How VCI Works

VCI PROTECTION IS A FUNCTION OF:

• Which Metals are in need of corrosion protection.
• Corrosion inhibiting chemicals used and their effectiveness on the metals.
• Ratio of chemicals in the formulation.
• Amount of VCI on the paper or in the film
• pH of the finished product.
• Water solubility and the effectiveness of the corrosion inhibitor in the presence of moisture and/or high humidity.
• Natural neutral kraft paper or polyethylene film used as the carrier for the VCI.
• The overall packaging design and the conditions expected during packing, shipping and storing.
Packaging Design Criteria

- Type of metals in need of protection
- Length of protection required
- Domestic or export
- Climate conditions
- Size and weight of product
- Value of the product
- Current packaging requirements
  - Handling
  - Automatic or manual
- Chemical or oil residue on the metal
- Processing and cleaning methods
- Packing station location relative to other processes
Packaging Design Considerations

- Coverage
  1 square foot of paper or film for every 3 square feet of surface area
  - OR -
  1 square foot for every 1 cubic foot of packaging volume being protected

- Daubert VCI works well through water and humidity.

- An excellent compliment to R-P oils.

- Printing should face away from the metal
Packaging Design Considerations

Example: Brake Discs or Clutch Plate Bulk Packaging

Metal Parts

Crate
(wood, cardboard, steel frame, plastic)

VCI Film
Packaging Design Considerations

VCI out-gassing from film

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Packaging Design Considerations

Interleaf of VCI paper protects inner parts
Packaging Design Considerations

Example: Packaging of large stampings

A VCI poly bag lines the crate and contains the VCI.

Interleaves of VCI paper protect parts above and below, in both the contact and vapor phase.
Packaging Design Considerations

Example: Electric Motor Housings and Assemblies

- Poly coated VCI paper sheds moisture and keeps the metal below from corroding.
- VCI stretch film reinforces the stack, creates a barrier to moisture and provides VCI protection from the sides.
- Poly coated VCI paper separates the metal parts from the wooden pallet and protects the metal above and below. VCI protects in both the contact and vapor phase.

600 – 800 mm

Poly coated VCI paper separates the metal parts from the wooden pallet and provides protection from below.
Packaging Design Considerations

10 year Engine Lay-up and Storage

- KPR VCI Poly gusset bag creates a moisture barrier and VCI protection for the engine block and steel components.
- Uniwrap A provided VCI protection for some non-ferrous metal components.
- Nox-Rust 3100 engine coating protects some of the cast, un-machined surfaces prone to pitting.
- KPR VCI POLY cover can be used to protect critical gears from oxidizing and causing uneven wear.
- Nox-Rust 1100 VCI-10 Oil additive to crankcase oil for corrosion protection.

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Packaging Design Considerations

Export Packing of CKD motorcycles in India

A shroud of Uniwrap A VCI paper protects metal and plated surfaces. The VCI formula is compatible with all synthetic components.

Uniwrap A at the base of the package provides VCI protection for the KD components attached to the pallet.
Packaging Design Considerations

Export Packing of CKD motorcycles in India

A plain poly bag lines the crate and contains the VCI.

Wooden crate is built around the KD unit once the corrosion protective packaging is properly in place.

Plain poly is also used to wrap any wood bracing within the package to prevent acidic moisture from contacting the metal surfaces.

A shroud of VCI paper protects metal and plated surfaces. The VCI formula is compatible with all synthetic components.

Uniwrap A at the base of the package provides VCI protection for the KD components attached to the pallet.
Packaging Design Considerations

Mechanical and Corrosion Protection of Pumps and Valves

Example of INCORRECT Packaging

In this design VCI is prevented from reaching the metal surface by the corrugated separator.

Exposed metal components susceptible to corrosion.

Corrugated cardboard separators used as cushioning can be a significant source of corrosion.

Painted surfaces don’t require VCI protection and the VCI does not affect them.
Packaging Design Considerations

Mechanical and Corrosion Protection of Pumps and Valves

Example of CORRECT Packaging

Corrugated cardboard can be a source of acidic moisture, from the paper and the glue, that can attack unpainted metal parts.

Plain or VCI poly protects against moisture from outside.

Water soluble VCI can provide protection against condensation that forms inside the bag.

Use VCI paper or foam as a separator. Provides mechanical protection and the VCI has free access to the metal.

Kpr Adcor Inc. 'We Stop Rust!' TM
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