

Nozzlefuse 26 and Nozzlefuse 624

The onsite automated solution for ID nozzle repair and upgrade



The WSI solution to repair and upgrade nozzles from 2 to 24 inches is delivered by an ID automatic welding system

Using our Unifuse® process enables us to build up wall thickness to restore the pressure boundary and to apply an improved metallurgy to reduce the effects of corrosion or the combined corrosion/erosion process. To overcome the potential problems affecting nozzles in vessels, such as wall thinning, pitting, cracking and corrosion/erosion issues, WSI offers a repair or upgrade using automated weld overlay technology.

The key advantage is that our automated weld overlay technology delivers consistent quality by ensuring the lowest dilution, thereby delivering the highest quality possible.

A unique solution

Our constantly updated R&D program has developed a unique solution to achieve the best results. By integrating hot wire TIG technology in our Unifuse process, a highly efficient automatic welding equipment operated and maintained by our well-trained welders and technicians, this ensures consistent quality while still controlling the schedule.

WSI ID nozzle solutions

A complete solution for nozzles within a range of 2 to 24 inches

Nozzlefuse 26™ - 2 to 6 inches

Unifuse GTAW process for ID weld overlay up to 750 mm length

Nozzlefuse 624™ - 6 to 24 inches

Hot wire Unifuse GTAW for ID weld overlay up to 750 mm length



MIG speed with TIG quality

Benefits of our automated hot wire TIG technology integrated into our Unifuse process:

- Control of parameter for consistent results
- Deposit thickness adjustable for better control of chemistry
- Reduced and controlled dilution rate
- High deposition rate gives high welding speed
- Clean deposit: no slag, no spatter
- Weld overlay can be applied to the nozzle in any position

Hot wire welding technology for ID nozzles

By combining hot wire technology with GTAW, deposition rates can almost approach that of MIG. More wire can be deposited and fill rates are increased with the added benefit of weld quality as good as – or in some cases better – than with cold wire GTAW.

In hot wire welding technology, the heat input to the base metal is reduced to the minimum just to create fusion with the surface, then the rest of the heat is drawn directly onto the wire. In this way, it is possible to achieve a travel speed several times faster than the usual GTAW. Filler wire is resistance-heated until close to the melting point and then added to the weld puddle, which stops the weld pool chilling and allows the filler metal to flow constantly, thereby resulting in a smooth, high-quality bead.

Key features of our Nozzlefuse™ technology

- Nozzle type: Forged, Seamless and EBW Pipe
- Weldable nozzle materials: Carbon and Alloy steels (ISO15608 Group 1, 5, 8, 9, 10; ASME P1, P4, P5A, P5B, P8, P10H, P42, P44, P45)
- Nozzle sizes: 2 to 24 inches
- Maximum nozzle preheat: 250°C
- Maximum depth of nozzle: 750 mm
- Nozzle orientation: Top head, side, bottom head, and any angle in between.
- Corresponding welding positions: ISO PC, PE, H-L045/J-L045 and ASME 2G, 5G, and 6G



Automated nozzle repair in the field



Mock-up using Nozzlefuse 624

Automated process and parameter control

Process control is the key for successful, cost-effective weld overlay. It enables the operator to have 'real-time' control, to improve the reliability of the welding process and simultaneously maintain the highest levels of welding overlay speed. The automated process is also an important improvement in maintaining a constant quality standard.

A further benefit is that the remote video control camera is also helpful for accurate visual inspection and even for PT test and repairs if needed.



Nozzlefuse 624: The built-in camera provides real-time visual control of the overlay



Nozzlefuse 624: Control pendant: Robust parameter control for ease of use



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