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**Agrément Certificate**

**90/2548**

Product Sheet 9

## TYVEK CONSTRUCTION MEMBRANES

### TYVEK STRUCTUREGUARD

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to TYVEK<sup>(2)</sup> StructureGuard, a spunbond, high-density polyethylene (HDPE) breather membrane for use in external wall timber-frame, steel-frame and masonry constructions.

(1) Hereinafter referred to as 'Certificate'.

(2) TYVEK is a registered trademark of E.I. du Pont de Nemours & Co. or its affiliates.

#### 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

**Weathertightness** — the product will contribute to protecting a wall against water penetration (see section 6).

**Risk of condensation** — the product has a low resistance to water vapour transmission and will reduce the risk of interstitial condensation (see section 7).

**Strength** — the product has adequate strength to resist the loads associated with the construction of the wall (see section 8).

**Properties in relation to fire** — the product is classified as Class E in accordance with EN 13501-1 : 2018 and its use is restricted in some cases by the national Building Regulations (see section 9).

**Durability** — the product will have a lifetime equal to that of the building element in which it is installed (see section 11).



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

On behalf of the British Board of Agrément

Date of Third issue: 2 March 2021

Originally certificated on 14 July 2016

Hardy Giesler  
Chief Executive Officer

*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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

*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, TYVEK StructureGuard, 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)

<b>Requirement:</b>	<b>B3(4)</b>	<b>External fire spread</b>
Comment:	The product can contribute to satisfying this Requirement. See section 9.1 of this Certificate.	
<b>Requirement:</b>	<b>B4(1)</b>	<b>External fire spread</b>
Comment:	The product is restricted by this Requirement. See section 9 of this Certificate.	
<b>Requirement:</b>	<b>C2(b)</b>	<b>Resistance to moisture</b>
Comment:	The product will contribute to a wall satisfying this Requirement. See section 6.1 of this Certificate.	
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:	The product can contribute to limiting the risk of interstitial condensation. See section 7.1 of this Certificate.	
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
Comment:	The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.	



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

<b>Regulation:</b>	<b>8(1)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:	The product can contribute to a construction satisfying this Regulation. See section 11 and the <i>Installation</i> part of this Certificate.	
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	2.4	Cavities
Comment:	The product can contribute to satisfying this Standard with respect to clause 2.4.2 <sup>(1)(2)</sup> . See section 9.1 of this Certificate.	
Standard:	3.10	Precipitation
Comment:	The product will contribute to a wall satisfying clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.5 <sup>(1)(2)</sup> of this Standard. See section 6.1 of this Certificate.	
Standard:	3.15	Condensation
Comment:	The product can contribute to limiting the risk of interstitial condensation, with reference to clauses 3.15.1 <sup>(1)(2)</sup> and 3.15.5 <sup>(1)(2)</sup> of this Standard. See section 7.1 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.	
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
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 <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 (as amended)

<b>Regulation:</b>	<b>23(a)(i)</b>	<b>Fitness of materials and workmanship</b>
Comment:	<b>(iii)(b)(i)</b>	The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>28(a)</b>	<b>Resistance to moisture and weather</b>
Comment:		The product will contribute to a wall satisfying this Regulation. See section 6.1 of this Certificate.
<b>Regulation:</b>	<b>29</b>	<b>Condensation</b>
Comment:		The product can contribute to limiting the risk of interstitial condensation. See section 7.1 of this Certificate.
<b>Regulation:</b>	<b>35(4)</b>	<b>Internal fire spread - structure</b>
Comment:		The product can contribute to satisfying this Regulation. See section 9.1 of this Certificate.

## Construction (Design and Management) Regulations 2015

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

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

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

### Additional Information

#### NHBC Standards 2021

In the opinion of the BBA, TYVEK StructureGuard, 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 6.1 *External masonry walls*, 6.2 *External timber framed walls*, 6.9 *Curtain walling and cladding* and 6.10 *Light steel framed walls and floors*.

#### CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard EN 13859-2 : 2014.

### Technical Specification

#### 1 Description

1.1 TYVEK StructureGuard is a non-woven, HDPE breather membrane.

1.2 The product has the nominal characteristics of:

Thickness (mm)	0.175
Mass per unit area ( $g \cdot m^{-2}$ )	58
Roll length (m)	100
Roll width (m)	1.4, 2.7 or 2.8
Hydrostatic head (m of H <sub>2</sub> O)	>1.5
Equivalent air layer thickness — $s_d$ (m)	0.015
Water vapour resistance ( $MN \cdot s \cdot g^{-1}$ )	0.075
Watertightness unaged	Class W1

aged <sup>(1)</sup>	Class W1
Tensile strength (N per 50 mm)	
longitudinal	165
transverse	140
Elongation at maximum tensile force (%)	
longitudinal	10
transverse	16
Nail tear (N)	
longitudinal	65
transverse	60
Low-temperature flexibility (°C)	-40
Resistance to penetration of air (m <sup>3</sup> ·m <sup>-2</sup> ·h <sup>-1</sup> ) at 50 Pa	0.25
Reaction to fire	Class E <sup>(2)</sup> .

(1) Aged in accordance with EN 13859-2 : 2014, Annex C.

(2) On mineral wool and wooden frame.

1.3 Air and vapour control layers (AVCLs) or air leakage barriers can be used in conjunction with the product. See Product Sheets 4, 5 and 10 of this Certificate.

1.4 Ancillary items, within the scope of the Certificate, for use with the product include:

- TYVEK 2060B Tape — a single-sided tape for sealing joints
- TYVEK Acrylic Tape (double-sided) — tape for sealing joints.

## 2 Manufacture

2.1 The product is manufactured by spinning strands of HDPE and bonding them together with heat and pressure to form a flexible sheet.

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 systems of DuPont de Nemours (Luxembourg) S.à r.l. have been assessed and registered as meeting the requirements of EN ISO 9001 : 2015 by DQS GmbH (Certificate 000093 QM15).

## 3 Delivery and site handling

3.1 The product is delivered to site in rolls with paper wrappings bearing the marketing company's name, the grade identification, the technical specifications, installation instructions and the BBA logo incorporating the number of this Certificate.

3.2 The rolls should be stored flat on their sides, on a smooth, clean, dry surface, under cover and protected from sunlight.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on TYVEK StructureGuard.

### 4 Use

4.1 TYVEK StructureGuard is satisfactory for use as a breather membrane in walls of timber-frame (either factory or site applied), steel-frame and masonry constructions behind lightweight cladding panels and masonry facades.

4.2 In the absence of other guidance, suitable timber-frame and steel-frame constructions are defined as those designed and built in accordance with *NHBC Standards 2021*, Chapters 6.1 6.2, 6.9 and 6.10 respectively.

4.3 The product satisfies the NHBC requirements given in *NHBC Standards 2021*, Chapter 6.2, as a high-performance breather membrane for use in very severe conditions<sup>(1)</sup>.

(1) Very severe conditions are defined in *NHBC Standards 2021*, Chapter 6.1, section 6.1.6, Figure 1 Exposure zones map showing categories of exposure to wind-driven rain.

4.4 The product can be damaged by high winds, careless handling or vandalism and should not be left exposed for longer than is absolutely necessary. Any damaged areas must be repaired or replaced before completion in accordance with section 15.

### 5 Practicability of installation

The product can be readily installed by operatives experienced with this type of product.

### 6 Weathertightness



6.1 The product is Class W1 in accordance with EN 13859-2 : 2014 and will resist liquid water penetration and wind-blown snow and will protect the sheathing and frame from external moisture.

6.2 The period prior to the installation of brickwork should be kept to a minimum. The Certificate Holder's advice is that the product may be used as a temporary weatherproof covering for a period not exceeding four months. The membrane must be adequately secured during this time and suitable precautions taken during periods of high wind, advice should be sort from the Certificate Holder on this matter.

### 7 Risk of condensation



7.1 The product has a design resistance to water vapour transmission of less than  $0.25 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$  and is defined as a low resistance (LR) membrane in accordance with BS 5250 : 2011. It will therefore contribute towards minimising the risk of interstitial condensation in walls designed and constructed in accordance with BS 5250 : 2011, Annex G.

7.2 The risk of condensation occurring within the wall of a building will depend upon the properties and vapour resistance of other materials used in the construction, the internal and external conditions and the effectiveness of the internal vapour control layer.

7.3 Convective water transfer into the wall construction can be reduced by installing a vapour control layer/air barrier such as the DuPont AirGuard AVCLs or air leakage barrier behind the internal lining (see Product Sheets 4, 5 and 10 of this Certificate).

### 8 Strength

8.1 The product will resist the normal loads associated with construction and installation into a building.

8.2 The product is not adversely affected by water and will retain its properties when wet.

## 9 Properties in relation to fire



9.1 The product is classified as Class E in accordance with EN 13501-1 : 2018<sup>(1)</sup>. Where the product forms the face of a cavity the spacing of cavity barriers are restricted by the national Building Regulations.

(1) Classification report MA 39 – VFA 2019-1420.02 issued by Magistratsabteilung 39 - Prüf-, Überwachungs- und Zertifizierungsstelle der Stadt Wien. A copy of the report is available from the Certificate holder.



9.2 In England and Wales the product should not be used on buildings that have a storey at least 18 m above ground level and contain: one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.

## 10 Maintenance

As the product is confined within a wall construction and has suitable durability (see section 11), maintenance is not required.

## 11 Durability



The product will have a lifetime equal to that of the building element in which it is installed.

## 12 Reuse and recyclability

The product is made from polyethylene, which can be recycled.

## Installation

### 13 General

TYVEK StructureGuard must be installed in accordance with the Certificate holder's instructions and the recommendations given in *NHBC Standards 2021*, Chapters 6.1, 6.2, 6.9 and 6.10, where appropriate.

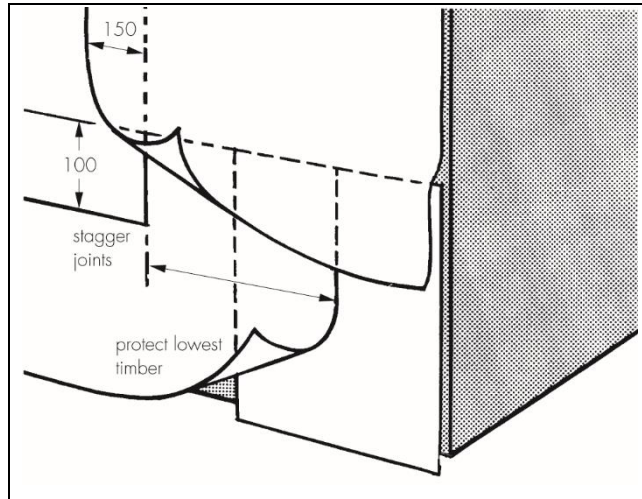
### 14 Procedure

#### Lapping and jointing

14.1 The product should be fixed in such a way as to shed water away from the sheathing, and below the lowest timber. Upper layers should be lapped over lower layers.

14.2 Horizontal laps should be at least 100 mm and vertical laps 150 mm. Vertical laps should be staggered wherever possible (see Figure 1).

Figure 1 Laps (dimensions in mm)



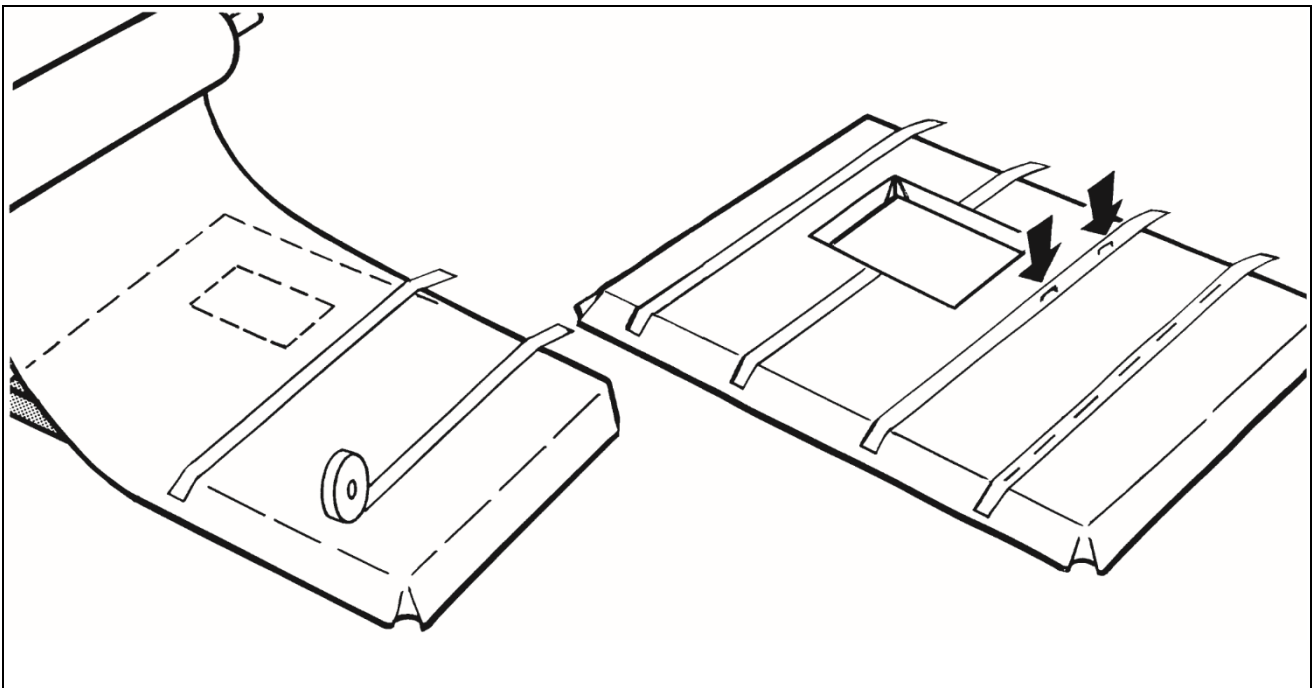
14.3 To assist in achieving the design air permeability, the lap joints and penetrations through the product can be sealed with TYVEK 2060B Tape or TYVEK Acrylic Tape (double-sided).

#### Timber-frame

#### Fixing

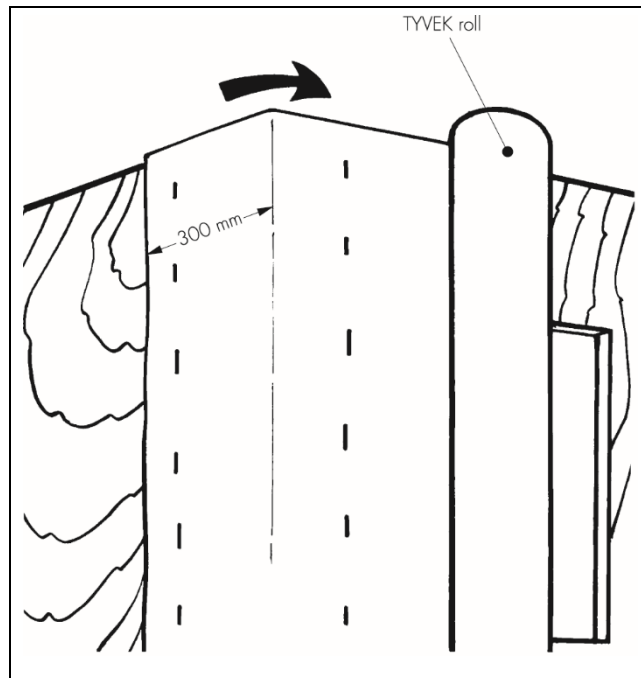
14.4 The product must be secured at regular intervals with nails and staples to prevent damage by wind (see Figures 2, 3 and 4).

Figure 2 Factory method of installation on timber-frame panel

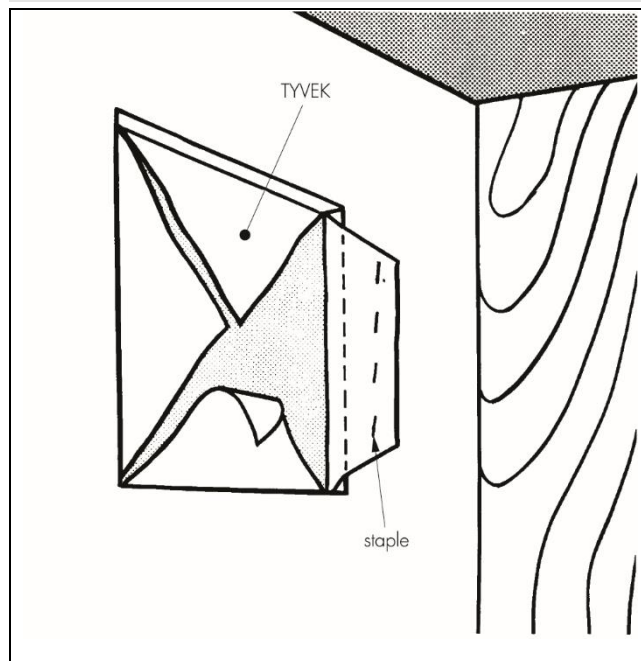




*Figure 3 Site installation — external corner*



*Figure 4 Site installation — opening (internal view of window)*



14.5 Nails should be of galvanized or sherardized mild steel, austenitic stainless steel, phosphor bronze or silicon bronze. Staples should be of austenitic stainless steel.

**Marking stud positions**

14.6 It is essential that the positions of studs are marked to enable wall tie fixing.

**Lowest timbers**

14.7 It is essential that the lowest timbers in the wall are protected by the breather membrane.



## Steel-frame

### Fixing

14.8 The product is fastened to the steelwork using an appropriate fixing system such as a 25 mm steel framing screw with an EPDM rubber washer in accordance with the Certificate holder's instructions.

## 15 Repair

Damage to the membrane can be repaired prior to the installation of the external walls or cladding by laying another sheet over the damaged area and sealing it using TYVEK 2060B Tape, ensuring that water is shed away from the sheathing.

## Technical Investigations

## 16 Tests

16.1 An assessment was made of data to EN 13859-2 : 2014 in relation to:

- length
- width
- straightness
- mass per unit area
- tensile strength and elongation
- resistance to tear
- dimensional stability
- low-temperature flexibility
- resistance to water penetration
- water vapour transmission properties
- resistance to artificial ageing
- reaction to fire.

16.2 Tests were carried out to determine:

- Mullen burst strength
- wet strength
- tear resistance after heat ageing and water soak

in order to assess:

- robustness during installation
- durability.

## 17 Investigations

17.1 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.

17.2 An assessment of practicability of installation was made from data gathered during previous assessments of TYVEK.

## Bibliography

BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*

EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*

EN 13859-2 : 2014 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for walls*

EN ISO 9001 : 2015 *Quality management systems — Requirements*

### 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 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.

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.