

## Customer Story

# Four Times more Customer Benefits

Innovation in pipe construction: Voith relies on EWM pipeSolution®

## IN A NUTSHELL

### ▶ Advantages at a Glance

- » EWM pipeSolution® – up to four times faster compared to the MMA process: root welding in one operation without backing run
- » Entering new dimensions: MAG welding with pipeSolution® process on pipes with 3,400 mm diameter – wall thicknesses up to 30 mm
- » Flawless welding result – high quality: certified by TÜV Hesse (technical service authority) in welding procedure test according to AD 2000 regulations
- » Performance is significantly enhanced for root welding: automated pipeSolution® achieves 150 to 500 mm per minute
- » Without weld pool backing and particularly efficient: single-V butt welds with included angle reduced from 60° to 50° save several 100 kg of filler wire
- » Very long service life: contact tips M7/M9 in the EWM MT MIG/MAG torch series with special features contribute to overall efficiency
- » The entire welding system from a single source: power source, welding consumables, welding torches, replacement parts and welding accessories

# Welding is our business

Innovation in pipe construction: Voith relies on EWM pipeSolution®



/ Project manager Harald Nirmaier (centre): “We weld the root in one single operation. We are now up to four times faster than before.” Welding engineer Holger Elfert (left): “Welding is our business, ... our trust in EWM grew with the project.” Branch manager Claus Tremmel: “First and foremost, we were impressed with alpha Q’s potential for savings.”

**Mündersbach, 1st of march 2012.** New innovative metal inert gas/metal active gas (MIG/MAG) welding processes based on the potential of highly dynamic, fully digital inverter welding power sources have revolutionised the industry in the past five years. Patented processes such as forceArc® and coldArc® have become synonymous with this technological change, even finding their way into previously strict regulatory provision and standards. Another innovation – pipeSolution® – is on the verge of a breakthrough: Voith Industrial Services GmbH, an industry leader in pipe construction, is taking advantage of the economic and qualitative benefits offered by this innovative system from Westerwald-based firm EWM HIGHTEC WELDING. In the construction of the highly efficient “Block 9” of the Großkraftwerk Mannheim AG (GKM) power plant, the system proved its worth as predicted – it was approved in welding procedure tests carried out by TÜV Hesse. Voith Industrial Services, a division of Heidenheim-based Voith GmbH, is the service partner for key industries worldwide.

Over 19,000 employees at more than 170 locations support clients with exemplary technical services from a single source.

Voith’s Ludwigshafen branch has a key role in the building of Block 9 of the power plant: it is in charge of constructing the pipes for coolant water and district heating. This principally requires the application of all joining processes – TIG, MMA and MIG/MAG. Decisions about which specific processes to use are determined by the pipe diameter and wall thickness, materials and the customer’s specifications. Pipes made of materials P265GH and P235GH have a diameter of up to 3,400 millimetres at wall thicknesses up to 30 millimetres. There are no pre-manufactured elbows for pipes of these dimensions. Everything needs to be built segment by segment and then welded together precisely on the building site – hundreds of welds are necessary for this.



/ A full range of innovative welding processes is utilised for the construction of Block 9 of the GKM power plant: manufacturers Liebherr, Manitovoc/Grove and Wilbert are also using new EWM technologies such as forceArc® and coldArc® for the reliable and cost-effective production of their cranes.

## A new way – more economical and efficient, but no loss of quality

Holger Elfert, welding engineer at Voith, sums it up succinctly: “Welding is our business.” Up to now, MMA welding was required for these pipe dimensions. During the project preparation stage, Voith met Hassan Lakhnati, pipe welding specialist and managing director of the EWM Technology Centre in Weinheim, not far from Mannheim. Lakhnati suggested a new method of joining for the power plant – much more economical and efficient, but with no loss of quality. Claus Tremmel, branch manager at Voith, Ludwigshafen, recalls: “He wanted to interest us in a process that was not permitted under our regulations. But ultimately his arguments for MAG welding with pipeSolution® in connection with probably the most versatile MIG/MAG welding power source on the market at the time – alpha Q – were worth considering.

Lakhnati brought a demonstration machine to the Ludwigshafen plant. In a test setup he immediately proved what he had promised. alpha Q, equipped with a double wire feeder for two different types of filler wire on a roll (solid and flux cored wire), first joined the weld root, then directly welded the filler and final passes. This only required taking hold of the second welding torch and calling up the flux cored wire welding program by pressing a button on the torch. The welding result was flawless, the quality very high. In the concluding welding procedure test according to AD 2000 regulations, TÜV Hesse awarded it its certificate.”

Harald Nirmaier, Voith project manager at the power plant, continues: “Now fully prepared, we presented the new solution to our customers. The practical demonstration even impressed the experts from the power plant; after a test by SLV Mannheim, they gave it their full approval.”

/ Titel: pipeSolution® stands for fast and reliable MAG root welding – manually or automated. Voith Industrial Services is already taking advantage of this new welding process in its pipe construction

## Features and advantages at a glance

alpha Q – this power source offers exceptional quality no matter what the task at hand, be it work on thin or thick metal sheets, or pipes with different variants of weld preparation – from weld roots to final passes. It safely and reliably handles established arc processes like standard MIG/MAG, pulsed, TIG (lift arc), MMA, superPulse welding and gouging – as well as the multiple award-winning joining process, forceArc®. Unique on the global market is also the additional inverter power unit with advanced microprocessor technology for extremely rapid control, which is used to generate the heat-reduced MIG/MAG process variants coldArc® and pipeSolution®. pipeSolution demonstrates its advantages on all panels and pipes in every position: rapid, totally dependable and high-quality MAG root welding, whether for manual or automated work (e.g. with the orbital system pipeTruck), with or without air gap, on unalloyed, low-alloy or high-alloy steels, or with solid and flux-cored wires. The characteristic of the minimised energy short arc impresses with its process reliability and excellent stability. This innovation, in fact, is the only cost-effective alternative to TIG welding, offering TIG quality with MAG speed.

pipeSolution® significantly enhances performance. For instance, the automated process can achieve 150 to 500 millimetres per minute for root welding. These high welding speeds require rapid regulation of the control and power source in order to ensure the arc parameters remain constant. Professionals consider it to be truly unique on the international market.

Other advantages of welding processes where heat transfer is kept to a minimum include increased safety with irregular air gaps (2 to 5 millimetres), minimum distortion, reliable sidewall fusion including



/ The Voith welders learned to handle the new joining process in no time. And they really enjoy their work – three hand movements are enough to set the parameters



/ Coolant water pipes with diameters of up to 3,400 millimetres – welded segment by segment for precision – are constructed using the TÜV Hesse-certified MAG process for the first time



/ Perfect MAG welding in one operation – the program-controlled, reduced energy pipeSolution® process produces the required weld pool viscosity in any position

with misaligned edges up to 1.5 millimetres, no “wire stab” and the fact that no weld pool backing is required.

### Three to four times faster than before

Project manager Harald Nirmaier describes the advantages of the machine and process for his specific application: “After welding the root using the traditional MMA process, we had to gouge the root and use a backing bar. Now we weld the root with pipeSolution® and solid wire in the same operation and weld filler and final passes directly with flux-cored wire.

The reduced-energy pipeSolution® process allows us to attain the required viscosity of weld pool in any welding position. Weld pool backing is therefore not necessary. For the following flux-cored wire welding, we use a characteristics specially adapted to our requirements by EWM. All in all, we are now three to four times faster than before. We also save several hundred kilogrammes of filler wire, as we were able to reduce the sidewall angle of the single-V butt welds from 60 to 50 degrees. Steeper sidewalls mean smaller volumes.”

After the first alpha Q system proved itself in preproduction, six of these systems with double wire feeders have been used on the construction site since March 2011.

### Trust and flexibility from the system supplier

“This step into new welding territory called for a lot of trust on both sides,” says welding engineer Holger Elfert. “Our trust grew along with the project – EWM became more than just an advisor and equipment manufacturer to us. The German market and technology leader is the exclusive system supplier of

all components of the complete welding system – from power source to welding consumables and torches, right through to accessories and replacement parts.”

Claus Tremmel also sees EWM’s flexibility as an important criterion for awarding them the contract for the complete system: “We expect an all-round service at all times. That’s why it’s important for our contacts at the company to be based nearby. Our welding machines are permanently needed – long downtimes are not acceptable. In choosing this system supplier, we reduce the time necessary to replace parts on the one hand, and on the other – and this is very important for us – we have a single contact person who takes responsibility for the smooth interaction of components and quality along the entire process chain. After buying machinery, efficient service like that provided by EWM is absolutely essential.” Other details guarantee complete satisfaction, as Elfert explains: “Even the contact tips contribute to the overall efficiency of the welding systems. Their special features, such as especially long contact surfaces, large threads – M7 and M9 instead of M6 and M8 – and a 30 percent larger cross section on thread undercut compared with standard nozzles all mean our equipment achieves a very long service life.”

### From a novice to a professional in 14 days

Changing over to the new MAG process was also easy for the Voith welders. Although familiar with the electrode and the corresponding welder examination according to BS EN 287, and also equipped with knowledge of pressure equipment directive 97/23/EC, they sometimes felt like novices when it came to MAG gas shielded arc welding. But after a 14-day training programme – led by an EWM applications engineer at the customer’s premises – they

were able to handle their new tools safely and evidently enjoy working with them.

At the end, they took a test of their manual welding skills in the Welding Training and Research Institute, SLV Mannheim. They were then given approval for work in Block 9 of the GKM power plant.

The control of the alpha Q machines makes operation even easier. All welding program required are already stored. The welder simply chooses the parent metal, the welding consumable and the shielding gas, selects the program and the parameters are set.

### An economical system with a promising future

In selecting alpha Q, Voith was also considering future applications, as branch manager Claus Tremmel confirmed: “First and foremost, we were impressed with the potential for savings in terms of time, energy, welding consumables and shielding gas. We had also been looking for a universal machine for all arc welding processes. alpha Q also has the ability to function as the centrepiece in an automated orbital welding system. An additional interface, welding tractor and machine welding torch will be sufficient for conversion.”

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