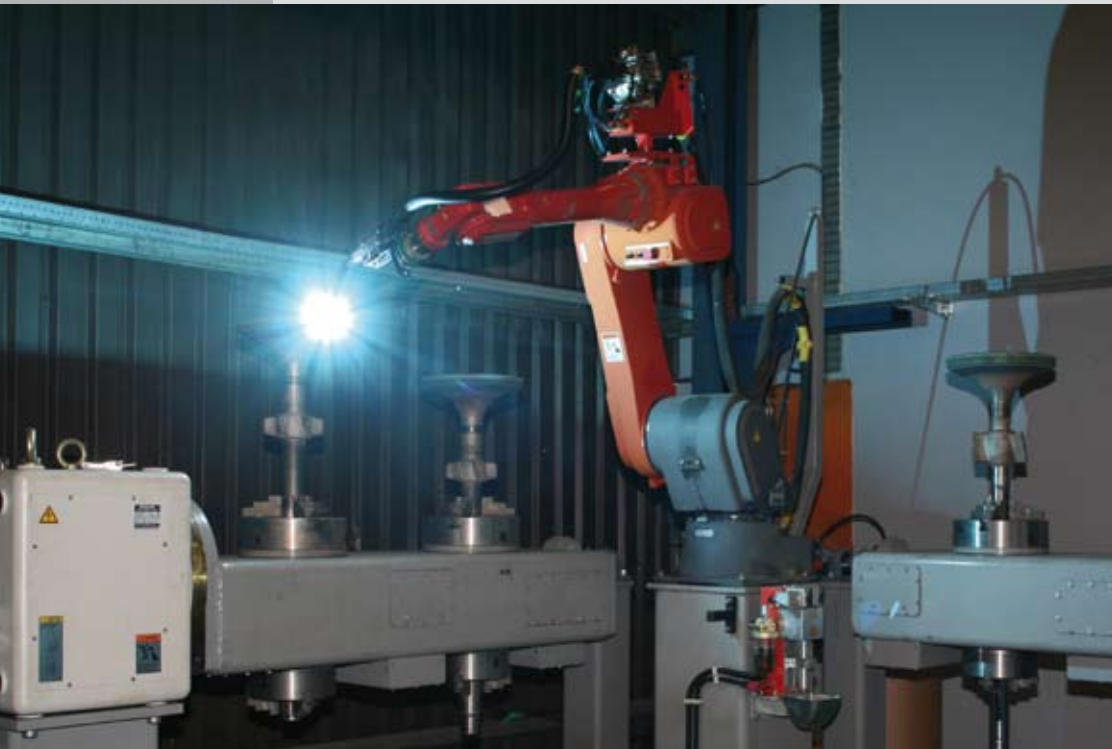


Wartsila and Air Products

Our work together

“Working with Air Products gave us the expertise necessary to achieve our goal: to melt as much weld material as possible as quickly as possible, while maintaining a high quality standard. It wasn’t easy to develop the ideal process, but we are now reaping the rewards and quality is at an absolute optimum.”

Jaap Weber, head of welding at Wartsila Kruijningen





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Wartsila

Wartsila, a Finnish engineering company, provides hi-tech power systems for the power generation and marine industries worldwide. The company's Kruiningen site in Holland is one of six global "reconditioning centres," specialising in reconditioning components for large marine two-stroke engines.

As part of a move to improve efficiency and improve turnaround times, the company installed a fully-automated precision welding system. After installing the first automated system five years earlier, plans were in place to introduce two further systems.

Wartsila realised that when operating automated welding systems without supervision, standard shielding gases may not be sufficient. Instead, the company was keen to explore other ways to improve efficiency and quality by selecting exactly the right gases and distribution systems for each welding application.

"We wanted to use a shielding gas that would enable us to melt as much weld material as possible as quickly as possible, without compromising quality," explains Jaap Weber, head of welding at Wartsila Kruiningen. "When using an unsupervised automated system it is especially important to use precise measurements and controls at every stage, to avoid problems. This includes using exactly the right gas mixture."



Delivering improvements

The marine engine reconditioning centre at Kruiningen in Holland introduced its first automated gas welding system five years earlier in order to test its productivity and efficiency. Since then, two further systems have been installed, which operate unmanned, 24 hours a day. “We have an established team at Kruiningen and our expertise is recognised within our organisation and the wider industry. We are pioneers in marine reconditioning and we are proud to be among the first to use automated welding systems in this way,” said Jaap Weber.

The engine components are typically reconditioned using a submerged arc welding process which removes the worn surface and applies 100-200kg of welding material. Only high quality materials are used and after further machining and surface treatment, the reconditioned part is as good, if not better quality, than a new part. This process uses 2.4mm wires in a twin-arc process to deposit the weld filler material at a rate of 13kg per hour. Where necessary, some components, such as pistons, are reconditioned using a standard arc welding process.

Since installing the automated welding systems, Wartsila has seen a number of improvements. Collectively, the three systems are capable of welding 600-700kg of weld material during a weekend, when the rest of the plant is closed. As a result, the turnaround time has been reduced to six weeks, which is especially important in an aftermarket industry, where demand is not fixed and it is difficult to predict orders more than a week ahead. The systems are also enhancing the quality and integrity of the end product by ensuring that the welding process consistently meets the highest quality standards.

Choosing the right shielding gas

Wartsila sought advice from Air Products at an early stage to help determine the right shielding gases to use, which would allow the automated welding systems to operate without supervision. The company was already aware, for example, that some gas mixtures could cause a build up of silicates if used during long multi-layer process runs. If the build-up was not removed manually, it could cause the system to shutdown.

The Air Products team advised that choosing the correct gas for any MIG or MAG gas welding application can have a significant effect on the overall efficiency of the process, as well as ensuring a more reliable and higher quality weld.

In order to match the right shielding gas to each welding application, Wartsila completed a series of onsite tests using Air Products' Maxx® range of gases alongside other gas products. Jaap Weber, commented: "Tests with other gases produced some reasonable results, but were not good enough to facilitate unmanned operation. In our tests, the Maxx® gases range demonstrated that by far and away it offers the best shielding gases available."

The company selected Ferromaxx® Plus gas for welding steel; Inomaxx® 2 gas for welding stainless steel and Alumaxx® Plus gas for special materials, such as Inconel 625. The Air Products' team provided advice at every stage, recommending that the helium content of Ferromaxx® Plus gas, in particular, would minimise silicate formation.



Hassle-free distribution

Due to the high volumes of shielding gases used, Wartsila opted to install a “microbulk” delivery system – the CryoEase® service. The gases are delivered directly into an onsite storage tank from a distribution centre in Ghent, every couple of weeks.

Before use, the gases are blended to precise specifications by an onsite mixing panel, which means there is a constant stream of mixed gas product available to the automated welding systems, at all times. As a result of the change, Wartsila is less dependent on logistics and operationally, the reconditioning centre is more self-sufficient.

For added convenience, the CryoEase® delivery system is managed and maintained by Air Products’ engineers to ensure it is operating efficiently at all times. Andrew Cornes, CryoEase® system manager at Air Products, adds:

“Microbulk distribution is advised when a plant is using more than about ten large cylinders of a single product a month and in this case, there was enough room for an onsite storage tank. By using the CryoEase® service our customers avoid the need to manage supplies, and therefore improve productivity.”

A relationship for the future

Based on the success of this project, Air Products and Wartsila are looking forward to continuing to work together to deliver improvements and to support the on-going expansion of the reconditioning centre at Kruiningen. Jaap Weber concludes:

“We will probably add more automated welding systems in the next few years in order to meet market demand. We also want to look at ways to continuously improve our systems by further increasing the volume of welding material produced. As for improving quality - it’s already as good as it can be, so all we have to do is keep it that way.”

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