

# Flame Retardants for Textiles

## Description of test methods and their application

### US – Standards

- DOC FF 3 – 71; 1972
- DOC FF 5 – 74; 1993
- FAR 25.853 A; 1972
- FAR 25.853 B; 1972
- MVSS 302; 1972
- California Standard, Bulletin 117; 1980
- NFPA 701; 1996

# Flame Retardants for Textiles

## Description of test methods and their application

### California Standard; 1980

#### (Technical Bulletin 117)

#### 1. Scope:

Methods for assessing the burning behaviour acc. to the California Standard Technical Bulletin 117; Selection A Part 1 Testing of burning behaviour of textiles after ignition

#### 2. Preparation of specimens:

5 specimen each of 340 mm x 100 mm in warp and weft direction

#### 3. Test procedure:

- place specimen in a vertical position in the American flame test cabinet
- 38 mm flame height to be adjusted
- perpendicular burner adjustment
- 12 sec edge ignition

#### 4. Apparatus:

American flame test cabinet height: 76.2 cm width: 32.9 cm depth: 32.9 cm

#### 5. Assessment:

- \* maximum average char length: 152.4 mm
- \* maximum damaged length of each single specimen: 203.2 mm
- \* maximum average afterflame time: 5.0 sec
- \* maximum afterflame time of each single specimen : 10.0 sec
- \* maximum average afterglow time: 15.0 sec
- \* maximum afterglow time of each single specimen : not specified

# Flame Retardants for Textiles

## Description of test methods and their application

### DOC FF – 3 – 71; 1972

#### 1. Scope:

Methods for assessing the flammability of children's sleepwear

#### 2. Preparation of specimens:

5 specimens each of 340 mm x 100 mm in warp and weft direction specimens washed 50 times at 60°C or if items do not withstand 50 launderings shall be tested at the end of their useful service life drying in a drying oven at 105 °C during 30 min cooling in a desiccator during 30 min

#### 3. Test procedure:

- place specimen in a vertical position in the American flame test cabinet
- 38 mm flame height to be adjusted
- burner inclined at 25°
- 3 sec edge ignition

#### 4. Apparatus:

American flame test cabinet height: 76.2 cm width: 32.9 cm depth: 32.9 cm

#### 5. Assessment:

- \* maximum after-flame time: 15 sec
- \* maximum average burn length: 178 mm
- \* maximum burn length of each single specimen: 254 mm

# Flame Retardants for Textiles

## Description of test methods and their application

### DOC FF – 5 – 74; 1993

#### 1. Scope:

To measure a material's ability to resist ignition

#### 2. Preparation of specimens:

5 specimens each of 340 mm x 100 mm in warp and weft direction

#### 3. Test procedure:

- place specimen in a vertical position in the American flame test cabinet
- 38 mm flame height to be adjusted
- perpendicular burner adjustment
- 3 sec edge ignition

#### 4. Apparatus:

American flame test cabinet height: 76.2 cm width: 32.9 cm depth: 32.9 cm

#### 5. Assessment:

- \* maximum average burn length: 177.8 mm
- \* maximum burn length of each single specimen: 254.0 mm

# Flame Retardants for Textiles

## Description of test methods and their application

### FAR 25.853 – Class A; 1972

#### 1. Scope:

Methods for assessing the flame resistance for aircraft interior materials  
(Ceiling panels, wall panels, partitions, galley structure, large cabinet walls, structural floorings and the materials used in the construction of stowage compartments)

#### 2. Preparation of specimens:

5 specimens each of 340 mm x 100 mm in warp and weft direction

#### 3. Test procedure:

- place specimen in a vertical position in the American flame test cabinet
- 40 mm flame height to be adjusted
- perpendicular burner adjustment
- 60 sec. edge ignition

#### 4. Apparatus:

American flame test cabinet height: 76.2 cm width: 32.9 cm depth: 32.9 cm

#### 5. Assessment:

- \* maximum after-flame time: 15 sec
- \* maximum burn length: 150 mm
- \* maximum flaming time of drippings: 3 sec

# Flame Retardants for Textiles

## Description of test methods and their application

### FAR 25.853 – Class B; 1972

#### 1. Scope:

Methods for assessing the flame resistance for aircraft interior materials (Floor coverings, textiles (including draperies and upholstery), seat cushions, padding, decorative and non – decorative coated fabrics, leather, trays, galley furnishings, electrical conduit, thermal and acoustical insulation and insulation covering, air – ducting ....)

#### 2. Preparation of specimens:

5 specimens each of 340 mm x 100 mm in warp and weft direction specimens conditioned at room temperature

#### 3. Test procedure:

- place specimen in a vertical position in the American flame test cabinet
- 40 mm flame height to be adjusted
- perpendicular burner adjustment
- 12 sec. edge ignition

#### 4. Apparatus:

American flame test cabinet height: 76.2 cm width: 32.9 cm depth: 32.9 cm

#### 5. Assessment:

- \* maximum after-flame time: 15 sec
- \* maximum burn length: 200 mm
- \* maximum flaming time of drippings: 5 sec

# Flame Retardants for Textiles

## Description of test methods and their application

### MVSS 302; 1972

#### 1. Scope:

Methods for assessing the flammability of interior materials in vehicle occupant compartments (see DIN 75200)

#### 2. Preparation of specimens:

5 specimens each of 342 mm x 72 mm in warp and weft direction, measuring marks fastened at a distance of 38 mm (mark 1), 165 mm (mark 2) and 292mm (mark 3) from the bottom edge of the specimen

#### 3. Test procedure:

- place specimen in a horizontal position
- set adjusting valve to provide a flame of 38 mm in height
- perpendicular burner adjustment
- edge of the specimen exposed to flame for 15 s

#### 4. Apparatus:

acc. to DIN 75200 and MVSS 302

#### 5. Assessment:

- measure the time starting from mark 1 where flaming stops or when it reached mark 3
- calculate the burn rate from the formula: quotient in inch per min and time in seconds for the flame to travel

a) length in cm x 60 time in sec

- b) result of 2.54
- a) = flame spread  
time in  
inches/min
- a) = flame spread  
time in  
inches/min

# Flame Retardants for Textiles

## Description of test methods and their application

### MVSS 302; 1972

\* if the flame goes out before reaching the first measuring mark the rate of flaming is zero

\* if the char length is 3.7 cm and the flaming time 60 sec, the rate of flaming is zero, too

-the maximum rate of flaming allowed is 4 inches/min (10.16 cm/min)

-1 inch = 2.54 cm

# Flame Retardants for Textiles

## Description of test methods and their application

### NFPA 701; 1969

#### 1. Scope:

Methods for assessing the burning behaviour acc. to NFPA 701 (Small Scale Test). To measure a material's ability to resist ignition

#### 2. Preparation of specimens:

5 specimens each of 340 mm x 100 mm in warp and weft direction

#### 3. Test procedure:

- place specimen in a vertical position in the American flame test cabinet
- 38 mm flame height to be adjusted
- burner inclined at 25°
- 12 s edge ignition

#### 4. Apparatus:

American flame test cabinet height: 76.2 cm width: 32.9 cm depth: 32.9 cm

#### 5. Assessment:

\* maximum after-flame time: 2 sec

\* maximum burn length:

weight per square metre in g/m <sup>2</sup>	max. average burn length in mm	max. burn length per spec. in mm
up to 203	140	165
203 – 340	114	140
340	89	114

**Remark** : The newest version NFPA 701 : 1996 is available in Langweid, but the test from 1996 itself can not be carried out here.