

Reference

Customer satisfaction:
our primary objective



YANMAR



YANMAR Construction Equipment Europe SAS

Location:
Saint Dizier, France
Business: Building
and distribution in Europe
of mini excavators

Founded: 1989
Workforce: 412 of which
300 production staff
Number of robots: 11

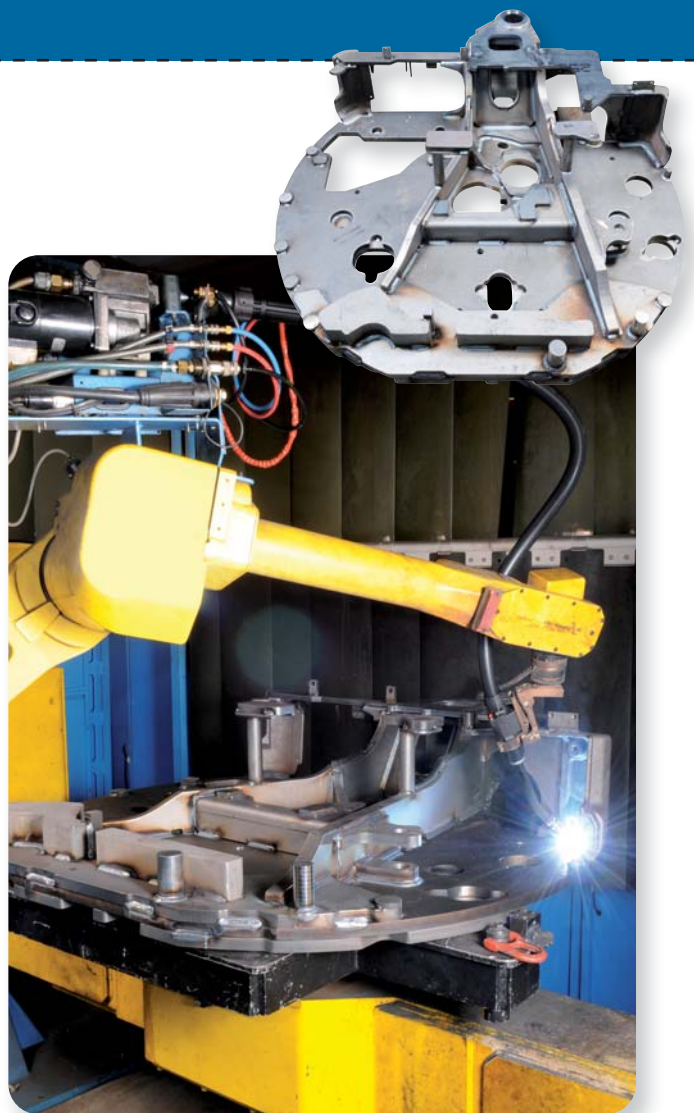
The Saint-Dizier plant was set up in 1989 as a joint venture between **AMMANN**, global leader of road-building plants and products, and **YANMAR**, one of the leading designers and manufacturers of diesel engines for marine and land applications, farm machinery, construction machines and energy systems. Each shareholder held 50% of the capital of the company, which was called **AMMANN-YANMAR S.A.S.** at the time.

After twenty years of close collaboration, the new developments in road-building and earthworks made AMMANN and YANMAR review their strategy, resulting in YANMAR taking over the entire capital of the Saint-Dizier plant in 2010. Now, the facility is a wholly owned subsidiary of YANMAR.

YANMAR Construction Equipment Europe SAS builds and distributes public works equipment for the European market: tracked micro, mini and midi excavators, tracked carriers, mini dumpers, articulated loaders and compact wheel loaders and site lighting systems.

The plant in Saint-Dizier designs and manufactures 10 models of conventional mini excavators or Zero-Tail-Swing (VIO) excavators. The remainder of the range - namely 7 other models of mini excavators, 3 carriers, 6 mini dumpers, 2 articulated loaders, 3 compact loaders and 5 lighting towers - are supplied directly from Japan by YANMAR, or by other European partners.

The current production capacity of the site is 4,000 machines per year. Until 2003, most of the welded production was sub contracted. Some thirty welders made the small sub assemblies and preparation kits.



In 2003, the company made the strategic decision of producing its own welded components with high added value, such as chassis, booms and arms. Robotics was identified as the ideal production tool. Out of the 4 companies contacted for producing SV15 and SV17 mini excavators, the Air Liquide Welding offer was found to be the most competitive. The proximity of the Air Liquide Welding Robotics Centre in Commercy, which is located less than an hour away from Saint Dizier, was also a determining factor in the choice of the best partner.



Right from this first project, Air Liquide Welding offered a complete service including the study and making of tooling and also programming and welding adjustment. To make it easier for welders to accept the arrival of robots in the company, Jean-Christophe Mercey* suggested giving the machines names from Star Wars. R2D2 and C3PO, thus began welding the first chassis.

In subsequent years, several projects were undertaken, reinforcing the collaboration between the teams of YANMAR and Air Liquide Welding. The project of ViO50 and ViO57 excavators made it possible to work on fairly unusual configurations in robotics, because each robot was associated with only one positioner.



« Air Liquide Welding recommended the use of a cassette type tooling system, where the manual tack welding tool includes the tool for holding the tack welded piece on the robot. That does away with handling between tack welding and the robot. The time taken to load/unload the installation is thus reduced to less than 10 minutes.

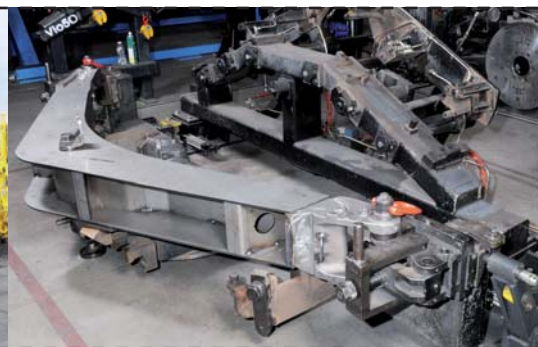


* Methods technician in charge of robotics

Compared to a robot cycle time of over 2 hours, a two-positioner configuration was no longer necessary, especially since it accounts for a large part of the price of a machine. The concept also made it possible to make the workstation more ergonomic for the operator. »

Each cassette has an encoding system that allows the robot to recognise the tool put in place and select the corresponding program. An entire area of the workshop is dedicated to the making of booms and arms for mini excavators. 4 identical machines installed side by side manufacture 6 models of excavators with 16 different cassettes.

« The concept has made our organisation and production capacities much more flexible, by allowing us to work on one piece after another. »



As with all the other robots, YANMAR uses OERLIKON CRISTAL F206 1.4-mm diameter cored wire with low fume emission.

« Compared to solid wire, the bead quality is better, we have less splatter, higher welding speed on large sizes and better penetration. »

Continuing in the Star Wars tradition, the boom and arm installations were named Anakin, Yoda, Windu and Grievous.

Finally, what are your observations after 8 years of robotics?

« In 2003, robotics was new for us, and we had to work hard on preparation and the quality of our components, upstream from the welding process. Our Quality department adapted to qualify and inspect our welds and we took account of the handling of high-load pieces. *Piece programming and the support provided by Air Liquide Welding ensured that the start of production was smooth.* On the basis of that experience, we can now programme independently. As regards the benefits of robotics, we have very greatly improved the quality and regularity of our welding. The concerns of the early days have given way to great satisfaction.

Robotised welding has created a new activity in our company, and now employs 40 welders working in three 8-hour shifts and 2 qualified programmers. The operators have acquired new skills with first-level robotics, and untrained personnel are waiting to receive training. »

Interview with **Mr Jean-Christophe Mercey**, Methods technician in charge of robotics.



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