Packaging Design Considerations from Daubert Cromwell
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 surface area of paper / film for every 3 square surface area of metal
Or
1 square surface area of paper / film for every 1 cubic area being protected

- Daubert Cromwell VCI works well through water and humidity.
- An excellent compliment to R-P oils.
Packaging Design Considerations

Example: Brake Discs or Clutch Plate Bulk Packaging
Packaging Design Considerations

VCI out-gassing from film

300 – 400 mm
Packaging Design Considerations

Interleaf of VCI paper protects inner parts
Packaging Design Considerations

Example: Packaging large stampings

- Interleaves of VCI paper protect parts above and below, in both the contact and vapor phase.
- A plain poly bag lines the crate and contains the VCI.
Packaging Design Considerations

Example: Packaging of large stampings

A plain 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.

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

Protection for bulk packaging small parts

VCI Film

Metal Parts

Crate (wood, cardboard, steel frame, plastic)

300 – 400 mm

VCI out-gassing from film

300 – 400 mm

Compatible VCI’s

300 – 400 mm

VCI Paper

300 – 400 mm

Compatible VCI’s

300 – 400 mm

300 – 400 mm

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300 – 400 mm

300 – 400 mm
Packaging Design Considerations

Protection during shipping and storage

Crating material (especially wood and corrugated) is often the source of contaminants causing corrosion.

**VCI film as a barrier between it and the metal is recommended.**

Desiccant pouch provides passive and **poor corrosion protection** in harsh packing and shipping conditions.

**VCI paper, with its active corrosion protection, is superior to the passive protection provided by desiccants such as silica gel.**
Packaging Design Considerations

Protecting high value assets shipping overseas

1. Place barrier material and VCI film over pallet

2. Place engine on pallet, barrier material and VCI Poly

3. Add VCI Emitters and seal VCI Poly

4. Heat seal barrier material
Packaging Design Considerations

Protecting wheels stacked on pallet: Use VCI Poly and Paper

**Poly Outer Wrap**

**Option #1**: Premium Metal-Guard or Clear Pak® stretch film protects against corrosion and oxidation inside; provides a barrier against outside contamination and moisture.

**Option #2**: Premium-Metal-Guard or Ferro-Film bag cover (shroud) pallet provides additional protection over the VCI stretch.

**Paper**

Protek Wrap (PW32) 48”x48” sheets provide protection at each layer.

VCI out-gassing from paper  VCI out-gassing from poly
Packaging Design Considerations

Protecting Individually Wrapped Small Parts (Stacked)

1) Wrap with VCI sheet
2) Insert into a VCI Poly bag
3) Stack packaged parts in bin or box
A shroud of Uniwrap MPI VCI paper protects metal and plated surfaces. The VCI formula is compatible with all synthetic components.

Uniwrap MPI 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.

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

Uniwrap MPI at the base of the package provides VCI protection for the KD components attached to the pallet.

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

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

Mechanical and Corrosion Protection of Pumps and Valves

In this design, the corrugated separator prevents the VCI from reaching the metal surface.

Exposed metal components susceptible to corrosion.

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

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

Mechanical and Corrosion Protection of Pumps and Valves

Corrugated cardboard can be a source of acidic moisture, from the paper and the glue, that can attack unpainted metal parts. *(This proposed design is a more effective alternative.)*

Plain or VCI poly protects against moisture from outside.

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

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