



Protecting plant piping from CUI with water repellency

ROCKWOOL

Water might be an essential ingredient to life on Earth, but it's a major challenge in many process-intensive industrial plants and manufacturing facilities. The insulation applied around a plant's pipework to protect against thermal energy losses and excessive noise is susceptible to water from a variety of sources, including rain, saltwater mist, condensation, temperature cycling, washdown water and process leaks or spills. No matter how well-jacketed piping insulation might be, some water will inevitably find its way inside, move through the insulation system and reach the pipe's metal surface to cause aggressive CUI.

CUI has dangerous and costly consequences if not properly addressed, including an increased risk of heat loss, unplanned downtime, leaks and spills. These risks are often more extreme in cyclic plant operations running between cold and hot temperatures. At the colder temperatures of the cycle, water — both liquid and vapor — can enter the insulation more readily. As process temperatures rise through the water's dew point, the corrosion rate and susceptibility to CUI risks increase as well.

By some estimates, CUI accounts for 10% of a plant's overall maintenance costs and up to 60% of pipeline maintenance costs. Leaks caused by CUI pose hazards for plant personnel while damaging the plant's reputation as a safe, environmentally responsible operation.

Setting a new standard in corrosion inhibition

ROCKWOOL Technical Insulation is meeting the challenge of CUI with the new and innovative CR-Tech™ (corrosion resistant technology), a proprietary corrosion inhibitor applied to ROCKWOOL ProRox® stone wool insulation that helps shield against corrosion in process-critical piping. Building on the company's 80-plus years of innovation in stone wool, the next-generation CR-Tech is embedded into the inner surface of ProRox PS 965 mandrel wound pipe sections right where the insulation touches the pipe. Upon contact with water, the inhibitor is activated to form a thin, passivating layer that is ready to help neutralize acidic leachates. CR-Tech inhibitor buffers the leachate by making it more alkaline and forms a protective, corrosion-mitigating film on the outer pipe surface.

Proven water repellency and corrosion protection in one

ProRox with CR-Tech also includes ROCKWOOL's water repellency technology (WR-Tech™), a low-chloride, water-repellent binder that coats individual insula-



A technician prepares an ASTM G189 test cell by applying a section of ProRox® PS 965 with CR-Tech™ around a pipe section containing carbon steel coupons. ASTM G189 is the standard guide for laboratory simulation of CUI. This test can be used to simulate an accelerated corrosion environment to compare corrosion rates of different combinations of insulation systems.

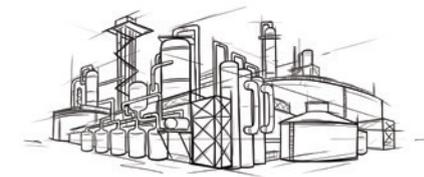
tion fibers to minimize water absorption. ProRox insulation with WR-Tech has been keeping critical plant systems dry since 2017. The technology won the prestigious Association for Materials Protection and Performance 2019 Corrosion Innovation of the Year Award, one of 10 technologies out of more than 50 nominees to receive the honor. Winners were selected by a panel of corrosion-control experts, spanning a diverse range of subject matter expertise from across the industry. To be considered an innovation, nominated projects must show the potential for a significant positive impact in corrosion control.

This unique combination of water repellency and corrosion inhibition is proven to shield pipes from CUI in multiple industry-standard tests, including:

- The ASTM G189 test standard measures corrosion on metal under insulation in lab conditions that mimic 10-year rainfall levels. In rigorous testing that includes exposing an insulated pipe section to wet and dry cycles ranging from 140°F to 302°F for 21 days, ProRox PS 965 with CR-Tech demonstrates five times superior corrosion mitigation on steel than other insulation materials containing inhibitors.
- ASTM C1617 is a standard test practice that measures the corrosion tendency of metals in the presence of solutions containing ions leached from thermal insulation. In modified testing that used different concentrations of chloride as the leachate ions, ProRox PS 965 with CR-Tech performed on par with alternative hydrophobic insulation materials — including those with inhibitors — when preheat-

ed to 482°F for 24 hours. The CR-Tech-treated insulation performs better than several popular insulation materials at elevated chloride levels, with minimal corrosion at chloride concentrations up to 600 ppm.

- EN 13472 testing simulates water absorption in the insulation caused by rain exposure. After immersion in water for 48 hours without high-temperature heat aging, the WR-Tech binder in the ProRox PS 965 insulation keeps water absorption to below 0.2 kg/m². This result is comparable to other leading mineral wool insulation pipe sections. But in tests in which the insulation is preheated at 482°F for 24 hours to simulate real-world cyclic heating and aging, ProRox PS 965 maintains low water absorption below 0.2 kg/m². Other mineral wool insulation products lose their water repellency after heat aging and absorb significant volumes of water.



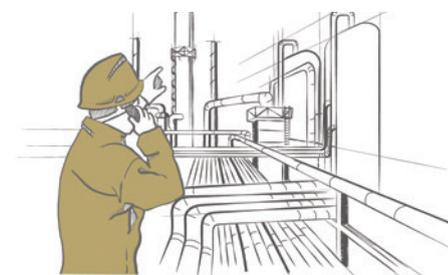
Wide performance versatility beyond corrosion protection

ProRox PS 965 with CR-Tech optimizes plant operations in several ways beyond water repellency and corrosion defense. The insulation maintains its thermal insulation performance to minimize heat losses in hot pipes, thus improving plant efficiency by reducing energy consumption and GHG emissions.



A ROCKWOOL field technician applies ProRox® PS 965 with CR-Tech™ insulation sections in the field. The lightweight, mandrel wound sections apply easily and efficiently, with minimal downtime and safety risks.

The insulation also delivers superior acoustics insulation performance to protect plant personnel from inherently noisy plant operations.



Simple and low-cost installation

ProRox PS 965 with CR-Tech is delivered to the site in split and hinged pipe sections that apply easily to pipes with less downtime. In addition to lower installation costs, the mandrel wound sections reduce logistics, handling and material costs.

ProRox PS 965 with CR-Tech is made in North America for plant operations requiring reliable and durable water protection.

ROCKWOOL Technical Insulation is a global business with a local presence, supplying advanced stone wool insulation solutions to the process and marine and offshore industries. Part of the ROCKWOOL Group, with approximately 12,000 passionate colleagues in 40 countries and sales in more than 120, we have manufacturing and service facilities around the world, ensuring we're there when you need us, with the right expertise and products to meet your requirements.

For more information, visit rti.rockwool.com/crtech.

The best defense against corrosion.

ROCKWOOL ProRox® with CR-Tech™ shields your piping from the dangers and costs of corrosion.

Corrosive conditions are an ever-present threat to your plant's infrastructure. Arm yourself with ProRox stone wool insulation with CR-Tech – our unique insulation solution that provides water repellency and long-lasting corrosion defense in one.



ProRox insulation with CR-Tech gives you wide-ranging protection and cost control:

- Achieves 5x better corrosion mitigation than alternative insulation materials with inhibitors in CUI test method ASTM G189
- Includes the power of WR-Tech™ Water Repellency Technology to help minimize the insulation's moisture content
- Provides superior acoustic and thermal insulation to improve health, safety and wellbeing
- Arrives in easy-to-handle sections that help lower installation time and costs



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TECHNICAL INSULATION

