Installation Guide



www.beamshield.co.uk

'A thermal resistance many times greater than aerated concrete blocks'

It's more than just insulation

Springvale BEAMSHIELD[®] Top Sheet and BEAMSHIELD[®] Plus expanded polystyrene (EPS) systems benefit from fully approved Agrément certificates and are the innovative, simple, fast and cost- effective way to create insulated suspended ground floors.

Beamshield units negate the need for concrete blocks and are located between the concrete T beams. Both style units provide both the total floor insulation and a base on which to lay the structural concrete topping.

Eliminating the need for additional insulation, the shape of the units have been carefully developed to minimise thermal bridging at the T beams. The Beamshield Infill units, which must be used with the Top Sheet, are installed between and above the beams. Whilst the Beamshield Plus units are installed between and below the beams, an optional EPS Top Sheet can be also be installed above the Beamshield Plus unit, before the structural concrete topping, for maximum thermal performance.

Superior Performance



Lifetime Performance

EPS units will maintain their performance for the lifetime of the building and beyond.



(/) Thermal Performance

Outstanding thermal performance with U Values $< 0.06 \text{ W/m}^2 \text{K}$.

Flexibility

Units manufactured to suit any beam size and configuration to aid design.

Agrément Approved & CE Marked





www.beamshield.co.uk



Beamshield Suspended Floor Insulation Information & Installation

The Beamshield[™] suspended floor insulation range is made up of three main configurations; all offering different U values. From minimum through to maximum performance.



Minimum Performance



Maximum Performance

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We recommend that you read the Beamshield Agrément certificates found on our website: **www.springvale.com** as this contains other useful information.

The Technical Office at Springvale[™] will be pleased to advise on any questions you may have. Contact **0845 769 7452**



Get to know what the Beamshield system is made up of.



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System Overview

The Beamshield system is made up of the below components. All the elements combined can achieve great performance levels with options in the system to increase the performance further.

Damp Proof Course

A Damp Proof Course is rolled out into place on the internal wall before Beams are laid.



Concrete T Beams

Springvale have T-Beam manufacturers nationwide who can design a Beamshield system floor with a wide range of different T-Beam profiles

Beamshield Plus

Units fit between and below

concrete T Beams, thus improving performance.



Beamshield EPS Units

The Beamshield[™] system can be made up of two different types of EPS units;

Beamshield Infill

Units fit neatly between concrete T Beams

Closure Blocks

Concrete closure blocks are used to finish of the row.

Damp Proof Membrane (if required)

The Damp Proof Membrane detailing is for guidance only and should be specified and installed in accordance with the manufacturers instructions.

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Beamshield Top Sheet

The Beamshield Top Sheet must be used above the Beamshield Infill units and is optional for use above the Beamshield Plus units to improve Psi values and thermal values.

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Perimeter Strips

Line the edge of the floor layout with insulation strip, preventing any cold bridging between the interior wall and concrete screed.

Reinforced Concrete Screed

The concrete layer completes the system and can be applied with or without the Top Sheet and DPM.



EPS Units

Beamshield systems comprise of a number of EPS components available from Springvale in two types of EPS; the commonly used high performance Platinum EPS in Grey or the standard substantial performance EPS in white: The components are made up of Full units, Half units and Starter/End units with Variable Width Boards (VWB) and Top Sheets completing the range.

The Beamshield Plus System uses extended toes to accommodate double, triple and other multiple beam layouts.

All units are 1200mm long and can be cut on site to the required length. Any cut units should be located at the edge of the floor and extra care taken to avoid damage and foot traffic and the minimum cut length should be not less than 300mm long.

For easy identification each pack is colour coded.



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End Units in the Beamshield Infill range are used for both the start and end of the Beamshield unit installation. The starter units are inserted at the start of the run with the straight (1200mm edge) opposite to the beam. The end units inserted at the end of the run are again inserted with the straight (1200mm edge) opposite to the beam.

BEAMSHIELD[®] Plus Units



Starter Unit

Half Unit



Full Unit





Common Units

The below units are used both with Beamshield Infill and Beamshield Plus units



Variable Width (for use in the Top Sheet system only)

Maximum 350mm wide x 1200mm long



Top Sheet 1200mm wide x 2400mm long

Telescopic Vents

Telescopic vents should be used to extend below the level of the Beamshield Plus units.

Beam Parallel to Inner Leaf



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Where the floor design has not allowed for the correct thickness of Beamshield units, and the vent opening is interfered with by the Beamshield units, it is possible to cut an opening to facilitate ventilation to the underfloor. The opening must be only the width of the vent itself and must not expose any part of an adjacent beam.

A sufficient ventilated space must be maintained below the EPS insulation units

Beam Layout

Correct design of the beam layout is essential and the beam layout drawing must be referred to throughout installation. Placement of partition walls and point loads are strictly controlled by the location of the concrete T beams. It is vital that walls are placed in accordance with the T beam layout.

Beam Layout

DPC strips are rolled out into place (Fig 1). Beams are then laid, followed by the units, closure blocks, perimeter strips, optional DPM, Top Sheet (if Top Sheet system is used) and then and then finished with the reinforced concrete topping.



Beam Spacing

Measured from the inside corner of the beam. Beam spacing's are typically 540mm for the Full unit and 270mm for the Half unit dependant on the floor design.







This particular layout consists of the essential starter and end units, plus rows of full units, a row of variable width board units and a row of half units.



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Beamshield Top Sheet must not be installed with the joints within any zone of the structural loadings or influence. These include (but are not limited to) directly over and parallel to the T beams, nor within 375mm of the centreline of a partition spanning perpendicular to the beams.

BEAMSHIELD[®] Plus Installation

Starter Units

It is good practice to begin each bay with a starter unit. Proceed installing the units in the direction of the toe and continue to the opposite wall. Do not change direction as this could lead to gaps in the insulation envelope. Lay the beam at a slight angle before attaching the starter units to enable ease of installation. Move the beam closer after each unit is attached.





Fit starter unit onto first beam.





Position starter units and beam tight against inner leaf.

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It is possible to create a starter unit (red) and end unit (white) from one full unit by cutting a full unit into two, providing the width of the starter or end unit is a maximum 300mm wide. Beamshield Plus units are lightweight and easy to handle. They should be installed with care, so as not to be damaged during fitting. We do not recommend that units are walked upon and that spreader boards or planks are used where access is required. All Beamshield Plus units are designed and accurately cut to suit the appropriate beam. Ensure that the correct unit is used in conjunction with the correct beam and that the EPS units are fully supported by the beam shoulders.





Installation in sequence.

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Installation generally proceeds in the direction of the toe however for thicker units the installation can be changed to working from the end unit back towards the starter unit, for ease of installation as described in Installation guidance page 28. Once a unit is positioned ensure that the beams are tightly butted up to the EPS units.

Completing a Row Full & Half Units

Off cuts from a row of the same Unit type can be used to start the next row of the same Unit type. This can reduce waste on site, but please note the final piece in a row must not be less than 300mm. All Beamshield Units must be placed closely abutting each other and cut pieces must be cut squarely. Care should be taken that these pieces are cut accurately and are not stepped upon before and during the pour.





The cut piece of not less than 300mm should be positioned at the floor edges.

Variable Width Boards

Variable Width Boards (VWB) can be supplied either pre-cut to size or cut from Beamshield Top Sheets proving the Top Sheet is between 75 – 100mm thick. VWBs must be no wider than 350mm. VWBs must be used only where shown on the T beam design layout. If additional VWBs are used then Springvale must be advised so they can check that the U value of the floor is unaffected.





Variable Width Boards are dropped straight into place and rest on the T beam.

End Units

End units are supplied as pre-cut units 300mm in width, or can be cut from half or full Beamshield Plus units. Ensure that cutting is done accurately and squarely so the units closely abut the inner leaf.





End units are the final unit to be inserted to complete the row.



(i) It is possible to create a starter unit (red) and end unit (white) from one full unit by cutting a full unit into two, providing the width of the starter or end unit is a maximum 300mm wide.

EPS units will maintain their performance for the lifetime of the building and beyond

BEAMSHIELD[®] Infill Installation

Unlike Beamshield Plus Beamshield Infill units do not feature an extended toe which simplifies the installation process. Beamshield Infill units are installed from above with the T beams in the location intended in the beam layout design. Once a unit is positioned ensure that the beams are tightly butted up to the EPS units.



Beamshield Infill units are made up of End, Full and Half units. The End units have the same profile and are used at both edges of the floor between the beam and the wall. Variable Width Boards are used as detailed in floor layout drawings and can be used with either Beamshield Plus or Beamshield Infill units providing a Top Sheet is used.



1. End Units

The row starts off with a **(White)** End Unit (End units are used at both edges of the floor).



2. Full Units

Dependent on the beam layout plan either full units (**Blue**) or half units (**Yellow**) are then installed.



3. Full Unit Offcut

The last unit in the row is then cut and used to start the next row. Please note the cut piece must be no less than 300mm and placed at the edge of the floor.



4. End Units

End units (White) are used to finish off the row.

Top Sheet & Completing the floor

After all the Units have been installed the concrete closure blocks are inserted (Closure blocks must be of equal strength to the rest of the inner leaf), followed by the perimeter strips, a damp proof membrane (if required may be laid under or over the Top Sheet as manufacturers guidance) and then the Top Sheet, finished off with the structural concrete topping.

Top Sheet can be configured to any Beamshield layout. As per the units, off cuts can be used to start the next row. Installation of Beamshield Top Sheet units must follow the T beam design layout. The Top Sheets must not be installed with the joints within any zone of the structural loadings or influence. These include (but are not limited to) directly over and parallel to the T beams, nor within 375mm of the centreline of a partition spanning perpendicular to the beams.



Do not walk on Beamshield units or top sheet. Use timber boards to form a temporary working platform.

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Perimeter strips must be a minimum of 25mm for Springvale Platinum EPS (Grey EPS) or 30mm White EPS. Closure blocks must be of equal strength to the rest of the inner leaf.

BEAMSHIELD[®] Top Sheet



Configuration Examples



BEAMSHIELD[®] Plus



Configuration Examples

Overall width of units is dependent upon width of beams and overall thickness is dependent on U Value.



Beamshield Plus units are also available with other extended toe lengths to insulate under different beam configurations.

A new generation of fast, green and economical thermally in-filled suspended T beam floors

Under Floor Heating (UFH)

Under floor heating pipes can be accommodated in several ways but in all cases the minimum concrete thickness above the services, as stated in the Agrément certificate, must be maintained.



UFH

Where a reinforcing mesh is used UFH pipes can be secured to the mesh. Where there is no mesh then plastic screw fixings can be used to secure the pipes to the Beamshield units.

Where a membrane prevents the use of screw fixings then systems incorporating a clip rail or plastic system plate may be used. Always seek manufacturer's advice before specification.

Where a compressible layer is required to secure the UFH pipes only EPS 120 grade material, as a minimum, should be used as part of the Top Sheet system.

What you need to know

Loadings & reinforced concrete topping specification

For details of loadings and reinforced concrete topping specification refer to relevant Agrément certificate.

Installation of double and triple beam units

Beamshield Plus is unique in offering specially cut double and triple beam units which are quick and simple in fitting to multiple beam layouts, without cutting and pinning of extra insulation units.





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When installing double and triple units it is essential that the beams can be moved to facilitate easy fitting. Check that the correct Beamshield Plus unit conforms to the correct beam and beam configuration.

Installation guidance

Thicker Beamshield Plus units can be installed working from the End Unit back towards the Starter Unit, as described in the procedure below. This makes it easier to position the beams into place.



Install the Starter Unit

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- If the row next to the Starter Unit is a Half Unit, install this unit next
- Accurately measure and set out all remaining beams

Cut and install the End Unit

- Install remaining rows working away from the End Unit except for the last ' Full Unit ' row
- Cut the last Full Units at an angle (roughly 45 degrees) down the length

Install the section with the toe onto the beam and then install the other section into the space making sure that both pieces are securely supported by the T beam shoulders

Once all of the Beamshield Plus units are installed and closure blocks are in place, sometimes it may be required for the replacement of a unit. This can be difficult especially with the thicker units. When this occurs the replacement unit can be cut and installed as point 6 & 7 above



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It is vital that units are not spoiled by the removal of unit toes etc. Where a non-standard spacing is unavoidable it is possible to cut a non-standard unit on site using a hot wire cutter and special templates. Ensure that all appropriate risk assessments and permits are in place before using a hot wire cutter on site.

Penetrations

It is important not to create unwanted cold bridges. Pipes should be positioned away from walls and beams, and where possible not less than 50mm to avoid a cold bridge.





Detailing

It is vital that all gaps caused by cutting the Beamshield units, particularly around SVP's and other penetrations are filled. Use suitable polyurethane expanding foam to fill any gaps. Trim any excess foam neatly using a sharp knife or saw.



Linear Thermal Bridging Good Practice

The Building Regulations Approved Document L focuses attention on heat loss at critical junctions within the construction and as a result linear thermal bridging values (Psi values) are now required to fully assess the energy performance of all new buildings. Springvale can provide Psi values for Beamshield junctions which can contribute to improved SAP ratings. The junction detailed below demonstrates good practice in preventing undue heat loss in a Beamshield floor, with this further improved, with the inclusion of a Top Sheet.



*Components not supplied by Springvale

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The three most critical details in a good junction are the lightweight foundation block and foundation wall, the perimeter strip, and the level of the cavity wall insulation relative to the T beam.

Health & Safety

Please note that these guidelines are strictly broad based and the information contained is not meant to be exhaustive. It remains the responsibility of the installer to ensure suitable and sufficient risk assessment is undertaken appertaining to the environment of each individual installation. All operatives and their supervisors must ensure safe and practicable controls are maintained and that those persons undertaking installation are trained, authorised and competent in the use of any equipment, tools etc required.

This guidance in no way absolves the installer of compliance of local and or national legislation. It remains the responsibility of the installer to ensure such requirements are adhered to.

Installation Requirements

Do's

Always read this installation guide before installing Beamshield for the first time

Prepare the site in accordance the relevant Agrément certificate and ensure the ground beneath the Beamshield units is free from vegetation

Always ensure that the minimum ventilated void as required is provided beneath the Beamshield system. Where clay heave is expected this should be increased in accordance with NHBC guidelines

- Always ensure that vents are installed so that the specified free flow of air to the underfloor void is provided
- Always consult the T beam layout drawing before installation
- Avoid placing T beams directly against parallel walls, as this will contribute to cold bridging
- It is good practice to start each floor with a Starter unit and proceed in the direction of the toe to the opposite wall
 - Avoid walking directly on the Beamshield units and where access is required use boarding or planks. Tamper boards should be used to level concrete where necessary
- Tape all top sheet joints with a durable 100mm wide material such as duct tape
- Limit the concrete pour to a maximum height of 300mm above the Beamshield units and restrict concrete heaps to no greater than 150mm
- When fixing a reinforcing mesh use spacers to ensure the minimum cover of concrete topping as required in the relevant Agrément certificate
- Where a membrane is required this must be laid flat and either above or below the Top Sheet
- Where UFH pipes are installed above the Beamshield systems ensure that the minimum designed thickness of reinforced concrete topping above the pipes is maintained
- Always install perimeter strip around the exposed edges of the floor
- Always fill any gaps with suitable polyurethane foam filler
- Where applicable ensure a good floor/wall junction by following an enhanced thermal detail

Dont's



Do not restrict the free movement of the beams with closure blocks prior to laying the Beamshield units

Do not change the direction of the toe mid-way in the floor as this could lead to gaps in the insulation envelope

Do not cut off the toes of the Beamshield Plus units in order to fit them to the beams

A first choice material for many construction applications

BEAMSHIELD[®] is manufactured exclusively by Springvale and is a registered trademark belonging to Springvale EPS Ltd.

With decades of experience in the design and manufacture of expanded polystyrene (EPS), Springvale offers a range of products and serves its customers across the UK from 2 manufacturing plants; Newcastle upon Tyne and Glossop, Derbyshire.

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