

Technical Bulletin SP-10

Underwriters Laboratories UL94 Flammability Test Protocol

Underwriters Laboratories (UL) first introduced their UL94 protocol in September of 1972. The full title of this test protocol is "STANDARD FOR TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS FOR PARTS IN DEVICES AND APPLIANCES." This test protocol has gone through several revisions since the first iteration and has now become a standard reference test for many plastics, including the plastics which are marketed by SciCron Technologies. UL uses the protocol to show different degrees of flammability for plastics which carry the UL label. The plastics industry uses the protocol as a standard test method to indicate relative flammability ratings for many plastic materials, whether they carry the UL label or not. We report these UL94 ratings (as well as the ASTM horizontal burn flame spread ratings) on all of our product information pages to help provide a relative flammability classification for each of our sheet products.

Test Methods:

Our products are characterized by either the UL94 horizontal burn test (HB), or the UL94 vertical burn test (V). Both tests employ specimens measuring 5.0 inches long by 0.5 inch wide. Both tests use a Bunsen burner for ignition of the specimens. Materials which achieve a vertical burn rating are less flammable than materials which can only pass the horizontal burn test.

Horizontal Burn Method: To achieve an HB rating, a material must have a burn rate less than 1.5 inches per minute over 3 inches of length, and must cease to burn before reaching the 4 inch mark on the test specimens. These test conditions apply to materials 0.120 - 0.500 inch in thickness. Ignition of the horizontal test specimens is initiated by applying a Bunsen flame to the end of each specimen for 30 seconds.

Vertical Burn Method: To achieve a V-0, V-1, or V-2 rating, a material must meet all the pertinent requirements in the following table after the vertical test specimens have been ignited twice for 10 seconds by a Bunsen flame.

Test Criteria	Flammability Classification		
	V-0	V-1	V-2
Flaming combustion time after each application of flame	<10 sec	<30 sec	<250 sec
Total flaming combustion time for each set of 5 specimens (10 flame applications)	≤50 sec	≤250 sec	≤250 sec
Flaming or glowing combustion up to the holding clamp	no	no	no
Duration of glowing combustion after second removal of test flame	≤30 sec	≤60 sec	≤60 sec
Ignition of surgical cotton by dripping flaming particles	no	no	yes

Ratings for SciCron Technologies Products:

Acrylic sheet products are rated HB.

Standard polycarbonate sheet products are rated V-2 for thicknesses of 3mm (0.118") to 6mm (0.236") and V-0 for thicknesses greater than or equal to 6mm. (V-0 rated material less than 6mm thick is available by special order.)

PVC sheet products carry a rating of V-0.

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