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Agrément Certificate
94/3010
Product Sheet 9

NEWTON MEMBRANE SYSTEMS

NEWTON 520 ECO

This Agrément Certificate Product Sheet(1) relates to Newton 520 Eco, a moulded, recycled HDPE membrane for use as damp-proofing on floors, over a contaminated or damp background, to support a flooring. The product is part of the Newton System 500 below-ground internal waterproofing system, and can also be used above ground as a damp-proofing membrane.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Resistance to water and water vapour — the membrane is water resistant and has a high resistance to water vapour transmission (see section 6).

Resistance to salt transfer — the membrane provides an effective barrier to the transmission of salts or other contaminants from the substrate (see section 8).

Resistance to puncture, impact and loading — the membrane has a high resistance to puncture and will not be damaged by normal foot traffic during installation, or while laying concrete or screeding. It can support the long-term loadings likely to be experienced in service without undue deformation (see section 9).

Durability — under normal conditions of use the membrane, when used as part of a system, will provide an effective barrier to the transmission of salts, liquid water and water vapour for the life of the structure in which it is incorporated (see section 11).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 12 September 2017

John Albon – Head of Approvals Construction Products

Claire Curtis-Thomas
Chief Executive

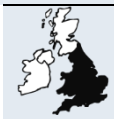
The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

Regulations

In the opinion of the BBA, Newton 520 Eco, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

For new construction and a 'Material Change of Use' of an existing building, as defined in Regulation 5a

Requirement:	**C2(a)(b)**	**Resistance to moisture**
Comment:		The product, when used as part of a system, adequately resists the passage of moisture. See section 6.1 of this Certificate.
Regulation:	**7**	**Materials and workmanship**
Comment:		The product is acceptable. See section 11 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

For new construction and a 'Conversion' of an existing building, as defined in Regulation 4

Regulation:	**8(1)**	**Durability, workmanship and fitness of materials**
Comment:		The product is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	3.3	Flooding and ground water
Comment:		The product, when used as part of a system, can contribute to minimising or eliminating the effects of flooding on the building fabric and/or the building element, with reference to clause 3.3.1(1)(2). See section 6.1 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product, when used as part of a system, adequately resists the passage of moisture, with reference to clauses 3.4.1(1)(2), 3.4.2(1)(2), 3.4.5(1)(2), 3.4.6(1)(2) and 3.4.7(1)(2). See section 6.1 of this Certificate.
Standard:	3.6(a)	Surface water drainage
Comment:		The product, when used as part of a system, can contribute to satisfying this Standard, with reference to clause 3.6.3(1)(2). See section 6.1 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product, when used as part of a system, adequately resists the passage of moisture, with reference to clause 3.10.1(1)(2). See section 6.1 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The product can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		Comments in relation to the product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1(1)(2) and Schedule 6(1)(2).

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

For new construction and a 'Material Change of Use' of an existing building, as defined in Regulation A9

Regulation:	**23(a)(i)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The product is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	**28(a)(b)**	**Resistance to moisture and weather**
Comment:		The product, when used as part of a system, adequately resists the passage of moisture. See section 6.1 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 1 *Description* (1.1) of this Certificate.

Additional Information

NHBC Standards 2017

In the opinion of the BBA, Newton 520 Eco, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 5.1 *Substructures and ground bearing floors*, 5.2 *Suspended ground floors* and 5.4 *Waterproofing of basements and other below ground structures*.

Where Grade 3 protection is required and the below-ground wall retains more than 600 mm (measured from the top of the retained ground to the lowest finished floor level), the product should be used in combination with either a Type A or Type B waterproofing protection.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European standard BS EN 13967 : 2012. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Newton 520 Eco membrane is a black, recycled high-density polyethylene (HDPE) sheet with moulded studs at 28 mm centres, for use as part of Newton System 500[(1)], or above ground as a damp-proofing membrane. The membrane is manufactured to the following nominal characteristics:

Thickness (mm)	0.9
Dome height (mm)	20
Weight per unit area (kg·m^{-2})	1.0
Roll length (m)	20.0 and 10.0
Roll width (m)	2.07[(2)]
Weight per roll (kg)	40.0 and 20.0
Air gap volume (litres per m^2)	12

Watertightness* 60 kPa	pass
Compressive strength* ($kN \cdot m^{-2}$)	240.

(1) Newton System 500 is a below-ground waterproofing system for both new build and refurbishment projects, consisting of Newton waterproof membranes linked to a water drainage system to convey excess water safely away from the property.
(2) Includes a 70 mm flanged dome-free area for overlapping sheets.

1.2 Ancillary items used with the membrane and included in this assessment are:

- Newton Waterseal Tape — black or white butyl tape for sealing joints in the membrane
- Newton Waterseal Rope — black or white butyl beading for sealing the air gap around pipes and the edges of the membrane, and joining floor and wall membranes
- Newton Overtape — self-adhesive membrane strip for sealing junctions between walls and floors, and for sealing joints at corners. It can also be used for sealing around service penetrations
- Newton Mastic Sealer — silicone sealant for sealing the Newton membranes in an above-ground situation where no hydrostatic pressure is possible
- Newton Basedrain — a PVC-U system of drainage channels with 18 mm diameter holes every 100 mm along its length, to collect excess water from behind the membrane and conduct it to a collection point for subsequent discharge. It is available in straight lengths and also in preformed angles for use at corners and junctions. Newton Basedrain is a part of the Newton System 500 internal cavity drain system
- Newton Floordrain — as Newton Basedrain but without the upstand or flange. Floordrain is used to receive water from floor construction joints and to connect Basedrain to internally sited sumps
- Newton Drainage Adaptor — changes profile from Basedrain or Floordrain to receive 63 mm outside diameter pipe for connections to services or to sumps.

1.3 Also for use with the product, but outside the scope of this Certificate, is Newton 106 Lime Inhibitor, for use prior to the installation of a Newton System 500 cavity drain membrane waterproofing system to prevent the 'leaching' of free lime from the concrete.

2 Manufacture

2.1 The membrane is formed in a continuous process in which recycled HDPE is extruded into sheets and the studs are impression-formed.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 The membrane is delivered to site in rolls packaged in woven plastic sacks, bearing the product and Certificate holder's name, and the BBA logo incorporating the number of this Certificate.

3.2 Rolls should be stored on end, under cover and protected from sharp objects, sunlight and high temperatures.

3.3 The packaging details of the ancillary items are shown in Table 1.

Table 1 Packaging details

Item	Dimensions/volume	Packaging/quantity
Newton Waterseal Tape	22.5 m long x 30 mm wide x 2 mm thick	1 roll per box
Newton Waterseal Rope	4.75 m long x 10 mm diameter	1 roll per box
Newton Mastic Sealer	0.4 litre cartridge	25 cartridges per carton
Newton Corner Detail	20 m x 150 mm in black or white 20 m x 100 mm in black	2 rolls per box at 150 mm wide 4 rolls per box at 100 mm wide
Newton Basedrain and Newton Floordrain	2 m lengths	6 lengths per pack

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Newton 520 Eco.

Design Considerations

4 Use

4.1 Newton 520 Eco is satisfactory for use as a damp-proofing membrane on floors above ground and as a waterproofing membrane below ground as part of Newton System 500, in new construction or in existing buildings over a contaminated or damp background. It can support a screed or flooring in the following situations:

- on damp floors in underground situations subject to high groundwater levels and perennial moisture
- in conjunction with a remedial dpc system where the floors have a high salt content and/or when it is necessary to complete the installation immediately without allowing a period for initial drying
- over floors which have a friable or painted surface, are contaminated with oil or mould, or have a high salt content
- as a waterproofing membrane in areas subject to vibration, as part of the Newton System 500.

4.2 Depending on the application required and the site conditions, the membrane may be used as:

- an underfloor damp-proof membrane
- part of Newton System 500 for use below ground, covering floor, walls and ceiling, with provision made for disposing of water build-up behind the membrane via a sump and pump. If available and considered suitable, natural gravity feed drainage that is below the internal basement floor level can be used instead of a sump and pump, in which case the advice of the Certificate holder should be sought.

4.3 The membrane has not been assessed for use in chemically contaminated areas, such as brownfield sites.

4.4 The membrane is satisfactory for use in Type C (drained protection) constructions in accordance with BS 8102 : 2009.

4.5 Under normal operating conditions, the membrane is not affected by underfloor heating.

5 Practicability of installation

The membrane should only be installed by installers who have been trained and approved by the Certificate holder.

6 Resistance to water and water vapour

6.1 The membrane is water resistant and has a high resistance to water vapour transmission. However, the system as installed is not resistant to hydrostatic pressure and, consequently, the measures described in the *Installation* part of this Certificate must be followed to ensure that the membrane acts as a drainage layer with no excessive build-up of water behind the system.

6.2 All joints and fixings must be sealed with Newton sealing products, and drainage channels and gullies or sumps and pumps should be installed as necessary to disperse excess or standing water.

7 Risk of condensation

7.1 The generation and dispersal of moisture in the internal environment must be controlled, and appropriate and robust designs must be selected to minimise the risk of both surface and interstitial condensation, especially where insulation is used over the membrane.

7.2 In common with most waterproofing membranes, the product has a very high resistance to vapour diffusion, and when placed on the cold side of a construction may increase the risk of interstitial condensation. A calculation should be carried out to BS 5250 : 2011 and designers should consider appropriate techniques for managing the safe egress of moisture vapour (such as control of the internal environment or use of a vapour control layer on the warm side of the insulation), and in particular the effect of moisture on any materials at, or in contact with, materials below the local dew-point.

8 Resistance to salt transfer

The membrane provides an effective barrier to the transmission of salts or other contaminants from the substrate.

9 Resistance to puncture, impact and loading

9.1 The membrane has a high resistance to puncture and will not be damaged by normal foot traffic during installation or while laying concrete or screeding to BS 8204-1 : 2003.

9.2 The membrane can support the long-term imposed loadings defined in the UK National Annex to BS EN 1991-1-1 : 2002, Table NA.2, categories A to D, without undue deformation.

10 Maintenance

10.1 As the membrane is confined within a wall or floor space and has suitable durability (see section 11), maintenance is not required.

10.2 Regular maintenance of all gullies, sumps and pumps must be conducted to ensure that a build-up of water does not occur behind the membrane.

11 Durability

Under normal conditions of use the membrane, when used as part of a system, will provide an effective barrier to the transmission of salts, liquid water and water vapour for the life of the structure in which it is incorporated.

12 Reuse and recyclability

The product comprises recycled HDPE, which can be recycled.

Installation

13 Survey

13.1 Where the property is below ground, or where conditions are damp, a full survey by a specialist waterproofing surveyor is necessary to diagnose the cause and to establish if treatment is required.

13.2 If rising damp to above-ground elevations is found, a remedial treatment is conducted in accordance with the relevant Agrément Certificate, BS 6576 : 2005 and the Property Care Association Code of Practice, 2013.

13.3 Appropriate remedial measures must be taken to rectify major causes of damp conditions or water ingress, and to repair structural defects.

14 Surface preparation

14.1 When the membrane is used in new constructions, the concrete base must be laid in accordance with BS EN 1992-3 : 2006.

14.2 If a board covering is to be laid directly on the membrane, the concrete base must have a surface regularity with a maximum permissible departure of 5 mm from the underside of a 2 m straight edge, resting in contact with the floor, in accordance with BS 8204-1 : 2003.

14.3 When the membrane is used in existing buildings, any unsound plaster, render or screed is removed to expose the substrate, which is cleaned with a stiff brush to remove loose material, laitance, salt residue, mould or adhesive. If mould is present, the substrate is treated with an HSE-approved fungicidal wash.

14.4 Uneven floor substrates should be dubbed out with a cement-sand (1:4) render or screed, to the tolerance described in section 14.2. They should be allowed to dry thoroughly before the membrane is applied above.

15 Procedure

General

15.1 When used as part of the Newton 500 System, Newton 520 Eco may be used in combination with any of the appropriate Newton membranes which are the subject of Product Sheets 1 to 4, 6 and 7.

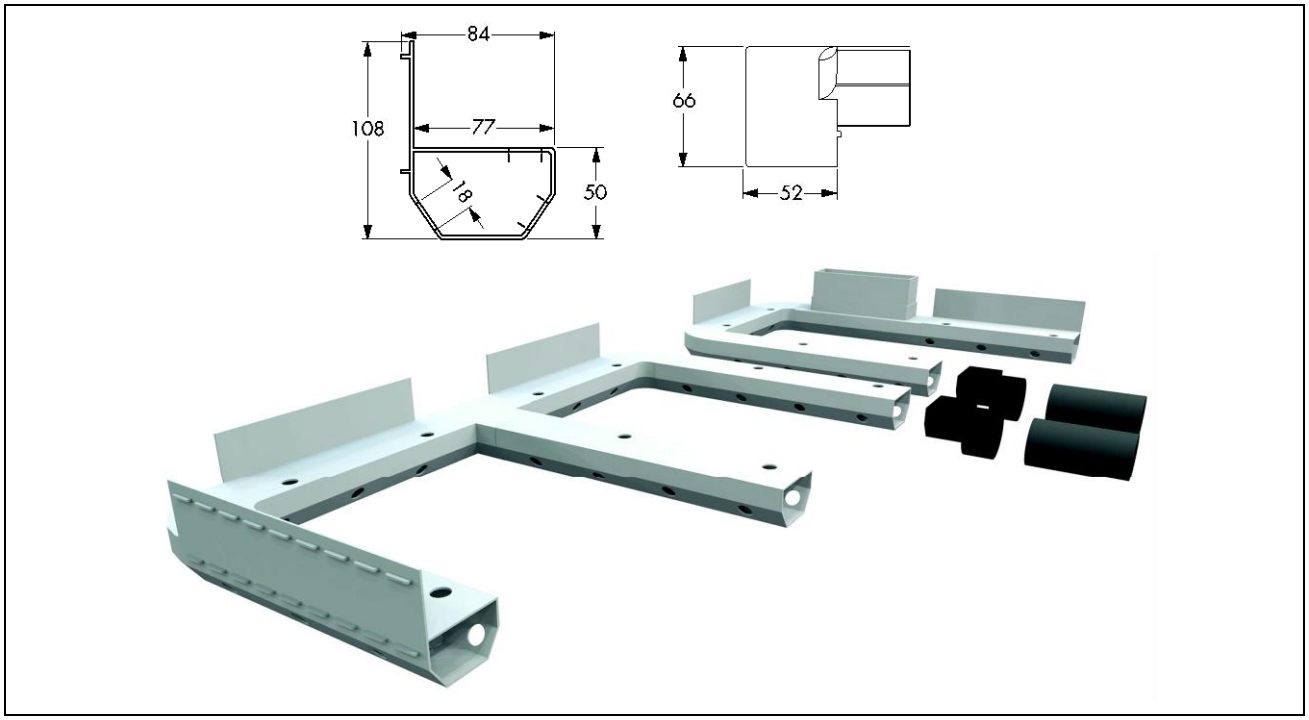
Floors

15.2 When used below ground level, Newton 520 Eco should be used as part of Newton System 500, with provision made for the disposal of any water which may find its way into the structure(1). This is achieved by the installation of Newton Basedrain around the perimeter of rooms and Floordrain(1) across the room, above the line of the construction joints, and connecting into the perimeter Basedrain. Water ingress is conveyed either to the outside of the structure and discharged via safe natural drainage (drainage that cannot block or generate back-pressure), or to a Newton sump and subsequently pumped out of the structure.

(1) Prior to the installation of the Newton Floordrain membrane, Newton Lime Inhibitor should be applied in accordance with the recommendations of BS 8102 : 2009.

15.3 Newton Basedrain (see Figure 1) is installed at wall/floor junctions around the perimeter of walls to convey ingressing water to a collection point (sump). The Basedrain can be cut on site using a handsaw to form mitred joints around corners, or preformed angled pieces can be used. In either case, sections of Basedrain are joined together using duct tape. Newton Floordrain should be used across construction joints in the slab.

Figure 1 Newton Basedrain (all dimensions in mm)



15.4 Newton Basedrain is either sunk into formed or cut channels in the floor slab adjacent to the wall, or placed on the existing floor with flooring grade insulation butted up to it (see Figures 2 and 3). In the latter case, the insulation may be subjected to some level of water exposure; therefore, water-resistant grades must be used. The membrane should be laid directly on top of the insulation and a 65 mm thick screed applied over the top.

Figure 2 Installation detail

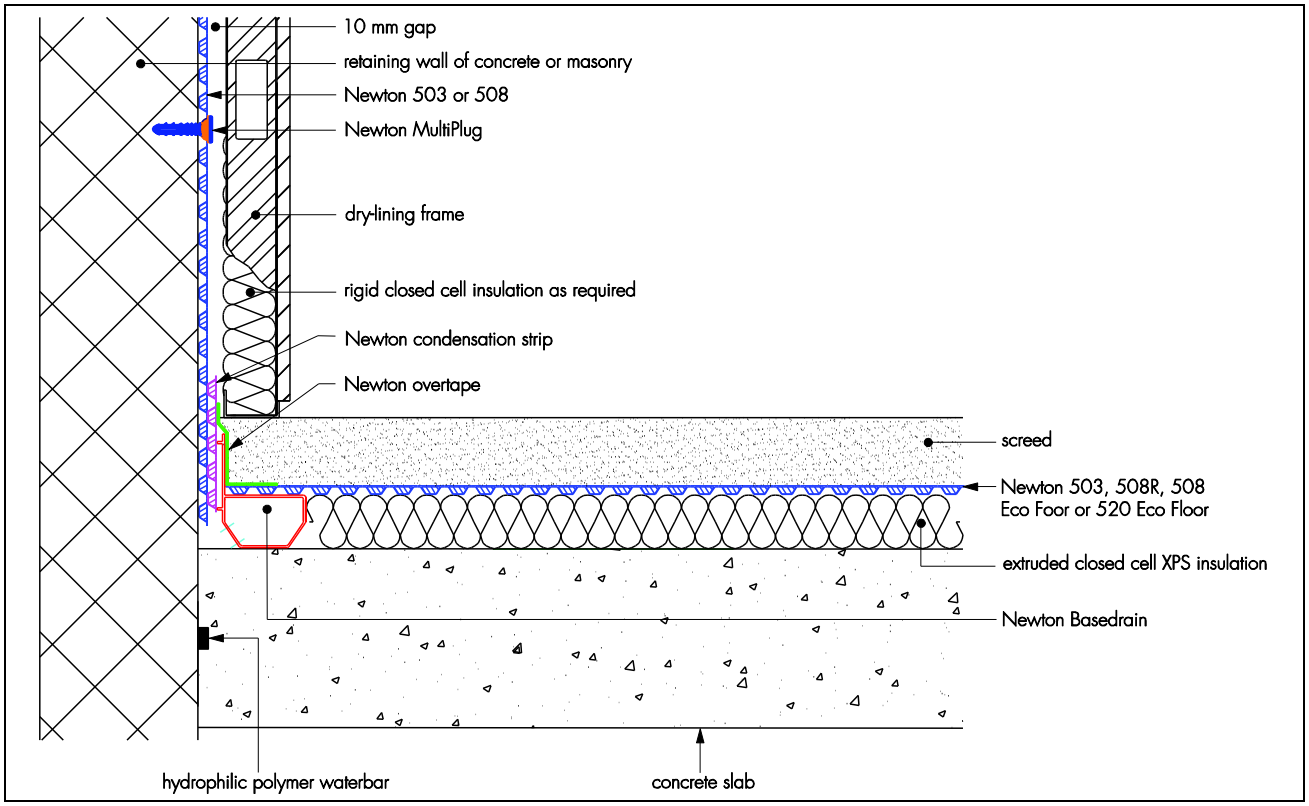
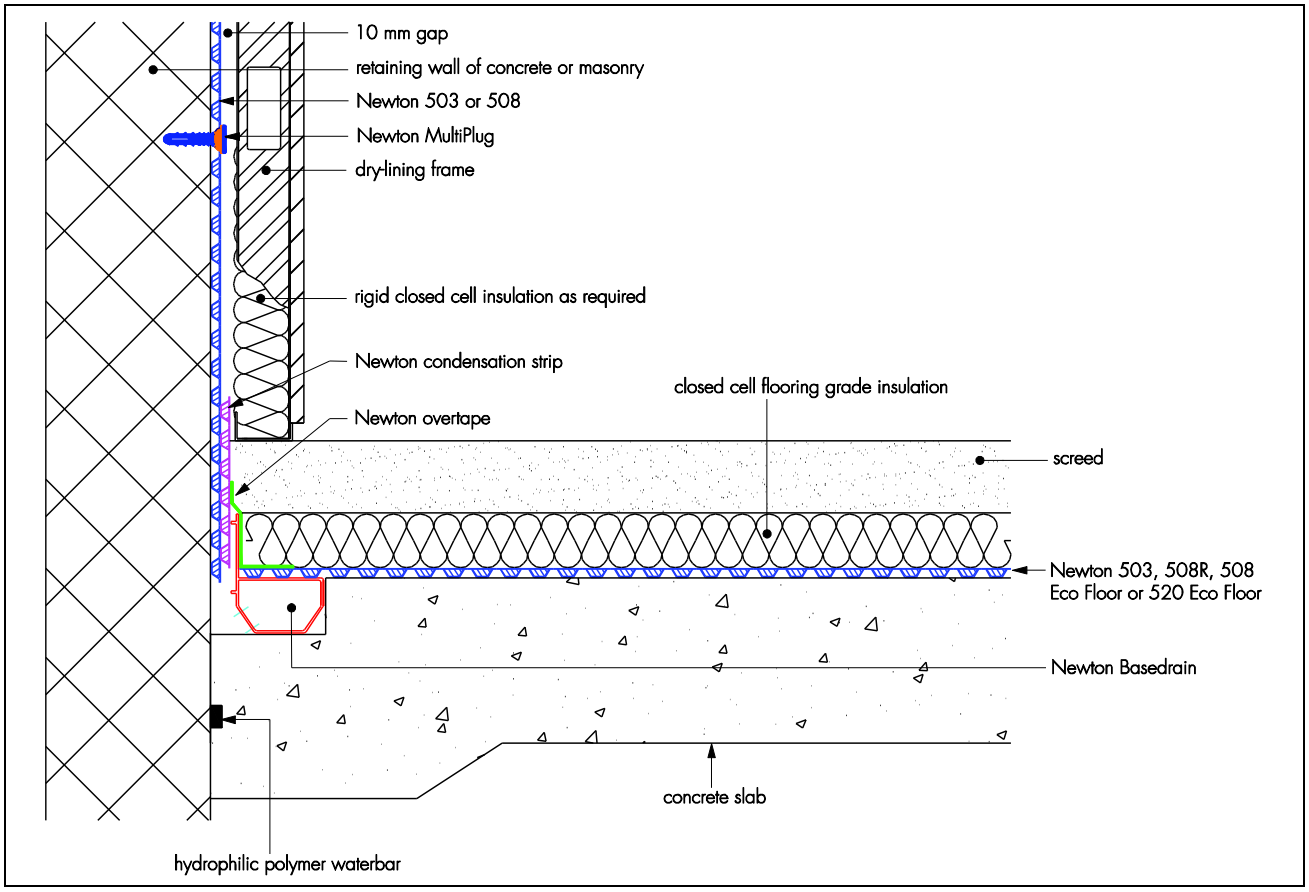


Figure 3 Installation detail



15.5 The membrane is rolled out 'studs down' over the floor, and consecutive membrane widths are laid so the flanged edge overlaps the first sheet by the width of the 70 mm flange. The joints are sealed with Newton Waterseal Tape.

15.6 The membrane is cut within 5 mm of any pipes and services in the floor, and the gap filled with Newton Waterseal Rope. A patch of membrane is overlaid and sealed to the services with Newton Waterseal Rope, and its circumference sealed with Newton Waterseal Tape.

15.7 Penetrations through the floor membrane should be sealed with Newton Waterseal Tape or Waterseal Rope or Newton Overtape. The penetrating item may require application of a primer to ensure adhesion of the Newton products. Advice should be sought on this from the Certificate holder.

15.8 In below-ground installations, the formation of open joints, either at the Basedrain/membrane junction or at other locations in the installation, may need to be reconsidered in cases where ingress of gases, odours or vermin is a possibility (such as in proximity to food preparation areas). The advice of the Certificate holder should be sought in these situations.

16 Floor membrane coverings

16.1 If required, extruded closed-cell polystyrene insulation boards, minimum density 30 $kg \cdot m^{-3}$, may be laid over the membrane.

16.2 Suitable tongue-and-groove flooring board panels should be selected in accordance with BS EN 12871 : 2013, and loose-laid over the membrane to within 10 mm of the walls. The panels are staggered and the joints sealed with a thermoplastic wood adhesive to BS EN 204 : 2001.

16.3 Alternatively, the membrane is covered by concrete or screed a minimum of 65 mm thick in accordance with BS 8204-1 : 2003. Care should be taken to ensure the membrane is not displaced when placing the concrete or screed.

16.4 Proprietary screeds may also be considered, which can generally be laid at thicknesses less than 65 mm, but the use of these products with the membrane has not been assessed by the BBA and is outside the scope of this Certificate.

Technical Investigations

17 Tests

17.1 Tests were carried out and the results assessed to determine the resistance to water penetration of the membrane's joints.

17.2 A comparative assessment was made between Newton 520 Eco and previously assessed Newton membranes 508, 508R, 520 and 520 Eco.

18 Investigations

18.1 A user survey of treated installations and contractors was conducted to establish the system's performance in use.

18.2 An assessment was made of the effectiveness of the sealing system based on data obtained during the assessment of Newton 508R membrane.

18.3 An assessment was made of the scope of use and durability of the system in relation to the generic properties of the membrane.

18.4 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS 6576 : 2005 *Code of practice for diagnosis of rising damp in walls of buildings and installation of chemical damp-proof courses*

BS 8102 : 2009 *Code of practice for protection of below ground structures against water from the ground*

BS 8204-1 : 2003 *Screeds, bases and in-situ floorings — Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*

BS EN 204 : 2001 *Classification of thermoplastic wood adhesives for non-structural applications*

NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1: Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*

BS EN 1992-3 : 2006 *Eurocode 2 : Design of concrete structures — Liquid retaining and containing structures*

BS EN 12871 : 2013 *Wood-based panels — Performance specifications and requirements for load bearing boards for use in floors, walls and roofs*

BS EN 13967 : 2012 *Flexible sheets for waterproofing — Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet — Definitions and characteristics*

Property Care Association COP02 *Code of Practice for Installation of Remedial Damp-proof Courses in Masonry Walls*

19 Conditions

19.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

19.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

19.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

19.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

19.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

19.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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