ZERUST® EXCOR®

CORROSION SOLUTIONS FOR INDOOR STORAGE

ZERUST® is a product of
Northern Technologies
International Corporation

NTI®

WHY CHOOSE ZERUST®?

PROVEN SAFE, RELIABLE, AND EFFECTIVE CORROSION SOLUTIONS FOR INDOOR STORAGE

ZERUST® corrosion inhibiting products provide a cost-effective and proven method to protect metal assets from rust and corrosion during indoor storage. For over 50 years, ZERUST® has led the industry with proprietary Vapor Corrosion Inhibitor (VCI) technology that delivers reliable protection across a wide range of environments and applications.

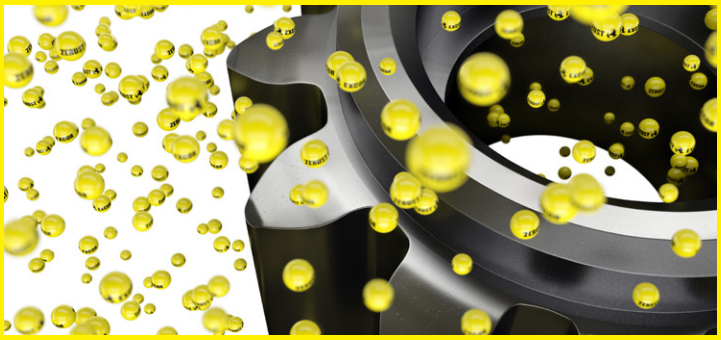
Even in controlled indoor environments, corrosion can occur due to humidity fluctuations, contaminants, and packaging materials. ZERUST® solutions are engineered to address these real-world conditions and provide consistent, long-term protection. Compatibility testing using recognized industry standards can be arranged through your local ZERUST® representative.

THE BENEFITS OF ZERUST® CORROSION INHIBITOR PRODUCTS

- **Reliable Indoor Protection:** Engineered to protect metal parts from humidity, airborne contaminants, and corrosive packaging materials.
- **Long-Term Corrosion Resistance:** Products such as Axxanol™ rust preventatives and ICT® VCI films provide extended protection for stored components and equipment.
- **Versatile Applications:** Suitable for parts, assemblies, machinery, electrical components, and finished goods across multiple industries.
- **Clean and Easy to Use:** VCI solutions leave parts clean, dry, and ready for immediate use without additional cleaning.
- **Proven Safety and Compliance:** ZERUST® products meet global safety standards and are compatible with a wide range of metals, including ferrous and non-ferrous materials.

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.



CORROSION CHALLENGES IN INDOOR STORAGE

Indoor storage environments are often assumed to be safe from corrosion. However, corrosion is driven by electrochemical reactions that can occur whenever moisture, oxygen, and contaminants are present, even in controlled indoor settings.

In reality, indoor environments are rarely stable. Daily temperature fluctuations can cause air to reach its dew point, leading to condensation forming directly on metal surfaces. This "micro-condensation" is often invisible but creates the ideal conditions for corrosion to initiate and propagate.

Humidity variations from HVAC cycling, seasonal changes, and facility traffic can further accelerate this process. In addition, airborne contaminants such as salts, industrial pollutants, and residues from manufacturing processes can deposit on metal surfaces, increasing corrosion rates.

Packaging materials themselves can also contribute to corrosion. Wood pallets may release acids and moisture, while standard corrugated materials can introduce contaminants that react with metal surfaces. When combined with trapped humidity or poor airflow, these factors create localized corrosion cells.

Another common issue is improper pre-packaging conditions. If parts are not completely clean and dry before storage, residual water, fingerprints, or process chemicals can act as corrosion initiation points. Once corrosion begins and remains undetected until the package is opened.

Because these risks are often subtle and cumulative, corrosion in indoor storage is frequently underestimated until it results in costly failures.

COMMON CAUSES OF CORROSION IN INDOOR STORAGE

- **Wood and Pallets:** Wood packaging materials can release acids and moisture that accelerate corrosion on nearby metal parts.
- **Corrugated Packaging:** Standard corrugated materials may contain contaminants that contribute to corrosion when in direct contact with metals.
- **Humidity and Condensation:** Daily temperature changes can create condensation cycles, even indoors, leading to rust formation.
- **Improper Cleaning or Residue:** Residual contaminants from manufacturing processes can accelerate corrosion if not properly addressed.
- **Incorrect Use of Desiccants:** Desiccants alone may not provide complete protection and must be used correctly alongside corrosion inhibitors.

THE BUSINESS IMPACT OF CORROSION

- Product damage and scrap
- Increased rework and labor costs
- Delayed shipments and customer dissatisfaction
- Reduced product reliability and brand reputation

Implementing a proactive corrosion protection strategy is essential to maintaining product quality and operational efficiency.

VCI FILMS & BAGS

A COMPLETE CORROSION MANAGEMENT APPROACH

ZERUST® provides more than just products. We deliver complete corrosion management solutions backed by technical expertise, testing capabilities, and global support.

From identifying root causes of corrosion to implementing effective protection strategies, ZERUST® helps ensure consistent results in indoor storage environments.

ENGINEERED VCI PACKAGING FOR RELIABLE INDOOR CORROSION PROTECTION

ZERUST® ICT® VCI films combine high-performance polyethylene packaging with integrated Vapor Corrosion Inhibitor (VCI) chemistry to protect metal parts during storage and handling. These materials create an enclosed environment where VCI molecules continuously protect exposed metal surfaces from corrosion.

Unlike traditional packaging, ZERUST® VCI films actively protect metal surfaces by releasing corrosion-inhibiting molecules throughout the enclosed space. When parts are removed from the packaging, the protective VCI layer dissipates, leaving them clean, dry, and ready for immediate use without additional cleaning.

ZERUST® ICT®510-C FERROUS VCI FILM

ICT®510-C Ferrous VCI Film is specifically engineered to protect carbon steel and cast iron components during storage and handling. It is ideal for machined parts, stampings, and assemblies where corrosion protection must be consistent, clean, and easy to implement.

Key Features:

- Protects ferrous metals including steel and cast iron
- Available in multiple thicknesses, widths, and formats

ZERUST® ICT®510-C NON-FERROUS VCI FILM

ICT®510-C Non-Ferrous VCI Film is designed to protect sensitive metals such as copper, brass, and aluminum from oxidation, staining, and discoloration. It is commonly used in electrical, electronic, and precision component applications.

Key Features:

- Protects non-ferrous metals including copper, brass, and aluminum
- Available in multiple thicknesses, widths, and formats

ZERUST® ICT®510-C MULTIMETAL VCI FILM

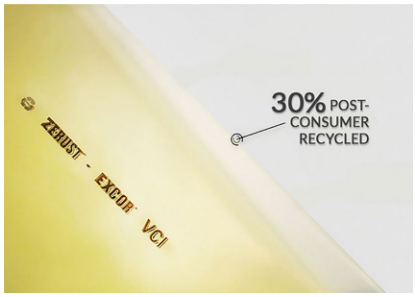
ICT®510-C Multimetal VCI Film provides broad-spectrum corrosion protection for multimetal assemblies. It eliminates the need to use multiple packaging materials, simplifying packaging operations while ensuring compatibility across different metal types.

Key Features:

- Protects ferrous and non-ferrous metals in a single package
- Available in multiple thicknesses, widths, and formats

VCI FILMS & BAGS

ZERUST® ICT®510-PCR30 VCI FILM

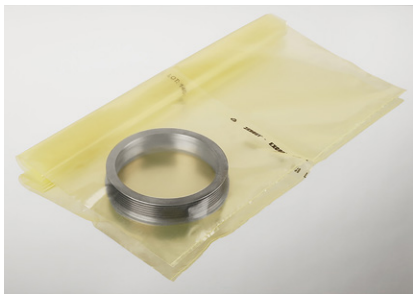


ICT®510-PCR30 VCI Film incorporates post-consumer recycled content while maintaining the corrosion protection performance expected from ZERUST® products. It is designed for customers looking to meet sustainability goals without compromising protection.

Key Features:

- Available in ferrous and multimetal protection formulations
- Supports sustainability initiatives

VCI BAGS (FLAT, GUSSET, ZIPPER)

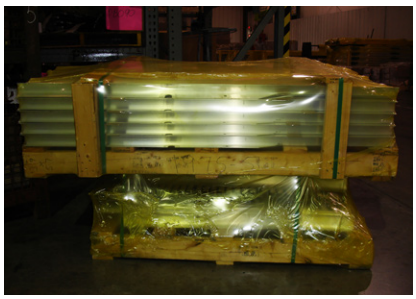


ICT® VCI Bags provide a convenient and effective way to create a sealed corrosion protection environment for metal parts during indoor storage. Available in flat, gusseted, and reclosable zipper formats, these bags accommodate a wide range of part sizes and shapes.

Key Features:

- Available in ferrous, multimetal, and non-ferrous protection formulations
- Available in multiple thicknesses, widths, and formats

ZERUST® ICT®510-SRK SHRINK VCI FILM



ICT®510-SRK Shrink VCI Film is designed for large parts, palletized loads, and equipment that require a tight, sealed enclosure. When heat-shrunk, the film conforms to the product, enhancing VCI concentration and protection effectiveness.

Key Features:

- Shrinks tightly around products to create sealed environment
- Available in ferrous and multimetal protection formulations

ZERUST® ICT®510-SM STRETCH VCI FILM

ICT®510-SM Stretch VCI Film combines load containment with corrosion protection, making it ideal for packaging operations. Available for both hand wrapping and machine applications, this film provides flexibility across different packaging environments while delivering consistent VCI protection.

Key Features:

- Stabilizes pallet loads during storage and handling
- Available in ferrous and multimetal protection formulations

BEST PRACTICE REMINDER

VCI technology works best when:

- Parts are clean and dry before packaging
- The package is properly sealed or enclosed
- The correct VCI chemistry is matched to the metal type

Scan the QR code to access our "How to Use VCI Packaging" guide.

VCI KRAFT PAPER

FLEXIBLE CORROSION PROTECTION WITH VCI PAPER TECHNOLOGY

ZERUST® ICT® VCI papers provide corrosion protection in a flexible paper format that is well-suited for wrapping, interleaving, layering, and void-fill applications. They are commonly used to protect metal parts inside enclosed packages, boxes, crates, and other storage systems where corrosion protection and packaging flexibility are both important.

VCI paper is often a strong choice when parts need separation within a package, when metal surfaces require protective wrapping, or when additional corrosion protection is needed inside a larger enclosed package.

HOW VCI PAPER WORKS

VCI molecules are embedded into the paper substrate and slowly release into the surrounding air, forming a protective molecular layer on metal surfaces.

This makes VCI paper ideal for:

- Interleaving between metal parts
- Use within enclosed packaging systems
- Wrapping large or irregular parts

ZERUST® ICT®420 VCI KRAFT PAPER

ICT®420 VCI Kraft Paper is a general-purpose corrosion inhibiting paper designed to protect ferrous metals during indoor storage and handling. It is ideal for wrapping, interleaving, and covering parts where flexible, breathable packaging is required.

Key Features:

- Protects ferrous and non-ferrous metals in a single package
- Ideal for wrapping, interleaving, and covering parts

ZERUST® ICT®427 PREMIUM VCI PAPER

ICT®427 Premium VCI Paper is a high-performance solution designed for demanding applications and extended storage periods. It offers increased VCI loading for enhanced corrosion protection in more challenging environments.

Key Features:

- Higher VCI loading for enhanced corrosion protection
- Ideal for critical or high-value components

ZERUST® ICT®420-170 VCI CHIPS

ICT®420-170 VCI Chips are loose-fill paper chips designed to protect metal surfaces inside void spaces and irregular packaging configurations. They provide an effective way to deliver VCI protection where traditional wrapping is not practical.

Key Features:

- Easy to use and distribute within packaging
- Ideal for filling void spaces in boxes and crates

REINFORCED VCI KRAFT PAPER

ZERUST® ICT®430-35SR VCI SCRIM REINFORCED PAPER

ICT®430-35SR VCI Scrim Paper is reinforced with scrim material to provide additional strength and tear resistance. It is designed for heavy-duty applications where standard paper may not provide sufficient durability.

Key Features:

- Reinforced with scrim for added strength and durability
- Resists tearing during handling and transport

ZERUST® ICT®420-35P VCI POLY KRAFT PAPER

ICT®420-35P VCI Poly Kraft Paper combines VCI protection with a polyethylene coating to provide added moisture resistance. It is well-suited for indoor environments where humidity fluctuations or condensation may be present.

Key Features:

- Protects ferrous metals in a single package
- Durable construction for added strength and handling

ZERUST® ICT®432-35P POLY VCI KRAFT PAPER

ICT®432-35P Poly VCI Kraft Paper features a multi-layer construction that combines VCI protection with enhanced moisture barrier properties. It is used in applications where both corrosion and moisture control are critical.

Key Features:

- Protects ferrous and non-ferrous metals in a single package
- Durable and resistant to handling damage

KEY ADVANTAGES OVER STANDARD PACKAGING

- Eliminates corrosion caused by corrugated and wood contact
- Provides protection without oils or coatings
- Easy to implement into existing packaging processes

BEST PRACTICE REMINDER

VCI technology works best when:

- Parts are clean and dry before packaging
- The package is properly sealed or enclosed
- The correct VCI chemistry is matched to the metal type

Scan the QR code to access our "How to Use VCI Paper" guide.

VCI DIFFUSERS & EMITTERS

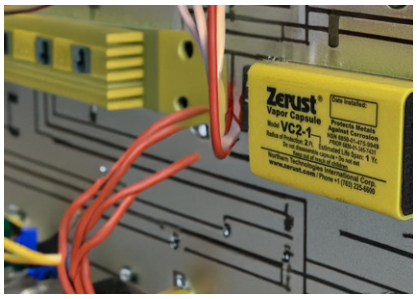
HOW VCI DIFFFUSERS & EMITTERS WORK

Emitters release VCI molecules into the air within an enclosure. These molecules:

- Diffuse throughout the space
- Adsorb onto metal surfaces
- Form a corrosion-inhibiting molecular layer

No direct contact is required, making them ideal for complex geometries and internal cavities.

ZERUST® VCI VAPOR CAPSULES

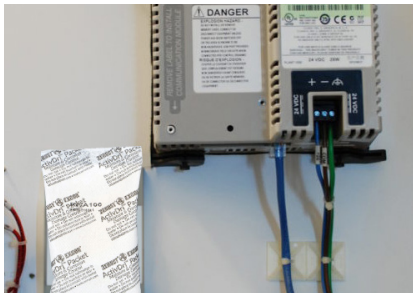


ZERUST® Vapor Capsules are compact VCI emitter devices designed to protect metal surfaces inside enclosed spaces such as electrical cabinets, control panels, and sealed equipment. They provide continuous corrosion protection by releasing VCI molecules into the enclosed environment.

Key Features:

- Protects metals inside enclosed spaces without direct contact
- Ideal for electrical cabinets, control panels, and enclosures

ZERUST® ACTIVDRI™ PWA PACKETS



ActivDri™ PWA Packets combine VCI corrosion protection with moisture absorption to deliver dual-action protection in enclosed environments. They are ideal for applications where humidity control and corrosion prevention are both critical.

Key Features:

- Combines VCI corrosion protection with moisture control
- Reduces risk of condensation-related corrosion

ZERUST® ACTIVPAK®

ActivPak® VCI sachets are fast-acting general-purpose emitters designed to protect metal parts inside packaging and enclosed spaces. They are a flexible and cost-effective solution for a wide range of indoor storage applications.

Key Features:

- Provides fast-acting VCI corrosion protection in enclosed spaces
- Suitable for packaging, bins, and storage containers

ZERUST® ACTIVPAK®(LS)

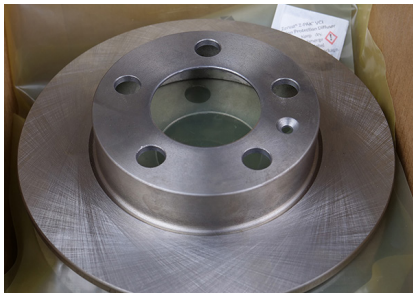
ActivPak®(LS) is a fast-acting VCI emitter designed to provide rapid corrosion protection, especially in environments prone to flash corrosion. It is commonly used in applications where immediate protection is required after cleaning or processing.

Key Features:

- Fast-acting VCI formulation for rapid protection
- Ideal for high-risk or aggressive environments

VCI DIFFUSERS & EMITTERS

ZERUST® Z-PAK® VCI PACKETS

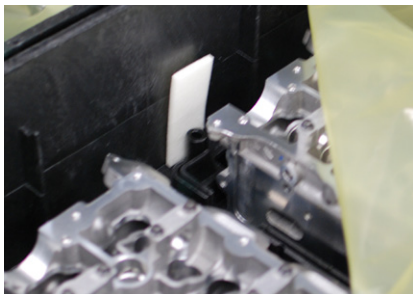


Z-PAK® VCI packets provide a simple and effective way to deliver corrosion protection within enclosed packaging environments. They are widely used for general-purpose protection across various industries.

Key Features:

- Flexible and cost-effective solution
- Easy to use in packaging, crates, and containers

ZERUST® ICT® OPEN CELL FOAM PADS



ICT® Open Cell VCI Foam Pads combine cushioning and corrosion protection in a single solution. They are ideal for protecting delicate components and electronics during storage and transport.

Key Features:

- Provides both cushioning and VCI corrosion protection
- Ideal for delicate or sensitive components

ZERUST® ACTIVDRI™ CAP-50A CAPSULE

ActivDri™ CAP-50A Capsule is a dual-action device that combines VCI corrosion protection with moisture control in a compact, installable capsule format. It is designed for enclosed environments such as electrical systems, control panels, and sensitive equipment.

Key Features:

- Combines VCI protection with moisture absorption in one device
- Ideal for environments with humidity fluctuations

KEY BENEFITS

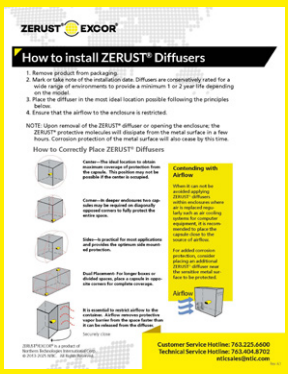
- Protect hard-to-reach internal surfaces
- Easy installation and maintenance
- Ideal for electronics and sensitive equipment
- Combine moisture control and corrosion protection

BEST PRACTICE REMINDER

VCI technology works best when:

- Installed inside enclosed spaces where VCI vapors can be retained
- The correct emitter type and quantity are selected based on enclosure volume
- Enclosures are kept closed as much as possible to maintain VCI concentration

Scan the QR code to access our "How to install ZERUST® Diffusers" guide.



RUST INHIBITORS, PREVENTATIVES AND COATINGS

COATINGS FOR EXTENDED INDOOR STORAGE PROTECTION

ZERUST® Axxanol™ rust preventatives provide a physical barrier layer that protects metal surfaces from moisture, oxygen, and contaminants.

These are typically used when:

- Storage conditions are severe or long-term
- Parts are not enclosed
- Additional protection is required beyond VCI

TYPES OF RUST PREVENTATIVE TECHNOLOGIES

- **Oil-based coatings:** Long-term protection with easy removal
- **Solvent-based coatings:** Fast drying with uniform coverage
- **Grease coatings:** Heavy-duty protection for extreme conditions
- **Water-based coatings:** Clean handling and minimal transfer

ZERUST® AXXANOL™ SPRAY-G

Axxanol™ Spray-G is a sprayable rust preventative grease designed for long-term corrosion protection in demanding indoor storage conditions. It forms a durable, heavy-duty barrier that protects metal surfaces from moisture, oxygen, and contaminants.

Key Features:

- Ideal for long-term storage and heavy equipment
- Protects against moisture, humidity, and contaminants

ZERUST® AXXANOL™ A35-8030

Axxanol™ A35-8030 is a long-term rust preventative oil designed to protect metal parts during indoor storage and light exposure conditions. It provides a uniform protective film that is easy to apply and remove when needed.

Key Features:

- Forms a consistent oil-based protective film
- Compatible with a wide range of metals

ZERUST® AXXANOL A35CD-7

Axxanol™ A35CD-7 is a high-flash solvent-based rust preventative that delivers fast drying and uniform coverage. It is ideal for industrial applications where efficient application and strong corrosion protection are required.

Key Features:

- Fast drying with uniform coating coverage
- Displaces moisture/water on metal surfaces

RUST INHIBITORS, PREVENTATIVES AND COATINGS

ZERUST® AXXANOL™ A35CD-32

Axxanol™ A35CD-32 is a dry-to-touch rust preventative that provides corrosion protection while allowing for clean handling of parts. It is ideal for components that require protection without transferring oils or residues.

Key Features:

- Dries to a clean, dry-to-touch finish
- Light lubricating properties

ZERUST® AXXANOL™ 718-ESS

Axxanol™ 718-ESS is an electrical corrosion inhibitor designed to protect connectors, contacts, and sensitive electronic components. It provides a thin protective film that prevents corrosion without interfering with electrical performance.

Key Features:

- Designed for electrical and electronic applications
- Meets MIL-PRF-81309H performance requirements

ZERUST® AXXANOL™ 758 VCI

Axxanol™ 758 VCI Oil combines barrier protection with VCI technology to provide enhanced corrosion protection for metal parts during storage. It is ideal for applications where both contact protection and vapor-phase protection are beneficial.

Key Features:

- Combines oil-based barrier protection with VCI technology
- Provides protection in both contact and vapor phases

ZERUST® AXXATEC™ 48C

Axxatec™ 48C is a water-based rust preventative specifically formulated to protect aluminum and other sensitive metals during indoor storage and processing. It provides a clean, temporary protective film that is ideal for applications where solvent-based coatings are not desired.

Key Features:

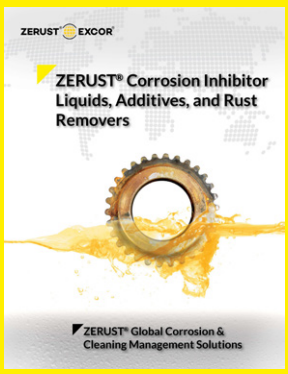
- Water-based formulation for safer and more environmentally friendly use
- Designed for aluminum and other sensitive metal surfaces

CHOOSING THE RIGHT RP

Selecting the right product depends on your application and protection requirements. Consider the following:

- Protection duration required (short-term vs long-term)
- Metal type (ferrous, non-ferrous, or multimetal)
- Application method (spray, dip, or automated systems)
- Downstream processes
- Environmental and safety requirements

Scan the QR code to explore the ZERUST® Corrosion Inhibitor Brochure and find the right solution for your application.



DUAL-ACTION RUST INHIBITORS WITH LIGHT-DUTY CLEANING

INTEGRATED CLEANING AND CORROSION PROTECTION SOLUTIONS

ZERUST® Axxatec™ Dual-Action Rust Inhibitors are designed to simplify metal protection by combining light-duty cleaning with corrosion prevention in a single step. These solutions remove light contaminants such as oils, fingerprints, and residues while leaving behind a temporary protective film to prevent rust during indoor storage and processing.

They are ideal for in-process applications, work-in-process (WIP) storage, and operations where efficiency, consistency, and reduced handling are critical.

TYPES OF DUAL-ACTION TECHNOLOGIES

ZERUST® Axxatec™ Dual-Action products are available in formulations designed to match specific metals and application requirements.

- **Ferrous Metal Solutions:** Designed for steel and cast iron, providing cleaning and corrosion protection for general industrial applications
- **Aluminum-Specific Solutions:** Formulated to clean and protect aluminum while preventing staining or surface damage
- **Yellow Metal Solutions:** Protect copper, brass, and other sensitive metals from tarnish and corrosion
- **Multimetal Solutions:** Designed to protect mixed-metal systems, simplifying processes where multiple metal types are present
- **Post-Clean Protection Additives:** Designed for use after cleaning processes to provide temporary corrosion protection during storage or handling

ZERUST® AXXATEC™ DA-23C

Axxatec™ DA-23C is a water-based dual-action solution that combines light-duty cleaning with corrosion protection for ferrous metals. It is designed to remove light contaminants while leaving behind a temporary protective film to prevent rust during indoor storage and processing.

Key Features:

- Combines light cleaning with corrosion inhibition in one step
- Designed for ferrous metals including steel and cast iron

ZERUST® AXXATEC™ DA-24C

Axxatec™ DA-24C is a dual-action cleaner and rust preventative formulated specifically for yellow metals such as copper and brass. It provides light cleaning while protecting against oxidation, tarnish, and corrosion.

Key Features:

- Combines cleaning with corrosion and tarnish protection
- Designed for copper, brass, and other yellow metals

DUAL-ACTION RUST INHIBITORS WITH LIGHT-DUTY CLEANING

ZERUST® AXXATEC™ DA-40AL

Axxatec™ DA-40AL is a water-based dual-action solution formulated for aluminum and other sensitive metals. It provides light cleaning while protecting against corrosion and surface staining during storage.

Key Features:

- Specifically designed for aluminum and sensitive metal surfaces
- Combines light cleaning with corrosion protection

ZERUST® AXXATEC™ 30C

Axxatec™ 30C is a water-based corrosion inhibitor designed to provide temporary protection for metal parts after cleaning or processing. It is ideal for applications where cleaning is performed separately and additional corrosion protection is required.

Key Features:

- Water-based corrosion inhibitor for temporary protection
- Suitable for ferrous and multimetal applications

KEY ADVANTAGES OVER SEPARATE CLEANING AND COATING PROCESSES

Using dual-action products can improve efficiency and reduce process complexity compared to traditional multi-step methods.

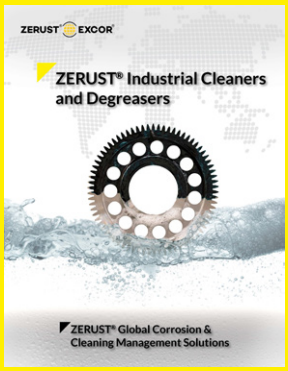
- Combines cleaning and corrosion protection in one step
- Reduces labor, time, and handling requirements
- Minimizes risk of flash rust after cleaning
- Improves process consistency across operations
- Reduces need for multiple chemicals and process steps
- Helps standardize processes across different part types and materials

CHOOSING THE RIGHT DUAL-ACTION PRODUCT

Selecting the right solution depends on your application and metal type. Consider the following:

- Metal type (ferrous, aluminum, or yellow metals)
- Level of cleaning required (light contamination vs heavier soils)
- Protection duration needed (short-term vs in-process)
- Application method (spray, dip, or wipe-down)
- Compatibility with downstream processes
- Drying and handling requirements (wet film vs light residual protection)

Scan the QR code to explore the ZERUST® Industrial Cleaners and Degreasers Brochure and find the right solution for your application.



INDUSTRIAL CLEANERS & DEGREASERS

PREVENTING CORROSION STARTS WITH PROPER CLEANING

ZERUST® AxxaWash™ Industrial Cleaners and Degreasers are designed to remove oils, greases, and contaminants from metal surfaces as a critical first step in corrosion prevention. Proper cleaning ensures that corrosion protection methods perform as intended and helps reduce the risk of flash rust and surface contamination.

While some AxxaWash™ products are formulated with built-in rust inhibitors for temporary corrosion protection, others are designed specifically for cleaning performance. Selecting the right solution depends on your process requirements, metal type, and level of protection needed.

TYPES OF CLEANING TECHNOLOGIES

- **General-Purpose:** Designed to remove oils, greases, and contaminants from a wide range of metal surfaces
- **Heavy-Duty Degreasers:** Formulated for removing heavy oils, residues, and difficult contaminants
- **Cleaners with Rust Inhibitors:** Provide light corrosion protection during and after cleaning to help prevent flash rust
- **Hard Water Compatible:** Maintain performance in environments with high mineral content
- **Aluminum & Sensitive Metal Cleaners:** Designed to clean without staining or damaging sensitive surfaces

ZERUST® AXXAWASH™ KF-121

AxxaWash™ KF-121 is a water-based industrial cleaner designed to remove oils, greases, and contaminants from metal surfaces prior to storage or further processing. It is ideal for general cleaning applications where consistent performance and compatibility with downstream corrosion protection are required.

Key Features:

- Water-based cleaner for removal of oils and contaminants
- Compatible with a variety of cleaning systems

ZERUST® AXXAWASH™ KF-122

AxxaWash™ KF-122 is a hard water compatible cleaner formulated to maintain cleaning performance in facilities with high mineral content in their water supply. It helps prevent scale buildup and ensures consistent cleaning results.

Key Features:

- Designed for use in hard water conditions
- Reduces scaling and residue buildup

ZERUST® AXXAWASH™ KF-123 WITH RUST INHIBITOR

AxxaWash™ KF-123 is an industrial parts washer fluid that combines cleaning performance with built-in corrosion inhibition. It is ideal for removing contaminants while providing temporary protection against flash rust.

Key Features:

- Combines cleaning and corrosion inhibition in one solution
- Helps prevent flash rust after washing

INDUSTRIAL CLEANERS & DEGREASERS

ZERUST® AXXAWASH™ KF-124 WITH RUST INHIBITOR

AxxaWash™ KF-124 is a water-based degreaser designed for removing heavy oils and contaminants from metal surfaces while providing added corrosion inhibition. It is well-suited for demanding cleaning applications where both cleaning performance and flash rust prevention are important.

Key Features:

- Removes heavy-duty oils, greases, and production residues
- Contains rust inhibitors to help prevent flash rust

ZERUST® AXXAWASH™ KMS-220 WITH RUST INHIBITOR

AxxaWash™ KMS-220 is a versatile part cleaner designed for industrial applications requiring effective contaminant removal with added corrosion protection. It provides cleaning performance while helping to reduce the risk of flash rust during processing and storage.

Key Features:

- Effective removal of oils, greases, and contaminants
- Contains rust inhibitors to help prevent flash rust

ZERUST® AXXAWASH™ KMS-305AL

AxxaWash™ KMS-305AL is specifically formulated for cleaning aluminum components. It removes contaminants while minimizing the risk of staining or surface damage to sensitive aluminum surfaces.

Key Features:

- Designed specifically for aluminum cleaning applications
- Removes oils and contaminants without damaging surfaces

ZERUST® AXXAWASH™ KMS-310AL

AxxaWash™ KMS-310AL is a multimetal cleaner formulated for both aluminum and ferrous metals. It provides effective cleaning while maintaining compatibility across multimetal systems.

Key Features:

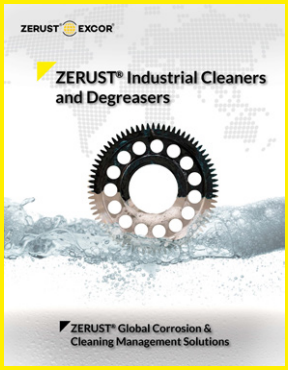
- Suitable for both aluminum and ferrous metals
- Removes oils, greases, and contaminants

CHOOSING THE RIGHT CLEANER

Selecting the right cleaner depends on your process, contamination level, and protection requirements. Consider the following:

- Level of contamination (light oils vs heavy residues)
- Metal type (ferrous, aluminum, or multimetal)
- Need for corrosion protection
- Water quality (standard vs hard water conditions)
- Application method (spray, immersion, or ultrasonic)

Scan the QR code to explore the ZERUST® Industrial Cleaners and Degreasers Brochure and find the right solution for your application.



INDUSTRIAL RUST REMOVERS

RESTORE METAL SURFACES

ZERUST® AxxaClean™ Rust Removers are designed to safely and effectively remove corrosion from metal surfaces prior to storage, processing, or protection. Removing existing rust is a critical step in restoring part quality and ensuring that downstream corrosion protection methods perform as intended.

Different rust removal technologies are available depending on the severity of corrosion, metal type, and application requirements. From gentle, non-acidic solutions to heavy-duty industrial formulations, ZERUST® offers options that balance performance, safety, and material compatibility.

TYPES OF RUST REMOVER TECHNOLOGIES

ZERUST® rust removers are available in multiple formulations designed to match specific corrosion conditions and application needs.

- **Chelating Rust Removers:** Use a non-acidic, chelation process to safely remove rust without attacking the base metal. Ideal for sensitive parts and applications requiring controlled, non-aggressive cleaning
- **pH Neutral Rust Removers:** Provide effective removal of light to moderate corrosion while maintaining a neutral pH. Suitable for applications where operator safety and material compatibility are important
- **Acidic Rust Removers:** Designed for aggressive removal of heavy rust and scale. Best suited for industrial applications where fast, high-performance cleaning is required

ZERUST® AXXACLEAN™ ICT®625-RR

AxxaClean™ ICT®625-RR is a chelating, water-based rust remover designed to safely remove corrosion from metal surfaces without aggressive acids. It is ideal for restoring parts prior to storage or applying corrosion protection.

Key Features:

- Chelating, acid-free formulation for safe rust removal
- Can be used in immersion cleaning processes

ZERUST® AXXACLEAN™ 2048

AxxaClean™ 2048 is a mild, low-pH rust remover designed for safe and effective removal of light to moderate corrosion. It is well-suited for applications where operator safety and material compatibility are important.

Key Features:

- Low-pH formulation for safer handling
- Removes light to moderate rust and oxidation

ZERUST® AXXACLEAN™ 3048

AxxaClean™ 3048 is a heavy-duty industrial rust remover designed to remove severe corrosion and scale from metal surfaces. It is ideal for restoring heavily rusted components prior to reprocessing or protection.

Key Features:

- Strong formulation for removing heavy rust and scale
- Effective on severely corroded metal surfaces

WHAT IS THE BEST RUST REMOVER?

Rust is a widespread and costly problem across industries. In the United States alone, corrosion costs are estimated in the hundreds of billions of dollars annually. Because of this, many manufacturers focus on preventing corrosion before it starts.

However, when corrosion has already formed, it must be removed before parts can be used, coated, or placed into storage. Selecting the right rust remover is critical to restoring part quality and ensuring long-term protection.

RUST REMOVAL METHODS

Rust can be removed using either physical or chemical methods, depending on the application and severity of corrosion.

Physical Rust Removal	Chemical Rust Removal
Includes sanding, grinding, and abrasive blasting. • Fast removal of heavy corrosion • Suitable for large, heavily rusted surfaces **Limitations:** • Can damage precision parts or sensitive surfaces • Cannot reach internal areas or complex geometries • Generates dust and debris	Chemical rust removers dissolve corrosion from the metal surface and are often preferred for controlled, consistent results. • Reaches complex shapes, threads, and internal surfaces • Safer for delicate or precision components • Available in multiple formulations for different applications

TYPES OF CHEMICAL RUST REMOVERS

Acidic (AxxaClean™ 3048)	Mild Acid (AxxaClean™ 2048)	Neutral / Chelating (AxxaClean™ ICT®625-RR)
Fast-acting solutions designed to remove medium to heavy rust quickly. • High performance for severe corrosion • Requires careful handling and proper neutralization • Best for industrial and heavy-duty applications	Balanced solutions that provide effective rust removal with improved safety and compatibility. • Removes light to moderate corrosion • Safer for a wider range of metals • Gentler on base material surfaces	Non-acidic solutions designed for safer operation and controlled rust removal. • Near-neutral pH for improved safety • Ideal for sensitive parts and precision components • Slower reaction with minimal impact on base metal

CHOOSING THE RIGHT RUST REMOVER

The best rust remover depends on your specific application. Consider the following:

- Severity of corrosion (light, moderate, or heavy)
- Metal type and surface sensitivity
- Safety and handling requirements
- Speed of rust removal needed
- Downstream processes and finishing requirements

Scan the QR code to explore the ZERUST® Rust Remover Brochure and find the right solution for your application.

THE Z-CIS® APPROACH

Corrosion failures in industrial environments rarely result from a single isolated issue. Instead, they are typically caused by a combination of factors across manufacturing, cleaning, handling, packaging, and storage.

Applying isolated corrosion products without evaluating the full process often leads to incomplete protection, recurring quality issues, and premature part degradation.

To address this, ZERUST® developed Z-CIS® (ZERUST® Corrosion Inhibiting System), a structured, engineering-driven approach that identifies corrosion risks and applies the right combination of technologies to eliminate them.

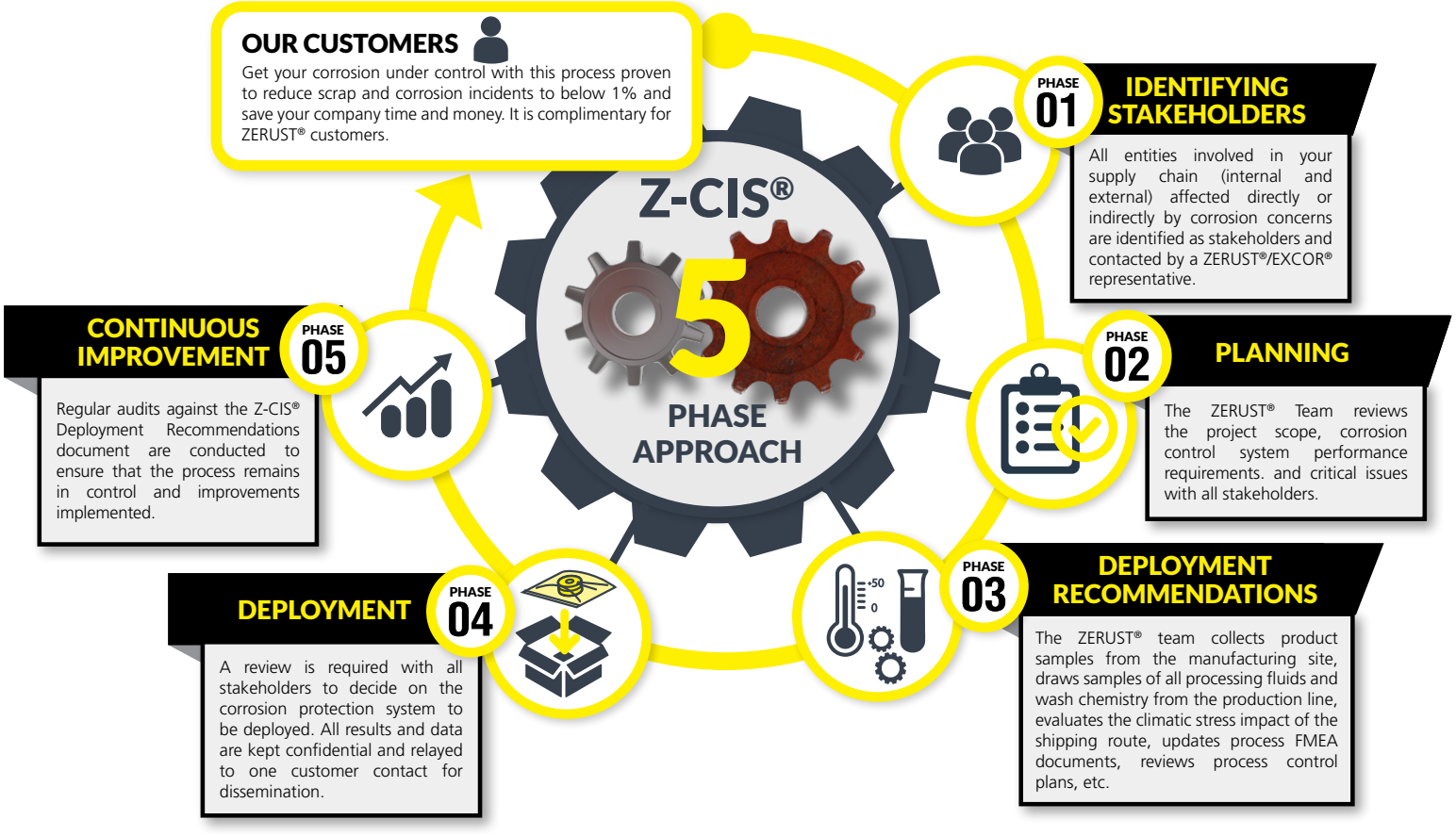
WHAT IS Z-CIS®?

Z-CIS® is a holistic corrosion management framework that integrates:

- Risk assessment
- Product selection
- Process optimization
- Validation and ongoing improvement

Rather than selling a single product, ZERUST® delivers a complete corrosion protection system, customized to your facility type, asset class, and operational environment.

Z-CIS® ensures corrosion protection is designed in, not reacted to later.



PROTECTING RELIABILITY THROUGH CORROSION CONTROL

For over 50 years, ZERUST® has helped manufacturers and industrial operations protect high-value metal assets during storage, handling, and production. From machined components and assemblies to electrical systems and finished goods, our solutions are designed to reduce corrosion-related damage and extend product life.

WHAT SETS ZERUST® APART

Industry-Proven Technology

ZERUST® VCIs are used worldwide in:

- Automotive and metalworking operations
- Industrial manufacturing and fabrication
- Aerospace and defense applications
- Electronics and electrical systems
- Oil and gas and heavy equipment industries

Our technologies protect metals at the molecular level, reaching areas that coatings and oils cannot.

Complete Corrosion Solutions

Unlike single-product suppliers, ZERUST® offers:

- VCI films, papers, bags, and stretch/shrink packaging
- VCI emitters and diffusers for enclosed spaces
- Rust preventatives, coatings, and water-based inhibitors
- Industrial cleaners, and rust removers
- Corrosion management support and application expertise

One supplier. One system. Total corrosion protection.

Environmentally Responsible

ZERUST® products are designed to meet modern environmental standards:

- Nitrite-free options
- RoHS and REACH compliant
- Minimal waste and reduced solvent use

Global Reach, Local Support

With operations and partners in more than 70 countries, ZERUST® provides responsive technical support wherever your operations are located.

Our experts provide fast, region-specific technical support wherever you operate.

Measurable Cost Savings

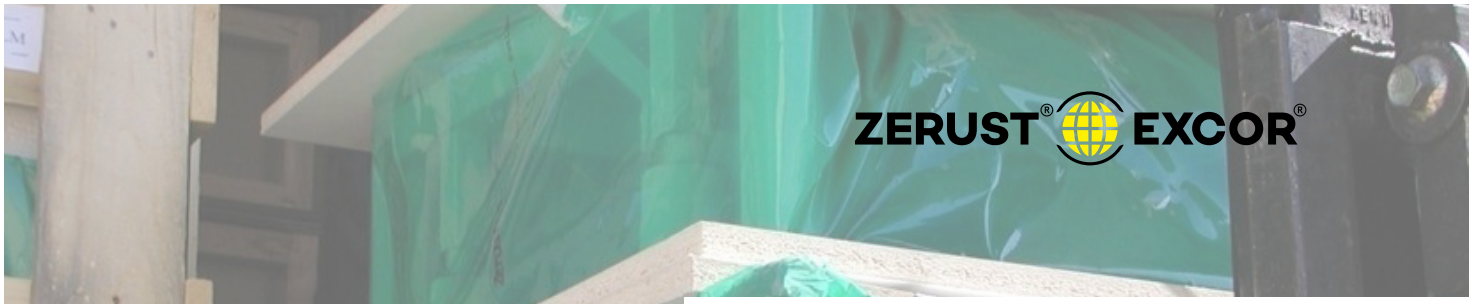
ZERUST® customers routinely achieve:

- Reduced scrap and product damage
- Lower rework and labor costs
- Improved product quality and reliability
- Extended storage life and asset protection

Corrosion prevention isn't a cost, it's an investment!

Certified Quality You Can Trust

Northern Technologies International Corporation (NTIC), the parent company of ZERUST®, is certified to the ISO 9001 Quality Management Standard. This certification reflects our commitment to delivering high-quality corrosion-inhibiting products and services while continuously improving our operations. Through our Quality Management System (QMS), we focus on productivity, innovation, regulatory compliance, and customer satisfaction to support sustainable growth and global excellence.



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Visit www.zerust.com for more information!

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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.