



Valmark Industries, Inc.

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UL Flammability Rating

Membrane Switches

The following summary information is supplied for the base materials used in all Valmark's membrane switch assemblies and graphic overlays. Included is information on two (2) of the most common types of materials used in Valmark membrane switch assemblies: (1) Polycarbonates and (2) PET polyesters for reference.

Polycarbonates (PC)

Lexan™, Autoflex PC™ materials, etc. have completed UL 94 V-2/VTM-2 ratings. All UL ratings are for "vertical burn" certification testing. Materials from 0.003" to 0.015" thick have UL-94 VTM-2 rating. Lexan™ and Autoflex PC™ polycarbonate materials at gauge thickness of 0.015" and above have UL-94 V-2 ratings.

These materials are used typically in Valmark graphics and nameplates but not in overlay materials for membrane switches with tactile response. Generally, polycarbonates do not have the necessary fatigue life or chemical solvent resistance for long-term performance over membrane switches.

Polyester (PET)

As can be seen from the material data sheet(s) the PET materials used for membrane switch graphic overlays does not have a direct UL rating. More importantly, however, the underlying base material (to which Autotype provides the pre-texturing and print treatments, etc.) does have UL ratings. The material in many switch graphics is: Autotype, Tekra Marnot XL or similar PET.

The materials typically used in the PET graphic overlays is an Autotype material like Autoflex™ EBA-77 or EBG-77 (0.007" thick antiglare/gloss PET); the *base* material for Autotype is Dupont Mylar™-D and has a UL-94 VTM-2 certification. PET material is used for membrane switches (for both circuit substrates and graphic overlays) because of strength, long actuation cycle life and excellent chemical resistance.

These materials are industry standards for both graphic and membrane switch manufacturers. Valmark works diligently to select the proper materials for each unique customer application and operating environments. Clearly, any membrane switch panel assembly needs to be tested in the fully assembled condition for a certified UL rating. It is impossible to extrapolate UL ratings from base materials and/or materials not mounted to the OEM customer's housing or front panel.

Note: Inasmuch as Valmark Industries, Inc. has no control over the use to which others may put these materials and assemblies, it does not guarantee that the same results as those described herein will be obtained. Nor does Valmark Industries, Inc. guarantee the effectiveness or safety of any possible or suggested design for articles of manufacture as illustrated herein by any photos, technical drawings and the like. Each OEM user of our products or design or both should make his own tests to determine the suitability of the materials, finished products, or any materials for the design, as well as the suitability of the materials, products and/or design for his own particular application.