

CustomerStory



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Bell Equipment GmbH

Bell establishes own welding production line with EWM

The articulated dump trucks made by South African construction machinery manufacturer Bell Equipment are built for use on tricky terrain and to carry huge loads. The production of these large vehicles can be tricky, too. It requires specialist welding machines and accessories able to withstand long weld seams and high duty cycles, all while at high currents in two-shift operation. The German branch of the South African company, based near Eisenach, no longer just assembles these vehicles, however. Starting in 2019, the Eisenach-based branch now also produces the requisite parts itself. To help with the planning and implementation of their own welding production line, Germany's largest and one of the most important worldwide manufacturers of arc welding technology, EWM AG, has been working to assist Bell Equipment Germany from the very start. Based in Alsfeld in the German state of Hesse since January 2000, the South African family company's German Branch, Bell Equipment Germany, supplies 22 European countries and North America with its dump trucks, construction machinery and spare parts. Bell Germany has had a production line in Hörselberg-Hainich near Eisenach since 2003. The site assembles around 500 vehicles every year. While the individual components come predominantly from European suppliers, the core assemblies are delivered from the South African parent plant. This was also the case for the bins up until 2018. To make these, the company shipped plates from European production lines to South Africa, where they were then cut, milled, edged and welded, ready to be shipped back to Germany as finished bins. However, there was clear room to streamline this process to bring it in line with the environmental ideas rooted in the companies principles, including a more sustainable and economical bin production, explains Steffen Zitter, a member of the strategic purchasing team responsible for carrying out global projects at Bell Equipment. Furthermore, bin production previously took four to six months after receiving the order.

Internal welding production line started in 2019

Bins are welded across seven stations both manually and automatically with mechanised robots in the 12,000-square-metre hall. As a solution to the above, Bell Equipment Germany started its own welding production line based near Eisenach in 2019. It has now been mass producing bins for articulated dump trucks for Europe and North America for six months. Bins for large, powerful vehicles with between 20-and 50-ton load capacities are now welded at various stations in the new, modern 12,000-square-metre hall. The hall hosts both fully mechanised, automated stations and manual welders. Manual welders are required primarily for the harder-to-reach seams. The dimensions of these vehicles are immense, just like the weld seams, with the smallest bin measuring 4.70 metres long and the largest, built in Thuringia, measuring at 5.30 metres.

EWM already involved in planning

To start the ball rolling, Stephan Giese, Technical Director at Bell Equipment Germany, gathered information about the possibility of an internal welding production line. As part of his research, he got to know Ralf Rauh, the Site Manager for EWM in Nossen. When the South African family business Bell Equipment finally decided to take the leap to establish their own welding production line at their site in Eisenach, EWM AG, Germany's largest manufacturer of and global leader in arc welding technology, was right there from the start. Ralf Rauh was already involved in the initial planning phase. As part of ewm maXsolution, the extensive EWM consultation service, Rauh worked on a custom complete solution for the company. With ewm maXsolution, the customer's entire production process chain is optimised in a way that saves the company energy, resources and time. To do so, Rauh became familiar with Bell Equipment Germany, its production site in Eisenach and its users and learned all about its specific needs. The specifications from the parent company played a huge role in creating a suitable solution. "Processes set by South Africa are reflected in our work," explains Steve Rudolph, head of assembly production and quality control.



Preparing for the EU Ecodesign Directive

Robust machines with a high duty cycle that can withstand long seams and welding times are needed for metres-long metal plates made from wear-resistant steel in thicknesses from 6 to 32 mm. For this, the production line in South Africa uses step switch controlled machines that require the user to find and set his/her own operating point. This meant that the same machines needed to be purchased in Germany, too. However, despite his endeavours to take all of the customer's wishes and specifications into account when creating his solution, Ralf Rauh intervened





Metres-long weld seams are welded at high currents and high duty cycles. EWM welding machines are the perfect machines for the job.

on this requirement. "In the coming year, the Europe-wide Ecodesign Directive will come into effect, including for welding machines. From 2023, power sources will have to use no more than 50 watts of power in open circuit." Rauh therefore offered the Taurus Basic instead, a welding machine with energy and resource-efficient inverter technology.

As the customer wanted one type of welding machine for the entire production line, and indeed one that allowed the user to manually set the operating point, all production employees now weld using the Taurus 505 Basic. This power source is similar to a step switch controlled machine in its operation, yet, thanks to digital technology and the EWM quality, it saves a lot of energy. The decision maker in South Africa ultimately gave the OK for the EWM complete solution which, as well as the welding machines, also included wire feeders, hose packages, drum connection, welding consumables and work safety equipment such as welding helmets.

Non-stop welding time in two shifts per bin

The close attention EWM pays to quality, performance, high power reserves and mains voltage tolerance, makes all of its welding machines perfect for the seams measuring up to 6 metres long. So EWM offers a full three-year guarantee in three-year guarantee in three-shift operation, all without a limitation on operation hours, for good reason. The company even offers a five-year material guarantee on its main transformers, output chokes and secondary rectifiers. Even when it comes to the duty cycle, EWM has its own measures in place that go beyond the legal regulations. The Taurus Basic 505, for example, has a duty cycle of 100% at 430 amperes. "Welding bins requires high currents of around 290 amperes over a long period of time. One bin takes at least two shifts of non-stop welding. The EWM machines are perfectly equipped for this," confirms Steffen Zitter.

As part of his complete solution, Rauh planned various improvements for users as well as optimisations for the company, which are different to those in South Africa. As a result, welders work with decompact systems with separated power sources and wire feeders. Intermediate hose packages from 10 to 15 metres increase the working radius. This makes work on large components and often hard-to-reach seam positions easier. The switchover to a drum connection for the weld wire saves around 17 spool changes per workplace. As part of internal solutions, Bell flexibly attached wire feeders to the metre-high manipulators, on which the bin components are conveniently positioned. The welder can change the welding parameters directly on the wire feeder control instead of having to set them on the power source. This increases mobility and saves any long back-and-forth and unnecessary climbing.





Wire feeders flexibly attached at the height of the bins give the welder mobility and save on the tedious back-and-forth as welding parameters can be set on the wire feeder control directly.

The welders were trained in groups and individually by employees from the EWM site in Nossen. Bell has set up a small warehouse for wear parts. Experiences and outcomes are discussed with Ralf Rauh. The whole approach follows the construction machinery manufacturer's concept: "As an Original Equipment Manufacturer (OEM), we prefer to work directly with the manufacturer," explains Gert Van Zyl, the head of bin production in Germany. This allows us to improve processes together and make use of synergies. "EWM has been our partner from the very start. They responded to our needs with precision, working continuously to improve processes and being able to take advantage of synergies in the development of our welding production line," adds Steffen Zitter.

Short delivery time and great service

The fact that all 22 machines were delivered in just three weeks was yet another reason to work with EWM. "The time factor and pricing played a roll, but also the personal contact

and great service," explains Zitter. All this meant that production could start quickly, with mass production being ready in just a few months. Together with EWM, the aim is to continue to improve the production process in the coming years. "All experience relating to machine technology or welding consumables is shared intensively with South Africa. If we find that something could be improved, it is discussed with South Africa and improved," explains Zitter. To find such areas for improvement, Rauh regularly visits the welding production, having welders test an EWM welding torch or answering any questions. The results speak for themselves. "With the EWM welding torches we only needed five EWM contact tips in two and a half weeks," Steve Rudolph responds to Ralf Rauh's enquiry. "Working with EWM, in particular in the area of torch technology, in no time we were able to save up to 30% on consumables and wear materials, depending on the use and workplace."

With its own production line, Bell Equipment Germany can now respond to enquiries and orders more quickly and with more flexibility. It also means production is significantly more economical and sustainable. The plates come directly from the steel mill – 6,000 tons of steel per year are now completely cut, edged, tacked and welded in the new production hall. One bin is ready in two to three weeks and can be assembled next door, in the 6,000-square-metre assembly hall. Later this year, Bell Equipment will also begin production on engine hoods as it gradually expands its production portfolio with further assemblies.



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Ralf Rauh (left), Site Manager for EWM in Nossen, assisted (2nd from left) Steve Rudolph, Gert Van Zyl and Steffen Zitter in planning and implementing welding production at Bell Equipment Germany.

Kindly supported by



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