

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



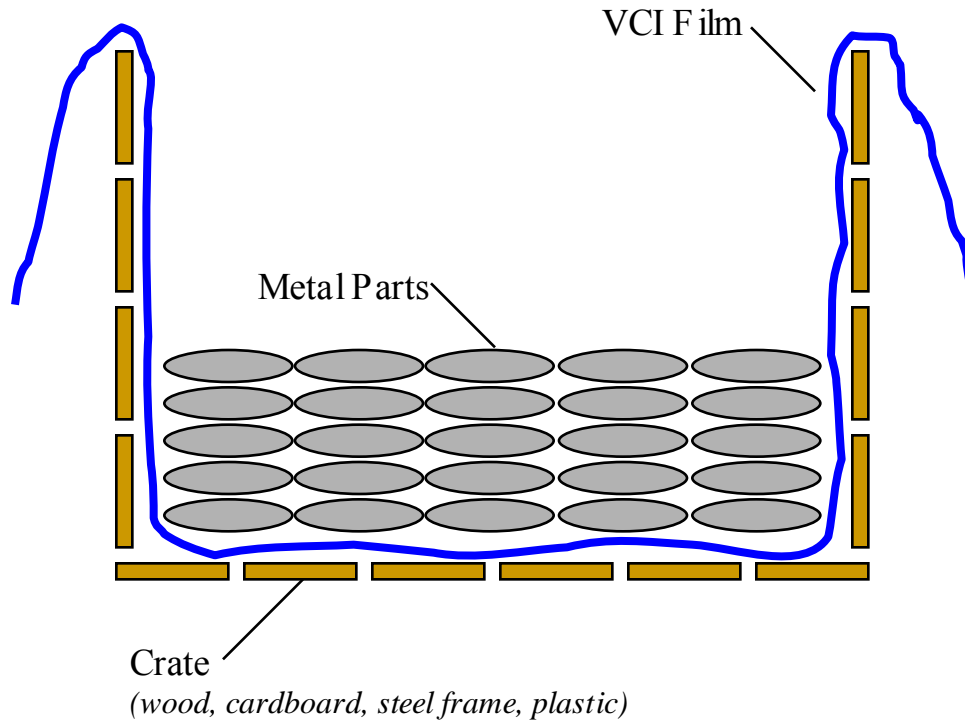
DAUBERT VCI, INC.

Packaging Design Considerations

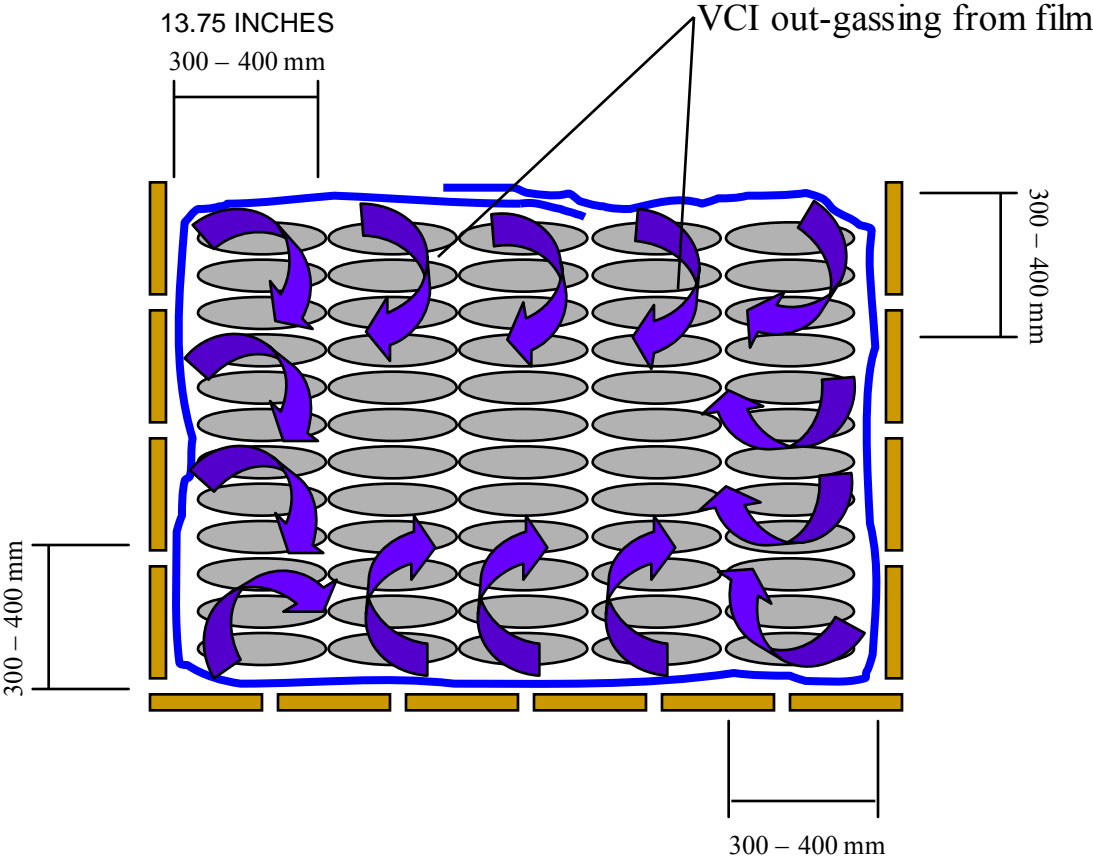
- Coverage
 - 1 square foot of paper or film for every 3 square feet of surface area
 - OR –
 - 1 square foot for every 1 cubic foot of packaging volume being protected
- Daubert VCI works well through water and humidity.
- An excellent compliment to R-P oils.
- Printing should face away from the metal

Packaging Design Considerations

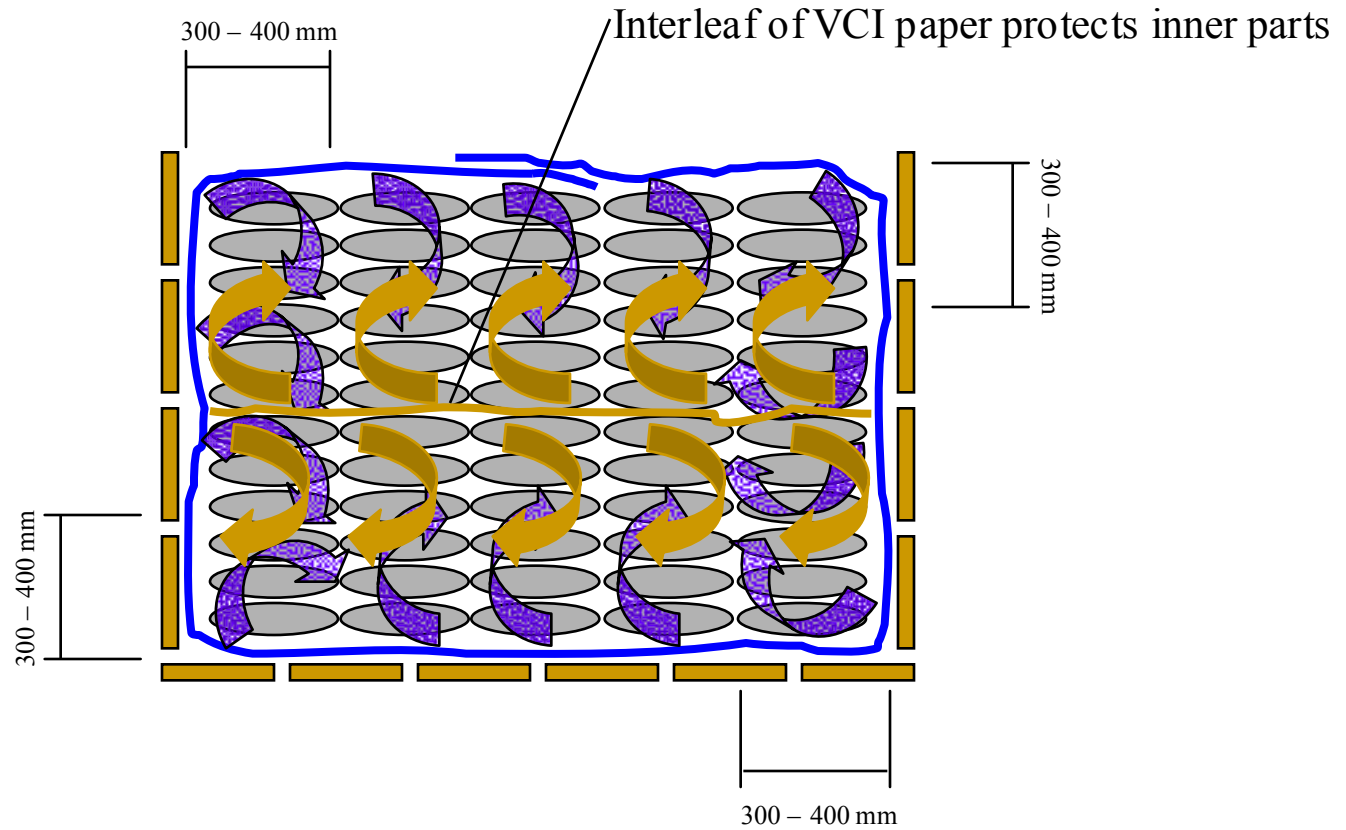
Example: Brake Discs or Clutch Plate Bulk Packaging



Packaging Design Considerations

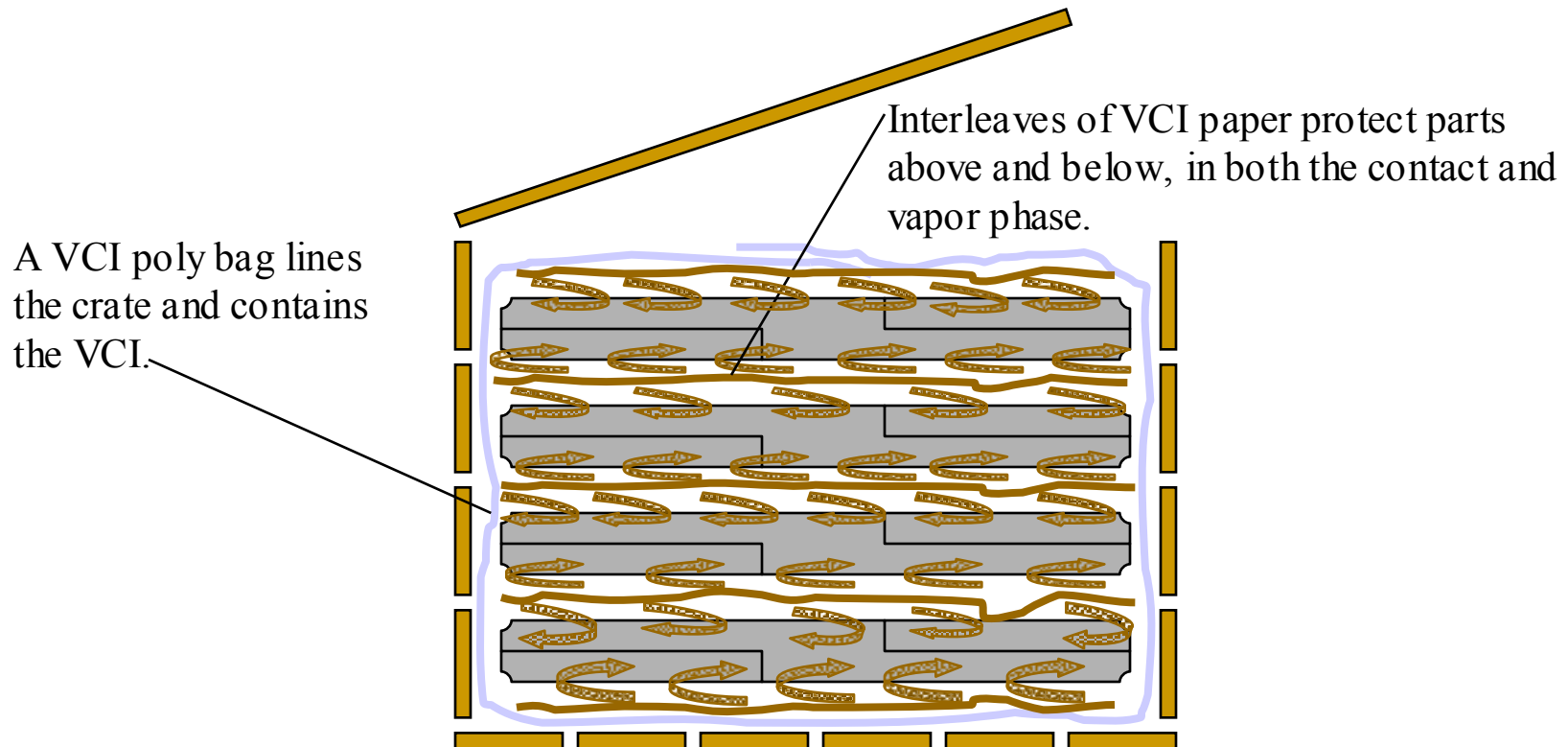


Packaging Design Considerations



Packaging Design Considerations

Example: Packaging of large stampings

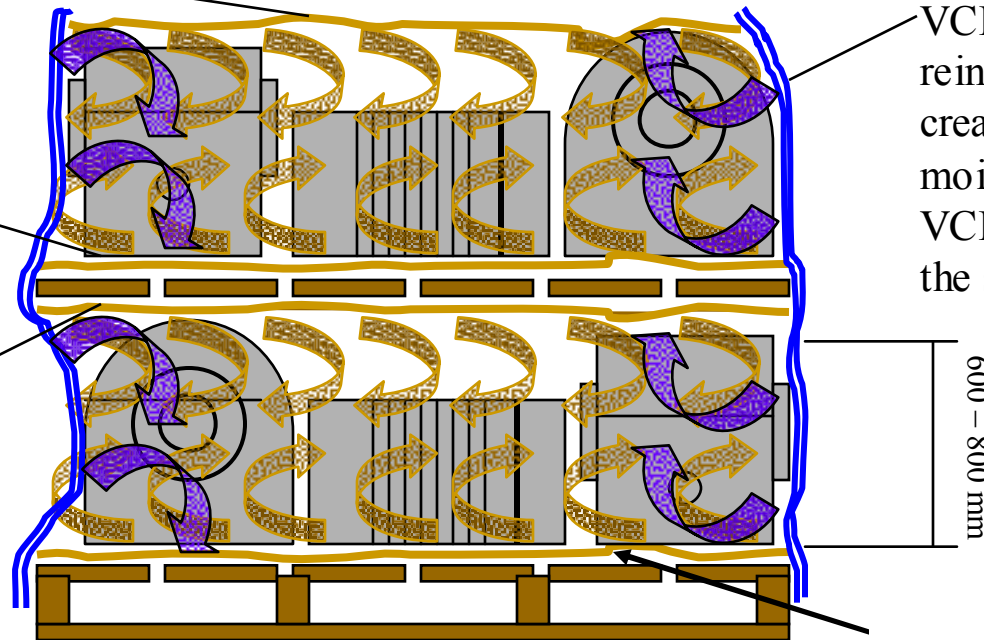


Packaging Design Considerations

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.

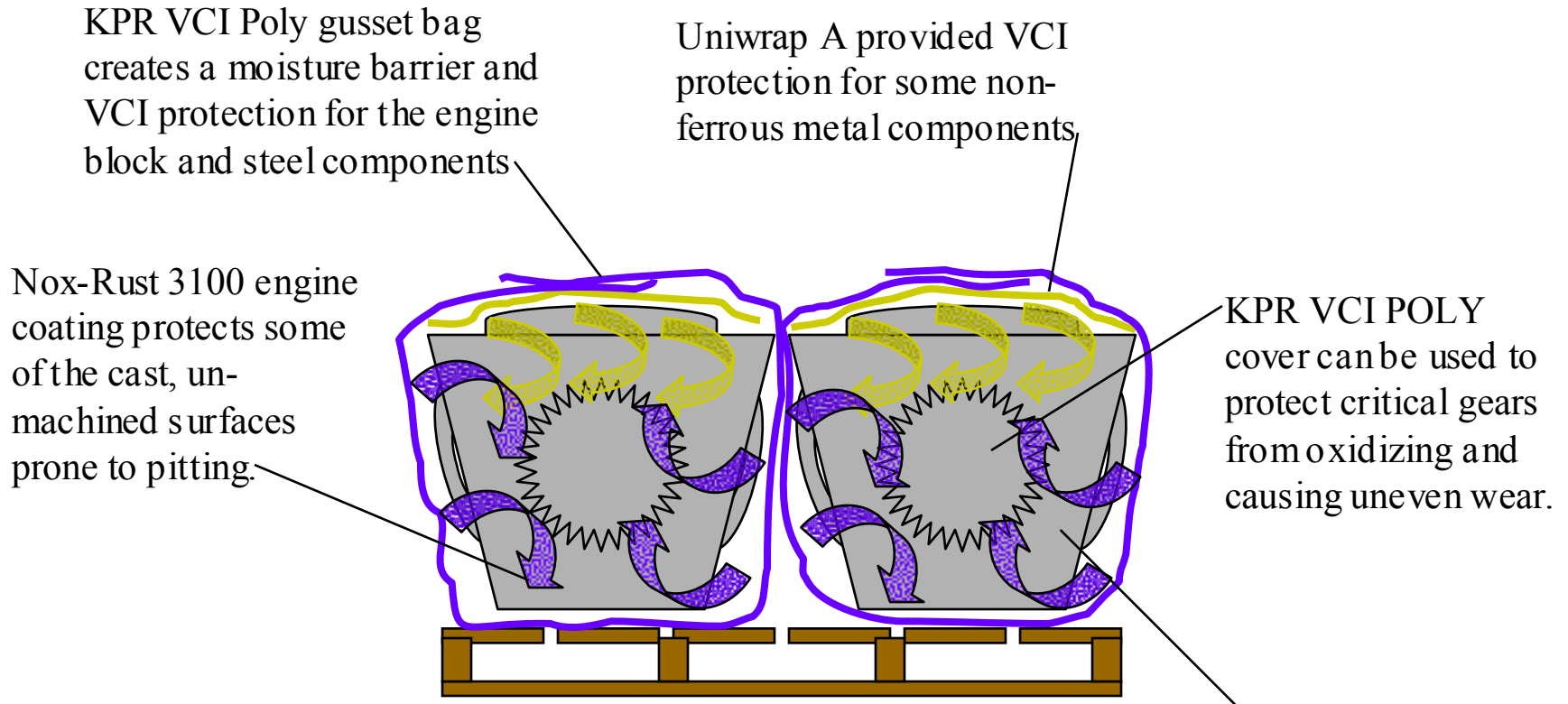


VCI stretch film reinforces the stack, creates a barrier to moisture and provides VCI protection from the sides.

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

Packaging Design Considerations

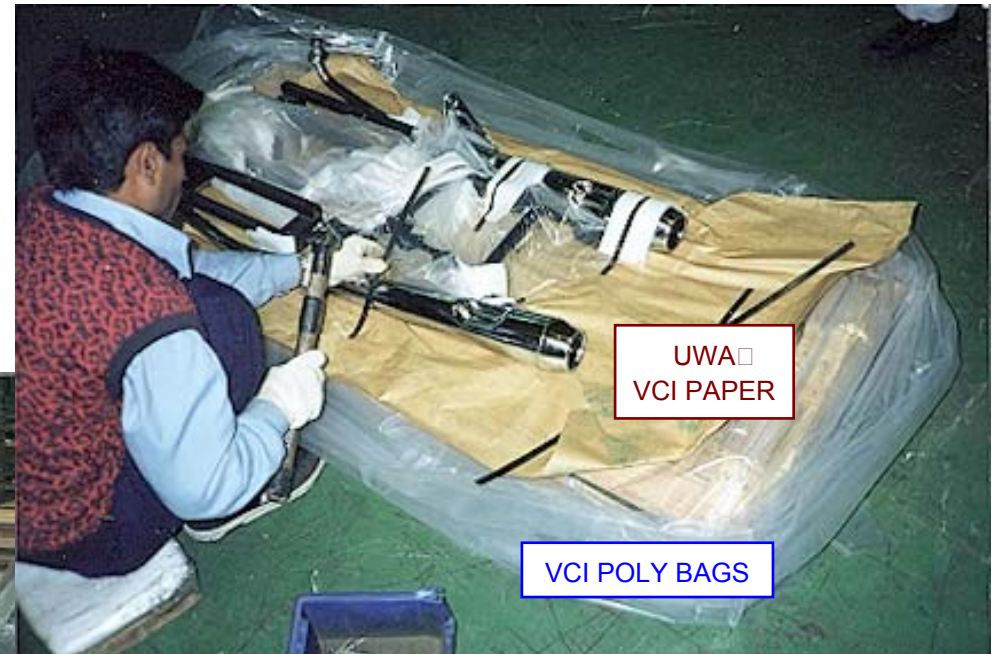
10 year Engine Lay-up and Storage



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

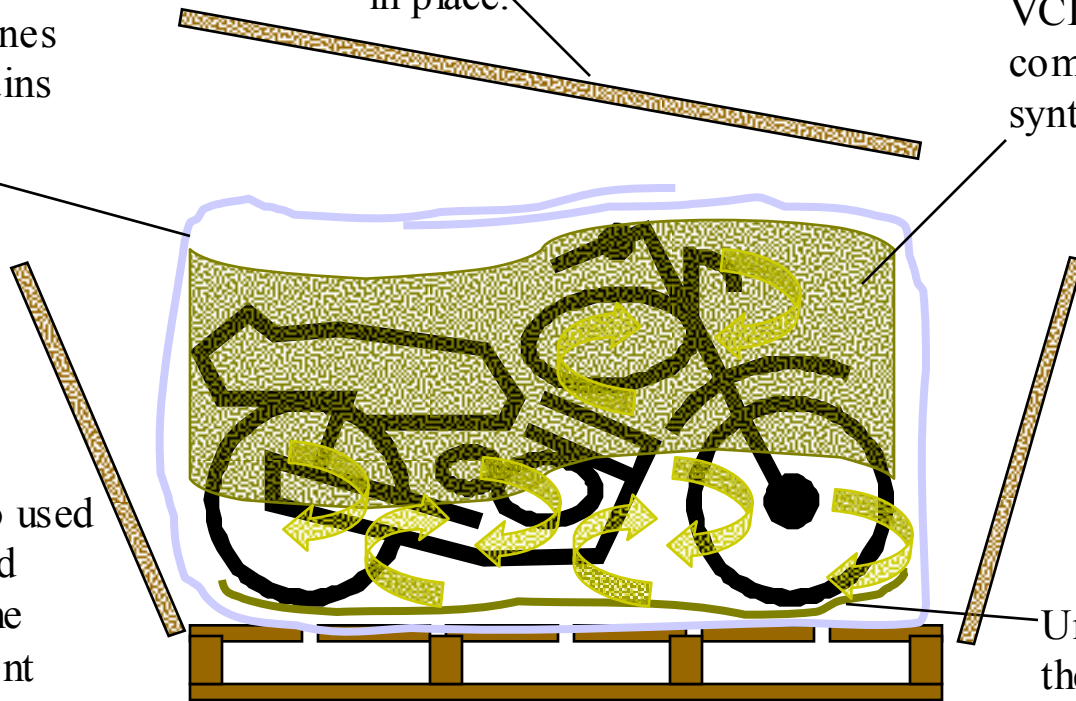
Export Packing of CKD motorcycles in India

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

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

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.



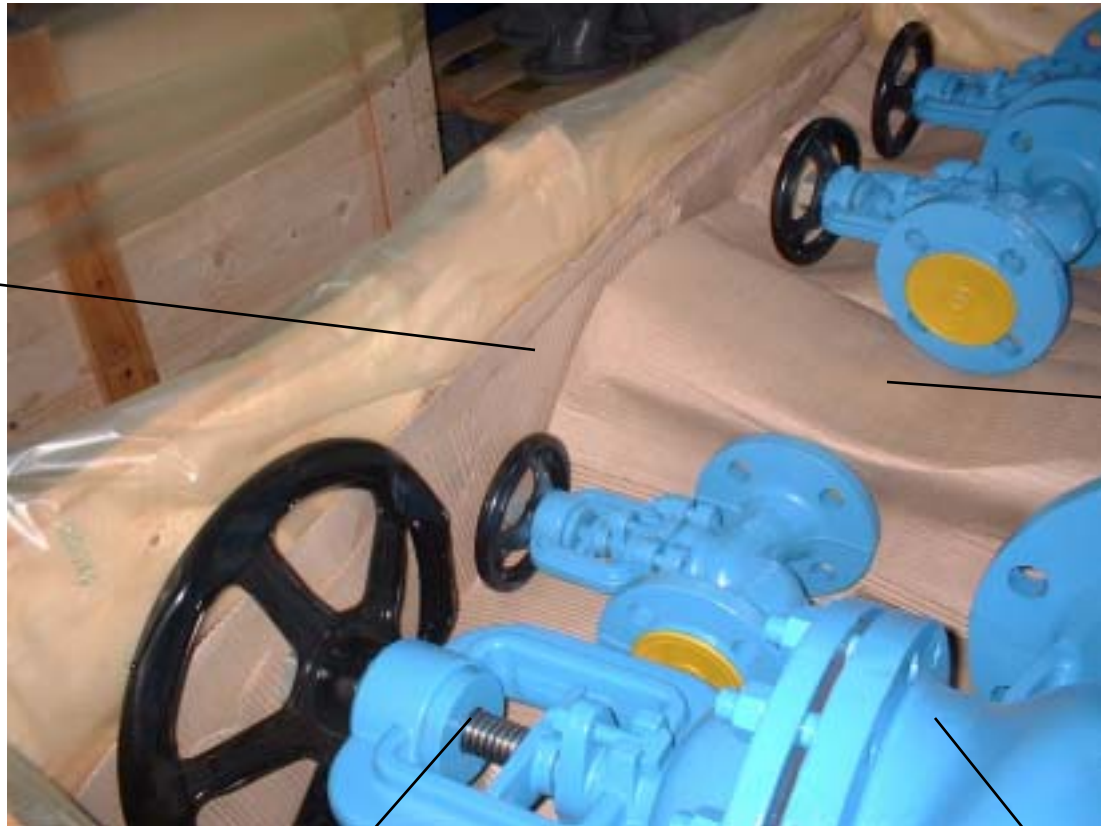
Uniwrap A at the base of the package provides VCI protection for the KD components attached to the pallet.

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.



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.

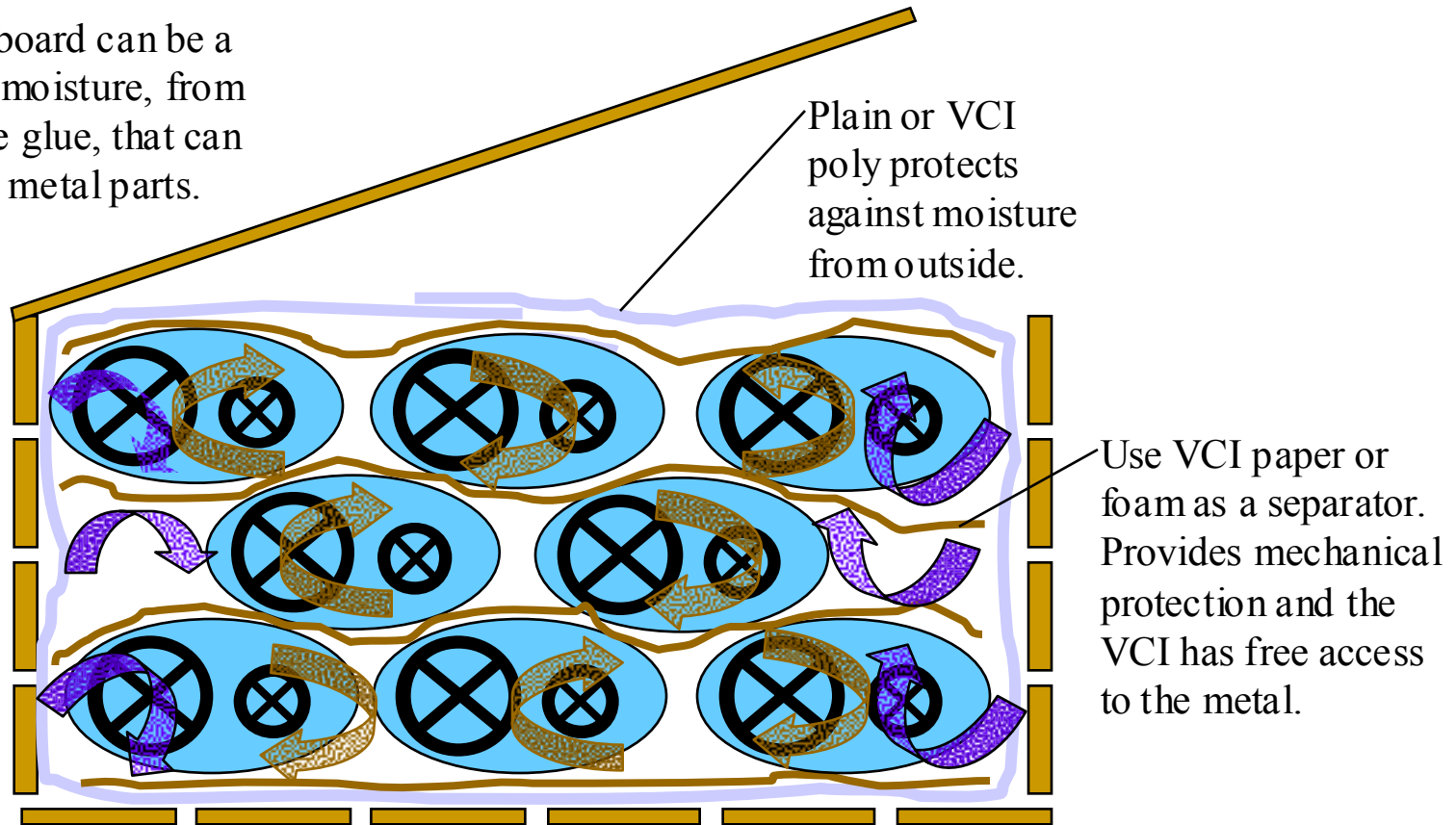
Packaging Design Considerations

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.

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



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