

Packaging Design Considerations from

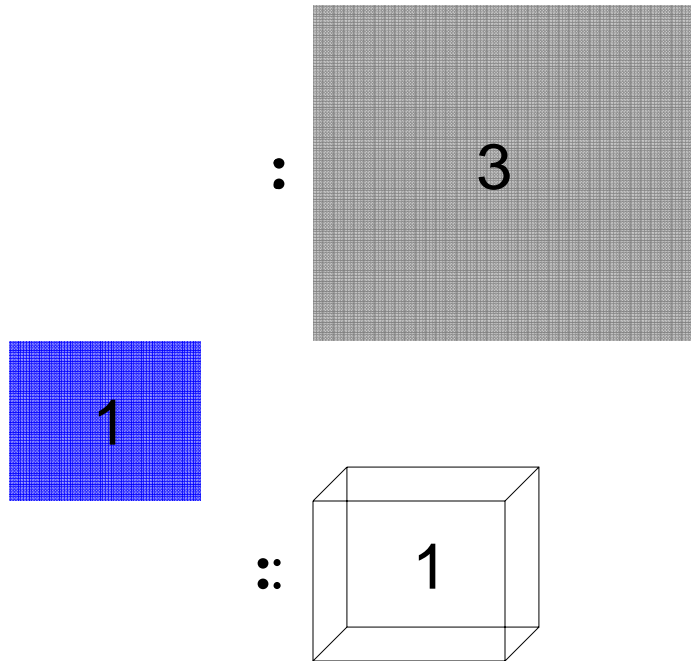


Packaging Design Criteria

- 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

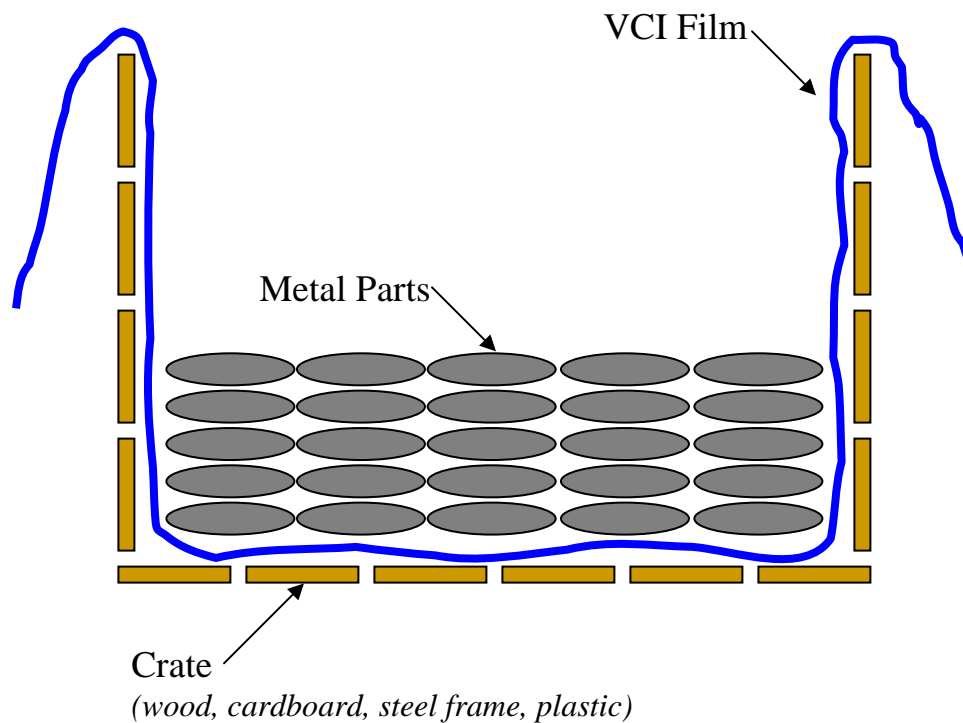
Or

1 square surface area of paper / film for every 1 cubic area being protected

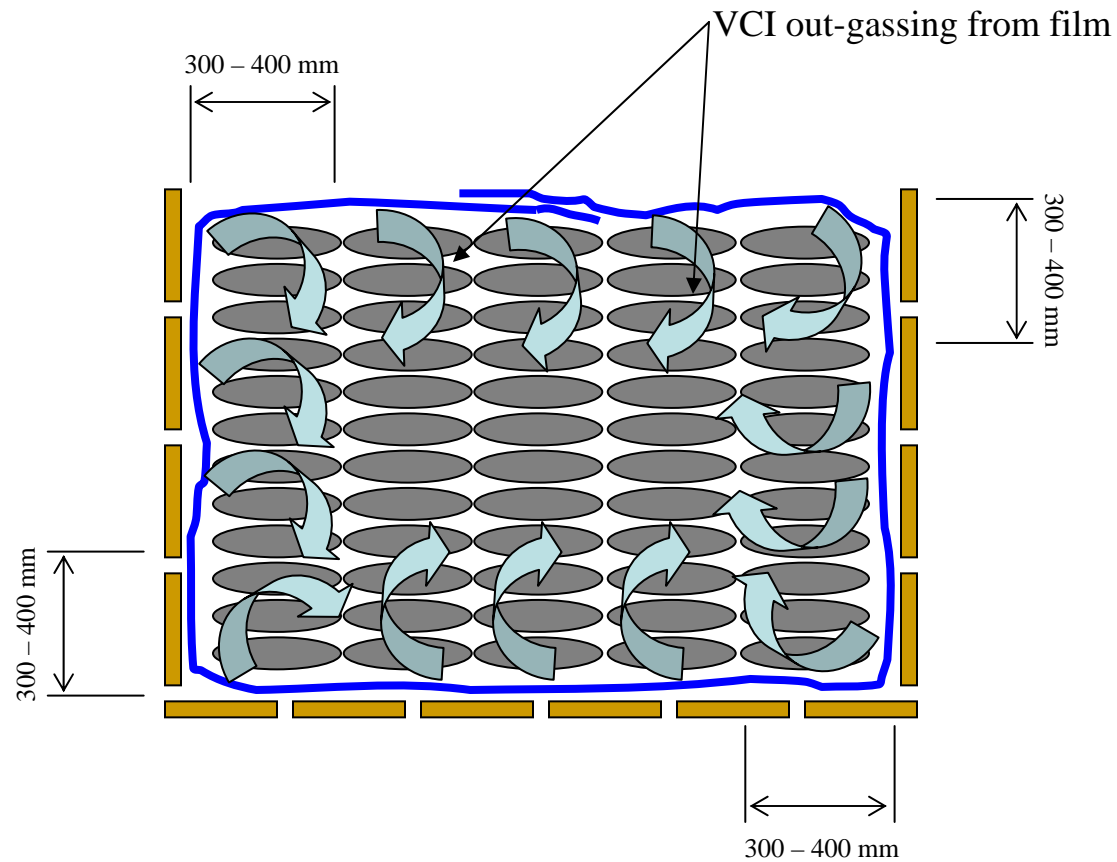
- Daubert Cromwell VCI works well through water and humidity.
- An excellent compliment to R-P oils.

Packaging Design Considerations

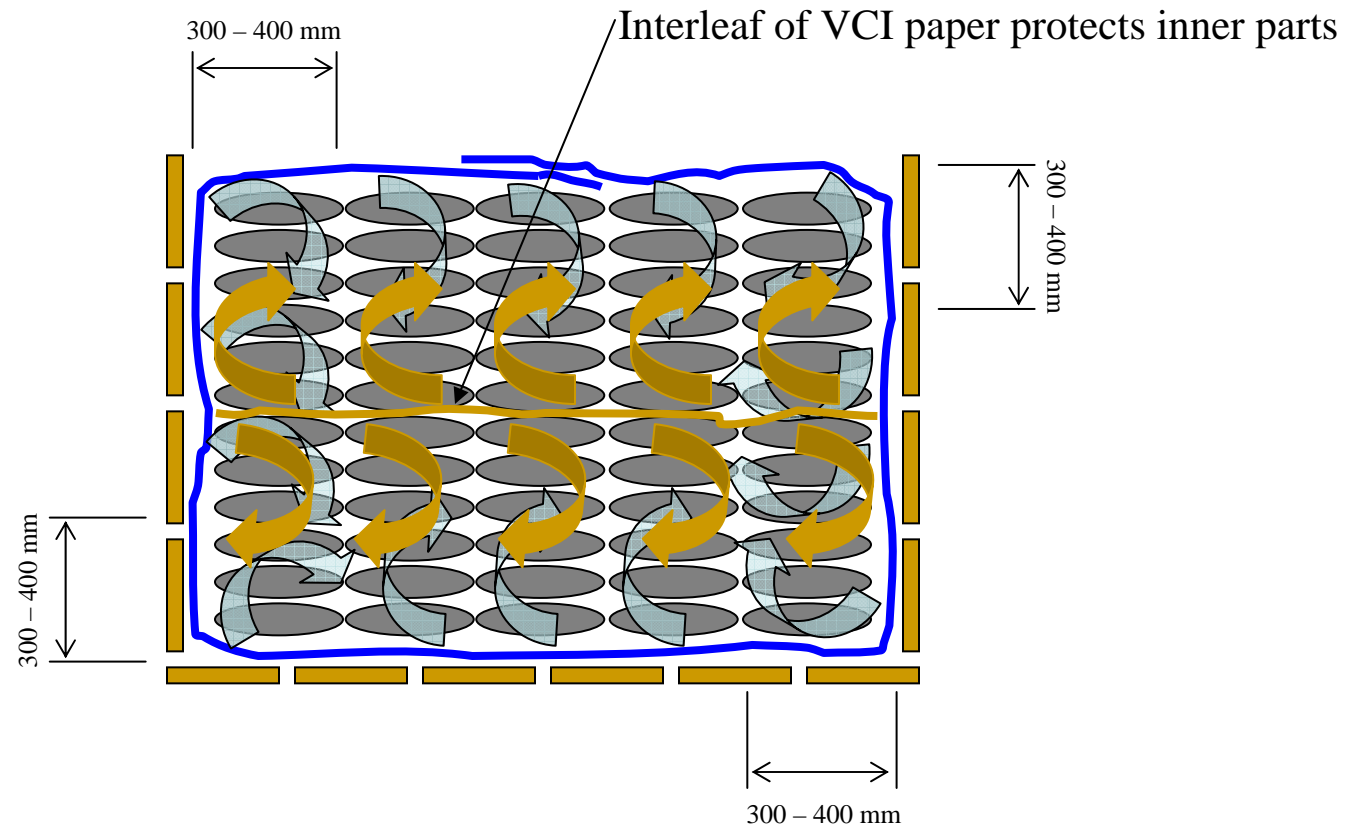
Example: Brake Discs or Clutch Plate Bulk Packaging



Packaging Design Considerations

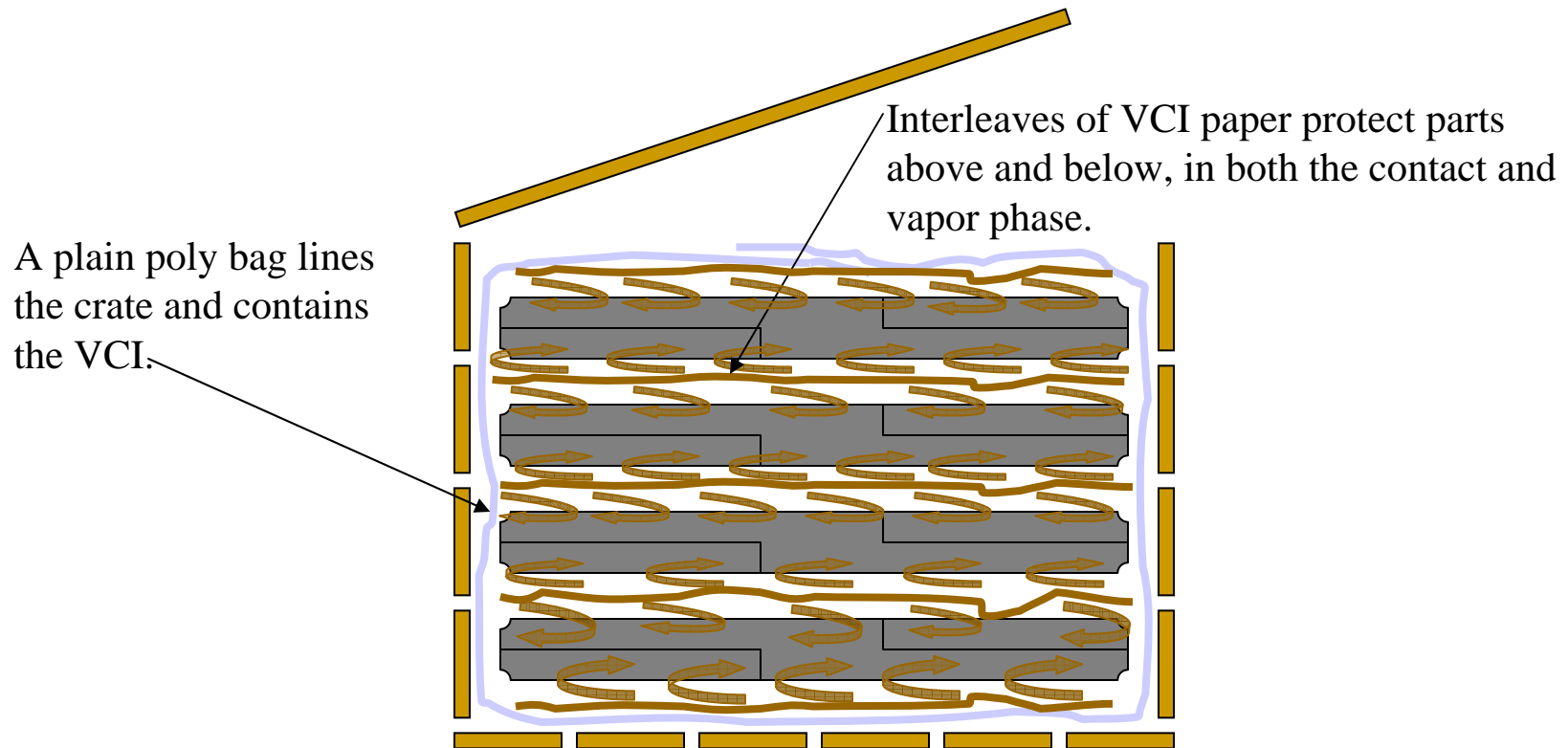


Packaging Design Considerations



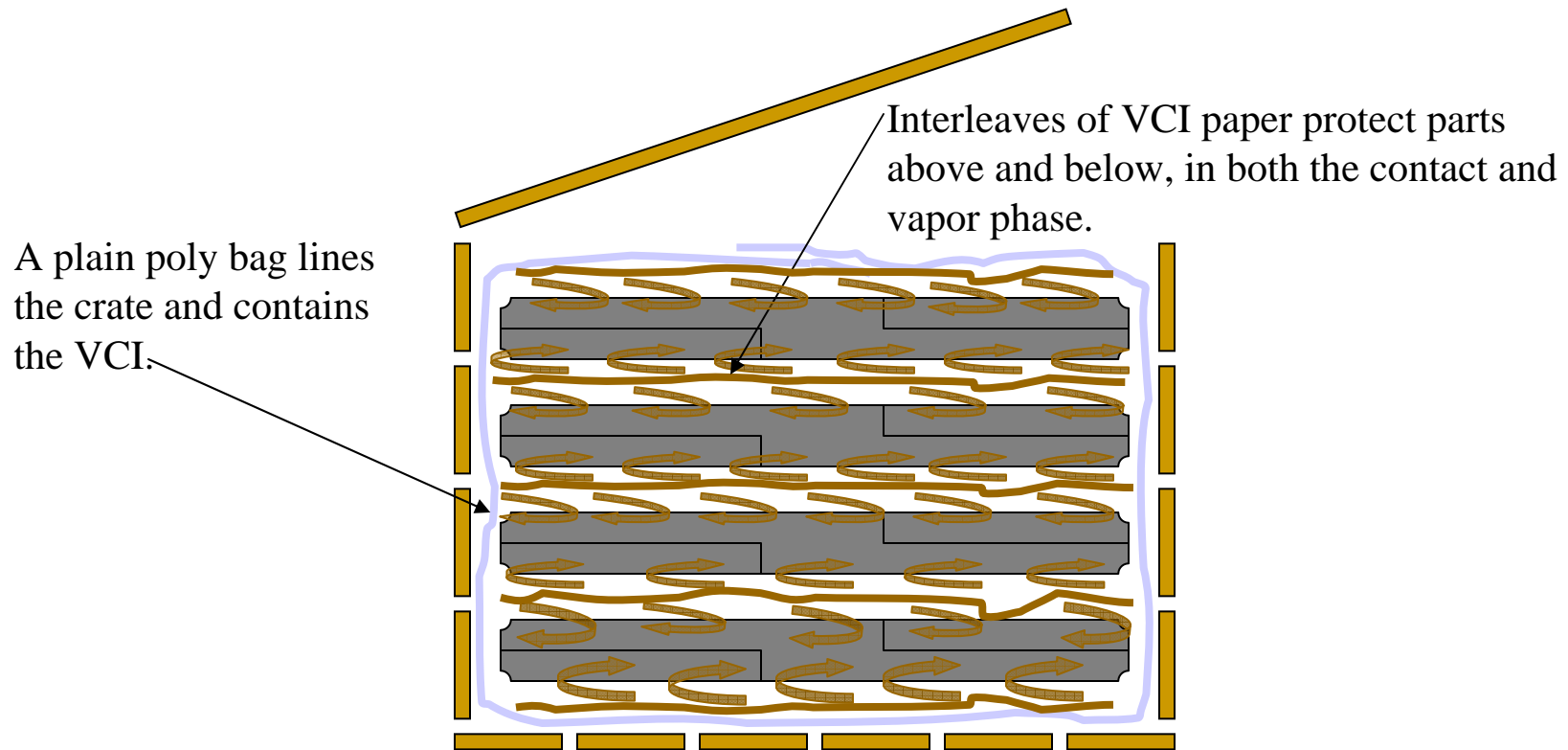
Packaging Design Considerations

Example: Packaging large stampings



Packaging Design Considerations

Example: Packaging of large stampings

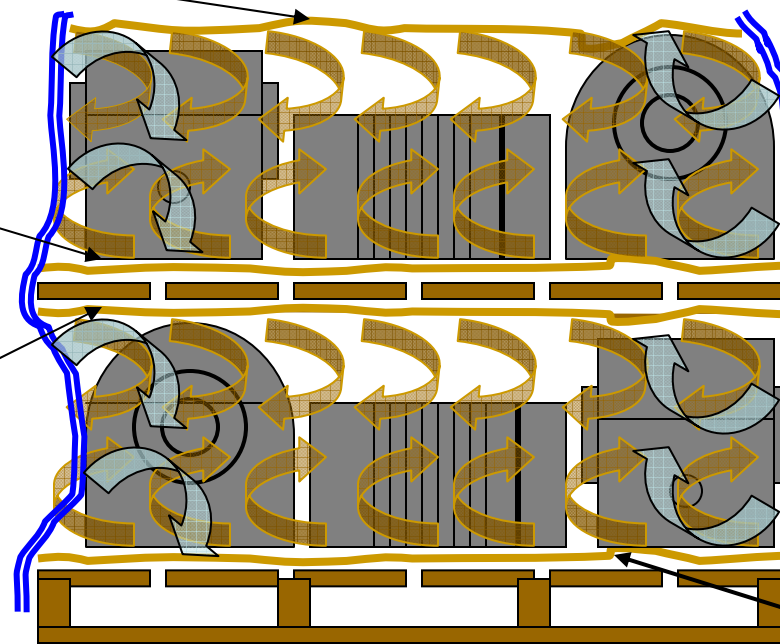


Packaging Design Considerations

Example: Electric Motor Housings and Assemblies

Poly coated VCI paper sheds moisture and keeps the metal below from corroding.

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.



VCI stretch film reinforces the stack, creates a barrier to moisture and provides VCI protection from the sides.

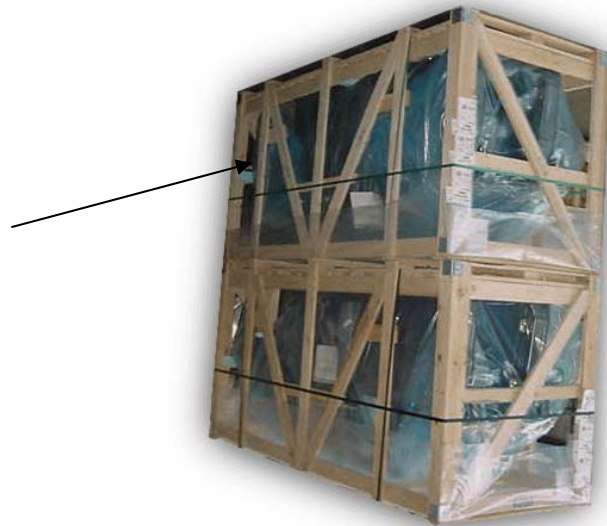
Poly coated VCI paper separates the metal parts from the wooden pallet and provides protection from below.

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

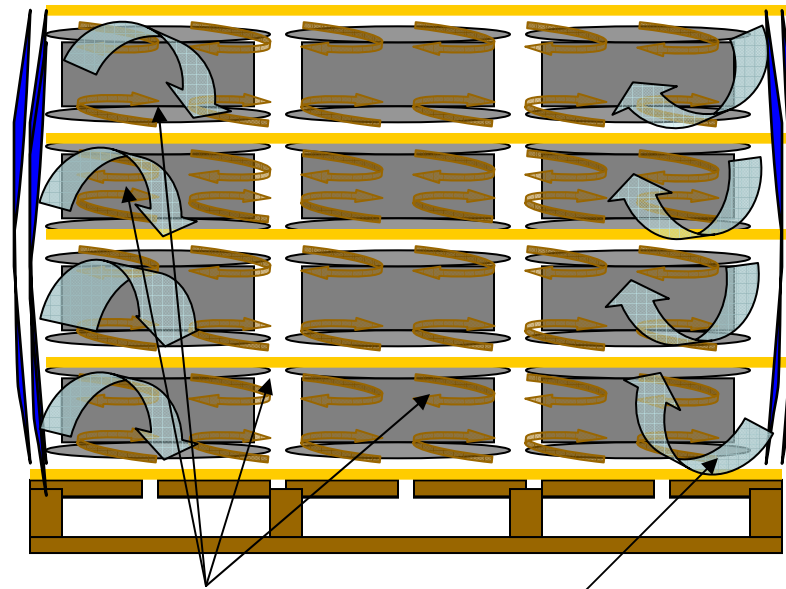
Packaging Design Considerations

Protecting wheels stacked on pallet: Use VCI Poly and Paper

Paper

Protek Wrap

(PW32) 48"x48"
sheets provide
protection at each
layer



VCI out-gassing from paper

VCI out-gassing from poly

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.

Packaging Design Considerations

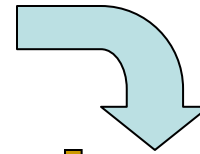
Protecting Individually Wrapped Small Parts (Stacked)



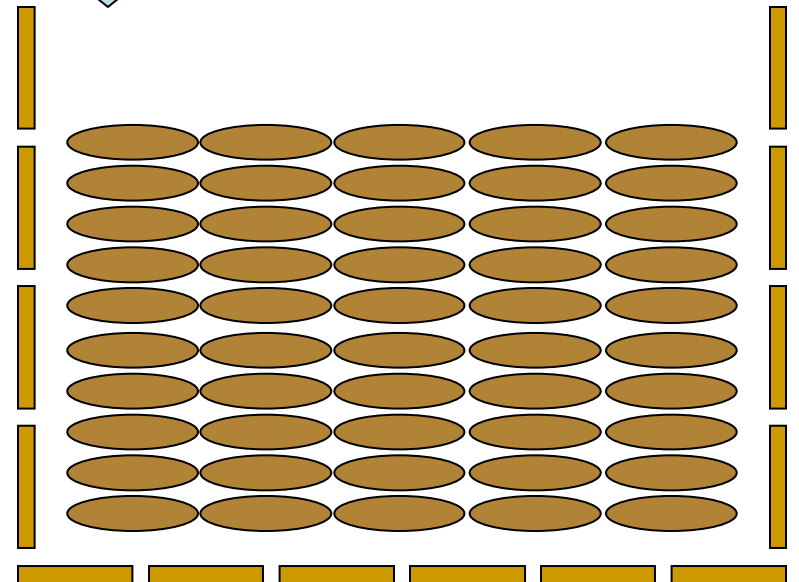
1) Wrap with VCI sheet



2) Insert into a VCI Poly bag



3) Stack packaged parts in bin or box



Packaging Design Considerations

Export Packing of CKD motorcycles in India

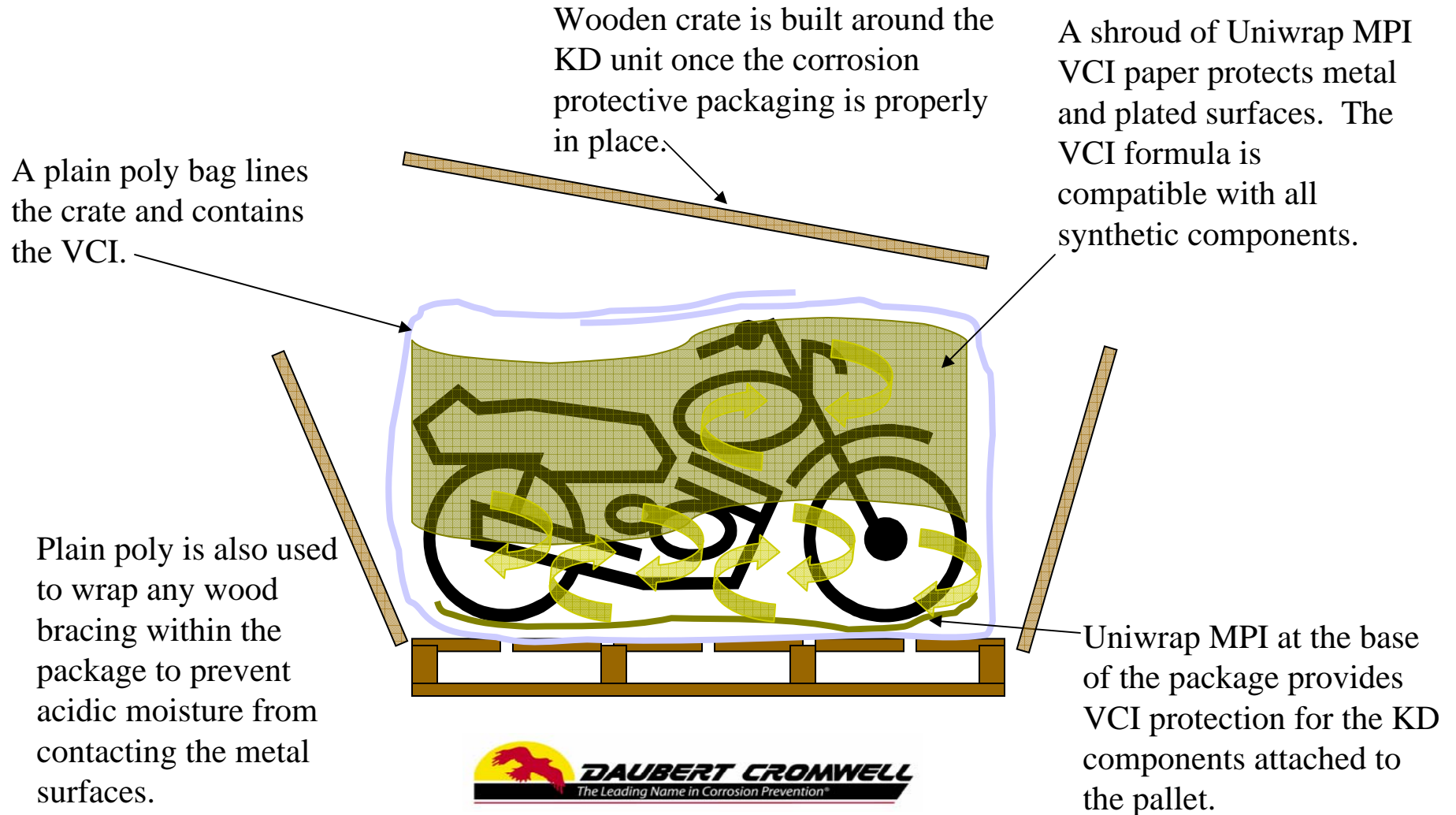
A shroud of Uniwrap MPI VCI paper protects metal and plated surfaces. The VCI formula is compatible with all synthetic components.



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

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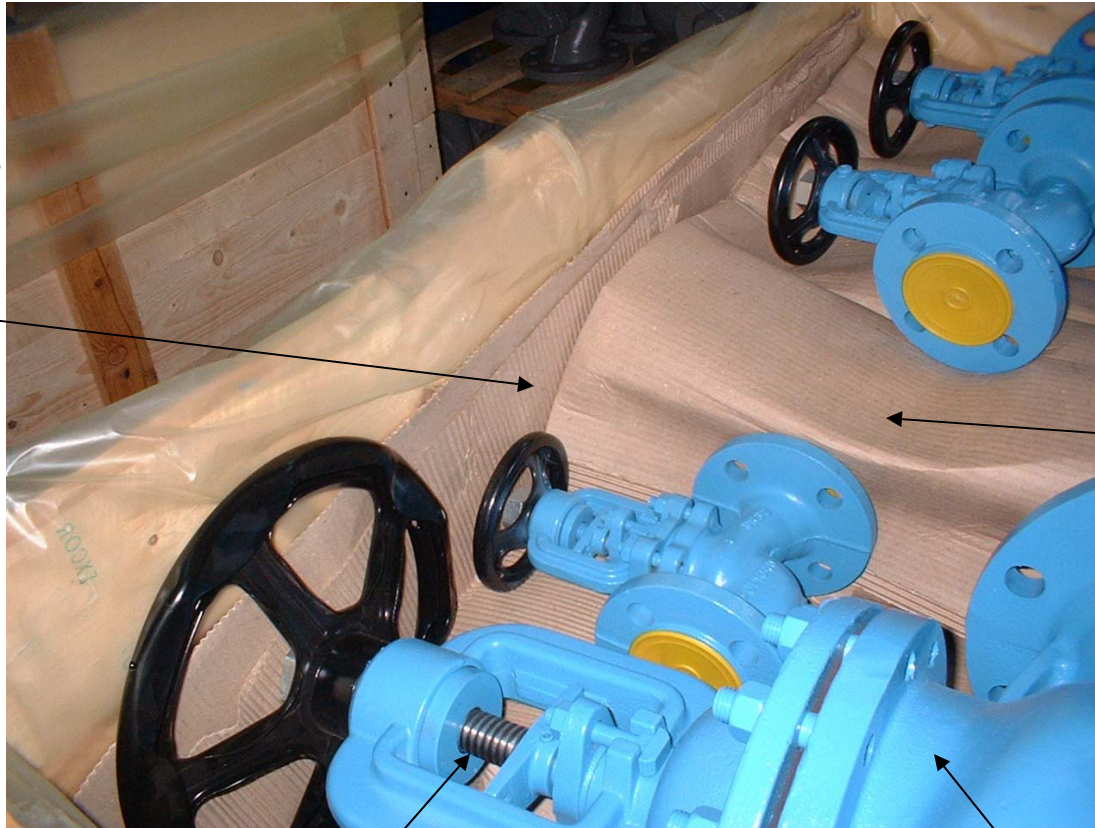
Export Packing of CKD motorcycles in India



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.



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

Exposed metal components susceptible to corrosion.

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

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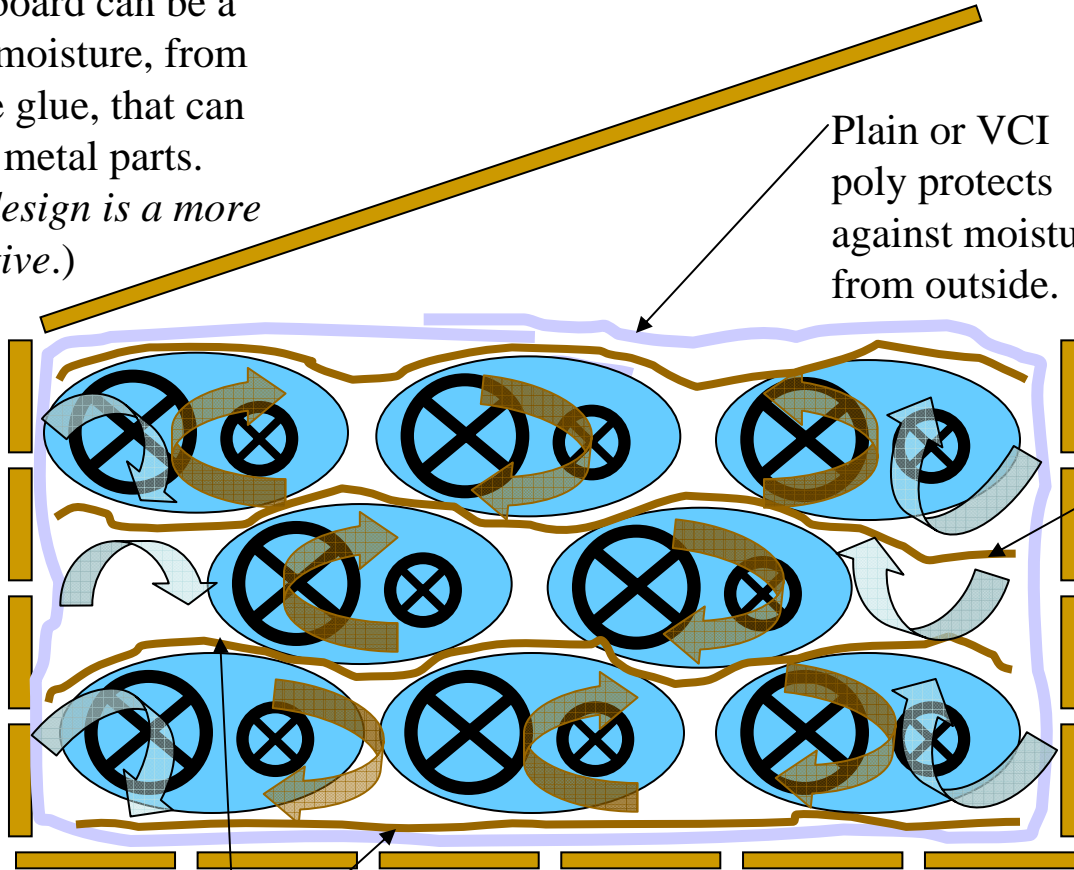
Mechanical and Corrosion Protection of Pumps and Valves

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

