



Best Practices for Corrosion Management

Pictures provided below may not be specific to your application and are only intended to convey best practices for corrosion management

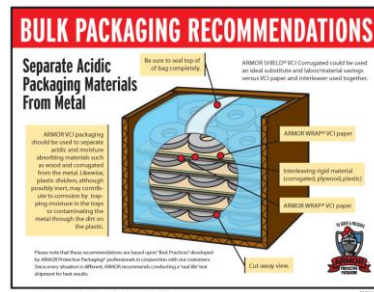
- 1) In process parts: Continue to place VCI paper on pallets to create a barrier between the wood and the metal part to avoid direct contact with acidic materials and prevent corrosion



Wrong



Correct



Correct

- 2) **Parts Not Protected / Exposed to Environment & Elements**

Leaving metal parts uncovered and unprotected while sitting in the plant, waiting for secondary operations or packaging for shipment, makes parts susceptible to rust and corrosion. In addition, parts left uncovered in the plant are susceptible to forklift exhaust. Chlorides, Sulfides, and Oxides from the exhaust contribute to the corrosion of metal parts. Cover all metal parts with VCI paper or VCI poly film / bags, protecting them from oxygen and contaminants that are in the plant atmosphere.



Wrong



Correct



- 3) Parts should be Clean and dry prior to packaging. Wear clean gloves when handling metal parts. Ensure gun cleaning (rope) brush used to clean out threaded holes/recesses is clean and free of contaminants.



- 4) The packaging needs to provide much greater seal capability. Consider folding & taping bag closed, zip tie, etc..to prevent exposure to atmosphere. Possible closure methods are provided below.

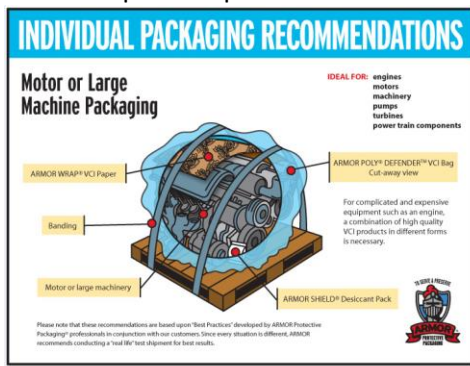


Current



Proper Closure Methods

- 5) Plant/storage facility's uncontrolled conditions, could provide opportunities for residual moisture to be trapped in packaging. We recommend the addition of vci paper on top and bottom of part in addition to the vci bag. The paper will emit vci vapors more rapid than poly and help to absorb moisture. (And perhaps the addition of desiccant for optimum protection to aid in moisture control).



VCI Bag + VCI Paper (top & bottom) + Desiccant

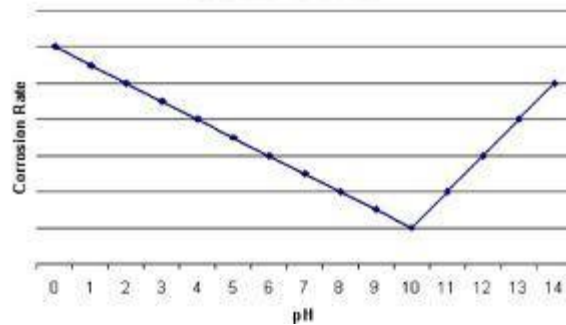


- 6. Washer blow off air-lines need to be inspected for moisture. Install water trap for compressor if necessary. (fans can also aid in dry times)



Filter-Regulator-Lubricator to avoid water in the air lines

- 7. Preventative maintenance should be performed frequently on all liquids (washes, machining fluids, etc..) and monitored for proper pH levels, etc. Out of spec or contaminated metal working fluids and washes act as corrosion promoters. Your fluids supplier should be able to assist.



- 8. An easy, economical test that could be done in-house is the Chip Test. ASTM D4627-92 (2002) Standard test method for Iron Chip Corrosion for Water- Diluted Metal working fluids. This would be applicable to both the alkaline wash and the metal working fluids.



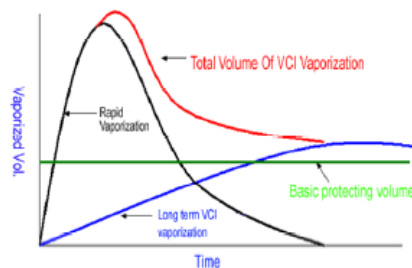


9. Best Practices & usage guidelines should be made available in applicable work areas as well as provided to client for their own knowledge of usage and handling factors. Electronic files and posters are available.



Know your VCI Product (Not all VCIs are the same!)

Low cost, poor quality VCI's can contain only one type of vapor pressure inhibitor. Proper selection of volatile compounds enables controlled and dependable volatilization and protection. Too high a vapor-pressure will cause the inhibitor to be released to such an extent that a protective concentration cannot be maintained. *On the other hand*, a low-vapor-pressure inhibitor is not used up as quickly and more time is needed for a protective vapor concentration. If parts are highly susceptible to rust, this could be damaging.



Use ARMOR VCI Nanotechnology! We offer a mixed nanotechnology that provides a range of vapor pressures. HIGH vapor pressure VCI's to provide protection quickly, MEDIUM and LOW vapor pressure VCI's to sustain protection over a long duration.



Global Reach & Support

ARMOR has sales representatives and technical support around the world. We are available to conduct corrosion/packaging audits, trial review/follow up, on-site training, and technical services where and when you need us! Refer to Global contact information.



ARMOR VCI packaging is a safe, clean, and easy way to protect metals from rust and corrosion during in-process, shipping and storage. However, if parts are contaminated or rusted before they are packaged, the VCI will not work to its fullest. VCI can only prevent rust, it will not remove it. Simply put, there are many contributors starting early in the process that build throughout the system, which are only magnified during temperature and other environmental fluctuations.

Please contact me with any questions you may have regarding these recommendation. I'd be happy to meet again with you or whatever teams you feel appropriate to help convey these recommendations and educate associates on proper VCI usage and corrosion control.

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