



Rig Stacking Extensive Product Guide

Zerust® VCI films, vapor capsules, sprays, greases, additives for engines, hydraulics and mud systems to safeguard critical equipment from corrosion allowing for easy re-activation of the asset.

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Worldwide Corrosion Solutions

Zerust® Oil & Gas has designed products and solutions to provide tangible savings for the oil and gas industry to support the following markets and sectors: exploration and production; refineries; terminals; equipment suppliers; pipelines and transportation. Some of our oil and gas clients include BP, Chevron, Enbridge, Reliance Industries (India), Petrobras (Brazil), Shell (Malaysia), ADMA-OPCO and FMC Technologies (USA). The team

leverages Northern Technologies International Corporation (NTIC) global network of trained corrosion management professionals and channel partners to deliver products, provide local support, conduct client training and participate in solution field trials. In addition, the research and development group works with companies like Chevron, Petrobras and Enbridge to develop specialized corrosion mitigation solutions and shared intellectual property (IP) technologies.

World Leaders

Zerust Oil & Gas is a division of NTIC which develops and markets proprietary environmentally beneficial products and services in over 70 countries either directly or via a network of subsidiaries, joint ventures, independent distributors and agents. NTIC's primary business is corrosion prevention marketed largely under the ZERUST® brand. NTIC has been selling its proprietary ZERUST® rust and corrosion inhibiting products and services to the automotive, electronics, electrical, mechanical, military and retail consumer markets, for over 50 years, and in recent years has targeted and expanded into the oil and gas industry. NTIC offers worldwide on-site technical consulting for rust and corrosion prevention issues. NTIC's technical service consultants work directly with the end users of NTIC's products to analyze their specific needs and develop systems to meet their technical requirements. NTIC also markets and sells a portfolio of bio-based and biodegradable polymer resins and finished products marketed under the Natur-Tec® brand.



Our Technology

Our Zerust Oil & Gas technologies have been successfully implemented across refineries, oil rigs, and tank farms around the world. By combining our proprietary Zerust inhibitor formulations with some of the traditional corrosion mitigation methods in use today (cathodic protection, coatings, etc.), our advanced technology yields several unique and innovative solutions that counter expensive corrosion problems. Zerust corrosion engineers go beyond VCI technology by offering a comprehensive system called Integrated Corrosion Technologies ("ICT"). Our trained professionals will help you pick the right VCI solution for your corrosion need.

Corrosion Solutions for

- ✓ Offshore Rigs / Platforms / FPSOs
- ✓ Pipeline Preservation
- ✓ Pipe Casing Protection
- ✓ Equipment Preservation
- ✓ Spare Parts Protection
- ✓ Tank Bottom and Roof Solutions

Product Guide Overview

FILM

PRODUCT	DESCRIPTION	APPLICATION
Zerust® ICT® Film 510-OPS	Gray, VCI shrink film	Wrap parts and equipment for long term storage.
Zerust® ICT® Film 510-C	Ferrous (ferrous and ferrous alloys) Non-Ferrous (Cu and Cu alloys, Al and	Wrap parts and equipment for long term storage (interior).

ELECTRICAL

PRODUCT	DESCRIPTION	APPLICATION
Zerust® ICT® Vapor Capsules™	VCI emitter in capsule form	Corrosion protection for enclosed spaces.

RUST PREVENTATIVE / GREASE

PRODUCT	DESCRIPTION	APPLICATION
Zerust® Axxanol™ Spray-G	Sprayable grease	Lubrication of moving/sliding surfaces: valves, cylinders, hinges, shafts, bushings. Indoor or covered outdoor exposure.
Zerust® Axxanol™ Z-Maxx LV	Soft grease	Lubrication of moving/sliding surfaces: valves, cylinders, hinges, shafts, bushings. Limited outdoor exposure.
Zerust® Axxanol™ Z-Maxx	Heavy grease	Lubrication of moving/sliding surfaces: valves, cylinders, hinges, shafts, bushings, wire ropes. Outdoor exposure.

RUST PREVENTATIVE / OIL

PRODUCT	DESCRIPTION	APPLICATION
Zerust® Axxanol™ 34CD	Near dry to touch thin oil	Lubrication of moving/sliding surfaces, wire rope penetrant.
Zerust® Axxanol™ 750-NV	Thin oily film	Lubrication of moving/sliding surfaces, indoor exposure.

RUST PREVENTATIVE / WATERBORNE

PRODUCT	DESCRIPTION	APPLICATION
Zerust® Axxatec™ 80C	Waterborne RP, dries to clear, dry to	Overcoat for interior painted surfaces.
Zerust® Axxatec™ 85-F	Waterborne rust preventative spray with VCI (ferrous metals)	Fogging into pipes, vessels, void spaces.

VCI PACKETS

PRODUCT	DESCRIPTION	APPLICATION
Zerion® FVS-S2	Corrosion inhibitor packet	Corrosion protection for enclosed spaces, especially for condensation.
Custom Leads	Corrosion inhibitor packets attached to leads	Corrosion protection for large volume enclosed spaces (leads hung at the perimeter of the space).

Product Guide Overview

WATER TREATMENT

PRODUCT	DESCRIPTION	APPLICATION
Zerion® FVS-B	Corrosion inhibitor powder (VCI and SCI)	VCI and SCI inhibitor solutions, flush pumps, lines, manifolds, enclosed pits.
Zerion® FAN-5	Corrosion inhibitor powder (SCI)	SCI only inhibitor solution, flush pumps, lines, manifolds, enclosed pits, mud tanks, drill water tanks, drill pipes.

ENGINE AND GEAR BOX

PRODUCT	DESCRIPTION	APPLICATION
Zeriol® MCO	Corrosion inhibitor oil (engine)	Treat engine lubricating oils.

HYDRAULIC

PRODUCT	DESCRIPTION	APPLICATION
Zeriol® MOV	Corrosion inhibitor oil (hydraulic)	Treat hydraulic oils.

COATINGS

PRODUCT	DESCRIPTION	APPLICATION
Zerust® AxxaCoat™ 90	Waxy solvent borne coating. Sprayable (black). Brushable (amber). Aerosol cans (black).	Direct to metal coating or overcoat already coated metal, equipment, pipes, metal parts. Exterior or Interior, translucent appearance.
Zerios® WES	Low VOC (<280 g/L) water reducible alkyd.	Direct to metal coating or overcoat already coated metal, equipment, pipes, metal parts. Exterior or Interior, translucent appearance.

COVERS

PRODUCT	DESCRIPTION	APPLICATION
Zerust® Inhibitor Fusion (ZIF) Tape	Silicone tape	Corrosion protection for piping, especially high temperature applications, CUI.

SPECIALTY

PRODUCT	DESCRIPTION	APPLICATION
Zeriol® FOD	Diesel fuel stabilizer	Additive used for treating diesel fuel.
Zerion® FOXL	Oxygen scavenger	Additive for water in sealed, stagnant, full vessel.
Zerust® AxxaWash™ NW-10C	Alkaline cleaner	Alkaline cleaner.

Zerust® Vapor Corrosion Inhibitors (VCIs) and Soluble Corrosion Inhibitors (SCIs) are special types of corrosion inhibitors that has been in use for decades to mitigate corrosion.



Film

Zerust® ICT® Film 510-OPS
Zerust® ICT® Film 510-C

ZERUST® EXCOR®

▶ Zerust® Outdoor Preservation Shrink

Use Zerust®/Excor® ICT®510-OPS VCI Shrink Film for long-term outdoor storage and mothballing of parts and equipment. Zerust® outdoor preservation film provides superior corrosion and UVI protection for up to 3 years even in extreme conditions.

Zerust®/Excor® Outdoor Preservation VCI Shrink Film provides advanced protection to metals with Zerust® Vapor Corrosion Inhibitor (VCI) technology. It is a premium 8-mil, high-strength shrink film with UV stabilizers for 3-year outdoor protection. The film shrinks and conforms to objects when heated to repel moisture and contaminants. Zerust® VCI saturates the interior of the packaging to protect hard-to-reach spaces and voids from corrosion.

This specially designed VCI shrink film is ideal for lay-up and mothballing of equipment, vehicles and outdoor storage of components. Multiple sheets can be shrunk together for any size application such as structures and machinery. Zerust® Outdoor Preservation Film protects valuable metal assets and makes them ready to use whenever and wherever they are needed. Check with your Zerust®/Excor® representative for a corrosion management solution most effective for your metal assets.

Application Example

Valuable assets are protected from corrosion when stored outdoors. Zerust® film enables items to be stored near the project site and be operationally ready.



▶ Benefits

- High strength and performance
- 3-year outdoor protection
- Proven corrosion and UV protection
- Excellent shrink properties
- Superior handling and drape
- Safe for electronics

Application Type

- Storage
- Shipping
- Works with Zerust® VCI diffusers

Zerust®

Specifications



Product Information	Zerust®/Excor® ICT®510-OPS Film is a heat responsive durable film that shrinks and forms a durable package.
Appearance	Typical colors are opaque gray and clear.
Protected Metal Types	Ferrous metal protection. Multimetal and non-ferrous protection are available upon request.
Protection Duration	Outdoor UV protection for up to 3-years. Under shelter, VCI protects clean metals for years when used correctly and utilized within three years from receipt.
Storage	Store in original packaging away from direct sunlight in conditions below 85°F (30°C) and 50% RH for up to 3 years from the date of shipment.

Product Comparison Chart

Property	Direction (Machine or Transverse)	Zerust® High-Strength Shrink Film*	Competitor Shrink Film	ASTM Test Method
Film Thickness	-	8.0 mil (203 µm)	10.5 mil (267 µm)	D-6988
Dart Impact Resistance	-	900 g	715 g	D-1709
Tear Strength	MD	15250 mN	18850 mN	D-1938
	TD	17280 mN	21800 mN	
Tensile Strength at Break	MD	3466 psi (23.9 MPa)	2756 psi (19.0 MPa)	D-882
	TD	3263 psi (22.5 MPa)	2900 psi (20.0 MPa)	
Elongation at Break	MD	930%	816%	D-882
	TD	895%	873%	
Water Vapor Transmission Rate 100°F (38°C), 100% RH	-	0.108 g/(100 in²/day) 1.64 g/(m²/day)	0.0924 g/(100 in²/day) 1.43 g/(m²/day)	F-1249
Vapor Inhibiting Ability (VIA)	-	Pass	-	NACE TM0208

* Typical values, not meant to be a specification.

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Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. No representation or recommendation not contained herein shall have any force or effect unless in a written document signed by an officer of the company. The foregoing warranty is exclusive and in lieu of all other warranties, express, implied or statutory, including without limitation any implied warranty of merchantability or of fitness for a particular purpose. In no case shall Northern Technologies International Corporation/Zerust® be liable for incidental or consequential damages.

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Availability

Custom options and printing available upon request. Minimum order quantities apply.

Stock Offerings:

PN 100-F-00070
8 mil 20' x 100' Opaque Gray
PN 100-F-00077
8 mil 40' x 425' Clear

Accessories:

PN 250-X-00002 (12 rolls/case)
6 mil 4" x 180' gray preservation tape
PN 250-X-00003 (8 rolls/case)
6 mil 6" x 180' gray preservation tape

Recyclable

Dispose of in accordance with local, national and international regulations. Check on options for recycling and incineration.

Safety

- Safe for people. This product does not pose a health hazard to users due to its classification as an article according to EU REACH, UN GHS, US OSHA HazCom and CA WHMIS regulations.
- Zerust® VCI chemistry is safe for sensitive electronics. No galvanic effects, residues or changes in the properties of metals. The protective molecules dissipate upon opening of package.

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Rev F4

ZERUST® EXCOR®

ZERUST® - EXCOR® VCI

▶ Zerust® ICT® 510-C VCI Ferrous Film

Zerust®/Excor® ICT® 510-C VCI Film provides cost-effective and versatile protection against corrosion damage for ferrous metals in shipping and storage. It protects steel, iron, cast iron and its alloys. It is available in various sized rolls, sheets, tubing and bags.

Zerust® VCI packaging film diffuses proprietary Zerust® VCIs (Vapor Corrosion Inhibitors) to protect metals from rust. Use Zerust® ICT® 510-C VCI Film to protect metal components and assemblies, machined and cast parts, and more for years. For additional protection and use in challenging environments, packaging can be used with Zerust® corrosion inhibitor liquid RPs and VCI diffuser products. Check with your Zerust®/Excor® representative for a comprehensive corrosion management solution most effective for your metal assets.

Zerust is the inventor of poly VCI technology and Zerust® VCI film has proven its performance and safety* with thousands of customers worldwide for over 40 years. It is used to protect valuable metal items for manufacturers in industries such as automotive, agricultural, aerospace and mining. Zerust®/Excor® offers on-site support and service in more than 70 countries via a network of 21 joint venture partnerships.

Application Example

A ferrous Zerust® VCI Film gusseted bag lines a dunnage system to protect precision steel parts from corrosion in shipping.



▶ Benefits

Effective corrosion protection and packaging combined in one step

Metals are ready for use and assembly directly out of the packaging

Available in many different shapes and sizes

Provides safe* and effective Zerust® VCI protection.

Recyclable

Application Type

Storage
Shipping
Work in progress

*Safe for people. This product does not pose a health hazard to users due to its classification as an article according to EU REACH, UN GHS, US OSHA HazCom and CA WHMIS regulations.



Product Information

Description	Zerust®/Excor® ICT®510-C VCI Film is a polyethylene product impregnated with volatile corrosion inhibitors.
Appearance	Typical colors are clear, yellow or green. Additional colors available upon request. Subject to order minimums.
Protected Metal Types	Protects ferrous metals such as steel, iron and its alloys.
Protection Life	Protects clean metals for years when used correctly and utilized within three years from receipt. Not intended for outdoor use.
Storage	Store in original packaging away from direct sunlight in conditions below 85°F (30°C) and 50% RH for up to 3 years from the date of shipment.

Property	Direction (Machine or Transverse)	Zerust® ICT®510-C Film*	ASTM Test Method
Film Thickness	-	4 mil (102 µm)	D-6988
Dart Impact Resistance	-	300 g	D-1709
Tear Strength	MD	0.60 lb-f (2.7 N)	D-1938
	TD	0.65 lb-f (2.9 N)	
Tensile Strength at Yield	MD	1905 psi (13.1 MPa)	D-882
	TD	1538 psi (10.6 MPa)	
Tensile Strength at Break	MD	3045 psi (21.0 MPa)	D-882
	TD	2917 psi (20.1 MPa)	
Elongation at Break	MD	560%	D-882
	TD	610%	
Breaking Factor	MD	11.0 lb-f/in (1926 N/m)	D-882
	TD	11.5 lb-f/in (2014 N/m)	
Water Vapor Transmission Rate @78°F (26°C), 90% RH	-	0.06 g/(100 in²/day)	F-1249
Vapor Inhibiting Ability (VIA)	-	Pass	NACE TM0208

* Typical values, not meant to be a specification.

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Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. No representation or recommendation not contained herein shall have any force or effect unless in a written document signed by an officer of the company. The foregoing warranty is exclusive and in lieu of all other warranties, express, implied or statutory, including without limitation any implied warranty of merchantability or of fitness for a particular purpose. In no case shall Northern Technologies International Corporation/Zerust® be liable for incidental or consequential damages. For full warranty and disclaimer information visit: www.zerust.com/warranty

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Availability

Zerust®/Excor® ICT®510-C VCI Ferrous Film is available in many stock and custom options such as UV and Anti Static additives. Contact a Zerust® account manager for pricing and availability.

Size Range (width):

Bags & Tubing:
2" - 125" (flat)
2" - 150" (gusset)
Sheeting: 2" - 26'

Recyclable

Dispose of in accordance with local, national and international regulations. Check on options for recycling and incineration.

Safety

- Safe for people. This product does not pose a health hazard to users due to its classification as an article according to EU REACH, UN GHS, US OSHA HazCom and CA WHMIS regulations.
- Zerust® VCI chemistry is safe for sensitive electronics. No galvanic effects, residues or changes in the properties of metals. The protective molecules dissipate upon opening of package.

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RevC9

Electrical

Zerust® ICT® Vapor Capsules™

ZERUST® EXCOR®

Zerust®
Vapor Capsule
Model VC2-1
Radius of Protection: 2 Ft.
Date Installed: _____
Protects Metals Against
Rust/Corrosion
NSN 6850-01-475-9949
PRIOR 6850-01-345-431
Estimated Life Span: 1 Yr.
Northern Technologies International Corp.
www.zerust.com | Phone 1 (763) 225-6600

Zerust® Vapor Capsules

Zerust®/Excor® Vapor Capsules are portable capsules that contain patented Zerust® VCI technology. Use to protect metals in hard to reach areas of control panels, electrical cabinets and other enclosed spaces, even when they are in operation. Or use as a supplement to other Zerust® VCI packaging products for added protection.

Use Vapor Capsules to protect multiple metal types from corrosion in almost any enclosure or sealed packaging. Zerust® diffusers emit Vapor Corrosion Inhibitors (VCIs) that prevent oxidation of the metal surface that causes rust. They provide targeted corrosion protection in hard to reach spaces and additional protection to metals in Zerust® VCI packaging applications.

Zerust® capsules are quick and easy to install. Simply peel back the protective paper from the adhesive tape and install securely in desired location. Tightly seal the enclosure to trap protective vapor inside. Metals will be protected from rust and tarnish for up to one or two years depending on the capsule model and environment.

Application Example

A Vapor Capsule protects an electronics enclosure from corrosion during operation. The capsule has been marked with the installation date so operators know when to replace it with a new capsule.



Benefits

Safe* and effective corrosion protection where traditional anti-corrosion methods can not be used.

Easy to install, economical to use.

Does not affect the circuit boards or sensitive components.

Suitable for new equipment and to protect the reliability of existing equipment.

Application Type

Storage
Shipping
During Operation
May be used with Zerust® Packaging

*Safe for people. This product does not pose a health hazard to users due to its classification as an article according to UN GHS, US OSHA HazCom and CA WHMIS regulations. Check REACH SDS for classification in EU.

Zerust®

Specifications

Product Information	Zerust® Capsules are VCI (Vapor Corrosion Inhibitor) diffusers. The capsules are made from recycled PE materials.
Appearance	PE-plastic capsule and foam or protective foam containing active pellets.
Protection Volume	See table below
Protection Duration	See table below
Storage	Store in a cool, dry place and away from sunlight for up to 2 years from the date of shipment.
Protected Metal Types	Multimetal protection for steel, iron, zinc and galvanized steel, copper, brass, bronze, aluminum (and alloys), nickel, tin, solder.

Protection Capabilities*

Model	Protection Volume	Protection Radius	Protection Duration
VC 1-1(s)	4 ft³ (0.12 m³)	1 ft (30 cm)	1 year
VC 1-1	4 ft³ (0.12 m³)	1 ft (30 cm)	1 year
VC 2-1	35 ft³ (1 m³)	2 ft (60 cm)	1 year
VC 2-2	35 ft³ (1 m³)	2 ft (60 cm)	2 years
VC 6-1	900 ft³ (25 m³)	6 ft (200 cm)	1 year
VC 6-2	900 ft³ (25 m³)	6 ft (200 cm)	2 years

* Protection ratings are based on the highest average tested protection properties and are not guaranteed. Results may vary according to usage environment and metal surface properties such as contaminants.

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Availability

Zerust® Vapor Capsules are in stock for immediate delivery. Sold in cases.

Model	Units/Case
VC 1-1(s)	50
VC 1-1	50
VC 2-1	25
VC 2-2	10
VC 6-1	4
VC 6-2	4

Safety

- Safe for people. This product does not pose a health hazard to users due to its classification as an article according to UN GHS, US OSHA HazCom and CA WHMIS regulations. Check REACH SDS for classification in EU.
- Zerust® VCI chemistry is safe for sensitive electronics. No galvanic effects, residues or changes in the properties of metals. The protective molecules dissipate upon opening of package.

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Rust Preventative (RP) / Grease

Zerust® Axxanol™ Spray-G
Zerust® Axxanol™ Z-Maxx LV
Zerust® Axxanol™ Z-Maxx Series

ZERUST® EXCOR®

▀ Zerust® Axxanol™ Spray-G

For superior corrosion protection in a sprayable grease, use Zerust®/Excor® Axxanol™ Spray-G. It protects in extreme conditions, such as during outdoor storage and overseas shipping.

Axxanol™ Spray-G provides the protection of a grease in the convenience of a sprayable form. It outperforms many other rust preventative coatings, while being easier to apply and remove, saving time and costs associated with corrosion control. The product has an oily grease consistency and provides advanced corrosion protection for parts and equipment for up to 1 year outdoors and 2 years indoors.

Axxanol™ Spray-G can be used as a light lubricant while it provides exceptional corrosion protection. The product is resistant to water and is compatible with packaging and most rubber and plastic materials. Test on a small area before use. Check with your Zerust®/Excor® representative for a corrosion management solution most effective for your metal assets.

▶ Benefits

- Sprayable multimetal rust preventative coating
- Protects in extreme outdoor conditions
- Safe for paint and plastic
- Non-hazardous* disposal
- Removable with an alkaline cleaner

▀ Application Example

A large piece of machinery was coated with Axxanol™ Spray-G before shipment overseas. It was shipped on the deck and in extreme open-air conditions. The item arrived corrosion-free to the end customer.



Application Type

- Storage
- Shipping
- During Operation
- May be used with Zerust® VCI packaging

*Non-Hazardous Disposal: Product in unopened original container prior to use is non-hazardous waste in the United States according to 40 CFR 261 (no components listed on F, K, P or U lists; not ignitable, not corrosive, not reactive and not toxic).

Zerust®

Technical Data

Product Information	Solvent-based corrosion inhibitor sprayable grease.	
Application	Apply via pressurized spray	
Tested on 1010 Steel panels with 20 Ra roughness	Application temperature	50 to 122°F (10 to 50°C)
	Coverage (Dry film)	211 ft² (20 m²) per lb 1900 ft² (180 m²) per gal
	Layer Thickness (Dry film)	1 mil (25 µm)
	Removability	Alkaline cleaner
	Max VOC content	40%
	Flash Point ASTM D93	177° F (80.5°C)
	Zahn Cup #3 Viscosity	13-20 secs @ 25°C
Protection Properties	Indoors	Up to 2 years
Tested at 2 mil (50 µm)	Outdoor	Up to 1 year
	ASTM D1748 Humidity	Meets or exceeds 1320 hrs
	ASTM B117 Salt Spray	Meets or exceeds 1500 hrs
	Packaging/Hermetically Sealed	Up to 5 years
	Metal types	Multimetal protection
Storage Guidelines	Store in a cool (50 to 90°F / 10 to 32°C), dry place and away from sunlight in original packaging for up to 2 years from the date of shipment.	

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Availability

Zerust®/Excor® Axxanol™ Spray-G is sold in a ready-to-use aerosol can and in bulk pails and drums. Large volume pricing available upon request.

Part Number	Qty
350-M-00023AC	12 oz (12 cans/case)
350-M-00023PL	5 Gal*
350-M-00023DR	55 Gal*

*5 Gallon approx. 35 lbs, 55 Gallon approx. 400 lbs

Contact an Expert

Consult your local Zerust®/Excor® representative to implement an optimum corrosion prevention system for your production facility and supply chain.

Safety

- Product in unopened original container prior to use does not meet criteria for hazardous waste according to 40 CFR 261 (no components listed on F, K, P or U lists; not ignitable, not corrosive, not reactive and not toxic).

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ZERUST® EXCOR®

Zerust® Axxanol™ Z-Maxx Series

For a hard-working corrosion preventative grease—use Zerust® Axxanol™ Z-Maxx or Z-Maxx LV. Z-Maxx greases provide extreme corrosion prevention for ferrous and non-ferrous metals for up to one year outdoors and two years under shelter.

Zerust®/Excor® Axxanol™ Z-Maxx is ideal for protecting bare-metal parts and components of machinery and equipment in extreme weather and salt-air conditions. Z-Maxx can be used for protecting parts during operation or long-term storage. Z-Maxx outperforms most petroleum-based corrosion preventive coatings and is easier to apply and remove—saving labor and maintenance costs.

Z-Maxx is a thick NLGI 2 grease and is also offered as Z-Maxx LV, a lower viscosity NLGI 0 grease. Both types offer exceptional corrosion protection while the original Z-Maxx is also a multipurpose EP lubrication grease for high-temperature range applications. Z-Maxx LV is designed for spreadability and has light lubrication properties.

Z-Maxx has very little odor and when applied in a thin uniform layer it creates a translucent film that allows visibility of the metal surface. It is hydrophobic and is compatible with synthetic rubber and plastics. For a sprayable Z-Maxx grease version, see information on Zerust® Axxanol™ Spray-G.

Application Example

Z-Maxx was applied to critical metal parts on wind generators and solar panels in preparation for shipping. Upon arrival, customers installed them without need for removing the protective coating.



Benefits

Superior corrosion protection

Long-term protection even outdoors

Multipurpose lubricant grease

Available in different formats for ease of application

Safe* and easy to apply and remove

Tenacious and resistant to water

Application Type

Storage
Shipping
During Operation
May be used with Zerust® packaging

*Safe to use and handle. Product is not hazardous for people or the environment according to EU (CLP) or OSHA HazCom 2012 (US GHS).

Zerust®

Technical Data

Product Series Information	Corrosion inhibitor lubricant greases.	
	Z-Maxx Original	Z-Maxx LV
Application	Apply via brush or cloth	Apply via brush or cloth
Application Temp	-13 to 176°F (-25 to 80°C)	-13 to 176°F (-25 to 80°C)
Coverage	290 ft ² (27 m ²) / gal	290 ft ² (27 m ²) / gal
Wet Film Thickness *	5 mil (127 µm)	5 mil (127 µm)
Grease Grade	NLGI 2	NLGI 0
Removability	Alkaline cleaner	Alkaline cleaner
VOC Content	Not Applicable	Not Applicable
Flash Point	475°F (246°C)	390°F (200°C)

Protection Specs

Metal types	Multimetal protection	Multimetal protection
Copper Compatibility	Pass	Pass
Salt Fog (ASTM B-117)	>500 Hrs @ 2 mil	>500 Hrs @ 2 mil
Indoors	Up to 2 years	Up to 2 years
Outdoors	Up to 1 year	Up to 1 year
In VCI Packaging/ Hermetically Sealed	Up to 5 years	Up to 5 years

Storage Temp Store in a cool (50 to 90°F / 10 to 32°C), dry place and
Shelf Life away from sunlight in original packaging for up to 2 years
 from the date of shipment.

*A change in thickness of coating will result in a change in coverage. Typical application thickness ranges from 5 to 20 mil. Theoretical coverage is 1450 ft² (135 m²) / gallon at 1 mil (24 µm) wet film thickness.

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Availability

Zerust®/Excor® Axxanol™ Z-Maxx is a ready-to-use grease product sold by volume. For sprayable version see infosheet for Axxanol™ Spray-G.

Part Number	Qty
Axxanol™ Z-Maxx	
360-M-00001PL	5 Gal*
360-M-00001DR	55 Gal*
Axxanol™ Z-Maxx LV	
360-M-00002PL	5 Gal*
360-M-00002DR	55 Gal*

Axxanol™ Spray-G (Z-Maxx Spray)	
350-M-00023AC	12 oz
350-M-00023PL	5 Gal*
350-M-00023DR	55 Gal*

*5 Gallon approx. 35 lbs, 55 Gallon approx. 400 lbs

Safety

- Safe to use and handle. Product is not hazardous for people or the environment according to EU (CLP) or OSHA HazCom 2012 (US GHS).
- Product in unopened original container prior to use does not meet criteria for hazardous waste according to 40 CFR 261 (no components listed on F, K, P or U lists; not ignitable, not corrosive, not reactive and not toxic).

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Rust Preventative (RP) / Oil

Zerust® Axxanol™ 34CD
Zerust® Axxanol™ 750-NV

ZERUST® EXCOR®

▶ Zerust® Axxanol™ 34CD

Zerust®/Excor® Axxanol™ 34CD is a solvent-based rust preventive coating that leaves a very light, oily film on the protected surface. It provides powerful corrosion protection against aggressive environments such as salt air and high temperatures for multiple metal types.

Use Axxanol™ 34CD to protect parts during program changeover periods in the assembly process. After allowing metals to completely dry, place into Zerust® Vapor Corrosion Inhibitor (VCI) packaging products for a more robust solution that protects for years and during challenging conditions such as ocean shipments. The coating can be removed with most alkaline cleaners or left on the surface. Its thin coating does not interfere with torque or pull-out requirements of parts and was tested by an independent lab to be compatible with engine oil.

The Axxanol™ 34CD coated and dried parts are safe to handle and have a near dry-to-touch finish. During drying, the solvent completely evaporates, leaving behind a harmless corrosion preventative coating. End users, when handling coated parts, do not need to wear personal protection equipment such as a respirator, mask or safety glasses. Only clean gloves without lint or talc are recommended to keep metals free of corrosion and contaminants.

▶ Application Example

Steel Parts are dipped in Zerust® Axxanol™ 34CD for corrosion protection prior to ocean shipment from India to Germany.



▶ Benefits

Proven corrosion protection for challenging environments

May be used with Zerust® VCI Film

Apply by spray, brush or dip

Multimetal protection

Near dry-to-touch thin oil

Compatible with most engine oil lubricants

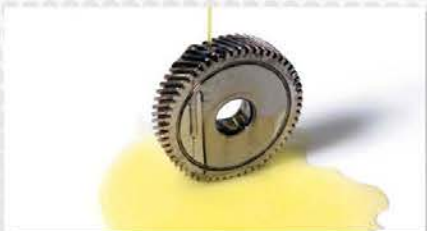
▶ Application Type

Storage

Shipping

During Operation

May be used with Zerust® packaging

Zerust®

Use Zerust® Axxanol™ 34CD alone or with Zerust® VCI packaging.

Technical Data

Product Information	Ready to use solvent-based rust preventative. Amber liquid dries to a thin, oily film that is near dry-to-touch.	
Application	Apply via spray, brush or dip	
	Application temperature	50 to 110°F (10 to 43°C)
	Coverage (dip application)	1240 ft² (115 m²) per gal
	Layer Thickness	Approx. 1 mil (25 µm)
Properties	Removability	Alkaline or solvent cleaner
	VOC content EPA Method 24	5.96 Lbs/gal (716 g/L)
	Flash Point	102°F (39°C)
	Viscosity	1.598 cSt @ 40°C
Protection Info	Indoors	Up to 6 months
	Outdoor	Not recommended
	Packaging/hermetically sealed	Up to 7 years
	ASTM B117 Salt Spray	Up to 24 hours
	Metal types	Multimetal protection
Storage	Store in a cool (32 to 85°F / 0 to 30°C), dry place and away from sunlight in original packaging for up to 2 years from the date of shipment.	

Availability

Zerust® Axxanol™ 34CD is sold as a ready-to-use liquid product.

Part Number	Qty*
350-M-00012PL	5 Gal (18.9L)
350-M-00012DR	55 Gal (208L)

Disposal

Dispose of in accordance with local, national and international regulations.

Safety

- When coating is dry, no personal protection is needed. Only clean gloves without lint or talc are recommended to keep metals free of corrosion and contaminants.

*Sold in US customary units, Metric for reference only.

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Rev K1

ZERUST® EXCOR®

▶ Zerust® Axxanol™ 750-NV

Zerust®/Excor® Axxanol™ 750-NV rust preventative oil provides robust corrosion protection to metal surfaces in an easy-to-use oil-based corrosion preventive coating. It offers corrosion protection for multiple metal types for up to 2 years indoors.

Axxanol™ 750-NV provides powerful corrosion protection against aggressive environments such as salt air and high temperatures for steel, cast iron, aluminum, brass and copper. It may be used with Zerust®/Excor® ICT® VCI film packaging products for sheltered protection beyond 2 years. Apply by spray, brush or dip.

Axxanol™ 750-NV leaves a clear, thin, oily film that can be removed with an alkaline cleaner. Typical Zerust® Axxanol™ 750-NV applications include corrosion protection for in-line rolling mill applications, cold rolled sheet and coils, wire bar, and cast and machined ferrous and non-ferrous metals during shipment and storage. Axxanol™ 750-NV remains sprayable at sub-zero temperatures of -10°F (-23°C). Please contact your Zerust® representative for more information on how to use Axxanol™ 750-NV oil.

Application Example

Axxanol™ 750-NV protects sensitive metal parts in overseas shipping in aggressive conditions.



▶ Benefits

Advanced Zerust® corrosion protection technology

Sprayable and easy to remove

Multimetal protection

Non-hazardous*

Application Type

Storage
Shipping
During Operation
May be used with Zerust® packaging

*Product in unopened original container prior to use does not meet criteria for hazardous waste according to 40 CFR 261 (no components listed on F, K, P or U lists; not ignitable, not corrosive, not reactive and not toxic).

Zerust®


Protection for metals in shipping and storage from corrosion.

Technical Data

Product Information	Ready to use oil-based rust preventative liquid. Light amber liquid coating results in an oily, thin, clear, water-barrier film.	
Application	Apply via spray, brush or dip Application temperature -10 to 122°F (-23 to 50°C) Dry time 30 mins Coverage 600 ft² (55.8 m²) per gal Layer Thickness approx. 1 mil (25 µm)	
Properties	Removability Alkaline cleaner VOC content EPA method 24 2.15 Lbs/gal (259 g/L) Flash point ASTM-D93 235°F (113°C) Viscosity 23 cP @73°F, #61, 100RPM	
Protection Info	Indoors up to 2 years* Outdoor Not recommended ASTM B117 Salt Spray Up to 90 hours Compatible with packaging Yes** Metal types Multimetall protection	
Storage	Store in a cool (50 to 90°F / 10 to 32°C), dry place and away from sunlight in original packaging for up to 2 years from the date of shipment.	

* Protection for up to 2 years when properly applied to clean and dry metal surfaces and protected metals are stored indoors away from direct sunlight, acid gases, with a RH below 60%. Increase the robustness of the protection to your coated parts by using Zerust® VCI packaging film and bags.

** Test before use with PE bags that are in direct contact with the coated surfaces. Sintered and/or cast metal surfaces treated with oil-based products when exposed to hot, humid conditions and in direct contact with the PE bags may potentially have some brownish oil staining.

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Availability

Zerust® Axxanol™ 750-NV is sold as a ready-to-use liquid product. Large volume quantities and pricing available upon request.

Part Number	Qty
350-M-00033PL	5 Gal
350-M-00033DR	55 Gal

Non-Hazardous

Dispose of in accordance with local, national and international regulations.

Safety

- Product in unopened original container prior to use does not meet criteria for hazardous waste according to 40 CFR 261 (no components listed on F, K, P or U lists; not ignitable, not corrosive, not reactive and not toxic).

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Rev D1



Rust Preventative (RP) / Waterborne

Zerust® Axxatec™ 80C

Zerust® Axxatec™ 85-F

ZERUST® EXCOR®

▶ Zerust® Axxatec™ 80C

Zerust® Axxatec™ 80C is a water-based rust preventative liquid that protects ferrous metals for up to one year under shelter. It can be applied by spray, brush or dip and leaves a clear and dry to the touch protective coating. Safe for painted, rubber and plastic materials.

Zerust® Axxatec™ 80C is a water-based rust preventative liquid concentrate that may be diluted from 2% to 7.5% per the application. This aqueous-based corrosion inhibitor system protects ferrous metals via proven Zerust® Integrated Corrosion Technologies (ICT®). Use Axxatec™ 80 to protect bare ferrous metals such as cast iron, steel and its alloys during shipping, storage and assembly.

Axxatec™ 80 forms a clear, thin, dry-to-touch coating and is safe for use on painted surfaces, rubber seals, and plastics. It provides up to one year protection indoors or in plain packaging and up to 5 years in hermetically sealed spaces or Zerust® VCI packaging. Axxatec™ 80C is designed for use on ferrous metals, but may provide some protection to other metals such as aluminum, copper, brass, and nickel alloys, etc. Test before use on non-ferrous metals.

Application Example

A solution of Axxatec™ 80 is ideal for use with in-line spray or dip applications. The addition rate can be adjusted for a protection period of 6 to 12 months depending on the project requirements.



▶ Benefits

Forms a clear, dry-to-touch, hydrophobic film

Concentrated formula reduces shipping costs and allows for customized dilutable protection

Safe for painted, rubber and plastic materials.

Easy to apply and remove

Non-hazardous*

Application Type

Storage
Shipping
During Operation
May be used with Zerust® VCI packaging

*Non-Hazardous Disposal: Product in unopened original container prior to use is non-hazardous waste in the United States according to 40 CFR 261 (no components listed on F, K, P or U lists; not ignitable, not corrosive, not reactive and not toxic).

Zerust®

Technical Data

Use Axxatec™ 80C for crystal clear, non-tacky water-based protection.

Product Info	Water-based rust preventative liquid concentrate.	
Application	Apply via immersion, brush, or spray	
	Application temperature	50 to 90°F (10 to 32°C)
	Immersion dwell time	45 seconds
	Drip time	0 - 15 mins
	Dry time	45 - 60 mins
	Dilution	2 - 7.5% (Dilute with DI water)
	Viscosity @ 71°F (21°C)	650 cps (#63 spindle) @ 100 rpm
	Coverage	3000 ft²/279m² per gal (at 7.5% and drained)
	Thickness (varies by method)	0.25-0.5 mil (6 - 12 µm)

Properties	Appearance	Amber liquid
	Surface finish	Clear, dry to touch
	Removability	Alkaline cleaner
	VOC content concentrate	<35%
	Freeze point	32°F (0°C)
	Flash point	Not applicable
	pH	Approx. 6 - 9

Protection Info	Indoor @ 2%	Up to 6 months
	Indoor @ 7.5%	Up to 12 months
	Outdoor	Not recommended
	Packaging/hermetically sealed	Up to 5 years
	Metal types	Ferrous protection, multimetal compatible, not safe for galvanized

Storage and Disposal	Store in a cool (50 to 90°F / 10 to 32°C), dry place and away from sunlight in original packaging for up to 2 years from the date of shipment.
	Dispose of in accordance with local, national and international regulations.

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Precautions

- Remove before painting.
- Not for use on galvanized metals.
- Test before use on yellow metals.
- Do not place treated metals in direct contact with cardboard packaging or wood.
- Product foams when used in spray mode. Contact your Zerust®/Excor® representative for recommendations for suitable defoaming agents.

Health and Safety

Non-Hazardous Disposal: Product in unopened original container prior to use is non-hazardous waste in the United States according to 40 CFR 261 (no components listed on F, K, P or U lists; not ignitable, not corrosive, not reactive and not toxic).

Availability

Zerust® Axxatec™ 80C is sold as a concentrate. Large quantity pricing available upon request.

Part Number	Qty
350-F-00005PL	5 Gal
350-F-00005DR	55 Gal

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Zerust® Axxatec™ 85-F VCI RP

Zerust®/Excor® Axxatec™ 85-F is an aqueous-based rust preventative liquid designed for fogging and spraying applications that protect **ferrous** metals via contact inhibitors and proven Zerust® Vapor Corrosion Inhibitor (VCI) technology. Zerust® VCI molecules migrate to provide protection on hard to reach voids within an enclosed space and sealed while the product is wet. It forms a thin coating that is safe for use on most painted surfaces. The product comes ready to use and can be applied by fogging or pressurized spray. Not for use on metals other than ferrous.



Use Axxatec™ 85-F for corrosion protection during assembly, shipping and storage or inside vessels after hydrostatic testing. It is ideal for fogging into complex steel assemblies or packages that contain components with voids and chambers. To gain the benefit of the VCI, use in a tightly sealed foggable enclosure or void. Axxatec™ 85-F provides one year protection in plain packaging and up to 5 years in hermetically sealed spaces or Zerust®/Excor® VCI packaging. Contact your Zerust®/Excor® technical representative for a multimetal compatible product.

Benefits

- Effective water-based RP with VCI
- Leaves a clear coating
- Ready to use, easy to apply
- Foggable VCI protects hard to reach crevices and voids

Application Type

- Storage
- Mothballing and Long-term storage
- Shipping
- May be used with poly packaging

Storage

Store in tightly closed container to preserve VCI. Do not freeze. May separate when frozen. If frozen, allow to thaw and mix thoroughly. Store in a cool (32 to 85°F / 0 to 30°C), dry place and away from sunlight in original packaging for up to 2 years from the date of shipment.

Disposal

Collect waste when removing. Dispose of in accordance with local, national and international regulations. Product in unopened original container prior to use is non-hazardous waste in the United States according to 40 CFR 261 (no components listed on F, K, P or U lists; not ignitable, not corrosive, not reactive and not toxic). Avoid release into the environment.

Availability

Zerust®/Excor® Axxatec™ 85-F is sold as a ready-to-use liquid product.

Product	Part Number	Quantity
Axxatec™ 85-F	350-F-00009PL	5 Gal (19 L)
	350-F-00009DR	55 Gal (208 L)



Surface Preparation

For best practice, parts should be dry, clean, free of process fluid residues, fluid contaminants, particulate contaminants, finger prints, and other oils/solvents prior to application.

Recommended application temperature: 41 to 120°F (5 to 49°C). For low freezing temperature application, please refer to Axxatec™ 87-MW3 Winterized product.

Application Instructions

Fog Application

Axxatec™ 85-F can be fogged/sprayed into a void space with the intention of trapping the liquid and vapor in that void space. Any high-volume low pressure or high-volume high pressure spraying system can be used to spray Axxatec™ 85-F, i.e. battery operated airless sprayer, etc. The suggested loading is 200 mL of Axxatec™ 85-F for every cubic meter of void space. This quantity will provide good coverage and ample VCI to protect any areas not directly exposed to spray. Once a void has been filled seal the space as thoroughly as possible. This will ensure that the VCI has the best possible chance of protection. Providing a consistent amount of the product inside a void is recommended. For parts with large aspect ratio, consult your Zerust®/Excor® technical representative.

Removal

Axxatec™ 85-F can be removed with the use of an alkaline cleaning agent.

Precautions

- Shake / stir product container before use. Inspect that the product is clear and homogenous before applying.
- Axxatec™ 85-F is a water based product and will freeze at temperature / environment conditions / substrate surface temperature when water freezes. Do not apply product when there is a chance of water freezing. Recommended application temperature: 41 to 120°F (5 to 49°C). For low freezing temperature application, please refer to Axxatec™ 87-MW3 Winterized product.
- Do not reuse product – such as in a circulating spray booth, even when enclosed, as the active VCI component of the product depletes when exposed to air.
- Product has propensity to foam.
- Do not use for dipping / immersion dip application with open sump / tank.
- Do not apply product onto red-hot heated surfaces – such as on surfaces immediately after welding.
- Do not dry surfaces coated with product. Seal enclosure immediately after application.
- Reseal unused, unexposed product in original container immediately after use.
- Do not use on aluminum, zinc, galvanized steel or yellow metals.
- Test before use on painted surfaces.
- Test before use on rubber seals, and plastics.
- Remove before painting. Axxatec™ 85-F can be removed with the use of an alkaline cleaning agent.
- Do not place treated metals in direct contact with cardboard packaging or wood.
- Metal may discolor or darken in contact with plastics under very aggressive conditions.

Contact Us



A product of:
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International Corp
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USA

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Technical Data

Zerust®	Axxatec™ 85-F
Product Info	Ready to use water-based VCI rust preventative liquid.
Appearance	Amber liquid
Surface Finish	Thin coating
Protected Substrates	Ferrous protection only. Not for galvanized, zinc, and yellow metals.
Application	Apply via spray, or fogging. Contact technical representative for other application methods. Application temperature 41 to 120°F (5 to 49°C) Dosage 0.2 fl oz/ft² (195 mL / 1 m²)
Protection Duration	Plain Poly Packaging 1 year VCI Packaging/hermetically sealed Up to 5 years Humidity Chamber ASTM D1735 Exceeds 500 hrs VCI Test (NACE TM0208-2013) Pass
Volatile Content	<20%
Flash point	>212°F (100°C)
pH	8 - 9
Viscosity	Water-like
Density at 25°C	0.95-1.05 g/ml

DECLARATION

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Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. No representation or recommendation not contained herein shall have any force or effect unless in a written document signed by an officer of the company. The foregoing warranty is exclusive and in lieu of all other warranties, express, implied or statutory, including without limitation any implied warranty of merchantability or of fitness for a particular purpose. In no case shall Northern Technologies International Corporation/Zerust® be liable for incidental or consequential damages.

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VCI Packets

Zerion® FVS-S2
Custom Leads



CORROSION PROTECTION

This versatile corrosion inhibiting product is widely used in applications where there are vapor spaces requiring the use of Vapor Corrosion Inhibitor (VCI) and also the possibility of water ingress that requires a strong Soluble Corrosion Inhibitor (SCI) to neutralize contaminants. Some of these applications include the following: above-ground storage tank (AST) soil side bottoms (SSB), long term preservation/mothballing of offshore structures, hydrostatic testing of complex vessels or systems, protection of voids and enclosures.

Recommended Product Applications / Guidelines

Aboveground Storage Tank Soil Side Bottoms

Zerion FVS has been used in multiple tank soil side bottom installations. FVS can be diluted with water and injected into sand/soil base or introduced as a powder during tank construction or bottom plate refurbishment. Even for tanks with concrete pad foundations, FVS in slurry form can be introduced into the spaces between the plates and the concrete to provide corrosion protection. Zerust has also pioneered a VCI Ring system using FVS if there is no liquid injection. This VCI Ring system is recommended for all SSB installations.

Pipe Casing and Pipeline Preservation

Zerust has developed a unique blend of corrosion inhibitors and gels that is injected into the annular pipe casing space. The Zerust corrosion inhibitors protect the carrier pipeline both in direct contact, using Soluble Corrosion Inhibitors and also through Vapor Corrosion Inhibitors that protect the entire annulus vapor space.

Protection of Voids / Enclosures

Zerion FVS VCI chemistry actively protects exposed steel from corrosion in large volume voids and enclosures. There are multiple delivery mechanisms and product packages that can be adapted to the geometry of the structure being protected. The corrosion protection can be provided by either an inhibitor solution or with inhibitor powder. When it is possible for the void to be hermetically sealed, a one-time introduction of FVS can provide protection for up to 2 years.

Hydrostatic Testing

Add Zerion FVS to hydrostatic testing water to provide excellent protection to exposed steel surfaces. In addition to the SCI protection, the VCI evolves to protect any air pockets or hidden voids. FVS is versatile and compatible with a variety of water profiles and works best with DI, RO or potable water with less than 150 ppm of chlorine.



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For more information please visit www.zerust-oilgas.com or e-mail: marketinginfo@zerust-oilgas.com.

PRODUCT / TECHNICAL DATA SHEET

Product Description

Zerion FVS is a versatile new corrosion inhibitor specifically designed to protect ferrous metals in aggressive corrosion environments where there is the possibility of the accumulation of water, moisture and/or water ingress.

Zerion FVS provides unique dual action corrosion protection making it the best in class in the market today.

Vapor Corrosion Inhibitors (VCIs) to protect the interiors of "air space" voids and exposed metal surfaces on welded joints, in crevices, at coating holidays, etc. Soluble Corrosion Inhibitors (SCIs) that mitigate corrosion from moisture accumulation or the ingress of water.

This combination penetrates gaps and interstices inside of enclosed voids to provide comprehensive coverage.

Physical Properties

Category	Details
Finish	N/A
Color	White
Reduction	See specific application data
Temperature Range	At injection: 35°-110°F Service Temp.*: 10°-140°F Take appropriate pressure relief measures.
Shelf Life	36 months, unopened

Availability

Product Name	Availability Description	Application Guide
Zerion FVS-S2	FVS in mesh packet	Place in center of void and seal tightly. Provides approximately 2-3m ³ volume* of protection.
Zerion FVS-S10	Mesh Sleeve 1 m (3ft.) long x 20 mm (0.75 in) diameter	Place in center of void and seal tightly. Provides approximately 3.1m ³ volume* of protection.
Zerion FVS-S15	Mesh Sleeve 1.5 m (5ft.) long x 20 mm (0.75 in) diameter	Designed for use with Inhibitor Delivery System solutions. Contact your sales representative for details.
Zerion FVS-B15	Bulk powder in pails 15 kg/pail	Dilute with water** to use as slurry. Mixing ratio of 0.5% to 15% (w/v) depending on application.
Zerion FVS-B165	Bulk powder in drums 165 kg/drum	



Product Storage

Keep only in original container. Store in a dry place. Store at room temperature. Store in a well ventilated place. Keep container tightly closed.

Part No. Zerion FVS-S2 375-F-00204 Mesh Packet
Zerion FVS-S10 375-F-00200 Mesh Sleeve
Zerion FVS-S15 375-F-00202 Mesh Sleeve
Zerion FVS-B15 460-F-00001 Pail
Zerion FVS-B15 375-F-00001DR Drum
Zerion FVS-B15 375-F-00001TT Tote

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Water Treatment

Zerion® FVS-B
Zerion® FAN-5

**CORROSION PROTECTION**

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Zerion FVS VCI chemistry actively protects exposed steel from corrosion in large volume voids and enclosures. There are multiple delivery mechanisms and product packages that can be adapted to the geometry of the structure being protected. The corrosion protection can be provided by either an inhibitor solution or with inhibitor powder. When it is possible for the void to be hermetically sealed, a one-time introduction of FVS can provide protection for up to 2 years.

Hydrostatic Testing

Add Zerion FVS to hydrostatic testing water to provide excellent protection to exposed steel surfaces. In addition to the SCI protection, the VCI evolves to protect any air pockets or hidden voids. FVS is versatile and compatible with a variety of water profiles and works best with DI, RO or potable water with less than 150 ppm of chlorine.



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PRODUCT / TECHNICAL DATA SHEET

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Zerion FVS provides unique dual action corrosion protection making it the best in class in the market today.

Vapor Corrosion Inhibitors (VCIs) to protect the interiors of "air space" voids and exposed metal surfaces on welded joints, in crevices, at coating holidays, etc. Soluble Corrosion Inhibitors (SCIs) that mitigate corrosion from moisture accumulation or the ingress of water.

This combination penetrates gaps and interstices inside of enclosed voids to provide comprehensive coverage.

Physical Properties

Category	Details
Finish	N/A
Color	White
Reduction	See specific application data
Temperature Range	At injection: 35°-110°F Service Temp.*: 10°-140°F Take appropriate pressure relief measures.
Shelf Life	36 months, unopened

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Product Name	Availability Description	Application Guide
Zerion FVS-S2	FVS in mesh packet	Place in center of void and seal tightly. Provides approximately 2-3m ³ volume* of protection.
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Zerion FVS-B15	Bulk powder in pails 15 kg/pail	Dilute with water** to use as slurry. Mixing ratio of 0.5% to 15% (w/v) depending on application.
Zerion FVS-B165	Bulk powder in drums 165 kg/drum	



Product Storage

Keep only in original container. Store in a dry place. Store at room temperature. Store in a well ventilated place. Keep container tightly closed.

Part No. Zerion FVS-S2 375-F-00204 Mesh Packet
Zerion FVS-S10 375-F-00200 Mesh Sleeve
Zerion FVS-S15 375-F-00202 Mesh Sleeve
Zerion FVS-B15 460-F-00001 Pail
Zerion FVS-B15 375-F-00001DR Drum
Zerion FVS-B15 375-F-00001TT Tote

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ZERION FAN-5 AND ZERION FAN-6
PROTECTION OF FERROUS METALS**CORROSION
PROTECTION**

Zerust Zerion FAN-5 and Zerion FAN-6 are corrosion inhibitor powders designed for the corrosion protection of ferrous metals. The powders are dissolved into water to provide contact corrosion protection.

Recommended Product Applications

Zerust Zerion FAN-5 and Zerion FAN-6 are used to provide corrosion protection for ferrous metals in such applications as pipeline preservation, bulk water lay-up (fire water protection) and in rinse water to reduce flash corrosion.

Product Features

Zerust Zerion FAN-5 and Zerion FAN-6 have the following features.

- Neutralizes acidic species
- Creates alkaline environment
- Used in immersion or as a rinse
- Non-Hazardous
- Environmentally friendly
- Provides long-term corrosion protection
- Economical cost
- Provides corrosion protection at low concentrations
- Designed for use with potable water or better

Can be combined with Vapor Corrosion Inhibitors (VCIs) to extend protection into airspace.

Application Guidelines

Typical concentration range would be 0.5% -10%. Concentration is dependent on water quality, performance requirements, and length of lay-up.

Availability

Zerion FAN-5 and Zerion FAN-6 are available in the following quantities: 18 kg pail, 136 kg drum and bulk super sacs available as special order.

Please contact the Zerust Oil and Gas technical staff for assistance in selection of the best product to meet your requirements.

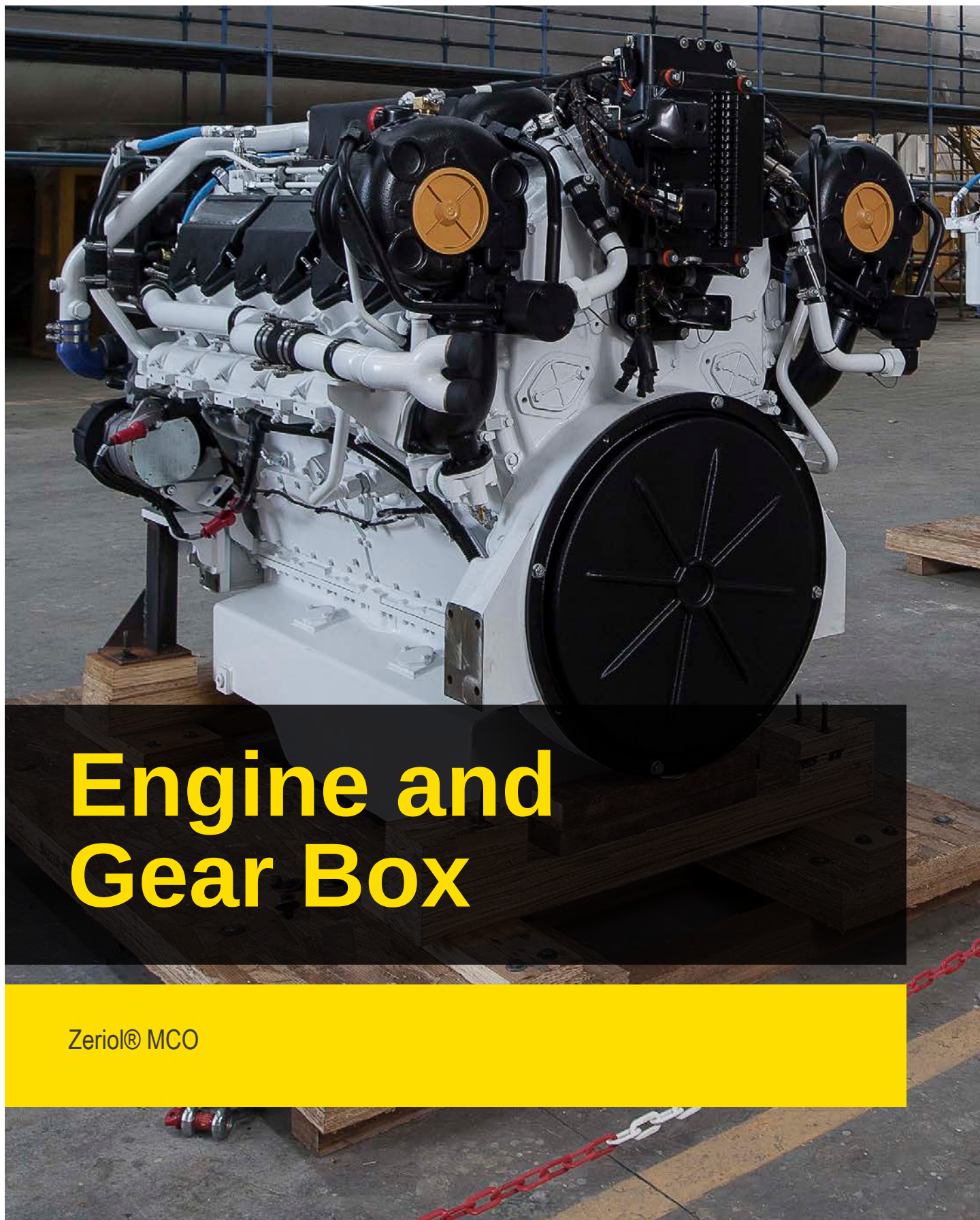
*Control**Increasing Inhibitor Concentration from Left to Right.*

Zerion FAN-5 Part No.
18 kg pail 460-F-00006
136 kg drum 460-F-00006 DR DR

Zerion FAN-6 Part No.
18 kg pail 460-F-00015
136 kg drum 460-F-00015DR

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Engine and Gear Box

Zeriol® MCO

ZERIOL MCO
LUBRICATING OIL**CORROSION
PROTECTION**

Zeriol MCO is a preservative oil designed to provide long term corrosion protection of metal surfaces. Zeriol MCO covers engine oils for break-in, and lubrication of reciprocating internal combustion engines of both spark-ignition and compression-ignition types, and power transmission fluid applications. Available in grades as noted in charts below.

Physical Properties

Category	Details
Appearance	Dark brown liquid
Odor	Mild solvent odor
Specific Gravity	0.90 - 0.98
Flash Point (minimum)	300° F

Zeriol MCO meets following specifications:

Viscosity Grade	Military Symbol	NATO Code	Part Number
SAE 10W	PE-10	C-640	350-X-00018
SAE 30	PE-30	C-642	350-X-00019
SAE 40	PE-40	----	350-X-00020
SAE 15W-40	PE-15/40	----	350-X-00021

Availability

Zeriol MCO is available in UN approved 5 gallon pails.
Special sizes available upon request.



Part No. SAE 10: 350-X-00018
SAE 30: 350-X-00019
SAE 40: 350-X-00020
SAE 15W: 350-X-00021

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Hydraulic

Zeriol® MOV

**ZERIOL MOV**
VAPOR PHASE STORAGE OIL**CORROSION
PROTECTION**

Zeriol MOV is a synthetic storage oil designed to protect new or rebuilt equipment in storage waiting for use. Zeriol MOV contains vapor phase corrosion inhibitors. Zeriol MOV is designed to be used for storage of engines, closed lubricating systems, hydraulic oils, and other similar types of applications. Zeriol MOV is designed to be used at 10% of the reservoir capacity. This will allow a generous concentration of vapor phase additives to adequately protect the internals of the equipment.

Recommended Product Applications

Recommended applications for Zeriol MOV include, but are not limited to, the following:

- Storage of Engines
- Closed Lubricating Systems
- Hydraulic Oils
- & More

Application Guidelines

Zeriol MOV is designed to be used at 10% of the reservoir capacity. It is important to cap all vents and hermetically seal the unit in storage. This will allow the corrosion inhibitors to coat the internals of the equipment while preventing any escape to the atmosphere. When installing equipment simply drain Zeriol MOV and fill the reservoir to normal capacity before putting the piece of equipment into service.

Caution: Zeriol MOV should not be mixed with Glycol or Silicone base oils.



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Product Description

Zeriol MOV is a synthetic storage oil designed to protect new or rebuilt equipment in storage waiting for use. Zeriol MOV contains vapor phase corrosion inhibitors. Zeriol MOV is designed to be used for storage of engines, closed lubricating systems, hydraulic oils, and other similar types of applications.

Zeriol MOV is designed to be used at 10% of the reservoir capacity. This will allow a generous concentration of vapor phase additives to adequately protect the internals of the equipment.



Physical Properties

ISO Grade	46
Specific Gravity	0.899
Pounds per Gallon	7.5
Color/Appearance	4 MAX
Viscosity (SUS@100°C)	120
Flash Point °F	120

Availability

Zeriol MOV is available in the following quantities:
Pail, drum, and tote.

Product No.
Drum: 350-M-00079DR
Pail: 350-M-00079PL
Tote: 350-M-00079TT

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Zerust AxxaCoat™ 90

DS)
r detailed use instructions.

Danger
Combustible liquid. Causes damage to organs through prolonged or repeated exposure.

Keep away from heat, open flames, sparks, hot surfaces. - No smoking. Do not breathe gas, mist, spray, vapors. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Wear eye protection, protective clothing, protective gloves. Get medical advice/attention if you feel unwell. In case of fire: Use carbon dioxide (CO2) extinguishing powder, foam to extinguish. Store in a well-ventilated place. Keep cool. Dispose of contents/container to State or local regulations.

Storage conditions: Keep container tightly closed. Store at room temperature. Do not store in a cool, well-ventilated place when not in use.

First-aid measures general:
Never give anything by mouth to an unconscious person. Seek medical advice (show the label where possible).

Coatings

Zerust® AxxaCoat™ 90
Zerios® WES

ZERUST® EXCOR®

▶ Zerust® AxxaCoat™ 90 Coating

Zerust®/Excor® AxxaCoat™ 90 is a corrosion preventative coating ideal for the protection of metal parts and assemblies. Use for long-term outdoor protection and in challenging overseas shipping applications where a durable yet removable coating is needed.

AxxaCoat 90 is a durable corrosion protection coating that can withstand minor nicks and abrasions. The coating is self-healing above temperatures of 100°F (38°C). When dry, AxxaCoat 90 forms a firm, light-brown film. Its color allows user to see where it has been applied. It may also be applied to slightly damp and contaminated surfaces.

AxxaCoat 90 is excellent for the protection of metals against the elements in overseas unsheltered applications and for long-term outdoor protection. The coating provides excellent indoor protection for metals during shutdown and bunkering. Use to protect machinery, spare parts and other metal assets from corrosion during shipping or stored long-term indoors and outdoors.

▶ Benefits

Effective corrosion protection where traditional anti-corrosion methods can not be used

Easy to apply, economical to use

Suitable for new equipment and to protect the reliability of existing equipment

Rugged coating does not wipe off

Self-healing at temperatures above 100°F (38°C)

▶ Application Example

AxxaCoat 90 can be applied to machinery that are transported on the open deck of cargo ships. The coating protects metals against salt, humidity and other causes of corrosion and can be removed upon arrival.



Application Type

Storage
Shipping
During Operation
May be used with Zerust VCI packaging

Zerust®

Specifications

Product Info	Self-healing, solvent, wax-based corrosion preventative.	
Application	Apply by spray, brush or dip. Dry to the touch after 3 hours at 77°F (25°C) and up to 75% humidity. Coating full cure time is 24 hours.	
Properties	Removability	Typical hydrocarbon solvent
	Appearance	Dark brown liquid
	Density at 25°C	0.83 - 0.87 g/mL
	TBN	28 mg KOH/g
	Volatile Content ASTM D2369	45%
	Viscosity #64, @ 20 rpm, 25°C	6500 - 7500 cP
	Flash Point ASTM D93 (B)	>162°F (>72°C)
	Coverage	802 ft² (74.5 m²) per gal
Protected Substrates	Multimetal protection for ferrous, non-ferrous, galvanized and painted metals. Not for use on electronics.	
Protection Duration	Indoors	Up to 3 years
	Outdoors	Up to 1 year
Tested on 1010 Steel panels with 20 Ra roughness	ASTM D1748 Humidity	Exceeds 3000 hrs
	ASTM B117 Salt Spray	Exceeds 3000 hrs
	UV Resistance (ASTM G154-C1)	Exceeds 500 hrs
	Compatible with Packaging	Yes
	Rain resistance ASTM D6904	Pass (Steel)
Storage	Store in a cool, dry place and away from sunlight for up to 2 years. Do not allow to freeze.	
Disposal	Collect waste when removing. Dispose of in accordance with local, national and international regulations.	

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Contact Us

ZERUST® EXCOR®

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Northern Technologies
International Corp
4201 Woodland Road
Circle Pines, MN 55014
USA

Precautions

- Avoid open flame or ignition sources during application or near partially dry coating.
- Remains tacky at exceptionally high humidity (above 75%).

Contact Us

Contact your Zerust/Excor representative for a corrosion inhibitor system best for your metal assets.

Availability

Zerust AxxaCoat 90 is available in a ready to use liquid form.

Part Number	Qty
350-M-00046PL	5 Gal
350-M-00046DR	55 Gal

Phone: +1 763.225.6600
Fax: +1 763.225.6645
sales@zerust.com
www.zerust.com

Rev A1

**ZERIOS WES
TEMPORARY COATING****CORROSION
PROTECTION**

ZeriosWES Temporary Coating (ZeriosWES) can be used as a temporary, stand alone, coating to "hold" metallic elements until construction or re-entry to service commences. ZeriosWES is suited to most non-immersion environments such as drill platform decking, structural steel, architectural elements, idle tooling, tank and pipe.

Recommended Product Applications

Recommended applications for ZeriosWES includes, but are not limited to, the following:

- Drill platform decking
- Structural steel
- Architectural elements
- Idle tooling
- Tank and pipe exteriors and more.

Application Guidelines

Best applied by airless spray, ZeriosWES, may also be applied by brush, roller or conventional spray. Reduction is not recommended, however, water may be used in very small amounts (<10%).

Environmental Restrictions

Substrate temperature 60°- 95° F., RH < 81%, Dew Point > 5° F. above substrate.



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ZERIOS WES TEMPORARY COATING**PRODUCT / TECHNICAL DATA SHEET****Product Description**

A fast-drying alkyd, thinned with water and designed for coating prepared metal. Low volatile organic content (VOC) and corrosion resistance make this product ideal for structural steel in preparation for top coat or as a short-term preservation method during lay-up or delayed construction.

Safety and Handling

Always provide adequate ventilation and use appropriate organic vapor masks. Soap and water clean-up.



Aboveground storage tank repair prior to Zerios WES Temporary Coating.

Physical Properties

Category	Details
Color	Translucent to provide a more visually subtle repair.
Volume Solids	53% volume solids allows coverage of 550 ft ² / gallon at 1.0 mils DFT
Dry-to-Touch	30 minutes
Dry-to-Recoat	2 hours
Dry Hard	24 hours
Wt./gal.	10.9 lbs.
Viscosity	85-90 KU
VOC	(excluding water) < 280 g./L.
Flash Point	109°F
Suggested DFT	1-3 mils. (WFT = 2-6 mils.)

Availability**Availability**

Zerios WES is available in 1 gallon pails.
Special sizes available upon request.

Storage

Keep from freezing. Shelf life, 6 months unopened at 77°F.

Part No. 350-X-00023

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Covers

Zerust® Inhibitor Fusion (ZIF) Tape

ZERUST INHIBITOR FUSION (ZIF) TAPE

ZIF TAPE

SILICONE FUSION TAPE

PROBLEM SOLVING

Unprotected flanges, valves and instruments can lead to crevice corrosion and frozen nuts and bolts. Crevice corrosion between flange faces is a severe problem where the wedging action of corrosion products can lead to a significant risk of product leakage. Frozen nuts and bolts can lead to hours of delay to cold cut all bolts. ZIF Tape can provide corrosion protection for flanges, valves, instrument preventing the severity of these problems.

Reccomended Product Applications**High Heat Temperature**

ZIF Tape can be used as protection for flanges against corrosion for temperatures up to 200° C instead of the typically used Zerust® Transparent Flange Saver®. The Flange Saver is a transparent film infused with VCI that is wrapped around the flange, tightly secured, and forms an enclosure around the flange allowing the VCI molecules to adsorb onto metal surfaces to form a protective layer against corrosion.

Corrosion Under Insulation (CUI)

ZIF Tape can be applied around pipes and beneath the insulation and areas that are susceptible to moisture buildup that can cause CUI.

Application Guidelines

Before applying ZIF Tape, ensure there are no oils or greases on the application surface. Water is acceptable, however oils and greases will prevent the ZIF Tape from effectively adhering to the surface and itself.



Winner of the EVOLEEN's 2017 Innovation Award for Zerust's® ZIF Tape



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PRODUCT / TECHNICAL DATA SHEET

ZERUST INHIBITOR FUSION (ZIF) TAPE

Product Description

ZIF Tape is a corrosion inhibiting tape based on silicone elastomers with proprietary Zerust corrosion inhibitor chemistry integrated into the matrix.

It combines Zerust's proven corrosion protection benefits with the specific properties of a self-fusing film for easy, cold application.

ZIF Tape is stable under prolonged exposure to UV/sunlight and is translucent in appearance. It is non-tacky to the touch, but will 'fuse' within ~30 seconds to form a permanent bond. ZIF Tape is elastic in nature and can be stretched to provide closer fits to surfaces to which it is applied. This close fit, coupled with the application tension minimizes the gaps/spaces where moisture might penetrate.



Features

Features	Approved
Provide protection with Zerust Volatile Corrosion Inhibitor (VCI).	✓
High capacity to conforms / molds when wrapped around/onto complex shapes.	✓
Bonds to itself Instantaneous and remains non-tacky to the touch.	✓
Easy and quick application process.	✓
No residue remains, when remove the tape.	✓
Watertight seal.	✓
Wind, sunlight UV, oxygen and seawater resistance.	✓
No heat/equipment required for installation.	✓
Wide temperature range of application (-40° C - 200° C)	✓
Flame resistant when wrapped.	✓
Good mechanical and puncture resistance.	✓

Availability

Available in 36 ft. long, individual, whole rolls in 2", 4", 12", and 16" widths.

Product No.
02" ZIF Tape: 250-F-00105
04" ZIF Tape: 250-F-00108
12" ZIF Tape: 250-F-00106
16" ZIF Tape: 250-F-00107

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Specialty

Zeriol® FOD

Zerion® FOXL

Zerust® AxxaWash™ NW-10C

ZERIOL FOD
FUEL STABILIZER**CORROSION
PROTECTION**

Zeriol FOD is a multi-faceted diesel fuel stabilization product that mitigates the common issues associated with diesel fuel storage. Zeriol FOD promotes fuel stability, sludge and deposit control and microbial induced corrosion control.

Application Guidelines

Apply 1 gallon of Zeriol FOD to every 1,000 gallons of treated diesel fuel. Untreated fuel may require additional Zeriol FOD.

Physical Properties

Category	Details
Physical State	Liquid
Color	Amber
Odor	Typical
pH	5-7
Flash Point	120 F
Specific Gravity	0.85 lbs./gallon
Water Solubility	Dispersible

Availability

Zeriol FOD is available in the following quantities:
5 gallon steel containers
*Special sizes available upon request.



Part No. 350-F-00202PL

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ZERIOR FOXL**OXYGEN SCAVENGER****CORROSION
PROTECTION**

Zeriol FOXL chemically reacts with dissolved oxygen and binds with it to prevent corrosion within enclosed spaces. Whether out-of-service pipelines, down-hole spaces or drill mud containments, Zeriol FOXL can cost-effectively treat large volumes of fresh or salt water. Containments should be filled to capacity for maximum protection. (See Zerust representative for advice on head-space protection).

Recommended Product Applications

Recommended applications for Zeriol FOXL include, but are not limited to, the following:

- Down-hole Voids
- Isolated Pipes and Tanks
- Out-of-Service Systems

Application Guidelines

For interior, closed system corrosion protection of ferrous substrates (up to 5- years). It can be used at full strength or reduced 10:1 with tap water or water already in the vessel (including sea water). NOTE: Zeriol FOXL will turn protected steel black with a thin layer of sulfate as evidence of oxygen consumed.

Performance may be further enhanced by de-aeration of resident water. Introduce enough Zeriol FOXL to reach concentration of 10 ppm Zeriol FOXL to 1 ppm dissolved oxygen. (Typically, this will be in the range of 10 gals. Zeriol FOXL to 100 gals. of resident water.) For best results, seal system for the entire lay-up period.



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Product Description

Zeriol FOXL is a powerful oxygen scavenger in a convenient aqueous solution. It can be used at full concentration or reduced with fresh or salt water to meet individual system needs.

With no ammonium ions, Zeriol FOXL does not support microbial growth, however, any additional biocidal treatments should be performed prior to Zeriol FOXL introduction to avoid possible chemical interactions.

Safety & Handling

Product may be harmful to aquatic flora and fauna - do not purge to soil or streams. Administer in well ventilated area and protect eyes and hands with goggles and gloves, respectively. See Safety Data Sheet for further details.



0% FOXL

9% FOXL

100% FOXL

Physical Properties

Category	Details
Appearance	Clear solution
Weight Solids	10-30%
VOC	10.4 lbs./gal.
Reduction	See specific application data
Temperature Range	At Injection: 35 -110 °F Service Temp*: 10°F. - 140°F. *Take appropriate pressure relief measures.
Shelf Life	36 months, unopened

Availability

Availability

Zeriol FOXL is available in the following quantities: 55 gallon drums

*Special sizes may be available upon request.

Storage

Keep from freezing. Store at 50-90° F. Shelf life 36 months, unopened.

Part No. 350-M-00074DR

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ZERUST® EXCOR®

Zerust® AxxaWash™ NW-10C

AxxaWash™ NW-10C is a metalworking wash and rinse fluid that cleans and deactivates sources of corrosion such as chlorides, oils and contaminants. Cleaning with the wash solution enhances the effectiveness of future corrosion prevention methods.

Zerust®/Excor® AxxaWash™ NW-10C is a mildly alkaline, aqueous-based cleaning agent that can be used in immersion, ultrasonic, and low to ultra-high pressure (UHP) spray cleaning modes. In addition to effective hydrocarbon soil removal, a solution of AxxaWash™ NW-10C deactivates common corrosion causing anionic contaminants such as chlorides and sulfates left by metalworking fluids. Cleaning metals effectively results in prolonged periods of flash corrosion inhibition. The product is conveniently offered as a liquid concentrate and may be diluted per the application.

Ideal for use on highly reactive ferrous metals such as cast iron and freshly worked steel. Metals properly cleaned with a solution of AxxaWash™ NW-10 have enhanced corrosion protection from products such as Zerust Axxatec™ and Axxanol™ coatings and Zerust® VCI packaging materials. Thoroughly dry the cleaned metals before placing into packaging. Check with your Zerust®/Excor® representative for a corrosion inhibitor system best for your metal assets.

Application Example

Prevent rust on parts caused by contaminants left over from metalworking fluids by washing with a solution of AxxaWash™ NW-10C. Apply as a final rinse for metals that are streak free.



Benefits

Water-based preservation cleaner concentrate

For use in ultrasonic, immersion, and low to ultra-high pressure spray modes

Streak-free and low odor

Deactivates common anionic contaminants

Removes soluble and particulate metalworking soils

Enhances the effectiveness of RP coatings and VCI packaging

Reduces flash corrosion

Complementary Products

Zerust® VCI Packaging
Axxatec™ Water-Based RPs
Axxanol™ Oil-Based RPs
AxxaVis™ Additives
AxxaClean™ Cleaners

Zerust®

Cleaned item is dried thoroughly and put into Zerust®/Excor® Outdoor Preservation VCI Shrink Film.

Technical Data

Product Info	Metalworking rinse and wash fluid concentrate.	
Application	Apply via immersion, ultrasonic, spray, pressurized spray	
	Application temperature	77 - 140°F (25 - 60°C)
	Dilution Ratio	As required/See below
	Dwell time	As required
Properties	Appearance	Amber liquid
	pH of concentrate	11.5-12
	pH of 5% solution	11-11.5
	Max VOC of concentrate	26%
Metals Compatibility	Mainly for use on ferrous-based alloys and stainless steel. Test prior to use on non-ferrous alloys.	
Storage	Store in (34 to 122°F / 1 to 50°C), dry place and away from sunlight in original packaging for up to 2 years from the date of shipment. Keep from freezing. If frozen, move to a location above 50° F (10° C) and allow to thaw. Mix well before use.	
Disposal	Dispose of in accordance with local, national and international regulations.	

Suggested Dosage Instructions

Application Method	Dosage Percent by Volume
Immersion	1-5%
Ultrasonic	1-5%
Spray - all pressures	1.5 - 2%

Note: The use concentration will be dependant on soil type, operating temperature and application method. Consult a Zerust®/Excor® representative if high UHP pressure spray cleaning methods are to be used. The operating guide for sump maintenance available on request.

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Precautions

- Product foams when used in spray mode. Contact your Zerust®/Excor® representative for recommendations for suitable defoaming agents.
- If product becomes frozen in storage or shipping, allow to thaw and mix well. Reconstituted product should appear clear and amber yellow. If it is cloudy or has solids, contact your Zerust®/Excor® representative.

Contact a Zerust/Excor Corrosion Expert

Consult a Zerust® representative to implement an optimum, cost-effective corrosion prevention system across your production facility and supply chain.

Availability

Zerust®/Excor® AxxaWash™ NW-10C is sold as a liquid concentrate. Large quantity pricing available upon request.

Part Number	Qty*
350-W-00001PL	5 Gal (19 liters)
350-W-00001DR	55 Gal (208 liters)

*Product sold in US customary units. Metric units approximate

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Rev U7



Zerust Oil & Gas, a division of Northern Technologies International Corporation (NTIC), is the world's largest manufacturer of Vapor Corrosion Inhibitors (VCIs). Based in Circle Pines, Minnesota, with client support in more than 70 countries, they have over 50 years of experience with products and solutions that reduce steel corrosion in multiple industries.

Over 50 Years of Experience

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