

# Determination of non-combustibility according to IMO 2010 FTPC Part 1

PAROC Marine Slab 160



Requested by: Paroc Group Oy

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**Requested by** Paroc Group Oy  
P.O.Box 47  
FI-00621 Helsinki, Finland

**Order** 25 October 2017 / Tommi Siitonen

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**Assignment** **Determination of non-combustibility of a mineral wool product**

**Product** The customer gave following information about the product:

Product name: **PAROC Marine Slab 160**  
Manufacturer: Paroc AB, Hällrkis Sweden  
Product description: stone wool slab  
Thicknesses of the product: 20...70 mm  
Nominal density: 160 kg/m<sup>3</sup>  
Nominal organic content: 2,0 %

**Sample** The quality control sample of the product was chosen 15 November 2017 by a representative of VTT Expert Services Ltd at the stock of Paroc AB, Hällrkis, Sweden.

Manufacturing date: 2 November 2017  
Date of delivery: 22 November 2017  
Size of sample: 50 mm x 600 mm x 1200 mm  
Density measured by VTT: about 165 kg/m<sup>3</sup>  
Moisture content measured by VTT: about 0,1 %  
Organic content measured by VTT: about 1,9 %

**Specimens** From the sample five test specimens were made with a diameter of 45 mm and a height of 50 mm.

**Test method** IMO 2010 FTPC Part 1 - Non-combustibility test  
A description of the method and requirements are presented in Appendix 1.

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<b>Date of test</b>	29 and 30 November 2017, 4 and 5 December 2017
<b>Test results</b>	The test results are shown in Appendix 2.
<b>Note</b>	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.
<b>Classification</b>	<p>The tested stone wool product, <b>PAROC Marine Slab 160</b>, met the requirements for non-combustible material according to IMO 2010 FTPC Part 1.</p> <p>Approval of the material may be obtained only on application to the appropriate Administration.</p>

Espoo, 15 December 2017



Tiia Ryyänen  
Product Manager



Sanna Järvinen  
Expert

**APPENDICES** Appendix 1, Description of the test method and requirements  
Appendix 2, Test results

**DISTRIPUTION** Customer Original (2)  
Archive Original

## DESCRIPTION OF THE METHOD

### IMO 2010 FTPC Part 1 *Non-combustibility test*

#### Moisture content

Three weighted specimens of each material in the sample are heated in a ventilated oven at a temperature of  $105 \pm 2$  °C (gypsum-based, cementations and similar materials shall be dried at a temperature of  $55 \pm 5$  °C) for 24 h and reweighted when cooled in a desiccator. The moisture content is calculated as a percentage of the dry weight.

#### Organic content

After the percentage moisture contents have been calculated, the three specimens shall be further heated in an oven at a temperature of  $500 \pm 20$  °C for 2 h and weighted when cooled in a desiccator. The organic content is calculated as a percentage of the dry weight.

The organic content of each material used in the test specimen shall be within  $\pm 0,3$  % absolute of the value stated as the nominal organic content.

#### Non-combustibility test

##### Specimens

The test specimens shall be cylindrical and shall have a diameter of 43...45 mm and a height of  $(50 \pm 3)$  mm. For non-homogenous materials, the test specimen shall be constructed such that all layers are represented in the test specimen in proportion to their presence, by volume, in the original sample. For homogenous products, five test specimens shall be made and for non-homogenous products ten test specimens.

##### Conditioning

The test specimens shall be dried in a ventilated oven maintained at  $(60 \pm 5)$  °C, for between 20 h and 24 h, and cooled to ambient temperature in a desiccators prior to testing.

##### Test procedure

The test specimen is placed in a vertical tube furnace with a temperature of  $750 \pm 5$  °C. Temperature alterations caused by possible burning of the test specimen are measured with three thermocouples, of which one is in the furnace, one on the test specimen surface and one in the test specimen centre. During the test the flaming time of the test specimen is also measured. For non-homogenous products five specimens are tested with one surface on the top of the specimens, and five specimens the same surface on the bottom.

##### The evaluation criteria

The material is deemed non-combustible according to IMO 2010 FTPC Part 1 if all the following criterias are satisfied.

- the average furnace thermocouple temperature rise does not exceed 30°C,
- the average test specimen surface thermocouple temperature rise does not exceed 30°C,
- the average duration of sustained flaming does not exceed 10 s and
- the average mass loss does not exceed 50 %.

8.5.2017

## TEST RESULTS

**Method:** IMO FTPC 2010 Part 1 – Non-Combustibility Test

**Product name:** PAROC Marine Slab 160

**Moisture and organic content:**

Test	Moisture content, %	Organic content, %
1	0,08	1,92
2	0,09	1,86
3	0,00	1,86
<b>Mean</b>	<b>0,1</b>	<b>1,9</b>

**Non-combustibility test:**

Test	Mass loss %	Temperatures °C					Temperature rise °C		Duration of sustained flaming s
		$T_i(\text{furnace})$	$T_m(\text{furnace})$	$T_m(\text{surface})$	$T_f(\text{furnace})$	$T_f(\text{surface})$	$T_r(\text{furnace})$	$T_r(\text{surface})$	
1	1,9	749	776	804	775	803	1	1	0
2	1,7	748	772	807	771	805	1	2	0
3	1,4	749	778	806	776	804	2	2	0
4	1,6	751	775	806	773	803	2	3	0
5	1,6	752	784	806	781	804	3	1	0
<b>Mean</b>	<b>1,6</b>						<b>2</b>	<b>2</b>	<b>0</b>

$T_i(\text{furnace})$  = the initial furnace temperature

$T_m(\text{furnace})$  = the maximum furnace temperature

$T_m(\text{surface})$  = the maximum specimen surface temperature

$T_f(\text{furnace})$  = the final furnace temperature

$T_f(\text{surface})$  = the final specimen surface temperature

Furnace temperature rise  $T_r(\text{furnace}) = T_m(\text{furnace}) - T_f(\text{furnace})$

Specimen surface temperature rise:  $T_r(\text{surface}) = T_m(\text{surface}) - T_f(\text{surface})$

### Summary of results:

The average furnace thermocouple temperature rise: 2 °C

The average test specimen surface thermocouple temperature rise: 2 °C

The average duration of sustained flaming: 0 s

The average mass loss: 1,6 %