

# Test report

## Fire Testing of 5 cm foam mattress according to IMO FTPC Part 9

Product identification: Offshore No.6 TOP

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### KEYWORDS

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### VERSION

2

### AUTHOR(S)

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### CLIENT(S)

Westnofa Industrier AS, Vollabakken 3, B-7030 Trondheim

### PROJECT NO.

102010.50/13.013

### TEST OBJECT

5 cm foam mattress

### DATE

2013-04-12

### CLIENT'S REF.

Gunnar Nypan

### NUMBER OF PAGES/APPENDICES

8 + 1 appendix

### TEST OBJECT RECEIVED

2013-03-04

### TEST PROGRAM

IMO FTPC Part 9

### TEST LOCATION

SINTEF NBL

### DATE OF TEST

2013-03-20

### ABSTRACT

The product Offshore No.6 TOP was tested according to IMO 2010 FTPC Part 9.

The product Offshore No.6 TOP satisfies the criteria for not readily ignitable bedding components according to IMO 2010 FTPC Part 9, section 10.3.

The test results relate only to the items tested

### PREPARED BY

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### APPROVED BY

Gunn Hofstad, Senior engineer

### SIGNATURE

*Gunn Hofstad*

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### CLASSIFICATION

Confidential

# Document history

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VERSION	DATE	DESCRIPTION OF VERSION
1	2013-04-11	

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2	2013-04-12	Information about the product has been corrected, see 3 Remarks and deviations.
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## 1 PRODUCT DESCRIPTION

### 1.1 Type of product

Foam mattress with removable cover.

### 1.2 Manufacturer, place of production:

Filling material: Eurofoam Polska

Cover fabric: Bekært Textiles Group

### 1.3 Sampling

The tested material was selected by the client. The material subjected for testing arrived SINTEF NBL 2013-03-04. It is not known to SINTEF NBL if the fire characteristics of the product received are representative of the fire characteristics of the average product.

### 1.4 Materials description

Information from the client:

The ticking was made up of:

1. Fabric
2. Fibre wadding
3. Non-woven fabric

The layers are quilted together.

<b>Fabric material:</b>	
Material: <i>e.g. wool, polyamide, etc.</i>	57 % Cotton / 43 % Modacrylic
Weave composition: <i>e.g. plain weave, twill, ...</i>	Jacquard
Mass, weight per unit area [g/mm <sup>2</sup> ]:	210 g/m <sup>2</sup>
Colour(s):	Beige/white
Fire retardant treatment:	"Pyroprotex"

<b>Fibre wadding:</b>	
Material: <i>e.g. wool, polyamide, etc.</i>	Thermally bonded polyester fibre
Mass, weight per unit area [g/m <sup>2</sup> ]:	200 g/m <sup>2</sup>
Colour(s):	White

<b>Non-woven fabric:</b>	
Material: <i>e.g. wool, polyamide, etc.</i>	100 % polypropylene
Mass, weight per unit area [g/m <sup>2</sup> ]:	35g/m <sup>2</sup>
Colour(s):	White

<b>Filling material(s):</b>	
Material: <i>(name of manufacturer, type designation)</i>	Flame retardant polyurethane foam, from Eurofoam Polska
Density [kg/m <sup>3</sup> or g/m <sup>2</sup> ]:	25 kg/m <sup>3</sup>
Fire retardant treatment:	TCPP – tris(2-chloro-metylethyl(phosphate)

## 1.5 Test specimens

Mattress: Measured thickness and square density: approximately 50 mm and 16.9 kg/m<sup>2</sup> respectively.  
Colour: white.

4 mattresses with dimensions 450 mm x 350 mm x 50 mm. The mattress had one shaped side, and 50 mm represents the largest thickness.

Ticking: Measured square density 0.45 kg/m<sup>2</sup>.  
Colour: Beige/white

## 1.6 Specimen conditioning

The ticking was washed 3 times in 60 °C with a commercial washing powder.

## 2 TESTING

*Operator:* Erling Stenhaug, engineer

*Conditioning of the test material:* The test material was stored first in indoor ambient conditions for 72 hours and then in an atmosphere with relative humidity of (50 ± 20) % and a temperature of (23 ± 2) °C for at least 16 hours immediately before the test.

*Number of single tests:* 2 with ignition source smouldering cigarette.  
2 with ignition source match-flame equivalent.

*Duration of the tests:* 1 hour

### **3 REMARKS / DEVIATIONS:**

This report replaces report 102010.50/13.013A. There was a misinformation about the density of the foam, which has now been corrected according to the sponsor's instructions.

According to IMO 2010 FTPC Part 9, the following statement shall be given in the test report:

“The test results relate 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.”

#### 4 TEST RESULTS

The tests were performed in a room under indoor ambient conditions, having a temperature of 20±5 °C and a relative humidity of 20-70%.

Test results for the cigarettes batch used:

Length:	70 mm
Diameter:	8 mm
Mass:	0.95 g
Smouldering rate:	10 min 55 sec/50 mm

**Table 4-1 Results from testing of mattress foam for Offshore No.6 TOP, without ticking according to IMO 2010 FTPC Part 9. Mattress exposed on the shaped side.**

1. Ignition source:	Cigarette 1
Damaged area (burning and/or char) [mm]	75 mm x 35 mm
Smouldering after 60 min	No
Occurrence of flaming ignition [Yes/No]	No
Observations	
2. Ignition source:	Cigarette 2
Damaged area (burning and/or char) [mm]	75 mm x 40 mm
Smouldering after 60 min	No
Occurrence of flaming ignition [Yes/No]	No
Observations	
3. Ignition source:	Propane flame 1
Damaged area (burning and/or char) [mm]	Ø 24 mm
Smouldering after 60 min	No
Occurrence of flaming ignition [Yes/No]	No
Observations	
4. Ignition source:	Propane flame 2
Damaged area (burning and/or char) [mm]	Ø 33 mm
Smouldering after 60 min	No
Occurrence of flaming ignition [Yes/No]	No
Observations	



**Table 4-2 Results from testing of mattress foam for Offshore No.6 TOP, with ticking according to IMO 2010 FTPC Part 9. Mattress exposed on the shaped side.**

5. Ignition source:	Cigarette 1
Damaged area (burning and/or char) [mm]	70 mm x 30 mm
Smouldering after 60 min	No
Occurrence of flaming ignition [Yes/No]	No
Observations	
6. Ignition source:	Cigarette 2
Damaged area (burning and/or char) [mm]	62 mm x 30 mm
Smouldering after 60 min	No
Occurrence of flaming ignition [Yes/No]	No
Observations	
7. Ignition source:	Propane flame 1
Damaged area (burning and/or char) [mm]	Ø 37 mm
Smouldering after 60 min	No
Occurrence of flaming ignition [Yes/No]	No
Observations	
8. Ignition source:	Propane flame 2
Damaged area (burning and/or char) [mm]	Ø 26 mm
Smouldering after 60 min	No
Occurrence of flaming ignition [Yes/No]	No
Observations	

## **Appendix A - Test procedure and criteria for classification**

### **A.1 Test procedure**

The method describes a procedure for determining the ignitability of bedding components. A smouldering cigarette and a small flame are used as ignition sources. The method is intended for testing bedding components such as blankets, quilts, bedspreads, pillows and mattresses, including thin, light mattresses used on top of other mattresses.

Blankets, pillows, quilts and thin light mattress specimens, are tested on an underlay of mineral wool.

The test is performed on a small mock-up bed in a test enclosure. By testing with smouldering cigarette, the cigarette is covered with a cotton wool pad; this simulates smoulderable materials used in bedding. The cigarette is allowed to smoulder completely, and the progress of combustion is observed.

A small propane flame is used as a flaming ignition source. The test specimen is exposed to the flame for 20 seconds, and the progress of combustion after the flame has been removed is observed.

### **A.2 Criteria for classification**

#### **A.2.1 Progressive smouldering**

For the purpose of this test method, all the types of behaviour described below in .1 to .5 are considered to be progressive smouldering ignition:

- .1 Any test specimen that produces externally detectable amounts of smoke, heat or glowing after a period of 1 hour following the application of the ignition source.
- .2 Any test specimen that displays escalating combustion behaviour so that it is unsafe to continue the test and requires forcible extinction.
- .3 Any test specimen that smoulders until it is essentially consumed within the duration of the test.
- .4 Any test specimen that smoulders to the extremities of the specimen, viz. to either side or to the full thickness of the specimen, within the duration of the test. However, all materials having a thickness of 25 mm or less, such as light mattresses, quilts and blankets are allowed to smoulder to the full thickness of the specimen.
- .5 Any test specimen that, on final examination, shows evidence of smouldering other than discoloration more than 25 mm in any horizontal direction from the nearest part of the original position of the edge of cotton-wool pad and open flame ignition source.

## **A.2.2 Flaming ignition**

### **A.2.2.1 Mattresses**

For the purpose of this test method, all the types of behaviour described below in .1 to .5 are considered to be flaming ignition.

- .1 The occurrence of any flames initiated by a smouldering ignition source.
- .2 Any test specimen that continues to flame for more than 150 seconds after removal of the igniting flame.
- .3 Any test specimen that displays escalating combustion behaviour, so that it is unsafe to continue the test and requires forcible extinction.
- .4 Any test specimen that burns until more than 66% is consumed within 150 seconds after removal of the igniting flame.
- .5 Any test specimen that burns to the extremities of the specimen, viz. to either side or to the full thickness of the specimen, within the duration of the test.

### **A.2.2.2 Blankets, quilts, pillows and thin light mattresses**

For the purpose of this test method, all the types of behaviour described below in .1 to .5 are considered to be flaming ignition.

- .1 The occurrence of any flames initiated by a smouldering ignition source.
- .2 Any test specimen that continues to flame for more than 150 seconds after removal of the igniting flame.
- .3 Any test specimen that displays escalating combustion behaviour, so that it is unsafe to continue the test and requires forcible extinction.
- .4 Any test specimen that burns until more than 66% is consumed within 150 second after removal of the igniting flame.
- .5 Any test specimen that burns to either side of the specimen within the duration of the test.

## **A.2.3 Classification**

The bedding component is classified as not readily ignitable if it shows no progressive smouldering ignition or flaming ignition as specified above.



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