Indicative test Report No. 20873B

Sponsor

WALLBARN LTD.
Unit 16 Capital Business Centre, 22 Carlton Road
CR2 0BS South Croydon
UNITED KINGDOM

Trade name of the roof covering

M-Tray® modular green roof system

Manufacturer of the roof covering

WALLBARN LTD.
Unit 16 Capital Business Centre, 22 Carlton Road
CR2 0BS South Croydon
UNITED KINGDOM

Supplier of the roof covering

WALLBARN LTD.
Unit 16 Capital Business Centre, 22 Carlton Road
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Nature of the tests

Test methods for external fire exposure to roofs: Test 4: Method with two stages incorporating burning brands, wind and supplementary radiant heat, according to CEN/TS 1187:2012: Test 4.

Deviations of the test standard

On the following points the test procedure deviated from the prescriptions of the standard: the number of specimens.
Therefore these results are of an indicative nature only and no classification can be given on only their basis.

PREPARED BY	APPROVED BY
Laurens Devynck (Signature) 2021.04.09 13:51:06 +02'00'	Bart Sette (Signature) General Manager Ghent 2021.04.12 09:33:45 +02'00'

This report consists of 9 pages including 1 annex

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1. DATA CONCERNING THE TEST SPECIMENS

Type of specimen: Recycled PP tray, filled with lightweight growing media with plants in it.

The firm Wallbarn LTD. has provided the laboratory, on 05/01/2021, with 4 mounted roof specimens. These roof specimens were prepared conforming to the prescriptions of the above-mentioned standard. The laboratory did not supervise the specimen fabrication.

Sampling by	:	David Holloway
Sampling date	:	18/12/2020
Sample ID	:	20-04-B24
Production place	:	White down Farm, Tadley, Hampshire, RG23 8PF
Production line	:	Row/Bed 24
Production date	:	14/04/2020
Identification within the quality system	:	IMS.T.810v1

2. DESCRIPTION OF THE TEST ROOF DECK

This description is based on information given by the sponsor.

	Nominal values (1)	Measured value (2)
M-Tray® modular green roof system		
SUBSTRATE		
Material	Fibre cement board	
Thickness (mm)	12	
Density (kg/m³)	1280	
Flame retardants	No	(3)
ROOF COVERING		
1.1 First layer: 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/m²)	None	
Thickness (mm)	2	(4)
Mass of the tray (g)	4400	(4)
Flame retardants	No	(3)
Fixing method	Loose laid	Loose laid
1.2 Top layer: 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%)		
Compost	6,6	(3)
Coir	4	(3)
Lytag	50	(3)
Expanded clay	39-40	(3)
Trade name	M-Tray® modular green roof system	
Manufacturer / Supplier	Sedum Growers Ltd	
Reinforcement (nature and g/m²)	None	
Thickness (mm)	70 - 80	(3)
Surface weight (g/m²)	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/m²) sedum spp. (mature plants, not seeds)		
Dry (35 RH%)	4000	(3)
Standard (55 RH%)	8000 – 10000	(3)
Humid (85 RH%)	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/m²) wildflowers (mature plants, not seeds)		
Dry (35 (unit)(%RH?))	3500	(3)
Standard (55 (unit)(%RH?))	7000 – 9000	(3)
Humid (85 (unit)(%RH?))	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)

Summary of tested systems & parameters

	B-1	B-2
Plants	**Sedum spp. And wildflowers**	**Sedum spp.**
Fixation method	Seeds are sown in the growing medium and nurtured until fully grown.	
Lightweight growing media	A mixture of compost, coir, lytag and expanded clay.	
Fixation method	Loose laid in tray	
Tray carrier	Recycled PP	
Fixing method	Loose laid	
Substrate	Fibre cement board (12 mm ; 1280 kg/m³)	

Position of the specimen:

The specimens were tested in the flat position. No joints were applied to the specimens, due to the nature of the system.

Conditioning

Due to the nature of the product (M-Tray® modular green roof system), the conditioning in accordance with EN 13238:2010 was not respected. Instead, the amount of water (RH%) in the specimen is determined before and after each penetration test.

3. TEST RESULTS AND OBSERVATIONS

a) Moisture content

Due to the nature of the specimens, the moisture contents before and after the penetration tests were determined. This was achieved using a protimeter.

	Penetration B-1	Penetration B-2
Before (RH%)	94,1	92,0
After (RH%)	101	90,5

b) Calibration

Calibration date: 08/02/2021

Burner No:	1	2	3	4
Heatflux (kW/m²)	11,1	12,1	11,8	11,4
Criterium (kW/m²)	12 ± 1,5	12 ± 1,5	12 ± 1,5	12 ± 1,5

c) Test results

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)

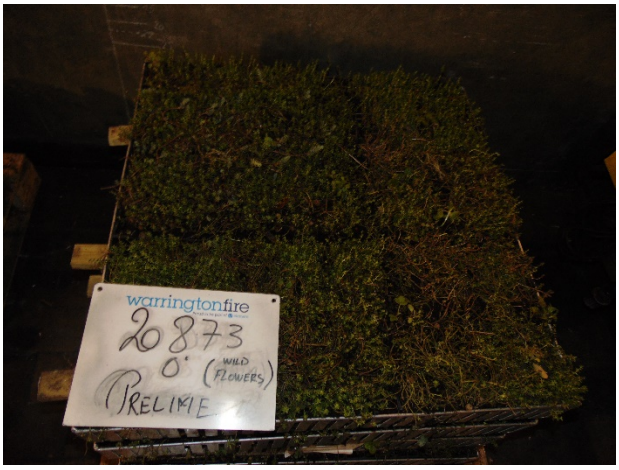
Specimen No:	B-1(*)	B-2	Average
Time to fire penetration (min:sec)	Did not penetrate	Did not penetrate	Did not penetrate
Nature of the penetration	N.a.	N.a.	-
Additional observations: None of the specimens ignited.			

(*) Reused in the official test 20873A

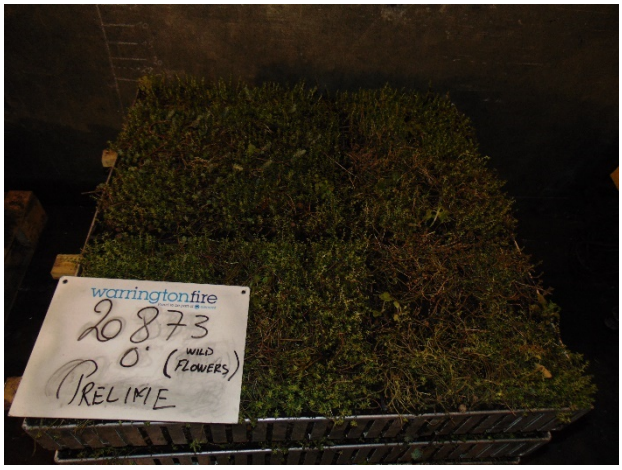
Photo of the test specimen before and after the test: annex 1.

Photo of the test specimen before and after the test

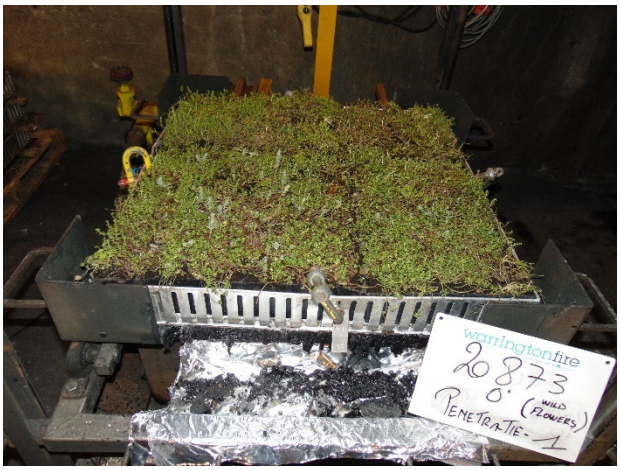
Peliminary B-1: Before



After



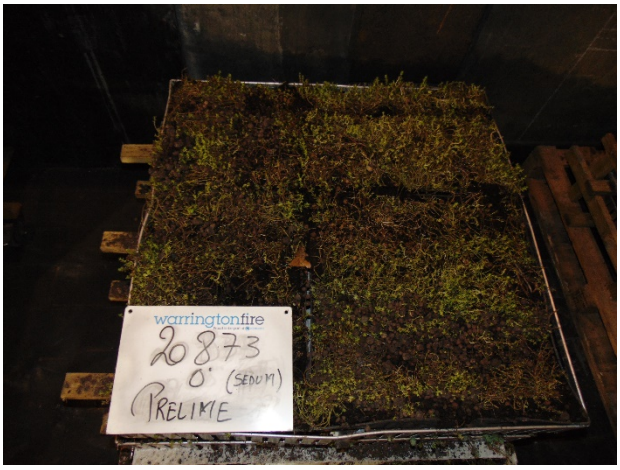
Penetration B-1: Before



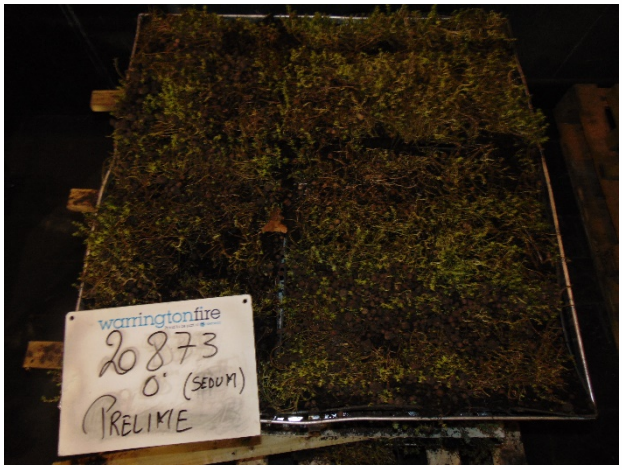
After

Photo of the test specimen before and after the test

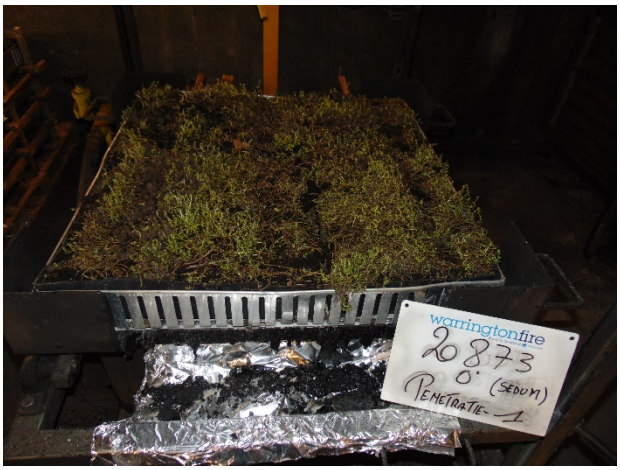
Preliminary B-2: Before



After



Penetration B-2: Before



After