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Agrément Certificate  
**10/4771**  
Product Sheet 2

## DURATHERM OS

## DURATHERM OS ROOF STABILISATION

### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate 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 or similar buildings.

#### AGRÉMENT 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

**Practicability of installation** — the product should only be installed by contractors trained and approved by the Certificate holder (see section 4).

**Adhesion** — the product bonds sufficiently to slate or clay tiles to replace the anchorage originally supplied by the nails (see section 5).

**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 6).

**Behaviour in relation to fire** — the product should not affect the external fire rating of a slated or tiled roof (see section 7).

**Durability** — the durability of the product is satisfactory and should extend the life of a roof by at least 20 years (see section 12).

The BBA has awarded this Agrément 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 First issue: 20 August 2010

Chris Hunt  
Head of Approvals — Physics

Greg Cooper  
Chief Executive

*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](http://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 used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



## The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	C2(b)	Resistance to moisture
Comment:		The product will contribute to a roof meeting this Requirement. See section 6 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is an acceptable material. See section 12 and the <i>Installation</i> part 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 section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building Standards – construction
Standard:	3.10	Precipitation
Comment:		The product will contribute to a roof satisfying clause 3.10.1 <sup>(1)</sup> (2) of this Standard. See section 6 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for this product under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)</sup> and Schedule 6 <sup>(1)</sup> . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		The product will contribute to a roof satisfying this Regulation. See section 6 of this Certificate.

## Construction (Design and Management) Regulations 2007

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

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

See sections: 2 *Delivery and site handling* (2.1 to 2.3) and 13 *Precautions* (13.1 to 13.6) of this Certificate.

# Non-regulatory Information

## NHBC Standards 2010

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.

# General

Duratherm is a registered trademark of Isothane Ltd.

# Technical Specification

## 1 Description

- 1.1 Duratherm OS Roof Stabilisation is a spray applied HFC blown, polyurethane rigid foam. It is applied to the underside of 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 foam 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 Quality control arrangements on site include checks on density and appearance.

## 2 Delivery and site handling

- 2.1 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 identification mark incorporating a BBA Certificate number.
- 2.2 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.
- 2.3 The isocyanate component is classified as 'harmful', under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009* (CHIP4) and bears the appropriate hazard warning signs. When cured, the product does not constitute a hazard.

# Assessment and Technical Investigations

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

## Design Considerations

### 3 General

- 3.1 Duratherm OS Roof Stabilisation is suitable for use as a repair and stabilising system on unfelted slate or tiled pitched 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.
- 3.2 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 14.1 and 14.2).
- 3.3 Roof spaces should have ventilation openings at eaves level to promote cross-flow of air in accordance with BS 5250 : 2002. 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.
- 3.4 The product forms a strong bond with clean and dry substrates. This should be taken into account when specifying the product or anticipating future alterations.
- 3.5 The product must not be applied over electrical cables or existing vents or ventilation gaps. Where accidental coverage occurs the foam must be removed immediately after installation. Water tanks must be covered to prevent contamination during installation.
- 3.6 The product must not come into direct contact with flue pipes, chimneys or other heat producing appliances within the loft space (see section 8)
- 3.7 Pitched roofs are defined for the purpose of this Certificate as those roofs having a pitch in excess of 15°.

### 4 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.

### 5 Adhesion

- 5.1 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.
- 5.2 For concrete tiles and soft or synthetic slate, the adhesive characteristics of foam to these surfaces must be established.
- 5.3 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.

## 6 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.

## 7 Properties in relation to fire

7.1 The internal face of the product achieved a Class 1 surface spread of flame rating when tested in accordance with BS 476-7 : 1997.

7.2 The use of the product should not affect the external fire rating of a slated or tiled roof when evaluated by assessment or test to BS 476-3 : 2004.

7.3 The product must be protected from naked flames and other ignition sources during and after installation (see also section 9.1).

7.4 Roofs 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.

## 8 Proximity of flues and appliances

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<sup>(1)(2)</sup> to 3.19.9<sup>(1)(2)</sup>

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

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

## 9 Materials in contact — wiring installations

9.1 De-rating of electric cables should be considered in areas where the product restricts the flow of air. Where the foam is likely to bond to electric cables, suitable conduit or trunking should be used.

## 10 Condensation risk

### Interstitial condensation

10.1 The product has a water vapour resistivity of  $305 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$ . Particular constructions should be assessed in accordance with BS 5250 : 2002.

10.2 The product has a water vapour resistance no more than  $12 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$ . Roof spaces should have ventilation openings in accordance with BS 5250 : 2002 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  $35^\circ$
- roofs of any pitch with a span greater than 10 m
- lean-to and mono-pitch roofs.

## 11 Maintenance

11.1 The product, once installed does not require any regular maintenance and has suitable durability provided the roof waterproof layers are inspected and maintained at regular intervals (see section 12), so maintenance is not required.

11.2 Slates and tiles treated with the product will be less prone to damage by impact due to the foam distributing the forces. Where slates and tiles are damaged after installation, they may be replaced by cutting away the foam from the underside, replacing the slate or tile and re-treating the affected area.

## 12 Durability



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

### 13 Precautions

13.1 The Duratherm OS Roof Stabilisation process may produce a build-up of harmful vapours. It is required that all personnel in the area for treatment wear the correct protective clothing, breathing equipment and gloves. The Certificate holder's instructions must be followed at all times.

13.2 Vapours given off by certain components, ie 4,4' diphenylmethane diisocyanate (MDI), are generally heavier than air and will tend to move to lower parts of the building. These parts should be suitably ventilated.

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

13.4 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.

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

13.6 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.

### 14 Procedure

#### General

14.1 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.

14.2 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 (see also section 3.2).

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

#### Application

14.4 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.

14.6 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.

14.7 Care must be taken not to apply the product to the face of the rafters, flue pipes, main roof trusses, electrical cables or below the lowest tiling batten.

14.8 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

### 15 Tests

Tests were carried out on Duratherm OS Roof Stabilisation to determine:

- shear strength
- tensile adhesion
- water vapour permeability.

### 16 Investigations

16.1 The methods adopted for quality control, relating to incoming materials and the installed product, were examined and found to be satisfactory.

# Bibliography

BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*

BS 476-7 : 1997 *Fire tests on building materials and structures — Method of test to determine the classification of the surface spread of flame of products*

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

# Conditions of Certification

## 17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

17.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

17.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

17.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.