

TEST REPORT

Lucideon Reference: UK242293 (QT-75151/1/JB)/Ref. 1

Project Title: Testing of Rockwool Ltd.'s Rainscreen Insulation System Fixed Using 50 mm Metal Washers in Accordance with BRE Digest 346-7

Client: Rockwool Ltd
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1 INTRODUCTION

Lucideon Limited were contracted by Rockwool Ltd. to conduct fatigue wind load testing in accordance with BRE Digest 346:1989 The Assessment of Wind Loads Part 7: Wind Speeds for Serviceability and Fatigue Assessments, on their Rainscreen Insulation System.

Testing was complete between 2 and 6 November 2024 within the Structures Laboratory, Queens Road, Penkhull, Stoke-on-Trent, ST4 7LQ.

2 SAMPLE CONSTRUCTION

Rockwool Ltd. supplied Lucideon with the following:

- NyRock® Rainscreen 032 600 mm x 1200 mm x 125 mm (W x L x D).
- NyRock® Frame Slab 032 600 mm x 1200 mm x 100 mm (W x L x D).
- EJOT JT3-D6H-5.5/6.3 x 147 mm Self-Drilling Screws.
- EJOT 50 mm Metal Washers (no specification supplied by the client).
- Proctor Group Ltd Self-Adhesive Wraptite 1500 mm x 10000 mm (1.5 m wide x 10 m long).

Lucideon constructed a 3200 mm x 2600 mm light gauge steel (LGS) frame consisting of:

- Header and base track – 3200 mm x 70 mm x 104 mm x 1.2 mm (L x H x W x T).
- Studs – 2600 mm x 70 mm x 102 mm x 1.2 mm (L x H x W x T).
- Screws – 4.2 x 19 mm self-drilling wafer head screws.

The LGS frame was clad with 1200 mm x 2400 mm x 12 mm cement bonded particle board using 4.2 mm x 32 mm self-drilling countersunk fasteners at 100 mm centres down each stud and around the peripheral edge of the board.

Proctor Group Ltd Self-Adhesive Wraptite was installed onto the wall by representatives from Proctor Group Ltd on 23 February 2024.

NyRock® 125 mm Rainscreen 032 panels were installed per Rockwool Ltd.'s Installation Guidance which can be found in Appendix A using EJOT JT3-D6H-5.5/6.3 x 147 mm Self-Drilling screws with EJOT 50 mm Metal Washers in the centre of each insulation panel and covering joints between panels.

NyRock® 100 mm Frame Slab 032 panels were installed between the LGS studs per Rockwool Ltd.'s Installation Guidance which can be seen in Appendix B.

3 TEST METHOD

The sample was placed and sealed into Lucideon's dynamic wind loading test apparatus.

The sample was then subjected to a number of proportional sequential loading cycles in accordance with Table 1 of BRE Digest 346 Part 7.

Table 1 Fatigue test representing typical UK service loads in 50-year exposure period

	Number of cycles	Percentage of design pressure
	1	90
	960	40
Apply sequence	60	60
five times	240	50
	5	80
	14	70
Finish with	1	100

Figure 1 – Table 1 from BRE Digest 346 Part 7

The sequence of cycles was repeated five times to represent the exposure over 50 years, followed by a single gust of 2.4 kPa.

The behaviour of the sample was observed following each sequential loading cycle.

The design pressure given by Rockwool Ltd was 2.4 kPa.

4 RESULTS

The sample completed all loading cycles with little evidence of any degradation of the sample.

Three of the washers were further embedded into the NyRock® 125 mm Rainscreen 032 panels following testing than they were prior to testing.

This result should give Rockwool Ltd.'s Rainscreen Insulation system a 50-year design life with regards to wind loading.

Photographs of the sample following testing can be seen in the Plates Section of this report.

NOTE: The results given in this report apply only to the samples that have been tested.

END OF REPORT

PLATES



Plate 1 – Metal Washer Embedded Deeper Following Testing (1)



Plate 2 – Metal Washer Embedded Deeper Following Testing (2)



Plate 3 – Metal Washer Embedded Deeper Following Testing (3)



Plate 4 – Test Wall Following Completion of Testing

NyRock® Rainscreen 032

Tools required

- Sharp insulation knife

General

- Installation of the product should be in accordance with current good building practice.
- The product can be cut using a fine-toothed saw or sharp knife.
- Cavity barriers should be provided at the junction of the external wall and roof space.
- It is important to ensure a tight fit between slabs. Trimming must be accurate, to achieve close-butted joints and continuity of insulation.
- The slabs should be close-butted at all vertical and horizontal joints, and at corners. The horizontal joints of the slabs should be staggered, in accordance with good practice.

Cladding system in conjunction with steel/timber frame or concrete

- Slabs should be close-butted at all vertical and horizontal joints. The horizontal joints of the insulation should be staggered in accordance with good practice.
- Fixings should have a minimum head diameter of 70 mm. A typical fixing pattern has three fixings per square metre with one metal fixing at the centre of every slab (see Figure 1). Note that the adequacy of this or any other fixing pattern should be verified on a per-project basis through assessment by a suitably qualified individual.
- The following non-exhaustive list of companies can supply fixings suitable for use with NyRock Rainscreen 032: Ejot, Fixfast, Fischer, ITW Construction Products, Hilti.
- The product should be cut and tightly fitted around wall brackets where these occur.
- For a typical installation, a breathable membrane is placed between the sheathing board and the product and a VCL is placed between the plasterboard and the frame (see Figures 2 and 3).

Figure 1

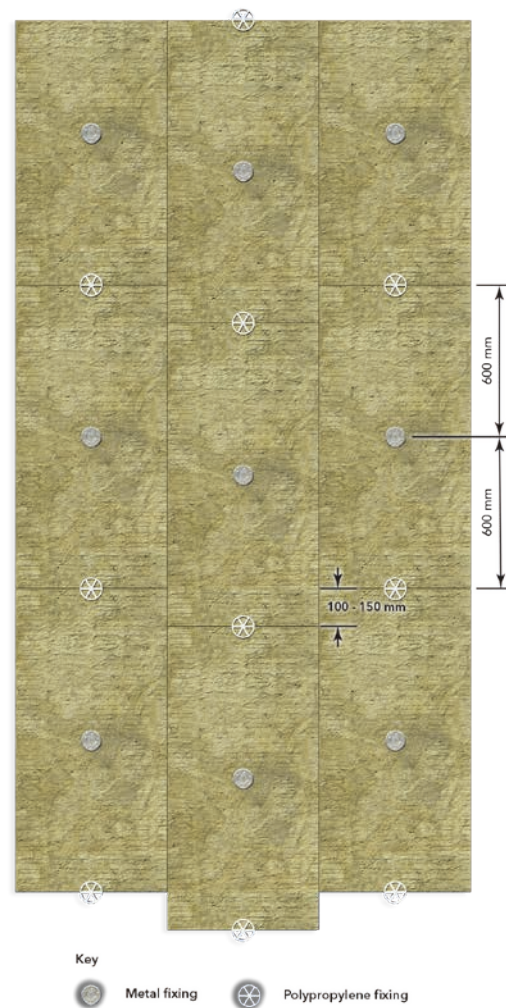


Figure 2
Cladding system in conjunction with steel frame

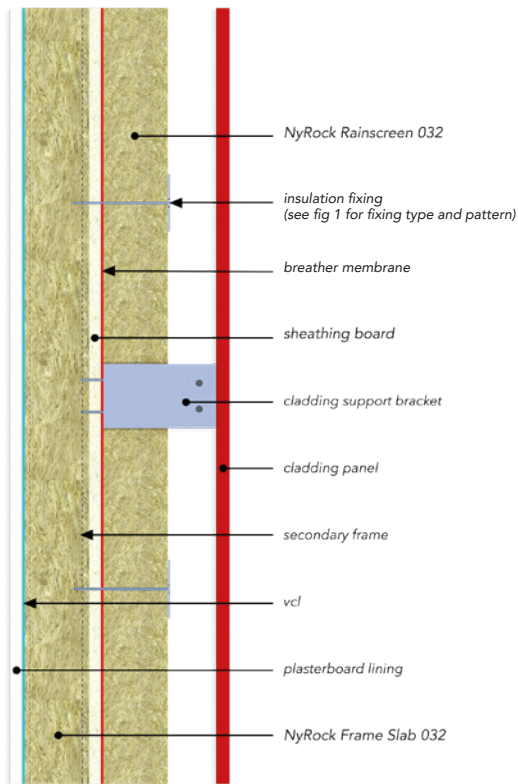


Figure 3
Cladding system in conjunction with timber frame

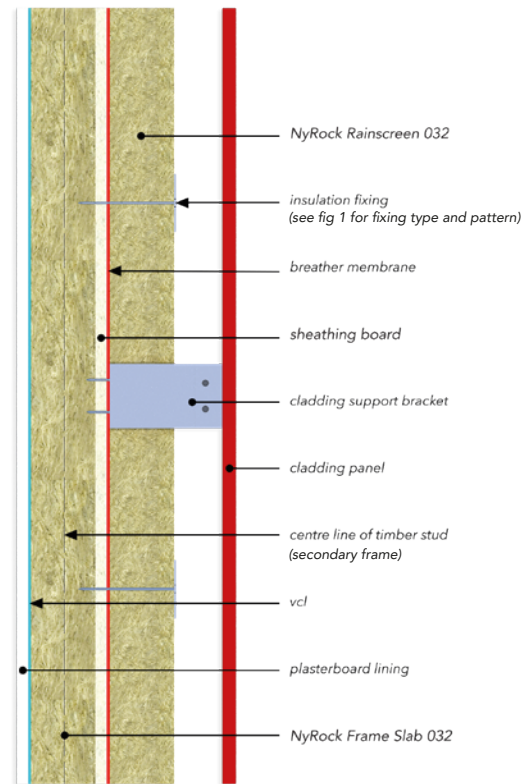
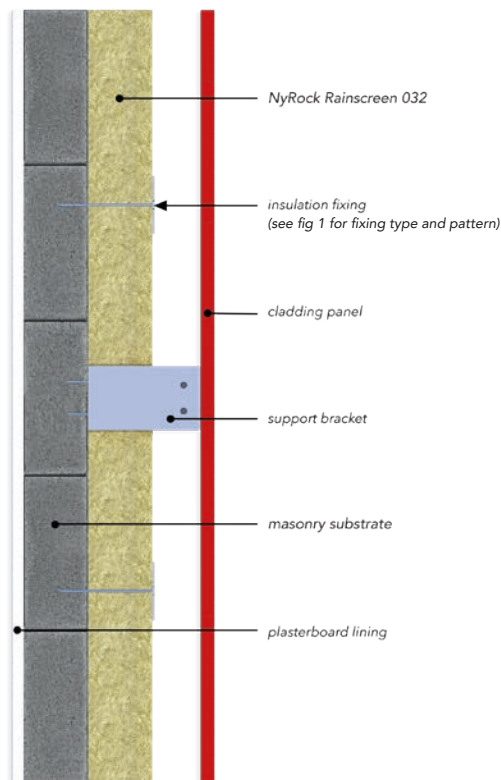


Figure 4
Cladding system in conjunction with concrete/masonry



Illustrations shown are in plan view

Masonry outer in conjunction with steel/timber frame

- Slabs should be carefully cut to fit around any protrusions into the cavity.
- A VCL is placed between the plasterboard and the frame. A breathable membrane is placed between the sheathing board and the product — see Figures 5 and 6.
- The insulation should be installed to coincide with the frame, with retaining discs used in conjunction with the wall ties at no more than 600 mm horizontally and 450 mm vertically.
- After each section of the leading leaf is built, excess mortar should be removed from the cavity face and mortar droppings cleaned from exposed edges of the installed board, before installation of the next run of boards. Use of a cavity board or a cavity batten will protect the installed board edges and help to keep the cavity clean as the following leaf is built.

Figure 5
Masonry outer in conjunction with steel frame

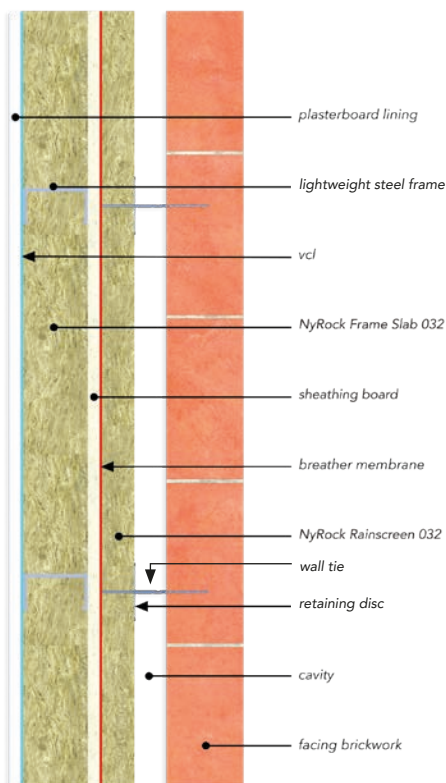
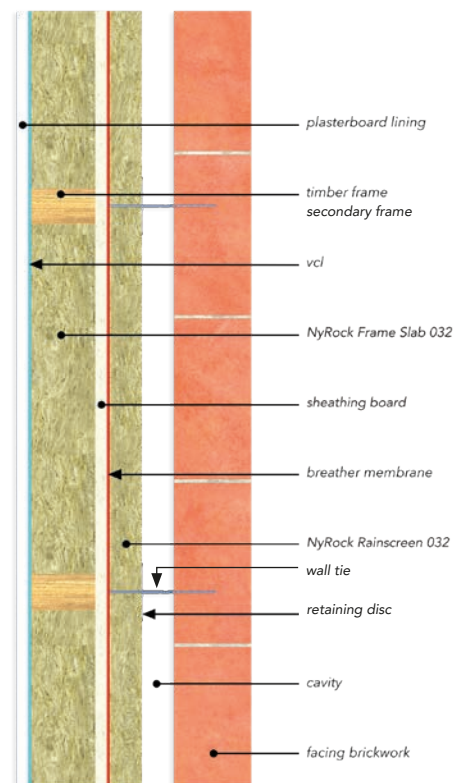


Figure 6
Masonry outer in conjunction with timber frame



*Wall ties should be embedded into the mortar joint.
Excess mortar must be removed from the inside face of the brick to prevent any bridging of the cavity.

Illustrations shown are in plan view

Health & safety

The mechanical effect of fibres in contact with skin may cause temporary itching.



Cover exposed skin
When working in unventilated area wear disposable face mask.



Clean area using vacuum equipment.



Waste should be disposed of according to local regulations.



Rinse in cold water before washing.



Ventilate working area if possible.



Wear goggles when working overhead.



NyRock[®] Frame Slab 032

Tools required

- Insulation saw
- Tape measure

Installing ROCKWOOL NyRock Frame Slab 032

1. Pre-install Preparation

- When installing into a wall frame, check that the centres are at 600mm then select an appropriate product width and thickness.

2. Installation Preparation

- Assemble tools such as an insulation saw, tape measure and PPE (personal protective equipment) such as gloves, mask if working in an unventilated area, and eye protection when working overhead. Cover all exposed skin. Refer to the EURIMA health and safety guidelines for further guidance when working with mineral wool.
- Carry out a pre-work safety check, identifying any potential hazards such as ease of access, work heights, trip hazards, and electrical safety. Check the construction ensuring it is structurally sound and free from defects such as corrosion, splitting, cracking and look for signs of leaks and moisture which can cause rot and mould.
- Clean and prepare the area for installation. Clear space to hold the insulation. When installing overhead wear protective eyewear. If installing at height, it is recommended this is done from a suitable structure such as scaffolding, rather than a step ladder, so that both hands can be used to safely fit the insulation. Ventilate the area if possible, and ensure it is well lit.

3. Measuring and cutting

- Using a tape measure, measure the internal aperture of the frame.
- Note that frame centre measurements include the thickness of the timbers / steel making up the structure, and that they may not always be consistent, so it is best to measure the internal aperture accurately to ensure the best possible fit, particularly when installing into older structures.
- Use an insulation saw, or knife with a serrated blade, for cutting the insulation to size. Do not over cut the insulation. Allow an extra 10mm on both dimensions (width and length) of the insulation, over and above the aperture dimensions.

4. Installation

- The density and dimensional stability of ROCKWOOL stone wool allows a tight friction fit. It will not require pinning or fixings unless specifically stated otherwise.
- To install, simply push the insulation into one side of the structure and let the insulation go so it tightly fits into the other side of the structure and holds in place.
- Ensure there are no visible gaps, as this will negatively affect the installed performance.
- Consider the dimensional tolerances of the wall before designing the width of the cavity. An extra 5mm above the nominal slab thickness will normally be sufficient.

Health & safety

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Clean area using vacuum equipment.



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Rinse in cold water before washing.



Ventilate working area if possible.



Wear goggles when working overhead.

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