

## Knauf Insulation Ltd

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**Agreement Certificate**

**13/4969**

Product Sheet 1

## SUPAFIL

### KNAUF INSULATION SUPAFIL CARBONPLUS CAVITY WALL INSULATION

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Knauf Insulation Supafil CarbonPlus Cavity Wall Insulation, a granulated glass mineral wool fibre material injected in loose form, for use in external masonry walls up to and including 12 m in height, with cavity widths not less than 40 mm, in existing domestic and non-domestic buildings. The product may also be used in buildings over 12 m in height where a height restriction waiver has been issued by the Certificate holder.

(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

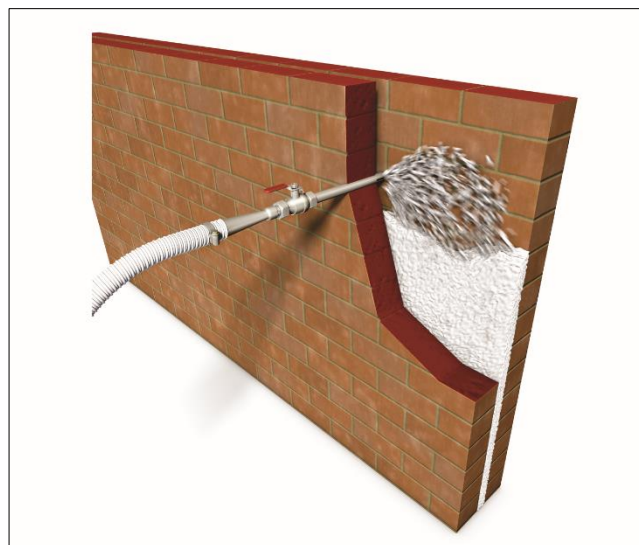
**Thermal properties** — the product has a declared thermal conductivity\* ( $\lambda_D$ ) of  $0.034 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  (see section 6).

**Water penetration** — the product will resist the transfer of water across the cavity (see section 7).

**Condensation** — the product will contribute to limiting the risk of condensation (see section 8).

**Behaviour in relation to fire** — the product is classified as non-combustible (see section 9).

**Durability** — the product is durable, rot-proof, water resistant and sufficiently stable to remain effective as an insulant for the life of the building (see section 11).



The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Third issue: 23 March 2016

Originally certificated on 8 March 2013

John Albon – Head of Approvals  
Construction Products

Claire Curtis-Thomas  
Chief Executive

*Certificate amended on 13 March 2019 to include Regulation 7(2) for England and associated text.*

*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.*

#### British Board of Agrément

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## Regulations

In the opinion of the BBA, Knauf Insulation Supafil CarbonPlus Cavity Wall Insulation, 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>C2(a)</b>	<b>Resistance to moisture</b>
Comment:		The product can contribute to satisfying this Requirement. See section 7.1 of this Certificate.
<b>Requirement:</b>	<b>C2(b)</b>	<b>Resistance to moisture</b>
Comment:		The product can contribute to satisfying this Requirement. See section 7.2 of this Certificate.
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:		The product can contribute to satisfying this Requirement. See sections 8.1 and 8.3 of this Certificate.
<b>Requirement:</b>	<b>L1(a)(i)</b>	<b>Conservation of fuel and power</b>
Comment:		The product can contribute to satisfying this Requirement. See sections 6.1 and 6.3 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 product is acceptable. See section 11.1 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>7(2)</b>	<b>Materials and workmanship (applicable to England only)</b>
Comment:		The product is unrestricted by this Regulation. See section 9.1 of this Certificate.
<b>Regulation:</b>	<b>26</b>	<b>CO<sub>2</sub> emission rate for new buildings</b>
<b>Regulation:</b>	<b>26A</b>	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
<b>Regulation:</b>	<b>26A</b>	<b>Primary energy consumption rates for new buildings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26B</b>	<b>Fabric performance values for new dwellings (applicable to Wales only)</b>
Comment:		The product can contribute to satisfying these Regulations. See sections 6.1 and 6.3 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 product can contribute to satisfying this Regulation. See section 11.1 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	3.4	Moisture from the ground
Comment:		The product can contribute to satisfying this Standard, with reference to clause 3.4.1 <sup>(1)(2)</sup> . See section 7.1 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product can contribute to satisfying this Standard, with reference to clause 3.10.1 <sup>(1)(2)</sup> , provided it complies with the conditions set out in section 7.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> and 3.15.5 <sup>(1)(2)</sup> . See sections 8.2 and 8.3 of this Certificate.

Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:	The product can contribute to satisfying clauses, or parts of, 6.1.1 <sup>(1)</sup> , 6.1.2 <sup>(2)</sup> , 6.1.6 <sup>(1)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(2)</sup> , 6.2.5 <sup>(2)</sup> , 6.2.6 <sup>(1)</sup> , 6.2.7 <sup>(1)</sup> , 6.2.8 <sup>(1)(2)</sup> , 6.2.9 <sup>(1)(2)</sup> , 6.2.10 <sup>(1)(2)</sup> , 6.2.11 <sup>(1)(2)</sup> , 6.2.12 <sup>(2)</sup> and 6.2.13 <sup>(1)(2)</sup> of these Standards. See sections 6.1 and 6.3 of this Certificate.	
Standard:	7.1(a)(b)	Statement of sustainability
Comment:	The product 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. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 <sup>(1)(2)</sup> [Aspects 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ], 7.1.6 <sup>(1)(2)</sup> [Aspects 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ] and 7.1.7 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> ]. See section 6.1 of this Certificate.	
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:	All comments in relation to the product 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</b>	<b>Fitness of materials and workmanship</b>
Comment:	The product is an acceptable material. See section 11.1 and the <i>Installation</i> part of this Certificate.	
<b>Regulation:</b>	<b>28(a)</b>	<b>Resistance to moisture and weather</b>
Comment:	The product can contribute to satisfying this Regulation. See section 7.1 of this Certificate.	
<b>Regulation:</b>	<b>28(b)</b>	<b>Resistance to moisture and weather</b>
Comment:	The product can contribute to satisfying this Regulation. See section 7.2 of this Certificate.	
<b>Regulation:</b>	<b>29</b>	<b>Condensation</b>
Comment:	The product will contribute to satisfying this Regulation. See section 8.3 of this Certificate.	
<b>Regulation:</b>	<b>39(a)(i)</b>	<b>Conservation measures</b>
<b>Regulation:</b>	<b>40(2)</b>	<b>Target carbon dioxide emission rate</b>
Comment:	The product can contribute to satisfying these Regulations. See sections 6.1 and 6.3 of this Certificate.	

## Construction (Design and Management) Regulations 2015

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

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

See section: 3 *Delivery and site handling* (3.1) of this Certificate.

## Additional Information

### CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard BS EN 14064-1 : 2010. An asterisk (\*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

## Technical Specification

### 1 Description

1.1 Knauf Insulation Supafil CarbonPlus Cavity Wall Insulation is a granulated glass mineral wool fibre material, treated with a water-repellent additive.

1.2 The target mean density of this product when installed is  $25 \text{ kg}\cdot\text{m}^{-3}$  over the entire installation. Individual areas within the wall must not have an absolute density variation of more than  $\pm 5 \text{ kg}\cdot\text{m}^{-3}$  from the target mean density when measured over an area of  $0.5 \text{ m}^2$ .

### 2 Manufacture

2.1 Molten glass is spun into fibres through holes in rotating dishes. Silicone oil is applied to the fibres from spray nozzles.

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 being operated by the manufacturer are being maintained.

2.3 The management system of Knauf Insulation Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008, BS EN ISO 14001 : 2007, BS EN ISO 50001 : 2011 and OHSAS 18001 : 2007 by Bureau Veritas Certifications (Certificates BE008875-2, BE008876-2, BEL-130711/EnMS Rev.4 and BE009276-2, respectively).

### 3 Delivery and site handling

3.1 The product is delivered to site in polythene wrapped bales weighing approximately 15.5 kg, which should not be opened until required for use. The bales are marked with the BBA logo incorporating the number of this Certificate.

3.2 It is essential that the product is stored such that it is raised off the ground, is inside or under cover on a dry, level surface and protected from rain, snow and other sources of dampness. Nothing should be stored on top of the product.

3.3 Damaged, contaminated or wet materials must not be used.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Knauf Insulation Supafil CarbonPlus Cavity Wall Insulation.

### 4 General

4.1 Knauf Insulation Supafil CarbonPlus Cavity Wall Insulation is satisfactory for use as an injected cavity wall insulation and is effective in reducing the thermal transmittance (U value) of external cavity walls, with masonry inner and outer leaves (where masonry includes clay and calcium silicate bricks, concrete blocks, and natural and reconstituted stone blocks). The product is for use in existing domestic and non-domestic buildings up to and including 12 m in height, with cavity widths not less than 40 mm. It is essential that such walls are designed and constructed to incorporate the precautions given in this Certificate to prevent moisture penetration.

4.2 This Certificate covers the product in the following hard to treat (HTT) applications:

- a cavity less than 50 mm wide (see section 4.3)
- a partially-filled cavity (see section 4.6)
- a building in excess of three storeys (see section 19).

4.3 This Certificate covers the use of the product in any exposure zone, subject to the following conditions being met. They are particularly important in areas subject to severe or very severe driving rain:

- a site survey should be carried out prior to installation (see section 12 and 14)
- the minimum cavity width must not be less than 40 mm
- walls must be in good state of repair and show no evidence of frost damage
- mortar joints must not show evidence of more than hairline cracking. Racked or recessed mortar joints should be avoided in very severe exposure areas.

#### Partial filling — omitted areas

4.4 Whenever practicable, all of the cavity space from ground level to the roof or gable copings should be filled, except when:

- separately insulating semi-detached or terraced properties. The cavity barrier used for this purpose is retained in the cavity and must be as defined in section 17.3
- filling up to the underside of a horizontal boundary, other than the roof, where that horizontal boundary is protected by a cavity tray or similar waterproof barrier
- treating properties where the wall to be insulated is below a waterproof cladding (eg tile hung) and this cladding either extends up to the roof or is protected at the top by other means (eg window sills)
- treating areas of wall where access for drilling may be limited by features such as carports and conservatories as defined in sections 18.7 and 18.8.

4.5 The product may be installed only:

- where there are no signs of dampness on the inner face of the cavity wall, other than those caused solely by condensation
- where the cavity is not being used as a source of combustion air or as a flue for ventilation purposes.

#### Partial fillings — residual cavities<sup>(1)</sup>

4.6 This Certificate covers the use of the product for topping up of residual cavities in partial-fill installations, subject to the following conditions being met:

- prior to installation, a site survey must be carried out by a BBA Approved Assessor (see section 13)
- the existing built-in insulation in the cavity is one of the following:
  - mineral wool (MW) batts
  - expanded polystyrene (EPS) boards
  - extruded polystyrene (XPS) boards
  - foil-faced polyisocyanurate (PIR), polyurethane (PUR) or phenolic (PF) boards
  - concrete building blocks incorporating a layer of EPS, XPS, PUR, PIR or PF insulation (faced or unfaced)
- the minimum residual cavity width is not less than 40 mm

- installation is carried out by a BBA Approved Installer, trained to work on this type of installation
- all other conditions in section 4.3 are met.

(1) Partial-fill installations relate to existing constructions where insulation, in the form of batts or boards, has previously been built into a wall and there is a residual cavity.

## 5 Practicability of installation

The product must be installed by operatives trained and approved by the Certificate holder and subsequently approved by the BBA. The Certificate holder operates an Approved Installer Scheme<sup>(1)</sup> for this product under which the installers are approved, registered and regularly reviewed by the Certificate holder to demonstrate that they are competent to carry out installations of the product in accordance with this Certificate. Details of Approved Installers are available from the Certificate holder. Approved Installers are responsible for each installation of the product that they undertake (see section 15).

(1) The Certificate holder's records relating to their Approved Installer Scheme will be audited annually by the BBA as part of its programme of surveillance.

## 6 Thermal properties



6.1 Calculations of the thermal transmittance (U value) of specific external wall constructions should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006, using the insulation's declared thermal conductivity\* ( $\lambda_D$ ) of  $0.034 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ .

6.2 Where an existing wall is subject to national Building Regulations (for example, a material change of use), designers should take account of the relevant guidance relating to technical and economic feasibility and target U values in the documents supporting those Regulations.



6.3 The U value of a typical brick and block cavity wall construction will depend on the cavity width and the insulating value of the internal block leaf and finish. Calculated U values for example constructions are given in Table 1 of this Certificate.

Table 1 Example cavity wall U values — existing buildings/retained walls

Cavity width/insulation thickness (mm)	U values ( $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ ) <sup>(1)</sup>	
	13 mm dense plaster <sup>(2)</sup> 100 mm dense block <sup>(3)</sup>	Plasterboard on dabs 100 mm AAC block <sup>(4)</sup>
40	0.63	0.43
50	0.53	0.38

(1) Assumes fixings correction for fully-penetrating mild steel fixings ( $50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) at  $2.5 \text{ per m}^2$  with cross-sectional area of  $12.5 \text{ mm}^2$ , nominal U value and 102 mm thick brick outer leaf.

(2) Plaster thermal conductivity  $0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ .

(3) Block and mortar thermal conductivity  $1.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  and  $0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  respectively.

(4) Block and mortar thermal conductivity  $0.12 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  and  $0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  respectively.

### Junctions

6.4 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

## 7 Water penetration



7.1 The product can be used in situations where it bridges the damp-proof course (dpc) in walls, dampness from the ground will not pass through to the inner leaf provided the wall is detailed in accordance with the requirements and provisions of the national Building Regulations:

**England and Wales** — Approved Document C, section 5

**Scotland** — Mandatory Standard 3.4, clause 3.4.1<sup>(1)(2)</sup>

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

**Northern Ireland** — Technical Booklet C, Sections 6.3 to 6.6.

7.2 When the product is properly installed in accordance with this Certificate, it will resist any water transfer across the cavity to the inner leaf.

## 8 Condensation

### Surface condensation



8.1 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point and the junctions with other elements are designed in accordance with the guidance referred to in section 6.4 of this Certificate.



8.2 For buildings in Scotland, constructions will be acceptable where the thermal transmittance (U value) does not exceed  $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point and the junctions with other elements are designed in accordance with the guidance referred to in BS 5250 : 2011, Annex G. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.4 of this Certificate.

### Interstitial condensation



8.3 Walls will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, Annexes D and G and the relevant guidance.

## 9 Behaviour in relation to fire



9.1 The fire classification of the product is Class A1\* according to BS EN 13820 : 2003 (as it contains less than 1% organic material) and therefore is non-combustible.

9.2 Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity closers and barriers, fire stopping of service penetrations and combustibility limitations for other materials and components used in the overall wall construction.

## 10 Maintenance

As the product is confined within the wall cavity and has suitable durability (see section 11), maintenance is not required.

## 11 Durability



11.1 The product is unaffected by the normal conditions in a wall, and is durable, rot-proof, water resistant and sufficiently stable to remain effective as insulation for the life of the building.

11.2 Should it become necessary for any reason, the product can be evacuated from the cavity void.

## Installation

### 12 Site assessment

12.1 Prior to the installation, an assessment must be carried out by a trained assessor, who may also be the installing technician, to ascertain the suitability of the property or properties to receive Knauf Insulation Supafil CarbonPlus Cavity Wall Insulation. An assessment report is prepared and held at the installer's offices. Particular problems are specifically identified and any reasons for rejection of the work noted. Care should be taken at this stage for the assessor and the party commissioning the work to identify, and agree in writing as appropriate, any areas of the wall that will not be filled (see sections 18.7 and 18.8) and any special requirements for making good (see section 18.5).

12.2 Assessment of hard to treat (HTT) properties must be carried out by a member of the BBA Approved Assessor Scheme for Assessing the Suitability of Buildings for the Installation of Cavity Wall Insulation (see section 13). The assessment of partial fill cavities requires additional checks, as detailed in BBA Policy 18 : *Requirements for Surveying of Hard to Treat Cavity Walls*<sup>(1)</sup>.

(1) Available on the BBA website ([www.bbacerts.co.uk](http://www.bbacerts.co.uk)).

### 13 Approved Assessors

All assessors of HTT properties must be BBA-approved, and registered with the BBA as part of the BBA Approved Installer and Assessor schemes. The BBA will monitor all Approved Assessors as part of the surveillance operated over BBA Approved Installers. BBA Inspectors will audit installation records during the annual office inspection to ensure that all HTT cavities have been filled in accordance with the relevant system Certificate including, where appropriate, that the property has been surveyed by an Approved Assessor.

### 14 Site preparation

14.1 The installing operative ensures that the property has been correctly assessed and is suitable for insulation with the product. Any problems encountered during installation which prevent compliance with this Certificate are referred to the installation company before proceeding.

14.2 Essential ventilation openings, such as those providing combustion air or underfloor ventilation, and all flues in the cavity wall must be checked. If adequate sleeving or other cavity closures are not present, installation must not proceed until these openings have been sleeved or otherwise modified to prevent blockage by the insulant.

14.3 Wherever practicably possible, all uncapped cavity walls must be sealed prior to installation, for example with plugs of mineral fibre.

### 15 Approved Installers

Installation of the product must be carried out by the Certificate holder or their Approved Installers. An Approved Installer is defined as a company:

- required to satisfy an initial site installation check by the BBA following approval by the Certificate holder, and subject to the BBA Assessment and Surveillance Scheme for Installation of Cavity Wall Insulation
- approved by the Certificate holder and the BBA to install the product
- having undertaken to comply with the Certificate holder's installation procedure
- employing technicians who have been issued with appropriate identity cards by the Certificate holder; at least one member of each installation team must carry a card
- subject to inspections by the Certificate holder, who oversees the activities of Approved Installers. It is a requirement that the Certificate holder undertakes inspections of each card-carrying technician using their products, and maintains records, as detailed in the *BBA Assessment and Surveillance Scheme for BBA Approved Installers of Cavity Wall Insulation*.



## 16 Supervision

16.1 Installation of the product should be carried out in accordance with the BBA Assessment and Surveillance Scheme for Installation of Cavity Wall Insulation.

16.2 During installation, as an aid to determining that the installation conforms to the certified method, the following simple checks can be made:

- the pattern of holes complies with the description given in section 18.1
- injection of material takes place in each hole, to complete the filling of the cavity space.

## 17 General

17.1 The installation of the product is undertaken using blowing machines, tested and accepted for use with the product by the BBA.

17.2 The installer provides all necessary hoses, drilling tools, equipment and materials for making good the walls after the installation.

17.3 Where a semi-detached or terraced property is to be insulated, a cavity brush is inserted at the line dividing the properties to contain the insulation. This consists of a continuous nylon brush which is left in place when the installation is completed.

## 18 Procedure

18.1 Injection holes 20 mm in diameter are drilled in a diamond pattern at approximately 1.1 m centres. The topmost injection holes should not be more than 350 mm below the top of the cavity and not more than 1 m apart. The bottom row of holes should start approximately 500 mm above the dpc level. Additional holes may be required to ensure complete filling around building features, eg under window sills, around air bricks, in column areas between doors and windows, at the tops of walls and under gables. Again, the topmost holes should not be more than 1 m apart under the horizontal boundaries and 1.1 m apart under the sloping boundary at the top of the gable end (see Figures 1 and 2).

Figure 1 Typical drilling pattern — frontage

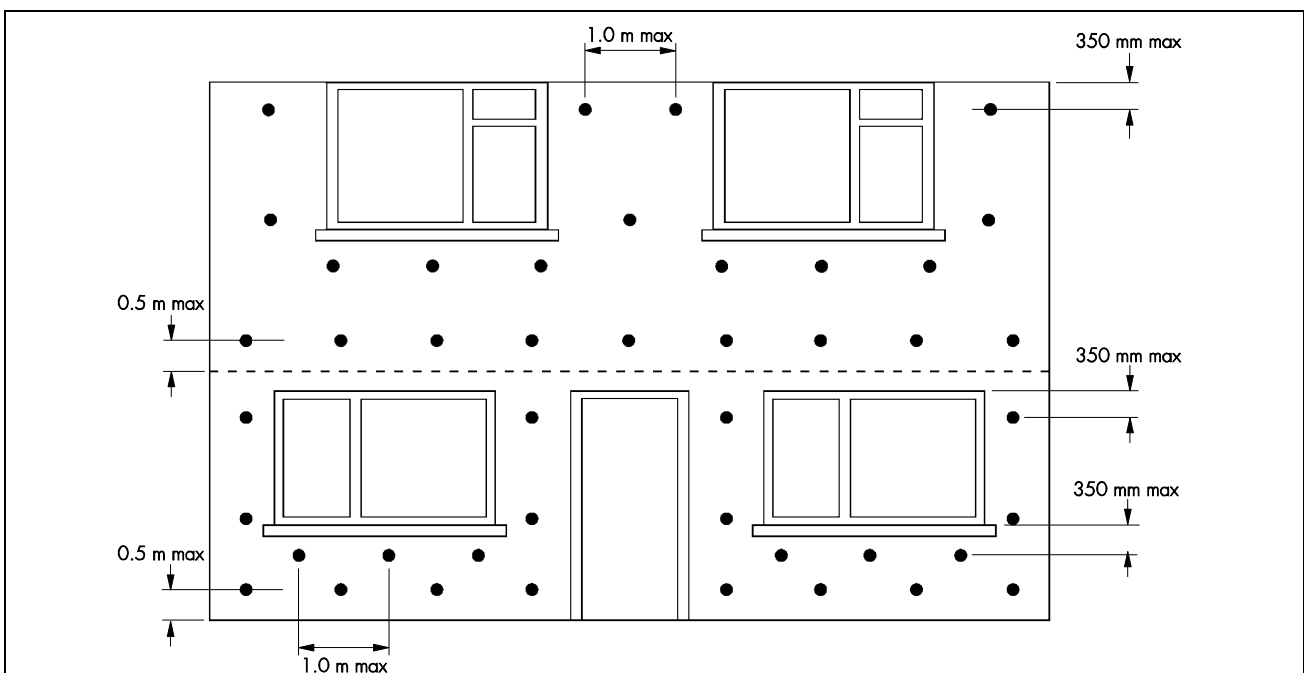
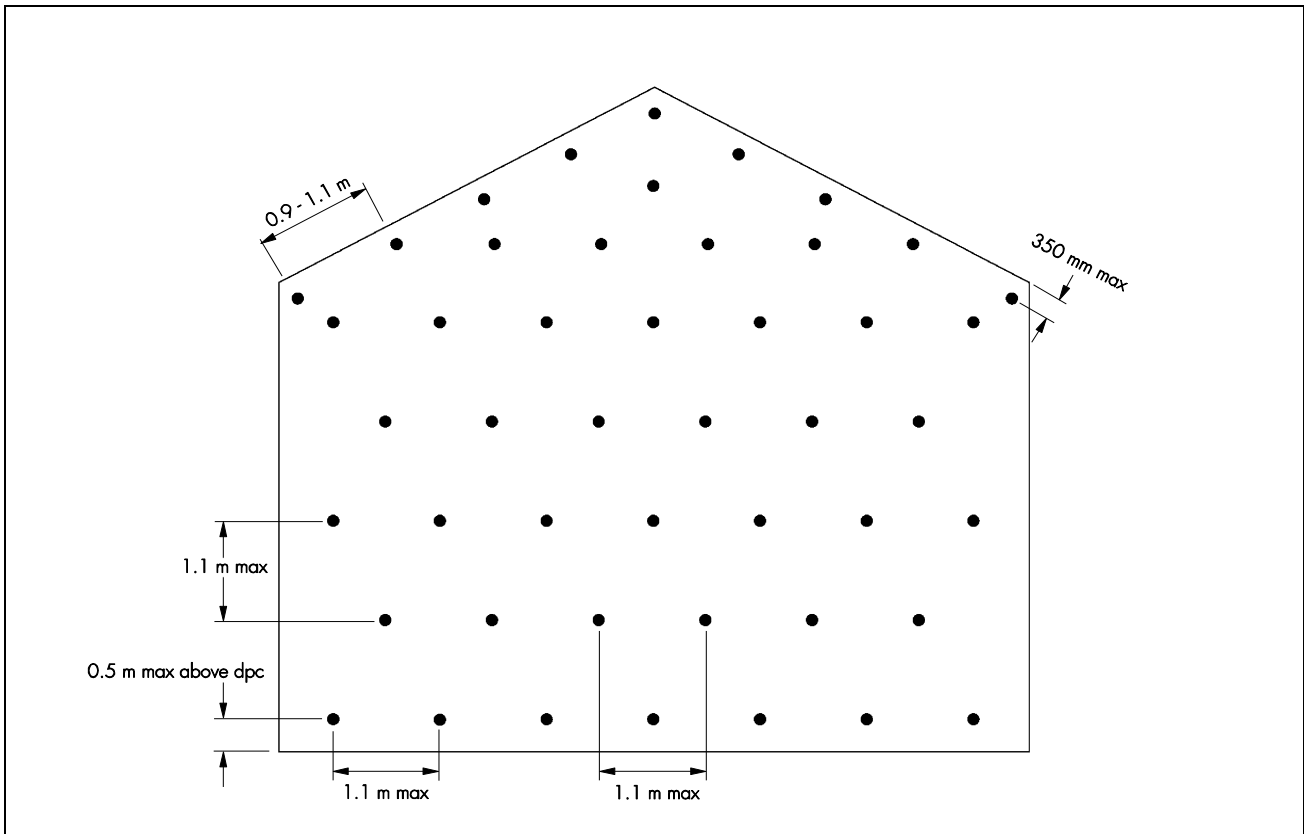


Figure 2 Typical drilling pattern — plain gable end



18.2 To prevent debris falling onto the insulation, filling of the cavity should not start until one elevation, and at least 2 m of the adjoining elevations, are drilled out. The adjoining elevation is filled only after completing the drilling.

18.3 The product is blown into the cavity under pressure through 20 mm clearance holes via a flexible pipe, fitted with a 17 mm-outside-diameter injection nozzle. Filling proceeds from the bottom to the top of the walls and from one end of an elevation to the other.

18.4 The wall is filled using the Knauf RF (directional) injection nozzle. Injection starts in the direction of a vertical barrier (eg doorframe or cavity brush) with Supafil CarbonPlus blown horizontally. Immediately after indication that the injection hole is filled in that direction, the nozzle is turned 180° and the product continued to be blown horizontally. Once the direction has filled, the nozzle is returned to its original direction until no more material can be injected. Injection of the next hole always starts in the direction of the last hole filled.

### Finishing

18.5 After injection, the drill holes are fully filled with mortar of a similar type, colour, texture and weathertightness to that of the existing wall. Where a wall requires a high degree of colour matching, the level of finish-matching should be agreed in writing during the site assessment. All trunked air vents, eg those providing underfloor ventilation and combustion air for heating appliances, are checked — any obstructions must be cleared. All flues must be carefully checked by an appropriate test (eg a smoke test) to verify that they are clear and unobstructed.

18.6 Insulant blown through the top of the cavity into the loft space must be removed and any points of leakage sealed (see section 14.3).

### Omitted areas

18.7 In some circumstances, access for drilling injection holes and filling with insulation may be limited by features such as carports, conservatories, cladding or tiling. The practicability of safely accessing and making good these areas, or installing the insulation through the inner leaf, may outweigh the benefits of insulating these areas.

18.8 It is permissible to omit such areas only when:

- a full justification detailing the reasons to omit areas is included in the survey report
- the assessor obtains written consent for omitting any areas of the wall from the party commissioning the work. The assessor should explain that 'heat loss' through uninsulated areas will not be reduced and that they will also be subject to a slightly higher risk of condensation.

## 19 Height restriction waivers

19.1 Knauf Insulation Supafil CarbonPlus Cavity Wall Insulation is for use in buildings up to and including 12 m in height, in existing domestic and non-domestic buildings. The product may also be used in buildings over 12 m in height where a height restriction waiver has been issued by the Certificate holder.

19.2 The Certificate holder has a detailed programme for the assessment of buildings over 12 m, as approved and maintained under surveillance by the BBA. Each installation beyond 12 m must be individually assessed by the Certificate holder against this agreed assessment programme and documented approval given prior to the commencement of work.

## Technical Investigations

### 20 Tests

Results of tests were assessed to determine:

- resistance to rain penetration of an insulated cavity wall
- adequacy of fill using specified installation machinery and drilling pattern
- thermal conductivity
- characterisation of the product.

### 21 Investigations

21.1 Existing data on durability and properties in relation to fire were evaluated.

21.2 The Certificate holder's training arrangements were evaluated.

21.3 An assessment of the practicability of installation was carried out.

21.4 A condensation risk analysis was carried out.

21.5 A series of U value calculations was carried out.

21.6 A calculation was undertaken to confirm the declared thermal conductivity ( $\lambda_D$ ).

21.7 An assessment of the product's suitability for topping up of residual cavities in partial-fill installations was carried out.

### 22 Other investigations

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

## Bibliography

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

BS EN 13820 : 2003 *Thermal insulating materials for building applications — Determination of organic content*

BS EN 14064-1 : 2010 *Thermal insulation products for buildings – In-situ formed loose-fill mineral wool (MW) products – Specification for the loose-fill products before installation*

BS EN ISO 6946 : 2007 *Building components and building elements – Thermal resistance and thermal transmittance – Calculation method*

BS EN ISO 9001 : 2008 *Quality Management Systems – Requirements*

BS EN ISO 14001 : 2007 *Environmental management systems — Requirements with guidance for use*

BS EN ISO 50001 : 2011 *Energy management systems — Requirements with guidance for use*

BRE Report (BR 262 : 2002) *Thermal insulation : avoiding risks*

BRE Report (BR 443 : 2006) *Conventions for U-value calculations*

OHSAS 18001 : 2007 *Occupational health and safety management systems — Specification*

### 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 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.