

ZERUST® EXCOR®

ZERUST® Industrial Cleaners and Degreasers



**ZERUST® Global Corrosion &
Cleaning Management Solutions**

How ZERUST® Works for You

For nearly 50 years, beginning with the invention of Vapor Corrosion Inhibiting (VCI) film packaging, ZERUST®/EXCOR® has led the market in quality corrosion solution products. We are dedicated to providing expert corrosion management services and broadening the range of corrosion solutions for our customers. In addition, ZERUST® users have access to on-site support from ZERUST®/EXCOR®



representatives in more than 70 countries. As a result, our customers have peace of mind when they choose ZERUST® for corrosion control management.

High-Performance Industrial Cleaners and Degreasers

In addition to ZERUST® VCI film and other packaging products, ZERUST® offers an increasing range of cost-effective, high-performance wash fluids and rust-preventative products. These products are formulated to work synergistically together to provide enhanced, comprehensive corrosion solutions for our customers. Backed by our global expert technical support and testing services, a comprehensive corrosion management program can be designed and deployed to meet each individual customer's needs.

- Application-specific products
- Overall cost reduction
- Reduction of corrosion issues associated with handling, packaging, and storage of precision machined, bare metal components
- Enhanced fluid maintenance and control procedures for extending the use life of wash fluids and rust-preventative products
- Customer and product-specific operating guides ZERUST® assured corrosion-free results from effectively cleaned and dried parts

Our Commitment to Quality, Safety, and the Environment

We are committed to making safe and effective products that reduce the industry's impact on the environment. ZERUST®/EXCOR® products are approved by many major companies' toxicology, engineering, and packaging departments and comply with health and safety regulations around the globe, including the following:



- REACH Regulation Compliant (EC No 1907/2006)
- European RoHS Directive Compliant
- Do not contain SVHC (Substances of Very High Concern)
- Labelled in accordance with GHS (Globally Harmonized System) and are compliant under UN GHS, EU CLP, US OSHA HazCom, and CA WHMIS

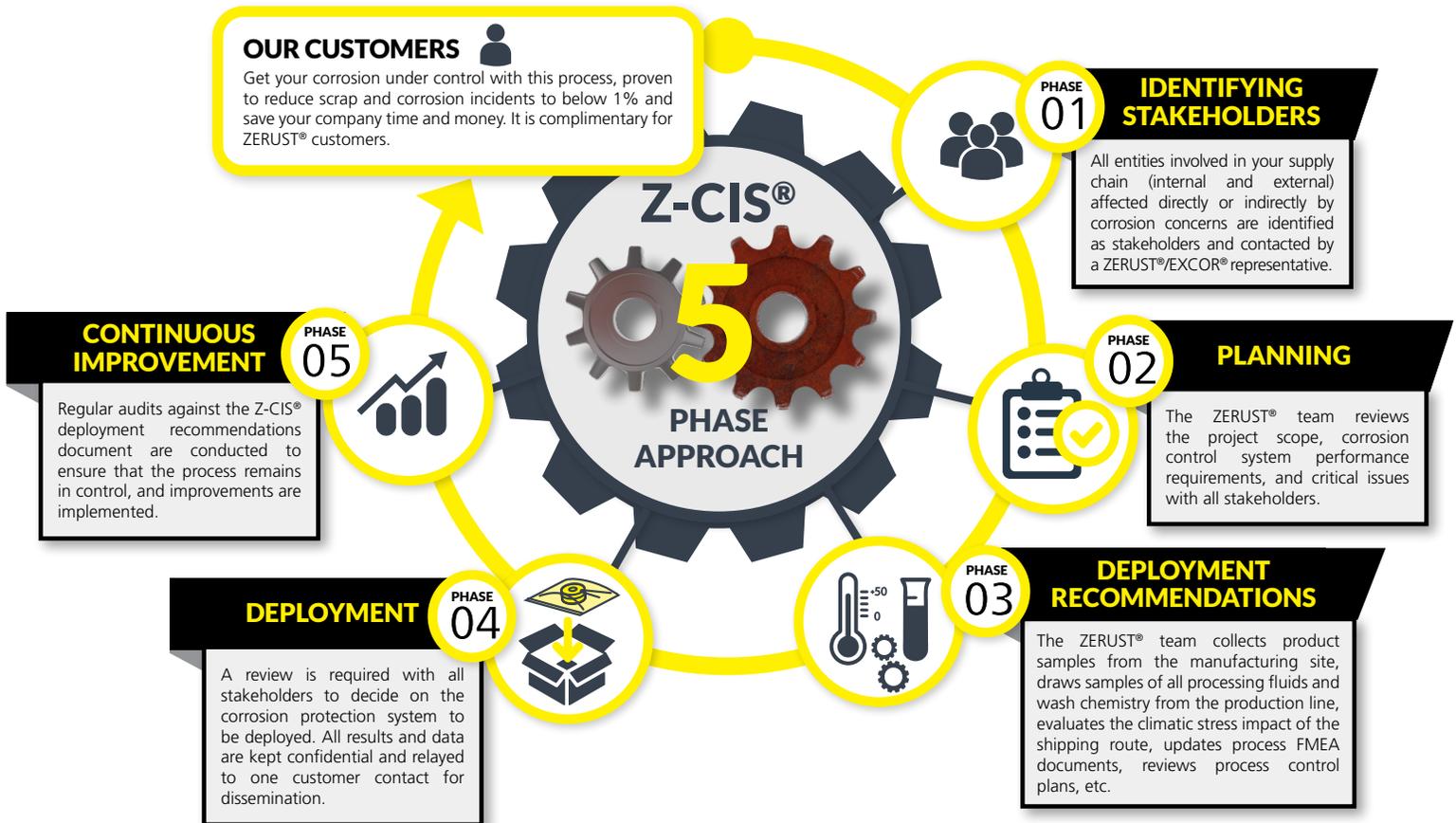
ZERUST® is a business unit of Northern Technologies International Corporation (NASDAQ: NTIC), Headquartered in Minnesota, USA. The management system of ZERUST® products is ISO 9001:2015 certified.

Choosing a Corrosion Management System

Z-CIS® is the ZERUST® Corrosion Inhibiting System and the proven methodology for deploying our comprehensive corrosion management solutions. It addresses the causes of corrosion at each stage in manufacturing processes, product handling, and in transit around the world. The Z-CIS® method is designed to meet both the rust-free and contaminant-free requirements of various OEMs sourcing from a global supply base. After implementing Z-CIS®, companies generally reduce costs related to corrosion by 10% or more and realize as high as 100% rust-free shipment yields. To get started, visit www.zerust.com/tellus.



Our GC/LC Mass Spectrometry is just one of the tools we use in our lab for testing a customer's process fluids and the effectiveness of recommended corrosion solutions.



ZERUST® AxxaWash™ Cleaner and Degreaser series consist of low foaming+ water cleaner and degreaser products that are specifically designed to quickly and effectively remove light to heavy-duty hydrocarbon soils typically encountered in metalworking and metal finishing operations. This series will include alkaline and neutral pH products uniquely formulated to suit customer and part-specific requirements based on substrate type, soil type, methods, and parameters of application, as well as cleanliness levels and corrosion inhibition requirements.

ZERUST® Axxatec™ DA (Dual-Action) series consists of low to no foaming+ water-based rust inhibitor products that also contain limiting cleaning designed to quickly and effectively remove light-duty hydrocarbon soils. Axxatec™ DA products protect bare metal surfaces during assembly and in situations where water-based spray-on, in-line production, or dipping applications are desired. Additionally, Axxatec™ DA products form clear, thin, dry-to-touch coatings that help prevent rust and corrosion for several months†, protecting in-between production processes and for short-term shipment and storage periods.

ZERUST® Product Name	Metal Compatibility*					Operating Temperature	Dilution Rate	pH*** (Conc)	pH*** (5%)	Foam+	Rinse Required	Contains			Application		Removal				Rust Protection†					
	Ferrous/ Stainless**	Aluminum	Copper	Brass	Galvanized							Chelants	Silicates	Phosphates	Spray	Immersion	Soils			Chloride neutralization	Oil Splitting	Hard Water Stable	Flash-Rust†	Extended Flash-Rust†	Several Months†	Hazmat
																	Light-Duty	Medium-Duty	Heavy-Duty							
AxxaWash™ KF-121	✓					115 – 135°F (46 – 57°C)	1 – 10%	13 – 14	12 – 13	Low	✓	✓	✓		✓	✓	✓	✓			✓			✓		
AxxaWash™ KF-122	✓					120 – 150°F (49 – 66°C)	1 – 10%	13 – 14	13 – 14	Low	✓	✓	✓		✓	✓	✓	✓			✓			✓		
AxxaWash™ KF-123	✓		✓	✓	✓	135 – 150°F (57 – 66°C)	1 – 10%	11 – 12	10 – 11	Low		✓			✓	✓	✓	✓	✓		✓	✓				
AxxaWash™ KF-124	✓		✓	✓	✓	120 – 145°F (49 – 63°C)	1 – 10%	9.5 – 10.5	9.5 – 10.5	Low		✓			✓	✓	✓	✓	✓		✓	✓				
AxxaWash™ KMS-220	✓		✓	✓	✓	105 – 165°F (41 – 74°C)	1 – 10%	9 – 10	8.5 – 9.5	Low		✓			✓				✓	✓	✓					
AxxaWash™ KMS-305	✓	✓			✓	115 – 140°F (46 – 60°C)	1 – 10%	12 – 13	10 – 11	Low	✓		✓		✓		✓	✓	✓		✓			✓		
AxxaWash™ KMS-310	✓	✓				120 – 140°F (49 – 60°C)	1 – 10%	11 – 12	10 – 11	Low	✓	✓	✓		✓	✓	✓	✓			✓			✓		
AxxaWash™ NW-10C	✓					77 – 140°F (25 – 60°C)	1 – 10%	11 – 12	11 – 12	High		✓			✓	✓	✓	✓	✓		✓	✓				
AxxaWash™ NW-12C	✓					77 – 140°F (25 – 60°C)	1 – 10%	10 – 11	10 – 11	High		✓			✓	✓	✓	✓	✓		✓	✓	✓			
Axxatec™ DA-23C	✓					72 – 165°F (22 – 74°C)	3 – 6%	9 – 10	8 – 9	No Foam					✓				✓	✓	✓	✓	✓			
Axxatec™ DA-40AL	✓	✓	✓	✓	✓	72 – 140°F (22 – 60°C)	3 – 10%	8.5 – 9.5	8 – 9	Low		✓			✓	✓	✓	✓			✓	✓	✓	✓		
Axxatec™ 30C	✓		✓	✓		120 – 180°F (48 – 82°C)	2 – 10%	9 – 10	8.5 – 9.5	Low		✓			✓	✓	✓	✓			✓	✓	✓	✓		

* Some cleaners may be safe to use on other substrates at lower concentrations, temperatures, and times. Contact a ZERUST® representative to discuss your specific application.

** For Cast iron/dutile/sintered metal parts test before use.

*** Typical pH values.

+ Foaming propensity and degree of foaming depend on several factors such as temperature, surfactant type, spray application pressure, air entrainment, and type of soil/contaminant.

AxxaWash™ and Axxatec™ DA Cleaning Capabilities



ZERUST® ICT®630 Industrial Cleaners & Degreasers

AxxaWash™ KF-121 Cleaner

AxxaWash™ KF-121 is a low foam, alkaline, water-based cleaner designed where low application temperature is desired. AxxaWash™ KF-121 is designed to remove light to medium-duty hydrocarbon soils on ferrous substrates. AxxaWash™ KF-121 should be rinsed following application, with a suitable ZERUST® rust inhibitor or preventative applied after for maximum corrosion protection. AxxaWash™ KF-121 is conveniently offered as a liquid concentrate and may be diluted per the application.

AxxaWash™ KF-122 Cleaner

AxxaWash™ KF-122 is a low-foaming, heavy-duty alkaline, water-based cleaner compatible with very hard water in a wide range of operating temperatures. AxxaWash™ KF-122 is a high-performance cleaner designed to remove medium to heavy-duty hydrocarbon soils on ferrous substrates and maintain low foaming under spray conditions. AxxaWash™ KF-122 is conveniently offered as a liquid concentrate and may be diluted per the application.

AxxaWash™ KF-123 Cleaner/Flash-Rust Inhibitor

AxxaWash™ KF-123 is a low foam cleaner designed for cleaning and where flash-rust inhibition is needed. Designed for ferrous substrates, AxxaWash™ KF-123 is a mildly alkaline water-based cleaner for the removal of light to medium-duty hydrocarbon soils while offering chloride mitigation. AxxaWash™ KF-123 is ideally suited to clean and prepare the surface for a long-term rust preventative such as ZERUST® Axxanol™ or Axxatec™ product lines. AxxaWash™ KF-123 can be rinsed or used as a dry-in-place cleaner and flash-rust inhibitor.

AxxaWash™ KF-124 Cleaner/Flash-Rust Inhibitor

AxxaWash™ KF-124 is a low foam cleaner designed for cleaning and flash-rust protection via corrosion inhibitors. AxxaWash™ KF-124 is a mildly alkaline water-based cleaner designed for the removal of light to medium-duty hydrocarbon soils on ferrous substrates while offering chloride mitigation. In addition, AxxaWash™ KF-124 contains a mild flash-rust corrosion inhibitor and is suited to clean and prepare the metal surface for a long-term rust preventative, such as ZERUST® Axxanol™ or Axxatec™ product lines. AxxaWash™ KF-124 can be rinsed or left on the metal surface as a dry-in-place cleaner and flash-rust inhibitor.

AxxaWash™ KMS-220 Cleaner/Flash-Rust Inhibitor

AxxaWash™ KMS-220 is a low foam cleaner designed for light-duty cleaning and exceptional oil-splitting performance. AxxaWash™ KMS-220 is a mildly alkaline water-based cleaner designed for the removal of light-duty hydrocarbon soils and particulates on multiple substrates. In addition, AxxaWash™ KMS-220 contains a flash-rust corrosion inhibitor and is suited to clean and prepare the metal surface for a long-term rust preventative, such as ZERUST® Axxanol™ or Axxatec™ product lines. When using a long-term rust preventative, AxxaWash™ KMS-220 should be rinsed from the surface prior to application. In addition, AxxaWash™ KMS-220 can be left on the metal surface as a dry-in-place cleaner and flash-rust inhibitor.

AxxaWash™ KMS-305 Cleaner

AxxaWash™ KMS-305AL is a low foam, low temperature, alkaline water-based cleaner designed for use with aluminum and ferrous metals in spray systems with its excellent oil-splitting capabilities. AxxaWash™ KMS-305AL is an ideal cleaner for removing light to moderate-duty hydrocarbon soils and particulates on aluminum heat exchanger components. AxxaWash™ KMS-305AL contains no chelating agents and low silicate levels for ease of waste treatment.

ZERUST® ICT®630 Industrial Cleaners & Degreasers

AxxaWash™ KMS-310 Cleaner

AxxaWash™ KMS-310AL is a low-foaming, alkaline, water-based cleaner designed for aluminum and ferrous alloys. AxxaWash™ KMS-310AL is an excellent cleaner for moderate to heavy-duty soils. AxxaWash™ KMS-310AL is free from phosphates, alkylphenol ethoxylates, and boron salts, VOCs, and solvents, is non-flammable, meets Global Automotive Declarable Substance, TSCA, ECHA SVHC, RoHS, and REACH requirements. AxxaWash™ KMS-310AL does contain low levels of silicate.

AxxaWash™ NW-10C Cleaner/Flash-Rust Inhibitor

AxxaWash™ NW-10C is a very effective oil-splitting cleaner-degreaser for most commonly used hydrocarbon and bio-based oils as well as human sebum oil soils. AxxaWash™ NW-10 is used as an interim W.I.P. (work-in-progress) wash fluid and as a final wash fluid in typical metal machining and fabrication operations. It also effectively counters moderate levels of corrosion inducing anionic contaminants such as chlorides and sulfates. It can be applied using immersion, ultrasonic, vibratory, and high to ultra-high spray washing methods. In addition to hot or cold drawn steels, AxxaWash™ NW-10 is also recommended for use on highly reactive ferrous metal alloys such as grey cast iron and sintered metal components.

AxxaWash™ NW-12C Cleaner/Extended Flash-Rust Inhibitor

AxxaWash™ NW-12C is a highly effective wash and rinse fluid that inhibits flash corrosion on treated metal surfaces. The wash removes oily contaminants and deactivates corrosion-inducing inorganic anions to provide robust post-wash flash corrosion inhibition for up to 72 hours[†]. Cleaning with AxxaWash™ NW-12C enhances the effectiveness of future corrosion prevention methods such as rust-preventative coatings and VCI film. AxxaWash™ NW-12C is silicate and phosphate-free and readily biodegradable.

Axxatec™ DA-23C Dual-Action Cleaner/Rust Inhibitor

Axxatec™ (Dual-Action) DA-23C is a water-based, no foam, liquid concentrate rust preventative and light-duty cleaner providing superb oil-splitting performance. Axxatec™ DA-23C is designed to provide several months[†] of indoor storage and in-transit protection. Additionally, Axxatec™ DA-23C can be applied via spray, leaving an invisible, dry-to-touch protective coating after drying. As a result, it's safer and more economical to use than solvent-based systems.

Axxatec™ DA-40AL Dual-Action Cleaner/Rust Inhibitor

Axxatec™ (Dual-Action) DA-40AL is a water-based, low-foaming rust preventative and multimetal light-duty cleaner liquid concentrate designed to provide up to 3 months[†] of indoor storage and in-transit protection for ferrous metals. When applied, it leaves a clear, dry-to-touch protective coating after drying. As a result, it's safer and more economical to use than solvent-based systems.

Axxatec™ 30C Rust Inhibitor/Light-Duty Cleaner

Axxatec™ 30C is a water-based low-foaming liquid concentrate rust preventative designed to provide several months[†] of indoor storage and in-transit protection. Axxatec™ 30C can be applied via spray or immersion, leaving a clear protective coating after drying. Depending on the situation or application, Axxatec™ 30C may also be used as a light-duty cleaner-rust preventative combination product.

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the Congo	Malaysia	South Africa	

‡ 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.