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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
**97/3310**
**Product Sheet 1**

# IKO INSULATED DPCs

# HYLOAD AND HYLOAD FR INSULATED DPCs

## PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Hyload and Hyload FR Insulated DPCs, for use where a cavity is closed around window and door openings.


### 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

**Hygrothermal behaviour** — the products can be used in Accredited Construction Details (version 1.0) for jambs and sills which require a path of minimum thermal resistance through the closer of 0.45 $Wm^{-2}K^{-1}$ (see section 8).

**Weather resistance** — the products are effective as damp-proof barriers and when used in a suitable wall construction will resist the passage of water into the interior of the building in flush and check reveal installations (see section 6).

**Properties in relation to fire** — Hyload FR will act as a cavity barrier. Hyload product when used in conjunction with a cavity barrier will provide 30 minutes fire resistance (see section 7).

**Durability** — the products, when installed correctly and protected within the cavity, will remain effective during the lifetime of a building (see section 11).

The BBA has awarded this Agrément Certificate to the company named above for the products described herein. The products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate

On behalf of the British Board of Agrément

Date of First issue: 1 June 2009
Originally certificated on 24 February 1997

Simon Wroe
Head of Approvals — Materials

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*

*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 Hyload and Hyload FR Insulated DPCs 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: | B3(4) | Internal fire spread (structure) |
| Comment: | | Hyload FR used in conventional masonry cavity walls comprising two leaves of masonry, will maintain the fire resistance of the walls where this is required to be 30 minutes. See sections 7.1 to 7.3 of this Certificate. |
| Requirement: | C2(b) | Resistance to moisture |
| Comment: | | The products prevent the passage of moisture from the outer leaf to the inner leaf of a cavity wall at window or door openings. See sections 6.1 to 6.3 of this Certificate. |
| Requirement: | C2(c) | Resistance to moisture |
| Comment: | | The products can contribute to minimising the risk of condensation. See sections 6.1 to 6.3, 8.2 and 8.3 of this Certificate. |
| Requirement: | L1(a)(i) | Conservation of fuel and power |
| Comment: | | The products can contribute to minimising heat loss at jambs and sills. See sections 8.1 to 8.3 of this Certificate. |
| Requirement: | Regulation 7 | Materials and workmanship |
| Comment: | | The products are acceptable. See section 11 and the *Installation* part of this Certificate. |

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

| | | |
|---|---|---|
| Regulation: | 8(1)(2) | Fitness and durability of materials and workmanship |
| Comment: | | The products can contribute to a construction satisfying this Regulation. See sections 10, 11 and the *Installation* part of this Certificate. |
| Regulation: | 9 | Building standards — construction |
| Standard: | 2.4 | Cavities |
| Comment: | | In conjunction with a cavity barrier, the products can satisfy this Standard, with reference to clause 2.4.1[1][2] and Annex 2.B[1] or 2.D[2]. See sections 7.1 to 7.3 of this Certificate. |
| Standard: | 3.10 | Precipitation |
| Comment: | | Walls incorporating the products can satisfy this Standard, with reference to clauses 3.10.1[1][2] and 3.10.3[1][2]. See sections 6.1 to 6.3 of this Certificate. |
| Standard: | 3.15 | Condensation |
| Comment: | | The products can contribute to minimising the risk of condensation, with reference to clauses 3.15.1[1], 3.15.4[1] and 3.15.5[1]. See section 8.3 of this Certificate. |
| Standard: | 6.1(b) | Carbon dioxide emissions |
| Standard: | 6.2 | Building insulation envelope |
| Comment: | | The products can contribute to minimising heat loss at jambs and sills. See sections 8.1 and 8.3 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[1][2] and Schedule 6[1][2]. |

(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 products are acceptable. See section 11 and the *Installation* part of this Certificate. |
| Regulation: | B3(2) | Suitability of certain materials |
| Comment: | | The products do not normally require maintenance. See section 10 of this Certificate. |
| Regulation: | C4(b) | Resistance to ground moisture and weather |
| Comment: | | The products can contribute to meeting the requirements of this Regulation. The products can be used where checked reveals are required. See sections 6.1 to 6.3 of this Certificate. |
| Regulation: | C5 | Condensation |
| Comment: | | The products can contribute to satisfying this Regulation. See section 8.2 and 8.3 of this Certificate. |
| Regulation: | E4 | Internal fire spread — Structure |
| Comment: | | Hyload FR can contribute to satisfying this Regulation. See sections 7.1 to 7.3 of this Certificate. |
| Regulation: | F3 | Target carbon dioxide Emissions Rate |
| Regulation: | F2(a)(i) | Conservation measures |
| Comment: | | The products contribute to minimising heat loss at jambs and sills. See sections 8.1 and 8.3 of this Certificate. |

**Construction (Design and Management) Regulations 2007**

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

In the opinion of the BBA, there is no information in this Certificate which relates to the obligations of the client, CDM co-ordinator, designer and contractors under these Regulations.

# Non-regulatory Information

## NHBC Standards 2008

NHBC accepts the use of Hyload and Hyload FR Insulated DPCs, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1 *External masonry walls*.

## Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Hyload and Hyload FR Insulated DPCs, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4, *Superstructure*, Sub-section *External walls – thermal insulation*.

# Technical Specification

## 1 Description

1.1 Hyload and Hyload FR Insulated DPCs consist of a foam insulation, bonded to a strip of a polymeric dpc.

1.2 The damp-proof course strip overlaps the insulation at both edges to allow for the extension of the dpc into the window or door and cavity.

1.3 The products are available with the nominal characteristics given in Table 1.

*Table 1 Product characteristics*

| Dimension (units) | Value | |
|---|---|---|
| | Hyload | Hyload FR |
| DPC type | DampMaster cross-linked | Hyload House Builder |
| Insulation type | polyethylene foam | phenolic foam |
| Insulation thickness (mm) | 17 | 2 |
| DPC thickness (mm) | 0.8 | 0.9 |
| Length (m) | 8 | 1.3(1) |
| DPC x insulation width (mm) | 165 x 100, 180 x 100, 225 x 140 | 165 x 100, 180 x 100, 225 x 140 |
| Insulation $\lambda$ value ($Wm^{-1}K^{-1}$) | 0.034 | 0.018 |

(1) Insulation length is 1200 mm, dpc length is 1300 mm to allow for lap joint.

1.4 Hyload DPC Jointing Tape is a 100 mm wide, double-sided adhesive tape, protected on both sides by silicone release paper, for jointing lengths of the dpc.

1.5 Hyload DPC Lap Adhesive is a medium viscosity, synthetic rubber/resin contact adhesive, for use as an alternative to the double-sided tape for jointing lengths of the dpc.

1.6 Quality control checks are carried out during manufacture and on the final product.

## 2 Delivery and site handling

2.1 Hyload is supplied in rolls and Hyload FR is supplied in strips in the quantities and packaging given in Table 2. Each roll/carton has a label bearing the name of the manufacturer, product name, product code, dimensions, and the BBA identification mark incorporating the number of this Certificate.

2.2 The pallets should be stored under cover, away from direct sunlight.

*Table 2 Packaging and quantity*

| Grade | Size (mm) | Quantity | Package type | Quantity per pallet |
|---|---|---|---|---|
| Hyload | 165/180 | 10 | cardboard cartons | 30 |
| | 180 | 5 | polyethylene bags | 45 |
| | 225 | 4 | polyethylene bags | 36 |
| Hyload FR | 165/180 | 10 | cardboard cartons | 30 |
| | 225 | 10 | cardboard cartons | 25 |

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Hyload and Hyload FR Insulated DPCs.

## Design Considerations

### 3 Use

3.1 Hyload and Hyload FR Insulated DPCs are satisfactory for use with timber, PVC-U or metal window and door frames, to provide an insulated dpc at areas where a cavity wall is closed.

3.2 General standards of good design practice for construction of walls are given in BS 5628-3 : 2005.

### 4 Practicability of installation

The products can be readily installed by competent general builders experienced with this type of material.

### 5 Behaviour under load

The products are non-loadbearing and must not be used to support loads from the masonry. Work should be detailed to ensure that the foam does not carry loads.

### 6 Weather resistance

6.1 The products form an effective vertical dpc at the jambs of the opening. The use of a cavity tray may be required at the head of the opening to provide additional protection.

6.2 The frame-to-wall gap should not exceed the dpc element thickness, so that effective damp-resistant contact can be made with the frame or frame rebate.

6.3 The products can be used with a checked reveal detail. This feature will provide enhanced resistance to water penetration and is conventional practice in Scotland and Northern Ireland. The use of the products in these situations may require the use of non-standard sizes and should be discussed with the Certificate holder.

### 7 Properties in relation to fire

Hyload FR

7.1 When Hyload FR was tested generally accordance with BS 476-20 : 1987 a result of greater than 30 minutes integrity was achieved.

7.2 The standard thickness of Hyload FR constitutes a cavity barrier against the penetration of smoke and flame at openings for windows and doors as defined in the Building Regulations.

Hyload

7.3 Hyload, when used in conjunction with cavity barriers as set out in the Building Regulations, is suitable for use in walls required to provide 30 minutes fire resistance. If a longer period of fire resistance is required, an appropriate test or assessment must be carried out by a UKAS accredited laboratory for the test concerned.

7.4 Hyload does not constitute a cavity barrier against the penetration of smoke and flame, as defined in the Building Regulations.

### 8 Hygrothermal behaviour

8.1 The path of minimum thermal resistance through the products is at least 0.45 $m^2KW^{-1}$ when used in jambs and sills with the window/door frame set-back 30 mm or more into the wall cavity. The products can therefore be used in accordance with the Accredited Construction Details (version 1.0) to limit heat loss and assign the default heat loss rates ($\psi$-values) in SAP 2005 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings* and the Simplified Building Energy Model (SBEM) calculations.

8.2 Jambs and sills incorporating the product in accordance with section 8.1 will adequately limit the risk of local surface condensation.

8.3 Under normal domestic conditions, the level of interstitial condensation associated with the products will be low and the risk of any resultant damage, minimal.

8.4 Door frames installed with proprietary fixings which cannot be set-back into the wall cavity by 30 mm may require additional thermal insulation, for example, insulated dry lining to minimise excessive heat loss and the risk of excessive surface condensation.

## 9 Compatibility with other materials

The products are compatible with all construction materials with the exception of timber preservatives based on creosote or tar oils. They are unaffected by water-based salt solution timber preservatives. Where there is doubt about the compatibility with materials in contact, the advice of the Certificate holder's Technical Department should be sought.

## 10 Maintenance

As the products are confined within a structure and have suitable durability (see section 11), maintenance is not required.

## 11 Durability

The products' durability depends mainly on the constituent materials, and measurements of their physical properties, both when new and after artificial ageing. Evidence from test data and performance in use indicates that, when properly specified and installed, the products will, in normal circumstances, remain effective during the lifetime of the building.

# Installation

## 12 General

12.1 Installation of Hyload and Hyload FR Insulated DPC's must follow normal good practice for the detailing of damp-proof courses, as set out in BS 5628-3 : 2005, and must be in accordance with the relevant Clauses of BS 8000-3 : 2001, BS 8000-4 : 1989, BS 8215 : 1991, BRE Digest 380 *Damp-proof courses*, and the Certificate holder's instructions.

12.2 The inner surface of the window/door frame should be set-back as appropriate to overlap the products.

12.3 Installation can be carried out using traditional methods with lengths cut to size on site using normal hand tools.

12.4 The products are sufficiently robust and flexible to allow manipulation and positioning within the cavity. However, care must be taken during site handling and cavity cleaning to avoid damaging the foam insulation and composite bond. If any significant damage occurs, the material should be replaced.

12.5 The width of the insulation must be sufficient to cover the masonry cavity closer and avoid any risk of condensation through cold bridging.

12.6 Side projections of the dpc must project beyond the masonry closer into the cavity, and not be bridged by mortar. The dpc projection into the opening must be located within the frame, with the end projection always at the bottom.

12.7 The dpc must not be secured by nailing. When required, the products may be given temporary support by turning the material over onto the top of the blockwork and holding in position with masonry.

## 13 Procedure

13.1 The cavity wall construction is built using conventional good practice and return headers installed as appropriate at openings for windows and door frames.

13.2 The products are placed vertically in the cavity, with the foam insulation towards the inner leaf and aligned with the return header (see Figure 1).

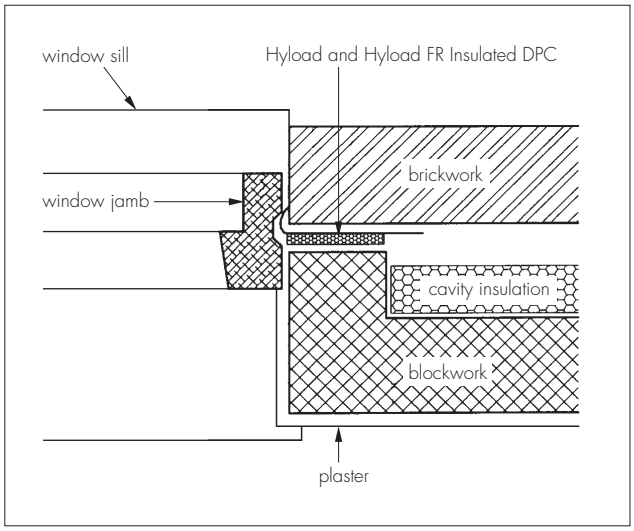
13.3 The vertically installed dpc must be dressed into the sill cavity tray and be located behind the head cavity tray or sealed to the soffit of the lintel.

13.4 The products are cut to the required length using a sharp knife.

13.5 Where lap joints occur, the dpc material must overlap by a minimum of 100 mm, the insulation strips should be tight-butted and the joint completely sealed.

13.6 Lap joints are produced either using Hyload DPC Jointing Tape or Hyload DPC Lap Adhesive. The advice of the Certificate holder should be sought regarding product dimensions for non-standard return headers and construction types.

*Figure 1 Typical installation*




# Technical Investigations

## 14 Tests

14.1 Tests were carried out to determine the peel strength of the composite bond before and after heat ageing.

14.2 During the previous assessments tests were carried out on the dpc to determine:

- thickness
- tensile strength and elongation at break
- flexibility at low temperatures
- resistance to water transmission under pressure
- impact resistance at normal and low temperatures
- tensile shear strength of joints
- weight per unit area
- handling characteristics
- water vapour permeability
- effect of ageing at high temperatures
- peel strength of adhesive tape
- effect of water soak on joints.

14.3 The following tests were carried out on the cross-linked polyethylene foam insulation to determine:

- thermal properties
- density
- compressive strength.

14.4 Independent test data on fire performance of Hyload FR to BS 476-20 : 1987 were examined and assessed.

14.5 Independent test data on fire performance of the polyethylene foam to BS 4735 : 1974 were examined and assessed.

14.6 The phenolic foam used in Hyload FR is the subject of a separate BBA Certificate.

## 15 Investigations

15.1 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.

15.2 An assessment was made of the hygrothermal properties of a construction incorporating the products.

15.3 An examination was made of reports of shear and flexure tests carried out to BS DD 86-1 : 1983 on the dpc materials.

# Bibliography

BS 476-20 : 1987 *Fire tests on building materials and structures — Method for determination of the fire resistance of elements of construction (general principles)*

BS 4735 : 1974 *Laboratory method of test for assessment of the horizontal burning characteristics of specimens no larger than 150 mm x 50 mm x 13 mm (nominal) of cellular plastics and cellular rubber materials when subjected to a small flame*

BS 5628-3 : 1985 *Code of practice for use of masonry — Materials and components, design and workmanship*

BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*
BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8215 : 1991 *Code of practice for design and installation of damp-proof courses in masonry construction*

BS DD 86-1 : 1983 *Damp-proof courses — Methods of test for flexural bond strength and short term shear strength*

## 16 Conditions

16.1 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.

16.2 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.

16.3 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.

16.4 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.

16.5 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.

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