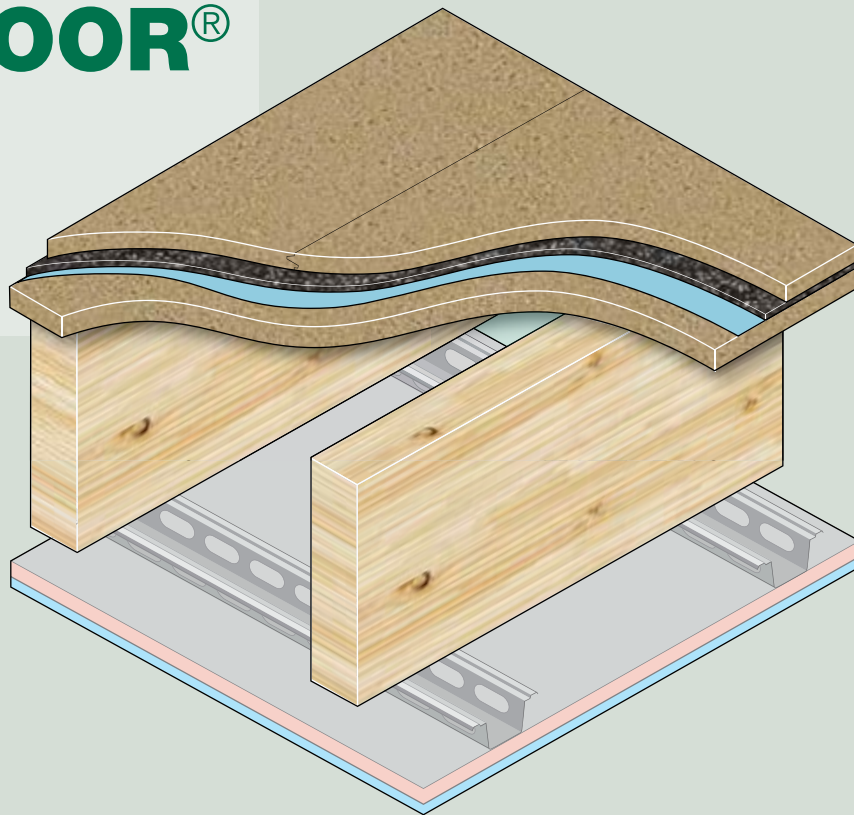


# VERSAFLOOR®

Technical Manual



[www.euroform.co.uk](http://www.euroform.co.uk)



# VERSAFLOOR® Technical Manual

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# **VERSAFLOOR®** is a cement bonded particle board manufactured to BS EN 634-1 and BS EN 634-2

Versafloor® is a cement bonded particle board intended for internal use which has very high levels of performance in the presence of moisture.

Versafloor® is conformity assessed in accordance with EN 13986 which specifies the requirements for cement particle boards bonded with Ordinary Portland Cement (OPC) for internal use as structural components in dry/humid conditions, panels for use as structural floor.

Versafloor® also complies with the general requirements as listed in EN 634-1 together with the requirements set out in table 1 of this standard.

## **Composition and manufacture**

Cement bonded particle board generally (but not exclusively) comprises wood particles bonded with ordinary Portland cement. Wood is the predominant component by volume but cement is predominant by weight. Small quantities of chemicals are added to the wet mix, one of their purposes is to accelerate cement setting.

Versafloor® is sold worldwide and has gained acceptance to various country standards by meeting required performances in applications. Further information is available on request.

# VERSAFLOOR® Systems

## Factory finished high performance flooring systems

The construction industry now requires as many components as possible to be supplied in a finished form, minimising any further work on site.

This particularly applies to the Modular and Volumetric construction industry where modules are of a repetitive sizing for such constructions as:

- Prisons
- Hospitals
- Restaurants
- Petrol Stations
- Hotels

Euroform have developed for this market Versafloor® factory finished flooring systems. Versafloor® is manufactured using Versapanel® cement bonded particle board which has high performance in the presence of moisture and high acoustic performance.

## Finished specification

Thickness of floor = 18mm - 19mm - 20mm - 22mm - 24mm - 25mm - 28mm

# VERSAFLOOR® Systems

Versafloor® is available to the following specifications:

## Type 001

Unsanded Versafloor® can be supplied with the standard unsanded finish with square edge or tongue and groove applied to two or four edges.

Care must be taken when using this specification as there will be a thickness tolerance of up to +/- 1.5mm.

Type 001 can also be supplied with a factory applied grey primer/sealer to both faces which is highly recommended for environments where the product may take on moisture during a build process or in it's construction life. The top surface is white and the bottom surface is grey.

## Type 002

Calibrated Versafloor® has been factory calibrated and all thickness' have a thickness tolerance of +/- 0.3mm. This range can also be supplied square edge or with tongue and groove applied to two or four edges. This product range is suitable for application of fine thickness overlays such as vinyl flooring and thin carpet tiles.

## Type 003

Primed/Sealed Versafloor® that has been factory calibrated and then has a factory applied primer/sealer to reduce uptake of moisture when used in damp or wet conditions, the thickness tolerance is +/- 0.5mm. The top surface is white and the bottom surface is grey, the application of this primer/sealer can prevent up to 80% of moisture uptake.

Type 003 can also be supplied square edge or with tongue and groove applied to two or four edges.

# VERSAFLOOR® Systems

## The factory finished high performance flooring systems

### Tongue & Groove

Where a tongue and groove is applied it will be in the centre of the panel according to thickness tolerance.

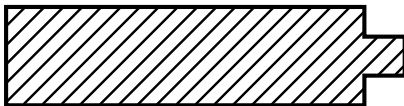
### Panel Sizes

Versafloor® panel sizes can be produced to suit client requirements and layouts but standard stock sizes are 1200 x 600mm and 1200 x 1200mm.

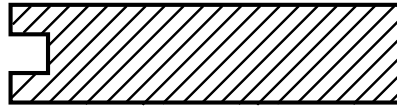
Versafloor® can also be produced in 'kit of part' supply to minimise on site cutting and wastage and can be supplied in the following panel types:

### Panel type

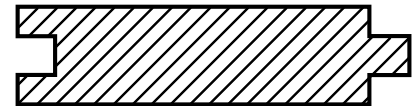
PT



PG



GT



Above illustrations not to scale.

# VERSAFLOOR® Systems

## Tiling to Versafloor®

When tiling to Versafloor® the Primed/ Sealed specification must always be used with tongue and groove to all four edges and laid in accordance with the BS 5385-3. Tile adhesive systems should be tested for compatibility and expansion joints incorporated in accordance with the BS 5385-3.

## Fixing Versafloor®

Self-drilling, self-countersinking screws should always be used for fixing to steel or timber support structure. No mechanical fixings should be used for floating floor applications. All edges of the Versafloor® must be bonded using a moisture resistant adhesive.

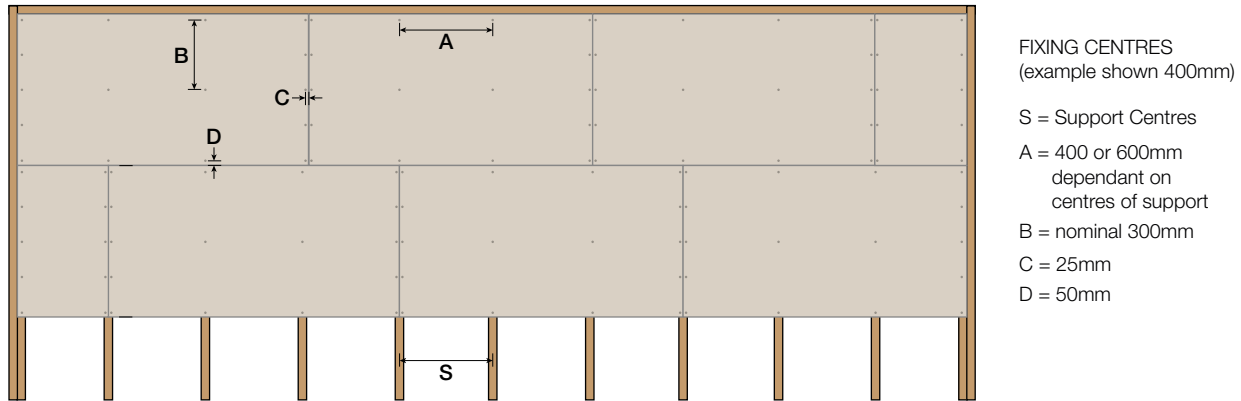
## Floating & acoustic floor applications

Versafloor® for acoustic flooring both as a working deck or finished floor will increase mass.

For details of Versafloor® used in high performance acoustic systems please see page 10 of this manual.

# VERSAFLOOR® Systems

Laying of system - typical layout also showing centres of mechanical fixings



ALL Tongue & Grooved edges should be bonded with a PUD4 adhesive.

## Note:

A 10mm perimeter gap should be allowed around the edge of the floor to wall junction.

Boards should not be installed with a moisture content over 12%, measurements should be taken prior to laying of Versafloor® to ensure that this is the case.

Please read these installation instructions in conjunction with BS 8201 Code of practice for installation of flooring of wood and wood based panels.



# VERSAFLOOR® Technical Data

## Product range

Panel Type:

unsanded / calibrated

Standard Sizes Thicknesses:

18, 19, 20, 22, 24, 25, 28

## Sizes

1200 x 600mm, 1200 x 1200mm

Special sizes of panel and thicknesses are available on request

Density (average)	1300Kg/m <sup>3</sup>	Surface Alkalinity	pH between 11 and 13
Modulus of Elasticity	4500N/mm <sup>2</sup>	Moisture Content (ex production)	9% +/- 3% by weight
1.Thickness tolerances Calibrated: un-sanded	18-28mm+0.3mm 18-19mm+1.0mm 22-28mm+1.5mm	Thickness Swelling (24hrs immersion)	0.7% (average)
2.Length: 3.Width: 4.Squareness:	+5mm +5mm -2.5mm on panel diagonal difference	Dimensional Stability	0.11% for an increase in relative humidity from 65% to 90%  0.16% for an increase in relative humidity from 65% to saturation
Bending Strength (min)	9N/mm <sup>2</sup>	Thermal Conductivity	0.26.W/m.k. Coefficient
Permissible design value	2.25N/mm <sup>2</sup>	Sound Insulation	See characteristics guide Also acoustic information
Tensile strength (parallel to surface)	4.0N/mm <sup>2</sup>	Reaction to Fire	EN 13501-1: B <sub>fl</sub> -s1
Tensile strength (perpendicular to surface)	0.5Nmm <sup>2</sup>	Bonding Agent	Versafloor® is odourless, Since the bonding agent is free from formaldehyde.
Compression strength (min)	15N/mm <sup>2</sup>		

Factory applied primer/sealer to Versafloor®

Versafloor® can be supplied with a factory applied primer/sealer that will resist up to 80% of possible moisture uptake. It can be applied to both unsanded and sanded material, compatibility of this finish to additional surface treatments should be referred to the finish-coating manufacturer before any application. This finish is standard for the Versafloor® range of flooring and is essential when used in conjunction with ceramic tile installations.

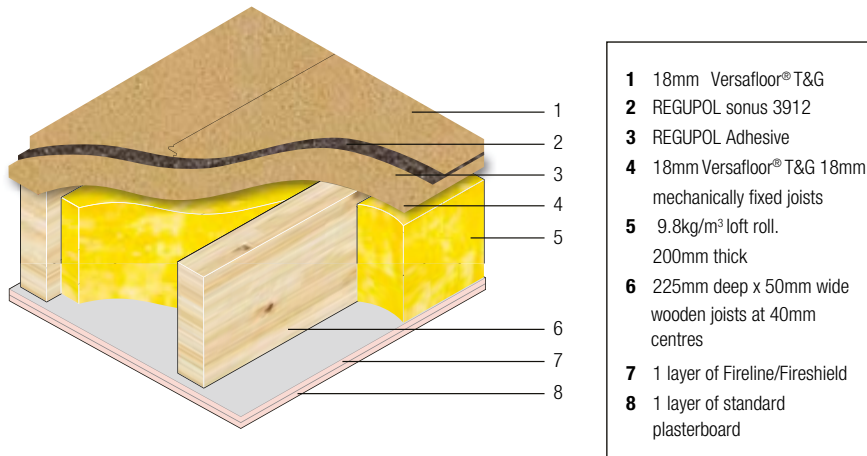
## VERSAFLOOR® System example 1

The following pages show the potential acoustic performance of Versafloor® when used with various CMS Danskin Acoustics products. For more information on CMS Danskin Acoustics products see [www.cmsdanskin.co.uk](http://www.cmsdanskin.co.uk) or contact 01925 577711.

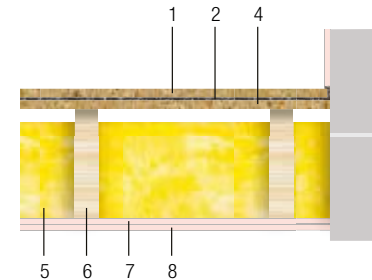
Airborne Sound Insulation ( $D_{nTw} + C_{tr}$ ) - 53dB (mean average)

Impact Sound Insulation ( $L_{nTw}$ ) - 48.5dB (mean average).

Assessed performance based on similar system tests.



Ceiling detail

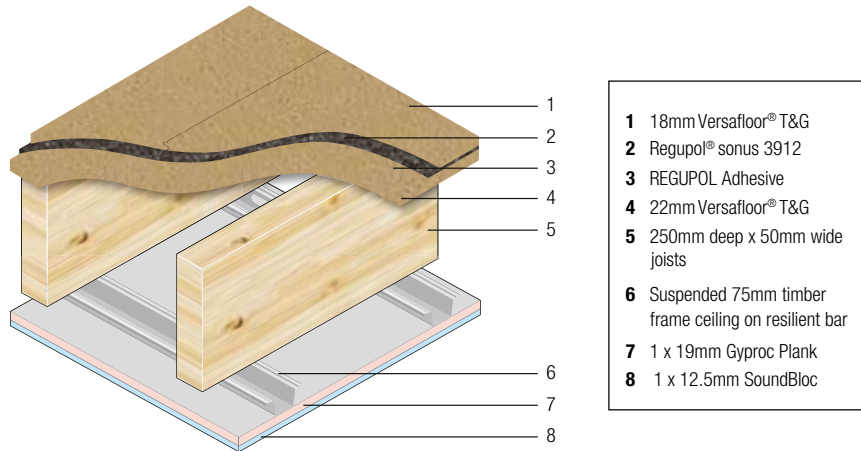


## VERSAFLOOR® System example 2

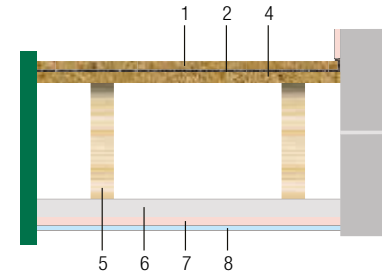
Airborne Sound Insulation ( $D_{nTW} + C_{tr}$ ) - 54dB (mean average)

Impact Sound Insulation ( $L_{nTW}$ ) - 51dB (mean average).

Assessed performance based on similar system tests.



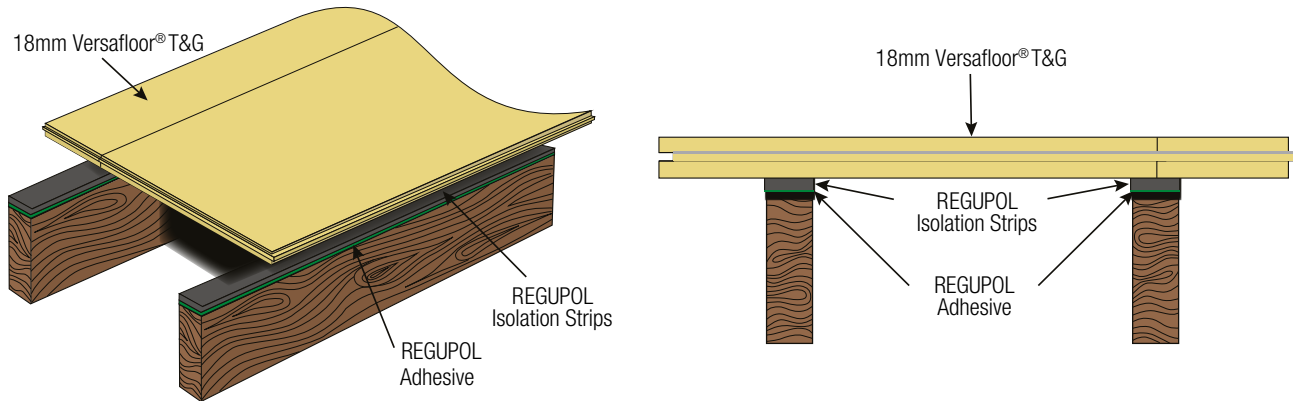
Ceiling detail



**Important Note:** Please note that Regupol® sonus 3912 consists of PUR foam and not rubber crumb. When comparing alternative products please be cautious where a 'direct equivalent' is offered. Many alternatives consist of a rubber compound which can cause plasticizer migration when used with certain floor finishes.

## VERSAFLOOR® Acoustic floor installation example

Regupol® Isolation Strips are a very simple and effective way to reduce structure borne noise and being a rubber crumb product benefits from longevity and minimal creep.



Note: For further information please contact our technical services 01925 860999.

# VERSAFLOOR® Examples of various system performances

## Timber walking surface

- Underfloor Heating
- REGUPOL sonus 3912 (adhesively installed to Versafloor®)
- 18mm Versafloor® T&G on strips of REGUPOL isolation (adhesively fixed to top of joists)
- Timber joists, with 100mm mineral wool within the joist cavity (RWA3, or any similar product with a density of 60kg/m<sup>3</sup>)
- Existing lath and plaster ceiling
- Impact performance 52dB L<sup>1</sup><sub>nT,w</sub> Airborne performance 49dB D<sub>nT,w</sub>+C<sub>tr</sub>

## Wood walking surface

- 18mm Versafloor® T&G
- Strips of REGUPOL isolation (adhesively installed to the top of timber joists)
- Timber joists with 100mm mineral wool insulation (density 60kg/m<sup>3</sup>)
- RB-1 resilient bar with 2x12.5mm soundbloc plasterboard as the ceiling
- Impact performance 54dB L<sup>1</sup><sub>nT,w</sub> Airborne performance 52dB D<sub>nT,w</sub>+C<sub>tr</sub>

## Wood walking surface

- 18mm Versafloor® T&G
- Strips of REGUPOL isolation (adhesively installed to the top of timber joists)
- Timber joists with 100mm mineral wool insulation (density 60kg/m<sup>3</sup>)
- Existing lath and plaster ceiling
- Impact performance 52dB L<sup>1</sup><sub>nT,w</sub> Airborne performance 53dB D<sub>nT,w</sub>+C<sub>tr</sub>

'The data presented is based on either the average or worst case taken from a number of site tests or single site tests'

# VERSAFLOOR® load charts

## 18mm Euroform - Versafloor® cement particle board

Uniformly distributed load (kN/m²)							Concentrated load (kN on 50mm x 50mm square)						
Span (mm)	Single Span			Continuous			Span (mm)	Single Span			Continuous		
	Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection			Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection	
		Span/300	Span/500		Span/300	Span/500			Span/300	Span/500		Span/300	Span/500
300	10.6	-	-	13.3	-	-	300	0.4	-	-	0.7	-	-
400	5.9	-	5.2	7.4	-	-	400	0.4	-	-	0.6	-	-
500	3.7	-	2.7	4.6	-	-	500	0.4	-	-	0.6	-	-
600	2.5	-	1.6	3.2	-	2.9	600	0.3	--	-	0.5	-	-
700	1.8	1.6	1.0	2.3	-	1.9	700	0.3	-	-	0.5	-	-
800	1.3	1.1	0.7	1.7	-	1.2	800	0.3	-	-	0.5	-	-
900	1.0	0.8	0.5	1.3	-	0.9	900	0.3	-	-	0.5	-	-
1000	0.8	0.6	0.3	1.0	-	0.6	1000	0.3	-	-	0.5	-	-

# VERSAFLOOR® load charts

## 19mm Euroform - Versafloor® cement particle board

Uniformly distributed load (kN/m²)							Concentrated load (kN on 50mm x 50mm square)						
Span (mm)	Single Span			Continuous			Span (mm)	Single Span			Continuous		
	Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection			Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection	
		Span/300	Span/500		Span/300	Span/500			Span/300	Span/500		Span/300	Span/500
300	11.8	-	-	14.8	-	-	300	0.5	-	-	0.7	-	-
400	6.5	-	6.2	8.2	-	-	400	0.4	-	-	0.7	-	-
500	4.1	-	3.2	5.2	-	-	500	0.4	-	-	0.6	-	-
600	2.8	-	1.8	3.5	-	3.5	600	0.4	--	-	0.6	-	-
700	2.0	1.9	1.2	2.5	-	2.2	700	0.4	-	-	0.6	-	-
800	1.5	1.3	0.8	1.9	-	1.5	800	0.3	-	-	0.6	-	-
900	1.1	0.9	0.5	1.4	-	1.0	900	0.3	-	-	0.5	-	-
1000	0.9	0.7	0.5	1.1	-	0.7	1000	0.3	-	-	0.5	-	-

# VERSAFLOOR® load charts

## 20mm Euroform - Versafloor® cement particle board

Uniformly distributed load (kN/m²)							Concentrated load (kN on 50mm x 50mm square)						
Span (mm)	Single Span			Continuous			Span (mm)	Single Span			Continuous		
	Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection			Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection	
		Span/300	Span/500		Span/300	Span/500			Span/300	Span/500		Span/300	Span/500
300	13.1	-	-	16.4	-	-	300	0.5	-	-	0.8	-	-
400	7.3	-	7.2	9.1	-	-	400	0.5	-	-	0.8	-	-
500	4.6	-	3.7	5.8	-	-	500	0.4	-	-	0.7	-	-
600	3.1	-	2.1	3.9	-	-	600	0.4	--	-	0.7	-	-
700	2.2	-	1.3	2.8	-	2.5	700	0.4	-	-	0.6	-	-
800	1.6	1.5	0.9	2.1	-	1.7	800	0.4	-	-	0.6	-	-
900	1.2	1.1	0.6	1.6	-	1.2	900	0.4	-	-	0.6	-	-
1000	1.0	0.8	0.5	1.3	-	0.9	1000	0.4	-	-	0.6	-	-



# VERSAFLOOR® load charts

## 22mm Euroform - Versafloor® cement particle board

Uniformly distributed load (kN/m²)							Concentrated load (kN on 50mm x 50mm square)						
Span (mm)	Single Span			Continuous			Span (mm)	Single Span			Continuous		
	Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection			Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection	
		Span/300	Span/500		Span/300	Span/500			Span/300	Span/500		Span/300	Span/500
300	15.9	-	-	19.9	-	-	300	0.6	-	-	1.0	-	-
400	8.8	-	-	11.1	-	-	400	0.6	-	-	0.9	-	-
500	5.5	-	4.9	7.0	-	-	500	0.5	-	-	0.8	-	-
600	3.8	-	2.8	4.8	-	-	600	0.5	--	-	0.8	-	-
700	2.7	-	1.8	3.4	-	3.4	700	0.5	-	-	0.8	-	-
800	2.0	2.0	1.2	2.6	-	2.3	800	0.5	-	-	0.7	-	-
900	1.5	1.4	0.8	2.0	-	1.6	900	0.4	-	-	0.7	-	-
1000	1.2	1.0	0.6	1.5	-	1.2	1000	0.4	-	-	0.7	-	-

## VERSAFLOOR® load charts

### 24mm Euroform - Versafloor® cement particle board

Uniformly distributed load (kN/m²)							Concentrated load (kN on 50mm x 50mm square)						
Span (mm)	Single Span			Continuous			Span (mm)	Single Span			Continuous		
	Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection			Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection	
		Span/300	Span/500		Span/300	Span/500			Span/300	Span/500		Span/300	Span/500
300	18.9	-	-	23.7	-	-	300	0.7	-	-	1.2	-	-
400	10.5	-	-	13.2	-	-	400	0.7	-	-	1.1	-	-
500	6.6	-	6.4	8.3	-	-	500	0.6	-	-	1.0	-	-
600	4.5	-	3.7	5.7	-	-	600	0.6	--	-	1.0	-	-
700	3.2		2.3	4.1	-	-	700	0.6	-	-	0.9	-	-
800	2.4	-	1.6	3.1	-	2.9	800	0.6	-	-	0.9	-	-
900	1.8	1.8	1.1	2.4	-	2.1	900	0.5	-	-	0.9	-	-
1000	1.4	1.3	0.8	1.9	-	1.5	1000	0.5	-	-	0.8	-	-

# VERSAFLOOR® load charts

## 25mm Euroform - Versafloor® cement particle board

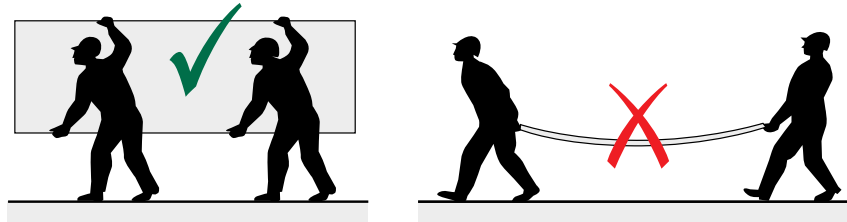
Uniformly distributed load (kN/m²)							Concentrated load (kN on 50mm x 50mm square)						
Span (mm)	Single Span			Continuous			Span (mm)	Single Span			Continuous		
	Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection			Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection	
		Span/300	Span/500		Span/300	Span/500			Span/300	Span/500		Span/300	Span/500
300	20.5	-	-	25.7	-	-	300	0.8	-	-	1.3	-	-
400	11.4	-	-	14.3	-	-	400	0.7	-	-	1.2	-	-
500	7.2	-	-	9.1	-	-	500	0.7	-	-	1.1	-	-
600	4.9	-	4.2	6.2	-	-	600	0.6	--	-	1.0	-	-
700	3.5	-	2.6	4.5	-	-	700	0.6	-	-	1.0	-	-
800	2.6	-	1.8	3.4	-	3.3	800	0.6	-	-	1.0	-	-
900	2.0	-	1.2	2.6	-	2.3	900	0.6	-	-	0.9	-	-
1000	1.6	1.5	0.9	2.0	-	1.7	1000	0.6	-	-	0.9	-	-

# VERSAFLOOR® load charts

## 28mm Euroform - Versafloor® cement particle board

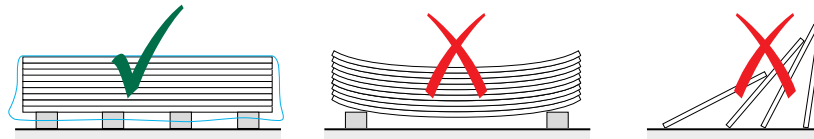
Uniformly distributed load (kN/m²)							Concentrated load (kN on 50mm x 50mm square)						
Span (mm)	Single Span			Continuous			Span (mm)	Single Span			Continuous		
	Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection			Load limited by stress	Load limited by deflection		Load limited by stress	Load limited by deflection	
		Span/300	Span/500		Span/300	Span/500			Span/300	Span/500		Span/300	Span/500
300	25.8	-	-	32.3	-	-	300	1.0	-	-	1.6	-	-
400	14.4	-	-	18.0	-	-	400	0.9	-	-	1.5	-	-
500	9.1	-	-	11.4	-	-	500	0.9	-	-	1.4	-	-
600	6.2	-	5.9	7.8	-	-	600	0.8	--	-	1.3	-	-
700	4.5	-	3.7	5.7	-	-	700	0.8	-	-	1.2	-	-
800	3.3	-	2.5	4.3	-	-	800	0.8	-	-	1.2	-	-
900	2.6	-	1.7	3.3	-	3.3	900	0.7	-	-	1.2	-	-
1000	2.0	-	1.3	2.6	-	2.4	1000	0.7	-	-	1.1	-	-

## VERSAFLOOR® Site Procedure



### Transport

Boards are usually delivered secured in plastic bound, edge protected pallets. When loose boards are transported they must be laid flat and fully protected with a waterproof sheet. When manually moving Versafloor® it must be carried in a vertical position.



### Storage

Versafloor® should be stored flat on levelled supports at 800mm centres. It must never be stored on edge or upright. If outside, a protective plastic sheet must be secured to protect from weather.

### Conditioning

Versafloor® has an ex-works moisture content of 9% + / - 3% and is in equilibrium when the temperature is 20°C with a relative air humidity of 50-60%. Versafloor® adapts to the ambient humidity level, therefore to adjust to its working conditions it should be allowed to acclimatise for 24-48 hours prior to fixing.

# VERSAFLOOR® Processing

## Machining

Dry working (drilling, sanding, cutting) can release dusts unless controlled. Versafloor® is machined and processed in the same manner as resin bonded particle boards, ensure that tungsten carbide tipped blades are used at all times. Comprehensive tests have shown that wear on tools during the processing of Versafloor® is significantly lower when compared with resin bonded board. This is due to the lack of resinification and a lower degree of heating.

Equipment should come with extraction / capture systems to control dust emissions. Wet processing is not recommended.

## Sawing

- Portable circular saw
- Fixed saw for dimensioning (vertical or horizontal)

## Type of blade

- Alternative or trapezoidal teeth
- Chart shows number of revolutions and number of teeth (Z)

Diameter mm	250	300	350	400
Panel thickness 18 - 28mm	Z=36	Z=48	Z=54	Z=60
Number of revolutions rpm	3000/4500	3000	3000	3000/1500

## Edging/Profiling

Common machines with carbide-tipped tools.

The higher the rpm, the better the milled edge.

## Countersinking drilling

Versafloor® can be drilled using conventional portable drilling machines; high speed steel drills or tungsten carbide drills (for prolonged use) and central tip for precision drilling. Although Versafloor® is a wood and cement panel it is not concrete and therefore does not require percussion drilling. The drilling speeds are the same as for chip-board panels (3000/4000 rpm).



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