CSPBZS BZSPlus and BZSPlus+

BZSPlus and BZSPlus+ IS CEMENT BONDED PARTICLE BOARD MANUFACTURED TO BS EN 634-1 and 2. These Boards are cement bonded particle board intended for both internal and external use which has very high levels of performance in the presence of moisture and has high resistance to fire.
BZSPlus and BZSPlus+ 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.
BZSPlus and BZSPlus+ also complies with the general requirements as listed in EN634-1 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.

BZSPlus+ **Physical and Mechanical Properties**		
	Limit Values According to Standard	**Mean Values - Actual**
Bulk density according to EN323	1350-1430 kg/m^3	1420 kg/m3
Bending tensile strength according to EN310	Min. 9.0 N/mm^2	12.5 N/mm2
Elasticity modulus according to EN310	Min. 4500 N/mm2	6800 N/mm^2
Tensile strength perpendicular to the surface of the board according to EN319	Min 0.5 N/mm2	1.05 N/mm2
Internal bond after cycle test in a wet environment according to EN321	Min 0.3 N/mm2	0.7 N/mm^2
Fire Resistance according to EN13501-1		A2-s1, d0
Swelling through thickness after 24 hours in water	Max 1.5%	0.3%
Swelling through thickness after cyclic test in a wet environment according to EN321	Max 1.5%	0.02%
Water absorption after 24 hours in water		Max 16%
Coefficient of thermal conductivity		0.23 W/mk
pH of board material		12.5
Mass activity Ra 226	150 Bq/kg	35 Bq/kg

BZSPlus **Physical and Mechanical Properties**		
	Limit Values According to Standard	**Mean Values - Actual**
Bulk density according to EN323	1000 kg/m3	1350 kg/m3
Bending tensile strength according to EN310	Min. 9.0 N/mm2	13.2 N/mm2
Elasticity modulus according to EN310	Min. 4500 N/mm^2	6200 N/mm^2
Tensile strength perpendicular to the surface of the board according to EN319	Min 0.5 N/mm2	0.8 N/mm^2
Internal bond after cycle test in a wet environment according to EN321	Min 0.3 N/mm2	0.6 N/mm^2
Fire Resistance according to EN13501-1		B-s1, d0
Swelling through thickness after 24 hours in water	Max 1.5%	0.5%
Swelling through thickness after cyclic test in a wet environment according to EN321	Max 1.5%	0.05%
Water absorption after 24 hours in water		Max 16%
Coefficient of thermal conductivity		0.23 W/mk
pH of board material		12.5
Mass activity Ra 226	150 Bq/kg	35 Bq/kg

ACOUSTIC INSULATION

BZSPlus has a minimum density of 1350kg/m3 and BZSPlus+ is 1420Kg/m3 and therefore have superior acoustic performances when used in various elements of construction: walls, floors or ceilings.
With today's environmental considerations, protection against noise in the design of modern construction is often part of material selection whether used in conventional construction or as a component in off site manufacture. BZSPlus and BZSPlus+ increases substantially the mass of the overall system.

BZSPlus acoustic performance based on minimum density of 1350Kg M3 by thickness

BZSPlus Thickness (mm)	Weight Kg (m2)	Weighted Acoustic Insulation Value Rw dB (Estimate)
10	13.5	31
12	16.2	31
14	18.9	32
16	21.6	33
18	24.3	33
20	27	34
22	29.7	34
24	32.4	35

Weight

Typical density of boards are 1350 kg/m3 (BZSPlus) & 1420 kg/m3 (BZSPlus+) and for example a 2400 x 1200 x 12mm board will weigh approximately 46 kgs and 49 kgs respectively.

Worldwide Standards

Generic Cement Bonded Particle Boards are available worldwide and have gained acceptance in many countries standards by meeting the required performances for their intended applications.

INTRODUCTION

BZSPlus and BZSPlus+ cement bonded particle board is suitable for a wide range of applications. Cement particle board represents an advantage in building board technology to meet increasingly stringent building regulations and demands for ever higher standards of durability, safety and economy.
BZSPlus and BZSPlus+ contains no hazardous volatiles, it is asbestos free and its process dust is nonaggressive.
It may be sawn, planed, sanded, drilled, routed, nailed and screwed.
The main properties are fire resistance and excellent sound attenuation.
It is durable, even when unprotected, and is able to withstand the destructive influences of weather, moisture, insects, vermin and fungi.
It is robust against impact, therefore the possibility of damage is reduced.
It will not build up static charges.
It will also accept a wide variety of finishes.

INTERNAL, EXTERNAL & OTHER APPLICATIONS

Internal

BZSPlus and BZSPlus+ has advantages over other types of board materials due to its strength, workability and durability coupled with the three main attributes: fire resistance, sound reduction and moisture resistance making it ideally suited for internal walls and partitions in all construction sectors.
BZSPlus and BZSPlus+ may be confidently used in wet areas. It has anti-fungal properties and so is ideal for cold storage, food processing and all areas which highlight the importance of hygiene.

External

BZSPlus and BZSPlus+ has high levels of performance as an external cladding material and can be used in prefabricated panel construction - both single skin and sandwich application. Due to excellent "racking" properties, BZSPlus and BZSPlus+ may be utilised as a structural member in a composite building application. BZSPlus and BZSPlus+ in an untreated state is weather resistant and will not degrade with permanent exposure, even if subjected to freeze/thaw conditions. However, in general, a surface treatment is recommended for external applications. Paints, tiles or textured finishes may be used but compatibility should be sought from the manufacturers of such finishes.

EWI and Rainscreen

BZSPlus and BZSPlus+ can be used for a wide range of applications including as a carrier panel for cladding systems such as:
Insulated Render Systems
Terracotta Cladding Systems
High Performance Cladding Panels
Brick Slip Systems
Coating Systems

SITE PROCEDURE

Transport

Must be laid flat and fully protected with a waterproof sheet.
When manually moved, BZSPlus and BZSPlus+ it must be carried in a vertical position.

Storage

BZSPlus & BZSPus+ 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

BZSPlus and BZSPlus+ have 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%.
BZSPlus and BZSPlus+ 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 Hazard Information - Health & Safety Statement

FIRE: Euroclass B (BZSPlus) & Euroclass A2 (BZSPlus+)
COMPOSITION: Portland Cement
TOXIC GAS: Nil Wood
HEALTH:
Skin contact - classified as non-aggressive dust. Non-toxic chemical
Eye contact - Normal neutralising agents treatment for removing foreign bodies from eyes. **pH Level** - Alkaline pH12.5
Inhalation - Process dust is non-aggressive, but protection is recommended.

HEALTH & SAFETY

1. PRODUCT INFORMATION

Trade Name BZSPlus and BZSPlus+ Generic Name: Cement Bonded Particle Board Supplier: CSPBZS

2. PRODUCT INGREDIENTS

Manufactured from:
Portland Cement Water Wood Fibres Chemical Additives

3. PHYSICAL DATA

Appearance & Odour: Grey Sheet - No Odour
Boiling Point: NA %
Volatile by volume: 0
Vapour Pressure: NA Melting Point: NA Water Solubility%: NA Specific Gravity: 1.25 Evaporation Rate: Nil Density: 1350kg/m3 (BZSPlus) & 1420kg/m3 (BZSPlus+) Surface pH: 12.5

4. FIRE & EXPLOSION DATA

Flash Point: NA
Extinguishing Media: Foam, Water
Unusual Fire or Explosion Hazard: None Special Fire Fighting Procedures: None Flammability: NA

5. FIRST AID MEASURES

Eye Contact: Flush eyes immediately with water or physiological saline for at least 15 minutes, then if necessary remove contact lenses and open eye widely. Seek medical advice if irritation persists. Skin Contact: Use water to wash skin thoroughly.
Ingestion: Flush mouth and drink plenty of water. Inhalation: Take person to an area away from product and where they can inhale plenty of fresh air.
If necessary to seek medical advice take this data sheet with you to the doctor or casualty department.

6. TOXICOLOGICAL INFORMATION

Short term effects:
Eyes - Dust may cause temporary irritation and watering of the eyes.
Lungs - Dust may result in irritation of the respiratory tract.
Ingestion - Mild discomfort.
Long term effects - Prolonged inhalation of high concentrations of the dust may cause respiratory conditions.

7. ACCIDENTAL RELEASE MEASURES

Collect dust with a type H vacuum cleaner that should comply to BS 5415 as a minimum or soak with water and brush up the dust. Restrict spreading and refer to handling procedures. Make sure to use personal safety equipment.

8. PERSONAL PROTECTION

Eyes: Safety Glasses for dust protection.
Skin: Protective gloves, normal working overalls.
Inhalation: Mask with dust type filter P2. Ensure to change filters as necessary.
Work Environment: The work area should be well ventilated.

9. HANDLING

When drilling or cutting effective emission ventilation should be in place. The use of high speed cutting tools should be avoided unless emission ventilation (dust extraction) is in place.

10. FIRE MEASURES

No special fire precautions are necessary.
Fire fighting equipment is not applicable.
Hazardous decomposition products - not flammable.
Small quantity of carbon monoxide and carbon dioxide.

11. OTHER INFORMATION

Occupational Exposure Standard (OES)
Portland cement OES 10mg/m3 total dust 5mg/m3 respirable dust, 8 hr time weighted averages. Cellulose OES 10mg/m3 total dust, 5mg/m3 respirable dust, 8 hr time weighted averages.
Soluble Aluminium Salts OES 2mg/m3 total inhalable dust.

PROCESSING

MACHINING

BZSPlus and BZSPlus+ can be machined and processed in the same manner as resin bonded particle boards, but ensure that tungsten carbide tipped blades are used at all times. Tool wear during the processing of BZSPlus & BZSPlus+ 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
Cross cut hand saws for thicknesses up to 12mm.
Jigsaw for thicknesses up to 12mm and small work.
Portable circular saw.
Fixed saw for dimensioning (vertical or horizontal).
Type of blade.
Alternative or trapezoidal teeth.
Table below shows number of revolutions and number of teeth (Z).

Diameter mm	**250**	**300**	**350**	**400**
Panel thickness up to 12mm	Z=48	Z=60	Z=72	Z=72
Panel thickness exceeding 12mm	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

BZSPlus and BZSPlus+ 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 CBPB 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).

SANDING

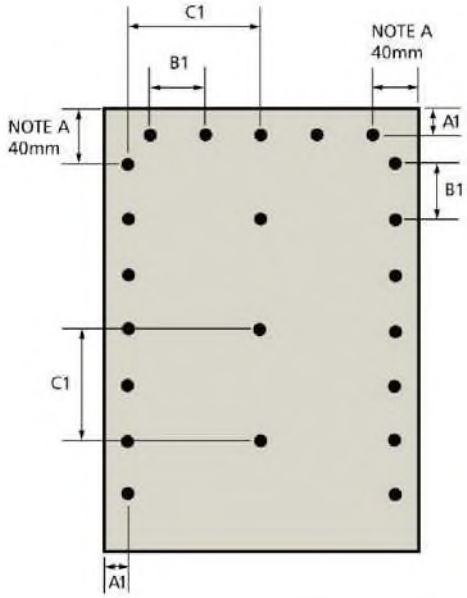
BZSPlus and BZSPlus+ can be sanded using an Orbital Sander, vibrating sanding machine or belt sanding machine. Belts should be 40-80 grit; open coat structure with linear speed of 20 to 28 m/sec. When working in confined areas dust extraction equipment is recommended.

EDGING, JOINTING AND GENERAL FIXING DETAILS

BZSPlus and BZSPlus+ can be affected by variation in relative humidity and as such, slight dimensional changes can occur.
If the panel is unprotected or a surface treatment is used which allows the panel to be subjected to the varying effects of relative humidity, then the fixings and in particular the joints between the panels must allow for movement.

MOUNTING & FIXING
MOUNTING

BZSPlus and BZSPlus+ can be fixed using nails, screws or staples and is also suitable for manual, pneumatic and powered fixing methods. The following table is a guide to fixing distances for most common applications however, the details are not sufficient when BZSPlus or BZSPlus+ is to be subjected to particular structural forces such as wind suction or loading on ceiling soffits etc. In such cases further advice should be obtained from the fixings manufacturer.

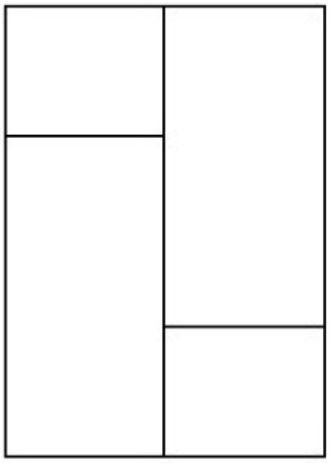


NOTE A - The first fixing in from the corner for both horizontal and vertical fixing must be 40mm in from edge

Fixing Distances

Board Thickness	**Centres mm**			
mm	A	A1	B1	C1
8	40	20	200	400
10 - 12	40	20	300	600
16 +	40	30	400	600

BOARD ARRANGEMENT
We recommend that BZSPlus and BZSPlus



NOTE
Do not use 4 way joints.
Minimum board width should not be less than 100mm.

EXPANSION/MOVEMENT JOINTS
BZSPlus & BZSPlus+ can be affected by variation in relative humidity and as such, slight dimensional changes can occur.
If the panel is unprotected or a surface treatment is used which allows the panel to be subjected to the varying effects of relative humidity, then the fixings and in particular the joints between the panels must allow for movement.
Recommendation-
oversize the screw hole and leave a 3-6mm gap at the joint.
Joints can be filled with Intumescent joint compound.

MOUNTING & FIXING

FIXING SCREWING

Type of screw:
Wafer head screws designed for particle boards in stainless steel, or Carbon Steel, preferably selftapping screws with central tip adapted to the type of substrate

- diameter: 3.5 to 5.5 mm
- length: 2.5 to 3 times the panel thickness. We recommend the following EJOT fixings.

Steel gauge	**Board Thickness**	**Screw Type**
0.9 - 3mm	up to 16mm	EJOT TBF 4.8x45mm
1.2 - 3.00mm	up to 16mm	EJOT WDLS 5.5 x 35mm
4.0 - 10mm	up to 16mm	EJOT WDHS 5.5 x 65mm

Timber Battens	**Board Thickness**	**Screw Type**
Must allow 40mm Embedment	up to 20mm	EJOT TKR 4.8x60mm
Must allow 40mm Embedment	up to 36mm	EJOT TKR 4.8x80mm

EJOT data for pull out and pull through available upon request

Fixing Technique:

- manually with pre-drilling
- pre-drilling is not necessary when using a pneumatic screw driving machine and central tip screws, preferably screws with a self tapping head
- screws must be positioned as shown in the table above
- on external application screw heads should be covered to avoid rust formation
- use self-tapping screws for a metal frame structure with thicknesses exceeding 7.5/10mm

NAILS
Type of nail: Flat-headed, galvanized stainless steel, twisted or sheradized serrated.

- diameter: 2.2 to 3.1 mm.
- length: 3 to 3.5 times the panel thickness

Fixing Techniques:

- for thicknesses up to 12mm nailing can be manual, but pre-drill an 0.8 x diameter hole.
- exceeding12mm use pneumatic tools set to 5-6 bars with tape loader or nail roll, or pre-drill pilot hole.
- avoid tapping the panel with hammer.
- keep panel steadily positioned on the background structure whilst nailing.

MOUNTING & FIXING

SPECIFIC FIXING METHODS a) **Cordless nail gun into timber**

The use of a cordless nail gun enables the rapid fixing of BZSPlus and BZSPlus+ to timber frame or battens. The advantage of this method is the speed of erection time and the subsequent cost reduction.

To fix 8mm to 22mm boards for internal and external applications a 51mm x 2.8mm annular ringed nails with sheradized coating to BS 492 should be used.

The variable power setting on the tool can provide either a flush finish with the board surface where visible fixing is acceptable or where a high build surface coating is to be applied, or a countersunk nail head where filling and painting are desired.

b) Cartridge nail gun

BZSPlus and BZSPlus+ can be fixed into steel framing or structure, concrete, brickwork or concrete blockwork using cartridge fixing tools.

Fixing method can be direct to substrate, or where irregular surfaces are encountered, via battens applied prior to panels.

METHOD -Screw fixing

BZSPlus and BZSPlus+ can be screw fixed to various support systems including timber battens or framing, metal studwork or structure and by either manual or power methods.

BZSPlus and BZSPlus+ FOR CEILINGS

BZSPlus and BZSPlus+ are not generally been regarded as a ceiling material however, combining the properties of BZSPlus or BZSPlus+ with other materials can provide a high performance ceiling construction.

B or A2 Euroclass fire resistance
Moisture resistance
Easily machined to produce profiles
Can be used in grid or demountable system
Acoustic Mass to help with reduction of Airborne sound transmission Wide range of surface finishes can be applied

Ceiling Grid

BZSPlus and BZSPlus+ can be cut to size, bevel or square edged, and with a variety of surface treatments including emulsion, veneers, laminates etc. - Surface Treatment Manufacturers advice on compatibility should be sought.

SURFACE TREATMENTS TO BZSPlus and BZSPlus+

Decoration

BZSPlus and BZSPlus+ will receive most standard paint finishes and stains.

BZSPlus and BZSPlus+ have a pH of 12.5 and therefore an alkali resistant primer may be required by some coatings - it is advisable to refer to the paint manufacturer in all instances.

Remove any surface dust prior to decoration and ensure that if boards have been exposed to the elements that they have been allowed to dry out and acclimatise before being coated.

For surface treatments that are not vapour or moisture permeable, the reverse and all edges of the panel should also be treated in the same way. Uneven joints, screw holes or surface damage can be rectified by use of compatible filler.