RACKHAM®
HOUSEFLOORS

# Rackham TS System

## Technical Specification

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# Why Choose the Rackham TS System?

- TS System Panels and Top Sheets are very quick and easy to install. They slot in effortlessly between the beams and can easily be cut to suit, where required, with a basic hand saw.
- Cost effective when compared to other types of insulated floor systems and traditional beam and block.
- Thermally efficient edge details. Psi values that are significantly better than the default values.
- The Rackham TS System can achieve 'u' values from 0.19W/m²K to 0.11W/m²K by overlaying varying depths of EPS Top Sheet.
- BBA Certified. Certificate No. 16/5360
- Bearing walls constructed from standard building blocks - no requirement for special wall units.
- The Rackham TS System has an A+ Green Guide rating.
- The TS System is suitable for use with both fibre and steel mesh reinforced finishes. *(NB. Macrofibres must be used on NHBC sites.)*
- Quick delivery/short lead times and great customer service for ALL Rackham products.
- The TS System is quick, easy and light to install saving on labour time and provides big site health and safety advantages as it removes the need for manual handling of heavy concrete blocks.
- The TS System poly infill panels can be cut with an ordinary hand saw, whereas concrete blocks require cutting with a petrol Stihl saw which creates more noise, fumes and dust together with the risk to the operator of potential injury from a mechanical rotating blade.

# Rackham TS System Components

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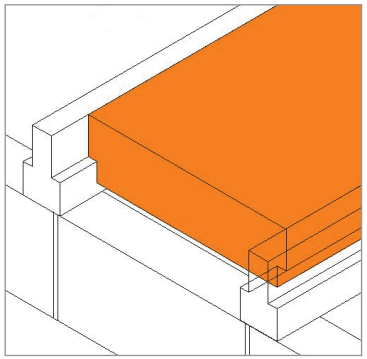
## TS Panel System - EPS Components

The Rackham TS Panel System is supplied in two EPS material types (white or grey).

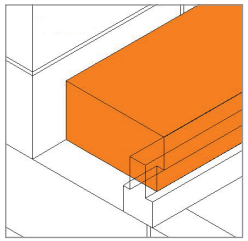
Better thermal 'u' values are obtained by laying EPS White or EPS Grey insulation board over the infill panel system.

When cutting the panels (standard length 1220mm) the minimum permissible cut length is 300mm.



**Standard Panel**

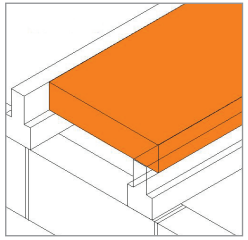
The TS Standard Panel (150mm x 533mm x 1220mm) is positioned between the beams were maximum centres are required - as indicated on the relevant Rackham drawing.



**Start Panel**

The TS Start Panel (175mm x 335mm x 1220mm) is for use between a wall and floor beam. The square face provides a friction fit against the wall and the profiled edge engages with the floor beam.

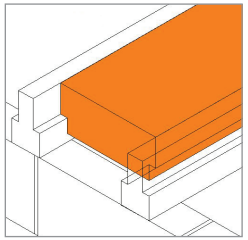
The Start Panel must NOT form part of the wall.



100mm x 440mm x 1220mm (cut on site to suit)

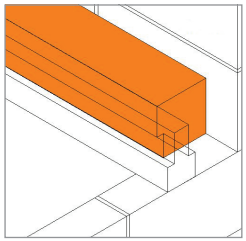
Used to adjust beam centres where a non standard panel dimension is required.

**Make Up Panel**



Half Panel – used where design requirements need the beams to be at closer centres.

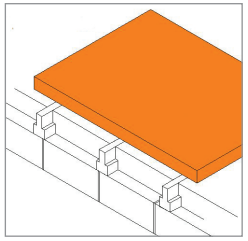
**Half Panel**



**End Panel**

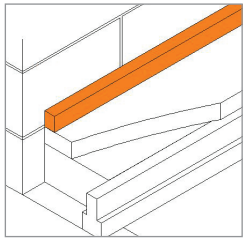
The TS End Panel (175mm x 178mm x 1220mm) is also used between a wall and a floor beam.

The End Panel must NOT form part of the wall.



The Top Sheet Insulation laid over the beams and infill panels is available in various depths (75-150mm /1200mm x 2400mm) in both white and grey EPS dependent upon the floor U value required.

**Top Sheet Insulation**



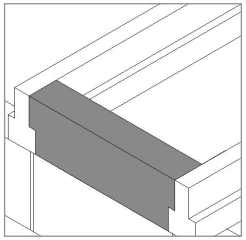
Polystyrene Perimeter Edge Strips (1200mm x75mm x 30mm) are laid around the perimeter of the floor on the inside of the inner leaf to prevent cold bridging.

**Perimeter Edge Strip**

**Need Help?**

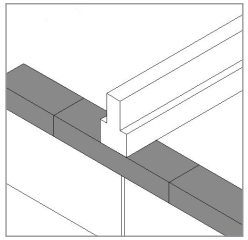
**Call 01924 455 876**

## TS Panel System - Concrete Ancillary Blocks



Poly-Closure Blocks - concrete blocks used at the end of the run of panels between the beam bearing ends, over the supporting wall, to avoid the need to cut blocks/bricks to size. (Sold in packs of 60)

**Poly Closure Block**



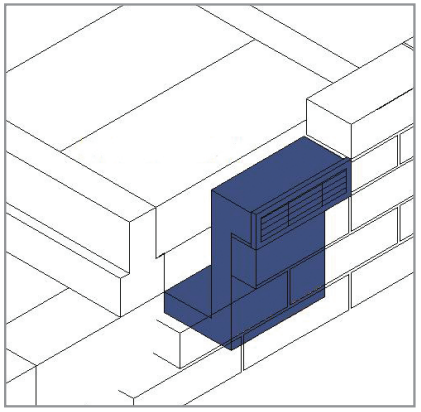
Slip Bricks - 385mm x 100mm x 45mm are available, if required, sold in packs of 204.

**Slip Brick**

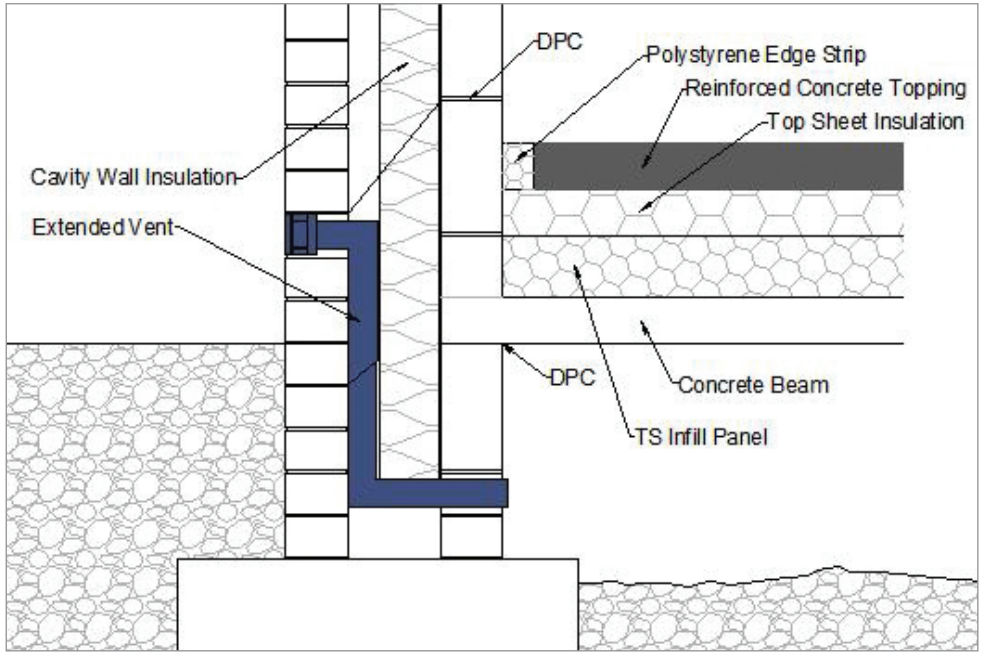
## Telescopic Cranked Ventilators & Airbricks

Telescopic Cranked Underfloor Ventilators & Airbricks - are used to ventilate the void beneath the floor and come complete with airbricks.

The ventilators are available in standard 2-3 courses and extended 5-8 courses. The extended ventilator is usually used with deep insulated floor finishes, particularly EPS infill panels.




Airbricks are supplied in four colours. Terracotta, buff, blue/black and brown to complement the outer skin of brickwork. (The colours shown are a guide only).




Section through vent/cavity wall

# Rackham TS System Section Details

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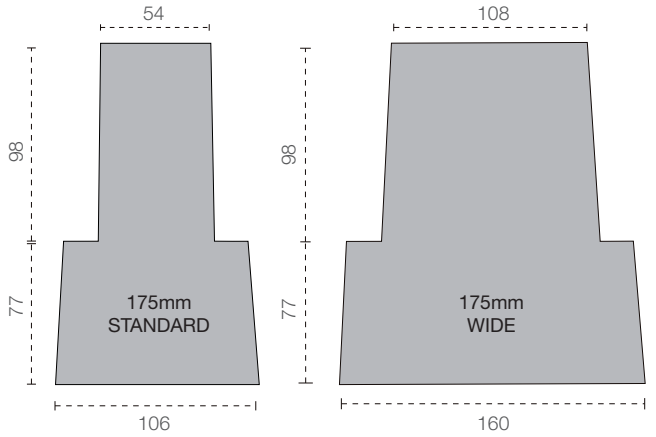
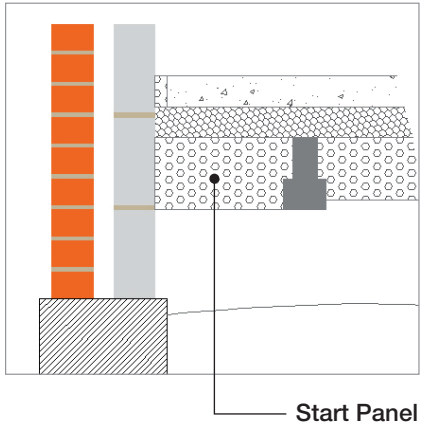
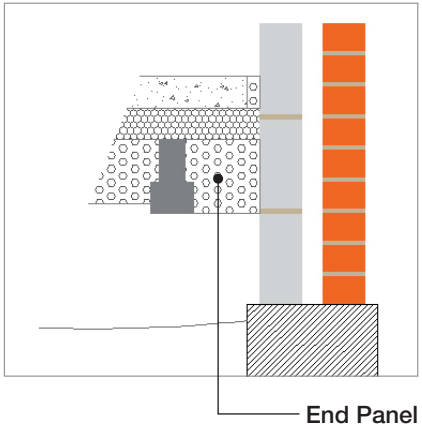
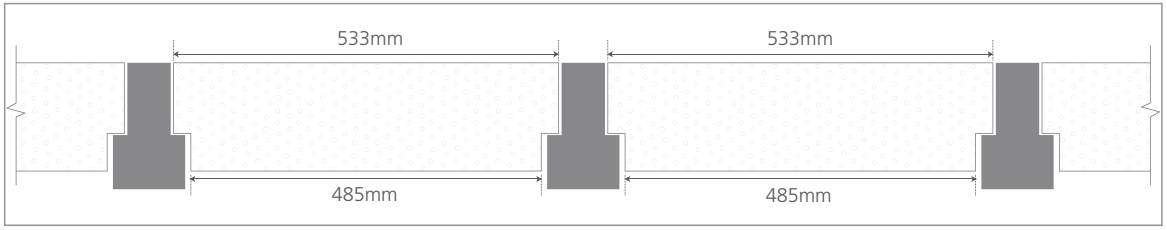
## Section Details



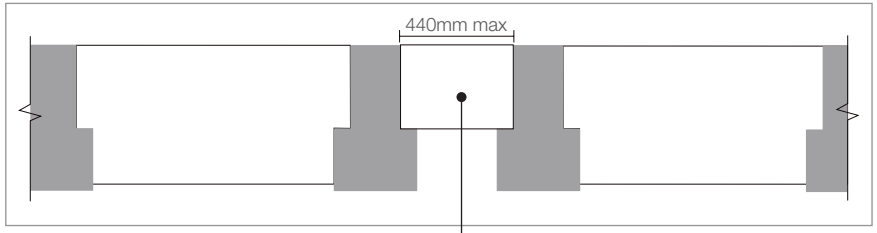

Beam Sections



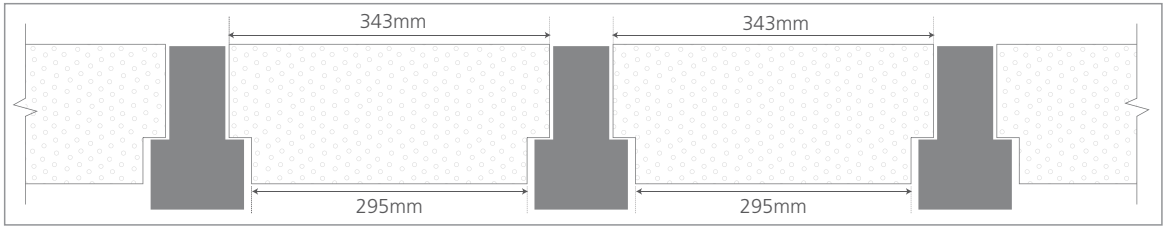




Standard Panel




Make Up Sheet
(Cut to length on site to suit)




Half Panel

Need Help?
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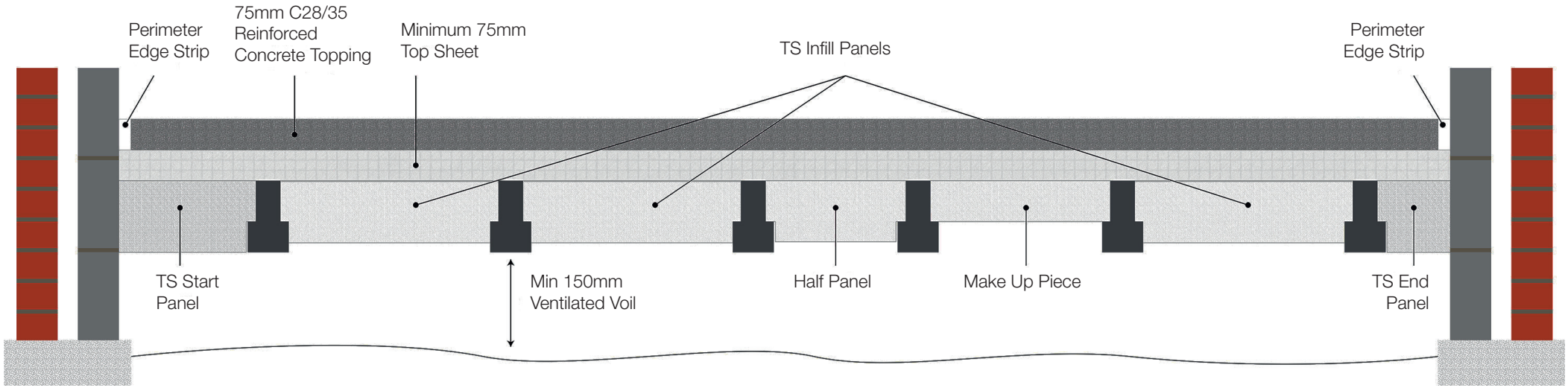
## Complete Floor Section




Under no circumstances should block partitions be built directly off the polystyrene overlay sheet.

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## Installation

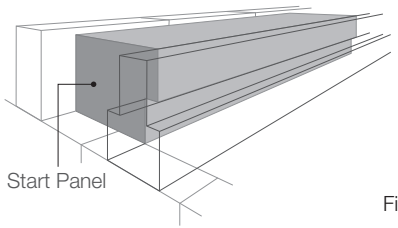



Fig. 1

1. Installation of the infill panels should always begin with the TS Start Panel. The location of the Start panel is identified on the relevant Rackham drawing. If the TS Start Panel needs to be cut on site, this can be do using a fine toothed saw to reduce either the length or width of the panel as required.

   External parallel blockwork adjacent to the TS Start Panels should be brought up an extra course to provide a vertical surface against which the panels can be installed.

2. The TS Start Panel should be held adjacent to the inner skin of the wall. The first beam in the bay is then moved into position to support this panel as shown in fig.1.

3. The other floor beams in the bay should be positioned as shown on the Rackham layout drawing and spaced out using a suitable gauge between beams just above the shoulder.

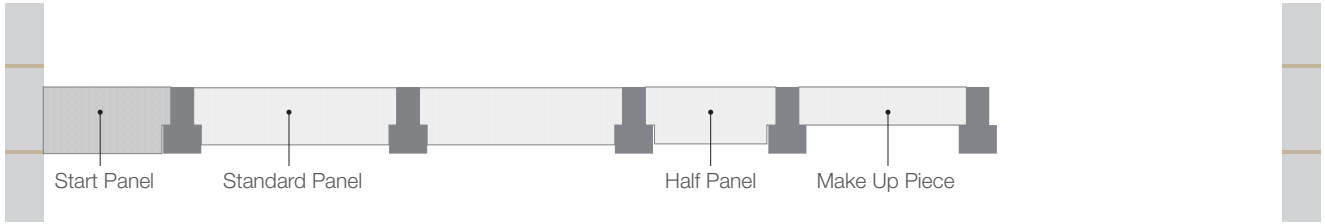



Fig. 2

4. The TS infill panels should be placed between the beams as shown in fig.2.

5. Before installing the last panel and beam in the bay you must first install the TS End Panel.

6. The TS End panel should be held adjacent to the inner skin of the wall and the last floor beam moved into position to support this panel as shown in fig.3.

7. When the TS End panel is in position, the final TS infill panel can be installed as in fig.4.

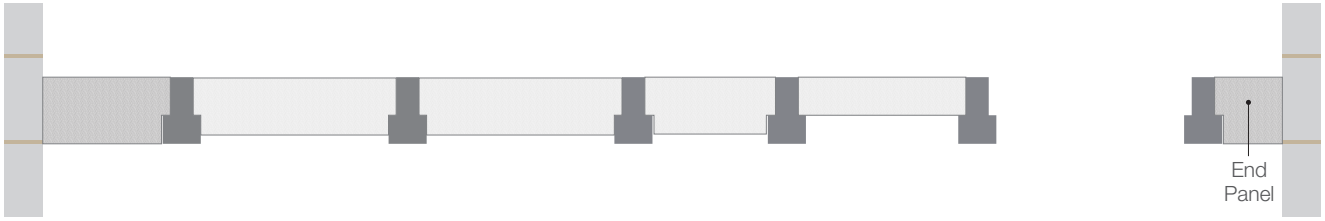



Fig. 3

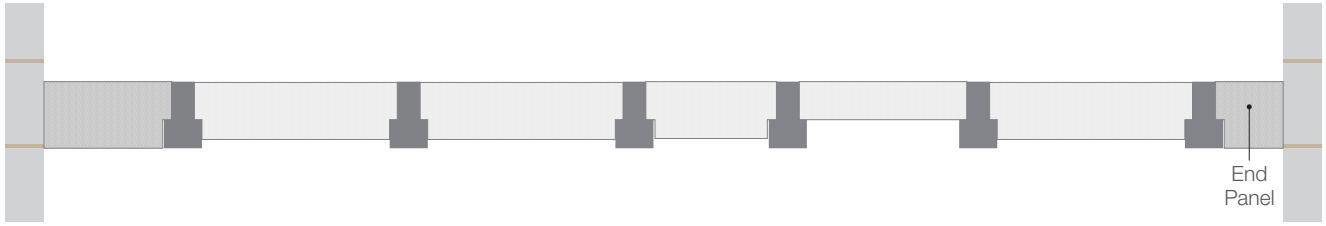



Fig. 4

Throughout the installation process, due consideration must be given to relevant health & safety regulations and Rackhams Product Information Sheets.

## Health & Safety

### Prestressed Concrete Floor Beams - (175mm & 175 WIDE)

#### Product

A concrete component for a specific use in building and construction.

#### Composition

Portland cement. Crushed limestone rock and sand from naturally occurring mineral deposits including some Quartz. Some mixtures contain a plasticiser to improve the characteristics of the product. High tensile indented steel wires to BS 5896/2 relaxation class 2.

#### Health Hazards

Floor beams made from hardened concrete do not present a specific health hazard as supplied.

#### Precautions

Inhalation of any dust from ground concrete should be avoided. Consideration should be given to wet methods of grinding and cutting. Where dry grinding or cutting is used dust masks to BS 2091 (B) or their European equivalent should be worn.

#### Installation

The 175mm standard beam weighs 34kg per metre run, the 175mm WIDE beam weighs 56kg per metre run and the 225mm beam weighs 65kg per metre run and therefore consideration should be given to safe handling and installation methods. All statutory health & safety requirements and associated codes of practice must be observed. Particular reference to lifting by mechanical means in relation to LOLER is required. The beams must have adequate bearings (normal 100mm) at either end onto suitable blockwork (min strength 7.0N/mm$^2$). Overloading during the construction process must be avoided i.e. no stacking/landing of materials on the floor structure

#### Storage

Beams when off loaded and not immediately used shall be stored on firm level ground and stacked with suitable minimum 50mm x 50mm timber bearers between. Stacking height should be adjusted accordingly to safe working practices (max height 1.6m) and safe ground bearing pressures to ensure stack stability.

#### C.D.M.

Regulation 11 relating to design risk. If correctly installed to our specification (other than obvious collapse if cut or overloaded) the product has a low risk factor. For specifications of loading capabilities please see our technical guidance note on the applicable Rackham layout drawing.

The beams must be positioned on suitable bearings, constructed by others.

#### Protective Clothing (P.P.E.)

Due attention should be given to the protection of eyes in cutting and grinding operations. Suitable protection for the head, hands and feet should be worn in accordance with relevant legislation.

### Rackham TS System Floor Panels

#### Health & Safety

The expanded polystyrene (EPS) used in the Rackham TS floor system is an excellent insulating material which exhibits consistent thermal performance over the range of the temperatures normally encountered in buildings.

The EPS is produced to the requirements of BS EN 13163 “Thermal Insulation Products for Buildings” and comprises expanded beads of polystyrene pre-foamed and fused together in a steam heated mould under pressure.

To achieve even better ‘u’ values graphite is incorporated into the manufacture of the EPS for the panels to give them their distinctive colour and to improve the highly efficient thermal performance credentials of white polystyrene.

The Rackham TS panels have high strength to weight ratio and no special precautions are required during handling or cutting when carried out in a well-ventilated area.

#### Environmental

All the EPS is nontoxic and biologically inert and causes no irritation to the eyes or skin. In addition, it will not sustain mould growth and has no nutritional value to insects or vermin.

The EPS conforms to the Montreal Protocol and will gain credits under BREEAM as it is an insulant with an ozone depletion potential (ODP) of zero; a global warming potential (GW P) of less than 5 and does not use, contain or produce Urea Formaldehyde, CFC’s or indeed any of the so called soft CFC’s, i.e. HCFC’s and HFA’s.

All the panels are made from 100% recyclable material.

## Technical Specification

### Building Regulations

When supplied and fixed in accordance with Agrément Certificate No. 16/5360 the Rackham TS System meets all the requirements of the latest Building Regulations.

### Rackham Floor Beams

Prestressed concrete floor beams, 175mm standard and 175mm WIDE deep are supplied in lengths to suit individual layouts, in 50mm increments.

### TS System Infill Panels

The Rackham TS System comprise of EPS panels, each specifically profiled for a particular application within the floor construction - the panels are described in greater detail in the TS System components sheets.

The Rackham TS system is supplied in white or grey EPS dependant on the 'u' value required. The panels should be installed as indicated on the relevant installation drawing along with reference to the system installation guide and BBA Certificate.

### Weight of Construction

175mm **standard** beam weight - 34kg/m. The calculated dead weight of the finished floor is 251kg/m$^3$ (based upon beams at S596 centres and a 75mm thick concrete topping). 175mm **WIDE** beam weight - 56kg/m. The calculated dead weight of the finished floor is 280kg/m$^3$ (based upon beams at S651 centres and a 75mm thick concrete topping).

### Imposed Loads

Normally 1.5kN/m$^2$ unless otherwise stated on the Rackham layout drawing. Extra Rackham beams are provided, where necessary to carry block partitions. **No other loads e.g. Wind buttressing loads, newel posts etc, are allowed for unless noted on the Rackham layout drawing.**

### Structural Calculations

The design method and calculations for this floor have been checked and approved by the Agrément Board. Particular calculations based on BS 8110 can be provided in connection with all schemes, if required.

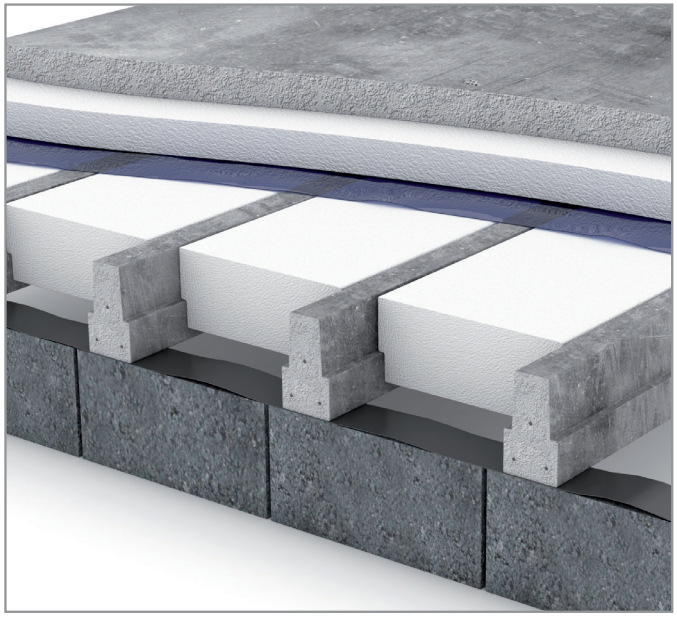
### Bearings

Rackham beams are normally supported by the inner skin of the cavity walls. A double bearing can be taken on internal 100mm brick or block walls by staggering the beam layout.

### Installation

Beams should always be lifted as near to the end as possible and always handled and stacked the right way up. Timber skids should be used in stacking, placed within 300mm of the beam ends.

**When installing the Rackham TS System always refer to the appropriate Rackham layout drawing.**



# Rackham TS System Panels U Value Examples

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## TS System with 75mm Top Sheet

| | White | |
|---|---|---|
| P/A | A | B |
| 0.90 | 0.19 | 0.19 |
| 0.80 | 0.19 | 0.19 |
| 0.70 | 0.18 | 0.19 |
| 0.60 | 0.18 | 0.18 |
| 0.50 | 0.18 | 0.18 |
| 0.40 | 0.17 | 0.17 |

| | Grey | |
|---|---|---|
| P/A | A | B |
| 0.90 | 0.16 | 0.17 |
| 0.80 | 0.16 | 0.17 |
| 0.70 | 0.16 | 0.16 |
| 0.60 | 0.16 | 0.16 |
| 0.50 | 0.15 | 0.16 |
| 0.40 | 0.15 | 0.15 |

## TS System with 100mm Top Sheet

| | White | |
|---|---|---|
| P/A | A | B |
| 0.90 | 0.16 | 0.17 |
| 0.80 | 0.16 | 0.17 |
| 0.70 | 0.16 | 0.16 |
| 0.60 | 0.16 | 0.16 |
| 0.50 | 0.15 | 0.16 |
| 0.40 | 0.15 | 0.15 |

| | Grey | |
|---|---|---|
| P/A | A | B |
| 0.90 | 0.14 | 0.15 |
| 0.80 | 0.14 | 0.14 |
| 0.70 | 0.14 | 0.14 |
| 0.60 | 0.14 | 0.14 |
| 0.50 | 0.14 | 0.14 |
| 0.40 | 0.13 | 0.13 |

## TS System with 125mm Top Sheet

| | White | |
|---|---|---|
| P/A | A | B |
| 0.90 | 0.14 | 0.14 |
| 0.80 | 0.14 | 0.14 |
| 0.70 | 0.14 | 0.14 |
| 0.60 | 0.14 | 0.14 |
| 0.50 | 0.13 | 0.14 |
| 0.40 | 0.13 | 0.13 |

| | Grey | |
|---|---|---|
| P/A | A | B |
| 0.90 | 0.13 | 0.13 |
| 0.80 | 0.12 | 0.13 |
| 0.70 | 0.12 | 0.13 |
| 0.60 | 0.12 | 0.12 |
| 0.50 | 0.12 | 0.12 |
| 0.40 | 0.12 | 0.12 |

## TS System with 150mm Top Sheet

| | White | |
|---|---|---|
| P/A | A | B |
| 0.90 | 0.13 | 0.13 |
| 0.80 | 0.13 | 0.13 |
| 0.70 | 0.13 | 0.13 |
| 0.60 | 0.13 | 0.13 |
| 0.50 | 0.12 | 0.13 |
| 0.40 | 0.12 | 0.12 |

| | Grey | |
|---|---|---|
| P/A | A | B |
| 0.90 | 0.14 | 0.15 |
| 0.80 | 0.11 | 0.12 |
| 0.70 | 0.11 | 0.12 |
| 0.60 | 0.11 | 0.11 |
| 0.50 | 0.11 | 0.11 |
| 0.40 | 0.11 | 0.11 |

1. Tables based on 175mm standard beams
   - White EPS thermal conductivity 0.036 W/mK
   - Grey EPS thermal conductivity 0.030 W/Mk
2. Configuration A - 100% Single beams at maximum centres

   Configuration B - 75% Single beams at maximum centres/ 25% half centres

**Need Help?**

**Call 01924 455 876**

# Rackham TS System Technical Specification

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## Rackham Beams

Rackham standard and wide 175mm beams can be used with the TS System infill panels. The type, centres and quantities of beams are shown on the relevant Rackham drawing (NB. Wide beams are usually indicated by a bold line and are noted accordingly on the drawing beams schedule). The beams should be positioned as indicated on the Rackham drawing.

## TS Infill EPS Components

All the EPS panels are available in either white or grey polystyrene dependent on the u value required.

The locations of the standard size panels are indicated by the dimensions '536' (between beams) and the half panels by the dimension '343'(between beams) on the relevant Rackham drawing.

The position of the make up pieces are indicated by the words 'make-up' between beams - these sheets will require cutting to size to suit the beam centres.

The top sheets (2400x1200mm) are supplied in different thicknesses (between 75mm and 150mm) dependent on the u value required.

NB. It is important that only the top sheets supplied by Rackhams are used, other products may not have the required structural strength.

Perimeter edge strips are supplied and should be used where necessary to prevent cold bridging.

## Imposed Loads

The maximum imposed load on the finished (concrete) floor should not exceed 1.5kN/m² at any time. Construction loads exceeding 1.5kN/m² must not be applied to the finished floor.

## Partition Loading

The finished floor is designed to support studwork partitions, where these have been confirmed by the Customers drawings and are indicated on the relevant Rackham drawings, maximum 1.0kN/m or 0.5kN/m².
Non-loadbearing block partitions, maximum 3.0kN/m, can be built off the finished floor only in the locations indicated on the relevant Rackham drawing.

NB. The finished TS System will support a maximum partition load of 3.0kN/m where indicated on the relevant Rackham drawing. Please see the relevant Rackham drawing and BBA Certificate No. 16/5360 second issue, for details.

## Thermal Insulation

The panels are available in white and more thermally efficient grey EPS.

The top sheet can be supplied in different thicknesses and grades to achieve most thermal requirements - see www.rackhamhousefloors.co.uk for more information.

## Finishes

The Rackham TS System should be finished with 75mm Macro fibre reinforced C28/35 concrete. Contact Rackhams Technical Department for more details and other finish options.

## Damp Proof Course

Damp proofing and ventilation arrangements must be in accordance with normal good practice.

A continuous damp proof course (dpc) should be laid along the support wall below the floor.

Where required, gas barrier membranes should be laid in accordance wih manufacturers instructions and Rackham Agrément Certificate No.16/5360.

A ventilated void of at least 150mm measured from the soffit of beams should be provided below the floor construction.

## Fixing

1. Beams should be lifted as near to each end as possible and always handled and stacked the 'right way up'. Timber bearers should be used for stacking, placed within 300mm of the beam ends.
2. All inner skin cavity wall and internal load-bearing wall blockwork adjacent (parallel) to Start and End panels (indicated on the relevant Rackham layout drawing) must be brought up one extra course to provide a vertical surface against which the panels can be installed. The blockwork should be allowed to cure before installation of the start/end panels.
3. The TS Start/End panels should be positioned against the inside face of the raised wall. The adjacent beam should then be moved into position to support the profiled edge of the panel. The square panel face provides a tight friction fit against the block wall.

   The remaining beams can then be installed using Rackham Closure Blocks or a suitable gauge - dependent on the required beam centres shown on the Rackham layout drawing.
4. Where the beams have to be positioned at irregular (maximum 440mm) centres indicated on the Rackham drawing as 'Make Up', due to obstacles, i.e. Service entrance points or to facilitate the installation of End/Start panels, the supplied 100mm thick Make Up piece must be cut to size, fitted tightly between the beams and bearing on the beam shoulders.

   Where necessary, the panels can be cut to length with a handsaw - the minimum usable panel length should not be less than 300mm.
5. The remaining area of the floor should then be infilled with full and half panels as shown on the Rackham layout drawing.
6. If required, gas/radon barriers should be installed in accordance with manufacturers instructions and BBA Certificate No. 16/5360.
7. The EPS Top Sheet (2400mm x 1220mm) insulation is then laid on top of the infilled beams and over any membrane. Where necessary this should be cut to size using a suitable hand saw.
8. Perimeter Edge Strips should be installed, where necessary, to prevent cold bridging.
9. The 75mm concrete topping (macro fibre reinforced C28/35) can the be carefully applied. Concrete must not be dropped from a height exceeding 500mm and any heaping must not exceed a height of 300mm.

   Throughout the fixing process, due consideration must be given to relevant health and safety regulations and Rackhams Product information sheets.

# Rackham TS System

RACKHAM®
HOUSEFLOORS


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