

MACHINING AND FIXING
of BZSPlus cement-bonded particleboard



2021

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Easy machining is one of the advantages of cement-bonded particleboard. Though it is considerably stronger than chipboard, it can be machined using common woodworking equipment.

Tungsten carbide or diamond tipped tools should be used to achieve smooth cut surface.

Cutting



Handheld circular saw should be used for cutting (formatting, trimming) of cement-bonded particleboard at the site. It is recommended to use a saw guide to obtain a clean and fast cut. In order to protect the front surface from damage, the panels should be cut on the underside.



Small fragments of cement-bonded particleboard can be cut using an angle grinder with a diamond blade or a silicon carbide stone cutting disc.



Electric jigsaw is suitable for chamfering edges and making curved cuts in cement-bonded particleboard. It is recommended to use special CBPB and diamond tipped blades.

Drilling



Handheld electric drills with digital speed control are used for drilling holes in cement-bonded particleboard.

High strength steel (HSS) drills can be used for drilling a small number of holes. For continuous use, high-speed carbide or diamond tipped twist drills are recommended.

Milling



Handheld electric routers with carbide tipped bits are used for milling cement-bonded particleboard.

Note: It is important to set the router bit speed correctly. If the speed is too high, you risk leaving burn marks on the panel. If the speed is too low, your productivity decreases and the quality of cuts deteriorates.

Sanding



After installation of the panels, there may be some uneven areas at the joints, which should be smoothed by sanding. Handheld vibrating, orbital or belt sanders are used for this purpose. The grit number of abrasive material should be within the range of 40–100.

Note: Sanding disrupts the fine surface layer, which results in exposed panel structure, increased moisture absorption, deterioration of physical and mechanical properties.

After sanding, apply a coat of primer on the panels to strengthen the surface and to reduce water absorption.

Note: Cutting, drilling, milling and sanding of cement-bonded particleboard produces a lot of dust, therefore dust collection systems and local dust extraction solutions are required.

Fixing of cement-bonded particleboard

Fixing of cement-bonded particleboard in interior applications

Fixing of cement-bonded particleboard in exterior applications

2.

Cement-bonded particleboards can be fixed to the substructure with screws and rivets (when fixing to metal profiles). In the industrial sector, metal staples are used for fixing cement-bonded particleboards to the wooden frame.

All fasteners and metal parts of the substructure should have a corrosion resistant coating. The elements of the

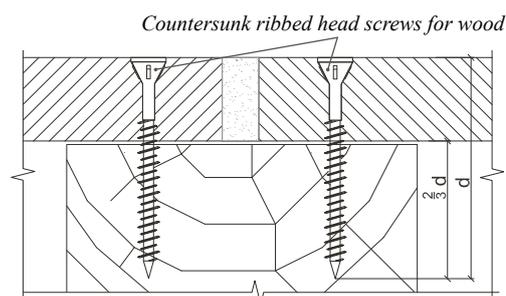
frame should be aligned and levelled before fixing cement-bonded particleboards. All surfaces and edges of the boards should be primed before fixing. Particular care must be taken in applying primer to the edges.

CBPB fixing in interior applications

The main requirement for correct installation of cement-bonded particleboards is to observe spacing between the fasteners and distance to the board edges.

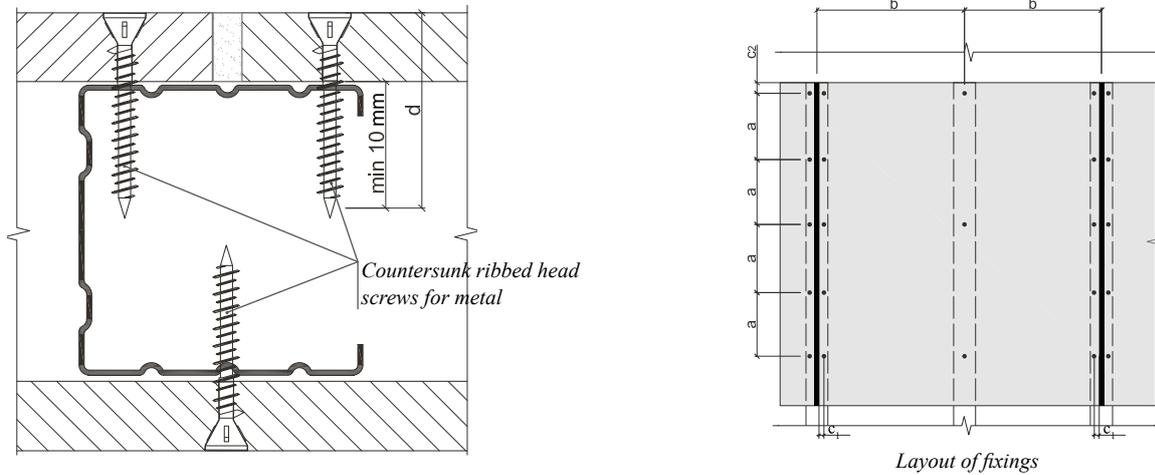
Fixing to timber substructure

Countersunk double thread strong-point screws with ribs for drilling a hole matching the head diameter are best suited for fixing cement-bonded particleboards. Screw length should be at least three times the board thickness, so that 2/3 of the screw body would be driven in the timber substructure.



Fixing to metal substructure

Galvanized CW and UW profiles are most commonly used as components of metal substructure. UW profiles are fixed horizontally to the floor and ceiling over a sound insulation strip. CW profiles should be placed vertically into the fixed horizontal tracks. The length of CW studs must be 15mm shorter than the floor-to-ceiling height. Cement-bonded particleboards are fixed with screws only to the vertical CW studs. Screw holes should be pre-drilled, and screw length should be at least 10 mm greater than the panel thickness.



Interior partitions without fire resistance requirements

CBPB thickness, (mm)	Spacing between screws, a (mm)	Spacing between studs, b (mm)	Distance to the vertical board edge, c₁ (mm)	Distance to the horizontal board edge, c₂ (mm)
8	< 200	< 404	> 25 < 50	> 50 < 100
10	< 250	< 460		
12	< 250	≤ 605		
16, 18, 20	< 300	≤ 642		
22, 24	< 350	≤ 642		

Interior partitions with fire resistance requirements

CBPB thickness, (mm)	Spacing between screws, a (mm)	Spacing between studs, b (mm)	Distance to the vertical board edge, c₁ (mm)	Distance to the horizontal board edge, c₂ (mm)
10, 12, 16, 18	< 200	≤ 605	> 25 < 50	> 50 < 100

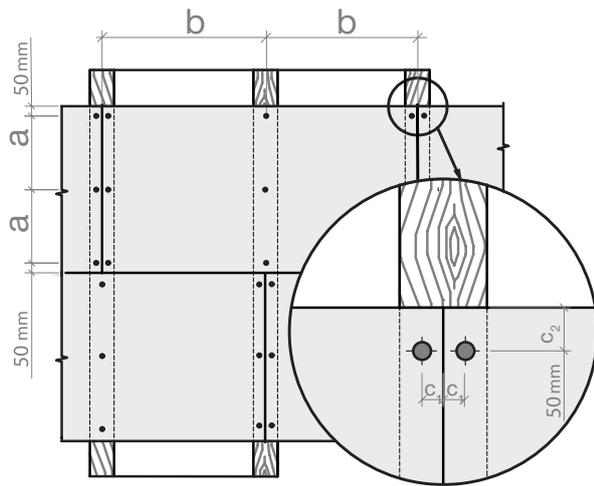
Interior ceiling without fire resistance requirements

CBPB thickness, (mm)	Spacing between screws, a (mm)	Spacing between studs, b (mm)	Distance to the vertical board edge, c₁ (mm)	Distance to the horizontal board edge, c₂ (mm)
8	< 200	< 404	> 25 < 50	> 50 < 100
10	< 250	< 460		
12	< 300	≤ 605		

Interior ceiling with fire resistance requirements

CBPB thickness, (mm)	Spacing between screws, a (mm)	Spacing between studs, b (mm)	Distance to the vertical board edge, c₁ (mm)	Distance to the horizontal board edge, c₂ (mm)
12	< 200	< 404	> 25 < 50	> 50 < 100

Floor Structures



Layout of fixings

Note: When cement-bonded particleboard is used as flooring board, the screw length should be at least 20 mm greater than the board thickness.

CBPB thickness, (mm)	Spacing between screws, a (mm)	Spacing between studs, b (mm)	Distance to the vertical board edge, c ₁ (mm)	Distance to the horizontal board edge, c ₂ (mm)
12 (in floating floor systems)	Pre-drilled upper layer < 300	—	> 25 < 50	50
16 – 24*	≤ 273	≤ 596**		

* — with machined edges (tongue and groove).

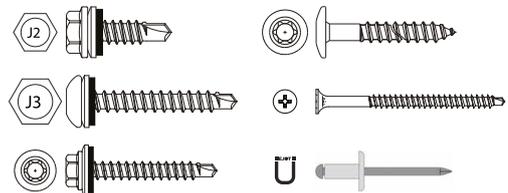
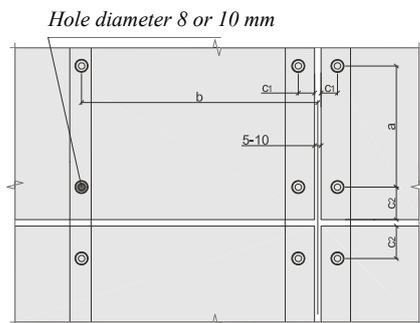
** — pursuant to calculated loads.

Fixing of cement-bonded particleboard in exterior applications

Depending on the board arrangement on the substructure, facade systems are classified into VARIO and PLANK systems.

VARIO facade system

(cement-bonded particleboard cladding with visible horizontal and vertical joints)



In VARIO system the boards are fixed with stainless steel or galvanized screws with corrosion-resistant coating, round or hexagonal head and washers with a waterproof gasket. The gasket is made of vulcanized elastomer (EPDM) which creates waterproof seal and flexible connection of materials. Screw type also depends on the type of load-bearing substructure used. Rivets can be used for fixing cement-bonded particleboards to galvanized (aluminum) structures.

Recommended thickness of cement-bonded particleboards for VARIO facade systems is 10–12 mm. Maximum panel size: 3200 x 1200 mm.

CBPB thickness, (mm)	Spacing between screws, a (mm)	Spacing between studs, b (mm)	Screw distance to the vertical board edge, c ₁ (mm)			Screw distance to the horizontal board edge, c ₂ (mm)
			timber	zinc plated steel	aluminum	
8	< 400	< 404	> 25 < 50	> 30 < 50 > 50 < 70*	> 50 < 70	> 70 < 100
10	< 500	< 460				
12	< 500	≤ 605				
16	< 550	≤ 642				

* For boards with horizontal dimension >1920 mm.

At least one fixed point of 5 mm diameter (in the center of the panel) is needed to stabilize the board position.

When fastening with screws, cement-bonded particleboards must be predrilled. Hole diameter: 10 mm for board length over 1600 mm; 8 mm for board length less than 1600 mm.

Panels should be fixed to the substructure to allow movement of the boards caused by dimensional

changes. Like any wood-based product, cement-bonded particleboard may be affected by slight expansion and shrinkage when exposed to changes in temperature and humidity.

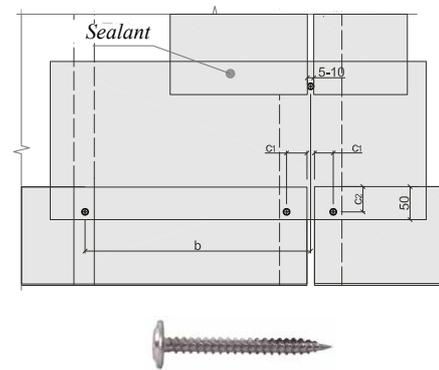
A 5–10 mm expansion joint is required between the panels to account for temperature induced linear expansion.

PLANK facade system

(overlapping cement-bonded particleboards with visible horizontal and vertical joints)

In PLANK system the boards are fixed with countersunk stainless steel or galvanized screws with corrosion-resistant coating.

The board must be pre-drilled using a 5 mm drill (minimum 1.2 times the screw diameter) before fixing. The holes must be countersunk before placing the screws.



CBPB thickness, (mm)	Spacing between screws, a (mm)	Spacing between studs, b (mm)	Screw distance to the vertical board edge, c ₁ (mm)	Screw distance to the horizontal board edge, c ₂ (mm)	Maximum CBPB length, (mm)
			timber, zinc plated steel, aluminum		
8	< 400	< 404	> 35 < 50	min. 40	1200
10	< 400	< 504			1500
12	< 350	< 604			1800
16	< 400	< 704			2100

Panels should be fixed to the substructure to allow movement of the boards caused by dimensional changes. At least 5 mm expansion joints are required between individual facade elements.

For esthetic appearance, it is recommended to bevel the outside panel edges at 45° or round them with r=3.2–3.5 mm radius router bit.



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