

Corrosion Intercept®  
Static Intercept® R.I.B.S.™

Solutions

# Protecting Recovered Items from a Disaster Site

*using clean packaging technology*

Presentation

Intercept Technology Group

# Corrosion Intercept®

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Intercept protects by sacrificially absorbing corrosive gases, including:

- Nitrous Oxides (**NO<sub>x</sub>**)
- Ozone (**O<sub>3</sub>**) - reactive oxygen
- Hydrogen Sulfide (**H<sub>2</sub>S**) and Sulfur Dioxides (**SO<sub>2</sub>**)
- Carbonyl Sulfide (**COS**)
- Hydrogen Chloride (**HCl**)
- Acetic acid (**CH<sub>3</sub>COOH**) and Formic acid (**CH<sub>2</sub>O<sub>2</sub>**) )  
from wood offgassing

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Or



**Protecting Recovered Items**

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## Intercept Technology



## VCI Protection



Actual Test Results by American Competitive Institute  
Using ASTM B117 Salt Water Testing  
Funded by Prospective Customer

## Pink Poly Anti-Static



## Aluminized Polyester



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## US Army TACOM (Tank, Automotive & Munitions Command) EVALUATION OF INTERCEPT BARRIER MATERIAL FOR MILITARY PACKAGING

### SALT-FOG Test Data Comparison

<<<<< Days of protection against corrosion >>>>>>

| Metal coupon    | Intercept<br>Poly<br>4-mil | VCI<br>Poly<br>4-mil | MIL-PRF-131<br>Foil / Poly<br>5-mil |
|-----------------|----------------------------|----------------------|-------------------------------------|
| <b>Steel</b>    | <b>102</b>                 | <b>28</b>            | <b>62</b>                           |
| <b>Aluminum</b> | <b>130</b>                 | <b>59</b>            | <b>91</b>                           |
| <b>Brass</b>    | <b>130</b>                 | <b>28</b>            | <b>91</b>                           |
| <b>Zinc</b>     | <b>97</b>                  | <b>59</b>            | <b>77</b>                           |

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Corrosion Intercept film (far right) placed in an atmosphere containing chlorine performs significantly better than other packaging films (foil, blue poly, volatile corrosion inhibitor).

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## Function

Intercept Products consist of special high surface area copper particles which are reacted into the polymer-matrix to create a new class of product with several protective functions:

- Neutralization of corrosive gases present in the bag and migrating gases
- Protection as an “Anode“ for electro-chemical processes
- Natural function against Bio-Corrosion (copper is a passive mildewcide)

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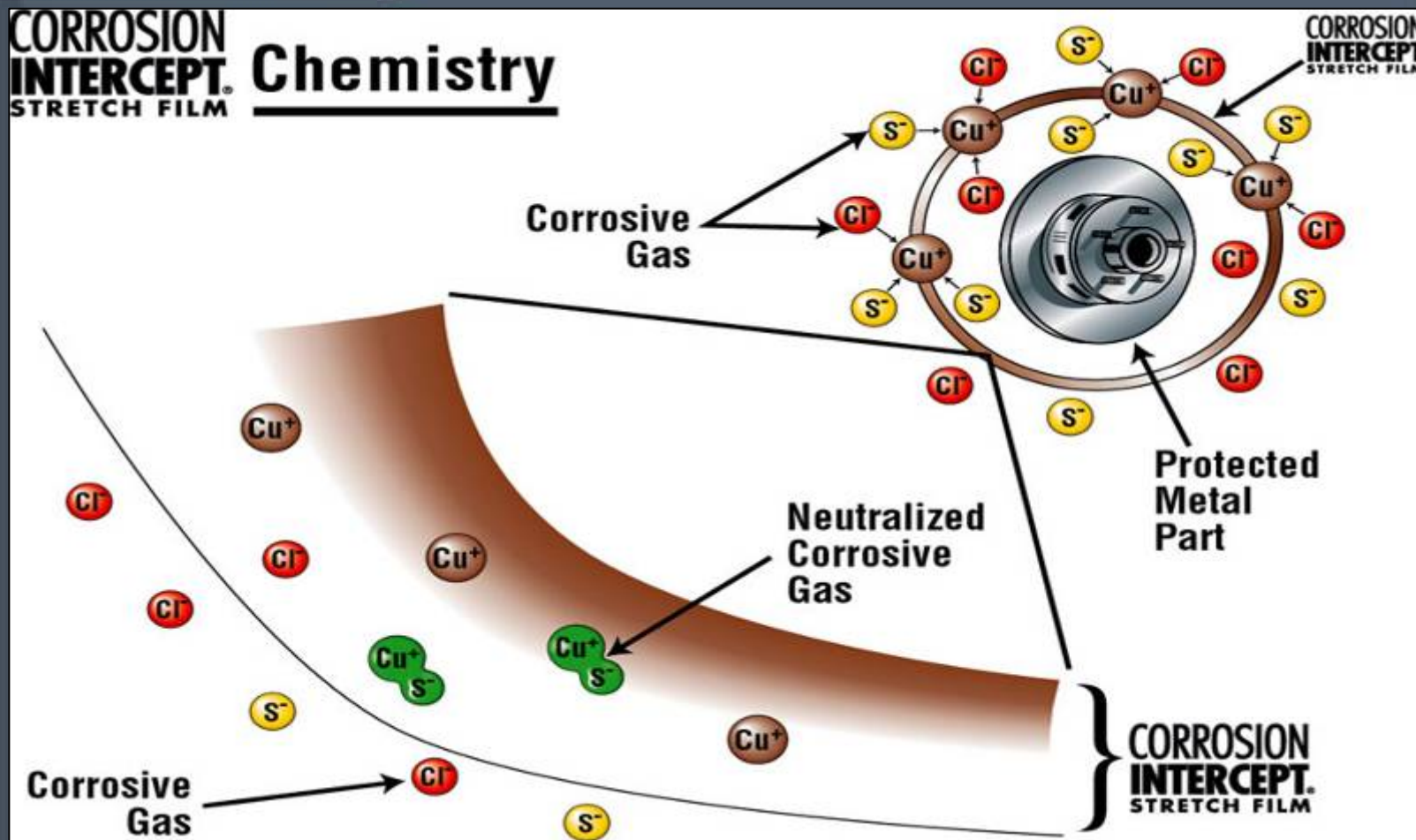


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## How Intercept Works



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## Intercept Benefits:

- **Environmentally-friendly** (no migration of particles and elements) when used as directed; **reusable**; **no chemicals** emitted, **no VOCs**; **no VCIs**, **no shelf-life** limit; **recyclable** as colored PE, decomposes in anaerobic landfill;
- RoHS, EU REACH, EPA, and TRGS-615 **compliant**;
- Only packaging system to win European **environmental award**;
- **made with ISO certified suppliers**;
- High **effectiveness** ( from  $-35^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ ) and 0-100% RH;
- Long **durability** ( > 10 Years per mil of resin under average atmospheric conditions);
- **Protects** all ferrous & non-ferrous metals, electronics, optics, elastomerics, and plastics from atmospheric corrosion;
- **Cost-savings** – saves labor, material, time, rework, shipment cost

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## Additional Benefits

- Intercept allows passage of **RFID** signals, foils do not
- **Anti-forgery:** Intercept packaging has a specific resistance  $10^6$ - $10^8$  ohm signature that can be verified by ohm meter
- Intercept makes other packaging technologies more robust
- Used Intercept packaging can be reused in the field for trans- and return shipments;
- Intercept packaging may better protect against **NBC attack** fallout because of anti-biological and corrosive gas neutralization;
- Intercept eliminates some factors that cause **shelf life** items to have short lives such as gas masks, NBC clothing, tires, gaskets, hoses. Intercept may allow taking S/L items off list

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CT Scanner Quick Pack  
Shroud and Base Sheet  
5 Minute Pack Out  
Approved for Export Shipping



Shrink Wrapping and  
Custom Covers



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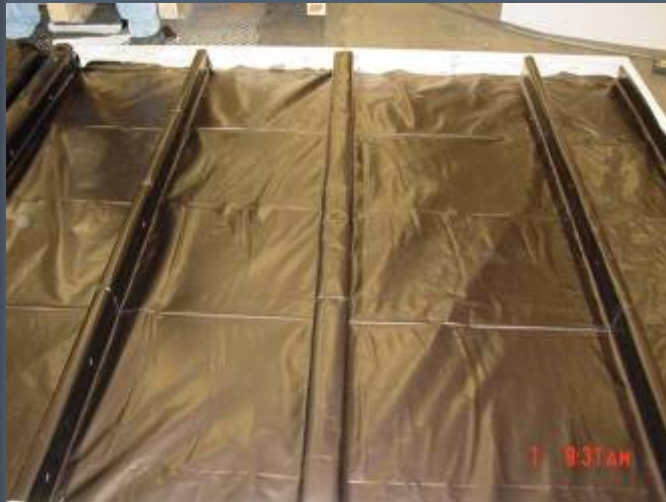
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Long-Term Storage:  
US Army TACOM designated  
2500 up-armored truck cab  
crates be lined with Intercept  
to protect stored std cabs from  
corrosive gases released by  
wood

Design won TACOM,  
Stewart & Stephenson, AIS  
top NIPHLE 2006  
packaging award



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Long-Term Storage:  
USMC Mobile Maintenance  
Facilities in accessible anti-  
corrosive storage



ROI calculated at 11-21  
months. Intercept Fabric  
cover provides forklift and  
personnel access and  
eliminates outside cleaning



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**AVLB Intercept Fabric Cover**  
anticorrosive, reusable,  
accessible, light & strong



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Many companies spend time and material applying oils, greases, VCIs, Cosmoline or other protective coatings to protect the metal products while in storage or shipment.

Later coating removal adds labor and solvent burden, and hazwaste requirement to receiving unit.

Intercept eliminates the coating requirement and subsequent labor costs for application and cleanup

**No Oils, Sprays,  
VCI Paper or  
VCI Sponges  
Required with  
Intercept!**

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## Intercept Used by:

- **US Military:** Army (TACOM), Navy, USAF, USMC; Coast Guard; MARAD
- **Allies:** Singapore, Germany, UK, Australia
- **Shipbuilders:** Conrad Industries
- **Automotive:** BMW, Ford, Chrysler, GM, Bosch, VW, Lemforder
- **Computers:** Analogic, Sky, Stratus, Cisco, 3Com
- **Museums:** Guggenheim, Getty, Smithsonian, National Gallery, etc
- **Mining, Oil, Gas:** BHP, Rio Tinto, KBR, Ausdrill, KBR
- **Electronics:** Alcatel-Lucent, Raytheon, Intel, Teradyne
- **Aerospace:** Boeing, Northrop, SpaceX, Rolls Royce, NASA, Thiokol, Aerojet, TRW, Hughes

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*“Intercept Technology...has been proven in laboratory tests to be better at protecting metals from corrosion than other similar corrosion protection methods such as volatile corrosion inhibitors (VCI). Additionally, Intercept Shrinkfilm is reusable, humidity independent; and safe for personnel and equipment.”*

**Frost & Sullivan**

Oct 2007 Advances in Corrosion Prevention Report Executive Summary

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In addition to acting as a barrier to external atmospheric gases the Corrosion Intercept film scavenges any corrosive gases that might be enclosed in the air space inside the package. Corrosion Intercept also acts as a sacrificial anode and prevents cathodic corrosion.

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## Intercept Stretch Wrap Benefits:

- Corrosion Intercept may be wrapped over irregular shapes – flip the film over to get the film to tuck closed
- Corrosion Intercept additionally acts as a moisture vapor barrier-preventing moisture from entering the package
- Corrosion Intercept film may be adequate to hold the object on a pallet without additional packaging.

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## Spare Parts – Supply Chain Storage / Shipment

Requested Protection Period: 2 weeks to 2 years

Shipment of goods world-wide. Partially opening by customs.  
Dramatic climatic changes.



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## Metals and Assemblies

### Bags / Stretch / Shrink



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## Applications – Cast Iron Engine Blocks



**Ford Motor Company (SA)**

**Engine blocks – 12 Month  
Storage test – No corrosion**

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1) Polyethylene bag



2) SI bag with Corex separator



3) Blocks head bank down on Corex strips



4) Cylinder blocks (6) with Desi Pak desiccant (4 sachets)



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5) Perforated Corex sheet separating layers



6) Blocks head bank up making 2<sup>nd</sup> layer. Desiccants added as per # 4



7) Corex sheet on top



8) Close and tap SI bag

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9) Close & tape plastic bag



10) Re-start the process on top layer separated by wooded sheet board



11) Complete double layer



12) Close bags as 8 & 9 - shrink wrap pallet

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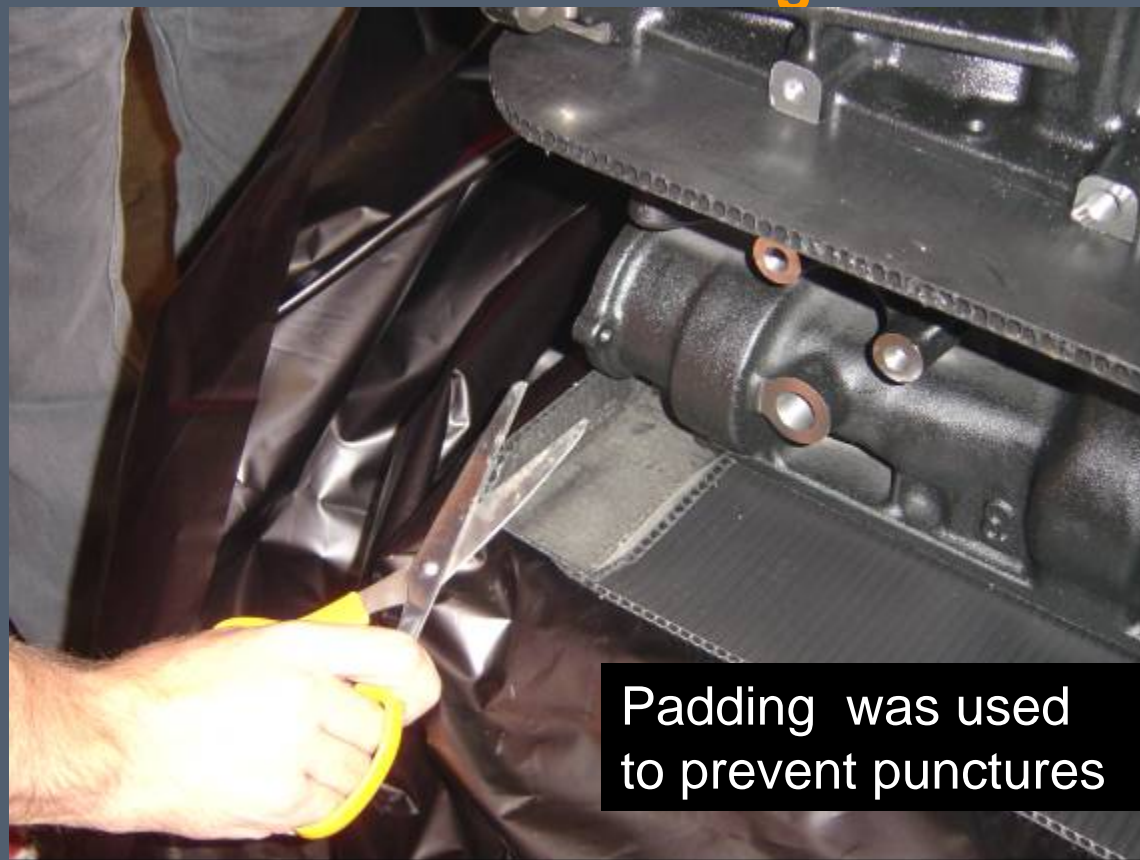
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Improvements seen

Shipments to India and China changed to Intercept

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Padding was used  
to prevent punctures

## Ball Bearing Packs 3 Month Test – High Sulfur Environment

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In addition to being able to pack without Oils – the packaging helps prevent counterfeiting



## Applications – Ship Germany to Mexico

ZF Lemförder



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## Applications – BMW 15-Yr Storage

BMW AG



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## Application – Engine Manifolds Shipped China to US

The use of Intercept bags has allowed these engine manifolds to be shipped from China to the US with no protective oil coating – no oil to be applied, no steam cleaning at receiving, no corrosion failures



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## After 4 Years of Outside Storage

“after unpacking we found it to be in excellent condition...Proof that your system works well under all conditions” – United Group Project Coordinator



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## Total Cost Analysis

- **Faster** to install & allows reclosable access;
- Reduces packaging inventory & waste;
- **Safer** for personnel: no PPE required, no chemical vapors, no equipment reaction, less MSDS admin
- Eliminates component compatibility analysis – safe for all materials: rubber, optics, storage media, polycarbonate, metals
- Eliminates need for oils, sponges, VCI separator sheets, and coatings removal

## Mandatory Use

- The only material consented by BMW for long term (15-year) storage – Most VCIs and Dry method storage are limited to under 3 years. Long-term data available
- Mandatory packaging suppliers of global mining companies BHP and Rio Tinto
- Mandatory packaging for Alcatel-Lucent for all 1<sup>st</sup>, 2<sup>nd</sup>, & 3<sup>rd</sup> tier suppliers (Specification X-21386)
- Kellogg, Brown & Root for O&G project

## Product Variety

Gusseted-Bags

Stretch and Shrinkfilm

Bags (With and without closing)

Flat-Film

MVTR- and EMI-Film

Injection Molded Products

Corrugated (up to 2.94)

CD-Protection

Nylon-Bags

Laminated Fabric for covers



## Cost

Initial pricing on the product is competitive with other standard materials, the overall project cost has always come out lower! In detailed tests the following parameters were recorded

1. Procurement
2. Cost of storage (shelf-life)
3. Handling (Time, secondary components, etc.)
4. Effective (recorded damage improvement)

Intercept always came out cheaper than the competition, with superior performance!

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## Service

The Intercept Technology Group (ITG) together with our partner companies around the world will develop, with our own engineering and design capacities, tailor-made solutions for your individual needs.

Technician and Application specialists are available in all regions (Americas, Africa, Asia, Australia, and Europe). Shipment trials are recorded and evaluated.

All Manufacturers are certified in accordance with DIN ISO EN 9001-9002 , or have similar QC systems (Veritas, etc.).

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Range of possibilities is nearly unlimited



Long Term Storage



Kits



Reusable



Shipment



Crate Lining

## Summary

### Intercept Technology Packaging:

- Lower overall item cost;
- Improved equipment protection;
- Improved logistical flexibility;
- Shorter lead times;
- Increased supplier responsiveness;
- Improved environment;
- More satisfied users.

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***Intercept Technology – Simply Better Protection***

Randy Dutton

CDR, SC, USNR-Retired

VP FPM Inc.

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