

ROOFS/ROOF COVERINGS EXPOSED TO EXTERNAL FIRE - CLASSIFICATION REPORT No. EUI-24-000503

1. INTRODUCTION

This classification report defines the classification assigned to roof/roof covering, Resin Bound Gravel System, in accordance with the procedures given in BS EN 13501-5:2016.

REACTION TO FIRE CLASSIFICATION IN ACCORDANCE WITH BS EN 13501-5:2016

Sponsor: RYNO SYSTEMS LTD

Castlepoint Global Headquarters, Castle way
AB41 9RG, Ellon
UNITED KINGDOM

Product name: The roof system consists of a resin-bound stone decking installed on pedestals, which are positioned above rigid foam insulation layers. This rigid foam insulation layers are placed over a waterproofing membrane, which was applied on top of an OSB deck.
Referenced: Resin Bound Gravel System

Classification report No.: EUI-24-000503

Issue number: 1

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This classification report consists of 11 pages and shall only be used or reproduced in its entirety.

2. DOCUMENT TRACKING

Revision Index.	Modification	Comments	Date	Writer	Approver
0	Original document	/	07 th of May 2025	GRE	MKE

3. DESCRIPTION OF THE PRODUCT

3.1. GENERAL INFORMATION ABOUT THE TESTED PRODUCT

The product, Resin Bound Gravel System, is defined as an inverted roof system.

The information below were provided by the applicant who attests their accuracy.

Manufacturer / Supplier	RYNO SYSTEMS LTD Castlepoint Global Headquarters, Castle way AB41 9RG, Ellon UNITED KINGDOM	
Identification of the product	Resin Bound Gravel System	
General description	General build-up	The roof system consists of a resin-bound stone decking installed on pedestals, which are positioned above rigid foam insulation layers. This rigid foam insulation layers are placed over a waterproofing membrane, which was applied on top of an OSB deck.
	Thickness	180 mm & 495 mm
	Density	250 kg/m ³
	Mass per unit area	41 kg/m ²

3.2. PRODUCT DESCRIPTION

The roof/roof covering, Resin Bound Gravel System, comprises:

3.2.1. Roof covering details

Layers	Characteristics	Value/Description	Unit
Resin bound stone	Material	Resin bound stone	-
	Trade name	Resin bound gravel	-
	Manufacturer/supplier	Ryno ltd	-
	Thickness	25 mm	mm
	Colour	Breccia	-
	Coating reference and manufacturer/supplier (if applicable)	N/A	-
	Mass per unit area	41	kg/m ²
	Density	Not provided by the sponsor of the test.	Kg/m ³
	Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	Not provided by the sponsor of the test.	-
	Fire retardant treatment (if applicable)	N/A	-
	Fixing/application method	The aggregate was mixed with the resin and discharge on top of the stabilisation mesh.	-
	Fixing reference and manufacturer/supplier (if applicable)	Resin part A, reference 67633 – Stonebound HB UV Part A (TERRACO). Resin part B, reference 67634 – Stonebound HB UV Part B (TERRACO). Catalyst, reference 67606 – Stonebound UV Catalyst (TERRACO).	-

N/A: Not applicable

Layers	Characteristics	Value/Description	Unit
Stabilisation mesh	Material	PET (Polyethylene terephthalate)	-
	Trade name	Stabilisation mesh	-
	Manufacturer/supplier	Ryno ltd	-
	Thickness	2	mm
	Colour	Black	-
	Coating reference and manufacturer/supplier (if applicable)	N.A	-
	Mass per unit area	Not provided by the sponsor of the test.	kg/m ²
	Density	Not provided by the sponsor of the test.	Kg/m ³
	Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	Not provided by the sponsor of the test.	-
	Fire retardant treatment (if applicable)	N/A	-
	Fixing/application method	Loose laid on baseboard beneath	-
	Fixing reference and manufacturer/supplier (if applicable)	N/A	-

N/A: Not applicable

Layers	Characteristics	Value/Description	Unit
Base board	Material	Aluminium 6063-T6	-
	Trade name	BB25 Baseboard	-
	Manufacturer/supplier	Ryno ltd	-
	Thickness	25 mm overall, with 2 mm on top surface and 1.5 mm support legs.	mm
	Colour	Mill finished aluminium	-
	Coating reference and manufacturer/supplier (if applicable)	N/A	-
	Mass per unit area	10.3	kg/m ²
	Density	Not provided by the sponsor of the test.	Kg/m ³
	Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	Class A	-
	Fire retardant treatment (if applicable)	N/A	-
	Fixing/application method	Screwed to aluminium joist	-
	Fixing reference and manufacturer/supplier (if applicable)	Reference: BBF baseboard screw Manufacturer: Ryno ltd Dimension: Ø 6.3mm x 15 mm length	-

N/A: Not applicable

Layers	Characteristics	Value/Description	Unit
Aluminium joist	Material	Aluminium 6063-T6	-
	Trade name	DS25 Aluminium joist	-
	Manufacturer/supplier	Ryno ltd	-
	Thickness	25 mm	mm
	Colour	Mill finished aluminium	-
	Coating reference and manufacturer/supplier (if applicable)	N/A	-
	Mass per unit area	2	kg/m ²
	Density	Not provided by the sponsor of the test.	Kg/m ³
	Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	Class A	-
	Fire retardant treatment (if applicable)	N/A	-
	Fixing/application method	Clip into adjustable pedestals	-
	Fixing reference and manufacturer/supplier (if applicable)	N/A	-

N/A: Not applicable

Layers	Characteristics	Value/Description	Unit
Self-levelling adjustable joist support pedestal with clip-on head	Material	Polypropylene	-
	Trade name	RDA-C self levelling adjustable pedestal	-
	Manufacturer/supplier	Ryno ltd	-
	Thickness	25 mm & 340 mm	mm
	Colour	Black	-
	Coating reference and manufacturer/supplier (if applicable)	N/A	-
	Mass per unit area	2	kg/m ²
	Density	Not provided by the sponsor of the test.	Kg/m ³
	Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	Not provided by the sponsor of the test.	-
	Fire retardant treatment (if applicable)	N/A	-
	Fixing/application method	The pedestal was installed on the waterproofing membrane using a loose-laid method.	-
	Fixing reference and manufacturer/supplier (if applicable)	N/A	-

N/A: Not applicable

Layers	Characteristics	Value/Description	Unit
Rubber pad (under pedestal)	Material	Rubber pad	-
	Trade name	Base rubber shockpad	-
	Manufacturer/supplier	Ryno ltd	-
	Thickness	3	mm
	Colour	Black	-
	Coating reference and manufacturer/supplier (if applicable)	N/A	-
	Mass per unit area	Not provided by the sponsor of the test.	kg/m ²
	Density	Not provided by the sponsor of the test.	Kg/m ³
	Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	Not provided by the sponsor of the test.	-
	Fire retardant treatment (if applicable)	N/A	-
	Fixing/application method	The rubber pad was installed using a loose-laid method.	-
	Fixing reference and manufacturer/supplier (if applicable)	N/A	-

N/A: Not applicable

Layers	Characteristics	Value/Description	Unit
Rigid insulation	Material	PIR insulation	-
	Trade name	Thermaboard	-
	Manufacturer/supplier	Kingspan	-
	Thickness	50 mm, incorporating 2 layers of 25 mm.	mm
	Colour	N/A	-
	Coating reference and manufacturer/supplier (if applicable)	N/A	-
	Mass per unit area	1.75	kg/m ²
	Density	70	Kg/m ³
	Thermal conductivity	0.022	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	F	-
	Fire retardant treatment (if applicable)	N/A	-
	Fixing/application method	The insulation boards were installed using a loose-laid method.	-
	Fixing reference and manufacturer/supplier (if applicable)	N/A	-

N/A: Not applicable

Layers	Characteristics	Value/Description	Unit
Waterproofing membrane	Material	Waterproofing membrane	-
	Trade name	Bituminous Roof Membrane	-
	Manufacturer/supplier	IKO	-
	Thickness	4 mm	mm
	Colour	Black	-
	Coating reference and manufacturer/supplier (if applicable)	N/A	-
	Mass per unit area	3.2	kg/m ²
	Density	80	Kg/m ³
	Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	Not provided by the sponsor of the test.	-
	Fire retardant treatment (if applicable)	N/A	-
	Fixing/application method	Loose laid onto OSB boards.	-
	Fixing reference and manufacturer/supplier (if applicable)	N/A	-

N/A: Not applicable

3.2.2. Decking/supporting construction

Layers	Characteristics	Value/Description	Unit
Oriented Strand Board	Material	Plywood	-
	Trade name	18 mm OSB 3 board	-
	Manufacturer/supplier	Cordiners timber & building supplies	-
	Thickness	18 mm	mm
	Colour	N/A	-
	Coating reference and manufacturer/supplier (if applicable)	N/A	-
	Mass per unit area	Not provided by the sponsor of the test.	kg/m ²
	Density	Not provided by the sponsor of the test.	Kg/m ³
	Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
	PCS value	Not provided by the sponsor of the test.	MJ/m ²
	Reaction to fire classification, according to EN 13501-1	Not provided by the sponsor of the test.	-
	Fire retardant treatment (if applicable)	Not provided by the sponsor of the test.	-
	Fixing/application method	The OSB board was installed on the sample holder using a loose-laid method.	-
	Fixing reference and manufacturer/supplier (if applicable)	N/A	-

N/A: Not applicable

These products conform to the following European Standard(s), ETAs or other relevant product specifications:
None

4. REPORTS AND RESULTS IN SUPPORT OF THIS CLASSIFICATION

4.1. REPORTS

Name of Laboratory	Name of sponsor	Report ref. no	Test method
EFFECTIS UK/Ireland	RYNO SYSTEMS LTD	EUI-24-RT4-000503	CEN/TS 1187:2012 Test 4
EFFECTIS UK/Ireland	RYNO SYSTEMS LTD	EUI-24-000503- REXAP	CEN/TS 16459:2019

4.2. TEST RESULTS

4.2.1. Test conditions:

Test pitch	0°
Deck	18 mm OSB 3 board
Supporting structure	N/A

4.2.2. Preliminary test (Stage 1):

Parameter	Criteria				Test results ^a		Compliance			
	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)	Test 1	Test 2	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)
Burn time (min:s)	< 5 min	< 5 min	< 5 min	≥ 5 min	< 5 min	< 5 min	Yes	Yes	Yes	Yes
Flame spread distance (mm)	< 0.38 m	< 0.38 m	< 0.38 m	No limit	< 0.38 m	< 0.38 m	Yes	Yes	Yes	Yes
Penetration	None	None	None	None	None	None	Yes	Yes	Yes	Yes

4.2.3. Penetration test (Stage 2):

Parameter	Criteria				Test results					Compliance			
	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)	Test 1	Test 3	Test 4	Test 5	Mean ^b	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)
Penetration time (min:s)	≥ 60 min	< 60 min	< 30 min	< 30 min	≥ 60 min	≥ 60 min	≥ 60 min	≥ 60 min	≥ 60 min	Yes	Yes	Yes	Yes
		≥ 30 min											

^b 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 the penetration.

Note: Test 2 was terminated prematurely due to an apparatus failure during the testing process. Consequently, an additional test was conducted to replace it. To avoid any confusion in the results, the test 2 (sample D) was removed from this test report.

5. CLASSIFICATION AND FIELD OF APPLICATION

5.1. REFERENCE

This classification has been carried out in accordance with BS EN 13501-5:2016.

5.2. CLASSIFICATION

The roof / roof covering, Resin Bound Gravel System, in relation to its external fire performance is classified:

B_{ROOF} (t4)

This European Standard does not represent type approval or certification of the product.

5.3. FIELD OF APPLICATION

This classification is valid for the product parameters and composition, as tested, described in the section 0 test report(s) in support of the classification listed in 4.1.

The classification is valid for the following end-use parameters:

Parameters	Conditions
Range of pitches	Valid only for $0^\circ \leq \text{pitch} \leq 10^\circ$
Decking & supporting construction	18 mm OSB 3 board (As tested), without joints.

5.4. EXTENDED FIELD OF APPLICATION

According to the statement of CEN/TS 16459:2019, §5 and §D.2, table D.1, the classification is also valid for the following product and end-use parameters.

The classification is valid for the following product parameters for roof covering / roof systems:

- Exposed layer: Resin bound stone: As tested
- Layer 1: Stabilisation mesh: As tested
- Layer 2: Base board: As tested
- Layer 3: Aluminium joist: As tested
- Layer 4: Self-levelling adjustable joist support pedestal with clip-on head

Characteristics	Value/Description	Unit
Material	Polypropylene	-
Trade name	RDA-C self levelling adjustable pedestal	-
Manufacturer/supplier	Ryno ltd	-
Thickness	Valid for any thickness between 25 mm & 340 mm	mm
Colour	Black	-
Coating reference and manufacturer/supplier (if applicable)	N/A	-
Mass per unit area	2	kg/m ²
Density	Not provided by the sponsor of the test.	Kg/m ³
Thermal conductivity	Not provided by the sponsor of the test.	W/m.K
PCS value	Not provided by the sponsor of the test.	MJ/m ²
Reaction to fire classification, according to EN 13501-1	Not provided by the sponsor of the test.	-
Fire retardant treatment (if applicable)	N/A	-
Fixing/application method	The pedestal was installed on the waterproofing membrane using a loose-laid method.	-

Fixing reference and manufacturer/supplier (if applicable)

N/A

-

- Layer 5: Rubber pad (under pedestal): Base rubber shock pad, as tested
- Layer 6: Rigid insulation: PIR insulation, as tested
- Layer 7: Waterproofing membrane: Bituminous Roof Membrane, as tested
- Supporting deck layer: OSB, as tested

6. LIMITATIONS

6.1. RESTRICTIONS

Consult classification standard and national laws and regulations for limitations on the period of validity of the classification.

6.2. WARNING

This European Standard does not represent type approval or certification of the product. The test laboratory has, therefore, played no part in sampling the product for the test, although it holds appropriate references, supplied by manufacturer, to provide for traceability of the sample tested.

Report	Name	Signature ^a	Date
Prepared by	Guillaume REMY	X  Project Leader Signed by: Guillaume REMY	07 th of May 2025
Reviewed by	Maurice McKEE	X  Testing Technical Supervisor Signed by: Maurice McKee	07 th of May 2025

^a For and on behalf of Efectis UK/Ireland