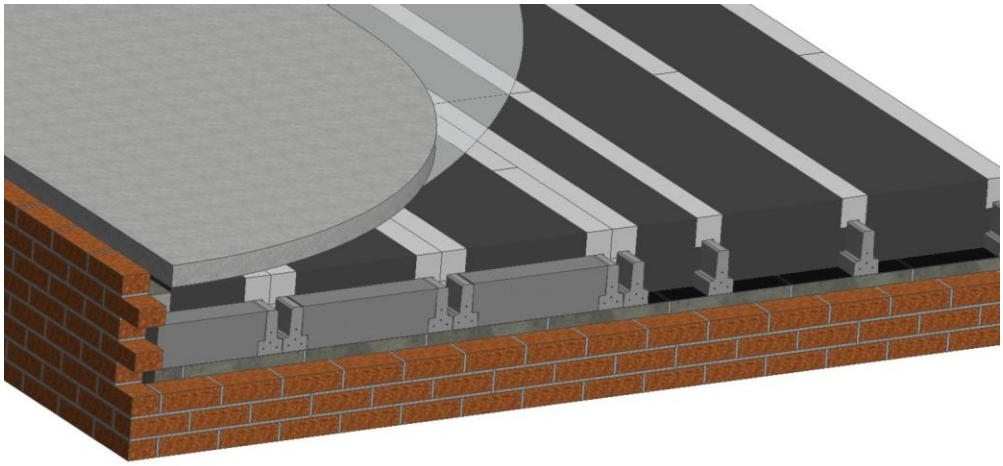
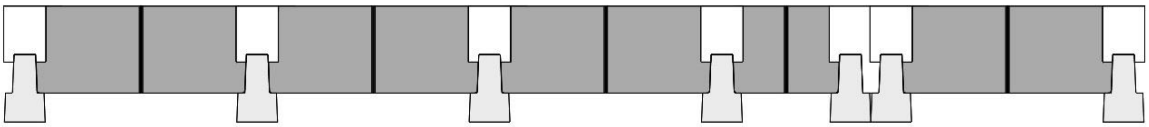
Gdeck™ Installation Manual





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What is Gdeck™?

The Gdeck™ EPS Panel System (Patent 1522000) is a revolutionary new way to insulate ground floors.
The system comprises of pre-stressed concrete beams and Gdeck EPS insulation panels. The infill silver insulation panels provide high thermal performance, these are then combined with high density white EPS rails which gives Gdeck great strength. The system offers many benefits including:

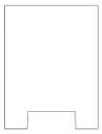
- Extremely quick install times for groundworkers
- Easy to fit insulation panels
- Symmetrical products with rails locatable on either side of the infill panel
- Finished floor easily monitored for quality assurance
- Instant photographic evidence can be taken to prove correct installation
- Load bearing Gdeck rails show groundworker safe areas to walk on
- Improved speed of install compared with concrete block and beam
- Lightweight panels reduce working load to groundworker
- Gdeck Multi Rails remove need for grouting multiple beam locations
- Reduced dig out required, saving money on spoil removal
- No need for top sheet insulation
- Can be used with variety of concrete toppings including reinforced micro-fibre
- Minimal waste
- Recyclable EPS panels
- Range of U-values available
- Install with hand tools, removing need for power tools
- Psi Strip™ supplied to reduce thermal bridging at perimeter of floor

Gdeck™ Components

Typical Gdeck Full Panel (545mm wide)

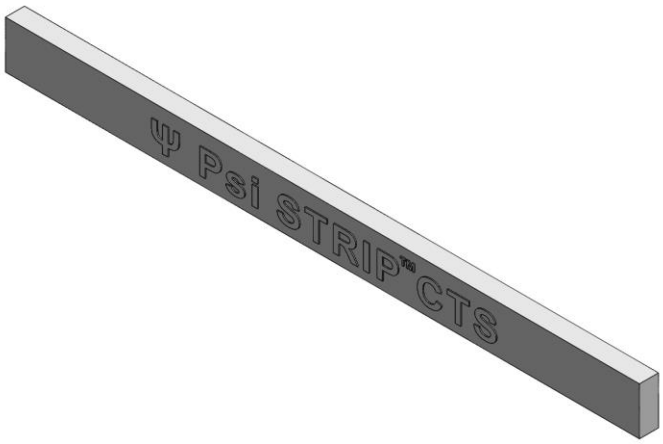
Typical Gdeck Half Panel (275mm wide)

Load Bearing Rail



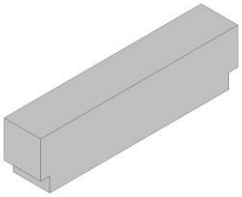
Multi Rail with Panel

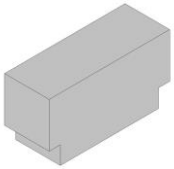
Psi Strip™



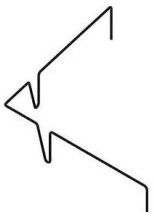
To complete Gdeck you will also need concrete closure blocks and you can also use steel edge starter clips. None of these parts are supplied by Moulded Foams. These parts should be ordered with your authorised Gdeck distributor.

Closure Blocks- the closure blocks are to be used in conjunction with Gdeck EPS Panel system, supplying a solid support thus allowing the continuation of the inner skin build. The closure blocks have a crushing strength of 7.0 $N \cdot mm^{-2}$. Closure blocks are to be installed between beam ends around the periphery of the floor, onto a mortar bed.





Steel Edge Clips- the edge clips provide a bearing for the EPS panels around the periphery of the build if required. A well-cut block will have suitable support therefore edge clips are not mandatory and are solely down to personal preference. The edge clips are installed at the same bearing level as the floor beam. The 'V' shaped unit will support the underside of the EPS panel to provide additional support. Typical usage is 2 clips per panel.



Delivery & Site Handling

The EPS panels are shrink wrapped and bonded in cube packs, but otherwise unprotected. All Gdeck EPS panels will have product name, dimensions, Agrément number and CE label attached. Care is to be taken when moving parts and during storage to avoid damage. Gdeck Panels are to be stored in clean, dry conditions, stacked on a flat base clear of the ground. Avoid storing in direct sunlight for prolonged time and secure to avoid wind damage. The EPS components shall be protected from being dropped or crushed by objects; care shall be exercised when storing large quantities on site. Do not expose Gdeck EPS panels to open flame or other ignition sources and store away from flammable material such as paint and solvents. To ensure maximum performance of Gdeck when installed, on site precautions shall be taken to protect from contaminants.

Installation Procedure

Once the floor has been constructed to correct coursing height and DPC is laid, you may begin to install Gdeck. Starter Edge Clips may be used to support the start and end panels, although if the internal wall blockwork is already built to finished floor height then they may not be needed. Gdeck is installed from above with no insulation under the beams. This means you can space the beams as per the approved drawing prior to install. Gdeck can also be installed the same as 'under the beam' systems where beams are butted up against the panels.

1. Starter Panel- the approved drawing will state the measurement for the required starter panel. This will normally be cut from a full panel. The cut off from the starter panel can be used as the end panel unless the approved drawing states otherwise.

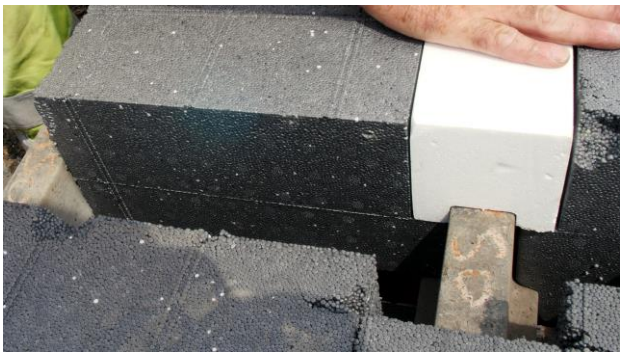
2. Once the starter panels are in place the next row can be installed. The approved drawing will specify if a full or half panel is needed. The Gdeck rail sits on the beam and the silver infill panel will rest on the shoulders of 2 beams filling the void.

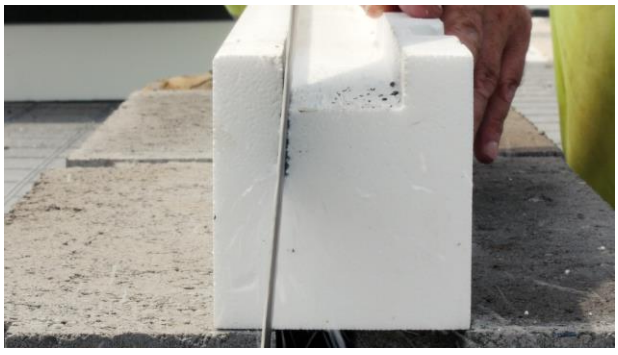
3. When the row of panels has been installed there may be excess. Once marked, the panel can be cut to fit the floor. This offcut can then be used to begin the next row.

4. Multi Rails- where drawings specify multiple beams the Gdeck multi rail is used. This is simply installed along the top of the beams. The multi rail has a toe piece which fits into the gap between the beams. You therefore do not need to screed between multiple beam locations when using Gdeck. Once the multi rails are installed the next panel will fit as normal.

5. Cut Rows- Sometimes an approved drawing will designate a row which is not a full or half panel. This can be called a 'cut row'. On these occasions, you will need to simply cut the panel to the desired width to fit the row as required. You begin by marking the required width on the panel. You then cut along the silver panel as below:

Install the cut panel as normal. The cut panel will then sit flush against the beam which prevents the next rail going onto the beam. To avoid cutting the profile into silver panel we need to remove part of the next white rail before fitting.





TIP- some Gdeck depths go to the bottom of the beam. The cut row method applies to depths which sit on the shoulder of the beam. If you are using a depth which goes to the bottom of the beam you will always be sent panels which sit on the shoulder for cut rows. Identify these upon delivery to avoid using by mistake.

6. Service Pipes- all penetrations including service pipes should be cut as neatly as possible. Any gaps around the service pipes should be filled using a polyurethane expanding foam. Excess expanding foam should be removed to leave a sealed neat finish.

7. End Panel- complete the installation as per approved drawing. The offcut from the starter panel should be used as the end panel which will again rest on steel edge clips if they are being used.

8. Closure blocks- concrete closure blocks are used to sit between the ends of the beams on either end of the floor. These will need to be mortared in place.

9. Membrane sheets- a gas or damp proof membrane can be installed if required.

10. Psi Strip™ - before applying concrete topping, a Psi Strip™ must be fitted to the perimeter wall. Psi Strip™ is supplied, minimum 25mm thickness and 75mm height to match perimeter screed height

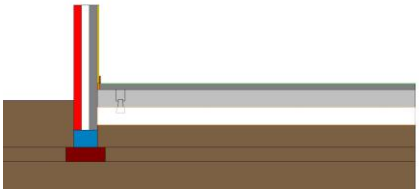
Thermal Performance

Gdeck™ load bearing rails and infill blocks:

Declared thermal conductivity $\lambda_{D\,(W\cdot m^{-1}\cdot K^{-1})}$

- EPS rails (white) : 0.032
- EPS infill blocks : 0.031

U-value calculations are calculated by authorised Gdeck distributors upon receipt of detailed site plans. Along with U-value calculations, psi (Ψ) calculations will also be included. To ensure psi calculations are delivered it is imperative that the Psi Strip™ is fitted between the concrete topping and inner block work.



Structural Performance

Mechanical properties of Gdeck™ rails and infill blocks:

- EPS load bearing rails, type R2, for line loads up to 5 $kN\cdot m^{-1}$: ≥ EPS 250
- Compressive strength at 1% strain according to BS EN 15037-4 for EPS 250 (kpa) : ≥ 115
- EPS infill blocks, type R1, shall have adequate resistance to Withstand loads applied during the construction phase, according To BS EN 15037-4 : ≥ EPS 80

Load span calculations are completed by authorised Gdeck distributors upon receipt of detailed site plans. Approved distributors will design floors to meet structural and thermal performance. The distributor's technical departments design floor layouts using beams made to BS EN 1991-1-1 and BS EN 1992-1-1 obeying maximum loading spans to create the most effective layouts for installation.

Concrete Toppings

To avoid damage to EPS panels, the structural topping shall be laid as soon as possible after the blocks have been installed. In case of underfloor heating being used with the floor, this is clipped to a clamp track. Avoid stapling if membranes have been fitted as staples will penetrate through. Specified structural concrete topping shall be poured carefully and not dropped from a height greater than 500mm. Ensure heaping is kept to a height of no greater than 300mm.

Two types of concrete can be used to form the oversite on top of the beam and EPS system. In both case the minimum strength class is C25/30 and should ideally have a minimum sand content of 47.5% to aid the placement and finishing of the concrete.

- Standard concrete – ideally the aggregate size should be 10mm but up to 20mm can be used. The recommended consistence class is not less than S3 (100 – 150mm) but preferably S4 (160 – 210mm). The higher consistence class minimises the temptation for site operatives to add water on site, which will result in excessive bleeding, segregation, surface dusting and poor quality surface finish.
- Self-compacting (also referred to as flowing concrete) – the maximum aggregate size for this type of concrete shall be 10mm and a slump-flow of not less than SF_3 is recommended.

Reinforcement type:

Overall concrete thickness above services (mm)	Grade	Maximum aggregate size (mm)	Type	Reinforcement Type	Reinforcement Specification
65-75	C25/30	20	Standard	Conventional	One layer of A142 steel mesh to BS 4483 with a characteristic yield strength of (fyk) 500 N/mm2 Nominal cover to reinforcement shall be 35 mm
	C28/35	10	Self-compacting		
65-75	C25/30	20	Standard	Micro-fibre (Class I)	Fibrin XT Ultra (0.90 kg/m3), Fibrin 23 (0.90 kg/m3), (or similar approved)
	C28/35	10	Self-compacting		
65-75	C25/30	20	Standard	Macro-fibre (Class II)	Durus S400 (4.0 kg/m3), Novomesh B&BA (macro) (3.33kg/m3), Durus Easy Finish (3.00 kg/m3), (or similar approved)
	C28/35	10	Self-compacting		
65-75	C25/30	20	Standard	Steel Fibre	Adfil SF86 (13.33 kg/m3), Novomesh B & BA (steel) (15.00 kg/m3), (or similar approved)
	C28/35	10	Self-compacting		

*Note: NHBC do not accept micro polypropylene only structural concrete toppings.
There may be more types available, this table is not finite. Information correct as of 16.10.17. For further information please contact your concrete supplier or Moulded Foams 01443 441491.

Disclaimer

The information provided in this Operation manual should only be used in conjunction with the Gdeck™ EPS Panel System, and not any other product or system. Specifications are only valid when using Gdeck™ materials and specified equipment. Any other material and/or equipment used would fall outside of the Gdeck™ Agrément Certificate and therefore not acknowledged.

These instructions do not purport to cover all details or variations in the equipment and do not claim to provide for every possible contingency met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently, the matter should be referred to Moulded Foams Ltd.