

# Automated weld overlay for corrosion protection: towers and vessels





# Improve the mechanical integrity with reliable and cost effective solutions

## Comprehensive tower and vessel service

As a leading provider of specialized field services, Sulzer is a global expert in plant retrofits, upgrades and maintenance services. With over 40 years of experience in enhancing tower and vessel performance, we offer our customers safe, cost-effective and reliable solutions from specialized and qualified engineering teams.

## Weld overlay capabilities

During your downtime periods, we can quickly mobilize our specialist teams for specific repairs and corrosion protection projects that require weld overlay. In addition, we offer comprehensive services, including internals maintenance, revamping or other installation activities.

## Vessel shell overlay repair and corrosion protection

We offer an advanced, automated welding process to repair corroded or eroded areas. By rebuilding the worn area, we can restore an acceptable material thickness and improve the corrosion resistance by using alloys that can withstand harsh conditions.

Typical applications of weld overlay that we can support include: towers, separators, coker drums, reactors, tanks, digesters, heat exchangers and more.



# CladFuse™ automated weld overlay process

CladFuse is an advanced automated welding technology that offers an effective and commercially viable protection for towers and vessels against base material thinning caused by corrosion and erosion. It provides a long-term and reliable protection whilst preventing future costly unplanned outages and parts replacement.

Key features of the CladFuse™ weld overlay process are:

- Vertical down and overhead welding positions
- Predetermined weld bead pattern
- 50% overlap of beads
- Continuity of beads
- Minimum iron content
- Pulsed gas metal arc welding (GMAW-P) and pulsed gas tungsten arc welding (GTAW-P) processes supported
- Controllable and minimal dilution rates, <10%
- Accurate control of operational parameters to achieve high-quality overlay claddings
- >2 mm weld overlay thickness
- Optimal material deposition
- High speed performance that slashes downtime
- Wide range of suitable alloys, including 625 Inconel, 300/400 series stainless steel and C276 Hastelloy
- Elevated pre-heat operational capability



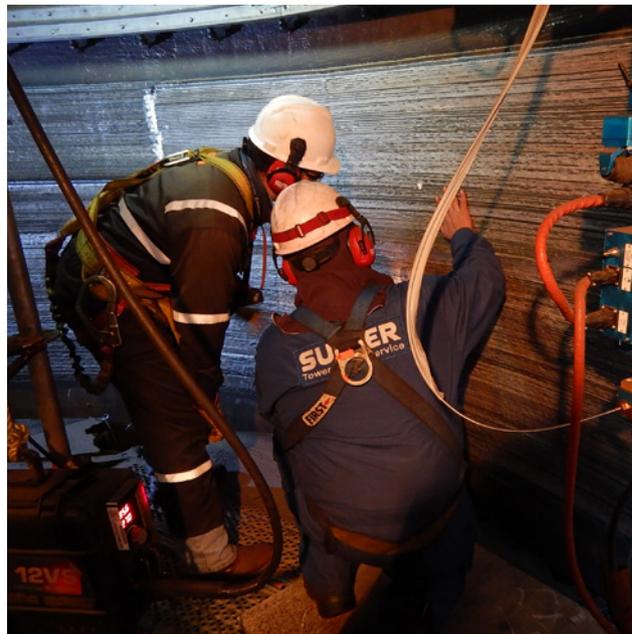
# We do what we say

## Project evaluation and planning

Sulzer conducts comprehensive project preparation and planning activities in cooperation with our customers. In this way, we can offer the most suitable solution that satisfy customers' requirements, as well as achieve the highest safety and quality standards.

## On-site nozzle repair, upgrade and replacement

Our state-of-the-art automated welding equipment can support small bore cladding and spiral cladding with welding diameters as small as 55 mm to 800 mm (2" to 31.5") and up to 1.6 m (63") deep in 2G, 5G and 6G configurations. Alternatively, we can completely replace the nozzle with a new one with higher corrosion resistance. This is manufactured by weld overlay processes in our facility and then installed on-site by our field service teams.



## Surface preparation

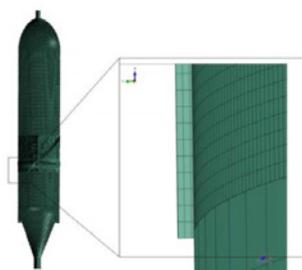
Sulzer's high-quality weld overlay service is designed to meet our customer's specifications and consistent Quality Assurance (QA) standards while working safely.

## NDT and inspection services

After the inspection of existing overlays or the completion of a weld overlay project, our level II and/ or level III QA inspectors will provide a comprehensive report on the work conducted. This will also discuss the Non-Destructive Testing (NDT) activities performed.

## Finite Element Analysis

As part of our service we can conduct a Finite Element Analysis (FEA) to calculate the shell characteristics during welding demonstrating minimal deformation and integrity of the vessel.



# Your ideal service partner

## Qualifications

We hold a comprehensive range of welding certifications from ASME, the National Board of Boiler and Pressure Vessel Inspectors, and the European Committee for Standardization. These attest to our ability to provide a complete range of welding services that satisfy various needs.

In addition, we ensure a quality service by adhering to ISO 9001 – Quality Management, ISO 3834-2 - Quality requirements for fusion welding of metallic materials, and AD 2000-Merkblatt HPO standard on the design, manufacture and testing of pressure vessels.



## Sulzer's comprehensive weld overlay offerings

Sulzer offers a wide range of automated weld overlay services for both onsite and offsite maintenance.

Common applications include:

- Nozzle ID welding
- Tower and vessel overlay
- Coker drum overlay
- Boiler waterwall membrane panels
- Boiler tube overlay
- Pipe and fittings
- CRA pipeline ID overlay welding

Sulzer is able to apply weld overlay to a broad range of equipment:

- Towers and vessels
- Reactors
- Separators
- Coker drums
- Heat exchangers
- Digesters
- Coal-fired boilers
- Waste to Energy boilers
- Biomass boilers
- Furnaces
- Storage tanks
- and more...





Sulzer has a global network that is well placed, equipped and experienced to service any needs and requirements from our customers.

Our facilities are located around the world with service facilities in:

- USA
- Canada
- Mexico
- Brazil
- UK
- Germany
- Saudi Arabia
- India
- Thailand
- Singapore
- China
- Australia

Each service facility has the capability to meet the demand of the local market, supported by the skills and expertise of the entire organization, including Sulzer's vast network of engineers and technical experts.

By mobilizing our resources, we have the ability – supported by a proven track record – to execute projects all around the world.



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