

## Customer Story

# Quality and Efficiency: Recycling Systems by Bollegraaf

Innovative forceArc<sup>®</sup> MAG welding process recommended by the expert  
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Around the world, the name of the Netherlands-based Bollegraaf Group stands for high-quality mechanical engineering in recycling. Along with solidity, high efficiency is a hallmark of the Bollegraaf recycling systems: of all the systems on the market, they make do with the lowest operating costs per tonne of recyclable material.

To achieve its ambitious sales targets in the coming years, the company is investing in new methods and means of production. In doing so, it is following its belief in quality and efficiency from the very start – separating the wheat from the chaff: for welding, it has chosen the innovative forceArc® MAG process by EWM HIGHTEC WELDING.



/ Centre for successful recycling technology: in Appingedam, a company consciously lives sustainability

**Mündersbach, march, 8th, 2012.** The family-owned business Bollegraaf Netherlands Holding is the umbrella company for Bollegraaf Recycling BV in Appingedam, Bollegraaf Logistics in Rotterdam and Lubo Systems in Emmen.

Its Appingedam factory focuses on recycling systems – from baling presses for waste paper to complete systems for detecting and sorting mixed recyclables consisting of textiles, paper, glass, plastics, biological and other waste.

From here, Bollegraaf exports its machines around the world: the company's main markets are North and South America, Asia – China, India, Japan – and Europe in its entirety. Even in Tahiti, the quality of Bollegraaf systems is renowned. As is the engi-

neering skill that is apparent in all parts of those systems. Designed wholly to meet the requirements of their users, they detect materials by means of laser, infrared, optically and digitally, and are for example able to detect even minute shards of glass and sort them by colour.

Everyone in the company consciously lives its motto of “sustainability”. As Bram Bos, production manager and welding expert in Appingedam, explains: “We are engineers and proud to have the opportunity to place our thoughts and actions in the service of environmental protection. We therefore always aim to design and produce long-lasting systems of the highest quality that also set themselves apart from the majority through their outstanding efficiency. These characteristics don't come free, but they pay for themselves in a very short time.



/ In demand around the world: turnkey recycling systems by Bollegraaf. Solid mechanical engineering and outstanding efficiency

Bollegraaf recycling systems separate recyclable materials with high precision and using significantly less energy than traditional systems, resulting in extremely low costs per tonne of recyclable material.”

Efficient separating systems reduce environmental contamination in several ways: recyclable materials can be collected without first being separated by consumers, which saves energy compared to separate logistics and improves the CO<sub>2</sub> balance of the recyclable materials.

Bollegraaf's success in recent years speaks for itself. For 2012, sales are expected to jump by 20 percent to approximately 65 million euros compared to the previous year. In as little as three years, the company hopes to be reaching for the 200 million euro mark. As Bollegraaf manufactures all mechanical, hydraulic, pneumatic and electrical components itself, production depth is close to 100 percent. Bought-in items are largely limited to optical detection systems. The production manager, who is also responsible for investments within the company, therefore demands quality and efficiency from the company's production machines and plants.

/ In the service of environmental protection: Bram Bos, production manager at Bollegraaf – Bob Kor, foreman automated welding – Bredan Cosgrove, foreman bending and welding processes thin sheets – René Kuipers, Service partner, Kumoweld – Jan Klosterhuis, Welder (left to right)

He notes: “Cutting and welding are the main tasks in our factory. 80 percent of our system components are welded. To ensure that this is done perfectly and economically, we have to separate the wheat from the chaff when choosing a joining technology – and buy machines that deliver quality and efficiency.” In the past, the company created all its welds with the standard MAG process. Just over three years ago, a decision on investing in new welding machines had to be made; a requirements specification was drawn up. Bos remembers: “We discussed it with our welding retailer and service partner René Kuipers of Kumoweld BV, Assen.”

### The tasks:

MAG welding of unalloyed structural steel according to BS EN 10025:

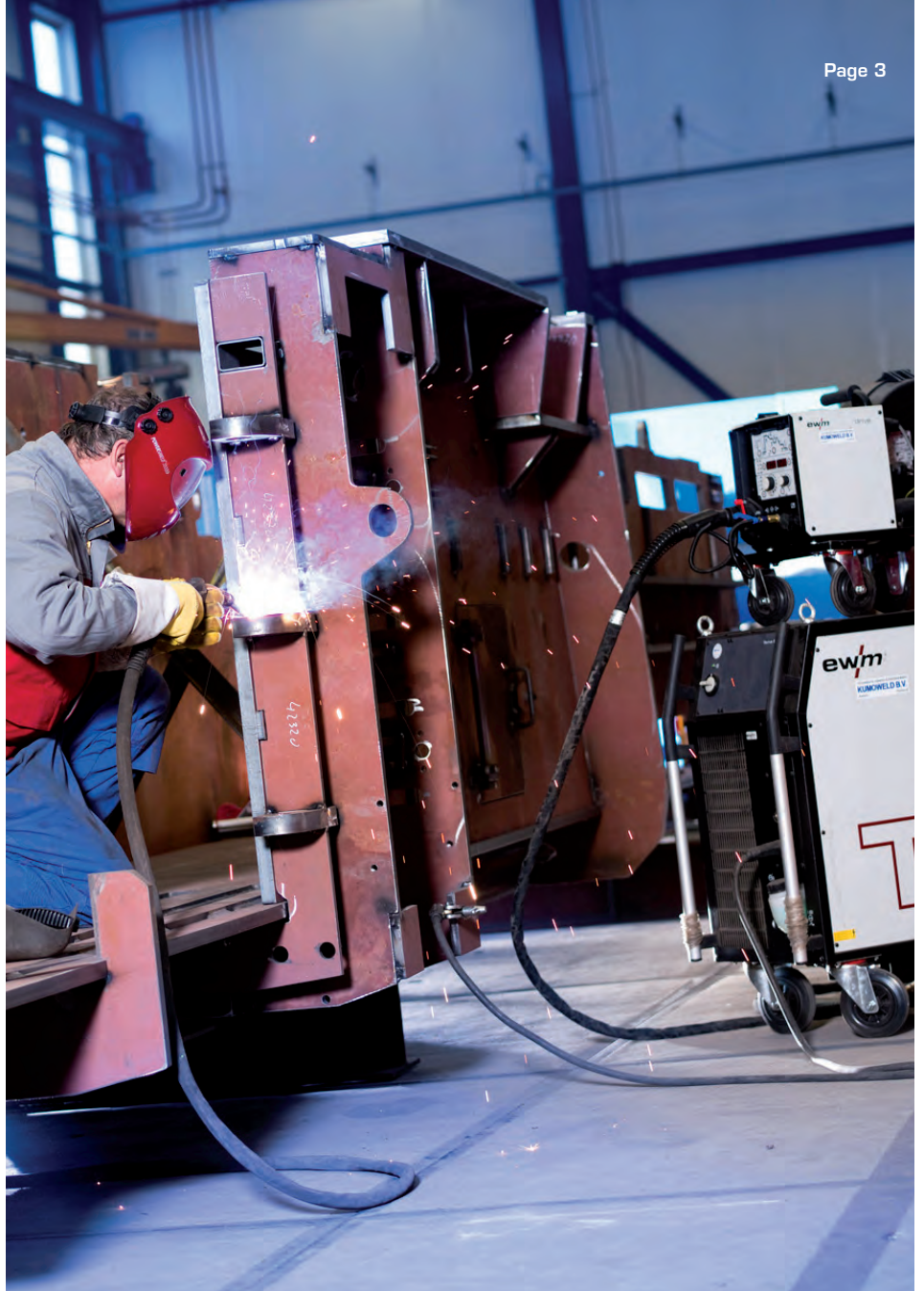
- » S235JR+AR, material no. 1.0038, and S355JR, material no. 1.0045
- » Panel thicknesses from 2 to 200 millimetres
- » Welding consumables – solid wire SG2 and SG3
- » Shielding gas M21 (85 percent argon, 15 percent CO<sub>2</sub>)
- » Weld type – butt weld

MAG welding of especially durable fine-grained structural steel especially for glass sorting systems:

- » Hardox\*) 400, material no. 1.8714, and Hardox\*) 450, material no. 1.8722
- » Panel thicknesses from 3.2 to 130 millimetres
- » Welding consumable SG3
- » Shielding gas M21
- » Seam type – butt weld

Extremely high-quality weld seams, no pores or lack of fusion, and a narrow heat-affected zone for lowest possible joint modification because shaking processes during operation put extreme strain on materials and weld seams.

Hardox\*) = registered trademark of SSAB



/ The Taurus 451 multi-process power source is also suitable for the forceArc® joining process

/ Innovative joining process – powerful welding arc, excellent fusion penetration and excellent sidewall fusion, narrow heat-affected zone, prevention of lack of fusion





Easy-to-operate power source that works well and fault-free both in the lower and the higher power range.

High duty cycle.

Easily manageable and controlled joining process.

The production manager elaborates: “As a universal solution, Kuipers recommended the Taurus 451 MIG/MAG multi-process power source, the workhorse from German market leader EWM in Mündersbach. Equipped with a Synergic control, it is also suitable for the innovative forceArc® joining process. Exactly what we needed for our application – he argued, and promptly loaned us the welding machine for testing.”

That the company’s service partner had hit the nail on the head with his advice was quickly apparent; the welders were impressed with the machine’s ease of use and operation, and the excellent results. Compared to the standard MAG process the company had previously used, the new process convinced them with its powerful, targeted welding arc, excellent fusion penetration and sidewall fusion, narrow heat-affected zone, prevention of lack of fusion, minimal undercuts and spatter.

Directly following the one-week test phase, Bollegraaf rented the first Taurus. Two of these machines have meanwhile replaced the previous devices, and more will be added over the course of the year so that production can keep up with the demand for the Rolls Royce of recycling systems.

Several factors led to this decision, emphasises Bos: in addition to the direct line to EWM, these included the competent advice and outstanding service from Kumoweld.

Retailer and service partner Kuipers is pleased: “Nowadays we recommend almost exclusively machines from the international technology leader, EWM. There are many and more affordable welding machines on the market, but none that are better.”

Bos sums up the advantages of the Taurus-forceArc® combination once more: “The new joining process meets our philosophy of sustainable, environmentally friendly production in all points. We now need far less energy, use significantly less filler wire, and the effort for finishing work is extremely low. Clean weld seams mean fewer errors for us, and less grinding work. The lower heat input into the parent metal reduces distortion, and thus a further unavoidable production step. The effort for the previously required straightening work with the oxyacetylene flame is so low that the throughput time for a recycling machine is up to 1.5 days shorter.”

He puts the cost savings achieved so far through the new welding process at approximately ten percent. But he sees further potential: “We will be starting forceArc® optimised construction this year. This means that we will be changing our seam geometries for the sheets we have to join. For example, when welding at a paper press machine, in the future five welding layers will suffice where we currently still need eight. In all, we aim to increase our efficiency by 25 percent – at a conservative estimate.”

The majority of the 20 welders who work in two shifts at Appingedam come from the Netherlands and Germany, a few are from Poland. Bram Bos has made it his aim to increase young people’s interest in technology in his own country. To this end he visits schools and advertises the opportunities that skilled trades offer. After all, qualified welders are also in demand in Europe’s high-wage countries.

From the middle of the year, Bollegraaf plans to increase the number of welders it employs to approximately 35. In preparation for moving completely to the forceArc® process, the company will be sending all its MAG welders to the EWM technology centre in Weinheim, Germany, for training. Bram Bos is certain that his employees will find it easy to cope with the change: “The

forceArc® process is more forgiving, even for less experienced welders. In contrast to our old welding machines, the result is always similarly good. We used to be able to see the welder’s level of skill directly in the welding result. That always meant a wide range of quality and regular finishing work.”

For the end of the year, Bos already has his eye on a further innovation from EWM: “At the moment we are still welding our roots with a Wega power source. But we have already been looking at the more extensive options offered by the highly dynamic alpha Q power source. Once we have changed our seam geometries from butt to single-V butt welds we could weld everything with this machine – the root passes with pipeSolution®, filler and final passes with forceArc®. All it takes to switch between the individual joining programs is the simple touch of a button on the torch; a special feature with a convenience that no other manufacturer can offer us.”

In answering the closing question about alternative joining technologies and better quality through the use of forceArc®, Bos is quite clear: “There is no alternative on the market for us – the quality is definitely higher.”

**Information:**

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**Images:** EWM HIGHTEC WELDING,  
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**As of:** March 2012