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Agrément Certificate

97/3325

Product Sheet 4

GCP STRUCTURAL WATERPROOFING MEMBRANES

PREPRUFE 160R

This Agrément Certificate Product Sheet⁽¹⁾ relates to Preprufe 160R, a pre-applied damp-proof and waterproof membrane for use in externally applied tanking below ground. It is also for use to protect the building against radon, methane and carbon dioxide from the ground.

(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

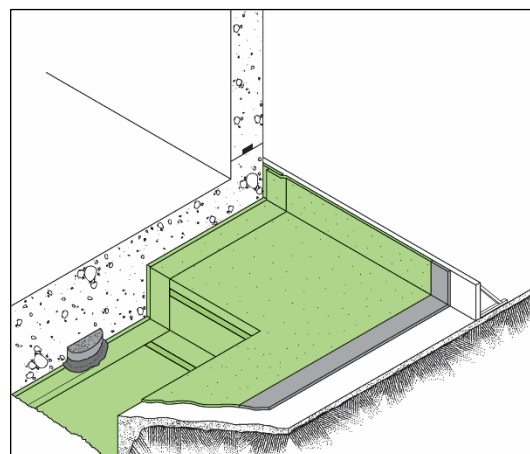
Resistance to water and water vapour — the product, including joints, provides an effective barrier to the passage of water and water vapour from the ground (see section 6).

Resistance to underground gases — the product will contribute to restricting the ingress of radon, methane and carbon dioxide into the building (see section 7).

Resistance to mechanical damage — the product will accept, without damage, the limited foot traffic and loads associated with installation (see section 8).

Adhesion and stability — the adhesion of the product to the substrate and to itself is satisfactory (see section 9).

Durability — under normal service conditions, the product will provide an effective barrier to the transmission of liquid water, water vapour, radon, methane and carbon dioxide for the lifetime of the structure in which it is installed (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

Date of Third issue: 11 July 2018

John Albon – Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

Originally certificated on 11 September 1997

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.*

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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Regulations

In the opinion of the BBA, Preprufe 160R, 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)

Requirement:	C1(2)	Site preparation and resistance to contaminants
Comment:		The product will contribute to a structure satisfying this Requirement for protection against methane and carbon dioxide. See section 7 of this Certificate.
Requirement:	C2(a)	Resistance to moisture
Comment:		The product will enable a structure to satisfy this Requirement. See section 6.1 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is an acceptable material. See section 12 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The use of the product satisfies the requirements of this Regulation. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.1	Site preparation – harmful and dangerous substances
Standard:	3.2	Site preparation – protection from radon gas
Comment:		When properly installed in a correctly designed structure, the product will restrict the movement of radon within the ground slab and thus contribute to compliance with these Standards, with reference to clauses 3.1.2 ⁽¹⁾⁽²⁾ , 3.1.6 ⁽¹⁾⁽²⁾ , 3.1.7 ⁽¹⁾⁽²⁾ , 3.1.8 ⁽¹⁾⁽²⁾ , 3.2.1 ⁽¹⁾⁽²⁾ and 3.2.2 ⁽¹⁾⁽²⁾ . See section 7 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product will enable a structure to satisfy the requirements of this Standard with reference to clauses 3.4.2 ⁽¹⁾⁽²⁾ , 3.4.4 ⁽¹⁾⁽²⁾ and 3.4.6 ⁽¹⁾⁽²⁾ . See section 6.1 of this Certificate.
Standard:	7.1(a)(b)	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:		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)

Regulation:	23(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.

Regulation:	26(a)	Preparation of sites and resistance to dangerous and harmful substances
Comment:		The product will contribute to a structure satisfying this Requirement for protection against methane and carbon dioxide. See section 7 of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The product will enable a structure to satisfy the requirements of this Regulation. 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 sections: 1 *Description* (1.2) and 3 *Delivery and site handling* (3.3 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2018

In the opinion of the BBA, Preprufe 160R, 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 4.1 *Land Quality – managing ground conditions* and 5.1 *Substructure and ground bearing floors*, clause 5.1.20 *Damp-proofing concrete floors*, for use below the slab and in sandwich constructions, and 5.4 *Waterproofing of basements and other below ground structures* for use externally.

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 must be used in combination with either Type B or C waterproofing protection, as defined in BS 8102 : 2009.

The Certificate holder should be consulted for approved Type B and C solutions.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard 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 Preprufe 160R is a white, pressure-sensitive adhesive protected by a weather-resistant coating. Preprufe Tape is available for use in overbanding end laps and cut edges and for detailing. An LT grade is available for use in low-temperature applications, and HC grade for use in hot climates.

1.2 The nominal characteristics of the product are:

Thickness* (mm)	0.8
Width* (m)	1.2
Roll length (m)	35
Roll weight (kg)	42
Mass per unit area* (kg·m ⁻²)	0.81
Watertightness* (60 kPa)	Pass
Tensile strength* (N per 6 mm)	60 (longitudinal) and 60 (transverse)
Elongation* (%)	4.5 (longitudinal) and 4 (transverse)

Nail tear strength* (N)	≥300
Compatibility with bitumen*	Pass.

1.3 The nominal characteristics of Preprufe Tape are:

Thickness (mm)	0.7
Width (m)	1.0
Roll length (m)	1.5
Roll weight (kg)	2
Mass per unit area (kg·m ⁻²)	1.33.

1.4 An ancillary item for use with the product, but outside the scope of this Certificate, is Bituthene LM, a liquid-applied compound for sealing around penetrations and irregular surfaces.

2 Manufacture

2.1 Preprufe 160R is manufactured by a compound mixing and coating process. The adhesive compound is blended and applied onto the release paper using an extrusion die and then laminated with HDPE film.

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.

2.3 The management system of the manufacturer, GCP Applied Technologies Inc., has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by Intertek (Certificate QMS-0816a-01).

3 Delivery and site handling

3.1 The product is delivered to site packaged in polythene wrappers and cardboard containers marked with the roll batch number, and bearing the Certificate holder's name and the BBA logo incorporating the number of this Certificate.

3.2 Rolls must be suitably stored to prevent damage, under cover and in a cool, dry area.

3.3 Bituthene LM is delivered to site in 5.7 litre units. The temperature of the separate components of Bituthene LM must not fall below freezing.

3.4 The Certificate holder has taken the responsibility of classifying and labelling the product under the *CLP Regulation (EC) No 1272 / 2008 on the classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Preprufe 160R.

4 Use

4.1 Preprufe 160R is satisfactory for use as a waterproofing and damp-proofing membrane in accordance with CP 102 : 1973 Section 2 and BS 8000-4 : 1989 in Grades 1 to 3 basement constructions, as defined in BS 8102 : 2009, Table 2.

4.2 The membrane is white in colour to reduce solar gain after installation, prior to pouring of the concrete.

4.3 The product can be used externally to provide an effective barrier to the transmission of liquid water and water vapour where Grades 1 to 3 waterproofing protection is required, as defined in Table 2 of BS 8102 : 2009. The product must not be used for negative side pressure waterproofing applications.

4.4 Where Grade 3 waterproofing protection is required, the environment must also be controlled by use of ventilation, dehumidification and/or air conditioning as appropriate, to ensure dampness does not occur. See also the *Additional Information* part of this Certificate relating to the *NHBC Standards*.

4.5 The product is satisfactory for use as a radon gas resistant membrane. It will contribute to restricting the passage of methane and carbon dioxide (see section 7). Installations must be verified in accordance with BS 8485 : 2015.

5 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Resistance to water and water vapour



6.1 The product, including joints, when completely sealed and consolidated, will adequately resist the passage of water and moisture from the ground and so satisfy the relevant requirements of the national Building Regulations.

6.2 The product is impervious to water and will give a waterproof layer capable of accepting minor structural movements without damage.

7 Resistance to underground gases



7.1 The product will contribute to restricting the ingress of radon, methane and carbon dioxide into buildings from landfill and naturally occurring sources.

7.2 When used as part of the structural barrier in basement floor and wall constructions conforming to BS 8102 : 2009, Grade 2 and Grade 3 waterproofing, the product will contribute to restricting the ingress of radon, methane and carbon dioxide into a building from landfill and naturally occurring sources, with reference to BS 8485 : 2015, Table 5.

7.3 Measured gas permeability/diffusion values on the membrane are given in Table 1.

Table 1 Gas permeability of Preprufe 160R

Gas	Method	Result
Methane ⁽¹⁾ with overlap	BS ISO 15105-1	78.5 ml·m ² ·day ⁻¹ ·atm ⁻¹
Radon	K124/02/95	5.7 x 10 ⁻¹² m ² ·s ⁻¹

(1) BS 8485 : 2015 requires that the methane transmission rate measured in accordance with BS ISO 15105-1 : 2007 for a gas-resistant membrane is <40 ml·m²·day⁻¹·atm⁻¹.

7.4 BRE Report BR 211 : 2015 recommends a 300 µm thick polyethylene sheet as the minimum required thickness for a gas-resistant membrane. It is generally accepted that other materials with comparable or higher gas-resistance are suitable, provided they can withstand the construction processes. In the opinion of the BBA, the membrane satisfies this criteria.

8 Resistance to mechanical damage

8.1 When installed horizontally, the membrane is suitable for use without a protection layer. Reinforcement should be placed on spreader type spacer blocks or similar. Care should be taken to avoid point loadings or damage to the membrane.

8.2 The membrane should be placed onto suitably prepared surfaces such as concrete blinding or any others advised by the Certificate holder. The membrane will not be damaged by normal foot or site traffic.

9 Adhesion and stability

The adhesion of the product to the substrates and to itself is satisfactory. The properties are such as to accommodate minor movements likely to occur under normal service conditions in the structure in which the membrane is incorporated.

10 Effects of temperature

The product will remain flexible and capable of being formed at the minimum recommended temperatures (see section 13.5).

11 Maintenance

As the membrane is protected by concrete placed against it and has suitable durability (see section 12), maintenance is not required. However, damage occurring prior to installation of the concrete must be repaired (see section 15).

12 Durability



The product, when fully protected and subjected to normal service conditions, will provide an effective barrier to the transmission of liquid water and water vapour and will restrict the ingress of radon, methane and carbon dioxide during the lifetime of the building.

Installation

13 General

13.1 Preprufe 160R must be installed in accordance with the relevant requirements of this Certificate, CP 102 : 1973 Section 2, BS 8102 : 2009 and the Certificate holder's instructions. Additional guidance on the use of damp-proof membrane materials is available in BS 8000-4 : 1989. For gas-resistant applications, the product must be installed and fixed in accordance with the relevant clauses of BRE Report BR 211 : 2015 and BS 8485 : 2015.

13.2 All surfaces to which the membrane is to be applied must be sound to solid, to eliminate movement during the pouring of concrete. The substrate must have a smooth finish with no gaps or voids greater than 12 mm. Substrates do not require priming prior to installation of the product.

13.3 Horizontal substrates suitable for application are either of monolithic concrete construction or well compacted sand blinding on a granular fill. For use on other substrates, the advice of the Certificate holder should be sought. The substrate must be free from sharp protrusions and loose aggregate. The substrate does not need to be dry, but must be free from standing water to avoid contamination of the overlap areas.

13.4 Vertical substrates suitable for application are either of concrete or 19 mm plywood, and provide support for the membrane. The plywood sheets must be closely butted and not more than 12 mm out of alignment. For use on other substrates, the advice of the Certificate holder should be sought.

13.5 The membrane must not be installed at temperatures below +5°C. To remove moisture or condensation and improve adhesion at low temperatures or in damp conditions, the selvedge of the membrane may require gentle warming. At temperatures below 13°C, the use of Preprufe Tape LT is recommended at all laps and detailing.

14 Procedure

14.1 Edge and end laps for Preprufe 160R, and end laps for Preprufe Tape, are a minimum of 75 mm. Laps are to be dry, clean and free from dust.

14.2 End laps and cut edges must be overbanded using Preprufe Tape. The overlap area is wiped with a damp cloth to ensure the area is clean and free from dust and allowed to dry prior to jointing. The tape is centred over the lap and rolled firmly to ensure a watertight seal. The plastic release liner must be removed.

Horizontal application

14.3 Preprufe 160R is unrolled over the substrate with the white HDPE film towards the substrate.

14.4 Subsequent sheets are accurately positioned to ensure the correct overlaps (see section 14.2).

14.5 The plastic release liner is peeled back from the overlap as the two membranes are bonded, ensuring a continuous bond without creases, and firmly rolled.

14.6 The plastic release liner is removed to expose the white protective coating prior to placing reinforcement and pouring concrete.

Vertical application

14.7 Preprufe 160R is installed with the white HDPE film towards the substrate and secured using the appropriate mechanical fastenings to suit the substrate.

14.8 The top of the membrane is secured using a batten or fastener 50 mm below the top edge.

14.9 The membrane can then be mechanically fastened through the self-adhesive selvedge so that the membrane lies flat.

14.10 The plastic release liner is then removed prior to installation of the next sheet.

14.11 The underside of the succeeding sheet must be dry, clean and free from dust before the overlap is made (see section 14.2). The overlap is firmly rolled to ensure it is sealed.

15 Repair

Damage to the membrane can be adequately repaired by patching prior to the application of protection or backfilling. If required by the local authority repair work should be confirmed by an independent validation report, as all gas membrane installations should be subject to third party independent validation in accordance with BS 8485 : 2015.

Technical Investigations

16 Tests

16.1 An assessment was made of data to EN 13967 : 2012 in relation to:

- visible defects*
- dimensions and tolerances*

- resistance to impact*
- reaction to fire*
- water vapour transmission*
- tensile strength and elongation* on controls and following 24 weeks at 90°C
- tear resistance*
- watertightness on controls following:
 - 12 weeks ageing at 70°C
 - 4 weeks ageing at 70°C subsequent to a compatibility with bitumen test*
 - 1 and 16 weeks' immersion in lime water
- resistance to static loading*
- joint strength*
- water vapour transmission.

16.2 Tests were carried out and the results assessed to determine:

- dimensional stability
- low temperature unrolling
- tensile strength and elongation and low temperature flexibility on controls and following 8 weeks' heat ageing at 60°C, water soak for 4 weeks at 23°C.
- shear strength of joints on controls and following 4 weeks' heat ageing at 60°C and water soak for 1 week at 60°C
- peel strength on controls and following 4 weeks' heat ageing at 70°C water soak for 4 weeks at 23°C
- slippage
- substrate movement
- air leakage of joints.

16.3 Test were carried out to assess:

- product characteristics and the coating medium
- durability of the product, the coating medium and joints
- properties when installed.

17 Investigations

17.1 An evaluation was made of test data on the permeability of radon, methane and carbon dioxide.

17.2 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

BRE Report BR 211 : 2015 *Radon : guidance on protective measures for new dwellings*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

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

BS 8485 : 2015 *Code of practice for the characterization and remediation from ground gas in affected areas*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

BS ISO 15105-1 : 2007 *Plastics — Film and sheeting — Determination of gas-transmission rate — Differential-pressure methods*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

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

18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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.