

Ignitability of upholstered furniture according to ISO 8191-1 and ISO 8191-2

(1 appendix)

Introduction

RISE has by request of Elmo Sweden AB performed fire tests according to ISO 8191-1 and ISO 8191-2. The purpose of the tests are basis for technical fire classification.

Product

According to the client:

Dark grey leather called “Elmotech” with nominal thickness 1.3 – 1.5 mm, with batch no. PB2523.

The leather was tested together with standard non-fire retardant polyurethane foam with nominal density 20 – 22 kg/m³. The foam was supplied by RISE.

Sampling

The sample was delivered by the manufacturer. It is not known to RISE Safety – Fire Research if the product received is representative of the mean production characteristics.

The sample was received on December 11, 2017 at RISE Safety – Fire Research.

Test results

The upholstery combination was tested with cigarette (ISO 8191-1) and match flame equivalent (ISO 8191 2) as ignition sources.

The ignition sources were applied in a position along the junction between seat and back. Special care was taken to note any progressive smouldering and/or flaming combustion in the combination.

The test results are given in appendix 1.

The test results relate only to the ignitability of the combination of upholstery composites under the particular conditions of the test; they are not intended as a means of assessing the full potential fire hazard of the materials or products in use.

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Criteria

Section 4 in ISO 8191-1, 1987 and ISO 8191-2, 1988 describing "Criteria of ignition" with regards to "Progressive smouldering ignition" (4.1) and "Flaming ignition" (4.2).

Assessment

The tested upholstered furniture combination meets the technical fire requirements according to ISO 8191-1 and ISO 8191-2.

Deviation from standard

The test was performed on a test rig according to EN 1021-1:2006. This test rig is identical to the test rig in ISO 8191 except for an extra plate at the end of the outer parts of the back and seat. This helps the filling from slipping and improves the repeatability of the test standard. This deviation was considered as having no influence on the test results (except for the better).

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Appendix

1. Test results

Appendix 1

Test results – ISO 8191-1, 1987 and ISO 8191-2, 1988

Product

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Observations, ISO 8191-1, ignition source cigarette

Table 1. Observations during the cigarette tests.

Test no	1	2
The cigarette was applied in a position along the junction between seat and back, min:s	00:00	00:00
The filling uncovers, min:s	03:40	04:50
Cover ignited, min:s	-*	-*
Filling ignited, min:s	-*	-*
The cigarette died out, min:s	29:13	22:34
The test was finished, min:s	60:00	60:00

*Ignition/Flaming ignition of the materials was not observed.

Table 2. Damage of cover material and filling after the cigarette tests.

Test no	1		2	
	Cover	Filling	Cover	Filling
Total charred length in:				
Cigarette length axis, back, mm	-	-	-	-
Up along back, mm	-	-	-	-
Depth, back, mm	-	1	-	1
Cigarette length axis, seat, mm	-	-	-	-
Forward, seat, mm	-	-	-	-
Depth, seat, mm	-	2	-	2
Charred to full depth of back	No		No	
Charred to full depth of seat	No		No	

Appendix 1

Observations, ISO 8191-2, ignition source small flame

Table 3. Observations during the match flame tests.

	Test no 1	Test no 2
The ignition source was applied in a position along the junction between seat and back, min:s	00:00	00:00
Cover ignited, min:s	-*	-*
Filling ignited, min:s	-*	-*
The ignition source was removed, min:s	00:20	00:20
After flame time, min:s	-*	-*

*Ignition/Flaming ignition of the materials was not observed.

Table 4. Damage of cover material and filling after the match flame tests.

Test no	1		2	
	Cover	Filling	Cover	Filling
Total charred length in:				
Burner length axis, back, mm	-	-	-	-
Up along back, mm	-	-	-	-
Depth, back, mm	-	-	-	-
Burner length axis, seat, mm	-	-	-	-
Forward, seat, mm	-	-	-	-
Depth, seat, mm	-	-	-	-
Charred to full depth of back	No		No	
Charred to full depth of seat	No		No	

Measured data of tested product

Material	Thickness (mm)	Area weight (g/m ²)
Leather	1.5 – 1.7	890 – 920

Conditioning

The tested product was conditioned for a minimum of 16 h at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) %.

Date of test

January 15 – 17, 2018.