

# In-situ Sealing of SF6 Gas Leak on GIS Equipment Using Belzona SF6-Fix System

ID: 10232

Industry: Power  
Application: GSS-Gaskets, Seals and Shims  
Substrate: Carbon steel  
Products: Belzona 1983 (SuperWrap II), Belzona SuperWrap, Belzona 5721, Belzona 7311, Accessories

Customer Location: Saudi Arabia  
Application Date: February 2026

## Problem

A significant SF6 gas leak developed on a GIS unit, resulting in a continuous pressure drop that compromised the system's operational integrity.

The severity of the leakage led to a forced outage of the unit. During this period, the client incurred financial penalties due to reduced power generation capacity.

Repeated attempts to replenish SF6 gas were unsuccessful, as system pressure could not be maintained, preventing the unit from returning to stable operation.

Inspection confirmed multiple leakage points across several GIS flanges, indicating a widespread sealing issue rather than a single-point failure.



Surface preparation of bond areas in accordance to SSPC-SP 11 using MBX Bristle Blaster.



Application of Belzona 7311 on breather membrane.



Application of Belzona 9371 reinforcement sheets wet out with Belzona 1983 SuperWrap II resin.



Application of Belzona 5721 UV-resistant topcoat.

## Application Situation

The unit was operating under critical service conditions, where prolonged downtime would continue to result in escalating financial penalties and operational losses.

A conventional repair would have required full system shutdown procedures, including SF6 gas recovery, dismantling of multiple flange connections, replacement of sealing components, and complete system recommissioning. Given the extent of leakage across multiple locations, this approach would have been time-intensive and costly, significantly delaying the return to service.

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ISO 9001:2015  
FS 695214  
ISO 14001:2015  
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Under these circumstances, there was a clear need for a rapid and effective in-situ repair solution that could be implemented without extensive disassembly, minimizing downtime and allowing the unit to be returned to operation as quickly as possible.

## Application Method

The repair was carried out in accordance with the Belzona SF6-Fix system leaflet GSS-14.

All bond areas were prepared to SSPC-SP 11 standard using an MBX bristle blaster, and surfaces were cleaned to remove contaminants.

A breathing tube was installed on each SF6-Fix repair using a 3D-printed holder to secure it in place.

Backing rod was installed in between the gaps of the bolts on the flanges to create a level surface.

A polypropylene based, needle-punched nonwoven geotextile breather membrane was applied to encapsulate each of the flanges and anchoring around the breathing tube.

Belzona 7311 was applied directly to the breather membrane and prepared bond areas until all surfaces were fully encapsulated. Pre-cut Belzona 9341 reinforcement sheets were then wet out with 7311 and applied across the repair area, maintaining 50 % overlap to ensure full coverage. Additional 75 mm strips of 9341 were applied circumferentially around the flange and along the bond edges, as well as around the breather tube. A further layer of 7311 was applied over the reinforcement sheets to provide a smooth, complete finish.

Next, larger Belzona 9371 (250 mm) reinforcement sheets were saturated with Belzona 1983 SuperWrap II resin and applied over the repair area with 50 % overlap, smoothing out air bubbles and creases. Pre-cut 80 mm 9371 sheets were then saturated and wrapped circumferentially around the flange ends and breather tube to secure the system. This process was repeated until five complete layers of 9371 had been applied. Finally, a top layer of 7311 was applied to fully encapsulate the wrap.

The repair was finished with a UV-resistant Belzona 5721 topcoat to protect against environmental exposure.

## Belzona Facts

The Belzona SF6-Fix repair provided a rapid, in-situ solution that prevented further downtime and avoided substantial financial penalties. The GIS unit had been experiencing a forced outage, resulting in penalties of approximately \$30,000 per day. By implementing the Belzona repair, the leaks were addressed quickly without the need for full system shutdown, eliminating ongoing losses and returning the unit to operation in a fraction of the time required for conventional methods.

Traditional alternatives would have required gas recovery, mechanical dismantling of multiple flanges, replacement of gaskets, and re-gassing, resulting in extended downtime, higher labor costs, and additional logistical challenges. In contrast, the Belzona approach allowed all work to be performed directly on the unit in service, reducing labor, materials, and operational impact.

Belzona was chosen because it enabled full encapsulation of all leak points, adherence to the substrate, and rapid curing under ambient conditions, providing a durable and long-lasting seal. The solution was cost-effective, minimized operational disruption, and ensured the GIS unit could resume service safely and efficiently, highlighting the advantage of using Belzona for critical in-situ SF6 leak repairs.

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