

CELLCORE CELLULAR VOID FORMER

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Cellcore Cellular Void Former for use in limiting the pressure exerted on in-situ, reinforced, suspended concrete floors or piled ground beams caused by expansion of clay soils (clay heave) or ground recovery.

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

Practicability of installation — the product can be easily installed by hand (see section 4).

Maintenance — the product does not require maintenance after installation (see section 5).

Durability — the product will have adequate durability during the life of the building (see section 6).

The BBA has awarded this Agrément 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

B C Chamberlain

Greg Cooper

Date of First issue: 11 November 2008

Brian Chamberlain
Head of Approvals — Engineering

Greg Cooper
Chief Executive

Originally certificated on 2 February 1993

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.

Regulations

In the opinion of the BBA, Cellcore Cellular Void Former, 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:	A2	Ground movement
Comment:		The cellular void former prevents expansion of clay soils impairing the stability of the building. See Section 3.1 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The system is acceptable. See section 6 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The system can contribute to a construction satisfying this Regulation. See section 6 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	1.1(b)	Structure
Comment:		The system contributes to meeting the relevant requirements of this Standard, with reference to clause 1.1.1 ⁽¹⁾⁽²⁾ . See section 3.1 of this Certificate. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



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

In the opinion of the BBA, there are no requirements in these Regulations pertaining to the use of Cellcore Cellular Void Former.

Construction (Design and Management) Regulations 2007

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

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

See section: 2 *Delivery and site handling* and 7 *General (Installation)*.

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of Cellcore Cellular Void Former, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapters 4.4 and 4.5.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Cellcore Cellular Void Former, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 3 *Superstructure*, Sub-section *Foundations*.

General

This Certificate relates to Cellcore Cellular Void Former.

The product is used to limit the pressure exerted on in-situ, reinforced, suspended concrete floors or piled ground beams caused by expansion of clay soils (clay heave) or ground recovery.

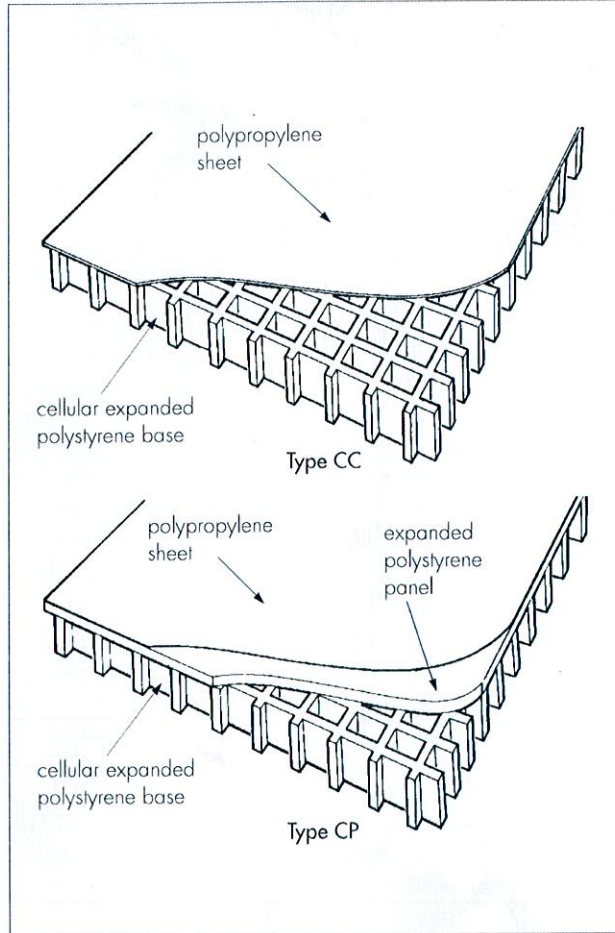
Cellcore must not be used on the vertical faces of concrete foundations.

Technical Specification

1 Description

1.1 Cellcore Cellular Void Former consists of a cellular expanded polystyrene compressible base with two different types of integrally bonded top. Cellcore type CC has a 5 mm to 8 mm thick, heavy duty polypropylene sheet. Cellcore type CP has a 50 mm thick, high density grade, expanded polystyrene panel, covered with a 2 mm thick layer of polypropylene (see Figure 1).

Figure 1 Cellcore Cellular Void Former

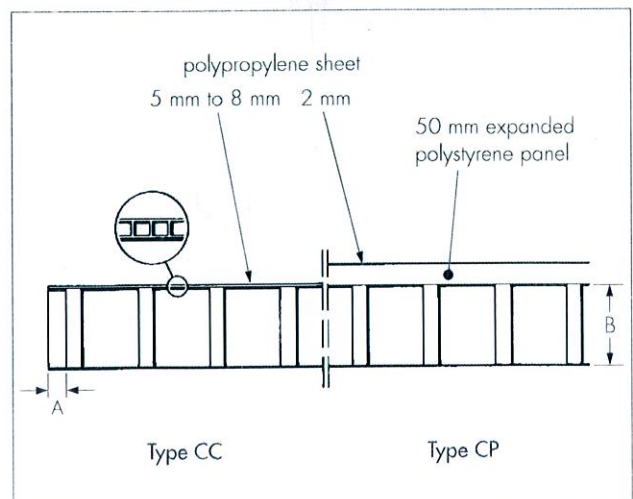


1.2 The base consists of expanded polystyrene forming a cellular unit. Cellcore types CC and CP are available in three grades: 10/15, 15/22 and 20/30 [safe load/fail load (kNm^{-2})]. In addition, Cellcore type CP can be obtained in an 8/12 grade. Cellcore panels are available in the standard size of 1220 mm by 2440 mm with depth details as given in Table 1 and Figure 2. Cellcore is also available in strips to suit beams 350 mm to 1200 mm wide.

Table 1 Standard depths and compression

Maximum compression at fail load (mm)	Cellcore depth	
	B (mm) Type CC	B+50 (mm) Type CP
55	100	150
100	175	225
150	250	300
200	300	350

Figure 2 Cellcore dimensions



- 1.3 Cellcore is an inert, non-toxic material free from CFC gases.
- 1.4 Production control is exercised during manufacture and checks are carried out on:
- density of incoming boards
 - dimensions of final product
 - appearance of final boards.

2 Delivery and site handling

- 2.1 Cellcore is normally delivered to site wrapped in polythene. Each pack carries a label bearing the manufacturer's name, product description and the BBA identification mark incorporating the number of this Certificate.
- 2.2 Each panel is individually marked with a label bearing details of Type, Depth and Grade.
- 2.3 The panels must be stored flat and protected from high winds and prolonged exposure to sunlight.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Cellcore Cellular Void Former.

Design Considerations

3 General



3.1 Cellcore Cellular Void Former, when designed and installed in accordance with the recommendations of this Certificate, is effective in limiting the pressure exerted on in-situ, reinforced, suspended concrete floors and piled ground beams.

3.2 Cellcore type CP is normally for use in reinforced concrete floor slabs and, provided the recommendations given in section 8.5 are satisfied, it is not affected by the normal foot traffic associated with installation. Cellcore type CC is normally for use under ground beams incorporating piles which are protected from or not subjected to significant foot traffic. Cellcore type CC topped with a 50 mm thickness of concrete binding is for use in heavily reinforced beams or slabs or where the reinforcement will be subjected to significant point loads from foot traffic or other imposed loading.

3.3 Cellcore is designed to withstand a safe load, with minimal compression of less than 5 mm, for a period of 16 hours and to compress by a specified amount at or before the fail load (see Tables 1 and 2).

Table 2 Cellcore loads.

Grade: safe load/ fail load (kNm ⁻²)	Safe load (kNm ⁻²)	Fail load (kNm ⁻²)	Maximum concrete thickness (mm) ⁽¹⁾	Type
8/12	8	12	270	CP
10/15	10	15	350	CC or CP
15/22	15	22	550	CC or CP
20/30	20	30	770	CC or CP

(1) These thicknesses allow for a 1.5 kNm⁻² imposed load including heaping.

- 3.4 The safe load is calculated and the correct product appropriate to the loading selected.
- 3.5 The safe load should be taken as the weight of the concrete slab or ground beam, including blinding if used, and a 1.5 kNm⁻² allowance for imposed loads including heaping.
- 3.6 The fail load is that at which compression collapse occurs (see Tables 1 and 2).
- 3.7 The slab must be designed to take an upward load equal to the difference between the fail load and the self-weight of the slab or ground beam including concrete blinding (as appropriate) increased by a suitable safety factor. The design of the structure must also take account of the resultant upward loads at the slab or ground beam supports. Where piles are used, the pile and the pile/ground beam connections should be designed to take account of the clay heave forces.
- 3.8 It is recommended that factory produced strips as defined in section 1.2 are used in piled ground beams. If standard Cellcore panels are cut to suit on site, then at least three longitudinal legs are required and the exposed ends must not exceed 50 mm.
- 3.9 The maximum likely ground movement due to clay heave is established from site investigations and the required product selected according to the maximum compression (see Table 1).
- 3.10 Although Cellcore type CP will contribute to the thermal insulation of the floor, it has not been assessed by the BBA for this purpose.

4 Practicability of installation

The product is light and easily manoeuvred by hand. It can be readily installed on suitably prepared ground, but must be cut to size with a hot wire cutter available from the Certificate holder. After cutting the polystyrene panel, care should be taken to ensure that the exposed ends of the cellular stiffening ribs do not exceed a maximum of 50 mm (see dimension A in Figure 2).

5 Maintenance



Once installed, the product does not require maintenance due to its stable properties, rot-proof and water-resistance.

6 Durability



Cellcore is dimensionally stable under varying conditions of temperature and humidity. It is rot-proof and water-resistant and will remain effective for the life of the building.

Installation

7 General

7.1 Specialists from the Certificate holder, experienced in site practice and installation of the material, if required, will attend the site to provide demonstrations to ensure correct installation.

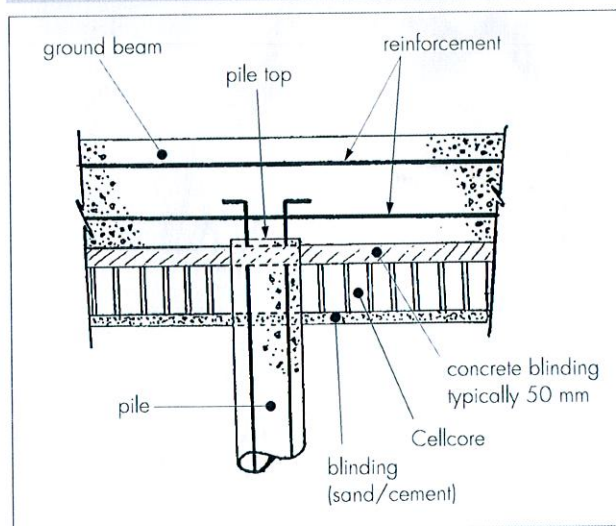
7.2 Adequate supervision must be maintained and the Certificate holder's specialists must have right of access to the site to ensure the product is correctly installed.

8 Procedure

8.1 For concrete floor slabs, the bottom of the excavation must be flat, even, properly compacted and blinded with a sand/cement layer.

8.2 For piled ground beams the top of each pile should be trimmed, so that they are slightly above the underside of the ground beam level (see Figure 3). The bottom of the excavation must be flat, even, properly compacted and blinded with a sand/cement layer, so that the Cellcore can be placed on top of this blinding. Each pile should penetrate through the void former to allow for an approximate 50 mm thickness of concrete blinding on top where applicable, and a keying length of approximately 25 mm into the ground beam.

Figure 3 Typical piled ground beam



8.3 If the Cellcore requires cutting, this should be done with the hot wire cutter supplied by the Certificate holder. Care should be taken to ensure that after cutting, exposed ends of the cellular stiffening ribs do not exceed a maximum of 50 mm in length (see dimension A in Figure 2). Joints between Cellcore panels are sealed with a formwork tape supplied by the Certificate holder.

8.4 Sufficient spacing blocks must be used to make sure that the correct depth of concrete cover to the reinforcement is achieved. Proprietary spacers designed to spread the load over an area of at least 8000 mm² of Cellcore or, as an alternative, concrete spacer blocks in conjunction with galvanized steel plates (minimum 120 mm by 120 mm) should be used.

8.5 During construction, spreader boards should be used to reduce the imposed load transmitted to the Cellcore (see section 3.2).

9 Tests

An examination was made of test data and tests were conducted to determine:

- density
- dimensional accuracy
- effect of density on pressure transmitted
- that when the safe load is increased to the fail load over a period of not more than 24 hours, the product subsequently collapses
- ability to withstand safe load for 16 hours.

10 Investigations

10.1 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.

10.2 Site visits were carried out to assess the practicability of installation.

10.3 An assessment was made of the performance characteristics and durability of the product.

11 Conditions

11.1 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.

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

11.3 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.

11.4 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.

11.5 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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