Designation: F2749 – 08

Standard Test Method for Determining the Effects of Creasing a Membrane Switch or Assembly[1]

This standard is issued under the fixed designation F2749; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method establishes a method for the creasing of any part of a membrane switch with conductive circuits.

1.1.1 The values given in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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. Terminology

2.1 *Definitions:*

2.1.1 *crease*—a ridge or groove made by folding and pressing.

2.1.1.1 *Discussion*—The fold mark in the substrate will be caused by a weight rolled over a fold that will likely remain in the substrate after testing.

2.1.2 *crease cycle*—a 180 degree crease followed by a flattening of the crease (see Fig. 1).

2.1.3 *membrane switch*—a momentary switching device in which at least one contact is on, or made of, a flexible substrate.

2.1.4 *membrane switch tail*—a flexible portion of a membrane switch used for input/output connection.

3. Significance and Use

3.1 Creasing of membrane switches or their components can affect their visual appearance, mechanical integrity or electrical functionality. This practice simulates conditions that may be seen during manufacture, installation or use.

3.2 Crease testing may be destructive, therefore any samples tested should be considered unfit for future use.

3.3 Specific areas of testing include, but are not limited to:

3.3.1 Membrane switch flex tails, and

3.3.2 Any component of a membrane switch that may be subjected to bending.

4. Interferences

4.1 The following parameters may affect the results of this test:

4.1.1 temperature,

4.1.2 humidity, and

4.1.3 orientation of the conductor (either extension or compression) could have significant impact on the results.

5. Apparatus

5.1 *Cylinder*, allowed to rotate smoothly around its longitudinal axis, rigid, low friction smooth surface.

5.1.1 *Cylinder 2" Specification*, 1 kg in size, measuring 50.8 mm (2 in.) in diameter by 68.6 mm (2.7 in.) in height. Weight and dimensions of weight to be within ±5 %.

5.1.2 *Cylinder 1" Specification*, 2 kg in size, measuring 63.5 mm (2.5 in.) in diametr by 86.4 mm (3.4 in.) in height. Weight and dimensions of weight to be within ±5 %.

5.1.3 *Other Specifications*—Dimensions or weight/force to be specified.

5.2 Fixture to hold test sample securely in place in a horizontal manner (refer to Fig. 1).

5.3 Mechanisms capable of providing a consistent force and rate of travel to the test sample.

5.4 Equipment for the continuous monitoring and recording of resistance.

6. Test Samples

6.1 The test samples may be components, tail assembles or finished switches. If the sample length is too short for the test fixture, a sample coupon of the same construction (layer to layer) must be provided (minimum; 250 mm length by 25 mm width).

6.2 The width of the test sample must not exceed the length of the cylinder.

7. Procedure

7.1 Refer to Fig. 1 – drawing of electrical/mechanical hook up.

7.1.1 Clamp one end of the test sample to the test fixture – this is the static end of the test sample.

[1] This test method is under the jurisdiction of ASTM Committee F01 on Electronics and is the direct responsibility of Subcommittee F01.18 on Membrane Switches.

Current edition approved Nov. 1, 2008. Published December 2008. DOI: 10.1520/F2749-08.