



## Standard Terminology for Membrane Switches<sup>1</sup>

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### 1. Scope

1.1 This terminology defines terms that are commonly used in the membrane switch industry.

1.2 These definitions are not mutually exclusive.

### 2. Terminology

**actuation force**—the maximum force measured prior to or including point at which contact closure is achieved on a membrane switch.

**bend**—to force from a straight form into different and especially a curved one.

**bend cycle**—a fold of a sample around a specified mandrel which is “rolled” in one direction, followed by rolling in the opposite direction, returning the sample to its original position.

**circuit resistance**—electrical resistance as measured between two test points whose internal contacts, when held closed, complete a circuit.

**conductor resistance**—the measured electrical resistance through a circuit loop between two test points.

**contact bounce**—intermittent contact opening and contact closure that may occur after switch operation.

**contact closure**—the event at which a specified resistance is achieved on a membrane switch.

**contact force**—the force at contact closure.

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

**crease cycle**—a 180 degree crease followed by a flattening of the crease.

**current carrying capacity**—the maximum level of electrical current that a circuit can conduct without sustaining damage.

**dielectric withstand voltage**—the maximum voltage a dielectric can withstand in a membrane switch without a visual change from a voltage discharge or specified change of insulation resistance, or both.

**duty cycle**—the ratio of switch closed time to total cycle time.

**graphic layer**—optional decorated layer of a membrane switch. See Fig. 1.

**insulation resistance**—the electrical resistance between two

isolated test points on a membrane switch.

**leakage current**—current flow through the insulation between test points.

**membrane layer**—a flexible dynamic layer which carries one or both switch poles the deflection of which is used to short both poles together. The membrane layer is a required component of a membrane switch. See Fig. 1.

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

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

**non-tactile switch**—a switch assembly that has a tactile ratio equal to zero.

**open circuit resistance**—minimum allowable resistance as measured between two test points that, if lower than, will indicate an electrical short.

**power capacity**—electrical power is defined as current  $\times$  voltage =  $V \times I$  (watts)

**rigid layer**—provides mechanical support for the membrane switch. See Fig. 1.

**silver migration**—a process by which silver, when in contact with insulating materials under electrical potential, is removed ionically from its original location, and is redeposited as a metal (silver dendrite) at some other location.

**spacer layer**—a material (usually dielectric) sometimes used to maintain a separation between the membrane layer and static layer of a membrane switch.

**specified circuit resistance**—maximum allowable circuit resistance as measured between two terminations whose internal contacts, when held closed, complete a circuit.

**static layer**—a mechanically supported layer which carries one or both poles of the switch or is used to short both poles together. The static layer is a required component of a membrane switch. See Fig. 1.

**tactile layer**—optional feature incorporated into a membrane switch to alter the tactile response. See Fig. 1.

**tactile response**—a physical sensation caused by a sudden collapse and/or snapback of a membrane switch.

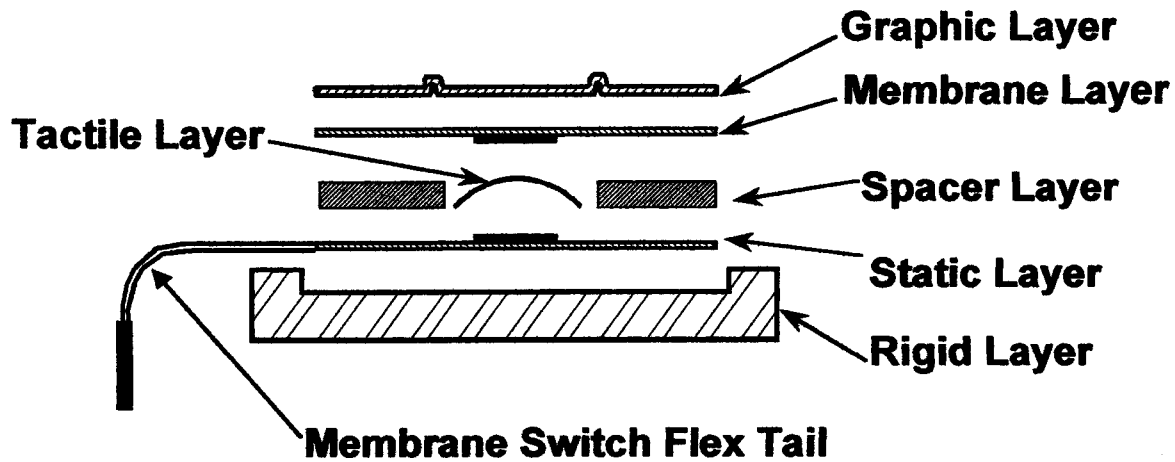
**tactile switch**—a switch assembly that provides a tactile ratio greater than zero.

**test points**—two preselected conductive points in a circuit loop, possibly including a switch.

**travel**—measured distance of movement when a membrane switch is depressed.

<sup>1</sup> This terminology is under the jurisdiction of ASTM Committee F01 on Materials for Specific Applications and is the direct responsibility of Subcommittee F01.18 on Membrane Switches.

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**FIG. 1 Six Basic Layers of a Membrane Switch** (Layers are shown as separate components but some can be combined into one layer. For example a graphic layer can also be the membrane layer. A second example is the tactile layer can also be the membrane layer.)

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