



Toughsheet[™]
Building Products

BBA Approval Inspection Testing Certification

Damp Proof Membranes (250 / 300 / 500)

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Agrément Certificate

99/3603

Product Sheet 1 Issue 8

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, low-density polyethylene (LDPE) membranes for use in ground supported and suspended slab applications that are not subject to hydrostatic pressure, to protect buildings against moisture from the ground.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

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 Eighth issue: 29 September 2024

Originally certified on 20 April 1999

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

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

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SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-Proof Membranes, 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 Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C2(a)	Resistance to moisture
Comment:		The products, including joints, will enable a floor to satisfy this Requirement. See section 3 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The products are acceptable. See sections 8 and 9 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The products are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	9	Building standards - construction
Standard:	3.4	Moisture from the ground
Comment:		The products will enable a structure to satisfy this Standard, with reference to clauses 3.4.1 ⁽¹⁾⁽²⁾ , 3.4.2 ⁽¹⁾⁽²⁾ and 3.4.5 ⁽¹⁾⁽²⁾ to 3.4.7 ⁽¹⁾⁽²⁾ . See section 3 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 - conversion
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(1)(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The products are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The products can contribute to satisfying this Regulation. See section 3 of this Certificate.

Additional Information

NHBC Standards 2024

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, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards* Chapters 5.1 *Substructure and ground bearing floors* and 5.2 *Suspended ground floors*.

Fulfilment of Requirements

The BBA has judged Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-Proof Membranes to be satisfactory for use as described in this Certificate. The products have been assessed as LDPE membranes for use in ground supported and suspended slab applications that are not subject to hydrostatic pressure, to protect buildings against moisture from the ground.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the products under assessment. Toughsheet 250, Toughsheet 300 and Toughsheet 500 Max Damp-Proof Membranes comprise a blown film of extruded LDPE.

The products have the nominal characteristics given 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
Colour	black, blue, clear	black, blue	black, blue, yellow

Ancillary Items

The following ancillary items are essential to use with the products and have been assessed with the products:

- jointing tape — double sided 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.

Applications

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

The products can also be used as an oversite membrane between a blinded hardcore bed and the base concrete and as a sandwich membrane in the base concrete or between the base concrete and the screed.

The products can also be used in suspended floor constructions.

Product assessment – key factors

The products were assessed for the following key factors, and the outcome of the assessment is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Data were assessed for the following characteristics.

1.1 Mechanical properties

1.1.1 Results of mechanical property tests are given in Table 2.

Product assessed	Assessment method ⁽¹⁾	Requirement	Result	
Toughsheet 300	Trouser tear strength to BS 2782-3 : Method 360B : 1980	Value achieved	Longitudinal direction	196 N·mm ⁻¹
			Transverse direction	217 N·mm ⁻¹
Toughsheet 250	Longitudinal direction Transverse direction		Longitudinal direction	184 N·mm ⁻¹
			Transverse direction	198 N·mm ⁻¹
Toughsheet 300	Nail tear to MOAT 27 : 5.4.1 : 1983	Value achieved	Longitudinal direction	119 N
			Transverse direction	116 N
Toughsheet 250	Longitudinal direction Transverse direction		Longitudinal direction	101 N
			Transverse direction	90 N
Toughsheet 300	Tensile strength to BS 2782-3 : Method 320A : 1976	Value achieved	Longitudinal direction	18.3 MPa
			Transverse direction	18.7 MPa
Toughsheet 250	Longitudinal direction Transverse direction		Longitudinal direction	19.1 MPa
			Transverse direction	18.7 MPa
Toughsheet 300	Elongation to BS 2782-3 : Method 320A : 1976	Value achieved	Longitudinal direction	553%
			Transverse direction	613%
Toughsheet 250	Longitudinal direction Transverse direction		Longitudinal direction	594%
			Transverse direction	636%
Toughsheet 250	Resistance to impact BBA method Tested at 19°C/drop height of 2.0 m Tested at 0°C/drop height of 1.75 m	Value achieved		Dented
				Dented
Toughsheet 250	Dart impact to BS 2782 : Method 352D : 1979	Value achieved		415 g
Toughsheet 250	Low temperature flexibility to MOAT 27 : 5.4.2 : 1983	Value achieved		-25°C
Toughsheet 300				-25°C

(1) Tested prior to the publication of the harmonised European Standard EN 13967 : 2012.

1.1.2 On the basis of data assessed, the products can be punctured by sharp objects and care must be taken when handling building materials and equipment over the exposed surface.

1.1.3 The products remain flexible in the extremes of temperature likely to occur in practice.

2 Safety in case of fire

Not applicable.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Resistance to water and water vapour

3.1.1 Results of resistance to water and water vapour tests are given in Table 3.

Table 3 Resistance to water and water vapour

Product assessed	Assessment method	Requirement	Result
Toughsheet 250	Water vapour transmission to BS 3177 : 1959 ⁽¹⁾	Value achieved	0.48 g·m ⁻² ·24 h ⁻¹
Toughsheet 300			0.50 g·m ⁻² ·24 h ⁻¹
Toughsheet 250/Toughsheet jointing tape/Toughsheet girth tape	Tensile strength (shear) of joints to MOAT 27 : 5.2.2 : 1983	Value achieved	175 N
Toughsheet 250/Toughsheet jointing tape/Toughsheet girth tape	Resistance to leakage at joints to MOAT 27 : 5.2.1 : 1983	No leakage of air	Pass

(1) Tested prior to the publication of the harmonised European Standard EN 13967 : 2012.

3.1.2 On the basis of the data assessed, the products, including joints, provide an effective barrier to the passage of water vapour from the ground. The products are impervious to water and provide a waterproof layer capable of accepting minor structural movements without damage.

3.1.3 Toughsheet 300 and Toughsheet 500 Max membranes comply with the minimum sheet thickness for polyethylene damp-proof membranes detailed in the documents supporting the national Building Regulations.

3.1.4 In Scotland, Toughsheet 250 µm thick membrane additionally complies with the minimum sheet thickness detailed in the national Building Regulations.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Not applicable.

7 Sustainable use of natural resources

The membranes comprise polyethylene, which can be recycled.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the products were assessed.

8.2 Specific test data were assessed as given in Table 4.

Table 4 Durability

Product assessed	Assessment method ⁽¹⁾	Requirement	Result	
Toughsheet 250	Trousers tear strength to BS 2782-3 : Method 360B : 1980 after heat ageing for 56 days at 60°C	Value achieved	Longitudinal	200 N·mm ⁻¹
			Transverse	206 N·mm ⁻¹
Toughsheet 250	Nail tear to MOAT 27 : 5.4.1 : 1983 after heat ageing for 56 days at 60°C	Value achieved	Longitudinal	107 N
			Transverse	107 N
Toughsheet 250	Tensile strength to BS 2782-3 : Method 320A : 1976 after heat ageing for 56 days at 60°C	No significant deterioration	Pass	
Toughsheet 250	Elongation to BS 2782-3 : Method 320A : 1976 after heat ageing for 56 days at 60°C	No significant deterioration	Pass	
Toughsheet 250	Tensile strength to BS 2782-3 : Method 320A : 1976 after UV ageing for 100 light hours	No significant deterioration	Pass	
Toughsheet 250	Elongation to BS 2782-3 : Method 320A : 1976 after UV ageing for 100 light hours	No significant deterioration	Pass	
Toughsheet 250/Toughsheet jointing tape/Toughsheet girth tape	Tensile strength (shear) of joints to MOAT 27 : 5.2.2 : 1983 after heat ageing for 28 days at 60°C	No significant deterioration	Pass	
Toughsheet 300	Dimensional stability to MOAT 27 : 5.1.6.1 : 1983	Value achieved	Longitudinal	-0.2%
			Transverse	+0.1%
Toughsheet 250			Longitudinal	-0.3%
			Transverse	+0.1%

(1) Tested prior to the publication of the harmonised European Standard EN 13967 : 2012.

8.3 Service life

8.3.1 Under normal service conditions, the products, when fully protected, will have a life equivalent to the structure in which they are incorporated, provided they are designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

8.3.2 Long periods of exposure to ultraviolet light will reduce the effectiveness of the products and so they must be protected from such exposure during storage and installation.

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed against the requirements of BS 8000-4 : 1989 and CP 102 : 1973 Section 3, and the following requirements apply in order to satisfy the performance specified in this Certificate.

9.1.2 On ground bearing slabs, unless the base is smooth, a surface blinding of soft sand or similar material must be used to prevent puncturing during installation or when the concrete or screed is being placed.

9.1.3 The products can 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.

9.1.4 The type of floor finish to be used may limit the suitability of polyethylene damp-proof membranes. The guidance given in CP 102 : 1973 must be followed.

9.1.5 When used in accordance with this Certificate, there will be no adverse effect on the products from underfloor heating under normal operating conditions. The advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

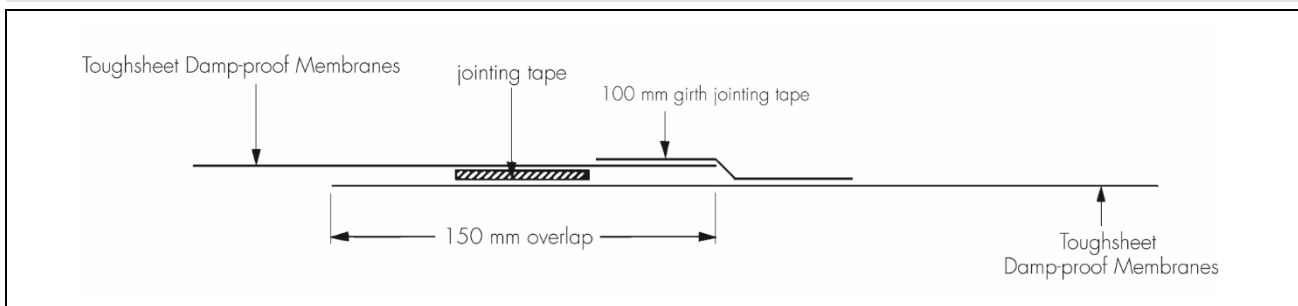
9.2.2 Installation of the products must be in accordance with the Certificate holder's instructions, CP 102 : 1973 Clause 11, the relevant clauses of BS 8000-0 : 2014 BS 8000-4 : 1989. A summary of instructions and guidance is provided in Annex A of this Certificate.

9.2.3 The products must be kept clean and free from dirt and grease.

9.2.4 On suspended floor slabs, the area must be free of debris and projections that may damage the products.

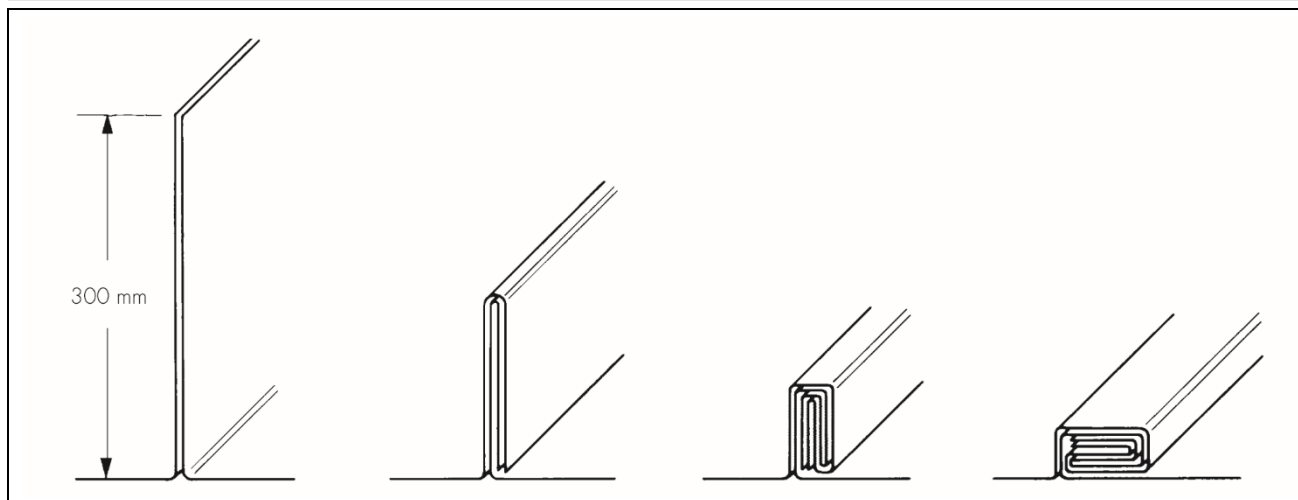
9.2.5 Adjacent membranes must be overlapped by at least 150 mm and must be bound with jointing tape and sealed with 100 mm wide girth jointing tape (see Figure 1).

Figure 1 Tape joint



9.2.6 Alternatively, when it is not possible to keep the sheet dry, a double-welted fold must 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



9.2.7 The damp-proof membrane must be continuous and linked with the damp-proof course (DPC) in the surrounding walls. Where necessary the membrane must be used as a vertical DPC to link the two. The damp-proof membrane and the DPC joint must be overlapped by a minimum of 100 mm and sealed with an appropriate sealant tape. Where there

is doubt about the compatibility of materials, the advice of the Certificate holder must be sought; but such advice is outside the scope of this Certificate.

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

9.3 Workmanship

Practicability of installation was assessed by the BBA, on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the products must be carried out by a competent general builder, or a contractor, experienced with these types of products.

9.4 Maintenance and repair

9.4.1 As the products are confined within the structure and have satisfactory durability, maintenance is not required. Any damage occurring during construction must be repaired prior to the application of any protection or backfilling.

9.4.2 Any damage to the products must be repaired using a patch of the appropriate product, and laps are sealed using tape.

10 **Manufacture**

10.1 The production processes for the products have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate. An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review 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.

11 **Delivery and site handling**

11.1 The Certificate holder stated that rolls of the products are delivered to site packed in wrappers bearing labels with the product name and the BBA logo incorporating the number of this Certificate. Rolls are supplied shrink-wrapped on pallets.

11.2 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 Rolls must be stored under cover on the original pallet or individually, on end.

Supporting information in this Annex is relevant to the products but has not formed part of the material assessed for the 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.

UKCA marking

The Certificate holder has taken the responsibility of UKCA marking the product in accordance with Designated Standard EN 13967 : 2012.

CE marking

The Certificate holder has taken the responsibility of CE marking the products in accordance with harmonised European Standard EN 13967 : 2012.

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by ISOQAR (Certificate 2092 QM-001).

Bibliography

- BS 2782-3 : Methods 320A to 320F : 1976 (1998) *Methods of testing plastics – Mechanical properties – Tensile strength, elongation and elastic modulus*
- BS 2782-3 Method 352D : 1979 *Methods of testing plastics – Mechanical properties – Determination of falling weight impact resistance of thin flexible sheet (film)*
- BS 2782-3 Method 360B : 1980 *Methods of testing plastics – Mechanical properties – Determination of tear strength of sheet and sheeting (trouser tear method)*
- BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*
- BS 8000-0 : 2014 + A1 : 2024 *Workmanship on construction sites – Introduction and general principles*
- BS 8000-4 : 1989 *Workmanship on building sites – Code of practice for waterproofing*
- CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*
- BS EN 13967 : 2012 + A1 : 2017 *Flexible sheets for waterproofing – Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet – Definitions and characteristics*
- BS EN ISO 9001 : 2015 *Quality management systems – Requirements*
- MOAT 27 : 1983 *General Directive for the assessment of Roof Waterproofing Systems*

Conditions of Certificate

Conditions

1 This Certificate:

- relates only to the product 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.

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.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product 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.

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

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

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product 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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