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Agrément Certificate
10/4771
Product Sheet 2

DURATHERM OS

DURATHERM OS ROOF STABILISATION

This Agrément Certificate Product Sheet⁽¹⁾ relates to Duratherm OS Roof Stabilisation, a spray-applied expanding polyurethane foam, for use as a repair medium on tiled and slated pitched roofs suffering from nail fatigue in existing domestic cold roofs.

(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

Adhesion — the product bonds sufficiently to slate or clay tiles to replace the anchorage originally supplied by the nails (see section 6).

Weathertightness — the product will contribute towards the roof covering resisting the passage of water, wind-blown snow and dust into the interior of a building (see section 7).

Condensation risk — the product can contribute to limiting the risk of condensation (see section 8). The risk of interstitial condensation will depend on the roof construction and should, therefore, be assessed for each project. A pre-installation survey must be carried out to ensure that the construction is suitable for the application of the product.

Durability — the durability of the product is satisfactory and should extend the life of a roof by at least 20 years (see section 13).

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

A handwritten signature in black ink, appearing to read 'John Albon'.

Date of Second issue: 8 July 2016

John Albon — Head of Approvals
Construction Products

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

Claire Curtis-Thomas
Chief Executive

Originally certificated on 20 August 2010

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.

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Regulations

In the opinion of the BBA, Duratherm OS Roof Stabilisation, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C2(b)	Resistance to moisture
Comment:		The product will contribute to a roof satisfying this Requirement. See section 7 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 8.1 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is an acceptable material. See section 13 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The product can contribute to a construction satisfying this Regulation. See section 13 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building Standards applicable to construction
Standard:	3.10	Precipitation
Standard:	3.15	Condensation
Comment:		The product will contribute to a roof satisfying these Standards. See sections 7 and 8.1 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for these systems 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	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 13 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The product will contribute to a roof satisfying this Regulation. See section 7 of this Certificate.
Regulation:	29	Condensation
Comment:		The product can contribute to satisfying this Regulation. See section 8.1 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1 to 3.3) and 15 *Precautions* (15.1 to 15.6) of this Certificate.

Additional Information

NHBC Standards 2016

In the opinion of the BBA, the use of Duratherm OS Roof Stabilisation, in relation to this Certificate, is not subject to the requirements of these Standards.

CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard BS EN 14315-1 : 2013. 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 Duratherm OS Roof Stabilisation is a cream coloured closed cell rigid polyurethane (PUR) foam. It is spray applied (HFC blown) to the underside of roof tiles and slates. The foam is built up to a total thickness of between 25 mm and 40 mm, in two or more passes. The maximum thickness of one pass should not exceed 20 mm.

1.2 The product is prepared from two liquid components, one part by volume of isocyanate to one part by volume of resin mixed within the nozzle of the spray gun during the spraying process. The foam cures within two hours.

1.3 The product has an installed density in the range of $30 \text{ kg}\cdot\text{m}^{-3}$ to $42 \text{ kg}\cdot\text{m}^{-3}$. Quality control arrangements on site include checks on density and appearance.

2 Manufacture

2.1 The product is formed in-situ by mixing together isocyanate and resin components within the nozzle of a spray gun. The foam mix produced is soft and fluid but quickly expands and hardens to a rigid foam mass.

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 Isothane Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 and/or BS EN ISO 14001 : 2004 by British Standards Institute (Certificates FM/21549 and EMS/68443).

3 Delivery and site handling

3.1 The two components of the product are delivered to site in drums (up to 250 kg capacity) bearing the product name, batch number and the BBA logo incorporating a BBA Certificate number.

3.2 Drums should be stored in a well-ventilated area, ideally above 10°C and away from possible ignition sources. The drums must be protected from frost.

3.3 The isocyanate component is classified under the *Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009*, and the packaging bears the appropriate hazard warning label(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Duratherm OS Roof Stabilisation.

Design Considerations

4 Use

4.1 Duratherm OS Roof Stabilisation is suitable for use as a repair and stabilising system on unfelted slate or tiled pitched cold roofs suffering from the effects of nail corrosion. The anchorage originally supplied by the fixing nails is replaced by the adhesive properties of the foam.

4.2 A pre-installation survey must be carried out to ensure that the construction is suitable for the application of the product.

4.3 The product must not be installed over wet or rotting timbers. Wet timbers without rot should be dried, and rotting timbers replaced. The roof must then be made weather tight prior to the installation of the foam. Damaged or dislodged valleys, gutters, chimney stacks, flashings, slates, tiles etc must be repaired or replaced to ensure that the risk of subsequent water penetration is kept to an absolute minimum (see also sections 16.1 and 16.2). Installation must not be carried out until the moisture content of any roof timber framing is less than 20%.

4.4 it is essential that construction elements are designed and constructed to incorporate normal precautions against moisture ingress before the application of the product.

4.5 The product must not come into contact with flue pipes, chimneys or other heat-producing appliances (see section 10).

4.6 The product forms a strong bond with clean, dry substrates. This should be taken into account when specifying the product or anticipating future alterations.

5 Practicability of installation

The product should only be installed by contractors trained and approved by the Certificate holder in accordance with the Certificate holder's Installation Manual (see section 14).

6 Adhesion

6.1 The product's adhesive properties to a slate or clay tile roof are sufficient to withstand the expected wind loads, thermal cycling and minor structural movements likely to occur in practice.

6.2 For concrete tiles and soft or synthetic slate, the adhesive characteristics of foam to these surfaces must be established.

6.3 Foam adhering to the underside of slates or tiles will significantly increase their attachment. The likelihood of future alterations to the roof, including removal of slates or tiles for re-use, should be taken into account when considering the use of the product.

7 Weathertightness



When the product is correctly applied it will contribute towards the roof covering resisting the passage of water, wind-blown snow and dust into the interior of a building.

8 Condensation risk

Interstitial condensation



8.1 Roofs should be designed in accordance with the relevant parts of BS 5250 : 2011 and Annexes D and H, including having a well-sealed ceiling. Advice should be obtained from the Certificate holder in relation to the suitability of the product for application in specific constructions, including carrying out a condensation risk analysis if required on a case by case basis.

8.2 Roof spaces should have ventilation openings in accordance with BS 5250 : 2011 at eaves level to promote cross-flow of air such that the area provided is at least equal to that of an opening of 10 mm running the full length of the eaves, and additional ventilation openings, equivalent in area to a continuous opening of 5 mm, should be provided at high level in:

- roofs where the pitch exceeds 35°
- roofs of any pitch with a span greater than 10 m
- lean-to and mono-pitch roofs.

8.3 Where the ventilation of the roof space is inadequate or where airflow across the roof space is restricted by design features, additional passages for ventilation to the roof space must be provided at eaves or ridges, as appropriate.

8.4 Care should be taken to provide adequate ventilation, particularly in rooms expected to experience high humidities, and to ensure the integrity of VCL's (where installed) and linings, against vapour ingress.

8.5 It is essential that roof design, construction and maintenance not only limit opportunities for vapour migration by diffusion but also convection through air gaps, cracks and laps in air barriers and/or VCL's and through penetrations.

9 Properties in relation to fire

9.1 The product has a reaction to fire classification* of Class E to BS EN 13501-1 : 2007. The product is not classified as 'non-combustible' and must be protected from naked flames and other ignition sources during and after installation.

9.2 Elements must incorporate cavity barriers at edges, around openings, at junctions with fire-resisting elements and in extensive cavities in accordance with the relevant provisions of the national Building Regulations and relevant purpose group. The design and installation of cavity barriers must take into account any anticipated differential movement.

9.3 The product must not be applied over junctions between roofs and on walls required to provide a minimum period of fire resistance. Care must be taken to ensure continuity of fire resistance at junctions with fire-resisting elements, in accordance with the national Building Regulations.

10 Proximity of flues and appliances

10.1 When installing the product in close proximity to certain flue pipes and/or heat-producing appliances, the relevant provisions of the national Building Regulations are applicable:

England and Wales — Approved Document J, sections 1 to 4

Scotland — Mandatory Standard 3.19, clauses 3.19.1⁽¹⁾⁽²⁾ to 3.19.9⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet L, sections 1 to 4.

10.2 The product must not be installed within 50 mm of heat-emitting devices, where the temperature is in excess of 93°C.

11 Materials in contact – wiring installations

11.1 The product is compatible with PVC materials in contact.

11.2 De-rating of electric cables should be considered in areas where the product restricts the flow of air. The use of suitable conduit or trunking is recommended.

11.3 Where recessed lighting is used, provision should be made to prevent the fitting overheating, or ventilated fittings must be used.

12 Maintenance

The product, once installed, does not require any regular maintenance and has suitable durability (see section 13), provided the roof waterproof layers are maintained in a weather-tight condition.

13 Durability



The durability of the product is satisfactory and should extend the life of a roof by at least 20 years.

Installation

14 Approved Installers

The Certificate holder operates an Approved Installer Scheme for this product, under which the installers are approved, registered and regularly reviewed by the Certificate holder to demonstrate that they are competent to carry out installation of the product in accordance with their instructions and this Certificate. Details of approved installers are available from the Certificate holder.

15 Precautions

15.1 To comply with the requirements of Section 4 of the Health and Safety at Work Act 1974, it is essential that there is an exchange of information between the client and the installer before spray operations commence on any site. Existing health hazards and those brought into the premises by the installer should be discussed and measures agreed to deal with them effectively.

15.2 The process of the installation of the product may produce a build-up of harmful vapours. Installers must wear full personal protection equipment (PPE) when working with the product, including full-face fresh-air-supplied respirators, protective clothing and chemical-resistant gloves. Other trades and personnel must be kept at least 4 metres away from the applicator while spraying is taking place. The Certificate holder's instructions must be followed at all times.

15.3 Vapours given off by certain components are generally heavier than air and will tend to move to lower parts of the building. These parts should be suitably ventilated.

15.4 If vapour levels need to be measured, methods should be those recommended by the Health and Safety Executive.

15.5 After installation in loft voids where the foam is left exposed, fire warning labels are to be placed in prominent positions. The foam is a combustible material and adequate precautions should be taken at all times to avoid ignition.

15.6 To prevent the product from entering the occupied space, the loft hatch/cover must be kept closed during the spraying process. Protective covers must be placed over water tanks to prevent contamination during application, and should not be removed until sufficient time has elapsed for potentially harmful vapours to be ventilated from the roof space.

16 Procedure

General

16.1 A site survey should be performed by the Certificate holder's approved surveyors to establish whether preliminary repairs are required and to check that the roof void is adequately ventilated.

16.2 Preliminary repairs should be made to structural timbers, and to the slates or tiles. Damp and rotting timbers should be renewed. Dislodged, damaged or missing slates or tiles are re-positioned or replaced and held in position using a silicone mastic. Installation must not be carried out until the moisture content of any roof timber framing is less than 20% (see also section 4.3).

16.3 Access boards and lighting should be positioned in the roof void. Water tanks are covered to prevent contamination and blockage due to overspray.

16.4 Where there is no provision made for ventilation of the space, care should be taken to ensure that ingress of moisture vapour from the dwelling space below is restricted. See also section 8.1.

Application

16.5 The product should be applied by spray to the underside of slates or tiles between rafters, starting at the eaves and working up towards the ridge in a flash coat, <10 mm thick. Subsequent coats not exceeding 20 mm thick are applied once the foam reaction has occurred, and within 10 minutes of the previous coat, until a total thickness of between 25 mm and 40 mm is achieved.

16.6 If the roof to be treated is cold, and/or if there is a risk of tiles or slates lifting due to the pressure created by the foaming process, it is recommended that the first coat should not exceed a thickness of 5 mm.

16.7 Care must be taken not to apply the product to flue pipes, electrical cables or below the lowest tiling batten.

16.8 After completion a survey should be performed to check that ventilation arrangements, electrical cables and flues are not obstructed. Corrective measures must be taken to clear such obstruction.

Technical Investigations

17 Tests

Results of tests were assessed to determine:

- shear strength
- tensile adhesion
- water vapour permeability.

18 Investigations

The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

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

BS EN 13501-1 : 2007 *Fire classification of construction products and building elements. Classification using test data from reaction to fire tests*

BS EN 14315-1 : 2013 *Thermal insulating products for buildings — In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products — Specification for the rigid foam spray system before installation*

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

BS EN ISO 14001 : 2004 *Environmental management systems — Requirements with guidance for use*

19 Conditions

19.1 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.

19.2 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.

19.3 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.

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

19.5 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.

19.6 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.