

## FLAMMABILITY STANDARDS | NORTH AMERICA

### **ASTM E 662**

This test measures the amount of smoke produced by burning materials. It is often cited by the transportation industry for various upholstery components.

### **ASTM E 1352**

This test is similar to California Technical Bulletin 116 and NFPA 261.

### **ASTM E 1353**

This standard is similar to the UFAC procedures.

### **ASTM E 1537**

This is the ASTM version of California Technical Bulletin 133, but with more detailed reporting requirements. It is cited by the national building codes for upholstered furniture used in nursing homes and prisons.

### **BIFMA Fabric Classification**

This is a cigarette ignition resistance test specified by The Business & Institutional Furniture Manufacturers Association. The classification assigned by this test is useful to the furniture manufacturer.

### **BIFMA Screening Test**

(see CA Technical Bulletin 117)

### **BFD IX-I**

This is a flame resistance test described by the City of Boston. It gives an idea of how the product might perform when used as a cover fabric in a full-scale fire test.

### **CA Technical Bulletin 116**

This test measures the cigarette ignition resistance of an actual item of upholstered furniture. While this appears to be a mandatory requirement in the State of California, it is in actuality not enforced and is therefore a voluntary requirement.

### **CA Technical Bulletin 117**

This standard measures flammability using both open flame and lighted cigarettes as the ignition sources. All upholstery components are to be tested. This test is mandatory in the State of California. It is used nationwide as a minimum voluntary standard and is also cited as a minimum standard by the General Services Administration (GSA).

### **CA Technical Bulletin 133**

This is a test procedure for completed items of upholstered furniture. It is mandatory in California, Illinois, Massachusetts, and Ohio. The City of Boston requires this test and has the strongest enforcement policy, along with the State of California.

### **FAR 25.853(a) Appendix F, Part I (a)(1)**

This test is a vertical Bunsen burner test designed by the FAA (Federal Aviation Administration) for cabin and cargo compartment materials. The test method is intended for use in determining the resistance of materials to flame when tested according to the 60-sec (i) and 12-sec (ii) vertical Bunsen burner tests. In this test, a specimen is held in a vertical position by a device

inside a cabinet and a Bunsen burner is placed beneath it for either 60 or 12 seconds. After the given period of time has elapsed, the burner is removed and the specimen is observed. Ignition time, flame time, drip flame time, and burn length are all recorded at the end of the test.

#### **FMVSS 302, CFR Title 49 Chapter V Section 571.302**

This is a horizontal rate of burning test procedure. It is mandatory for all automotive interiors throughout the United States and Canada.

#### **IMO A.652 (16)**

This test procedure prescribes methods for assessing the ignitability of material combinations, e.g. covers and filling used in upholstered seating, when subjected to either a smoldering cigarette or a lighted match as might be applied accidentally in the use of upholstered seats. It does not cover ignition caused by deliberate acts of vandalism. Annex I, 8.2 measures flammability using a lighted cigarette and Annex I, 8.3 measures flammability with a butane flame as the ignition source.

#### **NFPA 260**

The NFPA 260 procedures assess the cigarette ignition properties of the individual upholstery components. During the test the individual component is tested in conjunction with a standard component. For example, during the fabric test the candidate fabric is used to cover a standard filling material. During the filling material test, the candidate filling material is covered with a standard fabric. NFPA 260 is cited by the National Fire Protection Association for hospitals and prisons. Many hotel chains also site this standard.

#### **NFPA 261**

This test measures the cigarette ignition resistance of an actual item of upholstered furniture. It is cited by some of the building codes for upholstered furniture used in hospitals and prisons.

#### **NFPA 266**

This is the NFPA version of California Technical Bulletin 133, but with more detailed reporting requirements. It is cited by the national building codes for upholstered furniture used in nursing homes and prisons.

#### **NFPA 701, 1989 Edition Small Scale**

This is a small-scale vertical flammability test procedure that is not designed for upholstery fabrics. However, it is an unofficial national standard used to describe the fire resistance performance of upholstery materials.

#### **NFPA 701, 2004 Edition Test Method #1**

This is an intermediate scale vertical flammability test procedure that is not designed for upholstery fabrics. However, it is an unofficial national industry standard used to describe the fire resistance performance of upholstery materials.

#### **Port Authority of New York & New Jersey**

Specifications governing the flammability of upholstered chairs, benches, couches, banquettes, and solid plastic chairs; Method 2 Component Testing. This is a 12 second vertical flammability test.

#### **UFAC**

The UFAC procedures assess the cigarette ignition properties of the individual upholstery components. During the test the individual component is tested in conjunction with a standard component. For example, during the fabric test the candidate fabric is used to cover a standard

filling material. During the filling material test, the candidate filling material is covered with a standard fabric.

## FLAMMABILITY STANDARDS | INTERNATIONAL

### **AS 1530: Part 2**

This Australia/New Zealand test is suitable for materials that don't melt or shrink. The test specimen is mounted on a vertical support frame. A small denatured alcohol flame is used as the ignition source. Either the highest reach point of the flame during the test or the time for the flame to reach a marked point is determined. The speed factor, spread factor, heat factor and flammability index are calculated.

### **BS 5852: 1990 Section 4**

Ignition Source 5 - Ignition source 5 is a wooden crib structure produced to a specified size and weight, with a small piece of lint at the bottom. Alcohol is added to the lint, the crib is then positioned on the composite and ignited within 2 minutes. All flaming should cease within 10 minutes.

### **BS 7176: 1995**

This standard specifies the resistance to ignition of upholstered furniture for non-domestic seating by test composites. This test generally uses Direct Testing. This states that each composite shall be tested every 2500 units produced (or once per month, whichever is more practical). Re-testing is carried out where there is any major basic alteration to furniture specification.

BS 7176 is based on BS 5852 but has three additional parameters.

1. Watersoak procedure - This procedure requires a fabric to be soaked in water and dried prior to testing. This ensures FR treated fabrics are not adversely affected by watersoaking.
2. Predictive "Worst Case" testing - The foam used on the test rig is 35kg/m<sup>3</sup> High Resilient foam. This has been adopted as a "worst case" foam on the assumption that the vast majority of manufacturers use Combustion Modified foam which gives better flammability performance.
3. Hazard categories - Four hazard categories are identified which are linked directly to the ignition source used for testing (low, medium, high, and very hazard).

### **DIN 4102 Part 1 - Kleinbrenner (B2)**

All materials used in buildings in Germany need to meet the B2 requirement which is determined using a small flame test.

### **DIN 4102 Parts 15/16 - Brandschacht (B1)**

Referred to as the "Brandschacht test", this is the main test method in Germany which measures reaction to fire and is considered the highest flammability standard in the country for upholstery fabrics.

### **EN 1021 - 1: 1994 (cigarette)**

This standard (including EN 1021 - 2: 1994 match) is valid throughout the EU and examines a fabric's reaction to a burning cigarette. It replaces a number of national tests, including DIN 54342: 1/2 in Germany and BS 5852: 1990 in the UK.

Ignition Source 0 - This ignition source is used as a "smolder" test rather than a "flame" test as no flame is generated by the ignition source itself. The cigarette is left to smolder along its length and no smoldering or flaming of the fabric should be observed after 60 minutes.

**EN 1021 - 2: 1994 (match)**

Ignition Source 1 (match) - Although called the "match" test, the ignition source is in fact a butane flame with a flame height of 35 mm. This simulates a match and provides a more constant, repeatable flame. The flame is applied for 15 seconds; after removal, no flaming should occur after 2 minutes.

**NFP 92 - 503: Bruleur électrique (Classement M)**

The French test known as the "Bruleur électrique" - electric burner - is the principal method used not only in France, but also in Belgium, Spain and Portugal. It results in a classification of M1 to M4, with M1 being the highest classification.

**NFP 92 - 504: Rate of flame spread test**

This complimentary test to the Electric Burner helps establish a classification on samples which behave unusually during the primary test - for example, melting rapidly or shrinking away to form a hole so that the pilot flame cannot come into contact with the sample at 20 seconds, or if samples were unable to achieve an M3 rating.

**NFP 92 - 505: Dripping test**

Again complimentary to the electric burner, the dripping test is employed to investigate further into the potential hazard of burning droplets observed during the primary test.

*\*Note: This listing is for informational purposes only. Please consult your testing facility for specific descriptions and updates.*

*(Updated August 2009)*