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Standard Terminology for Membrane Switches¹

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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.

¹ 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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