

Flammability

Flammability testing is one of the most important testing procedures in the textile industry because it has crucial safety implications in the event of a fire. When testing fabrics for flammability, test rigs are designed to form a simulated chair. The most commonly used ignition sources are Ignition Source 0 (cigarette), Ignition Source 1 (match) and Ignition Source 5 (crib 5).



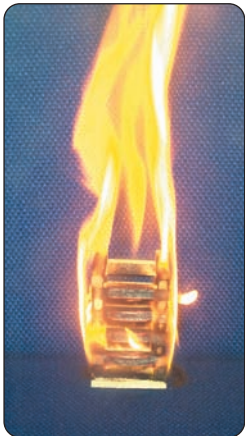
EN 1021 - 1 : 1994 (cigarette)

Ignition Source 0 - This ignition source is used as a “smoulder” test rather than a “flame” test as no flame is generated by the ignition source itself. The cigarette is left to smoulder along its length and no smouldering 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 35mm. 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.



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 testing 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 the 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/m³ 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 high hazard).

	Low Hazard	Medium Hazard	High Hazard	Very High Hazard
Typical examples of usage	Offices, colleges, museums, exhibitions, day centres. Schools, public houses and bars, casinos, hospitals & hostels	Hotel bedrooms, public buildings, restaurants, places of public entertainment, public halls,	Sleeping accommodation in certain hospital wards and in certain hostels, offshore installations.	Prison cells
<ol style="list-style-type: none"> 1. If a particular premise in the Low Hazard area is used for sleeping purposes then consideration should be given to specifying a higher performance level. 2. Upholstered furniture which is ordinarily intended for private use in a dwelling is subject to Government Regulations. 				

BS 476 - Part 7 : 1997

This standard applies to vertical surface or panel fabrics. It assesses the flammability performance of flat materials, composites or assemblies used as the exposed surfaces of walls, partitions, screens or ceilings. A sample is mounted vertically in a watercooled holder and is exposed to a radiant panel for 10 minutes. In addition, a pilot flame is applied to the bottom corner of the specimen during the first minute of the test. The time required for the flame front to reach reference marks on the sample is noted as well as the extent of flame spread at 1.5 minutes and at the end of the test. 6 - 9 samples are tested.

The classification system is based on the rate and extent of flame spread. Class 1, the highest classification, has a final spread of flame less than 165mm.

European Tests

In addition to the cigarette and match standards, there are several higher level national tests that are relevant to specific European countries. The B1 test measures reaction to fire and is considered the highest flammability standard in Germany for upholstered fabrics. In France the highest classification to aim for is the M1 standard while in Italy it's Classe Uno.

Flammability Performance

Some fabrics have inherent properties that make them flame retardant meaning the FR properties are locked into the fibre itself and will never wash off or wear off. Other fabrics require post treatments (Camreflam or Zirpro) to provide or enhance flammability performance.

- **Camreflam** - Enhances FR performance of wool blend fabrics (e.g. Screen) to meet B1 and M1 flammability.
- **Zirpro** - Wool is naturally flame retardant, it is resistant to ignition and does not melt or drip. To enhance these natural properties woollen fabrics (e.g. New Aquarius/Marathon) can be Zirpro treated to meet more stringent flammability standards (e.g. BS 7176 Medium Hazard, French M2) - the treatments do not affect the natural properties of the wool fibre.

A full listing of all products and their flammability performance is available separately.

If you would like any further information on European flammability standards, or would like a copy of the Flammability Matrix, please do not hesitate to contact Technical Services Tel: 01924 490591.