Cellcore HG Data Sheet

The Cellcore HG range of collapsible products has been designed to protect foundations from the effect of ground heave.

The product consists of a cellular construction of expanded polystyrene combined with a robust polypropylene board, which has been designed and tested to tight tolerances to achieve the specified performance characteristics.

The range of products are available in a variety of depths and grades to suit the most commonly encountered combinations of soil heave potential and concrete depths that exceed the capacity of the standard Cellcore HX range. If a suitable product for your requirements is not listed within this data sheet then please contact our sales support desk for further assistance.

In addition to the standard Cellcore HG range, the following variations of the product are available:

- Cellcore HX suitable for providing heave protection to lightweight slabs, ground beams and pile caps
- Cellcore HG and HX Plus with integral insulation incorporated
- Cellform HX with integral formwork for ground beams
- Cellvent which includes protection against VOC's and ground gases

Key Features

- Reduces the upward force transmitted to the structure
- Wide range of depths and grades to suit most applications
- Meets the NHBC's Technical Standards
- Consistent performance supported by extensive testing
- Available with integral EPS insulation, permanent formwork for ground beams or voids for gases to vent by request

Installation

- The procedure for installing Cellcore panels is straightforward, but the following points should be adhered to:
- Please ensure that the Cellcore panels are placed upon a suitable firm and level surface. Typically a layer of concrete blinding beneath the panels is recommended.
- The lightweight but durable panels can be easily laid by one person. Where they are required to be cut this can be carried out using a fine tooth saw or hot wire cutter (available for hire from Cordek – please contact our sales team on 01403 799600).
- When installing Cellcore adjacent to piles, we suggest the use of Cordek Heaveguard pile collars is considered – please see the Cordek Heaveguard data sheet for further information.
- Individual panels should be butted together, with taping of the joints using the Cordek formwork tape to avoid any grout loss between the panels.
- Reinforcement spacers can be positioned directly upon the Cellcore panels. The upper surface of the panels can be reinforced with a layer of concrete blinding to spread the spacer loads if a very heavy reinforcement cage has been specified.

For further information on the full range of Cordek's Ground Heave Solutions, please contact the Cordek technical team on 01403 799600, techsupport@cordek.com or consult our website at www.cordek.com.

Storage & Handling

All products are delivered in a polythene wrapping and are clearly labelled. Both packs of Cellcore and individual panels can be manually handled and offloaded upon delivery, taking into account any site specific manual handling regulations.

Due to the relatively light nature of the product, all of the packs of Cellcore should be weighted down or secured should they be stored outside prior to installation. No further storage requirements are needed as the product is unaffected by both UV light and water.

Product Sizes

Standard Panel: 2400mm x 1200mm

Beam Widths: 2400mm x 1200mm to 300mm (in 25mm increments)

Product specification

Firstly the depth of the Cellcore HG panel should be determined by the heave potential of the soil, as detailed in table one below:

Table One

Results of Soil Analysis	NHBC Category	Predicted Ground Movement or BRE/NHBC requirement	Depth of Cellcore HG required to achieve 'Equivalent Void'
Plasticity Index	**Shrinkage Category**	**Void Dimensions (mm)**	**Product depth (mm)**
10 - 20	Low	50	100
20 - 40	Medium	100	200
40 - 60*	High	150	300

* When the analysis exceeds 60 or a deeper void is required, please consult our Technical Services team.

Secondly, the grade of the product is determined by the depth of the concrete to be cast on the Cellcore, as detailed in table two below:

Table Two

Grade*	Safe Load (kN/m²)	Fail Load (kN/m²)	Maximum Depth of Concrete* (mm)
30/40	30	40	1140
40/50	40	50	1540
50/65	50	65	1940

For concrete thicknesses between 900mm and 2000mm, further grades of Cellcore are available. For further advice please contact the Cordek technical team on 01403 799600.

Design Notes

- Each Cellcore grade is designed to support a given thickness of concrete plus a live load allowance of 1.5 kN/m2 with negligible creep compression during a 16 hour curing period: this is known as the SAFE LOAD.
- At the pre-determined load the polystyrene legs of the Cellcore panels will buckle and collapse due to the upward movement of the ground beneath; this is known as the FAILURE LOAD.
- The slab, beam or pile cap must be designed to accept the difference between its self-weight and the fail load (please see example below).

Design Example

Reinforced Concrete Ground Beam / Slab (1500mm thick)

- Assume the soil survey showed a plasticity index of 25
- Table 1 shows that the potential for ground movement is medium
- BRE/NHBC data recommends a clear void of 100mm

1. Total deadweight/downward load is:

1.5m x 25 kN/m2 = 37.5 kN/m²

Live load allowance = 1.5 kN/m²

TOTAL LOAD = 39.0 kN/m²

2. Table 2 indicates the nearest SAFE LOAD value is 40.0 kN/m2 based upon the suggested use of the Cellcore HG Grade 40/50 (Fail load of 50.0 kN/m2)

3. A maximum 100mm ground movement is predicted and Table 1 shows that:

The Cellcore HG depth to accommodate this = 200mm, therefore the full product specification is Cellcore 200mm HG 40/50

As stated above, this Cellcore HG grade has a FAIL LOAD of 50.0 kN/m2

The slab must be suitably designed to accommodate the transmitted load and two possible modes of failure should be considered:

i) The slab being lifted off the foundation

ii) Failure of the slab in bending or shear due to the uplift

Additional Cellcore Products:

Cellcore HX

The Cellcore HX range of collapsible products has been designed to protect lightweight (under 900mm in depth) foundations from the effects of ground heave.

This BBA approved product consists of a cellular construction of expanded polystyrene which has been designed, moulded and tested to tight tolerances to achieve the specified performance characteristics.

Cellcore HG & HX Plus

In cases where insulation is also required beneath the slab, the Cellcore HG and HX Plus ranges can be utilised to provide combined ground movement protection and insulation from a

The thermal thickness of the Cellcore HG or HX Plus is based upon the thickness of insulation incorporated within the panels, as outlined in the table below. Please contact the Cordek Technical Team on 01403 799600 for further assistance with determining the most appropriate Cellcore HG or HX specification.

Thickness (mm)	Thermal Resistance m^2c/w
50 (Standard)	1.39
75	2.08
100	2.78
125	3.47
150	4.17

Cellform HX

Cellform HX combines the benefits of Cellcore HX with an economical and simple to install permanent formwork system.

Each Cellform HX panel is supplied to the required beam width and depth. The principle is that the hinged side panels are supported off the reinforcement cage by concrete spacers, this then allows the excavation to be backfilled. The backfill then supports the formwork against the concrete pressure whilst the beam is cast and thereby avoids the need for fixing and striking traditional formwork.

Cellvent

Cellvent HX protects a building from both ground heave and hazardous ground gases, for use under suitably reinforced concrete floor slabs.

For further details and design examples please refer to the Cellvent HX data sheet which is available for download from www.cordek.com.

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Cordek Ltd
Spring Copse Business Park, Slinfold, West Sussex
RH13 0SZ, United Kingdom

Telephone (+44) 1403 799600 Fax (+44) 1403 791718
E-mail info@cordek.com

www.cordek.com