Fire safety of upholstered furniture and mattresses in the domestic area

European fire services
recommendations on test methods

10 questions and answers about the study and the results

Q&A

1

What is fire safe furniture?

Fire safe furniture is furniture that can withstand different types of ignition sources. That means that the fire safety can also vary depending on the test carried out. So when we speak of fire safe furniture it does not simply mean that the furniture will not burn and then contribute to the fire load in the room. It means that the furniture can withstand a specific ignition source for a specified period of time. The chance for survivability increases if the fire does not start at all, or if the ignition time is prolonged/delayed so people in the building have a longer time to be alerted that a fire is about to start. The overall aim of fire safe furniture is making furniture's more fire safe in the terms of making ignition more difficult.

2

Why do we need fire safe furniture?

At the present time about 5,000 people die each year as a result of a house fire in the European Union. Several American, British and Dutch studies indicate that the number of deaths can be reduced by at least 25 percent by the use of fire safe furniture. These figures say enough about the need for fire safe furniture.

6

Why does furniture need to be resistant to cigarettes?

Two important fire scenarios will be covered by the cigarette ignition test. The cigarette ignition scenarios, such as smouldering ignition by lighted tobacco product, principally cigarette and smouldering ignition by ember, ash or other means or an unclassified hot or smouldering object. So, the cigarette ignition test is the most important because it covers the most common scenarios.

7

Why does furniture need to be resistant to small open flames?

Two important fire scenarios will be covered by the small open flame test. The small open flame test covers ignition by candle, match or lighter, and ignition by heat from operating equipment. So the ignition by small open flame is important because it covers more existing scenarios than those covered by the cigarette test.

3

What goals do we need to achieve?

A fire in upholstered furniture and mattresses should not have a large negative effect on the survivability and possibility of escape. It therefore seems to be a logical choice not only to focus on the ignition of the object, but also to the speed of the fire spread and the smoke production once the object has ignited. But there are a number of difficulties in proposing test standards for the measurement of burning behaviour and smoke production. At present the survivability and possibility of escape from fire is best served by avoiding ignition if possible. By preventing or delaying the ignition of upholstered furniture and mattresses, you also prolong the survivability and escape possibilities.

8

Why does furniture need to be resistant to larger open flames?

The open flame ignition by a wooden crib covers larger scenarios than the small open flame test and reflects a larger ignition source located on the upholstery. Such as open flame ignition by another fire: where upholstered furniture is the principal item contributing to fire spread but not the first item ignited. And also ignition by arcing. So the ignition by a larger open flame is important because it covers scenarios where the upholstered furniture is not the primary ignition source

9

What is the most representative way of testing?

Full scale testing for upholstered furniture is not realistic and composite testing is the best alternative. The fire test is then performed in small scale but with the same material combination as the end-use product. If there are many material combinations available they can be grouped together and tests can be performed on the worst case combination. From an ignition point of view there is no difference between testing a full scale mattress or a small scale sample. It is more practical with small samples during testing and the material and transportation costs are probably smaller for the manufacturer. However, some manufacturers find it more difficult to manufacture small scale samples, especially if the mattress has a wooden frame and a spring system. For that reason we have no opinion on the size of the mattress during testing. The ignition test can be performed either on a full scale mattress or a small scale sample.

4

Are there regulations about fire safe furniture?

Since the 80's the United Kingdom (UK) and Ireland have implemented legislation on the flammability of upholstered furniture and mattresses. Similar legislation and demands have been made by other European countries on a small scale. Most of this legislation focuses on furniture and mattresses in non-domestic buildings. For example buildings with a healthcare function, prisons, theatres, hotels and restaurants.

5

Do we need flame retardants?

There are several ways to make furniture fire resistant. At the present time, the most common way is the addition of flame retardants. Fortunately, we also see that innovations in the field of fire safety of furniture and mattresses take place at a high speed. Such as 3D woven fabrics and fillings and composition without flame retardants. The most common innovative way to improve the fire safety of upholstered furniture and mattresses is using fire barriers between the fabric and the foam. We also call them interliners. We believe that technology and knowledge exists that could allow furniture manufacturers to meet the fire safety standard proposed in the report. This may be through the use of alternative technologies/techniques or flame retardants.

10

What can we do with the results of the study and the report?

The result of this research is the European fire brigades (united in the FEU) urgent advice to manufacturers, suppliers, governments and standardization bodies to make sure only upholstered furniture and mattresses that meet the test methods in this report, are placed in homes. Looking at the benefits, we need to convince manufacturers, suppliers, governments and standardization bodies to implement the suggested recommendations on test methods of upholstered furniture and mattresses.

Conclusions and recommendations

Ignition sources

By introducing requirements to prevent ignition of upholstered furniture and mattresses, the survivability and possibility of escape from dwelling fires will increase.
Domestic furniture and mattresses should be able to withstand different ignitions sources:

Cigarette ignition test. This is the most important because it covers the most common ignition scenario's
Ignition by a small open flame. This is also important because it covers more ignition scenarios than those covered by the cigarette test
Open flame ignition by a wooden crib. This covers larger ignition scenarios than the small open flame test.

Way of testing

Full scale testing of furniture is not realistic, composite testing is the best alternative. The fire test is then performed in small scale but with the same material combination as the end-use product. If there are many material combinations available they can be grouped together and tests can be performed on the worst case combination. For mattresses the ignition test can be performed either on a full scale mattress or a small scale sample.

Test standards

The following test methods correspond to the chosen ignition sources and the way of testing the upholstery (i.e. testing on a composite level and the end use combination).

Object	Ignition source	Test method	Comments
Furniture	Cigarette	EN 1021-1	
	Open flame	EN 1021-2	
	Crib 5	BS 5852	Choose between BS 5852 chapter 11 or 12
Mattresses	Cigarette	EN 597-1	
	Open flame	EN 597-2	
	Crib 5	BS 6807	Test according to BS 6807 chapter 9

The cigarette and match flame tests in the European Standards are achievable at this time for most furnishings. We want manufacturers to make a public commitment to achieve the Crib 5 test as described in British Standards (or an equal test) within a realistic time frame.

Colofon

Full report
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