

Classification report for roofs/roof coverings exposed to external fire No. 20873D

Owner of the classification report

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Introduction

This classification report defines the classification assigned to the roof/roof covering **«M-Tray® modular green roof system»** in accordance with the procedures given in the standard EN 13501-5:2016 : Fire classification of construction products and building elements – Part 5: Classification using data from external fire exposure to roofs tests: Test 4: Method with two stages incorporating burning brands, wind and supplementary radiant heat

This classification report consists of 8 pages

1. DESCRIPTION OF THE ROOF/ROOF COVERING

		Nominal values (1)	Measured value (2)
M-Tray® modular green roof system			
SUBSTRATE			
Material	Fibre cement board		
Thickness (mm)	12		
Density (kg/m ³)	1280		
Flame retardants	No	(3)	
ROOF COVERING			
1.1 <u>First layer</u> : Recycled polypropylene tray carrier			
Material	A re-granulated PP tray carrier, made from post-consumer PP (PCR). The form of the tray is obtained through injection moulding.		
PP/PCR type	PP2117 x yy/zz, PP2131F20 yy/zz, PP2123 x yy/zz, PP 2126 x yy/zz, PP2132 z yy/zz, PP2143 x yy/zz, PP2154 x yy/zz, and PP2182 x yy/zz		
Trade name	M-Tray® modular green roof system		
Manufacturer	Techmarkets Ltd		
Supplier	Wallbarn Ltd		
Reinforcement (nature and g/m ²)	None		
Thickness (mm)	2	(4)	
Mass of the tray (g)	4400	(4)	
Flame retardants	No	(3)	
Fixing method	Loose laid	Loose laid	
1.2 <u>Top layer</u> : Lightweight growing media			
Material	The carrier tray is filled with substrate, in which the plants can grow. This substrate a mixture of compost, coir, lytag and expanded clay.		
Weight percentage (w%)			
<i>Compost</i>	6,6	(3)	
<i>Coir</i>	4	(3)	
<i>Lytag</i>	50	(3)	
<i>Expanded clay</i>	39-40	(3)	
Trade name	M-Tray® modular green roof system		
Manufacturer / Supplier	Sedum Growers Ltd		
Reinforcement (nature and g/m ²)	None		
Thickness (mm)	70 - 80	(3)	
Surface weight (g/m ²)	80000 (*)	(3)	
Flame retardants	No	(3)	
Fixing method	Loose laid in the tray	Loose laid in the tray	

1.3 Top layer: Plants		
A) Sedum spp.		
Material	Succulent plants fully rooted into the substrate / lightweight growing media.	
Relative amount of plants (when wildflowers are present) (%)	90	(3)
Trade name	M-Tray® modular green roof system	
Manufacturer / Supplier	Jelitto (https://www.jelitto.com)	
Height of the plants above the growing media (mm)	20 – 30 mm	(4)
Surface weight (g/m ²) sedum spp. (mature plants, not seeds)		
<i>Dry (35 RH%)</i>	4000	(3)
<i>Standard (55 RH%)</i>	8000 – 10000	(3)
<i>Humid (85 RH%)</i>	15000	(3)
Amount of organic material of the toplayer (%)	100	(3)
Flame retardants	No	(3)
Fixing method	Seeds are sown in the growing medium and nurtured until fully grown.	(3)
B) Wildflowers (optional)		
Material	Wildflowers fully rooted into the substrate / lightweight growing media. The wildflowers are a mix of different species, typically found in the UK.	
Relative amount of plants (when present) (%)	10	(3)
Trade name	M-Tray® modular green roof system	
Manufacturer / Supplier	John Chambers (https://www.johnchamberswildflowers.co.uk/)	
Height of the plants above the growing media (mm)	20 – 30 mm	(4)
Surface weight (g/m ²) wildflowers (mature plants, not seeds)		
<i>Dry (35 (unit)(%RH?))</i>	3500	(3)
<i>Standard (55 (unit)(%RH?))</i>	7000 – 9000	(3)
<i>Humid (85 (unit)(%RH?))</i>	13000	(3)
Amount of organic material of the toplayer (%)	100	(3)
Flame retardants	No	(3)
Fixing method	Seeds are sown in the growing medium and nurtured until fully grown.	(3)

(1) Based on the information given by the sponsor

(2) Values verified by the laboratory

(3) Unverifiable by the laboratory

(4) Not verified by the laboratory

(*) surface weight of 80000 g/m², based on moist of the substrate at a depth of 70-80 mm (with 20-30 mm of rooted sedum spp./wildflowers on top filling the 100 mm deep trays)

2. TEST REPORTS AND TEST RESULTS IN SUPPORT OF THIS CLASSIFICATION

a) Test reports

Name of the laboratory	Name of the sponsor	Test report ref. no.	Test method
WFRGENT nv Ghent - Belgium	WALLBARN LTD.	20873A&B	CEN/TS 1187:2012: Test 4
WFRGENT nv Ghent - Belgium	WALLBARN LTD.	20873C	CEN/TS 16459:2019

b) Test results

Test conditions: 20873B

Test date: 08/02/2021

Room temperature at start of test (°C): 18

Roof pitch: 0°

PRELIMINARY IGNITION TEST WITH BURNING BRANDS (STAGE 1)

Specimen No:	B-1'(*)	B-2'
Duration of flaming after withdrawal of the test flame (min:sec)	00:00	00:00
Maximum flame spread distance (mm)	0	0
Time to fire penetration (min:sec)	Did not penetrate	Did not penetrate
Nature of the penetration	N.a.	N.a.

(') Preliminary test corresponding with the penetration test in stage 2

(*) Reused in the official test 20873A

PENETRATION TEST WITH BURNING BRANDS, WIND AND SUPPLEMENTARY RADIANT HEAT (STAGE 2)

Specimen No:	B-1(*)	B-2	Average
Time to fire penetration (min:sec)	Did not penetrate	Did not penetrate	Did not penetrate
Nature of the penetration	N.a.	N.a.	-
Additional observations: None of the specimens ignited.			

(*) Reused in the official test 20873A

Test conditions: 20873A

Test date: 08/02/2021

Room temperature at start of test (°C): 18

Roof pitch: 0°

Build-up: Fibre cement board + tray carrier + lightweight growing media + plants (Sedum spp. and wildflowers)

PRELIMINARY TEST (STAGE 1)

Parameter	Criteria				Test ^(a) results	Compliance			
	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)		Spec. 1	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)
Burn time	< 5 min	< 5 min	< 5 min	≥ 5 min	00:00	Yes	Yes	Yes	Yes
Flame spread distance	< 0,38 m	< 0,38 m	< 0,38 m	No limit	0	Yes	Yes	Yes	Yes
Penetration	None	None	None	None	None	Yes	Yes	Yes	Yes

(a) Not for extended application.

PENETRATION TEST (STAGE 2)

Parameter	Criteria			
	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)
Penetration	≥ 60 min	< 60 min ≥ 30 min	< 30 min	< 30 min
Parameter	Test ^(a) results			
	Spec. 1	Spec. 2	Spec. 3	Mean ^a
Penetration	None	None	None	None
Parameter	Compliance			
	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)
Penetration	Yes	Yes	Yes	Yes

(a) If one or two of the specimens have not failed at one hour, a time of 60 min shall be used in calculating the mean time of penetration.

3. CLASSIFICATION AND FIELD OF APPLICATION

a) Reference

This classification has been carried out in accordance with clause 9 test 4 of EN 13501-5:2016.

b) Classification

The roof / roof covering «**M-Tray® modular green roof system**» in relation to its external fire performance is classified:

B_{ROOF} (t4)

c) Direct field of application

The classification is valid for the system as described in §1 for the following conditions:

- Range of pitches: $\leq 10^\circ$

d) Extended field of application

➤ Range of layer 0: Plants

Range of species:	Sedum spp. and wildflowers (optional)
Relative amount of plants	
<i>Sedum spp.</i>	100 % Sedum spp.
<i>Sedum spp. + wildflowers</i>	90 % Sedum spp. + 10 % wildflowers
Length of the plants:	
<i>Sedum spp.</i>	20 – 30 mm
<i>Wildflowers (optional)</i>	20 – 30 mm
Surface weight sedum spp. (mature plants, not seeds):	
<i>Humid (85 RH%)</i>	15000 g/m ²
Surface weight wildflowers (mature plants, not seeds) (optional):	
<i>Humid (85 (%RH?))</i>	13000 g/m ²
Organic content:	100 %
Fixing method:	Seeds are sown in the growing medium and nurtured until fully grown.

➤ Range of layer 1: The lightweight growing media

Compounds:	Compost, coir, lytag and expanded clay
Weight percentage:	
	<i>Compost</i> 6,6 w%
	<i>Coir</i> 4 w%
	<i>Lytag</i> 50 w%
	<i>Expanded Clay</i> 39 - 40 w%
Thickness:	70 - 80 mm
Surface mass:	80000 g/m ² (based on the moist on the bottom of this layer)
Fixing method:	Loose laid in tray carrier

➤ Range of layer 2: Tray carrier

Material:	A re-granulated PP tray carrier, made from post-consumer PP (PCR).
Thickness:	2 mm
Height:	100 mm
Fixing method:	Loose laid

➤ Range of layer 3: Substrate: Non-combustible board (Euroclass A2)

Thickness:	12 mm or more
Density:	1280 kg/m ³ or more

4. LIMITATIONS

At the time the standard EN 13501-5:2016 was published, no decision was made concerning the duration of validity of a classification document.

Provisions of Regulation (EU) 305/2011, commonly known as the Construction Products Regulation (CPR), prevail over any conflicting provisions in the harmonized standards and technical specifications.

5. WARNING

This classification report does not represent type approval nor certification of the product.

6. CONCERNING DECLARATION OF PERFORMANCE (DoP) ACCORDING TO THE CONSTRUCTION PRODUCT REGULATION (CPR)

According to the information delivered by the sponsor to the laboratory on the technical information sheet, there was no product standard for CE marking available at the time the classification report for the tested material/product was drafted. When such a product standard is published, this report may be submitted again to the laboratory to evaluate the adequacy of the report for CE marking.

The sponsor of this report has nevertheless committed himself to use a third party for the sampling and to assure in this way the traceability of the test samples.

PREPARED BY

APPROVED BY

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