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VCI Film Comparison for Our Customer

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Background:

Our customer manufactures springs and small automotive components. After manufacturing and processing, automotive parts are placed in VCI bags to prevent corrosion during storage and transport. Cortec Laboratories was asked to test the effectiveness of their current VCI bags and desiccant against Cortec's VpCI-126 bags and DesiCorr.

Sample Received:

12 carbon steel rings wrapped and folded in yellow VCI bag with silica gel desiccant. Rings appeared to be in good condition with no corrosion or dirt/grease observed.

Method:

ASTM D-1735 conditions as outlined in GM 4465P specification.

Materials:

1. VpCI-126 bag – lot#44560
2. DesiCorr 1/6 Unit Pouch – lot#067519

Procedure:

Rings were inspected for corrosion, dirt, or other contamination upon arrival and none was observed. After inspection, rings were randomly selected and divided into 3 groups of 4 rings each. One group was not wrapped or stored with any VCI protection as a control group and was placed into the ASTM D-1735 chamber for 5 days. The next group of rings was placed into a VpCI-126 bag with a 1/6th Unit DesiCorr pouch placed into the bag. The bag was loosely folded over and placed into the ASTM D-1735 chamber. The last group of rings was placed into the yellow VCI bag with a silica gel desiccant pouch. The bag was also loosely folded over and placed into the ASTM D-1735 chamber. Parts were not inspected or moved from the chamber until 5 days, 120 hours, had elapsed.

Results:

- All rings in the control group showed varying levels of corrosion on all surfaces.
- Rings protected by VpCI-126 and DesiCorr did not show any corrosion after 120 hours of testing.
- Rings protected by the yellow VCI film and silica desiccant showed very minor signs of corrosion along the top surface after 120 hours.

Figure 1: All rings after 120 hours of testing. The top row of rings is the control group. Middle row, VpCI-126 and DesiCorr protected. Bottom row, yellow VCI film and silica desiccant protected.

Figure 2: Rings from control group at 120 hours. Obvious signs of corrosion along the top surface, with small dark spots of corrosion seen as well.

Figure 3: Close up of parts protected by VpCI-126 and DesiCorr. No signs of corrosion.

Figure 4: Close up of parts protected by yellow VCI film and silica desiccant. Small dark spots of corrosion starting can be seen along the top surfaces.

Figure 5: Close-up of a ring protected by yellow VCI film and silica desiccant. Small dark spots of corrosion can be observed on the surface.

Interpretations:

A loosely wrapped bag of VpCI-126 and a 1/6th Unit DesiCorr showed excellent corrosion resistance in ASTM D-1735 conditions at 120 hours. No signs of corrosion were seen on the surfaces of any rings tested with VpCI-126 and Desicorr.

Rings protected by yellow VCI film and silica desiccant appeared in adequate condition at 120 hours of testing in ASTM D-1735. Closer inspection of rings from this group showed small signs of corrosion starting on the top surface of the rings.