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BRE CERTIFICATION LIMITED

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PRODUCT  
Weber Leca Insulation Fill

SUPPLIED BY  
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## SUMMARY

Weber Leca Insulation Fill has been assessed to confirm its suitability, within limitations, for use as an insulation and hardcore material below ground floors. The product is a graded lightweight expanded clay aggregate. In a construction it is overlaid with a specified waterproofing membrane and stabilising wire mesh layer (both items not covered by this certificate).

The characteristics of the product and its method of application have been assessed with respect to the Building Regulations (United Kingdom), European and British Standards current at the time of reissue.

This revision is for a change of company and product name only. The previous reissue in January 2007 included a re-appraisal to the current building regulations, a modification to the thermal performance of the product and a change to the manufacturers declared value for crushing strength.

The assessment is described in the following pages, which form integral parts of the certificate.

### 0. LIMITATIONS OF USE

- 0.1 Weber Leca Insulation Fill is certified for use below correctly detailed and designed ground floor concrete slabs which must be capable of uniformly distributing the load to the fill.
- 0.2 Weber Leca Insulation Fill can be used levelled without mechanical compaction up to a depth of 400mm and thereafter compacted in 600mm thick layers up to a total maximum depth of 3000mm to provide insulation and support loading from ground floor slabs of up to 100 kN/m<sup>2</sup>.
- 0.3 A waterproofing membrane must be applied over the surface of the aggregate.
- 0.4 A stabilising wire mesh is required when only loose Weber Leca Insulation Fill is used. This mesh is not for providing any reinforcement contribution to the properties of any subsequently applied concrete floor slab.
- 0.5 Weber Leca Insulation Fill must be installed strictly in accordance with the supplier's instructions and the requirements of this certificate. The quality of installation achieved on site is not covered by this certificate and therefore it is recommended that the quality of installation and workmanship is subject to appropriate checks by a competent person.
- 0.6 The perimeter structure to the construction containing the full depth of Weber Leca Insulation Fill must not be breached for the design life of the ground floor concrete slab.

**STATEMENT**

It is the opinion of BRE Certification that Weber Leca Insulation Fill is satisfactory for use within the stated limitations provided that it is used in accordance with the manufacturer's specifications, their instructions and the requirements of this certificate.

**CONFIRMATION**

For and on behalf of BRE Certification



Director

Date 20 November 2009

## 1. TECHNICAL SPECIFICATION

### 1.1 Description of Product

1.1.1 Weber Leca Insulation Fill is a coated granular lightweight expanded clay aggregate of nominal density 260 kg/m<sup>3</sup> with a grading between 10mm and 20mm diameter. Each granule has a hard ceramic shell surrounding a honeycomb core.

### 1.2 Product performance

#### 1.2.1 General

1.2.1.1 Weber Leca Insulation Fill can provide a method of enhancing the thermal insulation and act as hardcore below new concrete floor slabs in new and refurbished construction. The product will readily accommodate service runs below the concrete slab.

#### 1.2.2 Structural

1.2.2.1 The perimeter structure, containing the full depth of Weber Leca Insulation Fill, must be designed (or assessed as being acceptable existing construction) and detailed by a suitably qualified and experienced professional to retain the Weber Leca Insulation Fill.

1.2.2.2 When installed in accordance with the supplier's installation details and the requirements of this certificate, Weber Leca Insulation Fill will support combined dead and live loads up to 100 kN/m<sup>2</sup> from ground floor slabs. Tests have shown that the Weber Leca Insulation Fill has adequate strength to resist uniformly distributed loads without excessive deflection or long term permanent deformation.

#### 1.2.3 Environment

1.2.3.1 Weber Leca Insulation Fill is water vapour permeable. Weber Leca Insulation Fill should not promote surface or interstitial condensation when designed and installed in accordance with the appropriate Clauses of BS 5250 : *Code of practice for control of condensation in buildings*. However, condensation risk calculations should be undertaken for each application.

1.2.3.2 Tests have shown that Weber Leca Insulation Fill has hygroscopic water absorption in the order of 6% by weight. Typical moisture content at delivery is normally 15% on average by weight.

1.2.3.3 Moisture is prevented from entering the building from the ground by means of a damp proof membrane (not assessed) over the surface of the Weber Leca Insulation Fill.

#### 1.2.4 Thermal

1.2.4 Weber Leca Insulation Fill has a declared thermal conductivity value of 0.11 W/mK (when dry). Below floor construction incorporating the system increases the range of floor sizes that can be constructed to give a U-value of less than 0.25 W/m<sup>2</sup>K, depending on the thickness of the Weber Leca Insulation Fill, on the dimensions of the floor and on the particular application. U-values may be calculated in accordance with BS EN ISO 13370: 1998 *Thermal performance of buildings. Heat transfer via the ground. Calculation methods* or in accordance with CIBSE Guide:Part A3:1999 *Thermal properties of building structures* or as described in the document supporting the Building Regulations (AD L1A, AD L1B, AD L2A, or AD L2B as appropriate to the building).

#### 1.2.5.1 Durability

1.2.5.1 Weber Leca Insulation Fill should remain effective for the life of the construction for which it is specified provided it is installed in accordance with the manufacturer's instructions and the requirements of this certificate.

## 2. BUILDING REGULATIONS

2.1 In the opinion of BRE Certification, appropriately detailed constructions incorporating Weber Leca Insulation Fill that have been designed and constructed in accordance with the requirements and limitations of this certificate, can satisfy the following requirements from the building regulations listed below:

- Building Regulations (England and Wales) 2000 (as amended)

Part	
A	Structure
C	Site Preparation and resistance to contaminants and moisture
L	Conservation of fuel and power Regulation 7 Materials and workmanship

- The Building (Scotland) Regulations 2004

Sec.	
1	Structure
3	Environment
6	Energy Regulation 8(1) Fitness and durability of materials and workmanship

- The Building Regulations (Northern Ireland) 2000.

Part	
B	Materials and Workmanship
C	Preparation of site and resistance to moisture
D	Structure
F	Conservation of fuel and power

2.2 Justification for compliance with defined Building Regulations.

### 2.2.1. **Structure:** Ground Movement

Country	Req.	Opinion
E & W	A2	Concrete ground floors with Weber Leca Insulation Fill installed in accordance with the requirements of this certificate and BS 6399:Part 1, can be designed and constructed to be sufficiently stiff to sustain and transmit to the ground the combined dead and imposed load without excessive deflection or deformation. A suitably qualified and experienced professional must determine the appropriate design and construction requirements for the perimeter of the Weber Leca Insulation Fill for the full depth of the material.
S	1.1	
NI	D2	

### 2.2.2 **Environment:** Resistance to moisture

Country	Req.	Opinion
E & W	C2	Weber Leca Insulation Fill has adequate resistance to moisture.
S	3.10, 3.15	Resistance to the passage of moisture from the ground to the structure and prevention of interstitial condensation can be produced by using a waterproofing membrane applied over the surface of the Weber Leca Insulation Fill provided the floor is designed and constructed in accordance with requirements of this certificate and BS 5250.
NI	C4, C5,	

### 2.2.3 **Energy:** Conservation of fuel and power

Country	Req.	Opinion
E & W	L1	Floors incorporating Weber Leca Insulation Fill can be designed and constructed to have sufficient thickness, to provide the required U-value, and to limit heat loss from the building envelope.
S	6.2	
NI	F2	

### 2.2.4 **Materials and workmanship**

Country	Req.	Opinion
E & W	Regulation 7	Weber Leca Insulation Fill is manufactured from suitably safe and durable materials (resistant to deterioration and wear under normal service conditions) for its application as insulation and hardcore below concrete ground floor slabs, and can be installed to give a satisfactory performance.
S	Regulation 8	
NI	B2, B3	

### 3. INSTALLATION / PRACTICAL APPLICATION

#### 3.1 Identification

3.1.1 Weber Leca Insulation Fill can be delivered to site loose and in bulk (to be blown into position) or in 50 litre bags. Bags are printed with the company name and product name.

#### 3.2 Storage and Handling

3.2.1 Weber Leca Insulation Fill is easily handled on site and can be transferred by bulk blowing vehicles up to a distance of up to 35 metres horizontally and 20 metres vertically.

#### 3.3 Installation

3.3.1 Weber Leca Insulation Fill must be installed in accordance with the requirements of the supplier's instructions and this certificate. The supplier's handling and installation instructions have been inspected during the assessment. In the opinion of BRE Certification they provide satisfactory guidance for users of the product. The performance of the product depends on correct installation in accordance with the supplier's installation instructions and the requirements of this certificate. The quality of installation achieved on site is not covered by this certificate and therefore it is recommended that the quality of installation and workmanship is subject to appropriate checks by a competent person.

3.3.2 The perimeter structure of the over-site ground area intended to receive Weber Leca Insulation Fill must be prepared to the full height of Weber Leca Insulation Fill to be applied.

3.3.3 Any services to be installed within the fill should be appropriately secured before application of the Weber Leca Insulation Fill.

3.3.4 The subgrade must be assessed and suitably prepared prior to installation. When used over a soft subgrade a geotextile separation layer may be needed. Advice on the suitability of subgrades can be obtained from Saint-Gobain Weber or from specialist site investigation consultants.

#### **Weber Leca Insulation Fill in bags**

3.3.3 A loose layer of Weber Leca Insulation Fill (from the bags) is placed over the floor area to obtain a level surface.

3.3.4 Unopened bags are laid butted together to cover the floor area. Loose Weber Leca Insulation Fill is used to fill in any voids and spaces that are too small for whole bags.

3.3.5 If another layer of bags is required, the bags should be placed with joints staggered to the previous layer. Two layers of bags can be placed without the need for compaction.

#### **Weber Leca Insulation Fill in bulk**

3.3.6 Weber Leca Insulation Fill is placed on the over-site ground by either tipping or blowing.

3.3.7 Compaction is necessary where the total thickness exceeds 400mm. Compaction is applied to layers of maximum thickness 600mm with a plate vibrator using 4 passes for each layer. An 80-100kg vibrator is recommended.

3.3.8 The surface of the Weber Leca Insulation Fill should be levelled by light raking.

3.3.9 Weber Leca Insulation Fill must be covered with waterproof 1200 gauge polyethylene sheet membrane (PIFA Standard 6-83 A 1995 (not assessed)), with the joints sealed. Any penetrations for services must be sealed. The membrane must be brought up at the building perimeter, and must be made continuous with any adjacent wall damp-proof course in accordance with CP 102:1973 *Code of practice for protection of buildings against water from the ground*.

3.3.10 Where Weber Leca Insulation Fill has been used loose it must be stabilised for ease of access when concreting. Saint-Gobain Weber advise using an A142 stabilising wire mesh of standard 200mm x 200mm mesh size (to BS4483: (not assessed)) laid on top of the membrane, with overlaps of adjacent wire mesh sheets of at least 200mm. Access to partly completed work should be restricted to prevent damage to the membrane.

3.3.11 Any concrete floor applied over the Weber Leca Insulation Fill, with or without reinforcement, must be designed in accordance with BS 8110 *Structural use of concrete*, and applied in accordance with BS 8000:Part 2 *Workmanship on building sites: code of practice for concrete work*.

#### 4. TECHNICAL APPRAISAL

##### 4.1 Performance Tests

Assessment and site inspections have been carried out on the procedures and practicality of installation in the UK. Tests have been undertaken to determine the properties of Weber Leca Insulation Fill including:

- resistance to compaction
- thermal properties
- water absorption properties
- long term loading performance.

Some of the results are given in Table 1 -

**Table 1: Properties of bulk Weber Leca Insulation Fill aggregate**

Property	Test	result	Limits
Thermal conductivity	BS EN 12667	<0.11W/mK	<0.11W/mK
Water absorption-hygroscopicity	% increase at 28 days	Average< 6.3	No limit set
Capillary mean height at 28 days	BS EN 1097-10	56mm	<75mm
Crushing strength	BS EN 1097-1 Ann A	1.07 N/mm <sup>2</sup>	>0.70 N/mm <sup>2</sup>
Dry Density kg/m <sup>3</sup>	BS EN 1097-3	dry 295Kg/m <sup>3</sup>	<300Kg/m <sup>3</sup> >220Kg/m <sup>3</sup>
Grading Sieve	BS EN 933-1	Pass	>90% passing 20mm >15% passing 10mm
Moisture Content	BS EN 1097-5	<15%	Average 15%

##### 4.2 Quality Control

Saint-Gobain Weber Ltd carries out quality control tests and inspections at regular intervals including checks on grading and density to ensure the quality of aggregate is maintained within the product specification. Quality records are maintained on file by Saint-Gobain Weber Ltd.

In the opinion of BRE Certification the specification of materials used in the product and the quality control procedures of the supplier are suitable for the product.

##### 4.3 British Standards

The following British Standards and Codes of Practice have been referred to for this assessment:

- |                      |  |
|----------------------|--|
| BS 4483: 2005        | Specification for steel fabric for the reinforcement of concrete.  |
| BS 5250:2002         | Code of practice for control of condensation in buildings.   |
| BS 6399:Part 1:1996  | Loadings for buildings: code of practice for dead and imposed loads.   |
| BS 8000:Part 2: 1990 | Workmanship on building sites: code of practice for concrete work.   |
| BS 8000:Part 4:1989  | Workmanship on building sites: code of practice for waterproofing.   |
| BS 8102:1990         | Code of practice for protection of structures against water from the ground.                                       |
| BS 8110: 1997        | Structural use of concrete.  |
| BS 8204:Part 1:2002  | Screeds bases and in situ floorings. Code of practice for concrete bases and screeds to receive in-situ floorings. |
| BS EN 933-1:1997     | Tests for geometrical properties of aggregates. Determination of particle size distribution. Sieving method.       |
| BS EN 1097-3:1998    | Tests for mechanical and physical properties of aggregates. Determination of loose bulk density and voids.         |

BS EN 1097-5:1999	Tests for mechanical and physical properties of aggregates. Determination of the water content by drying in a ventilated oven.
BS EN 1097-10	Tests for mechanical and physical properties of aggregates. Determination of water suction height.
BS EN 12667:2001	Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance.
BS EN 13055-1:2002	Lightweight aggregates Part 1: Lightweight aggregates for concrete, mortar and grout.
BS EN ISO 13370:1998	Thermal performance of building heat transfer via the ground.
CP 102:1973	Code of practice for protection of buildings against water from the ground.
BS EN 14063:2004	Thermal insulation materials and products. In-situ formed expanded clay lightweight aggregate products (LWA). Specification for the loose-fill products before installation.

## 5. CONDITIONS OF CERTIFICATE ISSUE

### 5.1 Validity

This certificate will be valid for a period of three years from the reissue date. It will remain valid in so far as:

- a) The materials and methods of manufacture are unchanged or BRE Certification has assessed any changes and found them to be satisfactory.
- b) The designs and specifications are unaltered from those examined by BRE Certification.
- c) Saint-Gobain Weber Ltd continues to have the product checked by BRE Certification.

### 5.2 Health and Safety

This certificate and the recommendations herein do not purport in any way to restate the requirements of the Health and Safety at Work Act 1974 or any statutory or common law duty of care which exists now or in the future: nor is compliance with these recommendations to be assumed as satisfying the requirements of the said Act or any existing or future statutory or common law duty of care.

### 5.3 Reference to other Documentation

Where reference is made in this certificate to any Act of Parliament, Regulation, Code of Practice, British or other Standard or other publications, it shall be construed as reference to such publication in the form in which it is in force at the date of issue of the certificate.

### 5.4 Patents

BRE Certification. makes no representational warranty that any patent or similar industrial property right is valid or that the manufacture, use, sale, lease or any other dealing or disposition of the product in whole or in part is not an infringement of any patent or industrial property right not owned by Saint-Gobain Weber Ltd.

Confirmation that a certificate is current may be obtained from the BRE Certification website ([www.redbooklive.com](http://www.redbooklive.com)).

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