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

PAROC Hvac Section AluCoat T

FINAS Finnish Accreditation Service
T001 (EN ISO/IEC 17025)

Requested by: Paroc Group Oy

VTT EXPERT SERVICES LTD

Requested by	Paroc Group Oy P.O.Box 47 FI-00621 Helsinki, Finland
Order	9 September 2014 / 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 Hvac Section AluCoat T**
Manufacturer: Paroc Oy Ab, Lappeenranta, Finland
Product description: Stone wool pipe section with reinforced aluminium foil facing, tape fastening on the longitudinal seam
Thicknesses of the product: 20…50 mm
Inner diameter: 12/15…114 mm
Pipe section length: 1200 mm
Density: 85…120 kg/m^3
Nominal organic content of stone wool: 2,0 %

Sample

The quality control sample of the product was chosen 4 November 2014 by a representative of VTT Expert Services Ltd at the stock of Paroc Oy Ab, Lappeenranta, Finland.

Manufacturing date of sample: 10 October 2014
Date of delivery: 7 November 2014
Size of sample: thickness 20 mm, inner diameter 28 mm, pipe section length 1200 mm.
Density of stone wool measured by VTT: about 97 kg/m^3
Moisture content of stone wool measured by VTT: about 0,1 %
Organic content of stone wool measured by VTT: about 1,9 %

Specimens

From the sample without facing, 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.

Deviation	The product was non-homogenous. It composed of two components, substantial (wool) and non-substantial (aluminium facing). The substantial component was tested.
Date of test	28 February 2015
Test results	The test results are shown in Appendix 2.
Note	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.
Classification	The tested stone wool product, **PAROC Hvac Section AluCoat T**, without facing, met the requirements for non-combustible material according to IMO 2010 FTPC Part 1. Approval of the material may be obtained only on application to the appropriate Administration.

Espoo, 19 March 2015

Tiia Ryynänen
Product Manager

Katja Ruotanen
Expert

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

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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 ± 2 °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 precentage moisture contents have been calculated, the three specimens shall be further heated in an oven at a temperature of 500 ± 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 ± 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 ± 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 ± 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 ± 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 exeed 50 %.

29.9.2014

TEST RESULTS

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

Product name: PAROC Hvac Section AluCoat T

Moisture and organic content:

Test	Moisture content, %	Organic content, %
1	0,08	2,06
2	0,12	1,85
3	0,12	1,86
Mean	**0,1**	**1,9**

Non-combustibility test:

Test	Mass loss	Temperatures °C					Temperature rise °C		Duration of sustained flaming
	%	$T_{i(furnace)}$	$T_{m(furnace)}$	$T_{m(surface)}$	$T_{f(furnace)}$	$T_{f(surface)}$	$T_{r(furnace)}$	$T_{r(surface)}$	s
1	1,6	754	782	823	777	817	5	6	0
2	1,5	751	795	818	790	812	5	6	0
3	1,6	749	784	826	781	824	3	2	0
4	1,6	750	793	818	788	813	5	5	0
5	1,7	750	784	825	780	823	4	2	0
Mean	**1,6**						**4**	**4**	**0**

Ti(furnace) = the initial furnace temperature

Tm(furnace) = the maximum furnace temperature

Tm(surface) = the maximum specimen surface temperature

Tf(furnace) = the final furnace temperature

Tf(surface) = the final specimen surface temperature

Furnace temperature rise *Tr*(furnace) = *Tm*(furnace) - *Tf* (furnace)

Specimen surface temperature rise: *Tr*(surface) = *Tm*(surface) - *Tf* (surface)

Summary of results:

The average furnace thermocouple temperature rise: 4°C

The average test specimen surface thermocouple temperature rise: 4°C

The average duration of sustained flaming: 0 s

The average mass loss: 1,6 %.