

ZERUST[®]  **EXCOR[®]**

CORROSION SOLUTIONS FOR HYDROSTATIC TESTING



ZERUST[®] is a product of
Northern Technologies
International Corporation



PROVEN SAFE, RELIABLE, AND EFFECTIVE CORROSION SOLUTIONS FOR HYDROSTATIC TESTING

Hydrostatic testing is critical for verifying the integrity of pipes, pressure vessels, tanks, and industrial equipment. However, exposure to water during testing introduces a high risk of internal corrosion that can compromise asset reliability if not properly controlled.

For over 50 years, ZERUST® has provided proven corrosion protection solutions trusted across industries worldwide. Our hydrostatic testing additives are engineered to protect ferrous and non-ferrous metals during testing and short-term storage, helping maintain asset integrity from fabrication to commissioning.



ZERUST® solutions are:

- Field-proven across power generation, fabrication, and manufacturing industries
- Compatible with a wide range of water qualities and system conditions
- Designed for safe handling, application, and disposal

THE BENEFITS OF ZERUST® CORROSION INHIBITOR PRODUCTS



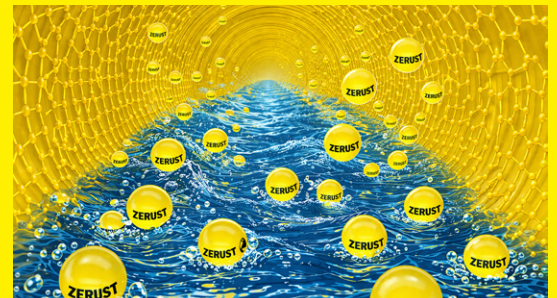
- **Effective Corrosion Protection:** Protects internal metal surfaces from flash rust and long-term corrosion during and after testing
- **Multimetal Protection:** Solutions available for ferrous and multimetal systems, including steel, aluminum, and copper alloys
- **Ease of Use:** Simple dilution and application into test water with minimal process disruption
- **Reduced Maintenance and Rework:** Eliminates the need for costly post-test cleaning, drying, or rework
- **Environmentally Responsible Options:** Select formulations designed for reduced environmental impact and easier disposal

HOW ZERUST® HYDROSTATIC TESTING SOLUTIONS WORK

ZERUST® hydrostatic testing additives protect metal surfaces using advanced corrosion inhibitor chemistry.

When added to test water, the inhibitors:

- Form a protective molecular layer on exposed metal surfaces
- Interrupt the electrochemical corrosion process
- Protect internal void spaces and hard-to-reach areas



This protective barrier remains effective during testing and provides ongoing protection during short-term storage or transport prior to commissioning.

CORROSION CHALLENGES DURING HYDROSTATIC TESTING

Hydrostatic testing is a critical step in verifying the integrity of pipes, pressure vessels, and industrial equipment. While effective for detecting leaks and ensuring structural performance, the use of water during testing introduces a significant risk of internal corrosion if not properly managed.



Unlike dry storage environments, hydrostatic testing fully exposes internal metal surfaces to water, oxygen, and dissolved contaminants. Even short-term exposure can initiate corrosion, especially when untreated or variable-quality water sources are used. Once corrosion begins, it can continue even after the system is drained if residual moisture remains.

In many cases, test water contains chlorides, salts, and other impurities that accelerate corrosion rates. These contaminants can be introduced through municipal water, well water, or seawater, depending on the testing location. Additionally, dissolved oxygen and microbial activity can further contribute to aggressive corrosion mechanisms, including localized pitting and microbiologically influenced corrosion (MIC).

Post-test conditions also play a critical role. Incomplete draining, inadequate drying, or delays between testing and commissioning can leave residual moisture trapped inside the system. This creates ideal conditions for corrosion to propagate in enclosed or hard-to-reach areas where visual inspection is not possible.

Because these risks occur internally and are often not immediately visible, corrosion during hydrostatic testing is frequently underestimated. Without proper corrosion control measures, this can lead to long-term damage, reduced asset reliability, and costly remediation efforts.

COMMON CAUSES OF CORROSION DURING HYDROSTATIC TESTING

Hydrostatic testing exposes internal surfaces to water, oxygen, and contaminants that accelerate corrosion.

Common contributors include:

- Dissolved oxygen in test water
- Chlorides and salts from untreated or seawater sources
- Microbial activity leading to microbiologically influenced corrosion (MIC)
- Inadequate drying after testing
- Extended hold times before system commissioning

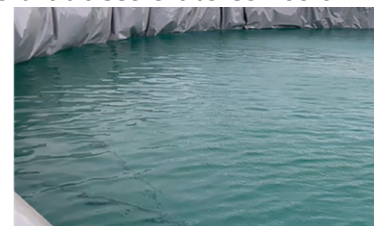
Without proper protection, corrosion can begin within hours of exposure.

THE BUSINESS IMPACT OF CORROSION

Failure to control corrosion during hydrostatic testing can result in:

- Premature equipment failure
- Increased maintenance and repair costs
- Project delays and commissioning setbacks
- Reduced operational reliability
- Warranty claims and reputational risk

Implementing corrosion protection during testing is a proactive step that reduces lifecycle costs and ensures long-term asset performance.



Pre-hydrotest water treated with ZERUST® AxxaVis™ HST-10, providing corrosion protection while maintaining clean, controlled test conditions.



Post-hydrotest discharge showing contaminants, residues, and corrosion byproducts flushed from internal pipe surfaces during testing.

ZERUST® AXXAVIS™ HST-10

ENVIRONMENTALLY RESPONSIBLE HYDROSTATIC TESTING PROTECTION



ZERUST®/EXCOR® AxxaVis™ HST-10 is a water-soluble powder additive that treats water and deactivates ionic contaminants found in water sources that cause rust and hard water deposits on metals during hydrostatic testing. AxxaVis™ HST-10 is a highly effective way to protect the interior surfaces of pressure vessels from corrosion that can rapidly form during hydrostatic testing and short-term post-test exposure. Add the product to water to make it suitable for hydrostatic test processes conducted on pressure vessels such as pipes, heat exchangers, storage tanks, and ship voids. Designed for use on ferrous metals only, it is not compatible with aluminum. For applications involving copper, brass, or other metal alloys containing red/yellow alloys, it may be used in conjunction with ZERUST®/EXCOR® Axxatec™ HST-M100 additive.

Used AxxaVis™ HST-10 product can be analyzed for quality and, in some cases, reused. Spent AxxaVis™ HST-10 working fluid may be discharged into the soil or marine environments (subject to normal legislative restrictions). AxxaVis™ HST-10 does not contain solvent, is non-flammable, compliant with Global Automotive Declarable Substance, TSCA, ECHA SVHC, RoHS, and REACH requirements, and designed to support environmentally responsible hydrostatic testing processes.

Key Features

- Effective corrosion protection for steel and iron
- Nitrite-free formulation (may contain trace amounts due to shared manufacturing processes)
- Easy to dilute and apply in test water
- Suitable for pipes, tanks, and pressure vessels

Performance Benefits

- Prevents flash rust during testing
- Protects internal surfaces during short-term post-test exposure
- Reduces need for post-test cleaning

Typical Properties

Appearance	White powder
Substrates	Ferrous. Warning: Not compatible with aluminum. However, it may be used in conjunction with ZERUST®/EXCOR® Axxatec™ HST-M100 additive, added at 0.5 – 2% in 0.5% AxxaVis™ HST-10 working solution for applications containing copper, brass, or other metal alloys containing red/yellow alloys. For applications containing aluminum, Axxatec™ HST-M100 is the desired product.
pH (0.5 – 2% solution)	9.8 – 10.2

Availability

ZERUST®/EXCOR® AxxaVis™ HST-10 is sold as a powder additive.

Part Number	Quantity*
460-M-00002CA	25 lb. (11.3 kg) case
460-M-00002SU	800 lb. (362.9 kg) sack

*Product sold in US customary units. Metric units approximate.

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ZERUST® AXXATEC™ HST-20L

VERSATILE WATER TREATMENT FOR CORROSION CONTROL



ZERUST®/EXCOR® Axxatec™ HST-20L is a highly effective water treatment concentrate designed to deactivate ionic contaminants found in water sources that cause rust and hard water deposits on metals during hydrostatic testing. Axxatec™ HST-20L is a highly effective way to protect the interior surfaces of pressure vessels from corrosion that can rapidly form during and after hydrostatic testing. Add the product to water to make it suitable for hydrostatic test processes conducted on pressure vessels such as pipes, heat exchangers, storage tanks, and ship voids. Designed for use on ferrous metals only and not compatible with aluminum. For applications involving copper, brass, or other metal alloys containing red/yellow alloys, it may be used in conjunction with Axxatec™ HST-M100 additive. For applications containing aluminum, Axxatec™ HST-M100 is the desired product.

Used Axxatec™ HST-20L product can be analyzed for quality and, in some cases, reused. Spent Axxatec™ HST-20L working fluid may be discharged into the soil or marine environments (subject to normal legislative restrictions). Axxatec™ HST-20L does not contain solvent, is non-flammable, compliant with Global Automotive Declarable Substance, TSCA, ECHA SVHC, RoHS, and REACH requirements, and is designed to support environmentally responsible hydrostatic testing processes.

Key Features

- Concentrated liquid formulation for flexible use
- Designed for use on ferrous metals only
- Compatible with various water qualities

Performance Benefits

- Protects during hydrostatic testing and short-term post-test exposure
- Counteracts ionic contaminants left on metal surfaces
- Reduces corrosion risk

Typical Properties

Appearance	Liquid concentrate
Substrates	Ferrous. Warning: Not compatible with aluminum. However, it may be used in conjunction with ZERUST®/EXCOR® Axxatec™ HST-M100 additive, added at 0.5 – 2% in 3.3% Axxatec™ HST-20L working solution for applications containing copper, brass, or other metal alloys containing red/yellow alloys. For applications containing aluminum, Axxatec™ HST-M100 is the desired product.
pH (3.3 – 13.4% solution)	9.8 – 10.2

Availability

ZERUST®/EXCOR® Axxatec™ HST-20L is sold as a liquid concentrate.

Part Number	Quantity*
350-F-00053PL	5 Gal (19 L) Pail
350-F-00053DR	55 Gal (208 L) Drum
350-F-00053TT	275 Gal (1041 L) Tote

*Product sold in US customary units. Metric units approximate.

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ZERUST® AXXATEC™ HST-M100

HIGH-PERFORMANCE CORROSION PROTECTION FOR DEMANDING APPLICATIONS



ZERUST®/EXCOR® Axxatec™ HST-M100 is a low to no-foam, water-soluble liquid additive designed for hydrostatic testing when a combination of yellow metals, aluminum, and/or ferrous metals are exposed to the test fluid. Axxatec™ HST-M100 treats water by counteracting ionic contaminants that cause rust and tarnish on metals during hydrostatic testing. It effectively protects the interior surfaces of pressure vessels from corrosion that can rapidly form during and after hydrostatic testing. Add the product to water to make it suitable for hydrostatic test processes conducted on pressure vessels such as pipes, heat exchangers, storage tanks, and ship voids. Axxatec™ HST-M100 is recommended when aluminum, copper, brass, or other metal alloys containing red/yellow alloys above 3% are processed. For hydrostatic testing involving only ferrous systems, AxxaVis™ HST-10 is the desired product.

Used Axxatec™ HST-M100 product can be analyzed for quality and, in some cases, reused. Spent Axxatec™ HST-M100 working fluid may be discharged into the soil or marine environments (subject to normal legislative restrictions). Axxatec™ HST-M100 does not contain solvent, is non-flammable, complies with Global Automotive Declarable Substance, TSCA, ECHA SVHC, RoHS, and REACH requirements, and is designed to support environmentally responsible hydrostatic testing processes.

Key Features

- Advanced corrosion inhibitor formulation
- Suitable for multimetal systems
- Designed for challenging environments

Performance Benefits

- Protects systems during hydrostatic testing and short-term post-test exposure
- Continues to counteract ionic contaminants when left on metal surfaces
- Effective in multimetal systems and variable water conditions

Typical Properties

Appearance	Yellow to light amber, clear liquid
Substrates	Aluminum, red/yellow metal alloys (copper and brass), and ferrous. Test before use on galvanized steel.
pH (1 – 5% solution)	8.9 – 9.1

Availability

ZERUST®/EXCOR® Axxatec™ HST-M100 is sold as a liquid concentrate.

Part Number	Quantity*
350-M-00105PL	5 Gal (19 L) Pail
350-M-00105DR	55 Gal (208 L) Drum
350-M-00105TT	275 Gal (1041 L) Tote

*Product sold in US customary units. Metric units approximate.

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PROTECTING RELIABILITY THROUGH CORROSION CONTROL

For over 50 years, ZERUST® has helped industrial operations protect critical assets during hydrostatic testing, commissioning, and short-term layup. From pipes and pressure vessels to tanks, heat exchangers, and process equipment, our solutions are designed to prevent internal corrosion, maintain system integrity, and ensure reliable startup.

WHAT SETS ZERUST® APART

Industry-Proven Technology

ZERUST® corrosion inhibitor technologies are used worldwide in hydrostatic testing across:

- Heat Exchangers
- Refineries and petrochemical facilities
- Power generation and utilities
- Fabrication and heavy manufacturing

Our technologies protect metals at the molecular level, reaching internal surfaces, void spaces, and complex geometries during hydrotesting.

Complete Corrosion Solutions

Unlike single-product suppliers, ZERUST® offers:

- Hydrostatic testing additives
- Water treatment concentrates
- Rust preventatives and temporary coatings
- VCI solutions for layup after testing
- Corrosion management support and application expertise

One supplier. One system. Total corrosion protection.

Environmentally Responsible

ZERUST® hydrostatic solutions are designed to meet modern environmental & operational requirements:

- Nitrite-free options
- Formulations designed for easier handling and disposal
- Reduced environmental impact compared to traditional chemistries

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 risk of internal corrosion and system damage
- Lower maintenance and remediation costs
- Minimized delays in commissioning & startup
- Improved reliability & asset performance

***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.

Global Support

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|----------------------------------|------------|-------------------|-------------------------------|
| Algeria | Denmark | Mexico | Sri Lanka |
| Angola | Ecuador | Monaco | Sweden |
| Argentina | Estonia | Morocco | Switzerland |
| Australia | Finland | Nepal | Taiwan |
| Austria | France | Netherlands | Thailand |
| Bangladesh | Gabon | Nigeria | Tunisia |
| Belarus | Germany | Norway | Turkey |
| Belgium | Hungary | Peru | Ukraine |
| Bhutan | India | Philippines | United Arab Emirates and MENA |
| Bolivia | Indonesia | Poland | (Middle East & North Africa) |
| Brazil | Ireland | Portugal | United Kingdom |
| Canada | Italy | Republic of Congo | United States |
| Chile | Japan | Romania | Uruguay |
| China | Kazakhstan | Singapore | Vietnam |
| Colombia | Korea | Slovak Republic | |
| Czech Republic | Latvia | Slovenia | |
| Democratic Republic of the Congo | Lithuania | South Africa | |
| | Luxembourg | Spain | |
| | Malaysia | | |

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.