ZERUST® EXCOR®

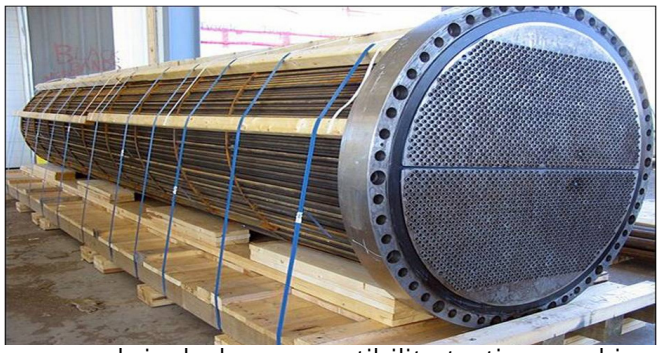
CORROSION SOLUTIONS FOR THE HEAT EXCHANGER INDUSTRY

ZERUST® is a product of
Northern Technologies
International Corporation

NTI®

WHY CHOOSE ZERUST®?

PROVEN SAFE, RELIABLE, AND EFFECTIVE CORROSION SOLUTIONS FOR THE HEAT EXCHANGER INDUSTRY



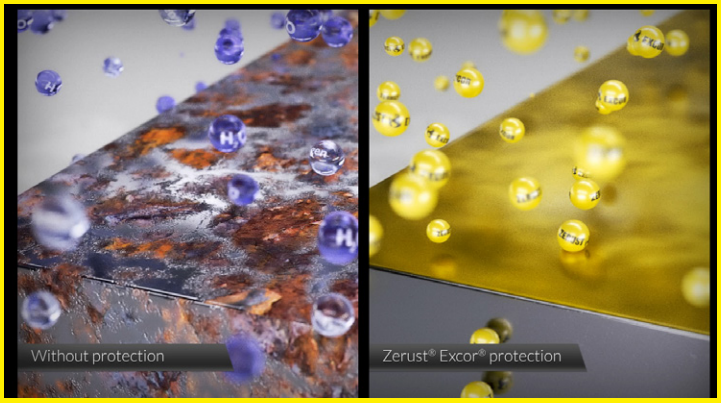
ZERUST® corrosion inhibiting products offer cost-effective, versatile, and reliable solutions to protect heat exchangers from rust and corrosion during storage and transportation. For nearly 50 years, ZERUST's proprietary vapor corrosion inhibitor (VCI) technology has been trusted to safeguard metal components, even in challenging environments. Whether your heat exchangers are new, refurbished, or awaiting installation, ZERUST® products ensure protection from the first day to long-term storage. Our comprehensive approach includes compatibility testing, making it easier for you to choose the right solution for your specific needs. Partner with ZERUST® to extend the life of your heat exchangers and enhance your operational reliability.

THE BENEFITS OF ZERUST® CORROSION INHIBITOR PRODUCTS

- **Ease of Use:** VCI poly is simple to use and do not require specialized equipment or labor to apply, making it cost-effective.
- **Environmentally Friendly:** VCI poly is environmentally safe and does not release harmful substances into the air or soil, ensuring compliance with environmental regulations.
- **Reusability:** VCI poly can be reused multiple times, making it a more sustainable option compared to traditional coatings.
- **Protection in Enclosed Spaces:** VCI poly provides protection against corrosion in enclosed spaces, such as within the complex structures of heat exchangers, where traditional coatings may not be effective.
- **Cost-Effective:** By reducing the need for reapplication and maintenance, ZERUST® products offer a more cost-effective solution for long-term corrosion protection.

HOW ZERUST® VAPOR CORROSION INHIBITORS (VCIS) WORK

VCI molecules inhibit corrosion by preventing moisture and environmental elements from reacting with the metal surface. Since VCI molecules are transported through the air, they must be trapped around the metal surface using a poly bag or other enclosure. Later, when the enclosure or package is opened, the ZERUST® corrosion inhibiting layer dissipates, leaving clean, dry, and residue-free metals.



THE IMPORTANCE OF CORROSION SOLUTIONS IN THE HEAT EXCHANGER INDUSTRY

Heat exchangers are critical components in a wide range of industrial processes, playing a vital role in transferring heat between fluids to regulate temperatures and optimize performance. However, the harsh environments in which these systems operate often expose them to conditions that accelerate corrosion, such as fluctuating temperatures, humidity, and exposure to corrosive chemicals. Corrosion can significantly impact the efficiency, safety, and lifespan of heat exchangers, making it imperative to implement robust corrosion protection strategies.

Corrosion in heat exchangers can manifest in various forms, including uniform corrosion, pitting, crevice corrosion, and galvanic corrosion. Uniform corrosion gradually reduces the thickness of metal components, compromising structural integrity and leading to potential system failures. Pitting and crevice corrosion, on the other hand, create localized weak points that are difficult to detect and can result in leaks or even catastrophic failures if not addressed promptly. Galvanic corrosion, which occurs when dissimilar metals come into contact in the presence of an electrolyte, accelerates the deterioration of the more reactive metal, further complicating maintenance and repair efforts.

The consequences of corrosion extend beyond physical damage to the heat exchanger itself. Corrosion can lead to increased operational costs due to unplanned maintenance and downtime, as well as potential liabilities if the equipment fails during operation. Furthermore, the reduced efficiency caused by corroded heat exchangers can disrupt entire processes, leading to increased energy consumption and reduced productivity.

ZERUST® Vapor Corrosion Inhibitors (VCI) offer an innovative solution to these challenges. VCIs are versatile and can be integrated into various packaging solutions, such as films and papers, making them ideal for protecting heat exchangers during storage, transportation, and even in operational standby. This proactive approach to corrosion prevention ensures that your heat exchangers remain in optimal condition, ready to perform when needed.

The implementation of ZERUST® VCI solutions not only extends the service life of your heat exchangers but also enhances overall operational reliability. By preventing corrosion before it starts, you can avoid costly repairs, minimize downtime, and ensure consistent performance across your industrial processes. Trust ZERUST® to provide the advanced protection your heat exchangers need, so you can focus on maintaining efficiency and productivity in your operations.

PRODUCT SOLUTION HIGHLIGHTS

ZERUST® ICT®510-OPS Outdoor Preservation VCI Shrink Film

ZERUST®/EXCOR® ICT®510-OPS Outdoor Preservation VCI Shrink Film is an 8-mil, high-strength shrink film engineered to provide superior corrosion protection for large heat exchangers and related equipment stored outdoors. This premium film is infused with ZERUST® VCI technology and UV stabilizers, making it exceptionally durable and resistant to both corrosion and UV radiation.

When applied, the film shrinks tightly around the heat exchanger, conforming to its unique shape and sealing out moisture, dust, and other contaminants. The ZERUST® VCI molecules then saturate the interior of the packaging, creating a protective layer on all metal surfaces, including those in hard-to-reach areas like crevices and tubing. This comprehensive protection ensures that the heat exchanger remains free from corrosion during long-term storage or transportation, even in extreme outdoor environments.

Once the protective film is removed, the VCI vapors dissipate, leaving the metal surfaces clean and ready for immediate use, without the need for additional cleaning or preparation. ZERUST® ICT®510-OPS Shrink Film is ideal for long-term outdoor preservation, offering reliable protection for heat exchangers against the elements, ensuring that your equipment is ready for deployment whenever and wherever needed.

ZERUST® ICT®510-C VCI Film

ZERUST®/EXCOR® ICT®510-C VCI Film provides versatile and cost-effective corrosion protection for heat exchangers during shipping and indoor storage. Available in various sizes, formulations, and packaging options, this VCI film is designed to meet the specific needs of different metals. Whether you are protecting ferrous, non-ferrous, or multimetal components, ZERUST® ICT®510-C VCI Film offers a tailored solution that fits your requirements.

The VCI technology in ICT®510-C Film works by diffusing invisible, odorless, and non-toxic VCI molecules, which then form a protective layer on exposed metal surfaces inside the packaging. This protective barrier prevents corrosion by disrupting the electrochemical processes that cause rust and degradation. This makes the film especially useful for protecting heat exchangers with complex geometries or those that require long-term storage.

The versatility of ZERUST® ICT®510-C VCI Film extends to its customization options, which include the addition of acid-gas blockers, and more. These features ensure that the film provides robust protection during indoor storage and transport. Additionally, ZERUST® VCI Film can be used in conjunction with other ZERUST® rust inhibitors or VCI diffuser products for enhanced protection in particularly harsh environments.

PRODUCT SOLUTION HIGHLIGHTS

ZERUST® AxxaVis™ HST-10

Hydrostatic testing is a crucial process used to verify the integrity and strength of heat exchangers, ensuring they can withstand operational pressures. However, this process often introduces water and contaminants that can lead to rapid corrosion of internal surfaces. ZERUST®/EXCOR® AxxaVis™ HST-10 is a water-soluble powder additive specifically designed to protect heat exchangers from rust and corrosion during and after hydrostatic testing.

During hydrostatic testing, heat exchangers are filled with water to check for leaks and structural soundness. This procedure, while essential, exposes the metal surfaces inside the heat exchanger to water that may carry ionic contaminants like chlorides and sulfates. These contaminants, combined with oxygen, can initiate corrosion. The risk is particularly high for ferrous metals, which are prone to rust in the presence of moisture and corrosive ions.

ZERUST® AxxaVis™ HST-10 mitigates these risks by deactivating ionic contaminants in the water, preventing them from reacting with the metal surfaces of the heat exchanger. By altering the water's chemical composition, AxxaVis™ HST-10 reduces the likelihood of corrosion. This additive forms a protective layer on internal surfaces, safeguarding them from rust and other forms of degradation. For heat exchangers containing copper, brass, or other non-ferrous metals, it can be used alongside ZERUST®/EXCOR® Axxatec™ CC-100 for comprehensive protection.

Beyond its corrosion protection capabilities, ZERUST® AxxaVis™ HST-10 is environmentally friendly. It is water-soluble, free of harmful solvents, and safe for both the environment and handling personnel. Used AxxaVis™ HST-10 can often be analyzed and reused, reducing waste and offering cost savings. If disposal is necessary, it is compliant with environmental regulations, allowing safe discharge into soil or marine environments, subject to local restrictions.

Incorporating AxxaVis™ HST-10 into your hydrostatic testing process not only prevents immediate corrosion but also prepares heat exchangers for long-term storage or further processing with minimal risk of future corrosion. This proactive protection extends the lifespan of your equipment, reduces the need for costly repairs, and ensures your heat exchangers are ready for operation when needed.

ZERUST® AxxaVis™ HST-10 provides an essential solution for protecting heat exchangers during hydrostatic testing. By neutralizing ionic contaminants and forming a protective barrier on metal surfaces, it helps maintain the integrity and performance of your equipment. Choose ZERUST® AxxaVis™ HST-10 to enhance your testing procedures and protect your valuable assets from corrosion.

PRODUCT SOLUTION HIGHLIGHTS

ZERUST® AXXANOL™ SPRAY-G

Heat exchangers are vital components in numerous industrial systems, requiring robust protection against corrosion during storage, transportation, or standby. ZERUST®/EXCOR® Axxanol™ Spray-G offers a convenient and effective solution for preserving these critical assets, providing the durability of a grease in an easy-to-apply spray form. Designed to safeguard metal parts and assemblies, Axxanol™ Spray-G is ideal for both indoor and outdoor environments, ensuring long-term corrosion protection even in the most challenging conditions.

Heat exchangers often face exposure to harsh conditions that can lead to significant corrosion. Factors such as humidity, temperature fluctuations, and exposure to salts or chemicals can accelerate rust, compromising the equipment's structural integrity and performance. Traditional coatings may be difficult to apply evenly across complex geometries, making Axxanol™ Spray-G an ideal solution by offering a sprayable grease that is easy to apply and highly effective in protecting against corrosion.

ZERUST® Axxanol™ Spray-G forms a thick, protective barrier on metal surfaces, shielding them from moisture and corrosive elements. The spray application ensures coverage of intricate parts, providing protection that can last up to 1 year‡ when stored outdoors and up to 2 years‡ indoors. For enhanced protection, Axxanol™ Spray-G can be used with ZERUST® Vapor Corrosion Inhibitor (VCI) film, adding an additional layer of defense during transit and storage.

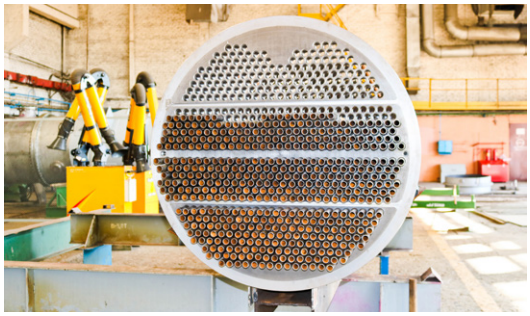
Axxanol™ Spray-G is easy to use, eliminating the need for specialized equipment or labor-intensive methods. The grease spreads evenly across surfaces, making it ideal for complex assemblies like heat exchangers. When the asset is ready for use, the coating can be easily removed with ZERUST® AxxaWash™ or other commercial cleaners, leaving the metal surface ready for further processing.

Formulated with environmental and safety standards in mind, ZERUST® Axxanol™ Spray-G does not intentionally contain barium or heavy metals, complying with TSCA, RoHS, and REACH SVHC requirements. This ensures safe use for both workers and the environment, offering peace of mind alongside reliable corrosion protection.

ZERUST® Axxanol™ Spray-G is a versatile, effective solution for protecting heat exchangers and other critical metal assets from corrosion. Its ease of application and durable protection make it an essential tool for industries focused on equipment reliability and longevity, ensuring your heat exchangers remain in optimal condition, ready to perform whenever needed.

PRODUCT SOLUTION HIGHLIGHTS

ZERUST® AXXACLEAN™ RUST REMOVERS



Heat exchangers are often exposed to harsh environments that can lead to rust and corrosion, compromising their performance and longevity. ZERUST® offers a range of AxxaClean™ rust removers designed to effectively clean and restore heat exchangers, ensuring they remain in optimal condition. Each product in the AxxaClean™ line addresses different levels of rust and corrosion, from mild to severe, providing versatile solutions for maintaining your equipment.

ZERUST® AxxaClean™ ICT®625-RR

ZERUST® AxxaClean™ ICT®625-RR is a ready-to-use chelating rust remover ideal for recovering mildly to moderately rusted ferrous parts. Its active ingredient dissolves rust effectively while being gentle on the metal, and it's compatible with aluminum and yellow metals. Simply immerse the parts in ICT®625-RR, then rinse with high-quality water or a 5% solution of ZERUST® AxxaVis™ HST-10, and dry thoroughly. The parts are then ready for immediate protection using ZERUST® VCI packaging films to ensure they remain rust-free during storage or transit.

ZERUST® AxxaClean™ 2048

For heat exchangers with medium levels of rust, ZERUST® AxxaClean™ 2048 provides a nonhazardous and effective solution. This rust remover safely eliminates rust from ferrous metals and deoxidizes other materials like red metals and aluminum alloys. AxxaClean™ 2048 penetrates deep into cracks and crevices, ensuring thorough rust removal. After treatment, the cleaned parts should be rinsed and dried, and for ongoing protection, ZERUST® VCI films are recommended to guard against future corrosion.

ZERUST® AxxaClean™ 3048

ZERUST® AxxaClean™ 3048 is a powerful, rapid-acting rust remover designed for severe corrosion on ferrous and yellow metals. Available as both an immersion solution and brush-on gel, AxxaClean™ 3048 effectively restores heavily rusted parts, preparing them for immediate use or further processing. Post-treatment, the parts should be rinsed with a 5% solution of ZERUST® AxxaVis™ HST-10 and dried thoroughly to prevent flash rusting, followed by the application of ZERUST® VCI films for continued protection.

Comprehensive Solutions for Heat Exchanger Maintenance

ZERUST® AxxaClean™ rust removers offer comprehensive solutions for maintaining and restoring heat exchangers affected by rust and corrosion. Whether dealing with mild, medium, or severe corrosion, the AxxaClean™ line provides effective treatments that keep your equipment in peak condition. By integrating these products into your maintenance routine, you can extend the life of your heat exchangers, reduce downtime, and maintain optimal performance in your industrial operations. Trust ZERUST® AxxaClean™ to deliver the corrosion solutions you need.

Global Support

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‡ DECLARATION
Corrosion protection claims are based on Northern Technologies International Corporation (NTIC) internal laboratory testing performed under controlled parameters on contaminate-free substrates. Real-world application corrosion protection duration on different substrates will vary and depends on factors such as, but not limited to, the application or use, environmental / storage conditions, surface cleanliness, type of substrates, and coating thickness (where applicable). The use of the term "Up to" in reference to time is defined as any time duration from zero up to a specified time frame, but in no event beyond the specified time frame. The use of the term "for years" is based on NTIC's experience with its products but is in no way guaranteed. The use of the term "Up to" in reference to volume is defined as any volume from zero up to a specified volume but in no event beyond the specified volume of protection. It is the customer's / user's obligation to evaluate product performance, corrosion protection duration, safety, and suitability for intended use within the scope advised in the data sheet and to comply with all applicable laws and regulations. **LIMITED WARRANTY/DISCLAIMER** Warranty is limited to the replacement of a product that fails to meet specifications. For full warranty and disclaimer information, visit www.zerust.com/warranty.