

# Corrosion And Its Prevention

## A Natural Aging Process For Metals

Corrosion is initiated when atmospheric moisture (humidity) settles on metals. This moisture will act as a conducting medium for the flow of ions and electrons between high-energy areas (cathodes) and low-energy areas (anodes) on metal surfaces. This electrochemical process then results in the visible oxidation referred to as tarnish, corrosion or rust, depending on the metal.



### Principles:

The molecular ZERUST® layers that form on metal surfaces suppress corrosion in three ways:

1. They passivate the electron flow between the anodic and cathodic areas on the surfaces.
2. They form a physical, hydrophobic layer that prevents water and moisture directly contacting the metal and acting as an electrolyte.
3. They regulate the pH value of the electrolyte.

## ZERUST® Corrosion Inhibitors

ZERUST® is a line of integrated corrosion inhibitor technologies (ICT) products and services including volatile corrosion inhibitors (VCI) and other inhibitors and surface preparations. ZERUST® packaging materials contain proprietary chemical formulations that release an invisible, odorless, and non-toxic corrosion inhibiting vapor into the air. The ZERUST® vapor molecules will settle on exposed metal surfaces in an enclosure and interrupt the electrochemical corrosion process. Other ICT products augment the protection power of VCI technology to solve specific corrosion and surface preservation problems.

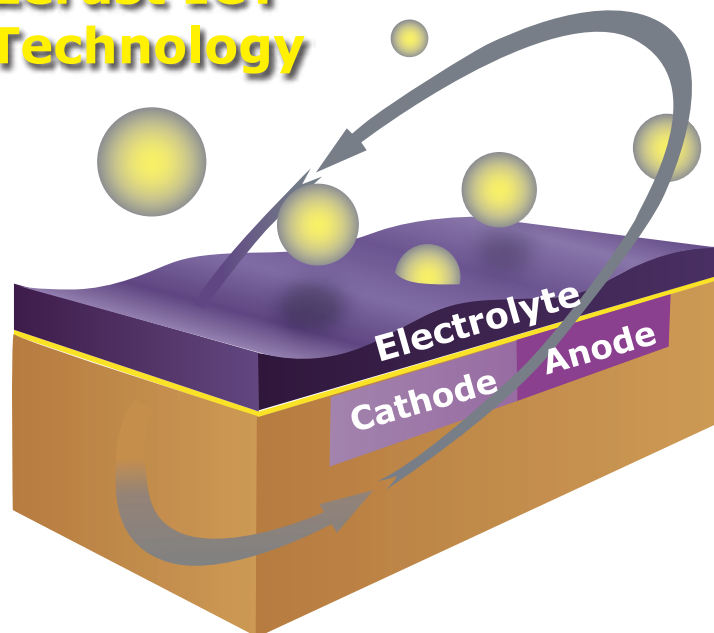
## ZERUST® Technology Is Easy To Apply

Simply place metal parts into ZERUST® packaging and seal it. Within two or three hours the interior of the package will be saturated with ZERUST® vapor molecules and a powerful corrosion inhibiting molecular layer will form on all exposed metal surfaces.

Later, when the parts are removed from the packaging, the ZERUST® corrosion inhibiting molecular layer will immediately proceed to vaporize into the atmosphere. This leaves behind clean, dry and corrosion free parts that are ready for immediate use and require no further cleaning or handling.

**“In effect, the ZERUST® corrosion protection applies and removes itself.”**

## Zerust® ICT® Technology



# Zerust® ICT® Types and Tips

## Ferrous

Iron, steel and cast iron metals are protected using the trademark yellow ZERUST® Ferrous packaging.

## Non Ferrous

Aluminum, copper, brass, bronze and fully galvanized steel are protected using blue ZERUST® Non-Ferrous packaging.

Colors (primarily): clear or blue

## Multi-Metal

Products that contain combinations of the ferrous and non-ferrous metals listed above can be protected using ZERUST® Multimetal packaging.

Colors (primarily): clear or green

## Anti-Tarnish

Protect silver, copper and related alloys from tarnishing with clear ZERUST® Anti-tarnish and other special acid-gas scavenging (AG-S) packaging films.

ZERUST® packaging materials have a shelf life of two years, combined with a subsequent in-service life of up to 5 years. It is highly recommended that customers consult with ZERUST® application engineers, to ensure the implementation of the appropriate products and the best packaging design.

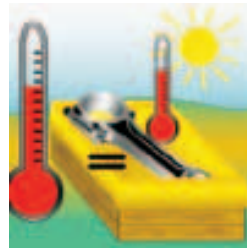
INSTRUCTIONS FOR USE



Pack only clean and dry parts!



Wear gloves to avoid leaving acidic, corrosion-causing fingerprints.



When packing, the ambient temperature and part temperature should be the same to prevent condensation from forming inside the pack.



Seal packs by heat sealing or applying waterproof tape.



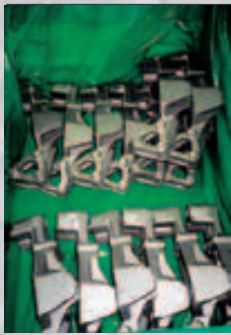
Insert additional ZERUST® packaging materials in the center of tightly packed parts to ensure protection throughout.



Avoid the contact of metal parts with wood, paper or cardboard as these materials contain corrosion-causing acids.

# Zerust® ICT® Packaging for Clean, Dry and Corrosion Free Products

- Packaging and corrosion protection becomes one operation.
- No oils or greases to apply or remove.
- Safe for health and the environment.
- No disposal problems—can be recycled, incinerated or land-filled as ordinary waste.
- Integrated combinations of protection systems such as corrosion protection with VCI and acid-gas scavenging and anti-static properties can easily be provided for any customer's specific requirements.



Heavy cast iron parts transported in a metal container lined with a ZERUST® Gusset bag.



An electrical control cabinet protected inside by ZERUST® Vapor Capsules and protected outside with combination ZERUST® Multimetal/Anti-Static film.



Automotive CKD (Complete Knock Down) components being protected with ZERUST® Multimetal film for intercontinental transit.

Crankshafts individually packed in ZERUST® Ferrous bags preventing corrosion and contamination.



Gears packed in a ZERUST® Ferrous crate liner that covers the interior dividers in order to prevent contact with corrosion-causing wood.



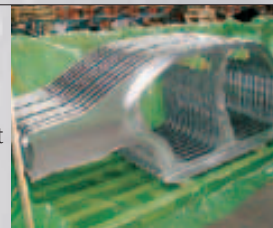
Small parts securely held by ZERUST® Skin Film to ZERUST® treated cardboard.



Clean and rust-free axle parts after trans-ocean shipment and storage in central global warehouse.



Stamped steel components being protected for sea freight with ZERUST® Multimetal film.



Steel bars being automatically wrapped in ZERUST® Ferrous stretch film.



# Product Guide

## Zerust® Film

ZERUST® Film is available in a wide range of sheeting, tubing and centerfold sheeting.



## Zerust® Bags

ZERUST® Bags can enclose a part or line a box in seconds.



## Zerust® Stretch Film

ZERUST® Stretch Film offers a secure method of enclosing products while providing corrosion protection.



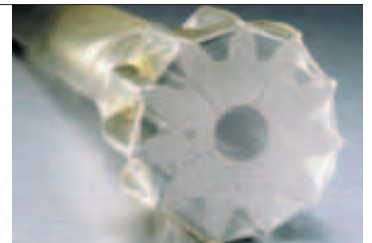
## Zerust® Skin Film

ZERUST® Skin Film can secure parts to sheets of ZERUST® treated cardboard.



## Zerust® Shrink Film

ZERUST® Shrink Film provides corrosion protection and increases pack integrity.



## Zerust® Paper

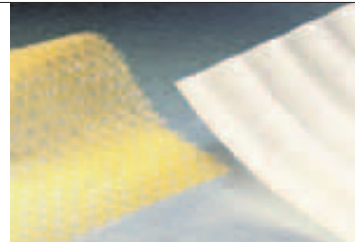
ZERUST® VCI Paper and Poly Paper are high-performance corrosion inhibitors.



# Product Guide

## Zerust® Cushioning Film

ZERUST® Cushioning Film provides corrosion protection as well as physical protection.



## Zerust® Foam Sheeting

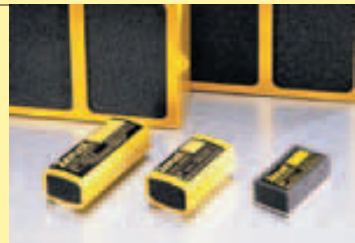
ZERUST® Foam Sheeting offers corrosion protection as well as physical protection.



## More Corrosion Solutions from Zerust®

## Zerust® Vapor Capsules

ZERUST® Vapor Capsules provide corrosion protection inside of enclosures like electrical control boxes.



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**ZERUST®**  **EXCOR®**

Worldwide Corrosion Solutions



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