Frank Mercer & Sons Ltd
Chequerbent Works
Manchester Road
Chequerbent
Westhoughton
Bolton
Lancashire BL5 3JF
Tel: 01942 841111 Fax: 01942 842388
e-mail: sales@toughsheet.co.uk
website: www.toughsheet.co.uk

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
99/3603
Product Sheet 1

FRANK MERCER MEMBRANES

TOUGHSHEET 250, TOUGHSHEET 300 AND TOUGHSHEET 500 MAX DAMP-PROOF MEMBRANES

This Agrément Certificate Product Sheet[1] relates to Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-proof Membranes, polyethylene membranes for use in solid concrete ground floors that are not subject to hydrostatic pressure, to protect buildings against moisture 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 membranes provide an effective barrier to the passage of moisture from the ground (see section 6).

Resistance to puncture — the membranes have high resistance to puncture and on a smooth or blinded surface will not be damaged by foot or site traffic (eg wheelbarrows) (see section 7).

Durability — under normal service conditions, the membranes will provide an effective barrier to moisture for the life of the concrete slab in which they are installed (see section 10).

The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Sixth issue: 15 June 2017

John Albon — Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

Originally certificated on 29 April 1999

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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA
tel: 01923 665300
fax: 01923 665301
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

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Regulations

In the opinion of the BBA, Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-proof Membranes, if installed, used and maintained in accordance with this Certificate, will 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:	C2(a)	Resistance to moisture
Comment:		The products will satisfy this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The products are acceptable. See section 10 and the *Installation* part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The products are acceptable. See section 10 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.4	Moisture from the ground
Comment:		The products can enable a floor to satisfy the requirements of this Standard, with reference to clauses 3.4.1[(1)(2)], 3.4.2[(1)(2)], 3.4.4[(1)(2)] and 3.4.6[(1)(2)]. See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products 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 the products 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)(iii)(b)(i)	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 10 and the *Installation* part of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The products will contribute to a roof satisfying this Regulation. See section 6 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

NHBC accepts the use of Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-proof Membranes, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Part 5 *Substructure, ground floors*, drainage and basements, Chapter 5.1 *Substructure and ground bearing floors*, Section M8 *Damp-proof membrane*.

CE marking

The Certificate holder has taken the responsibility of CE marking the products 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 Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-proof Membranes comprise a blown film of extruded low-density polyethylene (LDPE). The nominal characteristics are shown in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Grade		
	Toughsheet 250	Toughsheet 300	Toughsheet 500 Max
Thickness (µm)	250	300	500
Width (m)	4	4	4
Roll length (m)	25	25	12.5
Watertightness* (2 kPa)	pass	pass	pass
Durability (artificial ageing)*	pass	pass	pass
Durability (alkali)*	pass	pass	pass
Colour	black, blue, clear	black, blue, yellow	black, blue, yellow

1.2 Ancillary materials used with the membranes are:

- jointing tape — at least 0.2 mm thick and 25 mm wide, used for jointing
- girth tape — adhesive polyethylene tape, 100 mm wide, used for sealing joints.

2 Manufacture

2.1 The membranes are manufactured from a blown film of extruded LDPE.

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 Frank Mercer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by ISOQAR (Certificate 2092QM8001).

3 Delivery and site handling

3.1 Rolls of the membranes are packed in wrappers bearing labels with the product name and the BBA logo incorporating the number of this Certificate. Rolls are supplied shrink-wrapped and on pallets.

3.2 Rolls should be stored under cover on the original pallet or individually, on end.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-proof Membranes.

Design Considerations

4 Use

4.1 Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-proof Membranes are satisfactory for use in concrete floors not subject to hydrostatic pressure, in accordance with the relevant clauses of BS 8102 : 2009 and CP 102 : 1973.

4.2 The membranes can be installed either as an oversite membrane, between a blinded hardcore bed and the base concrete, or as a sandwich membrane in base concrete or between the base concrete and the screed.

5 Practicability of installation

The products must be installed by a competent installer, or a contractor, experienced with these types of products.

6 Resistance to water and water vapour



The membranes and the methods of jointing provide an effective barrier to the passage of moisture from the ground and will enable a floor to comply with the requirements of the national Building Regulations.

7 Resistance to puncture

The membranes have a high resistance to puncture. On smooth or blinded surfaces they will not be damaged by normal foot or site traffic, eg wheelbarrows. However, since they can be punctured by sharp objects, care should be taken to avoid damage during installation, particularly when handling building materials and equipment over the surface and when placing concrete or screeds.

8 Underfloor heating

When used in accordance with underfloor heating under normal operating conditions there will be no adverse effect on the membranes. However, the Certificate holder's advice should be sought in these circumstances.

9 Maintenance

As the membranes are confined within concrete ground floors and have suitable durability (see section 10), maintenance is not required. Any damage occurring during installation must be repaired prior to overlaying with concrete (see section 14).

10 Durability



10.1 When subjected to the normal conditions of use, the membranes will provide an effective barrier to the transmission of liquid water and water vapour for the life of the concrete slab in which they are installed.

10.2 Long periods of exposure to ultraviolet light will reduce the effectiveness of the membranes. The membranes should be protected from such exposure during storage and when in use.

11 Reuse and recyclability

The membranes comprise polyethylene, which can be recycled.

Installation

12 General

12.1 Installation of Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-proof Membranes should be in accordance with the Certificate holder's instructions and clause 11 of CP 102 : 1973, the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, and section 13 of this Certificate.

12.2 Unless the base is smooth, a surface blinding of soft sand or similar material should be used to prevent puncturing during installation or when the concrete or screed is being placed.

12.3 The membranes must be clean and free from dirt and grease.

12.4 The membranes may be installed in all conditions normal to ground-floor slab construction. Where there is a risk of ground becoming waterlogged, sub-soil drainage must be provided in accordance with CP 102 : 1973.

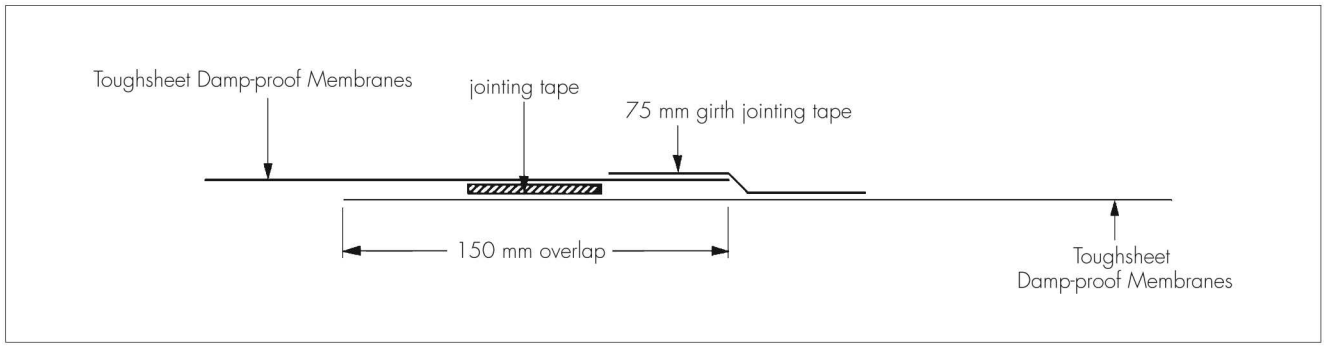
12.5 The membranes remain flexible in the extremes of temperature likely to occur in practice.

12.6 The type of floor finish to be used may limit the suitability of polyethylene damp-proof membranes. The guidance given in CP 102 : 1973 and BS 8102 : 2009, Table 1, should be followed.

13 Procedure

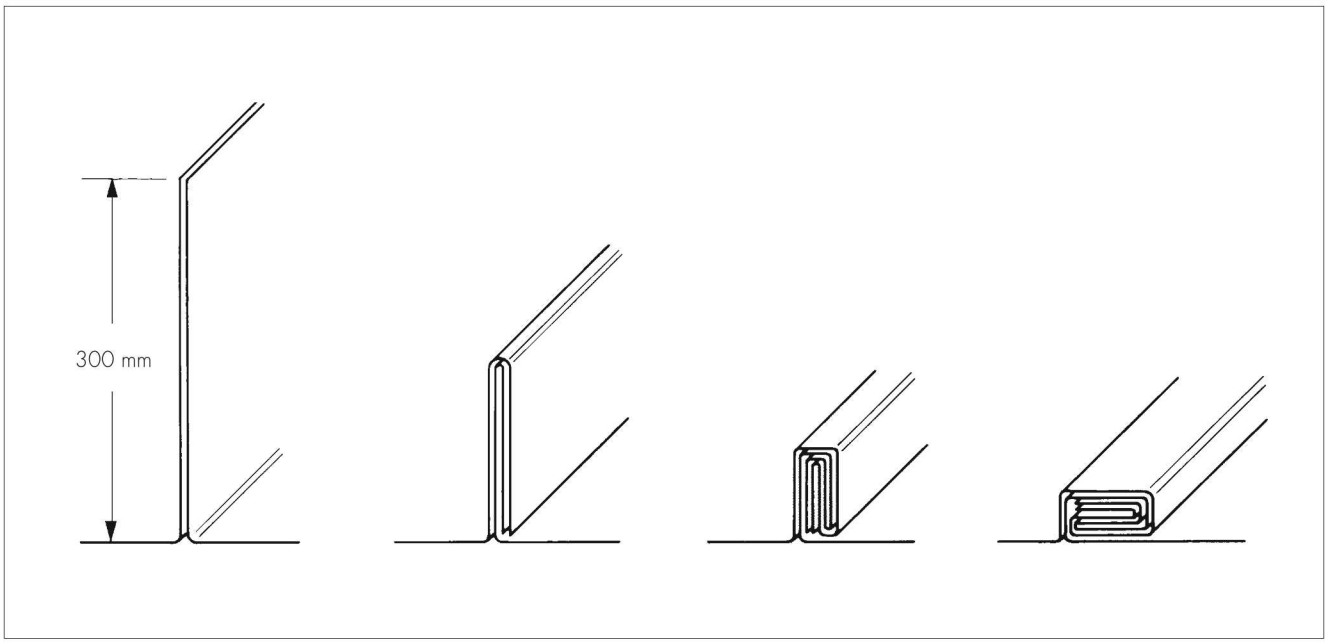
13.1 Adjacent sheets should be overlapped by at least 150 mm, and should be bound with mastic strips and sealed with 100 mm wide girth jointing tape (see Figure 1).

Figure 1 Jointing tape joint



13.2 Alternatively, when it is not possible to keep the sheet dry, a double-welted fold should be formed using at least 300 mm of the membrane (see Figure 2). It is essential that the fold is held in position prior to placing the concrete, eg by weighting with bricks.

Figure 2 Double-welted fold joint



13.3 The membrane must be continuous with the damp-proof course in the surrounding walls. Where necessary the membrane should be used as a vertical damp-proof course to link the two.

13.4 The membrane must be covered by a screed or other protective layer as soon as possible after installation. Care should be taken to ensure that the membrane is not stretched or displaced when placing the concrete or screed over the membrane. Sufficient allowance should be made to avoid bridging (ie creating areas of unsupported membrane) during screeding operations at details such as internal angles.

14 Repair

Perforations or punctures in the membranes should be patched with sheets of identical thickness, lapped at least 150 mm beyond the limits of the puncture and the laps sealed with double-sided pressure sensitive tape.

Technical Investigations

15 Tests

Tests were carried out on Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-proof Membranes and the results assessed to determine:

- dimensions
- density
- water vapour resistance
- water vapour permeability
- dart impact

- tensile strength and elongation
- low temperature flexibility
- nail tear
- trouser tear
- dimensional stability
- heat ageing at 80° for 56 days followed by tensile strength, elongation and nail tear
- short term UV ageing followed by tensile strengths and elongation
- tensile strength of joints
- heat ageing of joints at 60° for 28 days followed by tensile strength and elongation.

16 Investigations

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 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

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

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

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

17 Conditions

17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
fax: 01923 665301
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

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