



Designation: D 3079 – 94 (Reapproved 1999)

Standard Test Method for Water Vapor Transmission of Flexible Heat-Sealed Packages for Dry Products¹

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1. Scope

1.1 This test method covers the determination of the amount of water vapor transmission for flexible heat-sealed packages under specified conditions of exposure.

NOTE 1—Adequate heat-seal efficiency should be determined prior to this test method.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method²

3. Terminology

3.1 Definition:

3.1.1 *water vapor transmission of a desiccant-filled package*—the increase in mass after exposure to a specified humid environment ($90 \pm 2\%$ relative humidity, $100 \pm 2^\circ\text{F}$ ($37.8 \pm 1.1^\circ\text{C}$)). The mass increase may be divided by a time unit to give a rate (for example, grams per 30 days). It is assumed that this mass increase is due to water vapor transmission (through the package) from the test environment to the desiccant.

4. Summary of Test Method

4.1 Test samples are filled with desiccant and after sealing are exposed to $100 \pm 2^\circ\text{F}$ ($37.8 \pm 1.1^\circ\text{C}$) and $90 \pm 2\%$ relative humidity for at least 1 month. Measurements of mass are taken at intervals to determine the average rate of mass change. Controls are used to monitor mass gain of package materials.

5. Significance and Use

5.1 This test method determines the water vapor barrier properties of the package. With proper precautions and background experience, reproducible results can be obtained to aid in the selection of proper package materials required to provide the product shelf-life desired. This test method may be used to establish a performance specification.

6. Apparatus

6.1 *Weighing Balance*—Analytical balance accurate to 1 mg.

6.2 *Test Chamber*—A test room or cabinet provided with conditioned air that is continuously circulated around the specimens under test. The conditions in the chamber shall be such that no condensation occurs on the specimens.

7. Materials

7.1 *Desiccant*—Anhydrous calcium chloride in the form of small lumps is recommended for this test method. This should pass a No. 8 (2.36-mm) sieve, and be free of fines that will pass a No. 30 (600-μm) sieve. The desiccant should be dried for at least 24 h at 200°C prior to use.

8. Test Specimens

8.1 Test specimens shall be representative of the packages being tested, and shall be closed and sealed in the normal manner.

8.2 Review the precision and bias statement to determine the number of samples required to meet requirements. Generally, three to five samples have been found to be sufficient for most applications.

8.3 Each test specimen should be half full of desiccant up to 100 g of desiccant. If the half-full capacity is greater than 100 g of desiccant, the package shall be less than half full, but each shall contain approximately the same quantity of desiccant.

8.4 If more than one type of package is tested for comparison purposes, all types should have the same (as close as possible) surface area and shape, and should contain the same quantity of desiccant.

8.5 An appropriate number of identical control packages shall be prepared, containing no desiccant.

¹ This test method is under the jurisdiction of ASTM Committee F-2 on Flexible Barrier Materials and is the direct responsibility of Subcommittee F02.30 on Test Methods.

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² *Annual Book of ASTM Standards*, Vol 14.02.