Jarven Health Care
t.a.v. Göran Nordin
Bromsvägen 3
89160 Örnsköldsvik.
Sweden

Hengelo (ov), 7 jul. 11

Test specimen:	**Specimen:**	**Colour:**	**Client reference number:**
	A.	Yellow	FIRE PROOF MATRAS (dik material/aramide coating densiteit 35kg/m^3

Examination:	**Testnumber:**	**Testname:**
	1.	FIRE TESTS ACCORDING TO BS EN 597-1:1995 ASSESSMENT OF THE IGNITABILITY OF MATTRESSES AND UPHOLSTERED BED BASES (Part 1: Ignition source: smouldering cigarette)
	2.	FIRE TESTS ACCORDING TO BS EN 597-2:1995 ASSESSMENT OF THE IGNITABILITY OF MATTRESSES AND UPHOLSTERED BED BASES (Part 2: Ignition source: match flame equivalent)
	3.	FIRE TESTS ACCORDING TO BS6807: 2006 (Methods of test for assessment of the ignitability of mattresses, upholstered divans and upholstered bed bases with flaming types of primary and secondary sources of ignition).

Results See following pages

Laboratory Quality Control

Textile Lab, Generatorstraat 26, 7556RC Hengelo (ov), The Netherlands, Tel: +31(0)74-2491005, Fax: +31 (0)74-2593934
e-mail: info@textilelab.nl, VAT nr.: 8100.03.983.B.01 BIC: SNSBNL2A IBAN: NL62SNSB0907446167 Bank account: SNS 90.74.46.167

Test : **1. Fire tests according to BS EN 597-1 : 1995**
Assessment of the ignitability of mattresses and upholstered bed bases (part 1: Ignition source: smouldering cigarette).

Norm : BS EN 597-1 : 1995

Procedure

The sample of Yellow Fire Proof Matra, was tested after being conditioned for 16 hours in an atmosphere having a temperature of 23 ± 2℃ and a relative humidity of 50 ± 5%, in accordance with the above standard using the specified cigarette placed in the positions stated in Para, 9.2.1.

Criteria Of Ignition

Progressive smouldering ignition.

a) Any test specimen that displays escalating combustion behaviour so that it is unsafe to continue the test and active extinction is necessary;
b) Any test specimen that smoulders until it is essentially consumed within the test duration;
c) Any test specimen that smoulders to its full thickness, within the duration of the test;
d) Any test specimen that smoulders for more than one hour;
e) Any test specimen that, on final examination, shows evidence of charring other than discolouration more than 50 mm in any horizontal direction from the nearest point of the original position of the source.

Results

The following test results relate only to the ignitability of the combination of materials under the particular conditions of test, they are not intended as a means of assessing the full potential fire hazard of the item in use. They also only relate to the materials tested.

Ignitability Performance

Top Surface = Non-ignition

Results Test 1 Specimen	**A.**	
Smouldering criteria	**Test 1**	**Test 2**
Unsafe escalating combustion	No	No
Test assembly consumed	No	No
Smoulders through thickness	No	No
Smoulders more than 1 hour	No	No
More than 50mm from source	No	No
Flaming criteria		
Occurrence of flames	No	No

Comments
A non-ignition designation indicates that the sample met the performance requirements.

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Test : **2. Fire tests according to BS EN 597-1 : 1995**
Assessment of the ignitability of mattresses and upholstered bed bases (part 2: Ignition source: match flame equivalent).

Norm : BS EN 597-2 : 1995

Procedure

The sample of Yellow Fire Proof Matra was tested after being conditioned for 16 hours in an atmosphere having a temperature of 23 ± 2℃ and a relative humidity of 50 ± 5% in accordance with the above standard using the specified flame placed in the positions stated in Para, 9.2.1.

Criteria Of Ignition

Progressive smouldering & flaming ignition.

a) Any test specimen that displays escalating combustion behaviour so that it is unsafe to continue the test and active extinction is necessary;
b) Any test specimen that smoulders until it is essentially consumed within the test duration;
c) Any test specimen that smoulders to its full thickness, within the duration of the test;
d) Any test specimen that smoulders for more than one hour;
e) Any test specimen that, on final examination, shows evidence of charring other than discolouration more than 50 mm in any horizontal direction from the nearest point of the original position of the source.
f) Any test specimen that displays escalating combustion behaviour so that it is unsafe to continue the test and active extinction is necessary;
g) Any test specimen that burns until it is essentially consumed within the test duration;
h) Any test specimen on which any flame front reaches its extremities or passes through its full thickness within the duration of the test.
i) Any flaming that continues to burn more than 120 s after removal of the burner tube.

Results

The following test results relate only to the ignitability of the combination of materials under the particular conditions of test, they are not intended as a means of assessing the full potential fire hazard of the item in use. They also only relate to the materials tested. They do not guarantee to represent the performance of production materials.

Ignitability Performance

Top Surface = Non-ignition

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Results Test 2 Specimen	A.	
Smouldering / Flaming Criteria	**Test 1**	**Test 2**
Unsafe escalating combustion	No	No
Test assembly consumed	No	No
Smoulders through thickness	No	No
Smoulders more than 1 hour	No	No
More than 50mm from source	No	No
Test assembly consumed	No	No
Burning through thickness or to the extremities	No	No
Flaming for more than 120s	No	No

Comments
A non-ignition designation indicates that the sample met the performance requirements.

Laboratory Quality Control

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Test : **3. FIRE TESTS ACCORDING TO BS 6807: 2006 (**methods of test for assessment of the ignitability of mattresses, upholstered divans and upholstered bed bases with flaming types of primary and secondary sources of ignition).

Norm : BS 6807 : 2006

Procedure

Specimens of Yellow Fire Proof Matra were tested in the 'as received' condition in accordance with clause 9 of the above standard using ignition source 7 in the positions specified, after being conditioned for 72 hours in indoor ambient conditions, and then 16 hours in an atmosphere having a temperature of 23±2℃ and a relative humidity of 50±5%.

Progressive smouldering ignition

a) Any test specimen that displays escalating smouldering combustion behaviour so that it is unsafe to continue the test and forcible extinction is required;
b) Any test specimen that smoulders until it is essentially consumed or that smoulders to the extremities of the specimen, i.e. to either side or to the full thickness of the specimen, within the duration of the test;
c) Any test specimen that produces externally detectable amounts of smoke, heat or glowing 60 after ignition of the crib;
d) For top ignition only: any test specimen that on final examination shows evidence of smouldering by means of discoloured char that extends more than 100 mm in any horizontal direction from the nearest part of the original position of the source.

Flaming ignition

a) Any test specimen that displays escalating flaming combustion behaviour so that it is unsafe to continue the test and forcible extinction is required;
b) Any test specimen that burns until it is essentially consumed within the test duration;
c) Any test specimen on which any flame front reaches the extremities of the specimen other than the top or passes through the full thickness of the specimen within the duration of the test.
d) Any test specimen that continues to flame for more than 13 minutes after ignition of the crib;
e) Any test specimen that from which debris causes an isolated floor fire not meeting the criteria of item d).

Results

The following test results relate only to the ignitability of the combination of materials under the particular conditions of test; they are not intended as a means of assessing the full potential fire hazard of this item in use. They also only relate to the materials tested.

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Results Test 3 Specimen	A.		
Ignition source	Position	Time of extinction(s)	Ignition/Non-ignition
7	On top	540	Non-ignition
7	Below	480	Non-ignition
7	On top	506	Non-ignition
7	below	412	Non-ignition

Comments
A non-ignition designation indicates that the sample met the performance requirements.

Meets the requirements of BS 7177: 2008 (Specification for resistance to ignition of mattresses, mattress pads, divans and bed bases) High Hazard Category, when tested in accordance with: BS EN 597 – 1:1995, BS EN 597 – 2:1995 & BS 6807: 2006 (Clause 9).

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Järven Plast & Smide AB
Bromsvägen 3
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Fire test of a full scale mattress – preliminary results

Product

According to Järven Plast & Smide the mattress consist of polyether (35 kg/m^3) with a cover of a composite material based on armid (1000 g/m^2).

Purpose

The test is for informatory purpose.

The heat release and smoke production was measured according to fire test method NT FIRE 032 (modified). The testing was a part of SP project BRm6038 and was performed 2000-07-24.

NOTE: As a result of project BRm6038 a new Nordtest method was formed, NT FIRE 055, which is specifically designed for testing of mattresses. NT FIRE 055 is based on the same testing principle as NT FIRE 032. The test results described in this document show that the tested mattress also fulfil the criteria of NT FIRE 055, Annex G.

Testing

The mattress was tested according to NT FIRE 032, "Upholstered Furniture: Burning Behaviour – Full Scale Test". As an ignitions source a gas burner was used. This was specifically developed for ignition of upholstered furniture, the so called CBUF burner.

The test object is placed on a scale and is ignited on the top surface by the gas burner. After two minutes the gas burner is removed. The smoke formed during the test is collected by a hood placed above the test object. The heat release rate is calculated using oxygen consumption during the test.

The development of smoke is measured with a lamp (white light) and a photocell which are mounted in the duct leading from the hood. Mass loss is registered continuously during the test with the scale.

Test results

(min:s)

0:00 Ignition – burner is applied in the centre of the top surface of the mattress with a distance of 25 mm.

0:15 The cover is ignited where the burner is applied.

1:00 There is limited heat release from the mattress. No holes in the mattress. limited smoke production.

2:00 The burner is removed.

2:15 Flames in the mattress self-extinguished.

Observations after fire test

The top cover was burnt where the burner was applied (approximately 0.2 m^2), but there were no holes in the cover, the fabric structure was intact. Under the burnt part of top cover the polyether had melted to a depth of 5 cm. Mass loss was approximately 0.1 kg.

Figure 1 Damage in mattress after fire test (top cover is cut out). The polyether has melted where the burner was applied. The top cover is burnt, but there are no holes in the fabric.

Graphs of heat release rate and smoke production

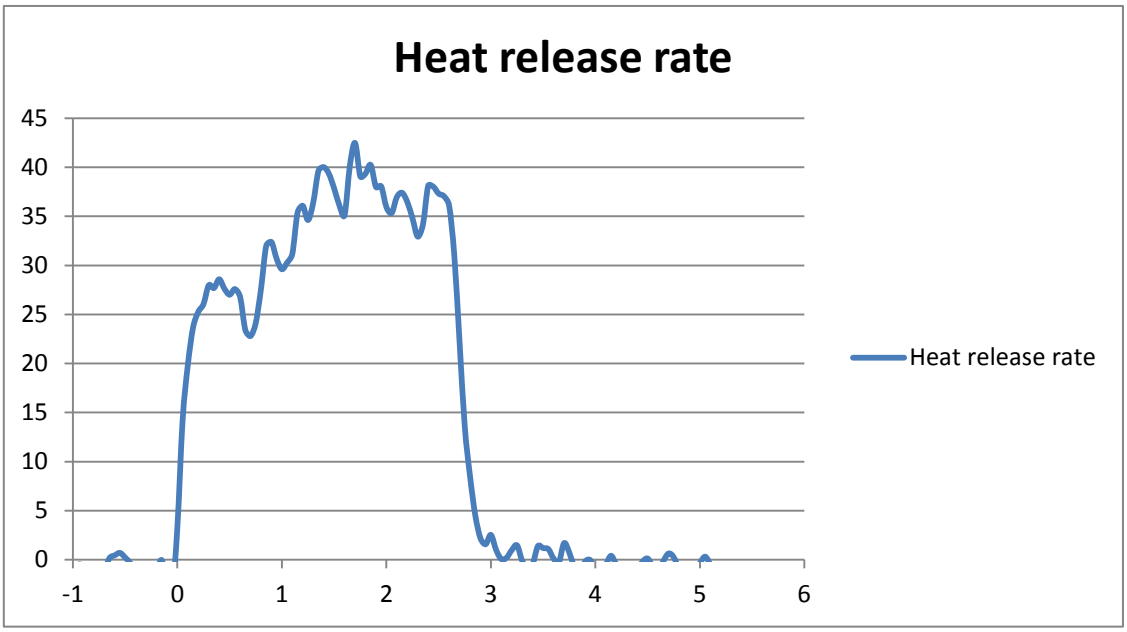

Figure 2 Heat release rate (including burner, 30kW) from the mattress during test. When the burner was removed the flames extinguished.

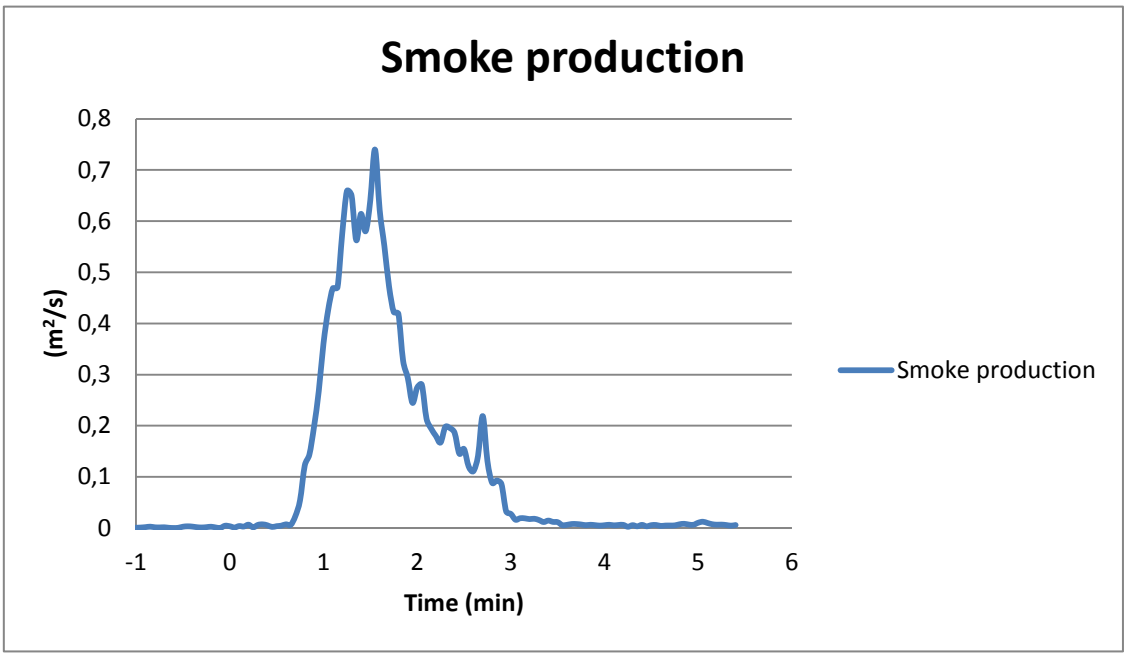

Figure 3 Smoke production from the mattress during test. Due to the small burnt area the smoke production was very limited.

REPORT
issued by an Accredited Testing Laboratory

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1002 ISO/IEC 17025

Swedish Coast guard
Pilotgången 4
611 92 NYKÖPING

FAR 25.853 Compartment interiors - Vertical test

(2 appendices)

Introduction

SP has been commissioned by Swedish Coast guard to fire test product according to FAR 25.853, Compartment interiors (2010), vertical test. The purpose of the test is to form a basis for technical fire classification.

The Federal Aviation Regulations, or FARs, are rules prescribed by the Federal Aviation Administration (FAA) governing all aviation activities in the United States. The FARs are part of Title 14, Aeronautics and Space, of the Code of Federal Regulations (CFR). "FAR 25.853" refers to § 25.853 of Part 25, subchapter C, Title 14 of the CFR. For classification in accordance to "FAR 25.853", the product is tested according to appendix F of Part 25, where the classification criteria also is described.

Product

According to the client: Fire proof mattress called "Specialmadrass Brand - Alfa", article No. 9950-Alfa. The mattress is assembled of a cover of PVC-coated Aramide fabric and filling of CMHR-foam. The coated fabric has a nominal area weight of 1000 g/m^2, the filling has a nominal density of 37 kg/m^3.

Manufacturer

Järven Health Care, Örnsköldsvik, Sweden.

Sampling

The sample was delivered by the client. It is not known to SP Fire Technology if the product received is representative of the mean production characteristics.

The sample was received August 11, 2011 at SP Fire Technology.

Test results

The test results are given in appendix 1 - 2.

The test results relate only to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

Criteria

According to Appendix F to Part 25, part I (a)(1)(i), a material should meet the following criteria when tested vertical in accordance with part I of this appendix, flame applied for 60 seconds:

- The average burn length may not exceed 6 inches (152 mm).
- The average flame time after removal of the flame source may not exceed 15 seconds.
- Drippings from the test specimen may not continue to flame for more than an average of 3 seconds after falling.

According to Appendix F to Part 25, part I (a)(1)(ii), a material should meet the following criteria when tested vertical in accordance with part I of this appendix, flame applied for 12 seconds:

- The average burn length may not exceed 8 inches (203 mm).
- The average flame time after removal of the flame source may not exceed 15 seconds.
- Drippings from the test specimen may not continue to flame for more than an average of 5 seconds after falling.

Assessment

The tested sample of the product called "Specialmadrass Brand - Alfa", article No. 9950-Alfa, meet the technical fire requirements mentioned above, part I (a)(1)(i) and part I (a)(1)(ii).

SP Technical Research Institute of Sweden
Fire Technology - Fire Dynamics

Performed by
Kerstin Borgerud

Examined by
Per Thureson

Revision

1-2. Test results - Vertical test according to appendix F of Part 25.

Revision

Revision comprises of updating of the product name and article No.

Test results - Vertical test according to appendix F of Part 25, subchapter C, Title 14 of the CFR.

Product

According to the client: Fire proof mattress called "Specialmadrass Brand - Swedish Coastguard", article No. 500-S. The mattress is assembled of a cover of PVC-coated Aramide fabric and filling of CMHR-foam. The coated fabric has a nominal area weight of 1000 g/m^2, the filling has a nominal density of 37 kg/m^3.

Application

Tests performed on the components of the mattress separately.

Flame exposure time 60 seconds.

Test results - Fabric

Sample dimension: 75 mm x 305 mm, thickness 0.8 mm.

Test no	1	2	3	Average value
Direction	→	→	→	
After flame time, s	0	0	0	0
Damaged length, mm	145	155	150	150
Burning time of drops, s	0	0	0	0

Measured data

Thickness 0.8 mm.
Area weight 836 - 961 g/m^2.

Conditioning

Temperature (21 ± 3) °C for 24 h.
Relative humidity (50 ± 5) %.

Date of test

September 23, 2011.

Appendix 2

Test results - Vertical test according to appendix F of Part 25, subchapter C, Title 14 of the CFR.

Product

According to the client: Fire proof mattress called "Specialmadrass Brand - Swedish Coastguard", article No. 500-S. The mattress is assembled of a cover of PVC-coated Aramide fabric and filling of CMHR-foam. The coated fabric has a nominal area weight of 1000 g/m^2, the filling has a nominal density of 37 kg/m^3.

Application

Tests performed on the components of the mattress separately. Flame exposure time 60 seconds.

Test results - Foam

Sample dimension: 75 mm x 305 mm, thickness 11.4 – 13.5 mm.

Test no	1	2	3	Average value
Direction	-*	-*	-*	
After flame time, s	0	0	0	0
Damaged length, mm	105	112	98	105
Burning time of drops, s	0	0	0	0

* Not applicable.

Measured data

Thickness 11.4 – 13.5 mm.
Area weight 32 – 38 kg/m^3.

Conditioning

Temperature (21 ± 3) °C for 24 h.
Relative humidity (50 ± 5) %.

Date of test

September 23, 2011.