

A guide for manufacturers seeking to claim compliance with BS 7176

Background

In 2010, FIRA produced the British Furniture Confederation document – ‘Fire Safety of Furniture and Furnishings in the Non-Domestic/Contract sector, A Guide to UK Requirements’. This comprehensive document, details the responsibilities of furniture manufacturers, component suppliers and specifiers. This clarification of responsibilities identified a potential discrepancy between the requirements within the British Standards and industry’s approach to compliance.

The most common method adopted by manufacturers to demonstrate the fire safety of their products is to claim compliance at the appropriate hazard level in accordance with British Standard – BS 7176: 2007 ‘Specification for resistance to ignition of upholstered furniture for non-domestic seating by testing composites.

In previous versions of this Standard compliance was possible by ‘predictive testing’. That is, if a manufacturer purchases a filling material that has been pre-certified and a fabric that has passed after being tested over a ‘worst case’ filling (normally a low density combustion modified polyurethane foam) to the appropriate level, the manufacturer could assume that the composite (the fabric and filling together) would also comply (see page 4 for more information).

The 2007 version of BS 7176 no longer allows for predictive testing on the basis that new types of combustion modified foam have been introduced to the market. These new types of foam exhibit different combustion behaviours and it has proved difficult to use predictive testing techniques to establish the ignition resistance of different fabric / foam combinations.

This change means that the only route for claiming compliance with the latest version of BS 7176 is to have the final composite tested.



Many furniture manufacturers produce multiple collections of upholstered seating for non-domestic and contract end-use applications. Often the final items of furniture are supplied in short runs/low volumes. In some instances the cover fabric is supplied or selected by the specifier. Therefore, for the furniture manufacturer to test the final upholstery composite in every case places a significant financial burden on the furniture manufacturer, which can add unacceptable delays to project timescales.

The furniture manufacturer bears the responsibility for ensuring that products comply with specified fire safety levels and there needs to be a reasonable, responsible method of proving compliance, which is also cost effective.

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FIRA's advice is summarised below:

Standard Furniture Ranges

A standard furniture range would be a range of furniture offered in a set number of cover fabrics defined in associated marketing literature, rather than a product where the specifier has specified/supplied a special fabric for their furniture.

Achieving full compliance to BS 7176 for a small number of standard furniture ranges can be relatively straight forward, as the manufacturer knows the upholstery components being used and can test cost-effectively the relevant combinations of cover and filling composites. This can be supported by a rolling test programme for product ranges which covers all composites at all appropriate hazard levels.

To claim full compliance with BS 7176 manufacturers should evaluate products against all requirements and then declare their suitability for appropriate hazard ranges. In other words, each piece of furniture produced would carry the label stating that the item 'complies with BS 7176: 2007 for (for example) Medium Hazard'. This information should also appear in brochures, catalogues etc.



However, manufacturers may find that, whilst the concept of this approach is attractive, the demands of short runs, repeat testing and labelling are such that the costs involved are unacceptable or make the product uncompetitive.

One route forward is to spread the cost of claiming full compliance over a realistic time period through a due diligence programme based on a form of predictive testing in conjunction with a regular testing programme, as suggested below:

- *Purchase foams or fillings that are compliant with the relevant parts of the Furniture and Furnishings (Fire) (Safety) regulations for domestic furniture.*
- *Purchase fabrics which, when tested in combination with a suitable, 'worst case', Schedule 1 Part 1 compliant foam, meet the desired ignition resistance requirements of BS 7176.*
- *Ensure 'certificates of compliance' are obtained with all foam and fabric purchases.*
- *Establish an ongoing test programme for all upholstery composites for the standard product range. Test the most popular fabrics early on in the programme with all fabric/filling combinations being tested over a defined time period.*
- *Revolve the test programme around a repeating cycle during this time period i.e. 1 to 4 years.*
- *Base the frequency of repeat tests on of the volume of product supplied.*
- *Ensure that a suitable matrix is maintained for test results to ensure traceability.*
- *Take account of any new fabrics introduced to the range .*
- *Commission testing of standard fabric range(s) in combination with actual fillings used preferably through a UKAS accredited test organisation.*
- *Retain all documentation from component purchases and direct testing for at least 6 years.*

The above approach is considered to demonstrate that reasonable steps have been taken to ensure standard product ranges comply with the requirements of BS 7176, for example the Medium Hazard Category, and mitigates the risk of failure to comply with specified ignition resistance requirements.

It is strongly recommended that if a manufacturer has any concerns regarding the development and maintenance of a suitable due diligence programme expert advice, such as that offered by FIRA, should be sought at the earliest opportunity.



Image courtesy of Plumtree Mee

Furniture Supplied to Order

The major problem encountered by industry is where upholstered furniture is supplied to order and cover fabrics are selected, or supplied, by purchasers or specifiers – often referred to as customer's own cover (COC). These selections are not made from ranges recommended by furniture manufacturers but from general pattern books issued by fabric producers, wholesalers or agencies. Furniture manufacturers will have no knowledge of the ignitability behaviour of these covers when combined with standard production fillings.

When manufacturing furniture using COCs, despite the changes within BS 7176, 2007, predictive testing may be the only viable route to ensure an appropriate level of fire safety, without imposing a significant financial burden on the manufacturer and causing delays in the manufacturing process.

This should involve the following steps:

- *Purchase foams or fillings that are compliant with the relevant parts of the Furniture and Furnishings (Fire) (Safety) regulations for domestic furniture.*
- *Ensure 'certificates of compliance' (COC) are obtained with all foam and fabric purchases.*
- *With COCs suitable documentation shall be supplied by the client / specifier demonstrating the capability of the supplied fabric to meet the required ignition resistance levels. If this is not available the fabric must be tested before it can be used.*
- *Assess whether the information received with the supplied fabric is relevant to the product being produced. That is, any supporting documentation must show that the fabric was tested over a filling that would provide a similar, or worse performance than the fillings that are used in the final product.*
- *Remember the behaviour of distinctly different filling types is difficult to equate. Whenever there is doubt over the performance of a fabric or composite, testing of the actual fabric and filling composites to be used, is advised.*
- *Confirm compliance of foams and fabrics purchased at selected intervals to further demonstrate due diligence in ensuring that products are fire safe to the required level, preferably through testing of individual components or composites through a UKAS accredited test organisation.*
- *Collate and retain all documentation for at least 6 years to demonstrate, in the event of a problem, that reasonable steps were taken to ensure compliance with required fire safety levels.*

Manufacturers should also ensure that clients/specifiers are aware that, for reasons of speed and cost, the upholstered furniture does not fully meet the requirements of BS 7176, but that all reasonable steps have been taken to ensure that it meets appropriate fire performance levels based around the use of the customer supplied covers.

The predictive route

The predictive test route was originally introduced in BS 7176 for the specific use of manufacturers where the major facet of the business involved the production of multiple small orders with an infinite selection of fabric covers. It also allowed for customers to supply their own covers. It was accepted at that time that the cost of direct testing each available fabric/filling combination would place significant cost restraints on industry and that use of predictive testing was more realistic. The same limitations apply equally today.

The predictive test route allowed manufacturers of small orders – less than 200 identical units – to claim compliance with the relevant ignition requirements (for example compliance to BS 7176 Medium Hazard). This route allowed a fabric to be tested over a ‘worst case’ filling and, provided a satisfactory result was obtained, it could be assumed that the fabric, when used in combination with a less ignitable foam would satisfy the test at the same ignition level.

However, the standardised foam filling identified in previous versions of BS 7176 is no longer available, and this route for compliance has been removed from the latest version of the standard. As a consequence, the majority of fabric suppliers provide manufacturers relevant information on the ignition behaviour of fabric by testing in combination with combustion modified foam (ref 35Kg/m³) that meets Schedule 1 Part 1 of the UK’s Furniture & Furnishings (Fire) (Safety) Regulations for domestic furniture.

For further help and advice contact FIRA Customer Services on 01438 777700 or email info@fira.co.uk



Image courtesy of Burgess

Approach towards predicting compliance

The argument for the use of a ‘worst case filling’ to predict the likely ignition behaviour of a composite is considered to remain valid. The ‘worst case’ test approach, usually applied to cover materials, is to test the cover over a filling which is known to produce a more ignitable composite than the filling that is planned to be used. Consequently furniture manufacturers can assess whether the fabric / filling combination to be used in production will be adequately represented by the test result already obtained.

Provided manufacturers use foam grades which meet Schedule 1 Part 1 of the Furniture and Furnishings (Fire) (Safety) Regulations, and obtain certification for all foams used in production confirming compliance, one step has been taken towards predicting conformity with BS 7176.

The majority of fabric suppliers assess the ignition behaviour of their fabric in combination with melamine combustion modified (CM) foam of density of 35 kg/m³ for contract applications. It is generally considered that low density foam is more ignitable than higher density foam, provided the same fire retarding chemical is used to modify its combustion. Thus it can be reasonably expected that if the fabric satisfies the medium hazard requirements of BS 7176 when tested in combination with melamine CM 35kg/m³ foam it will also satisfy the test in combination with melamine CM foam of higher density.

Provided that procedures are in place to ensure all fabrics meet the ignition resistance requirements of BS 7176 rated to the appropriate hazard level a second step to predicting conformity has been achieved.

Alternative foams, not using melamine as a fire retardant, are available in the marketplace. Under these circumstances a similar approach (using the lowest density foam of this type as the basis for predictive testing) should be adopted.

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