

# BELZONA FULLY SEALS FLANGE BETWEEN KAPLAN TURBINE AND SPIRAL CASING

ID: 5846

Industry: Power  
Application: GSS-Gaskets, Seals and Shims  
Substrate: Cast Iron & Stainless Steel  
Products: \* Belzona 1111 (Super Metal) ,  
\* Belzona 1321 (Ceramic S-Metal) ,  
\* Belzona 2131 (D & A Fluid Elastomer) ,  
\* Belzona 2941 (Elastomer SP-Conditioner) ,  
\* Belzona 9411 (Release Agent) ,

Customer Location: Hydropower Station, Aschbach, Austria

Application Date: July/August 2010

## Problem

A new larger turbine runner, which has recently been built to increase the turbine output, required the installation of a new turbine casing that required welding. The heat generated from this process caused the turbine casing to become distorted and a circumferential gap of between 2.8 mm to 4.6 mm appeared between the two mating flanges.



## Photograph Descriptions

- \* View of the Kaplan Turbine; A) stay vanes, B) spiral casing, C) circumferential gap, D) turbine runner output, 85 MW ,
- \* Surface preparation with the dust-free vacu-blast system ,
- \* Tape used to prevent overflow and to ensure gap was fully injected with Belzona 2131 ,
- \* Completed repair with Belzona 2131 on inside section of gap ,

## Application Situation

Flange between the turbine and spiral casing.

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ISO 9001:2015  
FS 695214  
ISO 14001:2015  
EMS 695213

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## Application Method

The surface in and around the gap was prepared by grit blasting to ensure a minimum profile depth of 90 microns. The next step was to insert a foam backer rod into the gap to prevent Belzona 2131 from flowing into the outer section. In order to achieve the best adhesion possible, the surfaces had to be pre-treated with Belzona 2941. The injection nozzle was elongated with a flexible straw to ensure that Belzona 2131 could be injected into even the smallest area. The injection method was carried out and after cure, which in this case needed three-and-a-half days, the tape was removed and Belzona 2131 was faired level to the metal surface. The outer gap was then prepared for the injection of Belzona 1321. 96 bolt holes were injected with Belzona 1321 and the edge was then sealed with Belzona 1111 to ensure no overflow would occur. The bolt was treated with Belzona 9411 which ensured that the bolt could be removed easily after curing. Once fully cured, the release agent bolts were replaced by the originals and the flanges could be mated together without unnecessary stressing and the casing joint was now fully sealed.

## Belzona Facts

The Belzona repair was carried out in-situ and provides a long-term solution for the hydropower station with additional cost-saving benefits because no new components would need to be fabricated.

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