



## Specifications - UL Test Procedures

### Procedure for Obtaining UL Listing of Device

- **Manufacturer opens an assignment**
  - Describes device
  - Requests review and applications forms
- **UL response**
  - Identifies device standard
  - Outlines test program
  - Provides cost limit and forms
- **Manufacturer submits samples and forms**
- **Samples tested by UL**
- **If results acceptable**
  - Device is listed
  - Manufacturer can attach UL label
  - Follow-up procedure is established
- **If results unacceptable**
  - Corrections must be made
  - Re-submitted and re-tested

### UL94 Standard Test Procedures and Requirements UL94HB

**Specimen:**

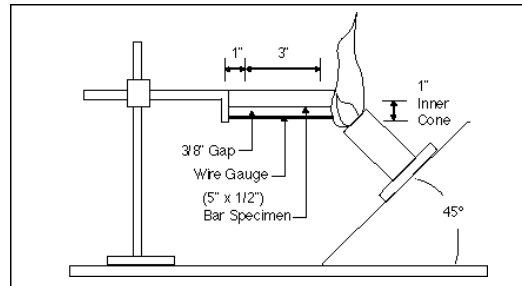
5" x 12" x thickness  
(typically thickness is 1/16".1/8".1/4")

**Procedure**

Three specimens are tested per thickness after conditioning for 48 hours at 23°C and 50% RH. Specimen is mounted with its long axis horizontal and its short axis at a 45° angle. Each specimen is marked with two lines, 1" and 4" from one end of specimen. Specimen is supported at one end such that its lower edge is 3/8" above a piece of wire gauge. A 1" high blue Bunsen burner flame is applied to the free end of the specimen for 30 seconds and then removed. If the specimen continues to burn after removal of the test flame, the time for the flame front to travel between the two gauge marks is measured and the burning rate calculated in inches per minute.

**Classification Requirements For 94HB**

- A. Not have a burning rate exceeding 1.5" per minute over a 3.0" span for specimen
- B. Not have a burning rate exceeding 3.0" per minute over a 3.0" span for specimen having a thickness less than 0.120", or
- C. Cease to burn before the flame reaches the 4.0" mark.



Horizontal Burning Test for 94HB Classification

94HB Horizontal Flame Class Requirements	
Thickness	Burning Rate
> 1/8in	>1-1/2 in/min
< 1/8 in	< 3in/min



## Specifications - UL Test Procedures

### UL94V-0, V-1, V-2

#### Specimen:

5" x 12" x thickness  
(typically thickness is 1/16", 1/8", 1/4")

#### Procedure

Total of 10 specimens (2 sets) are tested per thickness. Five of each thickness are tested after conditioning 48 hours at 23°C and 50% RH. Five of each thickness are tested after conditioning for 7 days at 70°C. Specimen is mounted with long axis vertical. Specimen is supported such that its lower end is 3/8" above Bunsen burner tube. Blue 3/4" high flame is applied to the center of the lower edge of specimen for 10 seconds. If burning ceases within 30 seconds, flame is re-applied for an additional 10 seconds. If specimen drips particles, these shall be allowed to fall onto a layer of untreated surgical cotton placed 12" below the specimen.

#### Classification Requirements

##### For 94V-0

- Not have any specimen that burns with flaming combustion for more than 10 seconds after either application of the test flame.
- Not have a total flaming combustion time exceeding 50 seconds for the 10 flame applications for each set of 5 specimens.
- Not have any specimens that burn with flaming or glowing combustion up to the holding clamp.
- Not have any specimens that drip flaming particles that ignite the dry absorbent surgical cotton located 12" below the test specimen.
- Not have any specimens with glowing combustion that persists for more than 30 seconds after the second removal of the test flame.

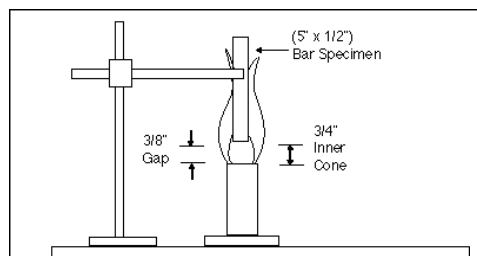
##### For 94V-1

- Not have any specimen that burns with flaming combustion for more than 30 seconds after either application of the test flame.

- Not have a total flaming combustion time exceeding 250 seconds for the 10 flame applications for each set of 5 specimens.
- Not have any specimens that burn with flaming or glowing combustion up to the holding clamp.
- Not have any specimens that drip flaming particles that ignite the dry absorbent surgical cotton located 12" below the test specimen.
- Not have any specimens with glowing combustion that persists for more than 60 seconds after the second removal of the test flame.

##### For 94V-2

- Not have any specimen that burns with flaming combustion for more than 30 seconds after either application of the test flame.
- Not have a total flaming combustion time exceeding 250 seconds for the 10 flame applications for each set of 5 specimens.
- Not have any specimens that burn with flaming or glowing combustion up to the holding clamp.
- Be permitted to have specimens that drip flaming particles that burn only briefly, some of which ignite the dry absorbent surgical cotton located 12" below the test specimen.
- Not have any specimens with glowing combustion that persists for more than 60 seconds after the second removal of the test flame.



UL94 Flammability Test V-0, V-1, V-2

Vertical Flame Class Requirements			
	94V-0	94V-1	94V-2
Individual Flame Time seconds	≤10	≤30	≤30
Total Flame Time, Seconds (5 Specimens)	≤50	≤250	≤250
Glowing Time, Seconds (individual specimens)	≤30	≤60	≤60
Drip Particles that ignite	NO	NO	YES



**UL94-5VA or UL94-5VB**

Material shall be classified 94-5VA or 94-5VB on the basis of test results obtained on small bar and plaque specimens. Test procedures are as follows: Specimens that do not exhibit a burn through (hole) are classified 94-5VA  
Specimens that burn through (hole) are classified 94-5VA

**Specimen:**

- 5" x 12" x thickness (bars)
- 6" x 8" x thickness (plaques)
- (typically thickness is 1/16".1/8".1/4")

**Procedure for Bar Specimens (Method A)**

Total of 10 specimens (2 sets) are tested per thickness.

Five of each thickness are tested after conditioning 48 hours at 23°C and 50% RH.

Five of each thickness are tested after conditioning for 7 days at 70°C  
For bar specimen, specimen is mounted with its long axis vertical.

A 5" overall high Bunsen burner flame with a 1-1/2" blue inner cone is applied to a lower corner of the specimen at an angle of 20° from the vertical such that the tip of the blue cone touches the specimen.

The flame is to be applied for 5 seconds and removed for 5 seconds. The operation is to be repeated until the specimen has been subjected to 5 applications of the test flame.

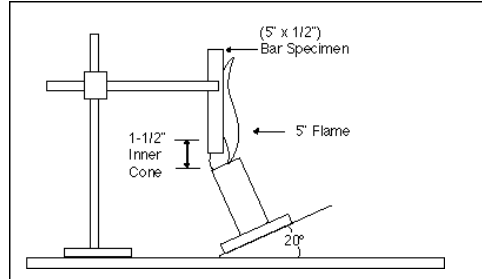
**Classification Requirements**

- A. Not have any specimen that burns with flaming combustion for more than 60 seconds after the fifth flame.
- B. Not have any specimens that drip flaming particles that ignite the dry absorbent surgical cotton located 12" below the specimen.

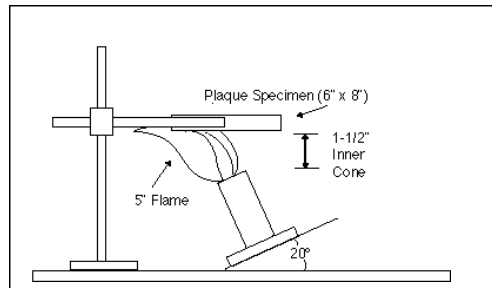
**Procedure for Bar Specimens (Method A)**

Same as for bars except that 3 plaques (2 sets) are to be mounted in the horizontal plane with the flame applied to the center of the bottom surface of the plaque.

**UL94-5V Flame Test Requirements**



Method A



Method B

94-5V Flame Class Requirements	
Maximum Flame Time, seconds	60
Maximum Glow Time, seconds	60
Drip Particles That Ignite	NO

**Summary of UL Listings for GE Materials**

GE engineering plastics are listed under the "Plastics" section in the Underwriters Laboratories, Inc Recognized Component Directory, This means that these materials have been evaluated in respect to ignition and flammability characteristics and certain other "as molded" properties, as well as in respect to effects of certain environmental conditions (e.g. heat aging). Pages 9 through 43 contain data on GE plastics appearing in the UL Component Directory