutions from our technology partners, e. g. in the field of automation, complete the machine to give forward looking total solutions.

Our Know how combined with our customer oriented attitude and actions make us the world-wide partner of choice for innovative total solutions on all aspects of cutting systems since more than 120 years.

JOOP VAN ZANTEN STAALSERVICE:

The family business, founded in 1966, is a full-range supplier of laser, plasma and oxy-fuel cutting of steel, including finishing operations such as press braking, straightening, blasting and welding. At the One-Stop Shop, customers receive the entire steel package from a single source. A balanced relationship between price and quality, flexibility and fast delivery characterise the company.

Joop van Zanten has recently moved to De Batterijen industrial estate in Veenendaal, with 10,000 m² of floor space and a modern hall layout. More than forty experts work here on the high-quality semi-finished products. For the shipbuilding, crane, mechanical engineering, infrastructure, construction and transport sectors, an extensive stock of certified first choice sheet material, mainly from Western European rolling mills, is kept on hand. With state-of-the-art machinery and control systems combined with specialisation and expertise, the company produces simple as well as high-quality and complex products quickly and effectively.

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