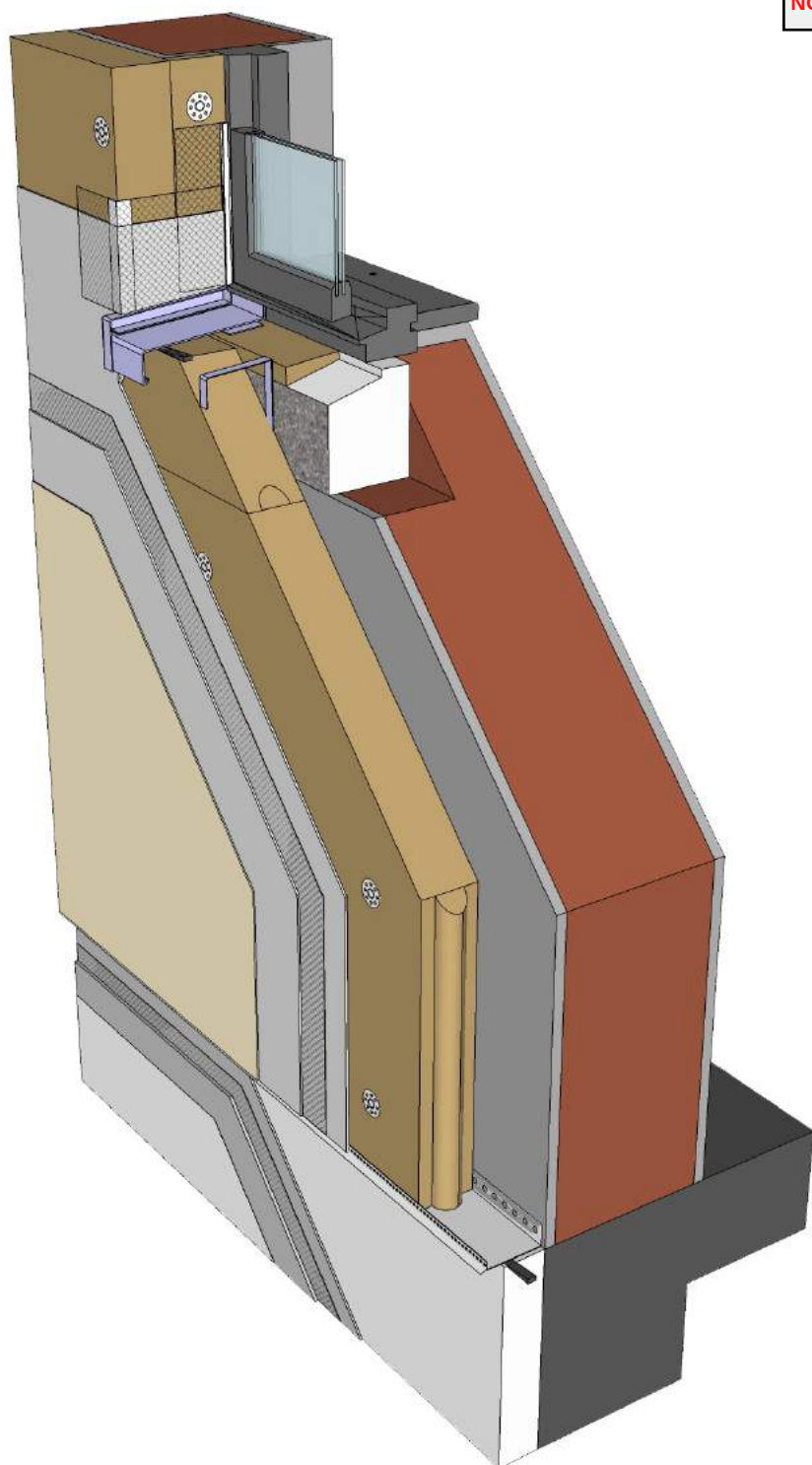


Technical Manual, NBT External Wall Insulation Render System

NOTE: DIFFUTHERM HAS NOW BEEN REPLACED BY ISOLAIR



NBT MASONRY EWI - Render

Introduction

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NBT Timber Frame Render System

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 No limits to architectural design: NBT CLAD System and NBT EWI RENDER System facades interact together

NBT Masonry Render Systems

The building system is a masonry structure insulated externally with woodfibre (Diffutherm) and finished with render.

Made from over 95 % waste softwood and under 5 % inert water-proofing additives, NBT PAVATEX DIFFUTHERM, are a genuinely sustainable non-toxic building material.

To produce NBT PAVATEX boards, waste wood fibres are pulped and mixed with water. The pulp is heated to activate the natural lignin they contain in order to glue the fibres together. The pulp is then pressed into boards, dried, and cut to size.

The advanced manufacturing process uses the inherent properties of wood fibres to produce boards with many excellent technical qualities for thermal and acoustic insulation, thermal storage capacity, vapour permeability and moisture control.

NBT MASONRY EWI - Render

Introduction

Performance Guide

A modern wall insulation system must do more than just protect building occupants from cold. It must create a comfortable and healthy environment in all possible combinations of external and internal conditions and control the effects of external heat, cold, noise and internal moisture generation.

NBT Building Systems

Keep the building warm for longer in cold weather:

Low thermal conductivity and high vapour permeability provide high thermal insulation with no risk of interstitial condensation. Vapour barriers are unnecessary. Woodfibre boards reduce the effect of thermal bridging and the interlocking board design easily achieves good windtightness, so increasing thermal performance. Energy use for heating is significantly reduced leading to lower CO2 emissions and running costs.

Keep the building quieter:

The high mass and the fibrous texture of NBT PAVATEX woodfibre boards give excellent acoustic performance to buildings.

Keep the building cooler in hot weather:

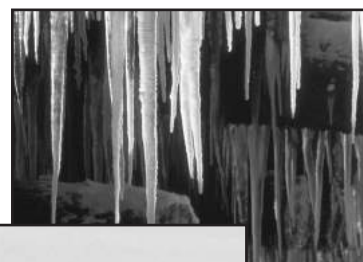
The unique combination of high density, high specific heat capacity and low thermal conductivity gives External Wall Insulation (EWI) solutions the effect of thermal mass that would normally be associated with render onto masonry. Compared to conventional EWI material the risk of condensation behind the render during cold nights is minimized as the boards will store the day's heat.

Keep the building dry and breathable:

NBT PAVATEX woodfibre boards are very vapour permeable and hygroscopic. This allows them to disperse accumulating short term moisture and protect vulnerable elements of the building fabric, with no reduction in the performance of the boards themselves. The boards allow moisture from within the structure to pass easily to the outside. This provides a safeguard against high moisture content. This is vital for the long-term health of the building fabric, and is completely overlooked by most conventional insulation systems.

NBT Natural Insulation Products for:

Simple and robust
Improved heat storage
Excellent sound insulation
Highly vapour permeable constructions that do not need membranes to control interstitial condensation
Substantial saving of build cost compared with conventional timber frame construction
Simple robust construction has few skilled operations and is easily adapted for off site manufacture
Reduced thermal bridging - ideal to achieve high standard and beyond



NBT MASONRY EWI - Render

Airtightness

Principle

A building envelope should be airtight when all ventilation openings are closed. The design requirement for air changes has to be provided by opening the windows manually, other controllable ventilation openings or suitable mechanical ventilation systems.

When assessing the air permeability of the building envelope, the following aspects must be considered separately:

- Individual building components must exhibit the necessary airtightness in accordance with building component standards
- The overall air permeability of the building envelope must meet the limiting and target values of building regulations
- Local air permeability (leaks, primarily on the inside) can lead to moisture damage because they allow moist interior air to infiltrate the construction
- Local air permeability and associated draughts can have a detrimental effect on the thermal comfort of the occupants and can also lead to increased energy consumption

Air permeability

The air permeability of the building envelope is specified by the ratio of surface area of the building to the hourly air exchange rate for a 50 Pa pressure difference. In Part L Building Regulations an air permeability of 10.0 m³/m²/h is allowed. 0.6 Air changes/hour at 50 Pa pressure for Passivhaus .

Design and construction

To ensure that the building envelope has the necessary degree of airtightness, an airtightness layer is required over all parts of the construction on the warm side of the thermal insulation. Generally, the vapour control layer and airtight layer functions are combined and provided by one membrane, sheeting or a board type material (OSB, multi-ply board, plywood, gypsum fibreboard, etc.). Such materials require fixings and permanent air tight seals at joints and junctions in the form of adhesive tape, glue, mechanical fasteners etc., or may need to be held in place with battens.

Rock wool and glass-fibre boards, wood fibreboards, wooden panelling, planking, acoustic linings, building papers, plaster board etc. cannot achieve the degree of airtightness required for modern buildings.

The airtightness layer must be conceived at the design stage as a “seamless” layer over the entire building envelope, planned with its practical installation in mind, and shown as a separate layer on all drawings. Good planning includes corresponding information in the tender documents and detail in the working and fabrication drawings. The materials used to achieve the airtightness must be sealed airtight at junctions with adjoining elements

such as windows, doors and foundations. The installation of several layers each of which are only partially airtight will not result in a building with an adequate degree of sealing.



△ Sketch of the principle of an airtightness layer: Build tight, ventilate right.

Testing

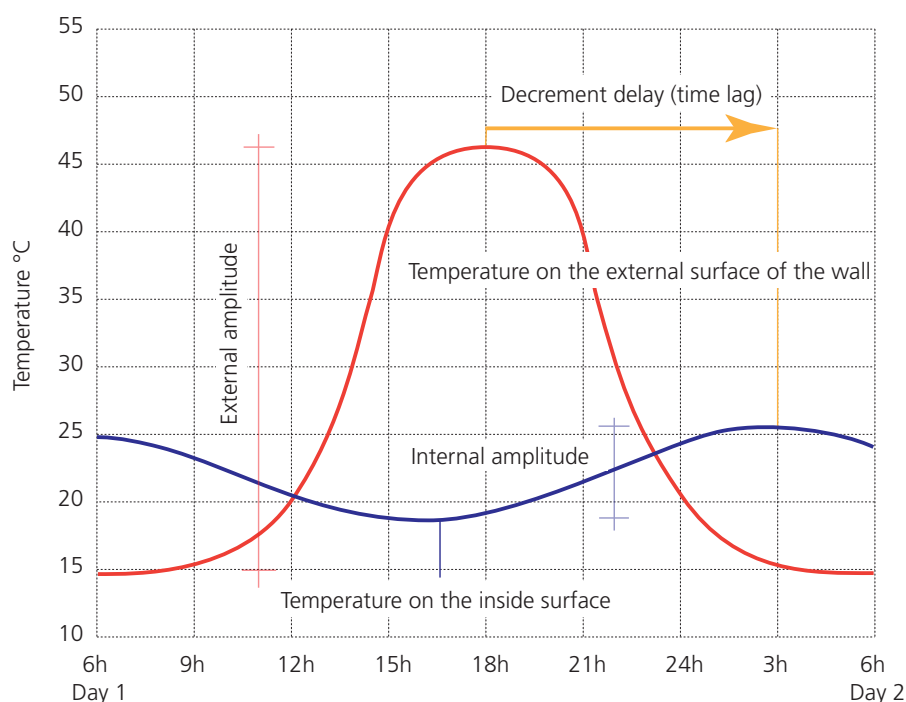
In order to achieve an air-

tight building envelope, measures and checks during construction and after completion of the building are necessary. If the airtightness layer has been properly designed and planned, expensive blower door measurements, leak detection by means of smoke tests or IR thermography, and unnecessary costs of repairs can be saved.

A properly designed and constructed building will fulfil airtightness requirements without the need for further special work. NBT systems provide proper design and site support to ensure that the correct levels of airtightness are achieved.

NBT MASONRY EWI - Render

Summer Overheating



Selecting the right insulation

As part of a building's design it is important to consider the effects of summer overheating control, particularly when there are rooms in roofs or where the construction system is lightweight such as steel or timber frame.

Summer overheating is caused by any or a combination of three reasons:

- high internal gains from appliances, people, machines etc.
- high solar gain through windows due to poor summer shading
- heat passing directly through the walls

The solution to the first is to reduce the gains or ventilate, the second requires better shading, and the third is solved by reducing peak heat gain to the room by changing the decrement delay and factor.

Decrement delay and factor can be thought of as the amount a peak external surface temperature is smoothed out by the structure, and the time that the peak is delayed before it reaches the inside.

To reduce the solar heat passing through a roof or a wall, a low decrement factor is needed, and more importantly, it should delay the passage of heat by between

6 - 12 hours after the external solar radiation peak – this means that the decrement delay of a wall or roof construction should be between 6 - 12 hours.

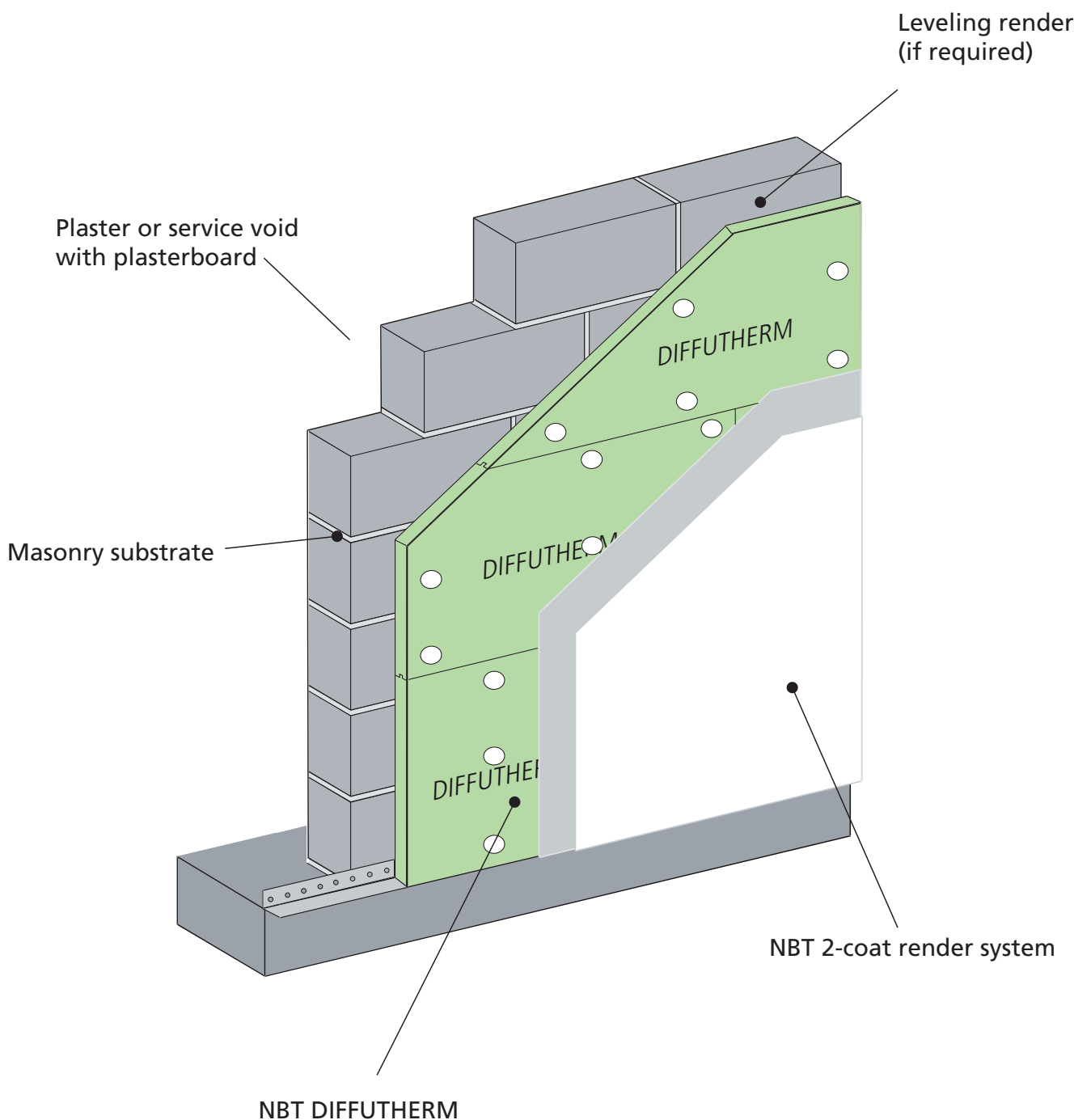
In terms of achieving these satisfactory values, an insulation material that has a high thermal mass is needed to produce better values. A combination of density, thermal conductivity and specific heat capacity is required.

NBT PAVATEX woodfibre boards have an excellent combination of low λ (k-value) (0.038 - 0.047 W/m²K), high specific heat capacity (2100J/kgK) and for insulation boards a high density (140 - 240 kg/m³). These values far exceed any conventional insulation material. This means that with NBT PAVATEX woodfibre insulation a roof or "lightweight" structure such as lightweight frame building can perform as though it was a much more massive structure.

The consequence is the reduction of internal temperatures by 4° C or more in summer compared to a room which may have the same U-value but conventional insulation.

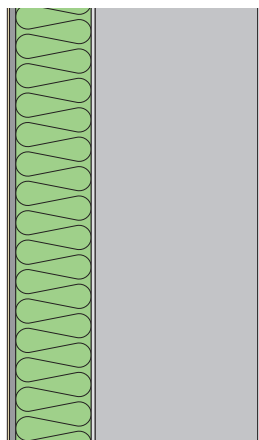
NBT MASONRY EWI - Render

Rendered System



NBT MASONRY EWI - Render

Physical Properties



1. NBT 2-coat render system
2. NBT DIFFUTHERM 60/80/100/120 mm
3. Existing Render (≥ 5 mm for airtightness)
4. Existing Masonry Wall
5. Existing Plaster (≥ 5 mm for airtightness)

1. 2. 3. 4. 5.

215 mm brick work

10 mm horizontal mortar bed

Insulation onto substrate	NBT DIFFUTHERM					
	100 mm	120 mm	140 mm	160 mm	180 mm	200 mm
U-Value [W/m ² K]	0.35	0.28	0.25	0.22	0.20	0.18
Admittance [W/m ² K]	1.48	1.51	1.52	1.52	1.52	1.
Sound insulation ca. [dB]	52	53	53	54	54	55
Decrement delay [h]	15.25	16.31	17.53	18.86	20.15	21.43

500mm Sandstone Wall

9.4% mortar fraction

Insulation onto substrate	NBT DIFFUTHERM					
	100 mm	120 mm	140 mm	160 mm	180 mm	200 mm
U-Value [W/m ² K]	0.33	0.28	0.24	0.21	0.19	0.17
Admittance [W/m ² K]	1.48	1.48	1.52	1.52	1.52	1.51
Sound insulation ca. [dB]	52	53	53	54	54	55
Decrement delay [h]	21.60	21.60	23.92	>24	>24	>24

Note: Calculations are done according to BS EN ISO 6946:1997 and BR 443.

- 215mm Brick Layer is chosen as a standard inner leaf, due its new location in the build-up (dry inner leaf).
- 500mm Rubble Sandstone wall is made up of layers of stone and mortar, according to the guidance in Historic Scotland technical paper 'U-values-and-Traditional-Buildings' to better reflect thermal resistance of massive stone/rubble walls. Sandstone thermal conductivity is 2.3 W/mK, please check NBT for U-value with alternative stones.
- 120mm insulation layer onto masonry is made of 60mm NBT DIFFUTHERM & NBT PAVATHERM 60mm
- 140mm insulation layer onto masonry is made of 60mm NBT DIFFUTHERM & NBT PAVATHERM 80mm
- 160mm insulation layer onto masonry is made of 60mm NBT DIFFUTHERM & NBT PAVATHERM 100mm
- 180mm insulation layer onto masonry is made of 60mm NBT DIFFUTHERM & NBT PAVATHERM 120mm
- 200mm insulation layer onto masonry is made of 60mm NBT DIFFUTHERM & NBT PAVATHERM 140mm

NBT MASONRY EWI - Render

Designers: Key Considerations

General:

Provide the contractor with full and complete details for all critical areas of the system including those listed below. Leave nothing to be agreed "on-site".

System Guarantee:

The NBT EWI RENDER system is guaranteed only if boards, mortars, renders and accessories approved by NBT are used. NBT DIFFUTHERM has LABC (Local Authority Building Control) approval and BBA (British Board of Agreement) approval (BBA CERTIFICATE No 10/4723).

The NBT MASONRY RENDER system is certified for use in rain exposure zones (EZ) 1- 4

DPC-Level:

Do not use NBT DIFFUTHERM boards below DPC level. Use boards suitable for wet exposure (EPS, XPS) and a different NBT base coat (HM 50) in the plinth area (i.e. within 300 mm of ground level).

Building Height:

The NBT EWI RENDER system is for use in buildings where the height to the top floor is ≤ 18 m. If intended for use in higher buildings, contact NBT for advice.

Non Load Bearing:

The NBT EWI RENDER system must be designed so that no loads from the structure are carried by the boards or render.

Only lightweight fittings can be attached directly to the NBT DIFFUTHERM boards. Carefully plan the location of down-pipes, lights, security systems etc.

Movement Joints:

Movement joints in the substrate must be incorporated into the NBT EWI RENDER system. Consider render only movement joints for walls ≥ 18 m.

Weather Tightness:

For weather tightness seal the boards against the structure at all joints, intersections, openings and penetrations and along all edges using ISO-BLOCO expanding sealing tape.

For weather tightness, seal the render around all openings (door/window) using the appropriate APU rail (Frame seal bead).

Rain Penetration:

Design a positive strategy for avoiding rain penetration of the external wall insulation system. This will include:

- Generous overhangs for roofs, sills and copings (in no case ≤ 30 mm), drip details on all overhangs
- Careful detailing of flashings at critical areas eg. balconies, decks, walkways, parapets, copings, service penetrations, roof abutments, intersecting and adjoining buildings, etc.
- Window and door frames set back from the external face of the wall by at least the thickness of the insulation boards

Airtightness:

Carefully detail the layer for airtightness at all openings and at internal corners and junctions.

Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

Fire Resistance:

NBT EWI RENDER system has been tested by Warrington Fire (report no 154324) and achieves a fire resistance of 60 minutes according to BS EN 1365-1:1999.

Render:

Colours:

Please be aware, when choosing colours for the top coat, that it must be taken into account that the LIGHT-BRIGHT RELATION VALUE is not less than 20.0. This is due to the fact that dark colours can be directly linked to elevated thermal stress, which leads to an increased risk for cracks.

Please check page 29 and 30 of the BAUMIT Product Brochure "Render, Plasters, Mortars" for further information and a wide range of different colours.

HBW should be 20 min.

Grain size:

Coarse-grained finishes (2 - 5 mm grain sizes) are preferred for long-term durability and appearance.

Apply equalisation paint to the finish render coat to avoid discolouration from uneven drying.

To select paints for applying to the finished surface without significant reduction of the vapour permeability of the RENDER system, refer to NBT.

NBT MASONRY EWI - Render

Installers: Key Considerations

General:

The NBT EWI RENDER system must only be installed by approved contractors who have been trained by NBT.

The details and specifications in this guide and from the and from the designer should be followed as the basis of a successful installation.

The system is guaranteed if only boards, mortars, renders and accessories approved by NBT are used.

Movement joints in the substrate must be incorporated into the NBT EWI RENDER system.

Only lightweight fittings can be attached directly to the NBT DIFFUTHERM boards. Carefully plan the location of down-pipes, lights, security systems etc.

Boards:

Plan board layout to reduce wastage prior to commencing installation.

A base rail must be used to start the system.

Minimum bond overlap is 200 mm between courses.

Boards must not be wet or damaged and board edges must be tightly butted together.

Tightly fill all gaps with woodfibre.

For weather tightness seal the boards against the structure at all joints, intersections, openings and penetrations and along all edges.

Do not use the NBT EWI RENDER system below DPC level.

Use appropriate boards (XPS) and a different NBT base coat (HM 50) in the plinth area (i.e. within 300 mm above ground level).

Do not allow the boards to stand exposed to weather for more than 60 days after fixing before applying the render system.

Renderers:

Do not apply the render system onto rain-soaked boards or when the air temperature is below 5° C and avoid working in strong, direct sunlight.

The reinforcing mesh should lie in the outer 1/3 of the base coat layer and sheets should overlap by at least 100 mm.

Additional mesh reinforcement is required around all openings, along all corners and edges, across zones where suspended floors intersect walls and where boards are applied over different substrates, along continuous straight board joints and over repaired areas.

Seal the render around all openings using the appropriate APU rail (Window Frame Sealing Bead).

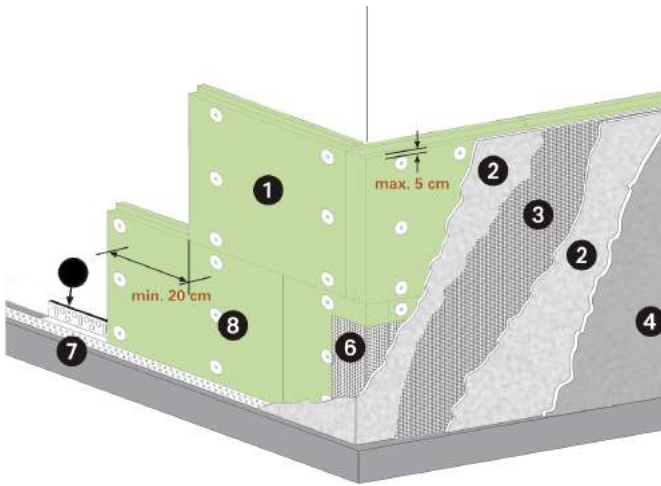
Allow 1 day per 1 mm thickness drying time for the base coat before applying the topcoat.

Apply equalisation paint to the finish render coat to avoid discolouration from uneven drying. This is not required where the top coat is Silica, Silicon or Nanopor top coat render is used.

For premixed Top coat apply DG27 primer for suction and key.

NBT MASONRY EWI - Render

Installation Procedures



- 1 NBT DIFFUTHERM insulation board
- 2 NBT base coat (MC 55 W)
- 3 NBT reinforcement mesh
- 4 NBT decorative finish
- 5 Solid substrate
- 6 Wemico mesh corner bead
- 7 Wemico base rail
- 8 EJOT NT U or STR U fixing
- 9 ISO-BLOCO sealing tape

General:

The system comprises NBT DIFFUTHERM boards and NBT thin mesh coat renders supplied together with all accessories by NBT.

Access:

Scaffolding and access to the work must be carried out in accordance with current CDM and Health and Safety Regulations.

Adverse Weather/Storage:

Application of the system must only take place in suitable weather conditions, in accordance with NBT recommendations and good rendering practice. Work may be protected if necessary. Do not apply the NBT EWI RENDER system in ambient temperatures below 5° C. Boards should be rendered within 2 months. Boards should be stored flat and dry. Edges should be protected to prevent damage to tongue.

Cutting:

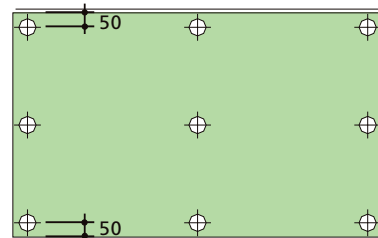
The boards are easily cut with any of the following tools:

- NBT PAVATEX jigsaw blades (bayonet fitting to suit most makes of jigsaws)
- Standard wave edge insulation knife
- Circular saw, hand-held or bench mounted with a fine, cross-cut, tungsten tipped blade

Safety goggles and dust mask must be worn during cutting to protect the user from the small, nonhazardous, dust particles.

Fixings:

NBT DIFFUTHERM boards need to be fixed with special thermally-broken fasteners. The washer rest just below



the surface of the NBT DIFFUTHERM. In general **9 fixings per board** if all sides (T&G) are engaged with adjacent boards. Increase the number of fixings at the open board edges (near opening, base, corners etc.)

NBT recommends fixings -

- Ejot NTU (min. embedment 35mm) for solid substrate
- Ejot STR-U (min embedment 35mm) for soft substrate.

Length of fixing = thickness of board + thickness existing render + 35mm min. embedment

"Remove pin for hammer in NTU fixings and insert plug into well cleaned drill hole (depth gauge recommended to achieve embedment + 10mm) until washer meets surface of diffutherm, hammer in so that washer plate rests just below surrounding surface of diffutherm"

Fixings specs must be consulted with project structural engineer. Pull-out test and wind-loading calculation recommended to determine fixing numbers. Ejot can help to perform in situ pullout test. Contact NBT for advice.

NBT MASONRY EWI - Render

Installation Procedures

Board System:

Below the DPC and in the plinth area (up to 300 mm above finished ground level) use XPS plinth boards; above the plinth area use NBT DIFFUTHERM boards

Fitting:

Above plinth area: Fix the base rail and corner rail above DPC to substrate, using 2 fixing per meter. Rail connector clips may be fitted at all rail joints. Attach clip-on drip profile to complete run of base and corner rail.

Locate the 1st course of NBT DIFFUTHERM boards tightly in the base rail channel with grooved side down and edge tongue and groove joints fully engaged. Fix through the boards into the substrate using recommended number of fixings per board. Increase fixings at the edges. The faces of the boards should be flush.

Install 2nd course in ½ bond pattern, over-lapping board ends at vertical corners, ensuring all board joints are fully engaged and tightly packed. Fix to substrate as for 1st course. Increase fixings at the corner.

Fill any gaps and areas of damaged boards with loose woodfibres and apply a “patch” of reinforcing mesh at least 200 mm larger than area of damage/repair.

Openings and Abutments:

At all openings, service penetrations and free edges, seal the board to the structure/service substrate using ISO-BLOCO sealing tape to create a weather tight joint.

Reveals:

Fully paste the rear side of the reveal boards using NBT base coat and trowel through using a tooth trowel. Apply a ISO-BLOCO sealing tape along the edge of the board and place the board tightly up against the window or door frame. if required use reveal fixings (Ejot DDA)

Render System:

Apply APU rails to all door and window frames to form a weather tight joint.

Apply diagonal strips of mesh reinforcement (see diagram) across the corners of all openings and continuous strips of mesh reinforcement above the base rail and along all free board edges into 2 mm of NBT base coat mortar.

Apply NBT base coat mortar to all corners and reveals and set fibreglass mesh beads plumbed and aligned to a render depth of 5 - 8 mm.

Hand or machine apply NBT base coat over the board surface and straighten out. Comb with a tooth trowel to an overall depth of 4 - 6 mm then place sheets of fibreglass mesh lightly onto the render (≥ 100 mm overlap).

Apply a further 2 - 3 mm coat of NBT base coat and smooth out. On hardening, scrape back the surface with the edge of a trowel.

Apply 2 - 3 mm decorative finish coat after 6 days. Apply equalizing paint after 6 days.

For premixed Top coat apply DG27 primer for suction and key.

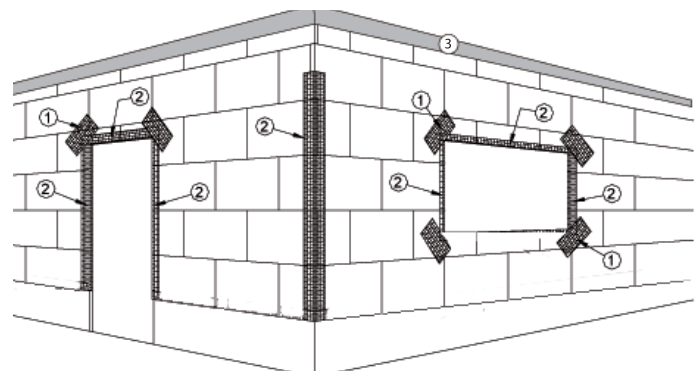
Additional Meshing:

To reduce the risk of cracking, additional mesh reinforcement is required along all exposed board edges and around all openings.

Bed the mesh in NBT base coat mortar and then apply the main meshed render layer.

In the diagram below additional mesh is shown across the corners of window and door openings (1), along all reveals and corners (2) and Mesh strips 500 mm wide at floor level

An additional band of mesh should be applied across the zone where suspended floor joists bear onto timber frame walls (3).



NBT MASONRY EWI - Render

Installation Procedures

System Movement Beads:

Where structural movement joints or change in substrate occur a system movement bead should be incorporated into the NBT EWI RENDER system to prevent cracking due to differential movement. NBT recommends Wemico PVC system movement bead.

Render Movement Beads:

Render movement joints in the substrate must be incorporated into the NBT EWI RENDER system every 18m on a continuous horizontal span.

ISO-BLOCO sealing tape:

For weather tightness seal the boards against the structure at all joints, intersections, openings and penetrations and along all edges using ISO-BLOCO sealing tape. Such areas include window and door frames, sills, eaves and soffit boards. ISO-BLOCO is also recommended around service penetration into the Diffutherm.

System Stop or Butting to other substrate:

Where boards butt up to other substrates or need a stop (Mid terrace), use system stop profile at the edge of Diffutherm. Seal the junction by ISO-BLOCO sandwiched between the substrate and the stop profile.

NBT MASONRY EWI - Render

Detail Solutions

1 Edges:

- Weather tightness with use of ISO-BLOCO sealing tape

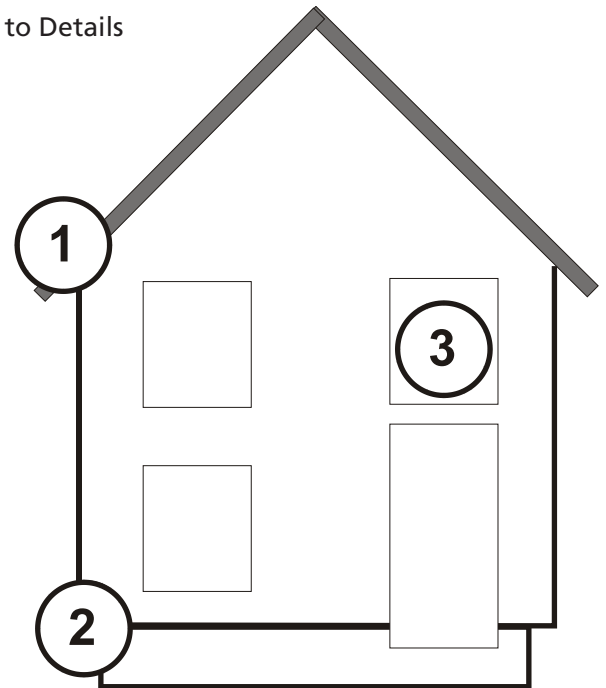
2 Plinth:

- Plinth area 300 mm
- Use plinth & perimeter insulation board (XPS) in plinth area
- Use base rail at bottom of NBT DIFFUTHERM

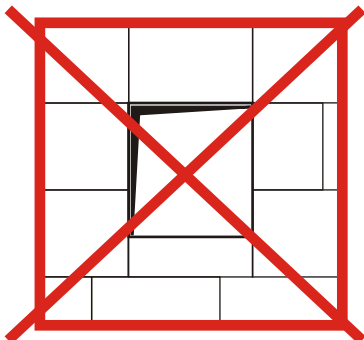
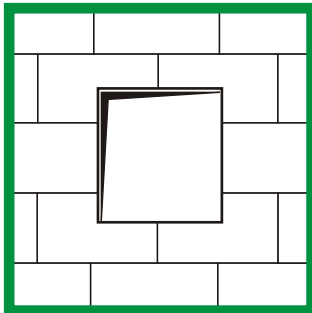
3 Window and door:

- Weather tightness with use of ISO-BLOCO sealing tape and APU-rails (window frame sealing bead)
- Use window sills with up stands. For wind driven rain exposur zone 3&4 use expansion resistance sill ends. Contact NBT for details.
- NBT DIFFUTHERM board pattern to window and door opening (see below)

Key to Details



Board Pattern:



NOTE:

PLEASE FIND STANDARD DETAIL DRAWINGS AT THE END OF THIS MANUAL. Contact NBT for full detail manual or for specific detail help.

Set out NBT DIFFUTHERM boards so that board edges DO NOT coincide with the corners of wall openings.

Always ensure that the vertical joints are staggered by at least 200 mm between courses.

NBT MASONRY EWI - Render

Components & Accessories



NBT base coat (MC 55 W onto NBT DIFFUTHERM)

Factory prepared white lime-cement dry powder mortar in accordance to BS EN 998-1. Base coat onto NBT DIFFUTHERM. Not recommended for plinth area. Grain size 0 - 1.2 mm, yield 1.0 kg/m² per mm thickness. Comes in 25 kg bag.

BYMC55W BAUMIT MC 55 W



NBT base coat (HM 50 onto plinth & perimeter board)

Factory prepared lime-cement dry powder mortar in accordance to DIN 18557 and BS EN 998-1. To use in plinth area onto XPS plinth insulation board. Grain size 0 - 1.2 mm, yield 1.2 kg/m² per mm. Comes in 25 kg bag.

BYHM50 BAUMIT HM 50



NBT decorative finish (top coat onto NBT base coat)

Factory prepared white lime-cement dry powder mortar in accordance to BS EN 998-1. Available in 200 colours. Comes in 25 kg bag.

SEP01: Grain size 0 - 1 mm, yield 2.2 kg/m²/2mm

SEP02: Grain size 0 - 2 mm, yield 3.3 kg/m²/2mm

SEP03: Grain size 0 - 3 mm, yield 4.0 kg/m²/3mm

BYSEP01 BAUMIT SEP01

BYSEP02 BAUMIT SEP02

BYSEP03 BAUMIT SEP03



ArtLine Egalisation / BasicEGA (equalization paint)

Silicon-based paint to equalize NBT SEP topcoat. Additional driven rain protection but very vapour open. Yield 0.2 l/m² (only one coat required). Comes in 5 l or 15 l tub.

BYSF00LO Colour silicon paint 15 l or 5 l

BYSF00WHITE White silicon paint 15 l or 5 l

Please check www.natural-building.co.uk or contact NBT for other top coat finishes

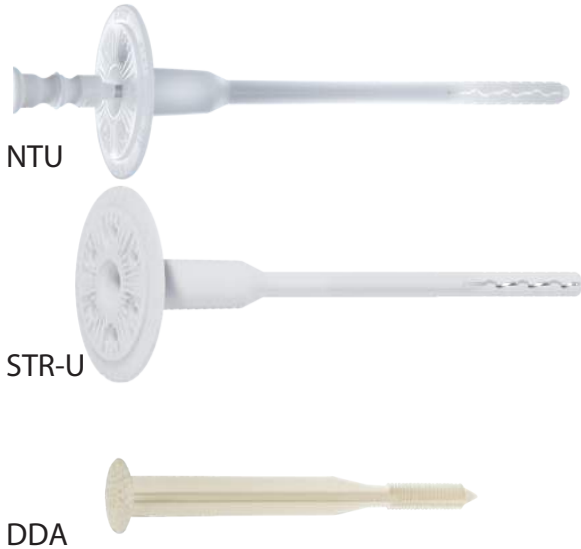
Natural Building Technologies Ltd

The Hangar, Worminghall Road, Oakley, Buckinghamshire. HP18 9UL

T: 01844 338338 F: 01844 338525

info@natural-building.co.uk www.natural-building.co.uk

Components & Accessories

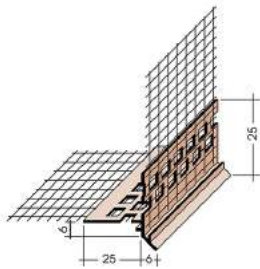


EJOT NTU and EJOT STR-U + STR-U plug

For fixing NBT DIFFUTHERM wood fibre insulation boards onto masonry. Min. embedment of 35 mm into masonry. The polystyrenes plug is needed for STR-U inserted in the washer head cavity to ensure least thermal bridging. Heat loss through conduction is therefore substantially reduced. Add existing render depth when calculating fixing length.

EJOT DDA reveal fixings

Reveal insulation board anchor fixing for masonry substrate
Available in 50mm and 75mm for 20mm and 40mm reveal
boards respectively.

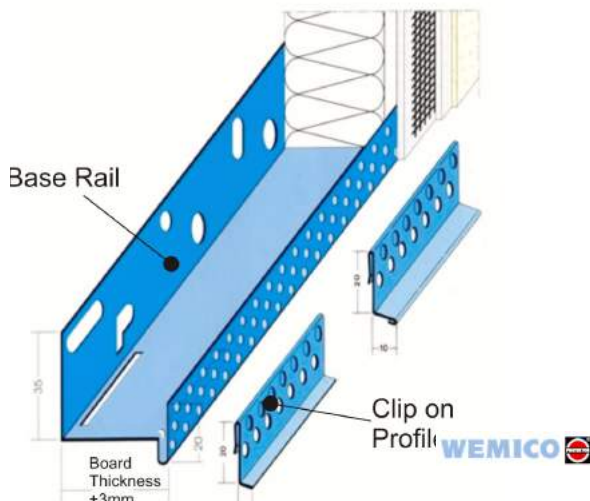


PVC Balcony Drip Bead with mesh, 6mm, 3794

Window head and balcony corner mesh bead with in-built drip profile.

Base rail & clip on profile

The base rail is generally fixed at DPC level to act as a base for the first layer of NBT DIFFUTHERM. The clip-on profile is then clipped to the front edge of the rail to provide a clean edge for the render to finish to. Length 2500 mm.



BYY9146	Base rail aluminium 60 mm*
BYY9148	Base rail aluminium 80 mm*
BYY9150	Base rail aluminium 100 mm*

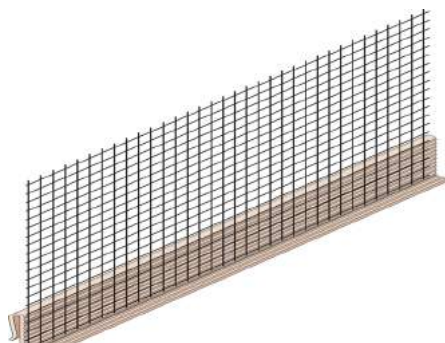
BYY9121	Base rail clip aluminium 6 mm*
BYY9124	Base rail clip aluminium 10 mm*

* Stainless steel also available

PVC Clip on profile

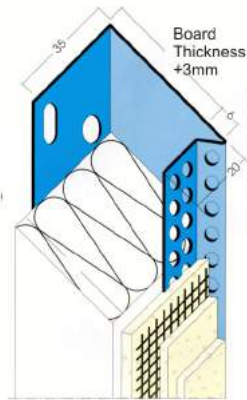
The PVC clip-on profile with integrated mesh provide better connection with the main mesh.

Length 2500 mm.
Drip - 6mm & 10mm



NBT MASONRY EWI - Render

Components & Accessories

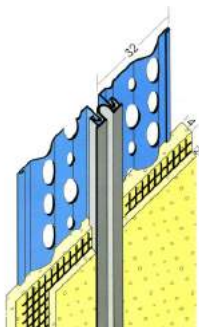


WEMICO

System Stop Profile

Similar in appearance to the base rail the stop end profile is used where the NBT DIFFUTHERM system finishes up against another wall of a different type, e.g. against timber or rainscreen cladding or a masonry wall. They are fixed vertically against the other wall with ISO-BLOCO sealing tape between the profile and wall to ensure the joint is sealed against the weather. The lip on the edge of the profile is used to provide a solid edge for the render to finish up to. Length 2500 mm.

BY9246	Stop profile aluminium 60 mm
BY9248	Stop profile aluminium 80 mm
BY9250	Stop profile aluminium 100 mm

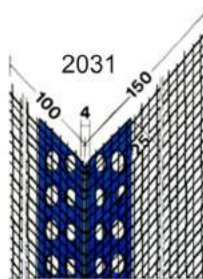
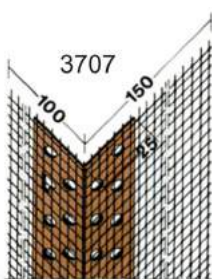


WEMICO

Movement beads

Applied where a movement joint occurs in the structure. The boards must be spaced apart over the joints and the bead set in NBT base coat mortar across the joint. Provides a neat joint to take up movement of the render. Length 3000 mm.

BYWE79/79	Stainless steel for render 6 mm
BYWE80/80	Stainless steel for render 10 mm



WEMICO

Corner mesh angle

PVC or stainless steel meshed angles are used on the corners of windows, doors and building corners to provide a straight reinforced edge for the render to finish to. Fixed prior to rendering with NBT base coat to the NBT DIFFUTHERM boards and levelled up. Length 2500 mm.

BY3707	Corner mesh bead PVC
BY2031	Corner mesh bead stainless steel



NBT PAVATEX jigsaw blade

Bayonet fitting jigsaw blade from PAVATEX for cutting woodfibre insulation boards. Length approx. 130 mm.

PAVZK	NBT PAVATEX cutting blades
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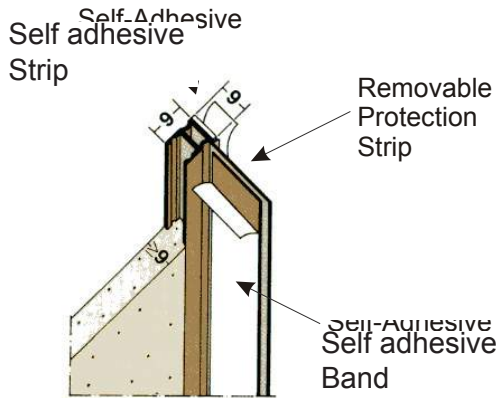
The Hangar, Worminghall Road, Oakley, Buckinghamshire. HP18 9UL

T: 01844 338338 F: 01844 338525

info@natural-building.co.uk www.natural-building.co.uk

NBT MASONRY EWI - Render

Components & Accessories



APU Rail

Fixed to door or window frames tight against the edge of the NBT DIFFUTHERM. The render is finished flush with the outside of the APU rail and the sacrificial strip removed. Provides a secondary waterproof seal with no additional mastic required. Self-adhesive band can be removed to enable a protective sheet to be applied to cover door and windows - this is then discarded by breaking away the removable protection strip. Length 2600 mm. Packed in bundles of 50.

BYY3726

APU sealing bead PVC

ISO-Bloco sealing tape

An expanding foam sealant applied around the frames of windows and doors, under window sills and soffits. Also around projections through the wall such as pipes or balcony steels. Provides a waterproof seal at these junctions. Length 4300 mm or 12000 mm.

FXISO-600 2-6

ISO-BLOCO sealing tape for joints up to 6mm

FXISO-600 6-15

ISO-BLOCO sealing tape for joints up to 15mm



Reinforcing mesh

Small, 300 mm x 300 mm patches are first applied diagonally to the corners of windows and doors. When the specified render thickness has been applied the reinforcing mesh is applied into the surface of the wet render. The mesh should overlap 100 mm where it meets. Prevents cracking and increases flexibility. Roll: 50 m length, 1 m width

BYYR131

Glassfibre mesh

PVC base profile (Adjustable) with mesh 6, 10 & 14mm

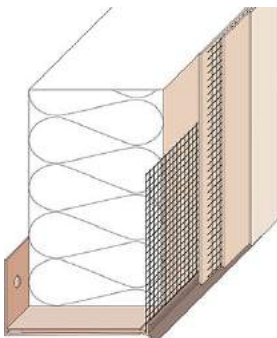
Two part system with built-in drip and mesh, have been designed to cut thermal bridging and are adjustable to suit wall thicknesses.

Thickness -

60 - 90mm

100 - 160mm

160 - 220mm



Roof with Extended Eaves (or New Sproket)

Thermal Performance of Junction

- Ensure insulation is well fixed to the substrate
- Ensure the continuity of the insulation throughout the junction. make sure to apply insulation around the external corner of base plate (wall plate).

Airtightness Layer Continuity

- External wall insulation reduces air infiltration through walls, however, if possible –
- Ensure all penetrations through woodfibre/plinth board are sealed with Iso-Bloco expanding foam tape
- Ensure internal airtightness continuity between the wall and the floor.
- Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

Weather Tightness Continuity

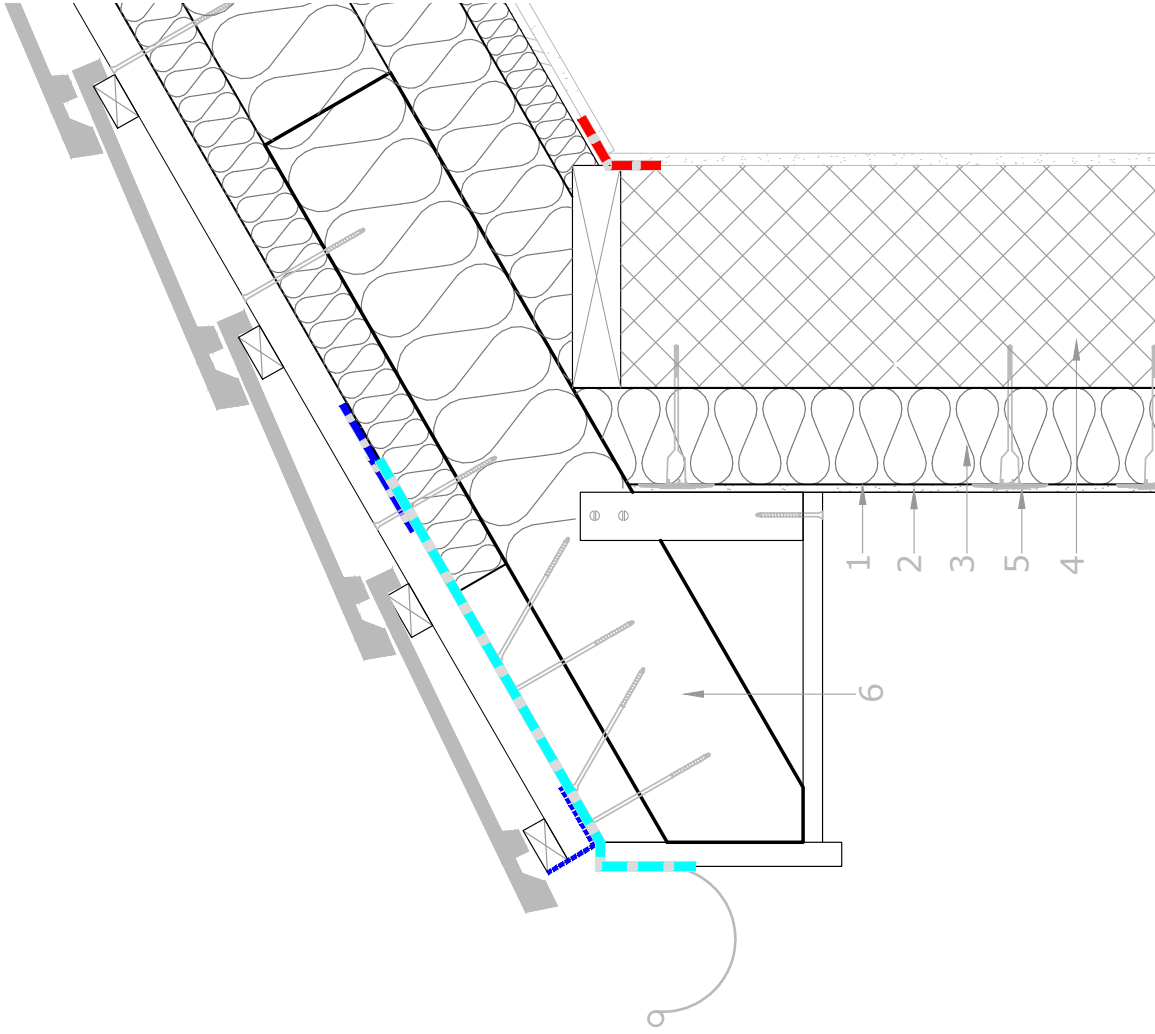
- Ensure the Diffutherm board top edge butt tight to the roof insulation (Isolair).
- Ensure Diffutherm is rendered or sealed with appropriate stop-profile at all exposed junctions
- Ensure all penetrations through Diffutherm/plinth board are sealed with iso-bloco expanding foam tape (prior to application of base coat) and secondary mastic seal (following application of base coat and prior to finish coat)

Notes

- For exposed soffit extend the Diffutherm board to the underside of flashing membrane butt to roof insulation and render to finish.
- Please refer NBT Retrofit Roof Detail Manual for roof specifications.

Key to Components

- NBT Top coat (options available)
- NBT MC55 6mm base coat render (meshed)
- NBT Diffutherm T&G boards
- Existing Substrate
- NBT recommended fixings (NTU or STRU)
- New roof extension sprocket.



RETROFIT EWI - NBT RENDER SYSTEM - Plinth Detail

Re-EWI-R-WF-01

Standard Plinth - 300mm Plinth height with drip

Thermal Performance of Junction

- Extend plinth board well below interior floor level where possible to minimise thermal bridging through foundations
- Ensure insulation is well fixed to substrate
- Ensure Diffutherm sits firmly in base-rail and plinth board butts closely to the underside, use PVC base-rail to minimise thermal bridging

Airtightness Layer Continuity

- External wall insulation reduces air infiltration through walls, however, if possible –
- Ensure all penetrations through woodfibre/plinth board are sealed with iso-bloco expanding foam tape
- Ensure internal airtightness continuity between the wall and the floor.
- Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

Weather Tightness Continuity

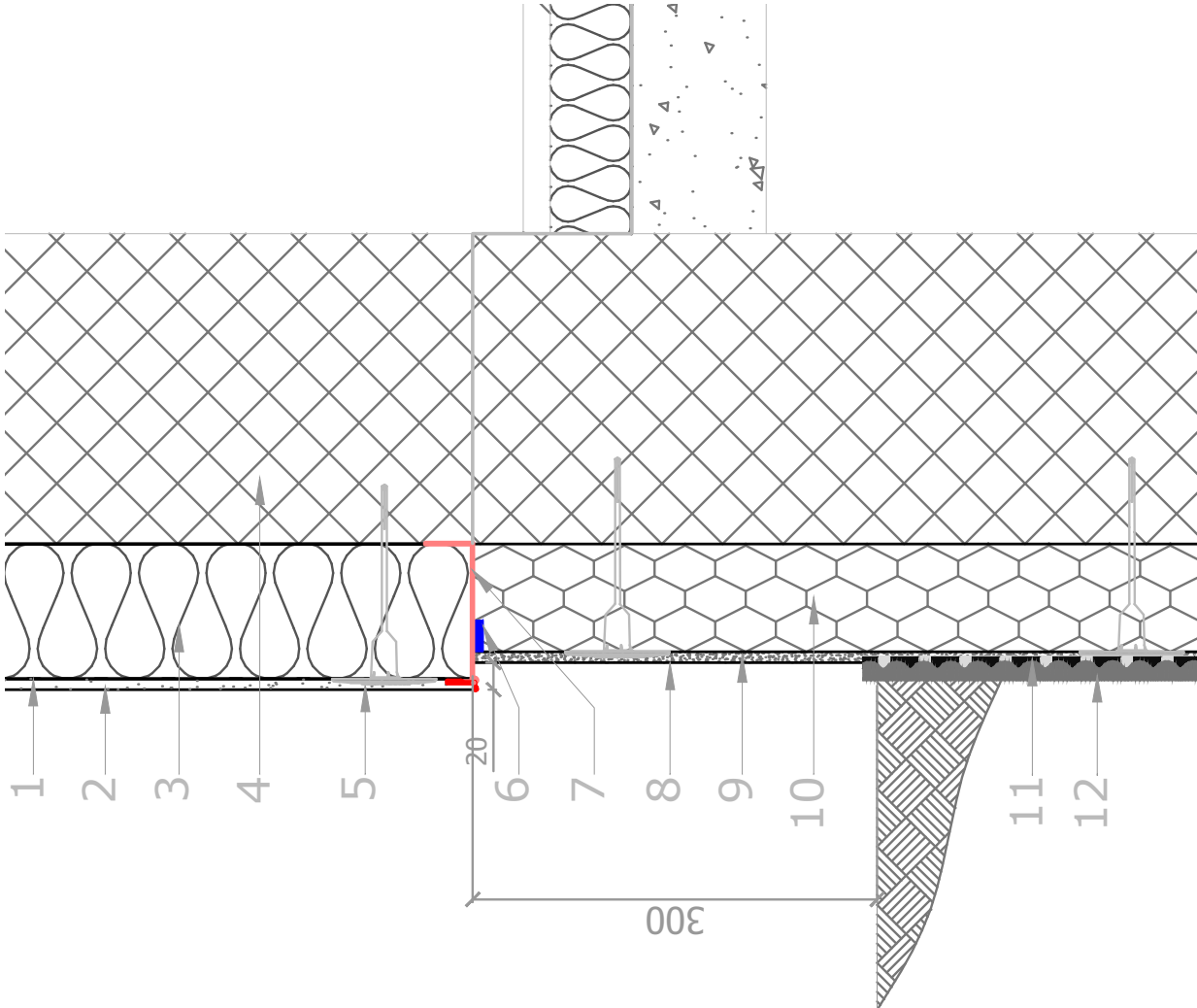
- Iso-bloco expanding foam tape to be installed along topmost edge of plinth board (under base-rail) to prevent tracking moisture. Ensure the base-rail drip is proud of plinth board by 20mm
- Ensure Diffutherm is rendered or sealed with appropriate stop-profile at all exposed junctions
- Ensure all penetrations through Diffutherm/plinth board are sealed with iso-bloco expanding foam tape (prior to application of base coat) and secondary mastic seal (following application of base coat and prior to finish coat)
- Undertake drainage measure at wall base to ensure water falls away from wall (French drain with soak away, ground surface inclined away from wall)

Notes

- Do not block existing airbricks to underfloor voids under suspended timber floors - add airbrick extensions where required. Conversely, ensure airbricks to heated internal spaces are blocked (providing they are not necessary for Building Regs. Requirements) and adopt appropriate internal ventilation strategy.

Key to Components

- | | |
|--|--|
| 1. NBT Top coat (options available) | 9. NBT HM50 6mm base coat (meshed) |
| 2. NBT MC55 6mm base coat render (meshed) | 10. NBT Plinth & Perimeter board |
| 3. NBT Diffutherm T&G boards | 11. Damp proof membrane |
| 4. Existing substrate (Brick, Stone or other) | 12. Combined drainage and protection layer |
| 5. NBT NTU or STRU masonry fixings | |
| 6. NBT expansion sealing tape. (ISO-BLOCO 600) | |
| 7. NBT base rail & base rail drip clip | |
| 8. NBT HM50 2mm top coat, finish - NBT Silicon or NBT Nanopor paint) | |



- 150mm Plinth height with drip
- THERMAL PERFORMANCE OF JUNCTION

Extend plinth board well below interior floor level where possible to minimise thermal bridging through foundations

Ensure insulation is well fixed to substrate

Ensure Diffutherm sits firmly in base-rail and plinth board butts closely to the underside, use PVC base-rail to minimise thermal bridging

AIRTIGHTNESS LAYER CONTINUITY

External wall insulation reduces air infiltration through walls, however, if possible –

Ensure all penetrations through woodfibre/plinth board are sealed with iso-bloco expanding foam tape

Ensure internal airtightness continuity between the wall and the floor.

Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

WEATHER TIGHTNESS CONTINUITY

Iso-bloco expanding foam tape to be installed along topmost edge of plinth board (under base-rail) to prevent tracking moisture. Ensure the base-rail drip is proud of plinth board by 20mm

Ensure Diffutherm is rendered or sealed with appropriate stop-profile at all exposed junctions

Ensure all penetrations through Diffutherm/plinth board are sealed with iso-bloco expanding foam tape (prior to application of base coat) and secondary mastic seal (following application of base coat and prior to finish coat)

Undertake drainage measure at wall base to ensure water falls away from wall (French drain with soak away, ground surface inclined away from wall)

Protect the first 300mm above ground level of the build-up using NBT Plinth base coat.

NOTES

Do not block existing airbricks to underfloor voids under suspended timber floors - add airbrick extensions where required. Conversely, ensure airbricks to heated internal spaces are blocked (providing they are not necessary for Building Regs. Requirements) and adopt appropriate internal ventilation strategy.

KEY TO COMPONENTS

1. NBT Top coat (options available)

2. NBT MC55 6mm base coat render (meshed)

3. NBT Diffutherm T&G boards

4. Existing substrate (Brick, Stone or other)

5. NBT NTU or STRU masonry fixings

6. NBT expansion sealing tape. (ISO-BLOCO 600)

7. NBT base rail & base rail drip clip

8. NBT HM50 2mm top coat, finish - NBT Silicon or NBT Nanopor paint)

9. NBT HM50 6mm base coat (meshed)

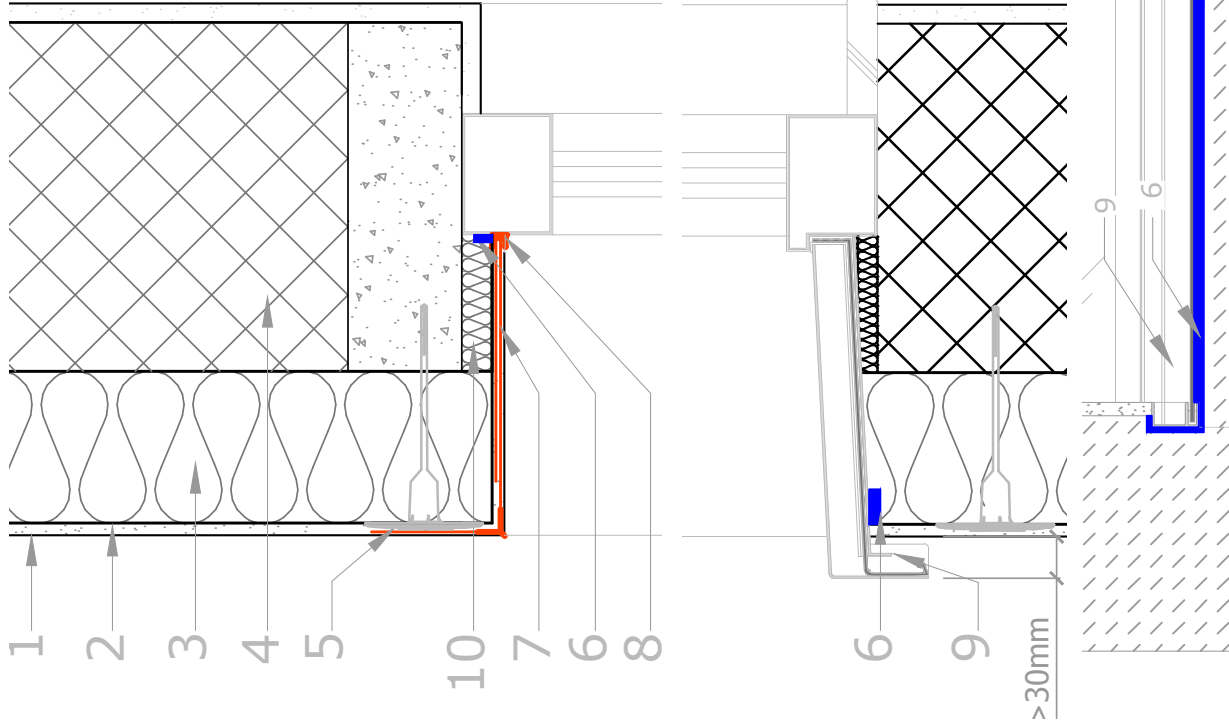
10. NBT Plinth & Perimeter board

11. Damp proof membrane

12. Combined drainage and protection layer

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Natural Building Technologies Ltd
The Hangar, Worminghall Road, Oakley, Buckinghamshire. HP18 9UL
T: 01844 338338 F: 01844 338525
info@natural-building.co.uk www.natural-building.co.uk



Standard Head & Sill

THERMAL PERFORMANCE OF JUNCTION

- Ensure insulation is well fixed to the substrate
- Ensure the continuity of the insulation throughout the junction
- Ensure reveal is insulated with min. 20mm Diffutherm reveal board. Please contact NBT if 20mm reveal insulation is not possible (exposed fixed frame width <30mm).

AIRTIGHTNESS LAYER CONTINUITY

- External wall insulation reduces air infiltration through walls, however, if possible –
- Ensure all penetrations through woodfibre/plinth board are sealed with iso-bloco expanding foam tape
- Ensure internal airtightness continuity between the wall and the window frame. If fitting new windows, seal/tape the frame to the window/door reveals.
- Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

WEATHER TIGHTNESS CONTINUITY

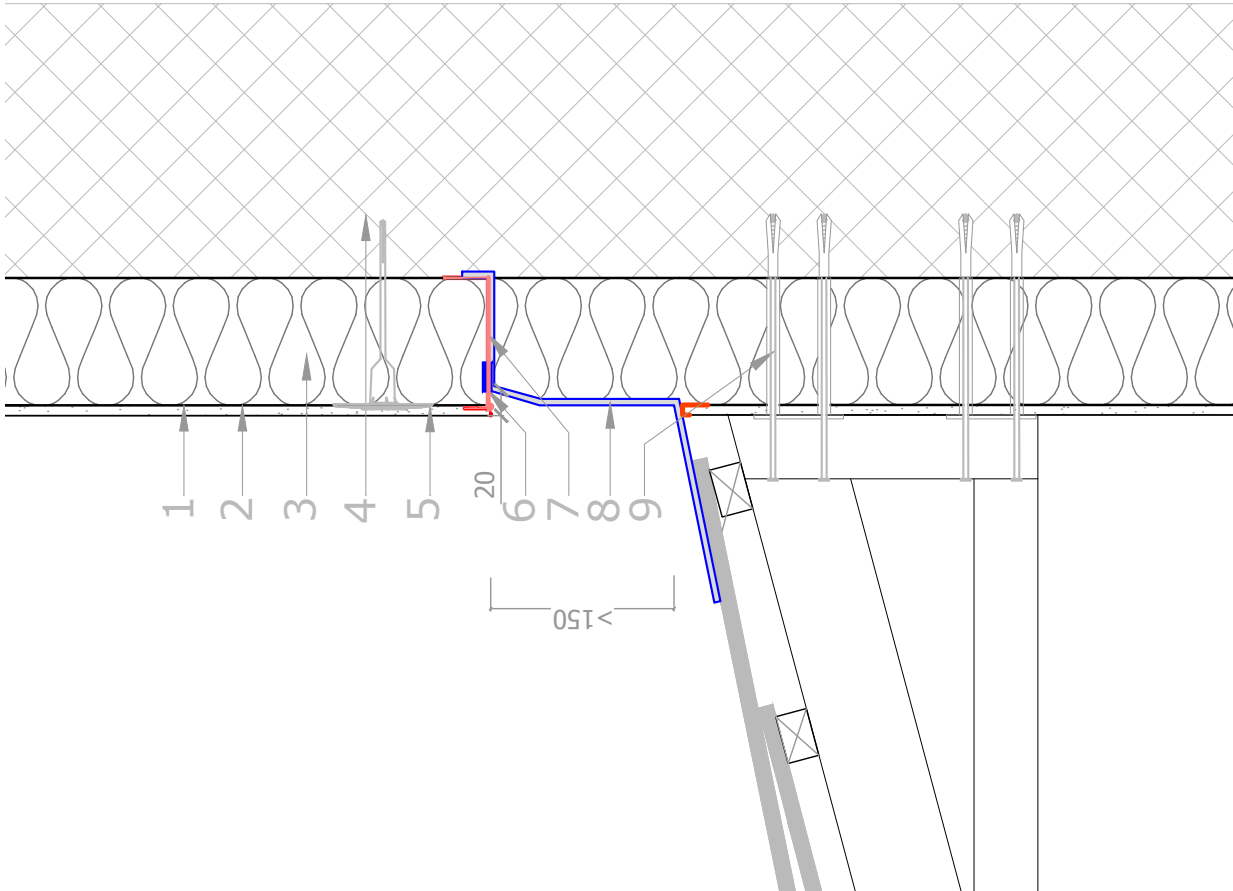
- Ensure the reveal board butt tight to the Diffutherm boards.
- Ensure weather tightness continuity between the reveal board and the frame. Use NBT APU mesh bead and NBT expansion sealing tape at the interface as shown.
- Ensure Diffutherm is rendered or sealed with appropriate stop-profile at all exposed junctions
- Ensure all penetrations through Diffutherm/plinth board are sealed with iso-bloco expanding foam tape (prior to application of base coat) and secondary mastic seal (following application of base coat and prior to finish coat)

NOTES

- Use Balcony Drip bead on the corner of sill head for exposed location
- Use NBT Nanopore or Silicon render for exposed location
- Aluminium extension sill with EPDM seals, vertical drip face of 40mm, thermal expansion compensation side clips are recommended for exposed locations.
- Minimise thermal bridge through sill by cutting back existing sill flush with masonry or rebating back of diffutherm boards to enable front face of sill to be insulated. Where possible insulate the upper face of the existing sill prior to installation of the extension sill.

KEY TO COMPONENTS

1. NBT Top coat (options available)
2. NBT MC55 6mm base coat render (meshed)
3. NBT Diffutherm T&G boards
4. Existing Substrate
5. NBT recommended fixings (NTU or STRU)
6. NBT expansion sealing tape. (ISO-BLOCO 600) Batters for service void (optional)
7. NBT Corner mesh bead (use NBT Balcony Drip bead for exposed location)
8. NBT AUP render stop with mesh
9. NBT Extension sill – Aluminium or EPS/Resin options available – Please contact NBT
10. NBT Reveal Board, 20mm or more.



Porch/Canopy Detail

Thermal Performance of Junction

- Ensure insulation is well fixed to the substrate
- External wall insulation reduces air infiltration through walls, however, if possible –
- Ensure all penetrations through woodfibre/plinth board are sealed with iso-bloco expanding foam tape
- Ensure internal airtightness continuity between the wall and the floor.
- Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

Airtightness Layer Continuity

Weather Tightness Continuity

- Iso-bloco expanding foam tape to be installed along topmost edge of lead flashing (under base-rail) to prevent tracking moisture. Ensure the base-rail drip is proud of plinth board by 20mm
- Ensure Diffutherm is rendered or sealed with appropriate stop-profile at all exposed junctions
- Ensure all penetrations through Diffutherm/plinth board are sealed with iso-bloco expanding foam tape (prior to application of base coat) and secondary mastic seal (following application of base coat and prior to finish coat)

Notes

Key to Components

1. NBT Top coat (options available)
2. NBT MC55 6mm base coat render (meshed)
3. NBT Diffutherm T&G boards
4. Existing Substrate
5. NBT recommended fixings (NTU or STRU)
6. NBT expansion sealing tape. (ISO-BLOCO 600)
7. NBT base rail & base rail drip clip
8. Lead flashing or similar
9. NBT Thermax or NBT SDF Frame fixings or NBT montage block depending on loading.

NBT Product Overview: Insulation

ISOLAIR sarking board



PAVATEX wood fibre board for breathable roof & wall constructions

Size: 770 x 2500 mm
Cover area: 750 x 2480 mm
Thicknesses: 22*, 35 & 60 mm
k-value / I_D : 0.044 W/(mK)
Density: 200 kg/m³
Compr. strength: 250 kPa (at 10 % compression)

PAVATEX DIFFUTHERM external wall insulation



Wood fibre board for rendered external walls

Size: 790 x 1300 mm
Cover: 780 x 1290 mm
Thicknesses: 60, 80, 100 & 120 mm
k-value / I_D : 0.043 W/(mK)
Density: 190 kg/m³
Compr. strength: 80 kPa (at 10 % compression)

PAVATHERM-PLUS sarking board



Composite wood board for roof & wall insulation

Size: 800 x 1600 mm
Cover area: 780 x 1580 mm
Thicknesses: 60, 80, 100 mm
k-value / I_D : 0.043 W/(mK)
Density: 180 kg/m³
Compr. strength: 100 kPa (at 10 % compression)

PAVADENTRO internal wall insulation



Innovative wood fibre insulation board for refurbishment

Size: 600 x 1020 mm
Cover area: 590 x 1010 mm
Thicknesses: 40, 60, 80 & 100 mm
k-value / I_D : 0.043 W/(mK)
Density: 175 kg/m³
Compr. strength: 70 kPa (at 10 % compression)

PAVATHERM general purpose insulation board



Universal wood fibre board for use in external & internal walls, floors & roofs

Sizes/Cover: 600 x 1020 mm
Thicknesses: 20 - 140 mm
k-value / I_D : 0.038 W/(mK)
Density: 110 kg/m³
Compr. strength: 50 kPa (at 10 % compression)

PAVADRY internal wall insulation



Innovative wood fibre insulation board for refurbishment

Size: 600 x 1020 mm
Cover area: 590 x 1010 mm
Thicknesses: 52, 72 & 92 mm
(Pavadentro/Hardboard) k-value / I_D : 0.043 / 0.14 W/(mK)
(Pavadentro/Hardboard) Density: 175/740 kg/m³
(Pavadentro) Compr. strength: 70 kPa (at 10 % compression)

PAVATHERM-PROFIL wall & floor board



Wood fibre board for insulating floors or internal walls with plaster

Size: 600 x 1020 cm
Cover: 590 x 1010 mm
Thicknesses: 40 & 60 mm
k-value / I_D : 0.043 W/(mK)
Density: 175 kg/m³
Compr. strength: 70 kPa (at 10 % compression)

NBT PAVATHERM-FORTE



Square edged woodfibre boards for flat roof insulation

Size/Cover: 600 x 1020 mm
Thicknesses: 80, 100, 120, 140 mm
k-value / I_D : 0.043 W/(mK)
Density: 175 kg/m³
Compr. strength: 70 kPa (at 10 % compression)

NBT Pavaflex



Flexible woodfibre insulation batts for loft, walls, floors & ceilings

Size I: 375 x 1350 mm
Size II: 575 x 1350 mm
Thicknesses: 50, 80, 100 & 140* mm
k-value / I_D : 0.038 W/(mK)
Density: 55 kg/m³
Compr. strength: -

PAVABOARD load bearing insulation



Wood fibre board for highly insulated floors that have to carry loads

Size/Cover: 600 x 1020 mm
Thicknesses: 40 & 60 mm
k-value / I_D : 0.046 W/(mK)
Density: 220 kg/m³
Compr. strength: 150 kPa (at 10 % compression)

NBT Warmcel 100 cellulose fibres



Loose fill derived from waste UK newsprint treated with fire retardant and biocidal additives

Packaging: Bags of 8 kg (compressed)
Cover area: e.g. 1 m² at 228 mm
k-value / I_D : 0.035 W/(mK)
Density: 35 kg/m³



Natural
Building
Technologies



Natural Building Materials and Systems



high performance systems NBT PAVATEX woodfibre systems provide exceptional thermal & acoustic insulation, summer overheating protection and moisture control for the whole building in wall roof and floor



low carbon, renewable products NBT PAVATEX boards are made of waste wood and lock up the equivalent of ca. 11 tonnes of CO₂ per building. Raw material resources are entirely renewable, unlimited and FSC certified



healthy housing NBT PAVATEX insulation boards are certified by natureplus as non-polluting and the NBT systems lead to breathable constructions; NBT PAVATEX insulation is specified exclusively by the Sentinal Haus Institute for healthy housing



tried & tested systems NBT PAVATEX woodfibre insulation are widely used across Europe in all climates and conditions; physical values are 3rd party tested and guaranteed and production is according to BS EN



local service & support Pavatex's partner in the UK is Natural Building Technologies (NBT) who are a Technical Sales Company with nationwide coverage based in Oakley, Bucks. NBT lead the UK sustainable materials & systems for high performance building shells



swiss quality & know-how for the UK produced and developed in Switzerland for more than 70 years by the world's most innovative woodfibre insulation manufacturer

Natural Building Technologies Ltd

The Hangar, Worminghall Road, Oakley, Buckinghamshire. HP18 9UL

T: 01844 338338 F: 01844 338525

info@natural-building.co.uk www.natural-building.co.uk

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Acara Concepts Ltd
Killossery, Kilsallaghan,
Co Dublin K67 E7N3, Ireland
www.acaraconcepts.com
info@acaraconcepts.com
Tel IRL: +353 (0)1 8409 286
Tel UK: 020 7998 1690