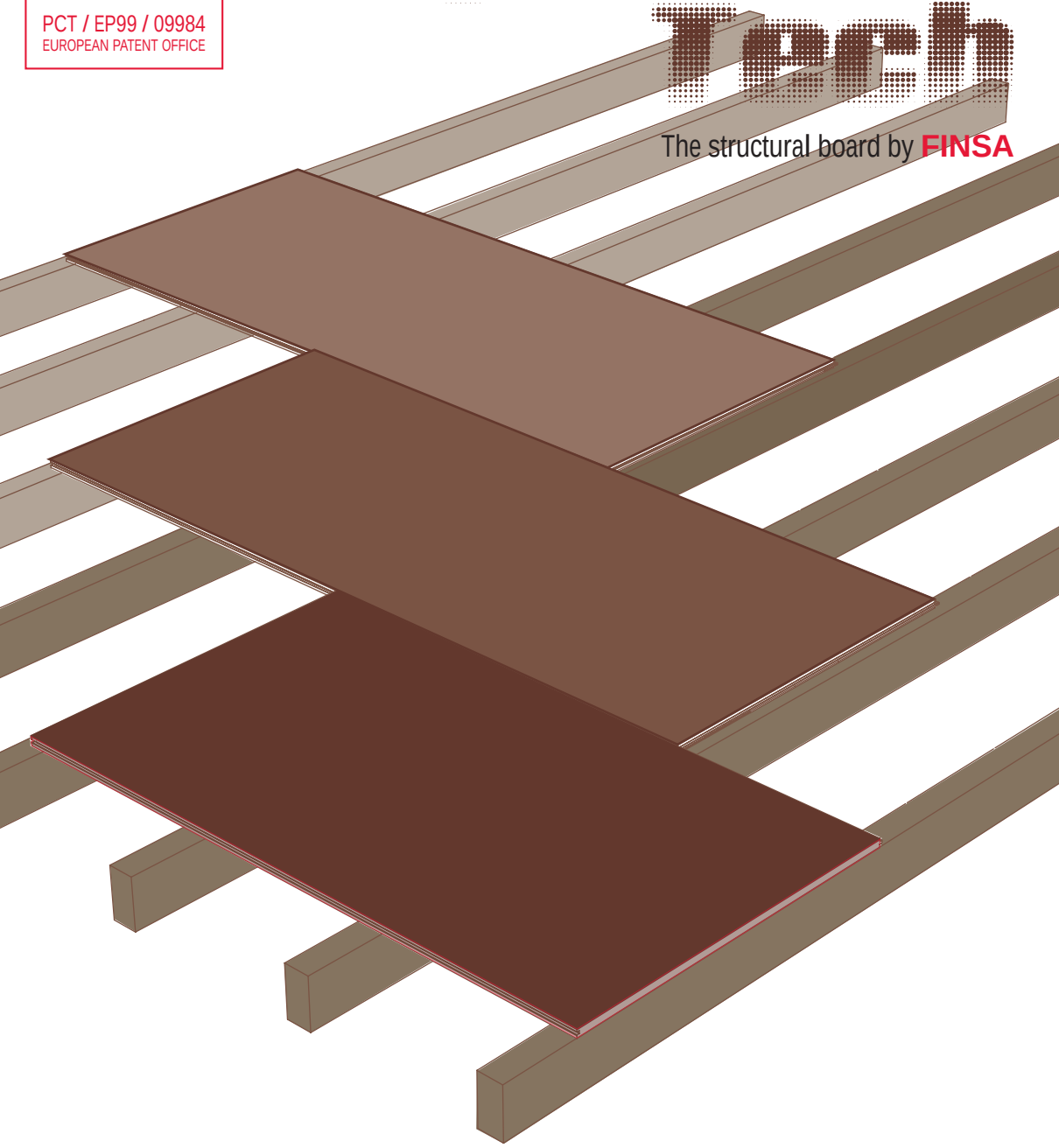
FINSA
solutions in wood

PCT / EP99 / 09984
EUROPEAN PATENT OFFICE

# superPan® Tech

The structural board by FINSA



# P4 P6

The mezzanine board

## *ABOUT* **FINSA**

*After over 80 years dedicated to wood processing, we remain committed to continue more technical and precise products.*

*With great enthusiasm and backed by extensive experience in the development of wood-based products, we want to share with you the advantages of using technical wooden boards in your projects, and share our commitment to the future of this material.*

## superPan®

*A new generation of technical wood manufactured by FINSA through a process of continuous pressing.*
*An innovative and exclusive product protected by patent no. PCT/EP99/09984 (European Patent Office)*
*Superpan is made of fibre surfaces and an inner core of wood particles.*
*This unique composition sets it apart from all other boards on the market and provides superior mechanical and physical properties.*

## superPan® Tech

*The range of structural boards by* FINSA.

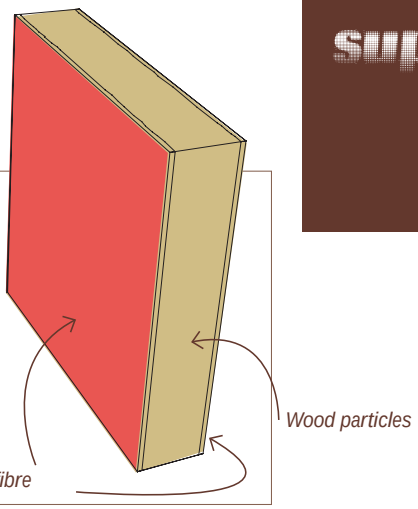
## SUPERPAN TECH P6

A high-performance and high-strength wooden board.

Ranked as P6 technical class structural board; heavy duty load-bearing boards for use in dry conditions, is a unique solution in the structural panels market.

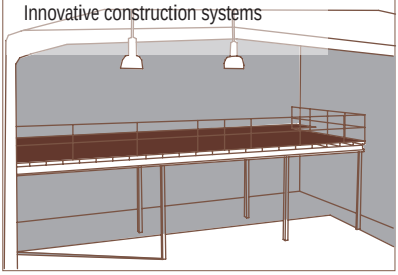
## SUPERPAN TECH P4

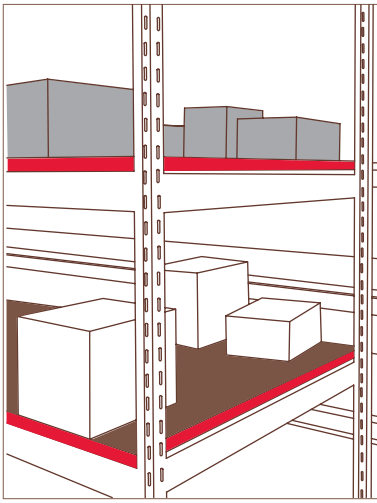
Ranked as a P4, load-bearing boards for use in dry conditions.




## APPLICATIONS

Construction of industrial mezzanines
Construction of floor slabs
Storage platforms and industrial shelving
Refurbishment and renovation of spaces
Construction of residential facilities
Innovative construction systems





## ADVANTAGES

High mechanical strength
Equal resistance in any direction of the board
Fast and easy installation with conventional woodworking tools
Significant savings in installation time and costs
Excellent value for money
Versatility of formats
Wide variety of coating possibilities
Smooth and compact surface, supports direct painting or coating
Excellent screw or nail fixing

## AVAILABILITY

Superpan Tech P6 is available in the following dimensions:

| | No. of boards per package |
|---|---|
| Format (mmxmm) ↓/Thickness (mm) → | 38 |
| 2400x600 TG2* | 27 |
| 2400x600 TG2* WHITE SUPER 1C | 27 |

*TG2=Tongue and groove on two longitudinal edges.
It is possible to supply tongue and groove on four edges (TG4).

Superpan Tech P4 is available in the following dimensions:

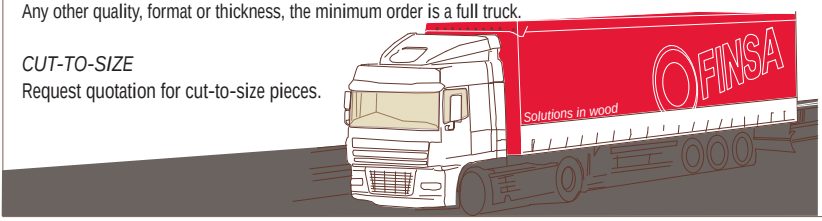
| | No. of boards per package |
|---|---|
| Format (mmxmm) ↓/Thickness (mm) → | 30 |
| 2400x900 TG4* GREY I ANTI-SLIP / WHITE SUPER | 27 |

*TG4=Tongue and groove on four edges.

It is possible to supply Superpan Tech P6.

It is possible to supply sanded surfaces with grit 40 (for improved anti-slip properties).
Also available for humid conditions, in P5 quality. Check the available sizes and thicknesses with our sales network.
Any other quality, format or thickness, the minimum order is a full truck.

*CUT-TO-SIZE*
Request quotation for cut-to-size pieces.



superPan Tech

P4 P6

## Superpan Tech P4
## TECHNICAL FEATURES

| TEST | PROPERTIES | Thickness (mm) | | | | | UNITS |
|---|---|---|---|---|---|---|---|
| | | 8 to 13 | 13 to 20 | 20 to 25 | 25 to 32 | 32 to 40 | |
| EN 323 | Density (values to be considered as a rough guide only) | 730 | 700/680 | 670 | 665 | 660/640 | kg/m³ |
| EN 319 | Internal bond | 0.40 | 0.35 | 0.30 | 0.25 | 0.20 | N/mm² |
| EN 310 | Bending strength | 23 | 21 | 20 | 19 | 18 | N/mm² |
| EN 310 | Modulus of elasticity | 2900 | 2800 | 2500 | 2200 | 2000 | N/mm² |
| EN 311 | Surface soundness | >0.8 | 1.0 | | | | N/mm² |
| EN 317 | Thickness swelling 24 h | 16 | 15 | 15 | 15 | 14 | % |
| EN 322 | Moisture content | 8±3 | | | | | % |
| EN 320 | Screw holding. Edge | 700 | | | | | N |
| EN 320 | Screw holding. Surface | 900 | | | | | N |
| EN 120 | Formaldehyde content | class E-1 <8.0 | | | | | mg/100g |
| TOLERANCE IN NOMINAL DIMENSIONS | | | | | | | |
| EN 324-1 | Thickness | ± 0.30 | | | | | mm |
| EN 324-1 | Length / width | ± 5 | | | | | mm |
| EN 324-2 | Squareness | ± 2 | | | | | mm/m |
| EN 324-2 | Edge straightness | ± 1.5 | | | | | mm/m |

These physical-mechanical values improve/comply with the P4 classification established in EN 312:2010 European Standard.
Table 1 and Table 6: Load-bearing boards for use in dry conditions.

## MECHANICAL PROPERTIES *(according to EN 12369-1)*

| PROPERTY | THICKNESS (mm) | | | | | UNITS |
|---|---|---|---|---|---|---|
| | 8 to 13 | 13 to 20 | 20 to 25 | 25 to 32 | 32 to 40 | |
| Characteristic strength values | | | | | | |
| Bending $f_{m,p,k}$ | 14.2 | 12.5 | 10.8 | 9.2 | 7.5 | N/mm² |
| Tension $f_{t,p,k}$ | 8.9 | 7.9 | 6.9 | 6.1 | 5.0 | N/mm² |
| Compression $f_{c,p,k}$ | 12.0 | 11.1 | 9.6 | 9.0 | 7.6 | N/mm² |
| Panel Shear $f_{v,p,k}$ | 6.6 | 6.1 | 5.5 | 4.8 | 4.4 | N/mm² |
| Planar Shear $f_{r,p,k}$ | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | N/mm² |
| Mean stiffness values | | | | | | |
| Bending $E_{m,p}$ | 3200 | 2900 | 2700 | 2400 | 2100 | N/mm² |
| Tension $E_{t,p}$ | 1800 | 1700 | 1600 | 1400 | 1200 | N/mm² |
| Compression $E_{c,p}$ | 1800 | 1700 | 1600 | 1400 | 1200 | N/mm² |
| Panel Shear $G_{v,p}$ | 860 | 830 | 770 | 680 | 600 | N/mm² |
| Characteristic density | 650 | 600 | 550 | 550 | 500 | kg/m³ |

The mechanical properties of Superpan Tech P4 boards have been tested according to EN 789 in the laboratory of the Joint Unit INIA-AITIM, in April 2012, having achieved the following values:

| PROPERTY | THICKNESS (mm) | | | | UNITS |
|---|---|---|---|---|---|
| | 18 | 22 | 25 | 32 | |
| Bending characteristic strength $f_{m,p,k}$ | 15.13 | 17.30 | 10.73 | 17.34 | N/mm² |
| Bending mean stiffness $E_{m,p}$ | 4108 | 4272 | 3793 | 4402 | N/mm² |

## CERTIFICATIONS

Superpan Tech P4 has the following certifications:

CE Marking
Issued by AENOR
No. 0099/CPD/A65/0008

AITIM 24/04/04 quality seal

Chain of custody certification
PEFC number 14-35-00006
FSC number TT-COC-003279

## DURABILITY

Superpan Tech P4 boards are suitable for Service Class 1 and Class of Use 1 according to EN 312.

## REACTION TO FIRE

Class D-s2, d0 or $D_{FL}$ -$s_1$ according to standard EN 13986.

## PHYSICAL PROPERTIES

Thermal conductivity: 0.12 W/m°K, according to standard EN 13986. Specific heat: 1700 J/kg°K.
Resistance factor to water vapour diffusion: 20, according to standard EN 13986.
Slip resistance, for anti-slip coated boards, according to UNE-ENV 12633:2003 ANNEX A: CLASS 2.
Critical sliding angle, according to DIN 5 51130:210 Chapter 5: R10.

# Superpan Tech P6
# TECHNICAL FEATURES

| TEST | PROPERTIES | | | UNITS |
|---|---|---|---|---|
| | | 25 to 32 | 32 to 40 | |
| EN 323 | Density (values to be considered as a rough guide only) | 670 | 650 | kg/m³ |
| EN 319 | Internal bond | 0.35 | 0.30 | N/mm² |
| EN 310 | Bending strength | 22 | 20 | N/mm² |
| EN 310 | Modulus of elasticity | 2800 | 2800 | N/mm² |
| EN 311 | Surface soundness | >1.0 | | N/mm² |
| EN 317 | Thickness swelling 24 h | 14 | 13 | % |
| EN 322 | Moisture content | 8±3 | | % |
| EN 320 | Screw holding. Edge | 800 | | N |
| EN 320 | Screw holding. Surface | 1000 | | N |
| EN 120 | Formaldehyde content | class E-1 <8.0 | | mg/100g |
| TOLERANCE IN NOMINAL DIMENSIONS | | | | |
| EN 324-1 | Thickness | ± 0.30 | | mm |
| EN 324-1 | Length / width | ± 5 | | mm |
| EN 324-2 | Squareness | ± 2 | | mm/m |
| EN 324-2 | Edge straightness | ± 1.5 | | mm/m |

These physical-mechanical values improve/comply with the P6 classification established in EN 312:2010 European Standard. Table 1 and Table 9: Heavy duty load-bearing boards for use in dry conditions.

## CERTIFICATIONS

Superpan Tech P6 has the following certifications:

CE Marking
Issued by AENOR
No. 0099/CPD/A65/0008

AITIM 24/04/04 quality seal

Chain of custody certification
PEFC number 14-35-00006
FSC number TT-COC-003279

## MECHANICAL PROPERTIES *(according to EN 12369-1)*

| PROPERTY | | | UNITS |
|---|---|---|---|
| | 25 to 32 | 32 to 40 | |
| Characteristic strength values | | | |
| Bending $f_{m,p,k}$ | 12.5 | 11.7 | N/mm² |
| Tension $f_{t,p,k}$ | 8.3 | 7.8 | N/mm² |
| Compression $f_{c,p,k}$ | 12.2 | 11.9 | N/mm² |
| Panel Shear $f_{v,p,k}$ | 6.5 | 6.0 | N/mm² |
| Planar Shear $f_{r,p,k}$ | 1.7 | 1.7 | N/mm² |
| Mean stiffness values | | | |
| Bending $E_{m,p}$ | 3300 | 3100 | N/mm² |
| Tension $E_{t,p}$ | 1900 | 1800 | N/mm² |
| Compression $E_{c,p}$ | 1900 | 1800 | N/mm² |
| Panel Shear $G_{v,p}$ | 950 | 900 | N/mm² |
| Characteristic density | 550 | 500 | kg/m³ |

The mechanical properties of Superpan Tech P6 boards have been tested according to EN 789 in the laboratory of the Joint Unit INIA-AITIM, in April 2012, having achieved the following values:

| PROPERTY | THICKNESS (mm) | | | UNITS |
|---|---|---|---|---|
| | 30 | 38 | 40 | |
| Bending characteristic strength $f_{m,p,k}$ | 17.28 | 15.73 | 14.42 | N/mm² |
| Bending mean stiffness $E_{m,p}$ | 3966 | 3379 | 3822 | N/mm² |

## DURABILITY

Superpan Tech P6 boards are suitable for Service Class 1 and Class of Use 1 according to EN 312.

## REACTION TO FIRE

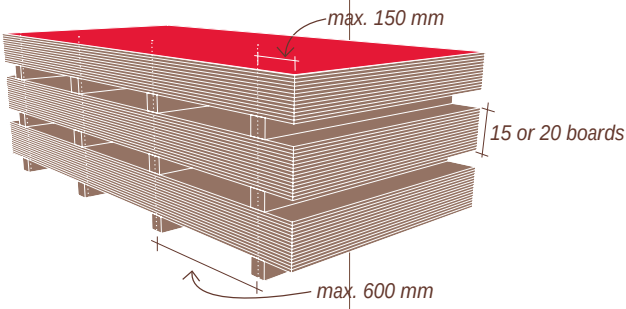
The 38mm Superpan Tech P6, coated on both sides with GREY I anti-slip, is class $B_{FL}$-$s_1$.
Any other quality, class D-s2, d0 or $D_{FL}$ -$s_1$ according to standard EN 13986.

## PHYSICAL PROPERTIES *(according to EN 13986)*

Thermal conductivity: 0.12 W/m°K. Specific heat: 1700 J/kgºK.
Resistance factor to water vapour diffusion: 20.

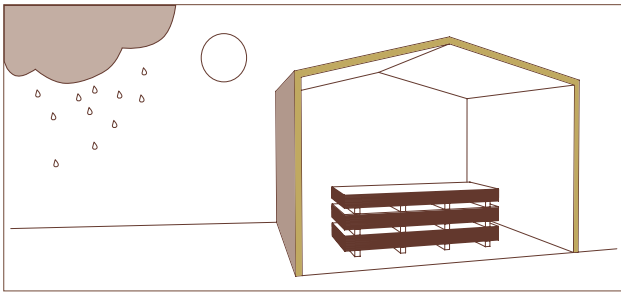
# APPLICATION GUIDE

*(according to ENV 12872:2000)*




## STACKING

Boards should be stacked horizontally upon flat surfaces, conveniently away from the ground and with a sufficient number of supports to prevent the lower panels from overload.
Intermediate battens are recommended between every 15 to 20 panels for ventilation, in line with the lower vertical battens. It is recommended that the battens are placed parallel to the shorter sides and along the entire length of the stack. It is recommended that the ends do not exceed 150 mm.
When packets are stacked, it is recommended that the supports are aligned vertically to prevent warping.
It is recommended that the top of the stack is covered.



## STORAGE

To be stored in closed dry areas, protected from the sun and rain, in compact stacks. To be protected from the action of the sun, rain and chemical splash.

It is not recommended to store the boards outside in the open air.

## CONDITIONING

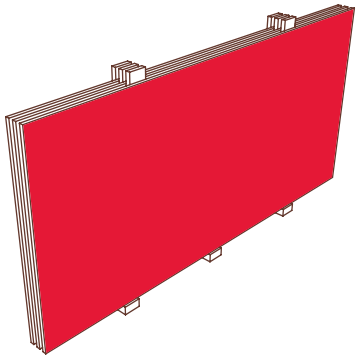
It is advised that the boards be conditioned according to the conditions of the place of application, because its moisture contents varies according to the hygrothermal conditions of the specific environment.

The dimensions of wood-based panels increase when they collect moisture from the air, and decrease when they lose it. Excessive variations in moisture contents can cause unacceptable dimensional changes, which may involve curvature, distortion and opening of the joints between boards.

| Dimensional variation corresponding to a 1% moisture variation of the boards | | |
|---|---|---|
| Length % | Width % | Thickness % |
| 0.03 | 0.04 | 0.5 |

Previous conditioning reduces dimensional variations.

*Possibility of conditioning with dividing battens*

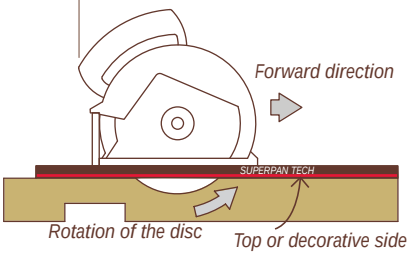


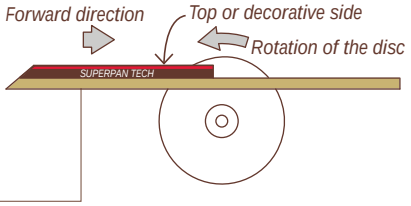
## CUTTING AND PROFILING

The machining quality of the surfaces decreases with increased moisture contents.
When greater precision is required, it is recommended that the boards be cut to size after packaging according to the moisture content of the end use.

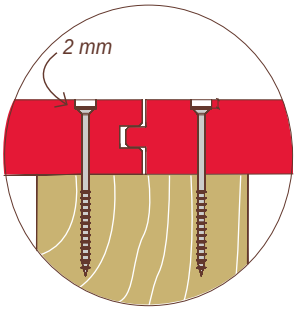
### Mechanization with power tools

The use of carbide or diamond tools and blades is recommended for increased service life.
Saw blades with alternating teeth are recommended.
It is recommended that circular saw discs are placed as low as possible in order to prevent chipping when the board comes out the back of the saw.
If the speed is too slow, the cutting tools have an insufficient cutting load and tools wear out prematurely. If the speed is too fast, the edges become rough and fibrous.
The position of the board during machine work is important. It is recommended that the boards be properly supported and pressed tightly against the cutting table and guides be used to prevent vibration.
If it is a coated board, it is recommended to place the board in such a way that the decorative side is attacked first by the saw blades.



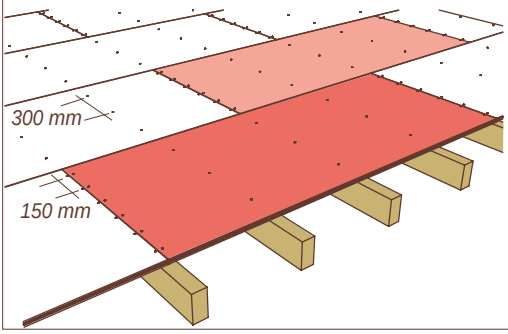

## MOUNTING




It is recommended to preferably use ringed or helical shank flat head nails, or other types of improved nails or screws with higher anchorage capacity.
It is recommended that the boards be fixed with Service Class 2 corrosion resistant connectors.
Corrosion resistant materials are galvanized steel or zinc, austenitic stainless steel, phosphor bronze, and silicon bronze.
It is recommended that the minimum length of such nails or screws is 50 mm or 2 times the thickness of the board, in case the latter dimension is bigger.
It is recommended that the diameter of the nails or screws should be at least 0.16 times the thickness of the board.
When fixing boards onto a metal structure, it is recommended to use self-screwing nails or screws. It is recommended that the screws are self drilling and self tapping slot head screws.
It is recommended to embed the screws and nails about 2 mm to 3 mm below the surface of the board.
When used as floor coating it is better not to seal the embossing holes.

Unless structural calculations require separation or different distributions, the following is recommended

| Maximum separation of fixation elements (mm) | | Minimum distance to the edge of the board (mm) |
|---|---|---|
| Distances between fixation elements around the perimeter of the boards | Distance between fasteners on the joists, transoms or studs that work as intermediate supports for the boards | |
| 150 | 300 | 8 |



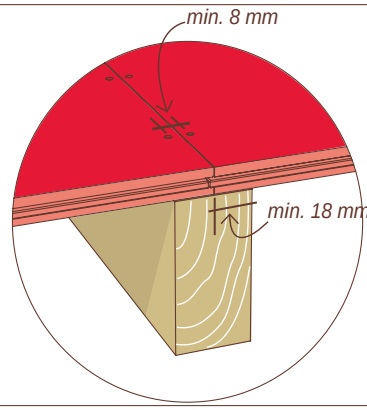

After fixation, it is recommended to protect the surfaces of the boards from damages caused by variations in humidity, sand and debris during construction work, by using polyethylene or suitable paper.

## USE IN MEZZANINES AND FLOOR SLABS

The choice of boards for floor slab structural enclosures upon beams depends on the required load stresses, spans, mechanical characteristics and class of service.
We recommend using wood-based panels only for floor slab enclosures in conditions corresponding to service class 1.

### STARTING TO WORK
### Structure preparation

It is recommended to align and level supporting edge joists, studs and braces.
It is recommended that wood, wood-based panels and structural elements not be unnecessarily exposed to more severe climate conditions than those they will have during their service life.
It is recommended that the joists and beams enable the edges of the boards to be supported in at least 18 mm.



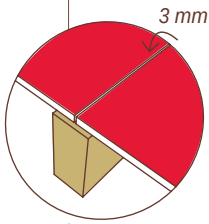

### Mechanization of the edges

Straight-edge boards require a clearance between boards and all sides should be supported upon joists or rafters.

*Thickness greater than 30 mm*


*Thicknesses 16 and 19 mm*


*Tongue and groove detail*

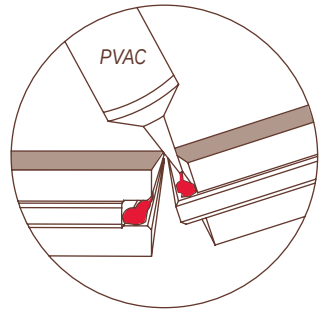



### Expansion clearances

Given the increases in moisture contents of boards, it is necessary to leave an expansion joint.
In tongue and groove edged boards, a clearance on the perimeter of the floor closure is recommended to allow possible expansions due to moisture migration from construction elements the boards are in contact with. At least 10 mm on each side or 1.5 mm per meter of board length is recommended. It is recommended that the joints be left free and covered by a skirting board or filled with a compressible strip of material such as cork or insulating fibreboard. For large floor slab enclosures longer than 7 m, intermediate expansion joints may be required.
In straight-edge boards, it is also recommended to leave a gap of 2-3 mm between each board.

### Bonding

It is recommended to glue all joints of floor slab enclosures made with tongue and groove wood boards with a suitable PVAC adhesive or the like, to prevent noises in their use.
Should you require an extra hold,
you can use a D4 PVAC glue. All boards, either tongue and grooved or with straight edges, can also be glued to the supporting wooden joists.




### Flooring materials

It is not recommended the use of thin sheet flooring or thin carpet as these may allow the board joints beneath to show through particularly after trafficking. It is advisable to have an additional layer or material between the Superpan Tech and the top surface to sufficiently absorb any potential telegraphing.

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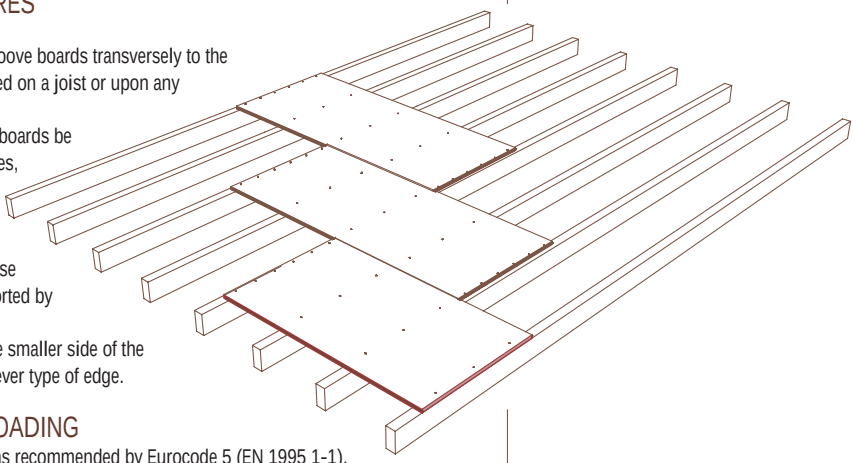
## MOUNTING SUPERPAN TECH IN FLOOR SLAB ENCLOSURES

We recommend placing tongue and groove boards transversely to the joists, with their shorter sides supported on a joist or upon any other edge support.
It is recommended that straight edged boards be continuously supported on all four sides, with the shorter sides supported upon joists and the larger ones upon crossbars or joint-covers.
All perimeter edges of the board or those obtained from cutting should be supported by studs or joists.
It is recommended that the joints of the smaller side of the boards are placed alternately, for whatever type of edge.



## PREDIMENSIONING FOR LOADING

Loads for predimensioning in kN/m², as recommended by Eurocode 5 (EN 1995 1-1).

### SUPERPAN TECH P6 38 MM

Uniformly distributed loads, service class 1.

| Uniformly distributed load, single-span kN/m² | | Medium-term loading (from 1 week to 6 months) | | | Long-term loading (from 6 months to 10 years) | | |
|---|---|---|---|---|---|---|---|
| | | Span (mm) | | | Span (mm) | | |
| | | 400 | 500 | 600 | 400 | 500 | 600 |
| Strength limit | | 130.30 | 83.39 | 57.91 | 93.07 | 59.57 | 41.37 |
| Deflection limit | L/150 | 50.07 | 25.64 | 19.84 | 33.38 | 17.09 | 9.89 |
| | L/200 | 38.94 | 19.94 | 11.54 | 25.96 | 13.29 | 7.69 |
| | L/300 | 27.82 | 14.24 | 8.24 | 18.54 | 9.49 | 5.49 |

| Uniformly distributed load, double-span kN/m² | | Medium-duration loads (from 1 week to 6 months) | | | Large-duration loads (from 6 months to 10 years) | | |
|---|---|---|---|---|---|---|---|
| | | Distance between supports, L (mm) | | | Distance between supports, L (mm) | | |
| | | 400 | 500 | 600 | 400 | 500 | 600 |
| Strength limit | | 130.30 | 83.39 | 57.91 | 93.07 | 59.57 | 41.37 |
| Deflection limit | L/150 | 120.50 | 61.70 | 35.70 | 80.33 | 41.13 | 23.80 |
| | L/200 | 93.72 | 47.99 | 27.70 | 62.48 | 31.99 | 18.51 |
| | L/300 | 66.94 | 34.28 | 19.84 | 44.63 | 22.85 | 13.22 |

Point loads applied to an area of 50x50mm, to design ultimate limit state conditions, service class 1

| Point load, in kN | Distance between supports, L (mm) | | |
|---|---|---|---|
| | 400 | 500 | 600 |
| Medium-duration loads | 6.70 | 6.29 | 6.13 |
| Large-duration loads | 4.79 | 4.49 | 4.38 |

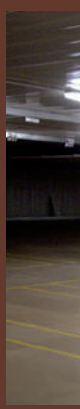
### HAND PALLET TRUCKS

General provisions, where no more than 50% of the All Up Weight is on one wheel, allow for a 1 tonne pallet truck up to 700mm spans and a 1.5 tonne pallet truck up to 500 mm spans. The engineer should refer to appropriate technical data in all design work and adequate provision should be made for all the static and dynamic effects of concentrated loads.

Load tables have been based on test data report by Centre for Timber Engineering, Edinburgh Napier University, completed in February 2013.

NOTE: These figures were obtained with calculation models for uniformly distributed loads upon boards with equal length spans loaded at the same time. It refers to predimensioned loads which do not exempt the technician responsible for the work from checking the appropriateness of the sizing to the project or to the work, by appropriate regulatory calculations.

*Industrial mezzanines and industrial storage solutions*



## EXPERIENCES OF USE

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## FINSA BRANCHES

### ESPAÑA

**Santiago de Compostela**
+34 981 99 31 01
+34 981 05 07 05
noroeste@finsa.es

**Madrid**
+34 91 212 61 00
+34 91 533 83 43
centro@finsa.es

**Barcelona**
+34 93 703 81 00
+34 93 703 81 19
catalunya@finsa.es

**La Rioja**
+34 941 20 35 00
+34 941 20 39 32
norte@finsa.es

**Valencia**
+34 96 120 20 13
+34 96 121 10 51
levante@finsa.es

**Sevilla**
+34 95 502 31 00
+34 95 444 02 37
sur@finsa.es

### PORTUGAL

**LUSO FINSA {Perafita - Matosinhos}**
+351 22 5574080
+351 22 5574089
luso@finsa.es

### FRANCE

**FINSA FRANCE {Morcenx}**
+33 5 58 82 59 00
+33 5 58 07 91 36
finsafrance@finsa.com

### ITALIA

**FINSA ITALIA {Monticello d´Alba}**
+39 0173 64607
+39 0173 64698
italia@finsa.es

### IRELAND

**FINSA FOREST PRODUCTS {Scariff}**
+353 (0) 61 64 04 09
+ 353 (0) 61 92 11 29
commercial-ffp@finsa.es

### UNITED KINGDOM

**FINSA UK {Merseyside}**
+44 151 651 2400
+44 151 651 2405
uk@finsa.es

### NEDERLAND

**FINSA BV {Vlissingen}**
+31 118 47 12 22
+31 118 47 24 00
holland@finsa.es

### POLSKA

**FINSA POLSKA {Gdynia}**
+48 58 6273200
+48 58 6273209
polska@finsa.es

### U.A.E.

**FINSA MIDDLE EAST {Dubai}**
+971 4 8809511
+971 4 8809556
finsame@finsa.es

**EXPORTS (Santiago de Compostela)**
+34 981 05 00 33
+34 981 05 07 06
export@finsa.es

FINSA
*solutions in wood*