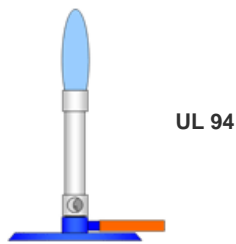


UL 94 Flame Rating



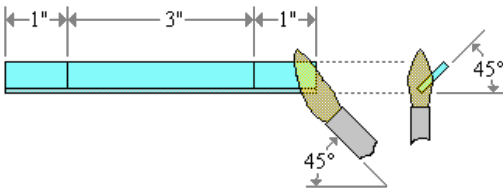
UL Flame Rating - UL94

UL 94 flame rating groups materials into categories based on their flammability. UL94 covers two types of testing: vertical burn and horizontal burn.

Product datasheets may display Flame Rating data derived from testing performed by the material supplier rather than UL. Please refer to [Prospector's UL Yellow Card Search](#) for a complete listing of UL Certified UL94 Flame Rating data. Further, it is important to always consult with the material supplier about the suitability of a material for your specific application.

Horizontal Testing (HB)

Procedure: A specimen is supported in a horizontal position and is tilted at 45°. A flame is applied to the end of the specimen for 30 seconds or until the flame reaches the 1 inch mark. If the specimen continues to burn after the removal of the flame, the time for the specimen to burn between the 1 and 4 inch marks are recorded. If the specimen stops burning before the flame spreads to the 4 inch mark, the time of combustion and damaged length between the two marks is recorded. Three specimens are tested for each thickness.

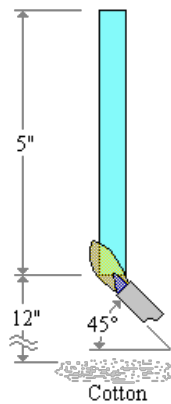


Horizontal Flame Test

Horizontal Rating	Requirements
HB	<ul style="list-style-type: none">Specimens must not have a burning rate greater than 1.5 inches/minute for thicknesses between 0.120 and 0.500 inches and 3 inches/minute for thicknesses less than 0.120 inches.Specimens must stop burning before the flame reaches the 4 inch mark.

Vertical Testing (V-0, V-1, V-2)

Procedure: A specimen is supported in a vertical position and a flame is applied to the bottom of the specimen. The flame is applied for ten seconds and then removed until flaming stops at which time the flame is reapplied for another ten seconds and then removed. Two sets of five specimens are tested. The two sets are conditioned under different conditions.

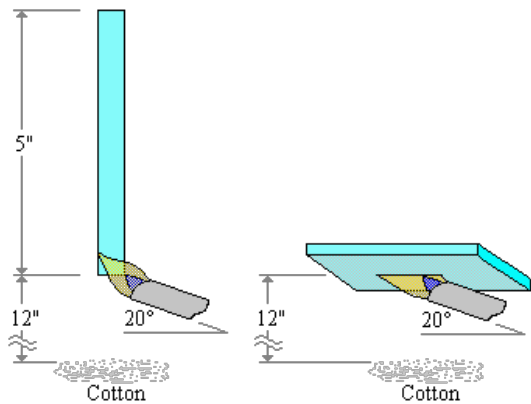


Vertical Flame Test

Vertical Ratings	Requirements
V-0	<ul style="list-style-type: none">Specimens must not burn with flaming combustion for more than 10 seconds after either test flame application.Total flaming combustion time must not exceed 50 seconds for each set of 5 specimens.Specimens must not burn with flaming or glowing combustion up to the specimen holding clamp.Specimens must not drip flaming particles that ignite the cotton.No specimen can have glowing combustion remain for longer than 30 seconds after removal of the test flame.
V-1	<ul style="list-style-type: none">Specimens must not burn with flaming combustion for more than 30 seconds after either test flame application.Total flaming combustion time must not exceed 250 seconds for each set of 5 specimens.Specimens must not burn with flaming or glowing combustion up to the specimen holding clamp.Specimens must not drip flaming particles that ignite the cotton.No specimen can have glowing combustion remain for longer than 60 seconds after removal of the test flame.
V-2	<ul style="list-style-type: none">Specimens must not burn with flaming combustion for more than 30 seconds after either test flame application.Total flaming combustion time must not exceed 250 seconds for each set of 5 specimens.Specimens must not burn with flaming or glowing combustion up to the specimen holding clamp.Specimens can drip flaming particles that ignite the cotton.No specimen can have glowing combustion remain for longer than 60 seconds after removal of the test flame.

Vertical Testing (5VA, 5VB)

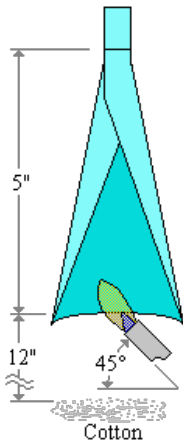
Testing is done on both bar and plaque specimens. Procedure for Bars: A bar specimen is supported in a vertical position and a flame is applied to one of the lower corners of the specimen at a 20° angle. The flame is applied for 5 seconds and is removed for 5 seconds. The flame application and removal is repeated five times. Procedure for Plaques: The procedure for plaques is the same as for bars except that the plaque specimen is mounted horizontally and a flame is applied to the center of the lower surface of the plaque.



Vertical Flame (5V Type) Test

Vertical Rating	Requirements
5VA	<ul style="list-style-type: none">Specimens must not have any flaming or glowing combustion for more than 60 seconds after the five flame applications.Specimens must not drip flaming particles that ignite the cotton.Plaque specimens must not exhibit burnthrough (a hole).
5VB	<ul style="list-style-type: none">Specimens must not have any flaming or glowing combustion for more than 60 seconds after the five flame applications.Specimens must not drip flaming particles that ignite the cotton.Plaque specimens may exhibit burnthrough (a hole).

Vertical Testing of Thin Materials (VTM-0, VTM-1, VTM-2)
This test is used for materials that are thin, or are too flexible or may distort, shrink or flex during ordinary vertical testing. Procedure:
An 8x2 in specimen is rolled longitudinally around a 1/2 in diameter mandrel and taped on one end. When the mandrel is removed the specimen forms a cone. The cone is supported in a vertical position and a flame is applied to the bottom of the specimen. The flame is applied for three seconds and then removed until flaming stops at which time the flame is reapplied for another three seconds and then removed. Two sets of five specimens are tested. The two sets are conditioned under different conditions.



Vertical Flame Test for Thin Materials

Vertical Rating for Thin Materials	Requirements
VTM-0	<ul style="list-style-type: none">Specimens must not burn with flaming combustion for more than 10 seconds after either test flame application.Total flaming combustion time must not exceed 50 seconds for each set of 5 specimens.Specimens must not burn with flaming or glowing combustion up to the specimen holding clamp.Specimens must not drip flaming particles that ignite the cotton.

	<ul style="list-style-type: none">• No specimen can have glowing combustion remain for longer than 30 seconds after removal of the test flame.• No specimen shall have flaming or glowing combustion up to a mark 5 inches from the bottom of the specimen.
VTM-1	<ul style="list-style-type: none">• Specimens must not burn with flaming combustion for more than 30 seconds after either test flame application.• Total flaming combustion time must not exceed 250 seconds for each set of 5 specimens.• Specimens must not burn with flaming or glowing combustion up to the specimen holding clamp.• Specimens must not drip flaming particles that ignite the cotton.• No specimen can have glowing combustion remain for longer than 60 seconds after removal of the test flame.• No specimen shall have flaming or glowing combustion up to a mark 5 inches from the bottom of the specimen.
VTM-2	<ul style="list-style-type: none">• Specimens must not burn with flaming combustion for more than 30 seconds after either test flame application.• Total flaming combustion time must not exceed 250 seconds for each set of 5 specimens.• Specimens must not burn with flaming or glowing combustion up to the specimen holding clamp.• Specimens can drip flaming particles that ignite the cotton.• No specimen can have glowing combustion remain for longer than 60 seconds after removal of the test flame.• No specimen shall have flaming or glowing combustion up to a mark 5 inches from the bottom of the specimen.

Additional Information

- [UL 94](#) on Underwriters Laboratories website

Similar Standards

- IEC 60695-11-10, -20



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