



Technical Resource

ARMOR LABORATORY TESTING OVERVIEW - CORROSION TESTING PROTOCOLS, VALIDITY AND RELIABILITY ISSUES & HOW TO EVALUATE TESTING RESULTS

At Armor Protective Packaging®, laboratory testing plays a key role in our company's protocols. Lab testing is performed for new product development purposes as well as on current products. Lab testing on current products allows us to benchmark ARMOR products with competitor products as well as provide results through direct comparison of products currently used by our customers. ARMOR conducts testing both for our customers and for ourselves. For customers, we provide testing to resolve issues they may be having with existing packaging and to determine cost savings such as if another supplier has recommended too many VCI products. Internally, we routinely test our VCI products against our competitors to keep our fingers on the pulse of competitor products and to demonstrate that ARMOR products are as good, or better, than other products on the market.

What is needed to perform accurate corrosion testing:

- Make sure parts are contaminate free - handle all parts with clean gloves.
- Obtain parts from the end of process.
- Ensure parts are corrosion free.
- Provide enough parts to prepare multiple packages for each variable/test, the best scenario is three samples of each for a total of 9 parts for each test:
 - (3) Control
 - (3) Current method
 - (3) Proposed method
- Replicate current packaging method:
 - If parts are tightly wrapped with VCI paper then they should be tightly wrapped for testing.
 - If the parts are loosely placed in a container with VCI paper then the parts should be loosely placed in a testing container with the loose paper.
 - The idea is to duplicate current packaging methods as close as possible.
- The control should be packaged without VCI materials.
- The proposed test package should replicate the final desired packaging design.
- If a humidity cabinet is being used for testing then all final packaging methods chosen should be put in individual 3-4 mil non-VCI poly bags before being put in the humidity cabinet to create individual test environments.
- If shipping trials are being performed then the completed packaging should replicate desired shipping requirements.



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When a test is run there are several factors that qualify the test's validity and reliability. These factors include:

- Multiple samples (to allow for repeatability).
- The use of a control sample without the independent variable to be tested. (VCI)
- Consistent results on control sample -- this ensures testing of the absence of the independent variable.
- Consistent results on test samples.
- Pictures of results.
A grading system.

ARMOR test sources:

ARMOR laboratory personnel are members of [NACE International](#). NACE International, the corrosion society, serves nearly 30,000 members in 116 countries and is recognized globally as the premier authority for corrosion control solutions. The organization offers technical training and certification programs, conferences, industry standards, reports, publications, technical journals, government relations activities and more. ARMOR currently uses the NACE test TM0208-2013, which was developed as an accepted VCI test method for VCI manufacturers.

At ARMOR, we use testing protocols established by the American Society for Testing and Materials International ([ASTM](#)), specifically a variation of the ASTM D 1748 test. ASTM International is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials. Tests are developed to provide standardization to the industry for corrosion testing protocols. ASTM tests are widely recognized and accepted for their valid testing methods.

Once testing is complete, it is important to review results with a critical eye:

- Ask questions about the reports, if something does not look correct it should be questioned.
- Be aware of reports that do not include photos or reports where results are omitted.
- If there are three results reported for some of the samples but only two results for others, simply ask what happened to the other samples.
- Be wary of words like "typical" or "usual," this could indicate that during this test a product did not perform well but the desire to report more favorable results leads the company to resort to phrases of "typical result" or "usually our products" which just means their product failed during testing.
- If the testing or report does not include controls or verifiable direct comparisons with the products of the testing company there may be cause for concern that the testing was not valid.