



BARRIER PLASTICS RECOMMENDED TESTING PROTOCOL

* Reference: 49 CFR Appendix B to Part 173

1. PREPARATION STEPS:

- a. Use exactly the same chemical(s) and/or formulation that will be packaged;
- b. Use the EXACT same closures and closing process as currently being utilized or being considered if a new product – variations in closures or closing process may result in skewed data (e.g., if a heat seal is required, then the test must be conducted with a heat seal);
- c. Fill the container(s) to be tested in order to minimize head space – rule of thumb is to fill container(s) to the base of the neck.

2. Compatibility and rate of permeation are determined by subjecting full size plastic containers (or smaller containers as discussed in paragraph 4) and hazardous material to one of the following combinations of time and temperature:

A. Test Method 1: 180 days at a temperature no lower than 64°F. Recommend monthly weigh-in for wt. loss trend.

B. Test Method 2: 28 days at a temperature no lower than 122°F. Recommend weekly weigh-in for wt. loss trend.

C. Test Method 3: 14 days at a temperature no lower than 140°F. Recommend first week weigh-in for wt. loss trend.

3. Regardless of which test method is used, at least three sample containers shall be tested for each combination of hazardous material and size and design of container. Fill containers to rated capacity with the specific hazardous material (at the concentration to be transported) and close as for shipment. For the first and last 24 hours of storage under the selected test method, place the containers with closures downward, except that containers fitted with a vent are so placed on each occasion for five minutes only.

4. For testing under Test Method 2 or 3 in those instances where it is not practicable to use full size containers, smaller containers may be used. The small container shall be manufactured by the same process as the larger container (for example, using the same method of molding and processing temperatures) and be made of identical resins, pigments, and additives.

5. Determine filled container weight or net weight of contents both before and after storage under the selected test method. Weigh containers per schedule recommended above and record results. Rate of permeation is determined from loss of hazardous materials contents, during the conduct of the test, expressed as a percentage of the original weight.

6. Each of the following constitute test failure:

a. Visible evidence of **permanent deformation** due to vapor pressure build-up or collapse of walls caused by weight loss from permeation, deterioration, swelling, crazing, cracking, excessive corrosion, oxidation, embrittlement, leakage, rupture or other defects likely to cause premature failure or a hazardous condition. **Paneling or 'panel sink' may occur due to O₂ scavenging from the head space by the chemical(s) contained and is acceptable if there is NO WEIGHT LOSS FROM PERMEATION.**

b. For materials meeting the definition of a poison according to this sub chapter, a rate of permeation in excess of 0.5% determined over the test period. For all other hazardous materials, a rate of permeation in excess of 2.0% determined over the test period.

c. Ambient drop testing not required unless pursuing UN Certification.