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Agrément Certificate

21/5981

Product Sheet 1 Issue 2

ADFIL FIBRES FOR CONCRETE

SF86 STEEL FIBRE FOR BEAM AND BLOCK FLOORS

This Agrément Certificate Product Sheet ⁽¹⁾ relates to SF86 Steel Fibre for Beam and Block Floors, for use in fibre-reinforced concrete toppings in suspended beam and block ground floors in single-family dwellings.

(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 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 Second issue: 13 February 2026

Originally certified on 24 December 2021

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 SF86 Steel Fibre for Beam and Block Floors 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: A1(1)

Loading

Comment:

The product can contribute to the strength of concrete members that resist dead and imposed loads. See section 1 of this Certificate.

Regulation: 7(1)

Materials and workmanship

Comment:

The product is 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 product can contribute to a construction satisfying this Regulation. See sections 8 and 9 of this Certificate.

Regulation: 9

Building standards – construction

Standard:

1.1(a)(b)

Structure

Comment:

The concrete members incorporating the product can satisfy, with reference to clause 1.1.1⁽¹⁾⁽²⁾ of this Standard. See section 1 of this Certificate.

(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)(ii)

The product is acceptable. See sections 8 and 9 of this Certificate.

Regulation: 30

Stability

Comment:

The product can be designed to contribute to the residual flexural tensile strength of concrete. See section 1 of this Certificate.

Additional Information

NHBC Standards 2026

In the opinion of the BBA, SF86 Steel Fibre for Beam and Block Floors, 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 3.1 *Concrete and its reinforcement* and 5.2 *Suspended ground floors*.

The opinion of the BBA does not amount to any endorsement or approval by NHBC and does not in any way guarantee that NHBC will approve such product / system as compliant with the NHBC Technical Requirements and Standards.

Fulfilment of Requirements

The BBA has judged SF86 Steel Fibre for Beam and Block Floors to be satisfactory for use as described in this Certificate. The product has been assessed for use in fibre-reinforced concrete toppings in suspended beam and block ground floors in single-family dwellings.

ASSESSMENT

Product description and intended use

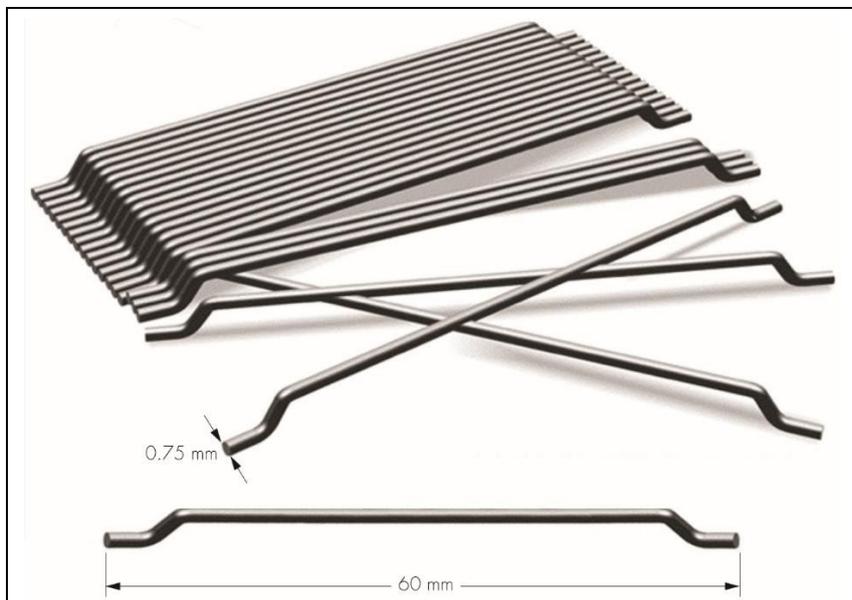
The Certificate holder provided the following description for the product under assessment. SF86 Steel Fibre for Beam and Block Floors is for addition to fresh concrete, to enhance the residual flexural strength of the concrete topping in a suspended beam and block ground floor. The fibres contribute to the flexural resistance of the hardened concrete and reduce the occurrence of plastic shrinkage cracking.

The nominal properties of the product are given in Table 1. The dimensions of the product are shown in Figure 1.

Table 1 Nominal properties of SF86 Steel Fibre for Beam and Block Floors

Property (unit)	Value
Shape	Hooked end
Steel type	Low carbon
Length (mm)	60 ± 3
Equivalent diameter (mm)	0.75 ± 0.04
Aspect ratio	80 ± 8
Tensile strength (N·mm ⁻²)	1225 ± 92 (for the mean value)
Elastic modulus (N·mm ⁻²)	200000
Density (kg·m ⁻³)	7850

Figure 1 Dimensions of SF86 Steel Fibre for Beam and Block Floors



Ancillary Items

The Certificate holder recommends the following ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- normal or self-compacting concrete, to the minimum specification given in Table 2 of this Certificate. The concrete must conform to the requirements of BS EN 206 : 2013, BS 8500-1 : 2023 and BS 8500-2 : 2023 and must be supplied by a ready-mix supplier with third-party quality scheme certification
- a beam-and-block-type suspended ground floor system with current BBA certification (see Product Sheet 99 of this Certificate).

Table 2 Concrete specification

Concrete grade	C20/25
Maximum aggregate size	20 mm ⁽¹⁾
Consistency class (standard concrete)	S3 or S4
Slump flow class ⁽²⁾ (self-compacting concrete)	SF1 (550 to 650 mm) or SF2 (660 to 750 mm)
Dosage rate of SF86 Steel Fibre for Beam and Block Floors	7.5 kg per cubic metre of concrete

(1) Aggregate must be in accordance with BS EN 12620 : 2002.

(2) The sand content must be greater than 45%.

Product assessment – key factors

The product was 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.

1 Mechanical resistance and stability

1.1 Structural performance

1.1.1 A typical ready-mix concrete with the specification detailed in Table 2, incorporating 7.5 kg·m⁻³ of SF86 Steel Fibre for Beam and Block Floors, has been shown to adequately resist the loading on a typical suspended beam and block floor in a single-family dwelling with the characteristic loading shown in Table 3. This has been verified by full-scale tests using the 'design assisted by testing' approach in accordance with BS EN 1990 : 2002.

1.1.2 Results of resistance floor loading are given in Table 3.

Table 3 Resistance floor loading full scale test

Product assessed	Assessment method	Requirement	Result
SF86 Steel Fibre for Beam and Block Floors	BBA method	Full scale test on a concrete slab sample as a proof of the structural adequacy of the floor ⁽¹⁾	Pass

(1) Maximum characteristic loads for single-family dwellings, see details in section 9.

1.1.3 The prism test was conducted solely as supplementary data and was not used as proof of the structural adequacy of the floor (see section 9)

2 Safety in case of fire

Not applicable.

3 Hygiene, health and the environment

Not applicable.

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 concrete, including steel fiber components, can be recycled.

8 Durability

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

8.2 Service life

The product contains carbon steel, which may rust. Therefore, the product's use must be limited to applications where the concrete member is in an environment classified as XC1 in accordance with BS EN 206 : 2013, which will result in a service life of 60 years. The product will not adversely affect the durability of the concrete under such conditions.

8.3 Application

SF86 Steel Fibre for Beam and Block Floors has been assessed as being suitable for use (at a dosage of 7.5 kg·m⁻³) with beam and block floor systems with current BBA certification as detailed in Product Sheet 99 of this Certificate, and with the parameters defined in Table 4 of this Certificate.

Table 4 Scope of application for beam and EPS block floors

Description	Parameter
Floor type	Beam and block with EPS infill blocks, with EPS top sheet/structural rails or under-beam insulation
Minimum EPS top sheet grade (compressive strength at 10% deformation) ⁽¹⁾	120 kPa
Beam – minimum width of top flange	42 mm
Concrete topping – maximum edge cantilever length	335 mm

(1) The minimum required depth of concrete topping incorporating the product is specified in Product Sheet 99.

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 SF86 Steel Fibre for Beam and Block Floors is suitable for use as part of a reinforced concrete topping where the topping is designed to resist the imposed loading. The steel fibres, when added to the concrete mix in appropriate dosages, contribute to the flexural resistance of the concrete topping in single-family dwellings.

9.1.2 A suitably experienced and competent engineer must ensure that concrete mixes containing the product are properly designed, placed and cured, and comply with the relevant requirements of BS 8500-1 : 2023, BS 8500-2 : 2023 and BS EN 206 : 2013.

9.1.3 The concrete topping for the suspended beam-and-block floor must be designed and installed strictly in accordance with this Certificate, and the BBA Certificate for the relevant floor system.

9.1.4 The dosage rate for steel fibres must be in accordance with Table 2 of this Certificate.

9.1.5 The product must be used in a floor system that is designed, installed and used strictly in accordance with the relevant floor system Certificate.

9.1.6 Results of Maximum characteristic loads for single-family dwellings are given in Table 5.

Table 5 Maximum characteristic loads for single-family dwellings

Description	Result
Imposed uniformly distributed load (UDL) ($\text{kN}\cdot\text{m}^{-2}$)	1.5 ⁽¹⁾
Imposed concentrated load (kN)	2 ⁽¹⁾⁽²⁾
Line load partition, parallel and perpendicular to the beam ($\text{kN}\cdot\text{m}^{-1}$)	1 ⁽³⁾⁽⁴⁾
Allowance for moveable partition ($\text{kN}\cdot\text{m}^{-2}$)	1 ⁽³⁾
Finishes ($\text{kN}\cdot\text{m}^{-2}$)	0.5

(1) Imposed concentrated load must not be combined with the imposed UDL or other variable actions.

(2) Imposed concentrated load is assumed to be applied over a square plate not less than 50 by 50 mm.

(3) Either the imposed load for lightweight partitions (moveable) or line load partition must be considered.

(4) Non-load-bearing partition walls heavier than $1 \text{ kN}\cdot\text{m}^{-1}$, in any orientation with respect to the concrete beams, must either be supported by the foundation or bear directly on the concrete beams, except where the fibre-reinforced screed is supported directly by the beams.

9.1.7 Prism and cube tests for concrete toppings reinforced with steel fibre were carried out in accordance with BS EN 14651 : 2005 and BS EN 12390-3 : 2019 respectively.

9.1.8 Adequacy of a standard concrete topping reinforced with SF86 Steel Fibre for Beam and Block Floors was assessed in accordance with BS EN 1990 : 2002, BS EN 1991-1-1 : 2002 and BS EN 1992-1-1 : 2004, and their UK National Annexes, for use in suspended ground floors in single-family dwellings.

Workability

9.1.9 Additional water must not be added to increase the slump of fibre concrete mixes.

9.2 Installation

9.2.1 SF86 Steel Fibre for Beam and Block Floors must be added to the concrete strictly in accordance with the Certificate holder's instructions and this Certificate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions. A summary of instructions and guidance are provided in Annex A of this Certificate

9.2.3 Good practice must be followed throughout the installation process, to include:

- cube compressive strength and slump tests for concrete pouring
- limitation of slump for standard concrete and slump flow for self-compacting concrete
- concrete topping not to be poured at a temperature below 5°C
- the maximum temperature at which concrete is placed is 30°C and decreasing
- all the constituents, including the fibres, to be added at the plant mixer
- concrete not to be poured during rainfall.

9.2.4 To prevent shrinkage cracks, the use of high-shrinkage-potential aggregate must be avoided

Mixing

9.2.5 The fibres are added at the batching plant, and care must be taken to ensure that adequate mix control and supervision is available.

9.2.6 The tolerances for the batching process and criteria for acceptability of steel fibre content must be in accordance with BS EN 206 : 2013, Tables 27 and B.2.

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 product must be carried out by a competent general builder or contractor experienced with this type of product.

9.4 Maintenance and repair

The product is contained within the concrete and does not require maintenance.

10 **Manufacture**

10.1 The production processes for the product 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.

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 the product is delivered to site in packaging bearing the product name, the Certificate holder's name, batch number, health and safety information and weight of contents in kilograms.

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

- fibres are packaged in measured quantities of 7.50 kg in bags, which are supplied on a pallet of 133 bags with a net pallet weight of 997.5 kg; or packaged in quantities of 20 kg in bags, which are supplied on a pallet of 50 bags with a net pallet weight of 1000 kg
- care must be taken when unloading, stacking and storing the fibres to prevent damage. They must be stored in a cool, dry environment and protected from exposure to direct sunlight
- the product is to be added directly to the concrete mix at a rate of 7.50 kg per 1 m³ of concrete, in accordance with the Certificate holder's instructions.

Supporting information in this Annex is relevant to the product 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.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonized European Standard EN 14889-1 : 2006.

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 UICC (Certificate 04324Q32166R0S14).

Additional Guidance

A.1 The addition of the product at the stated dosage does not normally require adjustment to the concrete mix design; however, this should be verified by trial mixes undertaken using the actual materials and mix design to be used by the ready-mix supplier.

A.2 Tests to confirm the dosage rate of steel fibre in a spot sample of the concrete mix, should be carried out in accordance with BS EN 14721 : 2005. The maximum allowed deviation of single test results from limit values, from tolerance on a target value or from the limits of the specified class, should be in accordance with BS EN 206 : 2013, Table 22.

Plastic shrinkage cracking

A.3 The adequacy of the fibre-reinforced concrete and the detailing of the concrete topping for resistance to shrinkage cracking should be assessed by a suitably experienced and competent engineer in accordance with the requirements of BS EN 1992-1-1 : 2004, Annex B, and its UK National Annex. Particular care should be taken near corners, around service openings, at the detail of joints to adjoining members and at discontinuities in the concrete member.

Workability

A.4 When used with either normal or self-compacting concrete, trial mixes should be undertaken by the concrete supplier to establish the effect of the addition of fibres on workability and compaction. Advice, if required, may be obtained from the Certificate holder.

A.5 Care is required when using slump test data as a general indicator of uniformity of concrete mixes containing fibres. The value obtained may suggest a misleadingly low workability, and their compaction under vibration is likely to be better than indicated.

Distribution of fibres

A.6 The fibres will be uniformly dispersed throughout the concrete mix without balling or agglomeration providing the Certificate holder's instructions for batching and mixing are followed (also see section 9.2 of this Certificate). When required, the fibre content of a sample of fresh concrete can be measured in accordance with BS EN 14721 : 2005.

Additional information on installation

A.7 To prevent shrinkage cracks:

- joints should be incorporated into the slab, and appropriate joints between the opening of two adjacent rooms should be provided. Inclusion of joints must not compromise the structural performance of the concrete topping
- where the internal walls are built through the slab, a joint should be formed across the door threshold where the wall separates the two rooms
- an aspect ratio greater than 2:1 should be avoided
- a compressible insulating material around the perimeter of the slab should be provided
- the water/cement ratio should not be increased beyond the limits specified in BS 8500-1 : 2023, BS 8500-2 : 2023 and BS EN 206 : 2013
- steel mesh or loose bars should be placed across re-entrant corners and any openings in the slab greater than 500 x 500 mm
- consideration should be given to the provision of an appropriate slab detail (eg crack inducer) over external walls at the position of porches.

Mixing

A.8 The fibres may be added to the mixer during or after the batching of the other concrete constituents.

Placing

A.9 Concrete mixes containing the product can be transported by conventional methods.

A.10 Special precautions are not necessary when pouring into moulds or shutters.

A.11 Fibre concrete mixes will flow around reinforcement, into restricted areas and against mould faces, as for plain concrete of similar mix proportions.

A.12 Fibre concrete mixes can be hand tamped or vibrated by conventional means to provide the necessary compaction.

Finishing

A.13 Placed concrete mixes containing the fibres may be floated and trowelled using any normal hand or power tools, to provide a smooth, fibre-free surface appearance.

Curing

A.14 It is essential that normal best practice for concrete curing is followed. Concrete containing SF86 Steel Fibre for Beam and Block Floors should be cured using the same methodology as for a plain or steel-reinforced concrete. Concrete should be protected from direct sunlight, wind and frost for the duration of the curing period. In addition, the concrete surface should be kept moist for the duration of the curing period to prevent excessive drying rates; a curing compound may be used for this purpose.

Bibliography

BS 8500-1 : 2023 *Concrete — Complementary British Standard to BS EN 206-1 — Method of specifying and guidance for the specifier*

BS 8500-2 : 2023 *Concrete — Complementary British Standard to BS EN 206-1 — Specification for constituent materials and concrete*

BS EN 206 : 2013 + A2 : 2021 *Concrete — Specification, performance, production and conformity*

BS EN 1990 : 2002 + A1: 2005 *Eurocode — Basis of structural design*

NA to BS EN 1990 : 2002 + A1 : 2005 UK National Annex to *Eurocode — Basis of structural design*

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

NA to BS EN 1991-1-1 : 2002 + A1 : 2014 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*

BS EN 1992-1-1 : 2004 + A1 : 2014 *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*

NA to BS EN 1992-1-1 : 2004 + A1 : 2014 UK National Annex to *Eurocode 2 : Design of concrete structures — General rules and rules for buildings*

BS EN 12390-3 : 2019 *Testing hardened concrete - Compressive strength of test specimens*

BS EN 12620 : 2002 + A1 : 2008 *Concrete — Aggregates for concrete* BS EN 14651 : 2005 + A1 2007 *Test method for metallic fibre concrete — Measuring the flexural tensile strength (limit of proportionality (LOP), residual)*

BS EN 14721 : 2005 + A1 : 2007 *Test method for metallic fibre concrete — Measuring the fibre content in fresh and hardened concrete*

EN 14889-1 : 2006 *Fibres for concrete — Steel fibres — Definitions, specifications and conformity*

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

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
- 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
- and any matter arising out of or in connection with it or its subject matter (including non-contractual disputes or claims) is governed by and construed in accordance with the law of England and Wales.
- the courts of England and Wales shall have exclusive jurisdiction to settle any matter arising out of or in connection with this Certificate or its subject matter (including non-contractual disputes or claims).

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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