

Silicone-Based Adhesive Technology

Leakage Mitigation for Reactor Cavity Liners and Transfer Canal Liners

Proven adhesive bondings qualified to provide repairs or preventive solutions

Challenge

The integrity of liners used in reactor cavities and transfer canals has to be maintained throughout the whole life time.

Stress corrosion cracking (SCC), mechanical or thermal stress, weld failures and mechanical impact are causes for leakages. Operational experience proves that SCC is the main reason for leakages; usually it occurs in the heat-affected zone near the weld.

Leakages causes radioactive contamination of concrete structures and groundwater resulting in high decommissioning and dismantling costs.

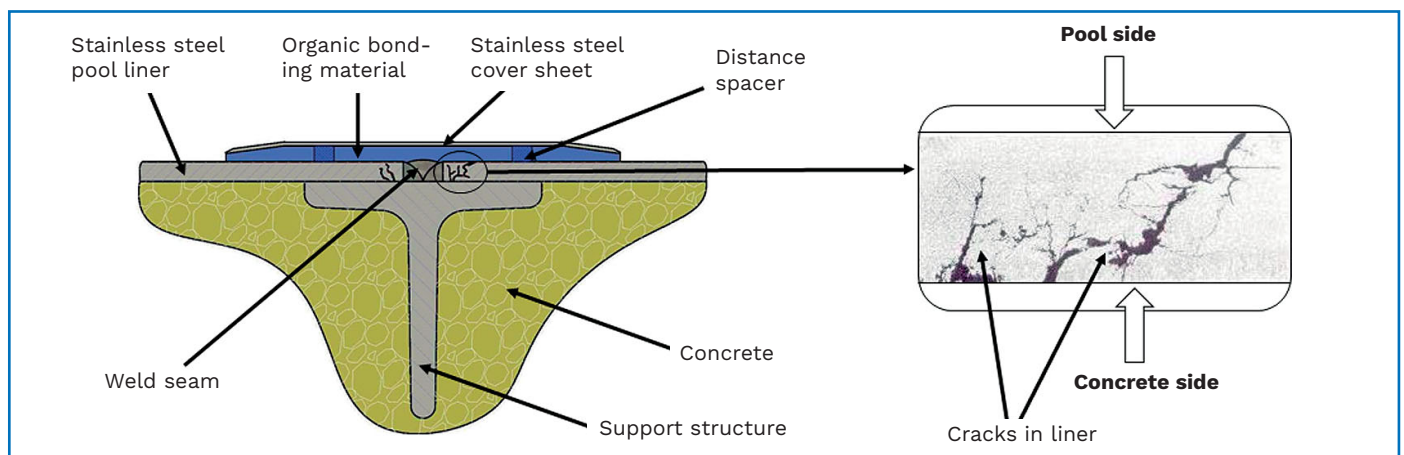
Solution

Our leakage mitigation technology seals leaks and prevents further leak propagation. During adhesive bonding application, the existing liners are not affected by additional heat input, which is essential in order to avoid new heat-affected zones.

The so-called “sandwich construction” is deployed for leakage repairs. The sandwich consists of an adhesive material and a stainless steel cover sheet. The adhesive material seals the leaks, does not affect the base material, is not affected by SCC, is highly radiation resistant and does not cause new SCC. The stainless steel cover sheet protects the adhesive material against mechanical damage.

Customer benefits

- Permanent repair
- More cost- and time-effective repair method than welding
- Zero leakage of contaminated water
- Nuclear qualified repair methodology
- Refurbished areas are resistant to future corrosion
- Adaptable to a wide variety of possible applications due to the use of a flexible and extendable manipulator system, if necessary
- Limited access and high radiation areas can be repaired
- Dry and underwater repair capability



Typical structure of the sandwich technology and failure mode

Your performance
is **our** everyday **commitment**

Technical information

- Silicone adhesive
- Radiation resistance: up to 3 MGy
- Temperature resistance: up to 150°C
- Crack bridging: up to 1 mm
- Media: air, demineralized, water, coolant, sea/river water,
- Adhesive material does not leach detrimental substances to the surrounding media
- Existing material structure is not affected by the repair
- Excellent decontaminability
- High flexibility and good adhesive force
- Product has been approved by European and Japanese authorities

Other fields of application

- Tube sheet repair
- Repair of piping without cutting and welding
- Lining of building compartments
- Nozzle repair
- Crack repair in tube sheet
- Flange repair at tanks
- Expansion joint repair
- Tank repair

Key figures

6,500 linear meters of weld seams have been treated in reactor cavities, spent fuel pools and transfer channels

0 leakages have been reported after application of our adhesive technology

More than **70** applications worldwide

Almost **30** years global experience



Repair examples: tubesheets, retaining clamps, lining, pipe nozzles, flanges and expansion joints



Reactor cavity repair: all welded joints were covered as a preventive measure



Sealing of wall penetration in an epoxy painted reactor cavity

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