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Agrément Certificate  
No 01/3810

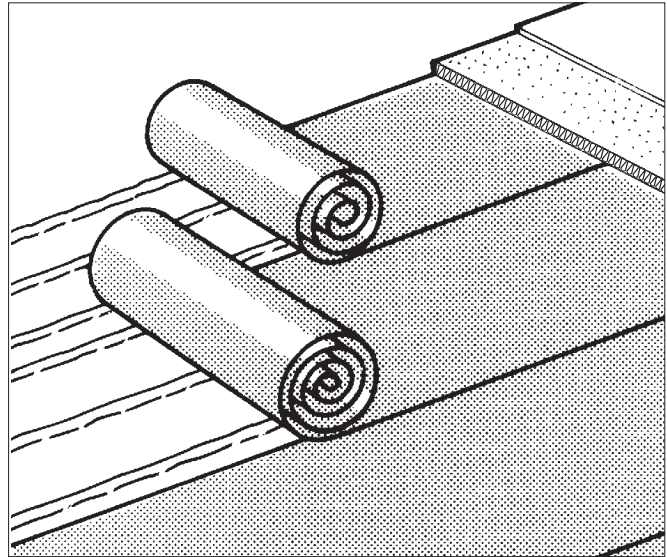
## PRODUCT SHEET 1 — REFLEX 275 VAPOUR CONTROL LAYER

### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Reflex 275 Vapour Control Layer, for use in wall and roofing envelopes of buildings with high relative humidity, eg swimming pools.

#### 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

**Risk of condensation** — the product has a high water vapour resistance and will limit the risk of interstitial condensation within the roof or wall construction (see section 4).

**Strength** — the product has adequate strength to resist the normal stresses associated with the construction and installation (see section 5).

**Durability** — under normal conditions found in a roof or wall, the product will have a service life comparable to other elements of the construction (see section 7).

The BBA has awarded this Agrément Certificate for Reflex 275 Vapour Control Layer to Icopal Ltd as fit for its intended use provided it is installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Date of First issue: 27 March 2001  
Date of Second issue: 24 December 2007

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, Reflex 275 Vapour Control Layer, 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(c)        | Resistance to moisture  |
| Comment:     |              | The product can contribute towards enabling a roof or wall meeting this Requirement. See sections 4.1 to 4.5 of this Certificate. |
| Requirement: | Regulation 7 | Materials and workmanship   |
| Comment:     |              | The product is an acceptable material. See section 7 of this Certificate.   |



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

|             |      |  |
|-------------|------|--|
| Regulation: | 8    | Fitness and durability of materials and workmanship  |
| Regulation: | 8(1) | Fitness and durability of materials and workmanship  |
| Comment:    |      | The product can contribute to a construction satisfying this Regulation. See section 7 and the <i>Installation</i> part of this Certificate.   |
| Regulation: | 9    | Building standards – construction  |
| Standard:   | 3.15 | Condensation   |
| Comment:    |      | The product can contribute to enabling a roof or wall to satisfy this Standard, with reference to clauses 3.15.1 <sup>(1)</sup> , 3.15.3 <sup>(1)</sup> , 3.15.5 <sup>(1)</sup> and 3.15.6 <sup>(1)</sup> . See sections 4.1 to 4.5 of this Certificate. |
|             |      | (1) Technical Handbook (Domestic).   |



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

|             |    |   |
|-------------|----|---|
| Regulation: | B2 | Fitness of materials and workmanship  |
| Comment:    |    | The product is an acceptable material. See section 7 of this Certificate.   |
| Regulation: | C5 | Condensation  |
| Comment:    |    | The product can contribute towards enabling a roof or wall to satisfy this Regulation. See sections 4.1 to 4.5 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 section: 1 *Description* (1.3).

# Non-regulatory Information

## NHBC Standards 2007

NHBC accepts the use of Reflex 275 Vapour Control Layer, when installed and used in accordance with this Certificate in relation to NHBC Standards, Chapter 7.1 *Flat roofs and balconies* and 7.2 *Pitched roofs*.

## Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Reflex 275 Vapour Control Layer, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4, *Superstructure*, Sub-sections *Pitched roofs*, *External walls* and *Flat roofs*.

# General

This Certificate relates to Reflex 275 Vapour Control Layer, for use in wall and roofing envelopes of buildings with high relative humidity, eg swimming pools.

The product is a five-layer polyethylene membrane incorporating aluminium foil and a reinforcing grid for use on new and refurbishment projects.

# Technical Specification

## 1 Description

- 1.1 Reflex 275 Vapour Control Layer is a 0.27 mm thick, five-layer polyethylene membrane incorporating aluminium foil and a reinforcing grid.
- 1.2 The inward facing is blue and the outward facing is grey. The membrane has 150 mm overlap guidelines printed on both edges.
- 1.3 The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

| Characteristic (units) | Nominal values |
|------------------------|----------------|
| Roll width (m)         | 2.0            |
| Roll length (m)        | 25             |
| Roll weight (kg)       | 17             |

- 1.4 Monobond is a double-sided adhesive tape for use in sealing lap joints and penetrations in the vapour control layer.
- 1.5 Quality control on the final product includes tests for:
- weight
  - width
  - thickness
  - coating weight.

## 2 Delivery and site handling

- 2.1 The membrane is delivered to site in rolls wrapped in polyethylene film with a label bearing the product name, width, length and UK marketing company's address and telephone number. A label bearing the BBA identification mark incorporating the number of this Certificate is applied to the outer polyethylene wrapper.
- 2.2 Rolls should be stored on their side, on a smooth, clean surface, undercover and protected from sunlight

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Reflex 275 Vapour Control Layer.

## Design Considerations

### 3 Use

- 3.1 Reflex 275 Vapour Control layer is satisfactory for use in low-slope insulated metal roofs and cladding, and warm deck single-ply membrane flat roofs on both new-build and refurbishment projects.
- 3.2 When used in insulated metal sheeted pitched roofs without ventilation including a breather membrane, the system must be designed, in accordance with BS 5250 : 2002 or relevant Agrément Certificate.
- 3.3 When used in warm-deck construction, the decks must be designed in accordance with the relevant recommendations of BS 6229 : 2003, BS 8217 : 2005.
- 3.4 The membrane must be installed so that joints are airtight.

### 4 Risk of condensation



4.1 The risk of condensation occurring within the roof or 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 product installation.

4.2 The product can contribute to enabling a roof or wall to meeting the relevant requirements of the national building regulations:

**England and Wales** — Requirement C2(c)

**Scotland** — Regulation 9, Mandatory Standard 3.15, clauses 3.15.1<sup>(1)</sup>, 3.15.3<sup>(1)</sup>, 3.15.5<sup>(1)</sup> and 3.15.6<sup>(1)</sup>.

(1) Technical Handbook (Domestic).

**Northern Ireland** — Regulation C5.

4.3 Considerations must be given in the overall installation to minimising penetration by services. Joints in the membrane and at ceiling/wall and wall/floor must be sealed to offer significant resistance to water vapour transmission. Sealing must be carried out in accordance with the Certificate holder's instructions.

4.4 The membrane has a water vapour resistance far greater than 0.12 mm polyethylene, (typically 250 MNsg<sup>-1</sup>) which has traditionally been used as a vapour control layer (see section 11, Table 2 *Physical properties*).

4.5 Construction should be in accordance with relevant recommendations of BS 5250 : 2002 and the suitability assessed in accordance with Appendix D.

## 5 Strength

Reflex 275 Vapour Control layer can resist the normal stresses associated with the construction and installation (see section 11, Table 2 *Physical properties*).

## 6 Properties in relation to fire

The product has similar properties in relation to fire to other polyolefinic sheets, tending to melt and shrink away from a heat source, but it will burn in the presence of an ignition source. Therefore, the product is unclassified in terms of the Building Regulations. This should be considered when assessing the overall fire risk.

## 7 Durability



Reflex 275 Vapour Control Layer will be unaffected by the normal conditions found in a roof or wall and will have a service life comparable to other elements of the construction.

## Installation

### 8 General

Reflex 275 Vapour Control Layer must be installed and fixed in accordance with the Certificate holder's instructions, provisions of this Certificate and the relevant recommendations given in NHBC Standards 2007, Chapters 7.1 and 7.2 and *Zurich Building Guarantee Technical Manual 2007*, Section 4, *Superstructure*, Sub-section *Pitched roofs*, *External walls* and *Flat roofs*.

### 9 Procedure

#### Metal roofing and cladding

9.1 The membrane should be laid blue face up and fully supported by the metal lining on the warm side of the thermal insulation (see Figures 1, 2 and 3).

Figure 1 Metal roof ridge

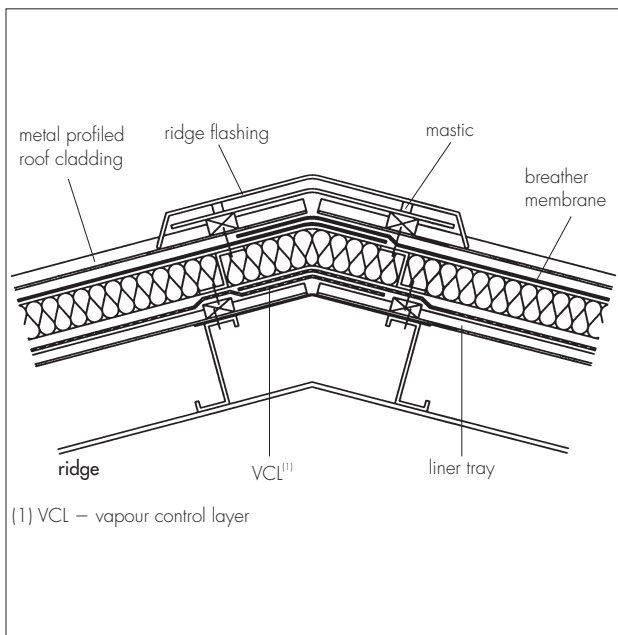


Figure 2 Metal roof verge

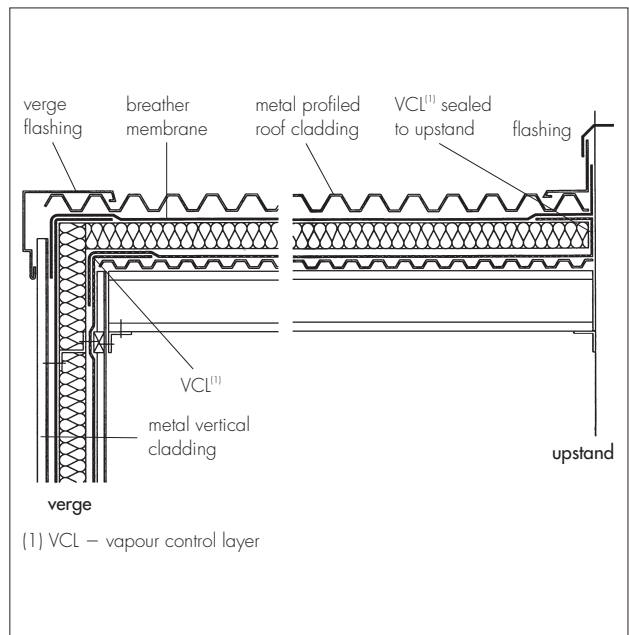
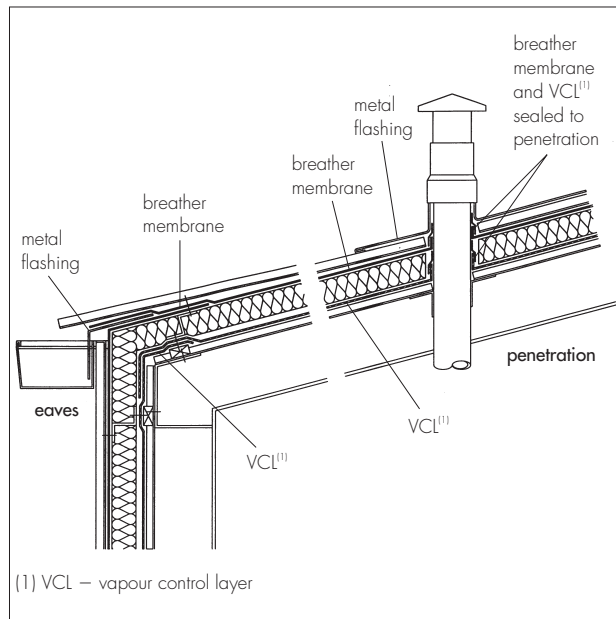


Figure 3 Metal roof eaves and penetration



9.2 All joints in the vapour control layer must be lapped, minimum 150 mm, and sealed with Monobond double-sided tape. A tight seal can be achieved by compressing the lap with a wallpaper roller.

9.3 At perimeters the vapour control layer should be dressed up at the detailing.

9.4 The vapour-tight seal must be formed wherever the vapour control layer is penetrated by pipes or ducts. Monobond sealing tape should be used to produce a tight fit and seal around the penetration.

### Single-ply membranes

9.5 The membrane should be fully supported by the deck on the warm side of the thermal insulation (see Figures 4, 5, 6 and 7).

Figure 4 Roof verge

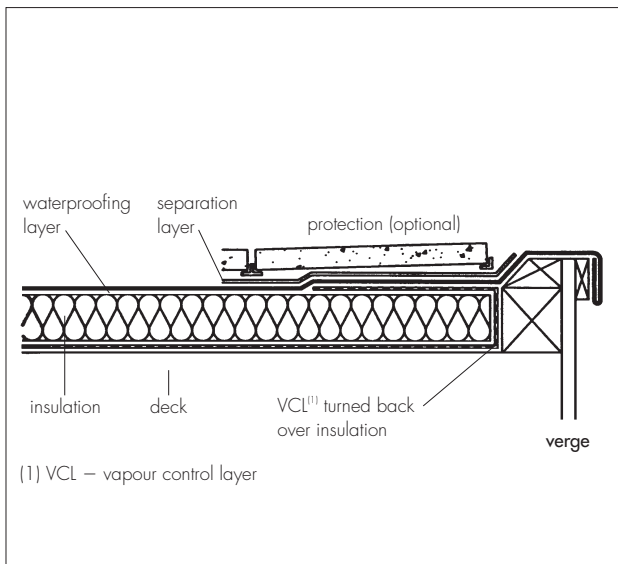


Figure 5 Roof upstand

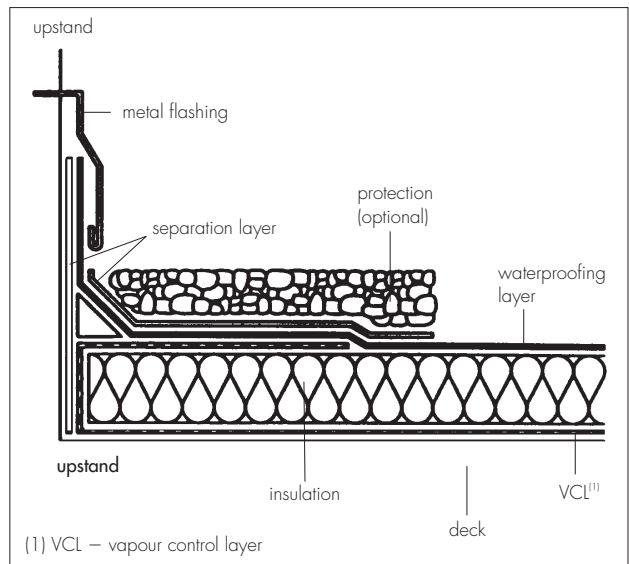


Figure 6 Roof penetration

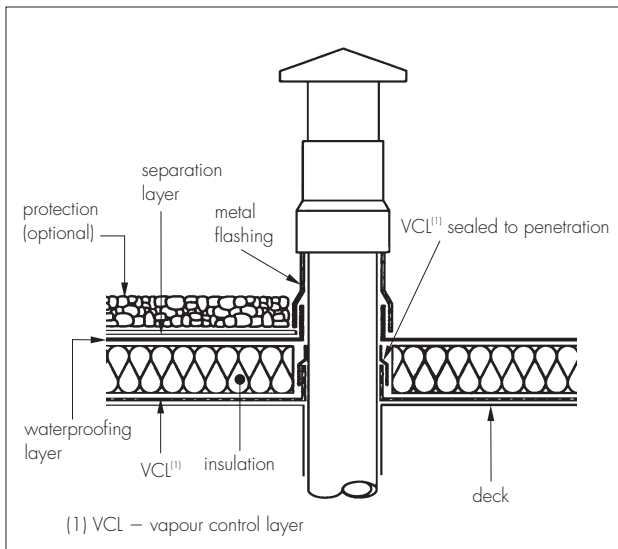
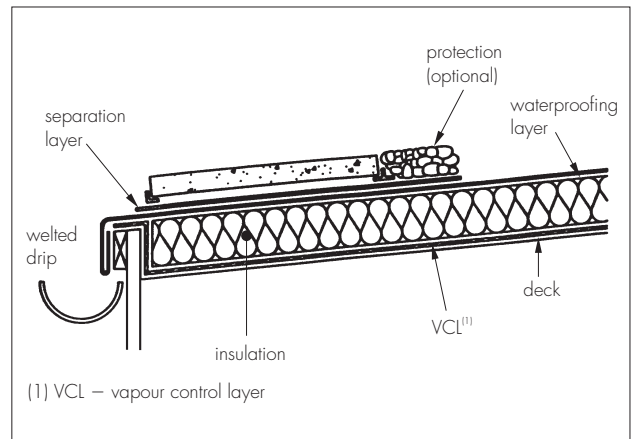


Figure 7 Roof eaves



9.6 All joints in the vapour control layer must be lapped, minimum 150 mm, and sealed with Monobond double-sided tape. A tight seal can be achieved by compressing the lap with a wallpaper roller.

9.7 The vapour-tight seal must be formed wherever the vapour control layer is penetrated by pipes or ducts. Monobond sealing tape should be used to produce a tight fit and seal around the penetration.

## 10 Repair

Damage to the product can be easily repaired during installation with a patch of the membrane fixed in place with Monobond sealing tape.

# Technical Investigations

## 11 Tests

Samples of Reflex 275 Vapour Control Layer were obtained from the Certificate holder for testing. The results of the tests carried out by the BBA are summarised in Table 2.

Table 2 Physical properties

| Characteristic (Units)  | Method <sup>(1)</sup> | Mean result |
|---|-----------------------|-------------|
| Density (gcm <sup>-3</sup> )                                    | BS 2782-6.620A        | 0.988       |
| Water vapour transmission (gm <sup>-2</sup> day <sup>-1</sup> ) | DIN EN 495-4 : 1991   | <0.005      |
| Water vapour resistance (MNsg <sup>-1</sup> )                   |                       | >43,000     |
| Nail tear (N)   | MOAT 27: 5.4.1        |             |
| long <sup>(2)</sup>   |                       | 150         |
| trans <sup>(3)</sup>  |                       | 168         |

(1) The test documents are detailed in the *Bibliography*, numbers in the table refer to the sections/parts of the various documents.

(2) Longitudinal direction.

(3) Transverse direction.

## 12 Investigations

12.1 An examination was made of data on a material of similar composition to:

- dimensional stability
- tensile strength
- effect of heating ageing
- affect of UV light
- resistance to leakage at joint
- tensile strength of joints.

12.2 The manufacturing process was examined, including the methods adopted for quality control.

## Bibliography

- BS 2782-6.620A to 620D : 1991 *Methods of testing plastics — Dimensional properties — Determination of density and relative density of non-cellular plastics*
- BS 5250 : 2002 *Code of practice for control of condensation in buildings*
- BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*
- BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*
- MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*
- DIN EN 495-4 : 1991 *Thermoplastic and elastomeric roofing and sealing sheets — Determination of water vapour transmission properties*

## 13 Conditions

13.1 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.

13.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

13.3 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.

13.4 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.

13.5 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.