

Versafloor® Technical Manual





VERSAFLOOR® SYSTEMS MANUAL

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 and has high resistance to fire.

Versafloor® conforms to the European Standards EN 634-2 for cement bonded particle boards. This specifies the requirements for particle boards bonded with Ordinary Portland Cement (OPC) for use in dry, humid and exterior conditions. Versafloor® is CE marked in accordance with EN 13986.

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.



Technical assessment papers on Cement Bonded Particle Board are available from the Building Research Establishment (UK). Who have carried out extensive research on the Generic material from 1979.

Due to our policy of continuous development we reserve the right to change specifications without prior notice. Euroform does not accept responsibility for any loss as a result of any company or person relying on material in this publication, or for any mistakes or misprints. Although every care is taken to ensure accuracy, this publication is a general guide and specific technical advice is recommended before proceeding with any transaction.

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

INTRODUCTION

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 high performance flooring systems. Versafloor® is manufactured using Versapanel® cement bonded particle board which is a high performance building material having the properties of fire resistance, high performance in the presence of moisture and high acoustic performance.

FINISHED SPECIFICATION

Thickness of floor = 18mm - 19mm - 20mm - 22mm - 24mm - 25mm - 28mm - 32mm. Versafloor[®] is available to the following specifications:

Type 002

Type 001 NTRODUCTION

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 $\pm /-1.5$ mm.

Note: This range can also be supplied

with a factory applied grey primer/

sealer to both faces which is highly

recommended for environments where

a build process or in it's construction

life. The top surface is white and the

bottom surface is grey.

the product may take on moisture during

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. This range can also be supplied square edge or with tongue and groove applied to two or four edges. This primer/sealer 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.

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.

PG

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







GT

Above illustrations not to scale.

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, fire resistant adhesive.

FLOATING & ACOUSTIC FLOOR APPLICATIONS

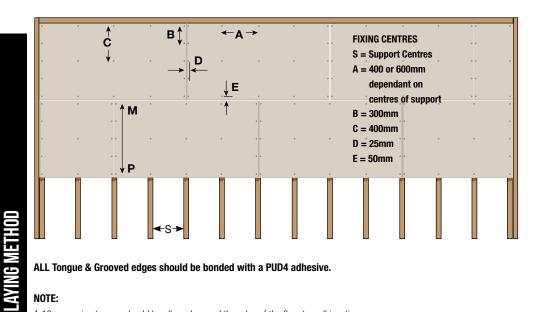
Versafloor[®] for acoustic flooring both as a working deck or finished floor will increase mass with fire rated performance.

For details of Versafloor® used in high performance acoustic systems please see section 4 of this manual.

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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.

TECHNICAL DATA

PRODUCT RANGE Panel Type: Standard Sizes Sizes

unsanded / calibrated
Thicknesses: 18, 19, 20, 22, 24, 25, 28, 32mm
1200 x 600mm, 1200 x 1200mm

SPECIAL SIZES OF PANEL AND THICKNESSES ARE AVAILABLE ON REQUES

Density (average)	1300Kg/m ³	Surface Alkalinity	pH between 11 and 13
Modulus of Elasticity	4500N/mm ²	Moisture Content (ex production)	9% +/- 3% by weight
 Thickness tolerances Calibrated: Length: Width: 	18-37mm+0.3mm 18-19mm+1.0mm 22-42mm+1.5mm +5mm +5mm	Thickness Swelling (24hrs immersion)	0.7% (average)
	-2.5mm on panel diagonal difference	Dimensional Stability	
		Thermal Conductivity	0.26.W/m.k. Coefficient
Permissible design value	2.25N/mm ²	Sound Insulation	See characteristics guide Also acoustic information
Tensile strength (parallel to surface)	4.0N/mm ²	Fire Rating	BS 476-6 & BS 476-7: Class 0 Building Board Class 1 surface spread of flame EN 13501-1: Β _η -s1
Tensile strength (perpendicular to surface)	0.5Nmm ²	Bonding Agent	Versafloor [®] is odourless, Since the bonding agent

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.

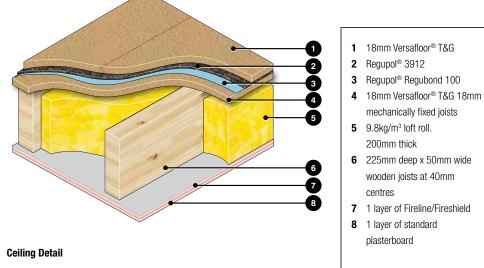
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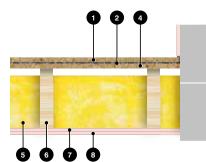
TECHNICAL DATA

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 or contact 01925 577711.

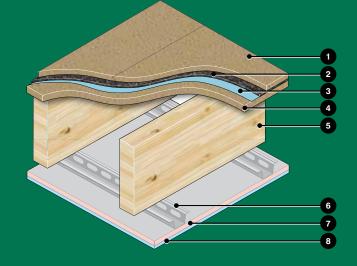
Airborne Sound Insulation ($D_{nTw} + C_{tr}$) - 53dB (mean average) Impact Sound Insulation (L_{otu}) - 48.5dB (mean average). Assesed performance based on similar system tests.



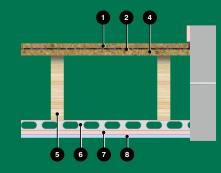


SYSTEM EXAMPLE 2

Airborne Sound Insulation ($D_{nTw} + C_{tr}$) - 54dB (mean average) Impact Sound Insulation $(L_{n_{TM}})$ - 51dB (mean average). Assesed performance based on similar system tests.







Important Note

Please note that Regupol® 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.

2 Regupol[®] 3912 **3** Regupol[®] Regubond 100 4 22mm Versafloor[®] T&G **5** 250mm deep x 50mm wide **6** Suspended 75mm timber frame ceiling on resilient bar 7 1 x 19mm Gyproc Plank **8** 1 x 12.5mm SoundBloc

1 18mm Versafloor[®] T&G

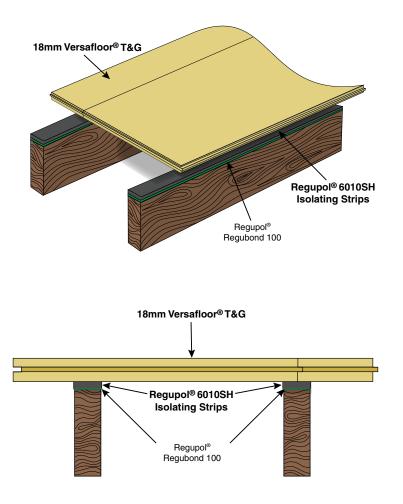
joists

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SYSTEM EXAMPLES

ACOUSTIC FLOOR INSTALLATION EXAMPLE

Regupol® Isolating 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.



SYSTEM EXAMPLES

For further information please contact our technical services 01925 860999.

EXAMPLES OF VARIOUS SYSTEM PERFORMANCES



Timber walking surface

- Underfloor Heating
- Regupol®4515 (adhesively installed to Versafloor®)
- 18mm Versafloor[®] T&G on strips of Regupol[®] 6010SH (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/m³)
- Existing lath and plaster ceiling
- Impact performance 52dB L_{nTw}^{1} Airborne performance 49dB D_{nTw} + C_{tr}

Wood walking surface

- 18mm Versafloor® T&G
- Strips of Regupol[®]6010SH (adhesively installed to the top of timber joists)
- Timber joists with 100mm mineral wool insulation (density 60kg/m³)
- RB-1 resilient bar with 2x12.5mm soundbloc plasterboard as the ceiling
- Impact performance 54dB L_{nTw}^{1} Airborne performance 52dB $D_{nTw} + C_{rr}$

Wood walking surface

- 18mm Versafloor[®] T&G
- Strips of Regupol[®]6010SH (adhesively installed to the top of timber joists)
- Timber joists with 100mm mineral wool insulation (density 60kg/m³)
- Existing lath and plaster ceiling
- Impact performance 52dB L_{nTw}^{1} Airborne performance 53dB $D_{nTw} + C_{rr}$

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

SYSTEM EXAMPLES

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VERSAFLOUR® I	LUAU

20mm EUROFORM - VERSAFLOOR® CEMENT PARTICLE BOARD

CHARTS

		Uniformly	distributed loa	ıd (kN/m²)				Con	centrated load	i (kN on 50mn	n x 50mm squ	are)		
		Single Span			Continuous				Single Span		Continuous			
Span (mm)	Load limited by	Load lin defle		Load limited by	Load limited by deflection			Load limited by			Load limited by			
		Span/300	Span/500		Span/300	Span/500		stress	Span/300		stress	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		-	2.5	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	-	-	

22mm EUROFORM - VERSAFLOOR® CEMENT PARTICLE BOARD

		Uniformly	distributed loa	ad (kN/m²)			Concentrated load (kN on 50mm x 50mm square)							
		Single Span			Continuous				Single Span		Continuous			
Span (mm)	Load limited by			Load limited by	Load limited by deflection		Span (mm)	Load limited by						
	stress	Span/300	Span/500	stress	Span/300	Span/500		stress	Span/300	Span/500		Span/300	Span/500	
300	15.9	-	-	19.9	-	-	300	0.6	-			-	-	
400	8.8	-	-	11.1	-	-	400	0.6	-			-	-	
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	-	-	

18mm EUROFORM - VERSAFLOOR® CEMENT PARTICLE BOARD

		Uniformly	distributed loa	ad (kN/m²)				Con	centrated load	d (kN on 50mn	n x 50mm squ	iare)	
		Single Span		Continuous					Single Span		Continuous		
Span (mm)				Load limited by		Load limited by deflection		Load limited by				Load limited by deflection	
		Span/300	Span/500	stress	Span/300	Span/500		stress	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	-	-		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	-	-

19mm EUROFORM - VERSAFLOOR® CEMENT PARTICLE BOARD

		Uniformly	distributed lo	ad (kN/m²)				Con	centrated load	i (kN on 50mr	n x 50mm sql	iare)		
		Single Span			Continuous				Single Span		Continuous			
	Load limited by		nited by ection	Load limited by limited by limited by		Span (mm)	Load limited by		nited by ction	Load limited by	Load limited by deflection			
		Span/300	Span/500	stress	Span/300	Span/500		stress	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	-	-	
	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			

LOADING TABLES

VERSAFLOOR®	LOAD CHARTS

28mm EUROFORM - VERSAFLOOR® CEMENT PARTICLE BOARD

			distributed loa	ıd (kN/m²)					centrated load		n x 50mm squ	iare)		
											Continuous			
Span (mm)	Load limited by		nited by ection	Load limited by	Load limited by deflection						Load limited by		nited by ection	
	stress	Span/300	Span/500		Span/300	Span/500		stress	Span/300		stress	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	-	-	

32mm EUROFORM - VERSAFLOOR® CEMENT PARTICLE BOARD

		Uniformly	distributed loa	ad (kN/m²)				Con	centrated load	i (kN on 50mn	n x 50mm sql	are)	
		Single Span			Continuous				Single Span		Continuous		
Span (mm)	Load limited by	Load lin defle	nited by ection	Load limited by		Load limited by deflection					Load limited by	Load limited by deflection	
	stress	Span/300	Span/500	stress	Span/300	Span/500		stress	Span/300	Span/500	stress	Span/300	Span/500
300	33.7	-	-	38.4	-	-	300	1.3	-	-	2.1	-	-
400	18.8	-	-	23.6	-	-	400	1.2	-	-	1.9	-	-
500	11.9	-	-	15.0	-	-	500	1.1	-	-	1.8	-	-
600	8.1	-	-	10.3	-	-	600	1.1		-	1.7	-	-
700	5.9	-	5.5	7.4	-	-			-	-	1.6	-	-
800	4.4	-	3.7	5.6	-	-	800	1.0	-	-	1.6	-	-
900	3.4	-	2.6	4.3	-	-	900	1.0	-	-	1.5	-	-
1000	2.7	-	1.9	3.4	-	-	1000	0.9	-	-	1.5	-	-

24mm EUROFORM - VERSAFLOOR® CEMENT PARTICLE BOARD

		Uniformly	distributed loa	ad (kN/m²)				Cor	icentrated loac	I (kN on 50mr	n x 50mm squ	iare)									
											Continuous										
Span (mm)	Load limited by	Load lir defle		Load limited by												Load limited by	Load lin defle		Load limited by	Load lin defle	
		Span/300	Span/500	stress	Span/300	Span/500			Span/300	Span/500	stress	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	-	-								

25mm EUROFORM - VERSAFLOOR® CEMENT PARTICLE BOARD

		Uniformly	distributed loa	ad (kN/m²)				Cor	centrated load	i (kN on 50mr	n x 50mm squ	iare)		
											Continuous			
	Load limited by		nited by ction	Load limited by				Load limited by			Load limited by			
		Span/300	Span/500	stress	Span/300	Span/500		stress	Span/300	Span/500	stress	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	-	-	

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LOADING TABLES

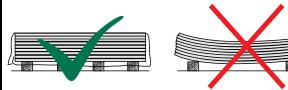
SITE PROCEDURE

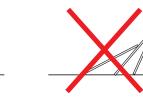




TRANSPORT

Versafloor® 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

0±N

6 Handling

SAFETY 8

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.

PRODUCT SAFETY INFORMATION

REACTION TO FIRE:	BS 476-6 & BS 476-7: Class 0 Building Board Class 1 surface spread of flame	COMPOSITION:	Portland Cement Wood Water Non-toxic chemical neutralising agents
	EN 13501-1: B _n -s1	BASE:	Alkaline pH12 in the presence of surface moisture
TOXIC GAS: HEALTH:	Nil Skin contact - classified as non- aggressive dust. Eye contact - Normal Treatment for removing foreign bodies from eyes. Inhalation - Process dust is non- aggressive, but protection recommended.	For further informatior) please contact our technical services

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PROCESSING

MACHINING

Versafloor® is machined and processed in the same manner as resin bonded particle boards, but ensuring 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.

SAWING Equipment

Type of blade

- Portable circular saw.
- Fixed saw for dimensioning (vertical or horizontal).
- Alternative or trapezoidal teeth
- Chart shows number of revolutions and number of teeth (Z)

Diameter mm	250	300	350	400
Panel thickness 18 - 37mm	Z=36	Z=48	Z=54	Z=60
Number of revolutions rpm	3000/4500	3000	3000	3000/1500

MILLING

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).



Versafloor[®] can be sanded using a vibrating sanding machine or belt sanding machine. Belts should be 40-80 grains; open coat structure with linear speed of 20 to 28 m/sec. When working in confined areas dust extraction equipment is recommended. Hand-held Orbital Sander, Hand-held Belt Sander. When used indoors, use vacuum dust extractor.

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