

# Polysoude: the Rolls-Royce of orbital welding

African Fusion talks to Renttech Product manager, Johan Bester, and the company's specialist application engineer for orbital welding, Melvin Gibbs, about the Polysoude orbital TIG welding range, the modern automation benchmark for consistency and control in high integrity tube-to-tube, tube-to-tubesheet and pipe welding applications.

“As part of our drive to bring the latest welding technologies to the Southern African market, we have partnered with Polysoude to offer high quality pipe and tube welding solutions with the necessary infrastructure to support specialised customer projects. Melvin Gibbs has been appointed as the custodian of this product range within the Renttech organisation. With over 20 years of physical welding experience as a contractor using this equipment, Gibbs has a wealth of knowledge on the applications best suited for this equipment,” begins Renttech Product manager, Johan Bester.

Describing orbital welding, Gibbs says it is an automatic and preprogrammed welding solution that involves mounting a rotating TIG welding torch around a stationary workpiece. “Basically, the TIG arc is set to do a 360° orbit around the joint, at an optimised and preprogrammed speed, and with ideal welding parameters saved and locked into a program. This enables perfect repeatability from joint to joint, across the various sectors of rotation, because the

orbital system takes absolute control of all the welding parameters required to deliver that perfectly flat and smooth inside seam,” he explains.

### Ideal for high integrity tubing

Factories producing high purity pharmaceutical ingredients such as vaccines and medicines must ensure that the inside surface of every connecting tube is perfectly flush and smooth. “This is essential to avoid bacterial growth on the inside surface of a tube, which will inevitably occur wherever a burr or any surface roughness provides an anchor for organisms to latch onto and grow.

“This also true for the food and beverage industry. Renttech was recently invited to demonstrate these solutions at the Food science department of the University of Stellenbosch, speaking to the specific welding needs and pitfalls for this industry,” Gibbs tells AF.

Other applications include automotive paint plants, where the piping must have perfectly smooth root seams for a differ-



Specialist application engineer for orbital welding, Melvin Gibbs, develops a Polysoude orbital welding solutions in Renttech's Application Centre in Wadeville.

ent reason: “Every time a painting booth changes colour, every single droplet of the previous colour must be flushed out so that it does not taint the new colour. This is an area that is often dominated by European contractors, but it can be done by South African companies if they have the right equipment and technical support.

“The processing of human blood for the medical industry is another area where manual welding is not permitted, as well as some nuclear applications. It is in critical applications like these that orbital welding comes into its own,” Gibbs tells AF.

For the tubes used by plants such as these, an orbital head with a closed chamber containing the shielding gas is typically used. “The wall thickness of the tube is typically 1.5 to 2.0 mm, and we can offer closed-chamber systems for welding tube diameters of between 6.0 mm and 115 mm.

“High currents are not often needed for these applications, particularly when welding stainless steels, because the heat input needs to be tightly controlled to prevent depleting the nickel content and destroying the corrosion properties offered by these materials. Having a welding program specifically set for the ideal heat input is a great value-add for fabricators of stainless-steel tubing, because it offers much better control of the heat, penetration and root bead consistency,” he says.

Achieving a perfect root seam inside a stainless tube also requires the inside of the tube to be purged with an inert gas such as argon to prevent oxidation around the heat affected zone. “We are the distributor for Huntingdon Fusion Techniques (HFT), which specialises in purging and oxygen

monitoring systems,” he adds.

Another area that is critical to the success of the orbital weld is the quality of the weld preparation. “Here we have partnered with PROTEM as they have a vast array of prepping and cutting solutions that cover challenging automated as well as manual welding tasks. Joint preparation as well as fit-up, is a critical step that cannot be ignored as it is often the difference between success and failure,” notes Gibbs.

### Open welding heads for thicker pipe

On the power side, for manufacturers of OEM package boilers, heat exchangers and pre-fabrication pipework components, fabricators may need to do over thousands of tube-to-tube butt welds – in a workshop at ground level. “In these high volume, well controlled environments, we can really see orbital welding shine,” continues Gibbs.

Where the tubes have thicker walls with larger diameters, Polysoude offers open welding heads, which travel around a ring clamped onto the pipe. “These are available for diameters from 8.0 mm to 275 mm (10-inch). Wire feeding is available for the fill and capping runs where multiple passes are required to complete the joint; and advanced features such pulse and double pulse TIG are part and parcel of the offering,” says Gibbs.

In addition, he says Polysoude offers a full tube-to-tube-sheet portfolio for use on heat exchangers.

### Technology that makes a difference

“There is this international perception that these advanced solutions take away jobs; cause strained relationships with labour; and that they are difficult to implement. For us it is very important to close that loop, so that both the operator on the shop floor, company owners, and their clients are part

of the solution,” Gibbs continues.

Everyone involved needs to understand the value and see the progress that these systems can deliver. These technologies also open up markets both locally as well as abroad, ensuring local fabricators can diversify their customer base across various sectors and economies, whilst growing the South African manufacturing offering. “Just think about the oil and gas in neighbouring countries such as Angola and Nigeria, Tanzania, Mozambique, and Namibia to name but a few. Most of these countries are currently serviced by non-South African firms when it comes to orbital solutions,” he points out.

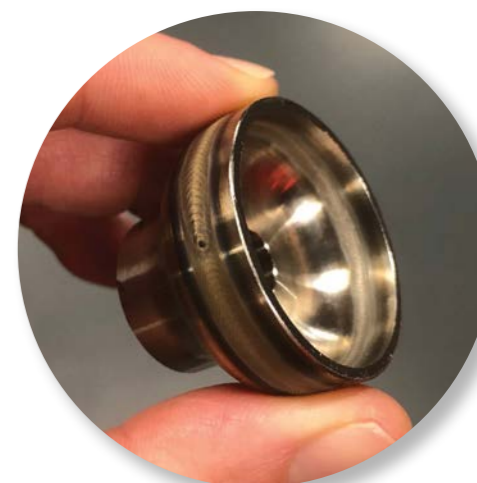
Renttech is putting the right systems and infrastructure in place to support Polysoude orbital systems, so that South African fabricators are able to successfully use the equipment. “The South African market tends to look for European assistance when having to use technologies such as these, but we now have the infrastructure to offer a complete range of Polysoude solutions, including procedure development, training, technical support, and after sales services from our applications centre in Wadeville – and through our 12 branches across South Africa.

“Renttech and our customers also have full access to the Polysoude group of technical engineers as well as welding specialists based in Nantes France for establishing a best solution for an application,” Gibbs assures.

“While it is easy to imagine the advantages of orbital welding, the feasibility of using the technology is also vital. People who have never used it before do not know the limitations or the full capabilities of orbital welding,” he continues. “We have that experience in-house, so it is very easy to zero in on areas of concern and/or exciting application possibilities. Advanced technology is expensive, so those who buy into it need to clearly understand where it is feasible and where is not,” he adds.

### Application development steps

Johan Bester goes on to outline the steps involved in developing and proving an orbital welding solution: “The first step is for us to have a look at the application to prove that the product can be successfully welded using a Polysoude orbital system. If it is, then we can organise a demonstration, either in our applications centre or at a client site depending on the complexity of the project. If the application is outside our area of expertise, we get the relevant specialists at Polysoude involved.



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“After that, we need to involve the operator, which is not necessarily the buyer of the equipment, to become familiar and comfortable. If this is successful, we will do specific application development, putting together formal qualification requirements (PQRs) and welding procedures (WPSs) for the specific tasks the equipment will be doing.

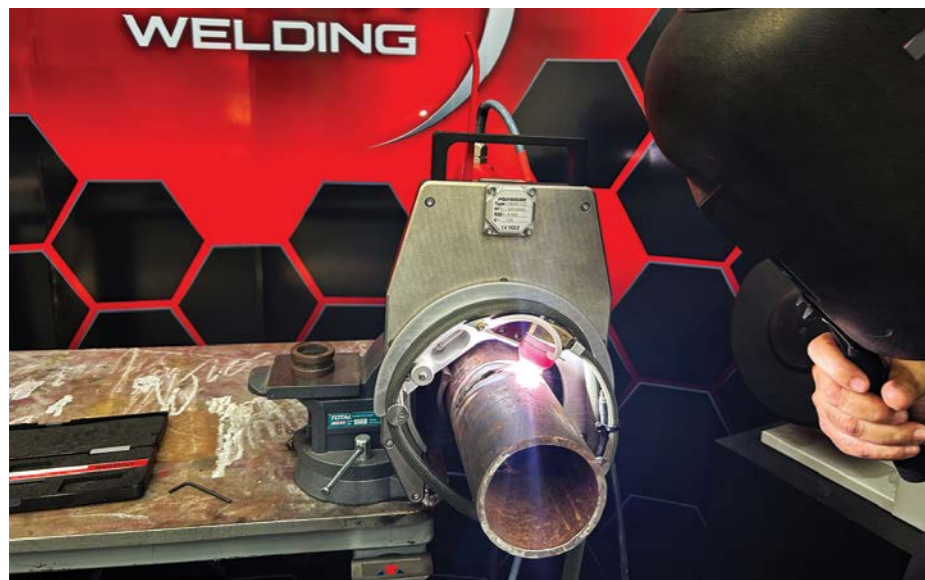
“We then follow through with after sales support: supporting the users in applying the technology during the first few weeks of operation – and we will continue to pop in until we are sure the client is self-sufficient. Over time, consumables and spare parts are likely to be needed and, if something does go wrong, it is important for us to respond quickly to address the problem so that production can be resumed without delay.

“Once people become comfortable with the technology, they are likely to recognise new orbital welding applications,” continues Gibbs. “And because of the versatile modular approach adopted by Polysoude, it is easy to modify an existing system, perhaps with different orbital heads, so that it can be used for the next project, and the next,” he says, adding: “Several customers have installed additional systems because they realised where orbital welding can add value and have therefore taken on more of this type of work.

“Polysoude is without a doubt the global leader in orbital welding solutions, and we are proud to be able to bring this product range to South Africa and to localise this state-of-the-art technology for the benefits of our customers and the industries we serve.

“This is an exciting product range with a lot of suitable applications in the Southern African market,” concludes Melvin Gibbs.

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