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**Agrément Certificate**

**00/3742**

Product Sheet 5

### DELTA MEMBRANE SYSTEMS

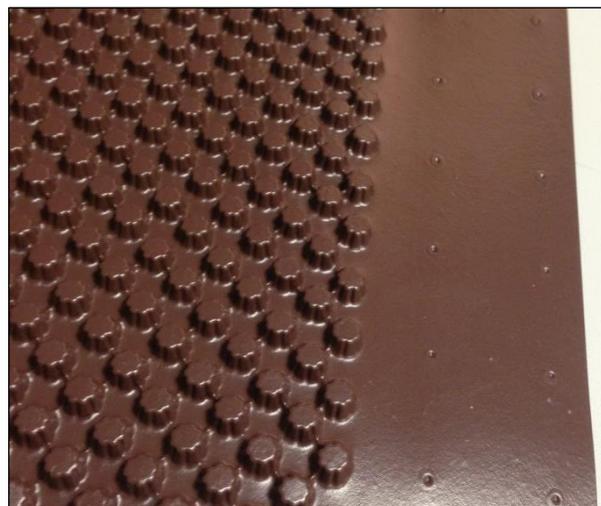
#### DELTA-FM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Delta-FM, a moulded high-density polyethylene (HDPE) membrane for damp-proofing walls, floors and vaulted ceilings in new construction or existing buildings. It is used above or below ground, over a contaminated or damp background, to support a dry lining and flooring.

(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

**Resistance to water and water vapour** — the membrane is water resistant and has a high resistance to water vapour transmission (see section 6).

**Resistance to salt transfer** — the membrane provides an effective barrier to the transmission of salts or other contaminants from the substrate (see section 8).

**Properties in relation to fire** — the membrane is not classified in accordance with BS EN 13501-1 : 2018 and its use is restricted under the national Building Regulations in some cases (see section 9).

**Resistance to puncture, impact and loading** — the membrane has a high resistance to puncture and will not be damaged by normal foot traffic during installation or while laying concrete or screed. It can support the long-term loadings likely to be experienced in service without undue deformation (see section 10).

**Durability** — under normal conditions of use, the system will provide an effective barrier to the transmission of salts, liquid water and water vapour for the life of the structure in which it is incorporated (see section 13).

The BBA has awarded this Certificate to the company named above for the system described herein. This system 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: 12 September 2019

John Albon  
Chief Scientific Officer

Claire Curtis-Thomas  
Chief Executive

Originally certificated on 4 August 2017

*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.*

*Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.*

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## Regulations

In the opinion of the BBA, Delta-FM, 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)

<b>Requirement:</b>	<b>B3(3)(4)</b>	<b>Internal fire spread – structure</b>
Comment:		The system adequately resists the passage of moisture. See section 6.1 of this Certificate.
<b>Requirement:</b>	<b>B4(1)</b>	<b>External fire spread</b>
Comment:		The system is restricted by this Requirement. See section 9 of this Certificate.
<b>Requirement:</b>	<b>C2(a)(b)</b>	<b>Resistance to moisture</b>
Comment:		The system adequately resists the passage of moisture. See section 6.1 of this Certificate.
<b>Regulation:</b>	<b>7</b>	<b>Materials and workmanship (applicable to Wales only)</b>
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship (applicable to England only)</b>
Comment:		The system is acceptable. See section 13 and the <i>Installation</i> part of this Certificate.



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

<b>Regulation:</b>	<b>8(1)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:		The system is acceptable. See section 13 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	2.4	Cavities
Comment:		The system can contribute to satisfying this Standard with respect to clause 2.4.2 <sup>(1)(2)</sup> . See section 9.1 of this Certificate.
Standard:	3.3	Flooding and ground water
Comment:		The system can contribute to minimising or eliminating the effects of flooding on the building fabric and/or the building element, with reference to clause 3.3.1 <sup>(1)(2)</sup> of this Standard. See section 6.1 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The system adequately resists the passage of moisture, with reference to clauses 3.4.1 <sup>(1)(2)</sup> , 3.4.2 <sup>(1)(2)</sup> , 3.4.5 <sup>(1)(2)</sup> , 3.4.6 <sup>(1)(2)</sup> and 3.4.7 <sup>(1)(2)</sup> of this Standard. See section 6.1 of this Certificate.
Standard:	3.6(a)	Surface water drainage
Comment:		The system can contribute to satisfying this Standard, with reference to clause 3.6.3 <sup>(1)(2)</sup> . See section 6.1 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system adequately resists the passage of moisture, with reference to clause 3.10.1 <sup>(1)(2)</sup> of this Standard. See section 6.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.

<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
<b>Comment:</b>	Comments in relation to the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .	
	(1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).	



## The Building Regulations (Northern Ireland) 2012 (as amended)

<b>Regulation:</b>	<b>23(a)(i)</b>	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>	<b>(iii)(b)(i)</b>	The system is acceptable. See section 13 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>28(a)(b)</b>	<b>Resistance to moisture and weather</b>
<b>Comment:</b>		The system adequately resists the passage of moisture. See section 6.1 of this Certificate.
<b>Regulation:</b>	<b>35(3)(4)</b>	<b>Internal fire spread – structure</b>
<b>Comment:</b>		The system can contribute to satisfying this Regulation. See section 9.1 of this 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.

See sections: 1 *Description* (1.1) and 3 *Delivery and site handling* (3.4) of this Certificate.

## Additional Information

### NHBC Standards 2019

In the opinion of the BBA, Delta-FM, 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 5.1 *Substructure and ground bearing floors*, 5.2 *Suspended ground floors* and 5.4 *Waterproofing of basements and other below ground structures*.

Where Grade 3 protection is required and the below ground wall retains more than 600 mm (measured from the top of the retained wall to the lowest finished floor level), the system should be used in accordance with *NHBC Standards*, Chapter 5.4, including in combination with either a Type A or Type B waterproofing protection.

In the opinion of the BBA, the use of the system on existing structures, when installed and used in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards for Conversions and Renovations*, taking account of other relevant guidance within the chapter and the suitability of the substrate to receive the system.

### CE marking

The Certificate holder has taken the responsibility of CE marking the membrane in accordance with harmonised European Standard BS EN 13967 : 2012. An asterisk (\*) appearing in this Certificate indicates that data shown is given in the manufacturer's Declaration of Performance.

### 1 Description

1.1 Delta-FM is a brown, HDPE sheet with moulded studs at a density of 8911 per m<sup>2</sup>, for use as a damp-proofing membrane (see Figure 1). The membrane is available in the following dimensions:

Thickness (mm)	0.6
Stud height (mm)	4.5
Weight per unit area (kg·m <sup>-2</sup> )	580
Roll length (m)*	20
Roll width (m) <sup>(1)*</sup>	2.0
Weight per roll (kg)	35
Air gap volume (l·m <sup>-2</sup> )	2.6.

(1) Including a 65 mm flat flange to one edge for sealing purposes.

1.2 Ancillary items used with the membrane include:

- Flexidri-Plus Fixing Plug — a plastic plug supplied with preformed rubber seal and plastic expansion pin. After fixing, the pin is inserted into the hollow shaft of the plug and hammered home. This slightly expands the shaft and provides a more secure fixing. The pin will accept a 5 mm diameter screw to enable a secondary fixing (see Figure 1)
- Delta Qwik-Seal Plug — a plastic plug supplied with preformed rubber seal for use in masonry walls and concrete (see Figure 2)
- Delta Plug — a glass-filled nylon plug for use in masonry walls and concrete (see Figure 3)
- Delta Tape — black butyl tape for sealing joints in the membrane
- Delta Rope — black butyl beading for sealing the membrane around pipes and openings, joining floor and wall membranes, and to seal around the head of Delta Plug prior to fixing the membrane
- Delta Mastic — an acrylic sealant for sealing the membrane around pipes and openings
- Delta Corner Strip — a self-adhesive membrane strip for sealing junctions between walls and floors, and for sealing joints at corners
- Delta Fleece-Tape — 100 mm wide butyl tape with fleece backing for sealing joints in the membrane. The fleece backing will form a bond with the plaster when used with meshed membranes
- Delta Primer — a solvent-based primer for sealing porous substrates prior to application of the Delta range of butyl-based sealing products.

Figure 1 Flexidri-Plus — Fixing Plug detail

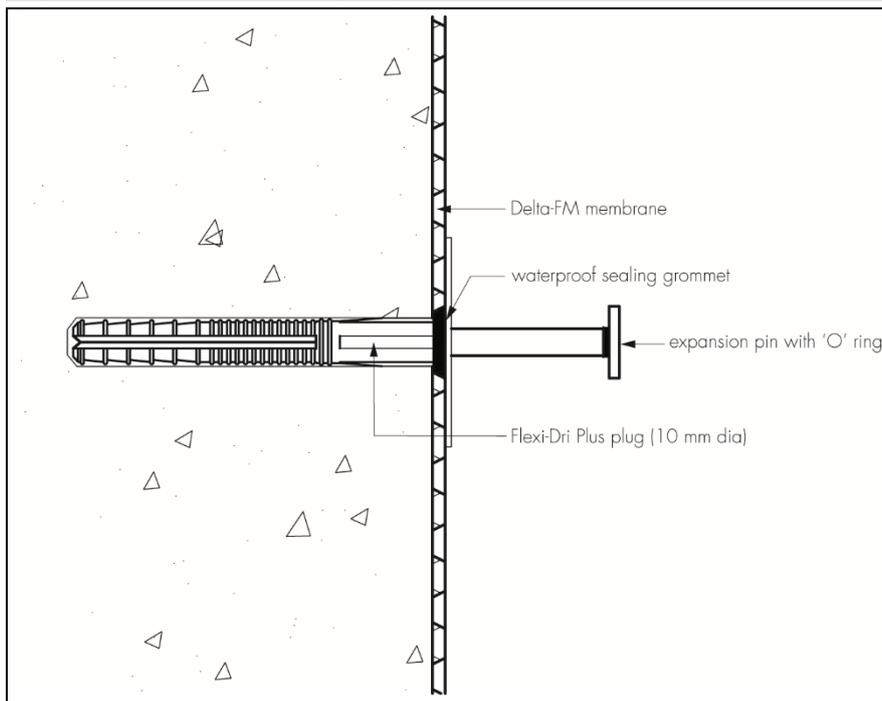


Figure 2 Delta Qwik-Seal Plug fixing detail

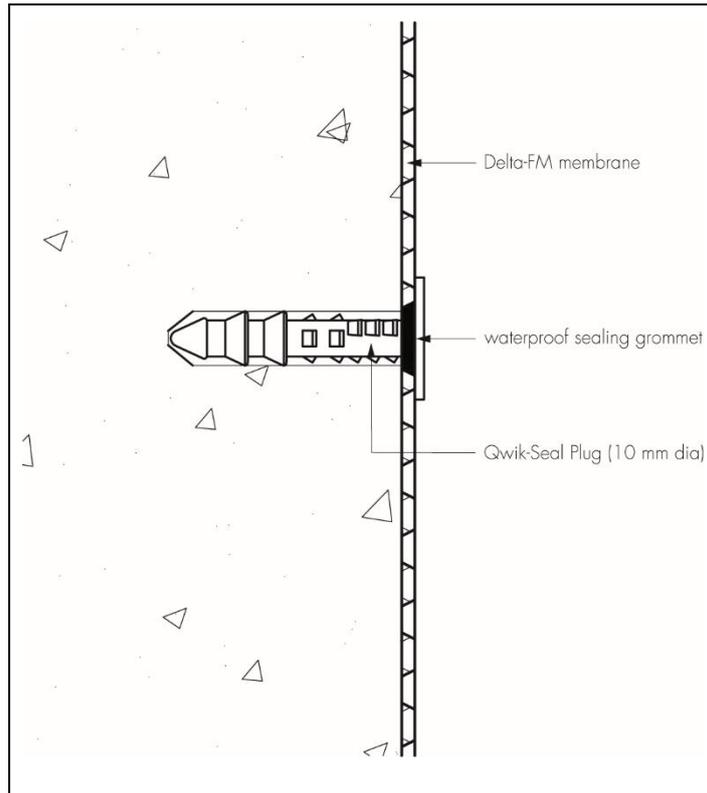
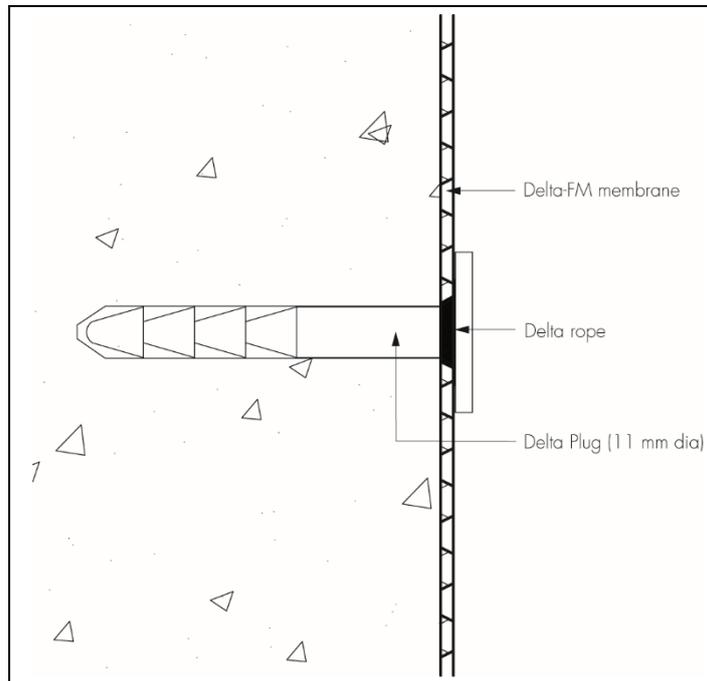


Figure 3 Delta Plug fixing detail



## 2 Manufacture

2.1 The membrane is formed in a continuous process in which HDPE is extruded into sheets and the stud impression formed.

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.

### 3 Delivery and site handling

3.1 The membrane is delivered to site in rolls secured with outer wrapping, and a headband bearing the product and manufacturer's name.

3.2 Rolls should be stored on end, under cover and protected from sharp objects, sunlight and high temperatures.

3.3 The packaging details of the ancillary items are shown in Table 1.

<i>Table 1 Packaging details</i>		
Item	Dimensions/volume	Packaging/quantity
Flexidri-Plus Fixing Plug	10 mm diameter 90 mm long	Boxes of 100
Delta Qwik-Seal Plug	10 mm diameter 58 mm long	Boxes of 100
Delta Plug	11 mm diameter 70 mm long	Boxes of 100 or 1000
Delta Tape	22.5 m long 28 mm wide 2 mm thick	1 roll per box 10 rolls per outer box
Delta Rope	4.75 m long 10 mm diameter	1 roll per box 10 rolls per outer box
Delta Mastic	0.4 litre cartridge	24 cartridges per box
Delta Corner Strip	20 m long 150 mm wide	Single rolls 2 rolls per box
Delta Fleece-Tape	20 m long 100 mm wide 0.9 mm thick	1 roll per box
Delta Primer	10 litre	Single 10 litre tin

3.4 The Certificate holder has taken the responsibility of classifying and labelling the membrane under the *CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Delta-FM.

### Design Considerations

#### 4 General

4.1 Delta-FM is satisfactory for use in damp-proofing walls, floors and vaulted ceilings, above and below ground, in new construction or in existing buildings over a contaminated or damp background. It can support a dry lining, screed or flooring, in the following situations:

- on damp walls and floors in underground situations subject to high groundwater levels and perennial moisture

- on vaulted ceilings of archways or cellars subject to water ingress
- in conjunction with a remedial damp-proof course (dpc) system where the walls and floors have a high salt content, and/or where it is necessary to complete the installation immediately without allowing a period for initial drying
- over walls and floors which have a friable or painted surface, are contaminated (eg with oil or mould), or have a high salt content
- as a waterproofing membrane in areas subject to vibration.

4.2 Depending on the application required and the site conditions, the membrane may be used as:

- an underfloor damp-proof membrane
- a dry lining for walls, ventilated into the room via aeration slots at the top and bottom of the wall or via passive air vents, where access through an external wall is available
- a sealed system covering wall, floor and ceiling with provision made for disposing of water build-up behind the membrane via a sump and pump.

4.3 The membrane has not been assessed for use in chemically contaminated areas, such as brownfield sites.

4.4 The system is satisfactory for use in Type C (drained protection) constructions in accordance with BS 8102 : 2009.

4.5 Under normal operating conditions, the membrane is not affected by underfloor heating.

## 5 Practicability of installation

The membrane is designed to be installed by competent specialist contractors experienced with damp-proofing work.

## 6 Resistance to water and water vapour



6.1 The membrane is water resistant and has a high resistance to water vapour transmission. However, the system as installed is not resistant to hydrostatic pressure and, consequently, the measures described in the *Installation* part of this Certificate must be followed to ensure that the membrane acts as a drainage layer with no excessive build-up of water behind the system.

6.2 All joints and fixings must be sealed with Delta sealing products; drainage channels and gullies, or sumps and pumps, should be installed as necessary to disperse excess or standing water.

## 7 Risk of condensation

7.1 As with any room, there is a need to control the generation and dispersal of moisture in the internal environment and to select appropriate and robust designs to minimise the risk of both surface and interstitial condensation, especially where insulation is used over the membrane.

7.2 In common with most waterproofing membranes, the system has a very high resistance to vapour diffusion, and when placed on the cold side of a construction may increase the risk of interstitial condensation. A calculation should be carried out to BS 5250 : 2011 and designers should consider appropriate techniques for managing the safe egress of moisture vapour (such as control of the internal room environment or use of a vapour control layer on the warm side of the insulation), and in particular the effect of moisture on any materials at, or in contact with materials below, the local dew-point.

## 8 Resistance to salt transfer

The membrane provides an effective barrier to the transmission of salts or other contaminants from the substrate.

## 9 Properties in relation to fire



9.1 The membrane is not classified in accordance with BS EN 13501-1 : 2018. Where the system forms the face of a cavity, the permissible areas of use and the spacing of cavity barriers are restricted by the national Building Regulations.



9.2 In England, when used as part of the external wall above ground level, the membrane should not be used on buildings that have a storey at least 18 m above ground level and which contain: one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.

## 10 Resistance to puncture, impact and loading

10.1 The membrane has a high resistance to puncture and will not be damaged by normal foot traffic during installation or while laying concrete or screed to BS 8204-1 : 2003.

10.2 The membrane can support the long-term imposed loadings defined in the UK National Annex to BS EN 1991-1-1 : 2002, Table NA.2, Categories A to D, without undue deformation.

## 11 Wall-mounted fittings

Wall-mounted fittings (apart from lightweight items such as framed pictures) should be fixed where possible into battens, whose position and number of support fixings into the loadbearing structure are predetermined. Only in exceptional circumstances should fittings be fixed<sup>(1)</sup> through the membrane and lining board to the loadbearing structure behind. Holes made in the membrane must be repaired in accordance with the Certificate holder's approved procedures.

(1) Using proprietary fixings.

## 12 Maintenance

12.1 As the membrane is confined within a wall or floor space and has suitable durability (see section 13), maintenance is not required.

12.2 Regular maintenance of all gullies, sumps and pumps must be conducted to ensure that a build-up of water does not occur behind the membrane.

## 13 Durability



Under normal conditions of use, the membrane will provide an effective barrier to the transmission of salts, liquid water and water vapour for the life of the structure in which it is incorporated.

## 14 Reuse and recyclability

The membrane is made from HDPE, which can be recycled.

## Installation

## 15 Survey

15.1 Where the property is below ground, or where conditions are damp, a full survey by a specialist waterproofing surveyor is necessary, to diagnose the cause and to establish if treatment is required.

15.2 If rising damp to above-ground elevations is found, a remedial treatment is conducted in accordance with the relevant BBA Certificate, BS 6576 : 2005 and the Property Care Association *Code of Practice for Installation of Remedial Damp-proof Courses in Masonry Walls*, 2006.

15.3 Appropriate remedial measures are taken to rectify major causes of damp conditions or water ingress, and to repair structural defects.

## **16 Surface preparation**

16.1 When the system is used in new constructions, the concrete base must be laid in accordance with BS 8204-1 : 2003.

16.2 If a board covering is to be laid directly on the membrane, the concrete base must have a surface regularity with a maximum permissible departure of 5 mm from the underside of a 2 m straight edge, resting in contact with the floor, in accordance with BS 8204-1 : 2003.

16.3 When used in existing buildings any unsound plaster, render or screed is removed to expose the substrate which is then cleaned with a stiff brush to remove loose material, laitance, salt residue, mould or adhesive. If mould is present, the substrate is treated with a HSE approved fungicidal wash.

16.4 Uneven floor substrates should be dubbed out with a cement-sand (1:4) or cement-lime-sand (1:1:6) render or screed, to the tolerance described in section 16.2, and allowed to dry thoroughly before Delta-FM is installed above.

## **17 Procedure**

### **General**

17.1 Delta-FM may be used in combination with any of the appropriate Delta membranes which are the subjects of other Product Sheets of this Certificate.

17.2 The membrane should be used with the flanged edge positioned in front of and overlapping the previously installed membrane width and sealed using Delta Tape. Stud-to-stud joints (without the flanged edge) are sealed by either overlapping the membrane by a minimum of 100 mm or butt-jointing the membranes, and over-sealing the joint with Delta Corner Strip or Delta Fleece-Tape.

17.3 Fixings are made through the membrane into 10 mm holes, drilled centrally through the studs. Delta Qwik-Seal Plugs are inserted into the holes and hammered flush with the membrane with a club hammer. Alternatively, Flexidri-Plus Fixing Plugs can be used and hammered flush with the membrane. The fixing pin is then inserted into the shaft and hammered home. The seal must be compressed to function as a barrier against water ingress, and this should be visually checked as each plug is fixed.

17.4 Alternatively, fixings are made through 11 mm holes, drilled centrally through the studs. Delta Plugs (to which Delta Rope has been applied around the shaft, next to the head) are inserted into the holes and hammered flush with the membrane. Delta Rope forms a sealing gasket between the plug and the membrane.

17.5 On walls and ceilings, preservative-treated timber battens of minimum dimensions 25 by 38 mm are fixed into the Delta Plug's fixing hole using No 12 screws, or Flexidri-Plus Fixing Plug's fixing hole using 5 mm diameter screws, or Delta Qwik-Seal Plug's fixing hole using No 10 screws, with a maximum screwing-in depth of 30 mm. The membrane can also be dry-lined, using free-standing framework, blockwork or similar. Where necessary, these should be tied back by fixing into the Delta Plug, Delta Qwik-Seal Plug or Flexidri-Plus Fixing Plug.

### **Walls**

17.6 Installation of the membrane is usually commenced at the top of the construction. The membrane may require initial fixing on a ceiling or along the upper edge of a wall, prior to final fixings along batten runs. For joints where the flanged edge is not used, the two membrane sheets are overlapped by a minimum of 100 mm, and for horizontal joints the lower sheet is always positioned in front of the upper sheet.

17.7 Spacing between fixings will depend on the method of dry lining to be applied. When using preservative-treated timber battens the fixings should be spaced at 600 mm centres. Proprietary metal fast track systems and independent frame systems will require fewer fixings, but sufficient should be used to ensure that the membrane is reasonably tight to the wall, especially at corners.

17.8 The installation is conducted over windows and the membrane is cut away to expose them. The gaps are sealed with Delta Tape or Delta Rope.

17.9 For doors and some obstructions the technique covered in section 17.8 cannot be used. Instead, the membrane is installed up to the perimeter and the gap sealed in the same manner.

17.10 Power cables, points and light switches should preferably be remounted in front of the membrane.

17.11 In below-ground installations, the practice of leaving the top of the wall membrane unsealed where there is no requirement for a ceiling membrane to be installed may need to be reconsidered in cases where ingress of gases, odours or vermin is a concern (such as in proximity to food preparation areas). The advice of the Certificate holder should be sought in these situations.

17.12 In above-ground installations, the build-up of water vapour behind the membrane is controlled by ventilating into the room via ventilation gaps provided at the ceiling and skirting board levels or via passive air vents, where access through an external wall is available.

### **Ceilings**

17.13 Ceilings to be covered must always have a fall (eg as per vaulted cellar constructions) to ensure that water does not lie against the membrane or a joint. Membrane sheets should have an overlap of 200 mm.

17.14 Delta Qwik-Seal Plugs, Flexidri-Plus Fixing Plugs or Delta Plugs sealed with Delta Rope should be used to fix the membrane to vaulted ceilings. Any sagging of the membrane between fixing points on ceilings should not be great enough for ponding to occur.

17.15 At the end walls of vaulted constructions the membrane must be turned down onto the end wall by a minimum of 200 mm. The membrane is mitred as necessary to fit the curve of the ceiling, and the joints sealed with Delta Tape, Delta Rope, Delta Corner Strip or Delta Fleece-Tape. The wall membrane should be cut into the curve of the ceiling, fixed in front of the ceiling membrane, and the gap sealed with Delta Rope.

### **Floors**

17.16 Floors should have a drainage outlet point. There should be a fall towards the outlet point or a drainage channel made around the circumference of the floor, to ensure that water can flow to the outlet.

17.17 The membrane is rolled out 'studs down' over the floor, and consecutive membrane widths are laid so the flanged edge overlaps the first sheet and the joints sealed with Delta Tape. Stud-to-stud joints can be over-sealed using Delta Corner Strip or Delta Fleece-Tape in accordance with section 17.2.

17.18 The membrane is cut within 5 mm of any pipes and services in the floor, and the gap filled with Delta Rope. If necessary, a patch of membrane is overlaid and sealed to the services with Delta Rope, and its perimeter sealed with Delta Tape.

17.19 Fixings must not be applied through the floor membrane.

17.20 Where appropriate, at wall/floor junctions and corners of the installation, the membrane may be cut flush and the gap between the wall and floor membranes sealed with Delta Corner Strip or Delta Fleece-Tape. Alternatively, the floor membrane may be turned up by 100 mm at the wall.

17.21 Where internal or external corners occur, they should be oversealed using Delta Corner Strip or Delta Fleece-Tape, in accordance with the Certificate holder's installation instructions.

## 18 Dry lining of walls

Gypsum plasterboard to BS EN 520 : 2004, or similar dry lining boards which are the subject of a current BBA Certificate, are fixed to the battens with galvanized screws or nails, positioned a minimum of 12 mm from the edge of the board. Care should be taken to ensure that penetration of the plasterboard screws or nails is less than the batten depth to avoid puncturing the membrane.

## 19 Finishing works

After the membrane has been installed and the walls have been dry-lined, permanent decorations, such as vinyl paper or oil paint, may be applied. Temporary permeable decorations (necessary with traditional, cement-based waterproofers) are not necessary with the membrane.

## 20 Floor membrane coverings

20.1 If required, extruded closed-cell polystyrene insulation boards, minimum density  $30 \text{ kg}\cdot\text{m}^{-3}$ , may be laid over the membrane.

20.2 Suitable tongue-and-groove flooring board panels should be selected in accordance with BS EN 12871 : 2013, and loose-laid over the membrane to within 10 mm of the walls. The panels are staggered and the joints sealed with a thermoplastic wood adhesive to BS EN 204 : 2016.

20.3 Alternatively, the membrane is covered by concrete or screed a minimum of 50 mm thick (or a minimum of 65 mm thick if laid over insulation boards) in accordance with BS 8204-1 : 2003. Care should be taken to ensure that the membrane is not displaced when placing the concrete or screed. The concrete or screed should be reinforced to inhibit shrinkage cracks.

20.4 Proprietary screeds may also be considered, which can generally be laid at thicknesses less than 50 mm, but the use of these with the membrane has not been assessed by the BBA and is outside the scope of this Certificate.

## Technical Investigations

### 21 Tests

21.1 An assessment was made of data to BS EN 13967 : 2004 in relation to:

- thickness of membrane
- watertightness to liquid water
- resistance to impact
- durability of watertightness against ageing/degradation
- tensile strength (unreinforced sheets)
- reaction to fire.
- mass per unit area of membrane
- water vapour transmission of the membrane
- resistance to static loading
- durability of watertightness against chemicals
- elongation (unreinforced sheets)

21.2 Tests were carried out, and the results evaluated, to determine:

- water vapour transmission of a sample incorporating a joint
- resistance to long-term loading
- watertightness of a sample incorporating a joint
- effectiveness of seal between fixing and membrane when sealed using Delta Plugs (with Delta Rope), Flexidri-Plus Fixing Plugs and Qwik-Seal Plugs.

### 22 Investigations

22.1 An assessment was made of the scope of use and durability of the product in relation to the generic properties of the membrane.

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

## Bibliography

BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*

BS 6576 : 2005 + A1 : 2012 *Code of practice for diagnosis of rising damp in walls of buildings and installation of chemical damp-proof courses*

BS 8102 : 2009 *Code of practice for protection of below ground structures against water from the ground*

BS 8204-1 : 2003 + A1 : 2009 *Screeds, bases and in-situ floorings — Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*

BS EN 204 : 2016 *Classification of thermoplastic wood adhesives for non-structural applications*

BS EN 520 : 2004 + A1 : 2009 *Gypsum plasterboards — Definitions, requirements and test methods*

BS EN 12871 : 2013 *Wood-based panels — Determination of performance characteristics for load bearing boards for use in floors, walls and roofs*

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

BS EN 12871 : 2013 *Wood-based panels — Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*

BS EN 13967 : 2004 + A1 : 2006 *Flexible sheets for waterproofing — Plastic and rubber damp proof shoes including plastic and rubber basement tanking sheet — Definitions*

BS EN 13967 : 2012 + A1 : 2017 *Flexible sheets for waterproofing — Plastic and rubber damp proof shoes including plastic and rubber basement tanking sheet — Definitions*

BS EN 13501-1 : 2018 *Fire Classification of construction products and building elements – Classifications from reaction to fire tests*

Property Care Association COP02 *Code of Practice for Installation of Remedial Damp-proof Courses in Masonry Walls*

### 23 Conditions

23.1 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.

23.2 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.

23.3 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.

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

23.5 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.

23.6 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.