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Agrément Certificate  
**05/4232**  
Product Sheet 1

## RIW STRUCTURAL DRAINAGE SYSTEMS

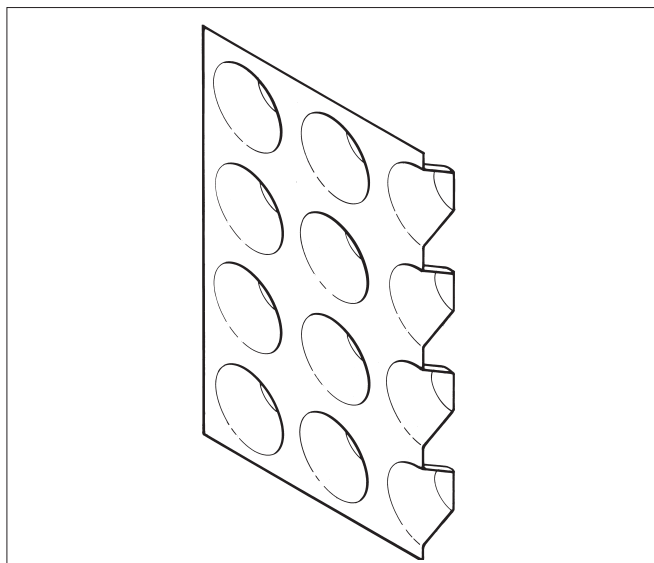
### RIW CAVITY DRAIN R20

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to RIW Cavity Drain R20, a high-density polyethylene (HDPE) membrane for damp-proofing walls and floors in new buildings which require a large air gap for a high drainage volume. It can be used above and below ground, over a contaminated or damp background, to support dry lining or flooring.

(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 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 12).

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

Simon Wroe  
Head of Approvals — Materials

Claire Curtis-Thomas  
Chief Executive

Date of First issue: 4 March 2014

Originally certificated on 22 November 2005

*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](http://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.*

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# Regulations

In the opinion of the BBA, RIW Cavity Drain R20, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting 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)

Requirement:	C2(a)(b)	Resistance to moisture
Comment:		The product 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 12 and the <i>Installation</i> part of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.3	Flooding and ground water
Comment:		The product 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 <sup>(1)(2)</sup> . See section 6.1 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product adequately resists the passage of moisture, with reference to clauses 3.4.1 <sup>(1)(2)</sup> , 3.4.2 <sup>(1)(2)</sup> , 3.4.5 <sup>(1)(2)</sup> , 3.4.6 <sup>(1)(2)</sup> and 3.4.7 <sup>(1)(2)</sup> . See section 6.1 of this Certificate.
Standard:	3.6(a)	Surface water drainage
Comment:		The product can contribute to satisfying this Standard, with reference to clause 3.6.3 <sup>(1)(2)</sup> . See section 6.1 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product adequately resists the passage of moisture, with reference to clause 3.10.1 <sup>(1)(2)</sup> . See section 6.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to meeting 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:		All comments given for this product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2012

Regulation:	23(a)(i)(iii)(b)(i)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	28(a)(b)	Resistance to moisture and weather
Comment:		The product adequately resists the passage of moisture. See section 6.1 of this Certificate.

## Construction (Design and Management) Regulations 2007

## Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 1 *Description* (1.2) of this Certificate.

# Additional Information

## NHBC Standards 2014

NHBC accepts the use of RIW Cavity Drain R20, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapters 5.1 *Substructure and ground bearing floors* and 5.2 *Suspended ground floors*.

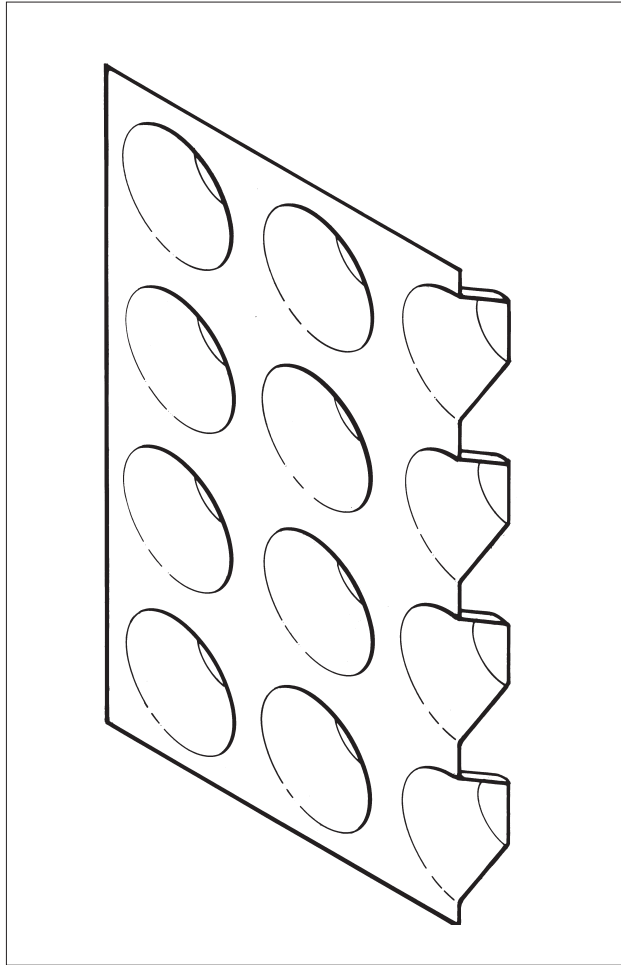
## CE marking

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.

## 1 Description

1.1 RIW Cavity Drain R20 is a black, high-density polyethylene (HDPE) membrane, moulded to form raised studs at 50 mm centres (see Figure 1).

Figure 1 RIW Cavity Drain R20



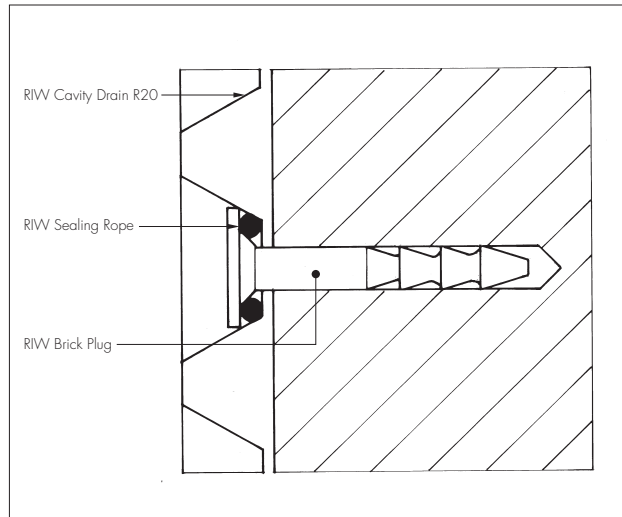
1.2 The product is supplied in roll form, and has characteristics of:

thickness (mm)	0.9
stud height (mm)	20
weight per unit area ( $\text{kg}\cdot\text{m}^{-2}$ )	0.95
roll size (m)	2.0 x 20
weight of roll (kg)	38 approx
air gap volume ( $\text{l}\cdot\text{m}^{-2}$ )	14.0.

1.3 Ancillary items used with the membrane include:

- RIW Brick Plug — a plastic plug for fixing membrane to brick and stone. The plug has a pre-formed hole permitting timber fixings to be inserted without breaching the membrane (see Figure 2)
- RIW Sealing Tape — butyl rubber tape for sealing around penetrations through the membrane
- RIW Sealing Rope — butyl rubber beading for sealing joints in the membrane and sealing the membrane around pipes and openings, and to form a gasket between the RIW Brick Plug and the membrane
- RIW Overtape — butyl rubber tape, 150 mm wide, backed with non-woven polypropylene, for sealing joints in the membrane, for use around services, penetrations and edge details, and between wall and floor membranes.

Figure 2 RIW Brick Plug



## 2 Manufacture

2.1 The membrane is formed in a continuous process in which high-density polyethylene (HDPE) is extruded into sheets and the stud impressions 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 wrapped rolls bearing the product and manufacturer'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.

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on RIW Cavity Drain R20.

## Design Considerations

### 4 Use

4.1 RIW Cavity Drain R20 is satisfactory for use as a damp-proof membrane on internal faces of walls and floors of all types of existing construction that require a large air gap for a high drainage volume. It can support a dry lining, screed or flooring in the following situations:

- on damp walls and floors in underground locations subject to high groundwater levels and perennial moisture
- over walls and floors which have a friable or painted surface, are contaminated (eg with oil or mould) or have a high salt content
- as a waterproofing membrane in areas subject to vibration.

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

- an underfloor damp-proof membrane
- a dry-lining for walls, vented into the room via aeration slots at the top and bottom of the wall
- a sealed system covering floors and/or walls used in conjunction with RIW Cavity Drain R7 on the ceiling, with provision made for disposing of water build-up behind the membrane via a sump and pump.

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

4.4 The membrane consists of 0.9 mm thick HDPE and, in the opinion of the BBA, meets the requirement for a radon barrier according to BRE Report (BR 211 : 2007) *Radon : guidance on protective measures for new buildings*. However, the effectiveness of the joint sealing system used with the membrane has not been assessed against radon by the BBA and is outside the scope of this Certificate.


4.5 The system is satisfactory for use in Type C (drained protection) structural concrete constructions in accordance with BS 8102 : 2009.

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

## 5 Practicability of installation

The product is designed to be installed by competent specialist contractors experienced with damp-proofing work.

## 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 product 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 without excessive build-up of water behind it.

6.2 All joints and fixings must be sealed with RIVW 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 As with any room, there is a need to control the generation and dispersal of moisture in the internal environment and to select appropriate and robust designs 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 with care (such as control of the internal room 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 product 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 National Annex to BS EN 1991-1-1 : 2002, Table NA.2, categories A to D, without undue deformation.

## 10 Wall-mounted fittings


Wall-mounted fittings (apart from lightweight items such as framed pictures) should be fixed where possible into battens, the position and number of support fixings into the loadbearing structure of which are predetermined. Only in exceptional circumstances should fittings be fixed through the membrane and lining board to the loadbearing structure behind, using proprietary fixings. Holes made in the membrane must be filled with a flexible sealant, or RIVW Sealing Rope or Tape.

## 11 Maintenance

11.1 As the membrane is confined within a wall or floor space and has suitable durability (see section 12), maintenance is not required.

11.2 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.

## 12 Durability

 Under normal conditions of use, the product 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.

## 13 Reuse and recyclability

The product comprises polyethylene, which can be recycled.

# Installation

## 14 Surface preparation

14.1 The concrete base must be laid in accordance with BS 8204-1 : 2003.

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 in BS 8204-1 : 2003.

14.3 Any unsound plaster, render or screed should be removed to expose the substrate which is then cleaned with a stiff brush to remove loose material, laitance, salt residue, mould or adhesive. If mould is present the substrate should be treated with a fungicidal wash. The Certificate holder can advise on suitable materials and procedures to be used.

14.4 Uneven 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 set before the membrane is fixed.

## 15 Procedure

### General

15.1 RIW Cavity Drain R20 may be used in combination with any of the appropriate RIW membranes which are the subject of other Product Sheets of this Certificate.

### Walls

15.2 Installation of the membrane is commenced at the top of the construction. For horizontal joints, the lower membrane is always positioned in front of the upper membrane. Membrane from rolls should be overlapped by two studs and sealed using RIW Sealing Rope placed between the two rows of studs. Membrane from sheets should be overlapped by one stud and sealed using RIW Overtape applied with equal overlap on the two membranes.

15.3 Alternatively, for vertical joints only, the membrane can be fixed flush and the joints sealed with RIW Overtape.

15.4 Fixings are made through the membrane into 10 mm holes drilled through the studs. RIW Brick Plugs, to which RIW Sealing Rope has been applied around the rim, are inserted into the holes and tapped flush with the membrane. The RIW Sealing Rope forms a sealing gasket between the plug and membrane.

15.5 Preservative-treated timber battens of minimum dimensions 25 mm by 38 mm are fixed into the plug's fixing hole using suitable screws with a maximum screwing-in depth of 25 mm plus the batten depth. The membrane can also be dry-lined, using free-standing framework, blockwork or similar.

15.6 Spacings between fixings will depend on the method of dry lining to be applied. When using preservative-treated timber battens the fixings should be kept to a maximum of 600 mm. Proprietary metal fast track systems and independent frame systems will require fewer fixings, but sufficient should be used to ensure that the membrane is reasonably tight to the wall, especially at corners and laps.

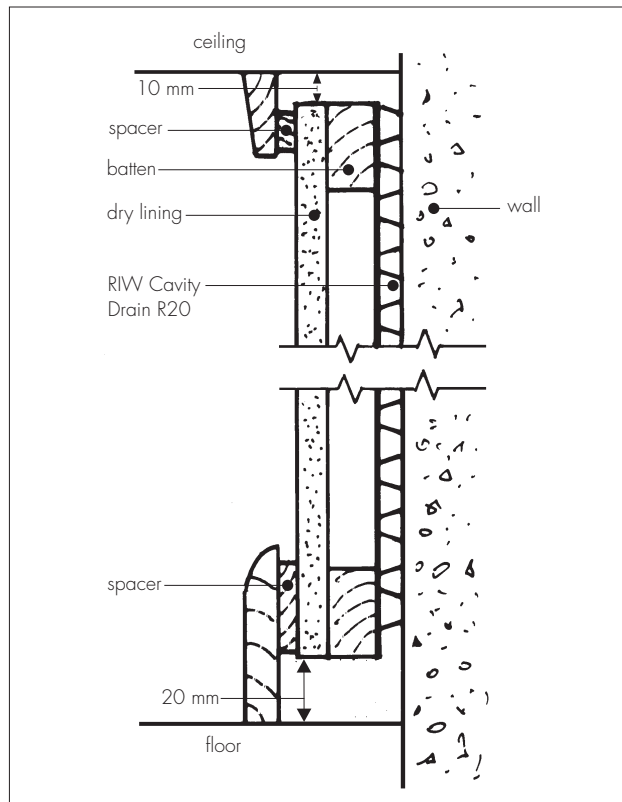
15.7 The membrane is installed over windows and then cut away to expose them. For doors and other obstructions, the membrane is installed up to the perimeter. In both cases, the gaps are sealed with RIW Overtape

15.8 Power cables, points and light switches should preferably be remounted in front of the membrane.

15.9 In below-ground installations, the practice of leaving the top of the wall membrane unsealed where there is no requirement for a ceiling membrane to be installed may need to be reconsidered in cases where ingress of gases, odours or vermin is a consideration (such as in proximity to food preparation areas). The advice of the Certificate holder should be sought in these situations.

15.10 In above-ground installations, the build-up of water vapour behind the membrane is controlled by venting into the room. To facilitate this, the membrane is installed with a 10 mm gap at the top and a 20 mm gap at the bottom of the wall. Spacers measuring 3 mm by 200 mm are fixed at 600 mm centres behind the skirting board and ceiling coving to ensure a ventilation gap (see Figure 3). Alternatively, a proprietary ventilated skirting board or ceiling coving may be used.

Figure 3 Wall detail with dry lining



## Floors

15.11 Floors should have a drainage outlet point. There should be a fall towards the outlet point or a drainage channel made around the perimeter of the floor, to ensure water can flow to the outlet.

15.12 The membrane is rolled out 'studs down' over the floor, and consecutive membrane widths are laid so an overlap of two interlocking studs is achieved. Membrane from rolls should be overlapped by 2 studs and sealed using RIW Sealing Rope placed between the two rows of studs. Membrane from sheets should be overlapped by one stud and sealed using RIW Overtape applied with equal overlap on the two membranes.

15.13 The membrane is cut within 5 mm to 10 mm of any pipes and services in the floor, and the gap filled with RIW Sealing Rope. A patch of membrane is overlaid and sealed to the service with RIW Sealing Rope, and its circumference sealed with RIW Sealing Tape or RIW Overtape.

15.14 Fixings must not be applied through the floor membrane.

15.15 Where appropriate at wall/floor junctions and corners of the installation, the membrane should be cut flush and the gap between the wall and floor membranes overlaid and sealed with RIW Overtape. Alternatively, where a wall membrane is not being installed the floor membrane may be turned up by 100 mm at the walls.

15.16 At corners, a cut is made and the membrane folded to form an edge-to-edge joint, then overlaid and sealed with RIW Overtape.

## 16 Dry lining of walls

16.1 Gypsum plasterboard to BS EN 520 : 2004, or similar dry lining boards covered by a current Agrément Certificate, are fixed to the battens with galvanized screws or nails, positioned a minimum of 12 mm from the edge of the board. Care should be taken to ensure that penetration of the plasterboard by screws or nails is less than batten depth to avoid puncturing the membrane.

16.2 Alternatively, linings can be free-standing framework, blockwork or similar. Where necessary these should be tied back by fixing into the RIW Brick Plug's fixing hole.

## 17 Floor membrane coverings

17.1 If required, extruded closed-cell polystyrene insulation boards (minimum density 30 kg·m<sup>-3</sup>) are laid over the membrane.

17.2 The membrane is covered by reinforced concrete or screed at least 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 over the membrane.

17.3 Alternatively, the studs should be filled with dried sand, and then suitable tongue-and-groove panels should be selected in accordance with BS EN 12871 : 2001 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.

## 18 Tests

Tests were carried out on RIW Cavity Drain R20 and the results assessed to determine:

- thickness
- short-term compression resistance
- resistance to long-term loading
- nail tear resistance
- puncture resistance.

## 19 Investigations

19.1 The manufacturing process and quality control procedures were evaluated and details obtained of the quality and composition of materials used.

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

## Bibliography

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

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*

BS EN 520 : 2004 *Gypsum plasterboards — Definitions, requirements and test methods*

BS EN 12871 : 2010 *Wood-based panels — Performance specifications and requirements for load bearing boards for use in floors, walls and roofs*

BS EN 1991-1-1 : 2002 *Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*

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



## 20 Conditions

20.1 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 or 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.

20.2 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.

20.3 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.

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

20.5 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.

20.6 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.