



A technology by:



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TRIPLE LAYERED CUI PROTECTION

A SINGLE SOLUTION TO PROVIDE A COMBINATION OF
BARRIER AND CATHODIC PROTECTION TO INSULATED PIPING

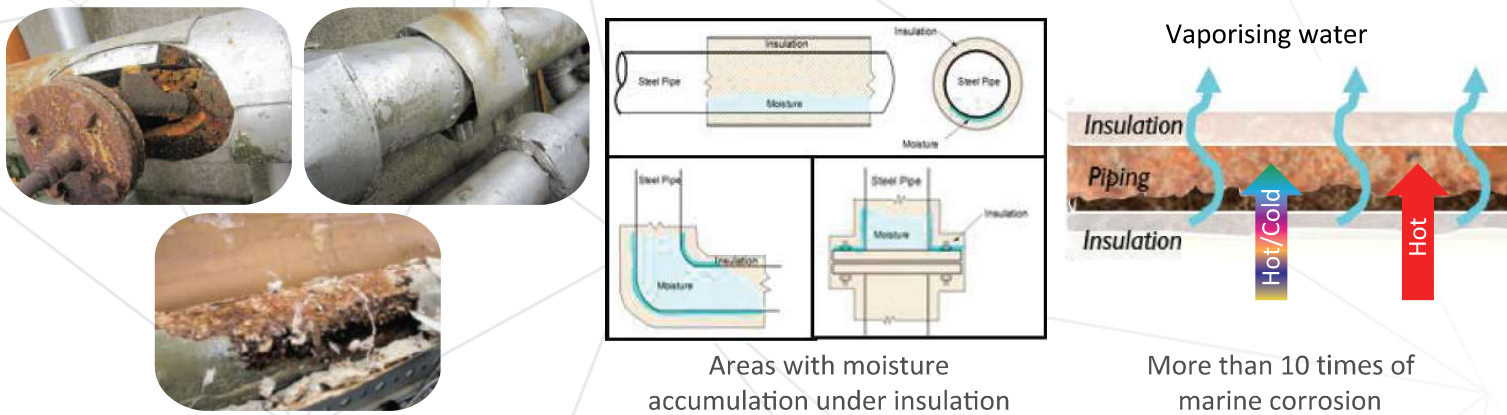


A technology by **NANOVIZ**

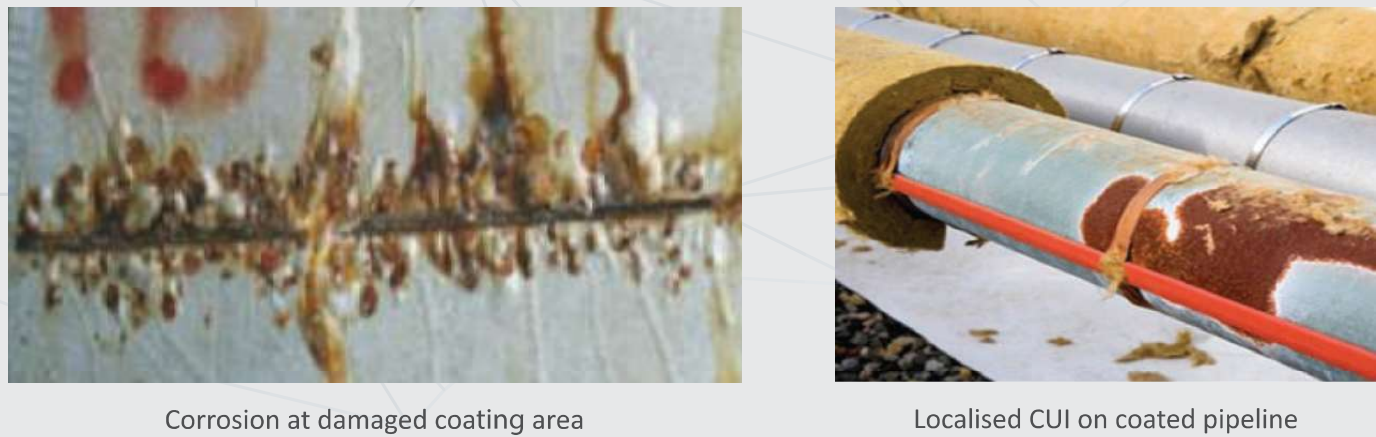
CORROSION UNDER INSULATION (CUI)

A hidden threat with catastrophic effects caused by water between pipe and the insulation material

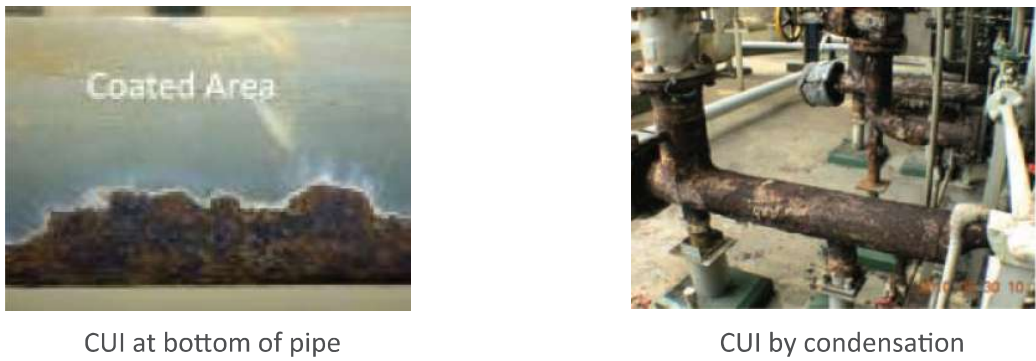
CUI CAUSED BY INGRESS OF WATER FROM DAMAGED INSULATION



CONVENTIONAL CUI COATING FAILURE



FAILURE OF COATING IN HIGH TEMPERATURE WATER (WET HEAT)



COMPARATIVE TECHNOLOGIES FOR CUI PROTECTION

	Thermal Spray Aluminum	Epoxies	Inorganic Zinc	IPN Silicones	TRIZASHIELD
FEATURES					
Prevention Mechanism	Barrier	Barrier	Galvanic anode	Barrier	Barrier & Galvanic Cathodic
Components	1	2	1	Multiple	3
No. of protection Layers	1	1	1	1	3
Cyclic Temperature	May cause internal stress	Poor	Good	Good	Good
Cryogenic in Cyclic Temperature	Good	Poor	Poor	Good	Good
Service Life	25 to 30 years with 100% proper application	Varies with temperature and depending on existence of coating holidays	Varies with temperature (Max. 5 years)	3 to 10 years	Up to 50 years (Adjustable)
Chemical Resistance	Limited	Good	Limited	N/A	Good
Damage Resistance	No	No	No	No	Yes
APPLICATION					
Minimum Surface Preparation	SSPC-SP 10 Near-White Blast Cleaning (100%)	SSPC-SP 10 Near-White Blast Cleaning	SSPC-SP 6 Commercial Blast Cleaning	SSPC-SP 6 Commercial Blast Cleaning	SSPC-SP 2 Hand Tool Cleaning
Specialised equipment requirement	Yes	Yes	Yes	Yes	No
Level of skill required	Very high	High	High	High	Low
Application Rate (Including Surface Preparation)	Medium	Slow	Slow	Slow	High to medium depending on piping surface condition
Requirement of safety monitoring	Yes	No	No	No	No
Application in congested area	No	No	No	No	Yes
Maximum application temperature	Min of 10°C for sealer	150°C	Below 60°C	120°C	≤100°C
MAINTENANCE AND INSPECTION					
Partial reparability	Very difficult	Very difficult	Difficult	Very difficult	Easy
Application	Very High	High	Medium	High	Low
Material	Low	High	Medium	High	Medium

APPLICATIONS

Industries

- Petrochemical
- Power plant
- Oil & Gas
- Fertiliser
- Chemical
- Geothermal



For New Facilities

Application of Trizashield saves capital expenditure and reduces maintenance costs.

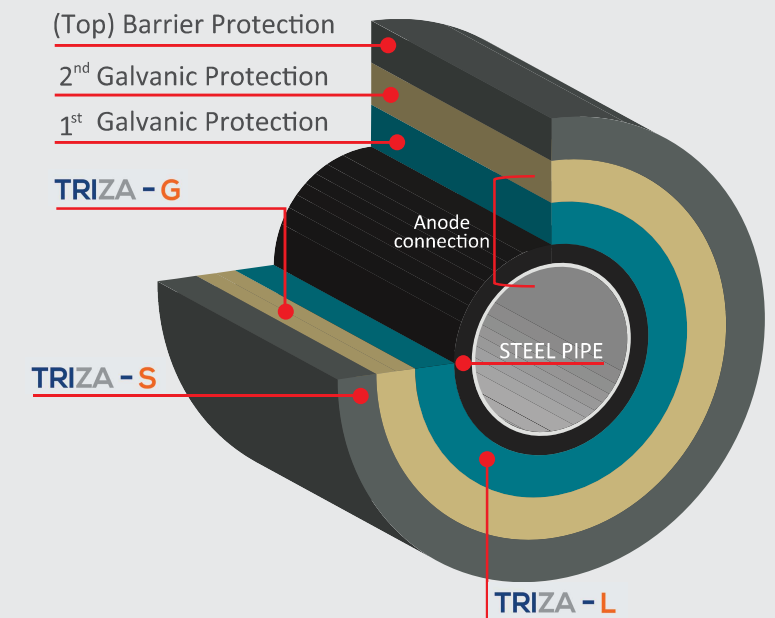
For Existing Facilities

Reliable, long-lasting, efficient and cost-effective solution compared to traditional CUI protection systems.

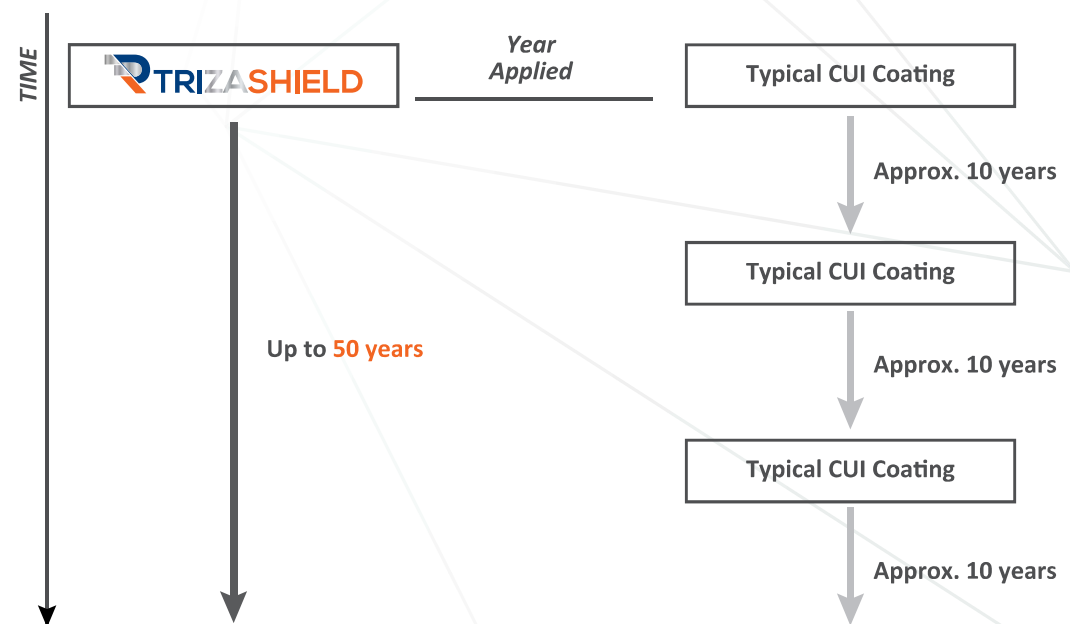


TRIZASHIELD is a highly cost-effective CUI protection that combines galvanic zinc, aluminum anode cathodic protection (CP) and corrosion resistant aluminium barrier for piping, vessels and equipment under insulation.

“Corrosion prevention is achieved by not only shielding water from piping but also using any water that ingresses below the shield to activate the CP system.”



LONG-TERM PROTECTION & COST SAVINGS



A one-time application of TRIZASHIELD offers up to **50 years** of protection with minimum periodical maintenance compared to traditional coatings where the entire process of surface preparation to application has to be repeated every 10 years.

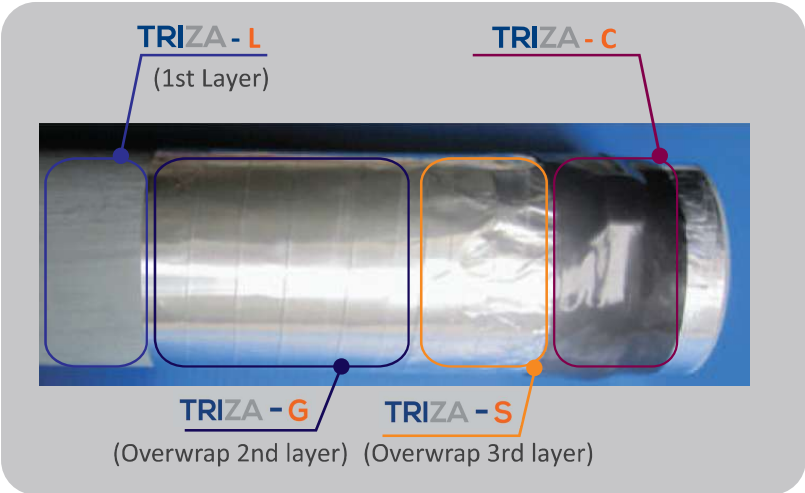
FEATURES & BENEFITS

- Triple-layered system using a combination of two layers of galvanic CP and one layer of barrier protection
- Recommended operating temperature: **-60°C to 260 °C**
- Protection continues from galvanic system even if the shield is damaged
- Minimum steel surface preparation (*only wire brush; SSPC, SP2 OR SP3 and no enclosure required.*)
- **Low Life-Cycle Cost**
- Long and adjustable service life (**up to 50 years**)
- Easy to apply (*no specialized equipment required*)
- No shutdown required

TRIZASHIELD SERIES

The **TRIZASHIELD** solution is made available. The selection is based on the operating temperature of the asset at the time of application.

Recommended for application on substrates operating at temperatures of 100 degrees Celsius or below ($\leq 100^{\circ}\text{C}$).

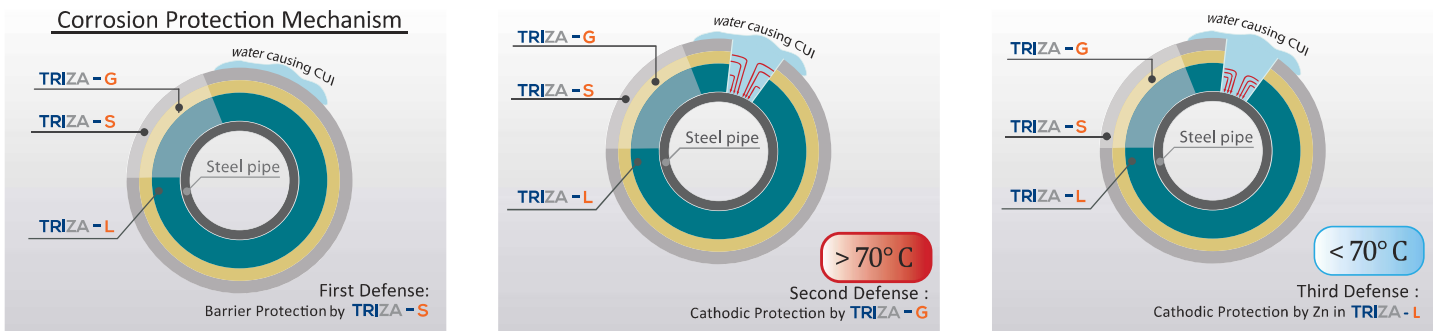


TRIZA - L activates when presence of water is detected and in low temperatures ($< 70^{\circ}\text{C}$) to provide CP to the exposed steel substrate.

TRIZA - G protects the exposed steel if the shield wrap is damaged and water penetrates the first barrier layer. Triza-G becomes an active anode when exposed to temperatures above 70°C ($> 70^{\circ}\text{C}$) and provides CP to the exposed steel. In addition, the lower negative potential of Triza-G to Triza-L provides CP to zinc particles in the Triza-L thus prolonging its service life.

TRIZA - S is made of a highly corrosion-resistant aluminium and provides the barrier protection to Triza-G and Triza-L from the highly corrosive water that is trapped in the insulation.

POLARIZATION BY TRIZA-G AND TRIZA-L IN CYCLIC TEMPERATURE



APPLICATION PROCEDURE

Step 1: Surface Preparation

SSPC-SP2 Hand Tool Cleaning

Remove all paint, loose mill scale, loose rust and other loose detrimental foreign matters by hand chipping, scrapping, sanding and wire brushing.

SSPC-SP3 Power Tool Cleaning

Remove all paint, loose mill scale, loose rust and other loose detrimental foreign matters by power tool wire brushing, sanding, grinding, chipping and descaling.

Note: Wash the surface by fresh water and wipe with clean cloth or paper. Ensure the surface is properly cleared from oil, grease, and any loose rust scales.



Step 2: Application of TRIZA - L

Mixing TRIZA - L

Follow the instructions for mixing. Stir slowly for about 3 minutes.

Applying TRIZA - L

Apply Triza-L with a brush, ensuring a minimum of two coats. The maximum application temperature on live steel pipes should be 100 degrees Celsius or below ($\leq 100^{\circ}\text{C}$).



Triza-L (on surface temperature $\leq 100^{\circ}\text{C}$)

Step 3: Application of TRIZA - G and TRIZA - S

Applying TRIZA - G

Tightly apply TRIZA-G after TRIZA-L. Install the TRIZA-C to provide electrical continuity of the TRIZA-G to the steel substrate as per the instruction provided. Test the electrical continuity between TRIZA-G and the piping.

Applying TRIZA - S

Tightly apply TRIZA-S over TRIZA-G. Make sure there are no openings between the tape seams by rubbing the tape down firmly by hand or rubber rollers. If there are openings, apply proper sealers as per the instruction provided.

