ZERUST® EXCOR®

ZERUST® Corrosion Inhibitor Liquids, Additives, and Rust Removers



ZERUST® Global Corrosion & Cleaning Management Solutions

How ZERUST® Works for You

For over 50 years, ZERUST®/EXCOR® has led the market in quality corrosion solution products. We are dedicated to providing expert corrosion management services and broadening the range of corrosion solutions for our customers. In addition, ZERUST® users have access to onsite support from ZERUST®/EXCOR® representatives in more than 70 countries. As a result, our customers have peace of mind when they choose ZERUST® for corrosion control management.



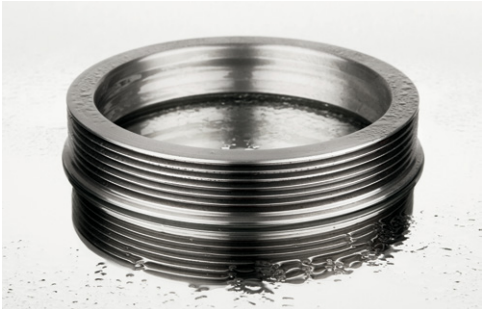
ZERUST® corrosion engineer in the field demonstrating a rust remover

High-Performance Rust Removers, Corrosion Inhibitor Additives, and Liquids

In addition to ZERUST® VCI (Vapor Corrosion Inhibiting) film and other packaging products, ZERUST® offers an increasing range of cost-effective rust preventatives (RPs), VCI oils, corrosion inhibiting additives, and rust removers. These products are formulated to work together to provide comprehensive corrosion solutions for our customers. Backed by our expert technical support and global testing services, a complete corrosion management program can be designed to meet each customer's needs.

Our Commitment to Quality, Safety, and the Environment

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



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

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

Choosing a Corrosion Management System

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



Humidity chambers are used for testing, such as evaluating a customer's process fluids and the effectiveness of recommended corrosion solutions.

ZERUST® Vapor Corrosion Inhibitors (VCIs) and Related Rust Removers and Coatings

For over 50 years, ZERUST® has been a global leader in corrosion management solutions. We continue to apply our knowledge of corrosion to meet customer needs with innovative solutions and services that add value to ZERUST® VCI packaging. Check with your ZERUST® representative to find the product that is right for your application.

How VCI Works

VCI molecules inhibit corrosion by preventing moisture and environmental elements from reacting with the metal surface. Since VCI molecules are transported through the air, they must be trapped around the metal surface using a polybag or other enclosure. When metals are contaminated in highly corrosive environments or stored for long periods of time, the use of a VCI packaging product and a corrosion inhibitor coating can provide comprehensive protection.



On the left: competitor VCI oil protection; on the right: ZERUST® Axxanol™ 750 VCI Oil. Results after 24 hours in ASTM B117 salt-spray testing.



Illustration of VCI molecules enclosed in a ZERUST® VCI bag.

ZERUST® ICT®600 Rust Removers



Corrosion doesn't always mean a part must be scrapped. In many manufacturing, maintenance, repair, and overhaul operations, rusted components can be restored quickly and economically using the proper rust removal technology. ZERUST® AxxaClean™ rust and tarnish removers are engineered to recover valuable metal assets while minimizing damage to the underlying substrate.



Before and after treatment with ZERUST® AxxaClean™ 2048.



Rust removed with ZERUST® AxxaClean™ ICT®625-RR.

Unlike abrasive cleaning methods that can alter surface finishes or dimensional tolerances, AxxaClean™ products chemically dissolve rust and oxidation, even in cracks, crevices, threaded areas, and other difficult-to-clean locations. Depending on the application, ZERUST® offers mild pH-neutral formulations, medium-strength acidic removers, and aggressive industrial rust removers to match the severity of corrosion and the metals being treated.

Whether restoring lightly oxidized precision components or heavily rusted industrial equipment, the AxxaClean™ product family provides reliable performance while helping reduce rework, replacement costs, and production downtime.

ZERUST® AxxaClean Rust and Tarnish Remover Series

Attributes	AxxaClean™ 2048	AxxaClean™ 3048	AxxaClean™ ICT®625-RR
Corrosion Removal Power	Medium corrosion, even in cracks and crevices	Heavy corrosion, even in cracks and crevices	Mild to moderate corrosion, even in cracks and crevices
Speed	Moderate	Rapid	Slow
Metals Treated	Ferrous and yellow metals. Test before use on aluminum, magnesium, and zinc.	Ferrous and yellow metals. Test before use on aluminum, magnesium, and zinc.	Ferrous alloys. Additionally, it's aluminum and yellow metal compatible (Do not use on zinc).
Application Methods	Immersion, brush-on, spray	Immersion, brush-on	Immersion
pH Level	Mild acidic pH of about 2 – 2.5	Stronger acidic pH ≤1	Neutral pH of about 6 – 7
Temperature For Use	50 – 120°F (10 – 49°C)	50 – 120°F (10 – 49°C)	70 – 120°F (21 – 49°C)
Compatibility (<24 hour soak)	Generally safe for paint, gaskets, rubber, and plastics (Test before use).	Generally safe for paint, gaskets, rubber, and plastics (Test before use).	Generally safe for paint, gaskets, rubber, and plastics (Test before use).
Post-Cleaning Action	Do not let product dry on surface. Recommended DI or RO water rinse. Wipe off and dry well.	Do not let product dry on surface. Recommended DI or RO water rinse. Wipe off and dry well.	Do not let product dry on surface. Recommended DI or RO water rinse. Wipe off and dry well.

ZERUST® ICT®600 Rust Removers

AxxaClean™ 2048: Medium Rust and Tarnish Remover



AxxaClean™ 2048 is a medium-strength acidic rust remover formulated to quickly eliminate rust, tarnish, oxidation, and mineral deposits from ferrous metals and many copper alloys. Suitable for immersion, spray, or brush application, it removes corrosion from exposed surfaces and difficult-to-reach areas such as threads, recesses, and crevices. Its balanced chemistry provides effective cleaning while remaining compatible with many painted surfaces, plastics, and elastomers when tested prior to use.

AxxaClean™ 3048: Heavy Rust and Tarnish Remover



AxxaClean™ 3048 is a high-performance industrial rust remover designed to rapidly eliminate heavy rust, oxidation, and scale from severely corroded ferrous components. Its powerful acidic formulation reduces the need for manual scraping or mechanical cleaning, helping restore tooling, machinery, fabricated parts, and industrial equipment. Ideal for immersion or brush application, it provides fast, effective rust removal for demanding maintenance and refurbishment applications.

AxxaClean™ ICT®625-RR: Mild to Moderate Rust and Tarnish Remover



AxxaClean™ ICT®625-RR is a ready-to-use chelating rust remover that safely removes mild to moderate rust while maintaining a near-neutral pH. It selectively dissolves iron oxide while helping preserve the underlying metal surface. Compatible with ferrous metals, aluminum, and many yellow metals, it is an excellent choice for precision components, mixed-metal assemblies, and applications requiring effective rust removal with a gentler chemistry.

ZERUST® ICT®700 Rust Preventative Additives

Corrosion often begins long before a protective coating or package is applied. Water chemistry, process fluids, hydraulic systems, metalworking operations, hydrostatic testing, and storage environments can all contribute to premature corrosion if left untreated. ZERUST® corrosion inhibitor additives help address these challenges at their source by improving process fluids and introducing corrosion protection directly into existing manufacturing and maintenance operations.



On the left: submerged in untreated water (60 ppm Cl^-, 300 ppm $CaCO_3$), on the right: submerged in AxxaVis™ HST-10 treated water.

ZERUST® offers specialized additives for oils, water-based systems, metalworking fluids, rinse waters, hydrostatic testing, and hard water treatment. These products integrate easily into existing processes while helping reduce flash rust, neutralize contaminants, improve water quality, and extend corrosion protection throughout manufacturing, storage, and transportation.

Whether protecting enclosed hydraulic systems, conditioning hard water, enhancing oil performance, or preventing corrosion during hydrostatic testing, ZERUST® additives provide economical solutions that work together with ZERUST® packaging and coatings as part of a complete corrosion management system.

ZERUST® Rust Preventative Additives and Water Conditioners

ZERUST® Product Name	Typical Application	Format	Incompatible Metals	Addition Rate
Rust Preventative Liquid Additives				
Axxatec™ 8110C	Closed system rust preventative additive	Liquid concentrate	None	10%
Axxanol™ 707C	VCI oil additive	Oil additive with VCI	Galvanized	3-10%
Axxanol™ 710C	VCI oil additive	Oil additive with VCI and contact inhibitors	None	3-10%
Water-Soluble Additives				
AxxaVis™ PX-05-AN	Acid neutralizer	Water-soluble powder	Limit contact with aluminum	1-10%
AxxaVis™ PX-10-HRD	Hard water conditioner	Water-soluble powder	None	0.04-10%
AxxaVis™ WBA-10	Wet blast additive	Water-soluble powder	Aluminum, brass, and copper	1-8%
AxxaVis™ HST-10	Ferrous closed system rust preventative additive	Water-soluble powder	Aluminum, brass, and copper	0.5-5%
Axxatec™ HST-M100	Multimetal closed system rust preventative additive	Water-soluble liquid	Test before use on galvanized steel	1-5%
Axxatec™ HST-20L	Ferrous closed system rust preventative additive	Water-soluble liquid	Aluminum, brass, and copper	3.3-13.4%

ZERUST® ICT®700 Rust Preventative Additives



Axxatec™ 8110C: Closed System Corrosion Inhibitor Additive

Water-based corrosion inhibitor additive developed for closed-loop hydraulic, coolant, and water-filled systems. Forms a protective molecular layer that inhibits corrosion within enclosed void spaces while remaining easy to incorporate into existing water-based systems.



Axxanol™ 707C and 710C: VCI Oil Additives

Axxanol™ 707C and 710C are corrosion inhibitor oil additives that protect lubricated systems during storage and shipment. 707C provides VCI protection for enclosed void spaces, while 710C combines VCI and contact corrosion inhibitors for enhanced protection.



AxxaVis™ PX-05-AN and PX-10-HRD: Water Treatment Additives

AxxaVis™ PX-05-AN and PX-10-HRD are water-soluble powder additives that improve corrosion protection. PX-05-AN neutralizes residual acids to reduce flash rust, while PX-10-HRD conditions hard water to improve the performance of water-based products.



AxxaVis™ WBA-10: Wet Blasting Additive

Powder additive formulated specifically for wet blasting and wet vapor blasting operations. Provides temporary corrosion protection during blasting while helping reduce flash rust between blasting and coating operations.



AxxaVis™ HST-10: Ferrous Hydrostatic Testing Additive

Powder corrosion inhibitor for hydrostatic testing of ferrous systems. Protects pressure vessels, pipelines, tanks, and fabricated steel equipment during testing and short-term storage.



Axxatec™ HST-M100 and HST-20L: Hydrostatic Testing Additives

Axxatec™ HST-M100 and HST-20L convert ordinary water into a corrosion-safe hydrostatic testing fluid. HST-M100 protects multimetal systems, while HST-20L is formulated for ferrous systems during hydrostatic testing and short-term storage.

ZERUST® ICT®700 Rust Preventative Coatings

Selecting the right rust preventative is one of the most important steps in an effective corrosion management program. The ideal solution depends on several factors, including the metal being protected, the expected storage or shipment duration, environmental conditions, application method, and whether the coating will be used with VCI packaging. Choosing the proper rust preventative helps reduce corrosion-related failures while minimizing coating removal, maintenance, and overall operating costs.

ZERUST® offers a complete line of water-based, solvent-based, oil-based, grease-based, and VCI-enhanced rust preventative coatings engineered for manufacturing, work-in-progress protection, export packaging, long-term storage, and equipment preservation. Each product is designed to provide the level of corrosion protection required for a specific application while integrating with existing manufacturing processes.

ZERUST® Rust Preventatives and Coatings Product Series Highlights



Axxatec™ Series consists of water-based rust preventative products that are specifically designed to protect ferrous, non-ferrous, and multimetal metal assets. Use Axxatec™ products to protect bare metal surfaces during assembly and in situations where water-based spray-on, in-line production, or dipping applications are desired. In addition, Axxatec™ products offer easy-to-use corrosion-inhibiting additives that form a clear, thin, dry-to-touch coating that helps prevent flash rust in between production processes and for short to medium-term shipment and storage periods in conjunction with ZERUST® VCI packaging.



Axxanol™ Series consists of solvent and oil-based rust preventative products that are specifically designed to protect ferrous, non-ferrous, and multimetal assets. Use Axxanol™ products to protect bare metal surfaces during manufacturing processes, storage, and shipping applications from rust and corrosion. In addition, Axxanol™ products offer ready-to-use corrosion-inhibiting coatings that form thin oil to dry-to-touch coatings on the metal surface to provide medium to long-term corrosion protection and work in conjunction with ZERUST® VCI packaging.



AxxaCoat™ Series consists of solvent-based rust-preventative coatings designed to protect metal parts and assemblies during long-term indoor and outdoor storage and challenging overseas shipping applications where a tough yet removable coating is essential. In addition, AxxaCoat™ products are ready-to-use corrosion-inhibiting coatings that form a firm film, and their color allows the user to see where it has been applied.

ZERUST® ICT®700 Rust Preventative Coatings

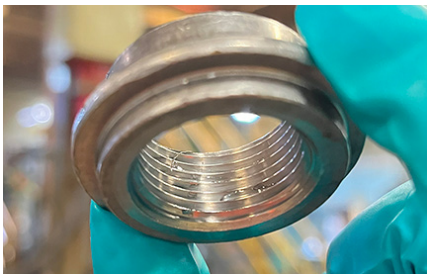
	Protected/Compatible Metals								Application Method				
ZERUST® Product Name	Ferrous	Aluminum	Brass	Zinc	Copper	Outdoor Protection Life (Up To)‡	Indoor Protection Life* (Up To)‡	Designed for Use with Packaging	Spray/Fog	Brush	Immersion	Formulation Base	Surface Finish
Water-Based Coatings													
Axxatec™ 80C (7.5% dilution)	✓	✓	✓	✓	✓	Not recommended	6 months‡	Yes	✓	✓	✓	Water-based	Clear, slightly tacky
Axxatec™ DA-23C (5% dilution)	✓					Not recommended	3 months‡	Yes	✓		✓	Water-based	Clear, dry-to-touch
Axxatec™ DA-24C (5% dilution)	✓		✓		✓	Not recommended	3 months‡	Yes	✓		✓	Water-based	Clear, dry-to-touch
Axxatec™ DA-40AL (5% dilution)	✓	✓	✓	✓	✓	Not recommended	3 months‡	Yes	✓		✓	Water-based	Clear, dry-to-touch
Axxatec™ 30C (5% dilution)	✓		✓		✓	Not recommended	3 months‡	Yes	✓		✓	Water-based	Clear, dry-to-touch
Axxatec™ 48C (5% dilution)	✓	✓	✓	✓	✓	Not recommended	6 months‡	Yes	✓		✓	Water-based	Clear, dry-to-touch
Axxatec™ 85-F	✓					Not recommended	12 months‡	Yes	✓			Water-based with VCI	Thin
Axxatec™ 87-M	✓	✓	✓	✓	✓	Not recommended	12 months‡	Yes	✓			Water-based with VCI	Thin
Solvent-Based Coatings													
Axxanol™ 33CD	✓	✓	✓	✓	✓	Not recommended	6 months‡	Yes	✓		✓	Solvent-based	Dry-to-touch
Axxanol™ 34CD	✓	✓	✓	✓	✓	Not recommended	12 months‡	Yes	✓	✓	✓	Solvent-based	Very thin oil
Axxanol™ A35CD-32	✓	✓	✓	✓	✓	Not recommended	12 months‡	Yes	✓	✓	✓	Solvent-based	Near dry-to-touch
Axxanol™ A35CD-7	✓	✓	✓	✓	✓	Not recommended	6 months‡	Yes	✓		✓	Solvent-based	Dry-to-touch
AxxaCoat™ 90B HFS	✓	✓	✓	✓	✓	2 years‡	For many years‡	Test before use	✓	✓	✓	Solvent-based	Dry-to-touch, matte black film
AxxaCoat™ 93B HFS	✓	✓	✓	✓	✓	3 years‡	For many years‡	Test before use	✓	✓	✓	Solvent-based	Dry-to-touch, matte black film
AxxaCoat™ 93AM	✓	✓	✓	✓	✓	2 years‡	For many years‡	Test before use	✓	✓	✓	Solvent-based	Slightly tacky, matte amber film
Oil-Based Coatings													
Axxanol™ 33	✓	✓	✓	✓	✓	Not recommended	12 months‡	Yes	✓	✓	✓	Oil-based	Light oil
Axxanol™ 750-NV	✓	✓	✓	✓	✓	Not recommended	24 months‡	Yes	✓	✓	✓	Oil-based	Thin oil
Axxanol™ 758-NV	✓	✓	✓	✓	✓	Not recommended	24 months‡	Yes	✓	✓	✓	Oil-based	Non-staining thin oil
Axxanol™ 46-Bio	✓	✓	✓	✓	✓	Not recommended	12 months‡	No	✓	✓	✓	Bio-based oil	Thin oil
Axxanol™ A35-30	✓	✓	✓	✓	✓	Not recommended	12 months‡	Yes	✓	✓	✓	Oil-based	Light oil
Axxanol™ A35-8030	✓	✓	✓	✓	✓	12 months‡	5 years‡	Yes	✓	✓	✓	Oil-based	Thin oil
Greases													
Axxanol™ Spray-G	✓	✓	✓	✓	✓	12 months‡	5 years‡	Yes	✓			Grease-based with solvents	Thin oily grease
Axxanol™ Spray-A15G	✓	✓	✓	✓	✓	12 months‡	5 years‡	Test before use	✓			Grease-based with solvents	Weather resistant thin oily grease
Axxanol™ Z-Maxx LV	✓	✓	✓	✓	✓	12 months‡	36 months‡	Yes		✓		Grease-based	Light grease (NLGI 0)
Axxanol™ Z-Maxx	✓	✓	✓	✓	✓	12 months‡	36 months‡	Yes		✓		Grease-based	Thick grease (NLGI 2)
VCI Oil Coatings													
Axxanol™ 750	✓	✓	✓	✓	✓	Not recommended	For years with VCI Packaging‡	Yes	✓			Oil-based with VCI	Thin oil
Axxanol™ 758	✓	✓	✓	✓	✓	Not recommended	For years with VCI Packaging‡	Yes	✓			Oil-based with VCI	Non-staining thin oil

* Indoor protection life is rated for items stored indoors or under shelter in temps less than 100°F/38°C and in less than 70% relative humidity. Check with your ZERUST® representative for details on ZERUST® packaging products that extend protection life for years‡ and beyond. Water-based product test results are per ASTM D2247 humidity chamber testing. Oil- and solvent-based product test results are per ASTM B117 salt spray testing.

Selecting the Right Rust Preventative for Your Application

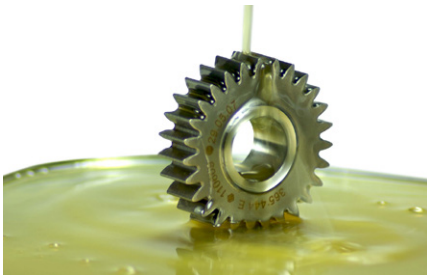
No single rust preventative is ideal for every application. Selecting the right product depends on storage conditions, transportation, metal type, humidity, salt exposure, required protection life, downstream processing, and coating removability. ZERUST® corrosion specialists evaluate these factors to recommend the most effective corrosion management solution.

Water-Based Rust Preventatives



Water-based rust preventatives provide corrosion protection with easy application and cleanup. They are commonly used for in-process manufacturing, work-in-progress storage, and short to medium-term protection. Many formulations dry to a clear, dry-to-touch coating compatible with downstream manufacturing operations.

Solvent and Oil-Based Rust Preventatives



For longer protection or greater resistance to moisture and humidity, solvent-based and oil-based rust preventatives provide excellent performance. Solvent-based products leave a thin protective film, while oil-based products provide both a moisture barrier and contact corrosion inhibition for storage, shipping, and industrial preservation.

VCI-Enhanced Rust Preventatives



ZERUST® VCI oil coatings and additives release Vapor Corrosion Inhibitors that migrate throughout enclosed spaces, protecting internal surfaces that conventional coatings cannot reach. They are ideal for engines, gearboxes, hydraulic systems, pumps, and other enclosed equipment. Combined with ZERUST® VCI packaging, they also protect void spaces, crevices, and other difficult-to-reach areas.

Complete Corrosion Management

The most effective corrosion protection programs rarely rely on a single product. ZERUST® corrosion management solutions combine rust preventative coatings, VCI packaging, corrosion inhibitor additives, rust removers, and technical expertise to create complete protection systems tailored to each application. By evaluating manufacturing processes, environmental conditions, storage duration, and shipping requirements, ZERUST® helps customers reduce corrosion-related costs while improving product quality and reliability.

Why Choose ZERUST®?

For more than 50 years, ZERUST® has helped manufacturers, OEMs, military organizations, and industrial companies protect valuable metal assets from corrosion. From individual components to large-scale preservation projects, our products are trusted around the world to reduce corrosion-related failures, minimize maintenance costs, and improve product quality.

Unlike suppliers that offer only coatings or packaging, ZERUST® provides a complete portfolio of corrosion management solutions. Our rust preventatives, VCI packaging, rust removers, cleaning products, corrosion inhibitor additives, and technical expertise work together to address corrosion throughout manufacturing, storage, transportation, and long-term preservation.

Global Expertise

With representatives and technical support in more than 70 countries, ZERUST® delivers local service backed by global corrosion expertise. Whether your products are manufactured domestically or shipped around the world, our team can help develop solutions that meet your corrosion protection requirements.



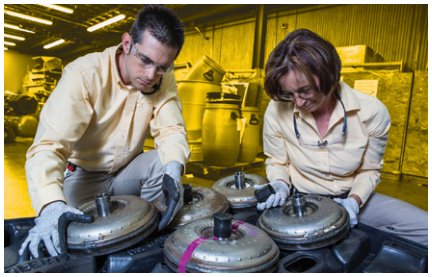
Proven Performance

ZERUST® products are extensively tested in our laboratories and in real-world industrial environments. We work closely with customers to validate performance, optimize existing processes, and recommend solutions that improve reliability while reducing the total cost of corrosion.



Our Commitment

At ZERUST®, we believe every corrosion challenge has a solution. Our corrosion specialists are ready to help you select the right products, improve existing processes, and develop a corrosion management program tailored to your application.



Protect your products with confidence. Partner with ZERUST®.

ZERUST EXCOR

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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.

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