FloorSure

FLOORSURE CEMENT FLOOR BOARDS DESIGN & LOAD TABLES

Supplied by Ecobuild Solutions

FloorSure floor boards have been independently tested and certified to meet NCC/BCA Deemed-to-Satisfy structural requirements for floor loadings to AS/NZS 1170.1 Table 3.1

The following tables are provided to inform designers, engineers and relevant users of:

- the maximum concentrated and uniformly distributed actions that the FloorSure floor boards have been designed to withstand; and
- the applications for which the FloorSure floor boards are suitable using Table 3.1 in AS/NZS 1170.1 as the basis.

These load tables are based on the following assumptions:

- The FloorSure floor boards will be installed in accordance with the details described in the FloorSure Installation guide including:
  - o their lengths will be laid across the joists;
  - o their short edges will be fully supported on joists;
  - o their long edges will be fully supported at stair treads or landings;
  - o their long groove edges will be filled with a continuous bead of approved joint sealant prior to the adjacent board's tongue being slotted into the groove.
  - o they will be dry when being installed and thereafter.
- The design will include 1kPa of super-imposed dead action as well as the weight of the board.
- The design will adopt a serviceability limit $G + \psi Q$ = span/300.

1. Concentrated Actions

a. AS/NZS 1170.1 (Table 3.1) specifies the following reference values of concentrated floor actions:
   i. For residential applications, a concentrated action of 1.8kN applied to a minimum area of 350mm2.
   ii. For commercial and other applications, concentrated actions of 2.7kN or above (depending on the specific application) applied to a minimum area of 0.01m2 (100mm x 100mm).

b. In the context of AS/NZS 1170.1's requirements, TABLE 1 below reflects the maximum allowable concentrated actions to be applied to the 30mm thick FloorSure floor boards. Note: A combination factor of 1.5 applies.

TABLE 1: MAXIMUM ALLOWABLE CONCENTRATED ACTIONS - kN

Thickness (mm)	Maximum Joist Centres (mm)	Domestic & Residential Activities[1]	Commercial Activities (min area of 0.01m^2)
30	300	2.7	4.5
	450	2.7	4.5
	600	2.7	4.5

Notes:

1. The maximum concentrated action of 1.8kN for domestic & residential activities shall be applied over a minimum area of 350mm2 for calculation of punching or crushing.

2. Uniformly Distributed Actions

a. AS/NZS 1170.1 (Table 3.1) also specifies reference values of uniformly distributed floor actions which vary depending on the specific application.

b. In the context of AS/NZS 1170.1's requirements, TABLE 2 below reflects the maximum allowable uniformly distributed actions to be applied to the 30mm thick FloorSure floor boards. Note: A combination factor of 1.5 applies.

TABLE 2: MAXIMUM ALLOWABLE UNIFORMLY DISTRIBUTED LIVE ACTIONS - kPa

Thickness (mm)	Maximum Joist Centres (mm)		
	300	450	600
30	7.5	7.5	7.5

3. Applications for which the FloorSure floor boards are suitable using Table 3.1 in AS/NZS 1170.1 as the basis

✔ = suitable;
✖ = not suitable

Note: FloorSure floor boards are not suitable for any applications not reflected in the below table.

Type of activity / occupancy for part of building or structure	Specific uses	Uniformly distributed actions (kPa)	Concentrated actions (kN)	FloorSure Cement Floor Boards		
				30mm FloorSure Flooring		
				Maximum Joist Centres (mm)		
				600	450	300
A Domestic & residential activities (see also Cat C)						
A1 Self-contained dwellings	General areas, private kitchens and laundries in self-contained dwellings.	1.5	1.8[1]	✔	✔	✔
	Balconies used for floor type activities in self-contained dwellings: (a) less than 1m above ground level	1.5	1.5kN/m run along edge	✔	✔	✔
	(b) other	2.0	1.8[1]	✔	✔	✔
	Stairs[2] and landings in self-contained dwellings.	2.0	2.7	✔	✔	✔
	Non-habitable roof spaces in self-contained dwellings	0.5	1.4	✔	✔	✔
A2 Other	General areas, bedrooms, hospital wards, hotel rooms, toilet areas.	2.0	1.8[1]	✔	✔	✔
	Communal kitchens	3.0	2.7	✔	✔	✔
	Balconies used for floor-type activities with community access.	Same as areas providing access but not less than 4.0	1.8	✔	✔	✔

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				30mm FloorSure Flooring		
				Maximum Joist Centres (mm)		
				600	450	300
B Offices & work areas not covered elsewhere						
	Operating theatres, X-ray rooms, utility rooms.	3.0	4.5	✔	✔	✔
	Work rooms (light industrial) without storage.	3.0	3.5	✔	✔	✔
	Offices for general use	3.0	2.7[3]	✔	✔	✔
	Offices for general use with allowance for a safe.	3.0	6.7	✖	✖	✖
	Communal kitchens	3.0	2.7	✔	✔	✔
	Commercial / institutional kitchens	5	4.5	✔	✔	✔
	Laundries	3.0	4.5	✔	✔	✔
	Laboratories	3.0	4.5	✔	✔	✔
	Factories, workshops & similar buildings (general industrial)	5.0	4.5	✔	✔	✔
	Balconies used for floor-type activities.	Same as areas providing access but not less than 4.0	1.8	✔	✔	✔

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				30mm FloorSure Flooring		
				Maximum Joist Centres (mm)		
				600	450	300
C Areas where people may congregate						
C1 Areas with tables	Public, institutional & communal dining rooms & lounges, cafes & restaurants[5]	2.0	2.7	✔	✔	✔
	Reading rooms with no book storage	2.5	4.5	✔	✔	✔
	Classrooms	3.0	2.7	✔	✔	✔
C2 Areas with fixed seats[6]	Institutional assembly areas such as classrooms, lecture theatres & similar	3.0	2.7	✔	✔	✔
	Public assembly areas such as public halls, theatres, courts of law, auditoria, conference centres & similar	4.0	2.7	✔	✔	✔
	Places of worship	4.0	2.7	✔	✔	✔
C3 Areas without obstacles for moving people	Corridors, hallways, aisles, stairs[2], landings[2], concourses, terraces, plazas etc not subject to wheeled vehicles.	4.0	4.5	✔	✔	✔
	Corridors, hallways, aisles, stairs[2], landings[2], concourses, terraces, plazas etc subject to wheeled vehicles.	5.0	4.5	✔	✔	✔
	Footpaths, terraces and plazas at ground level subject to wheeled vehicles	5.0	31[4]	✖	✖	✖
	Museum floors and art galleries for exhibition purposes	4.0	4.5	✔	✔	✔
	Balconies used for floor-type activities	Same as areas providing access but not less than 4.0	1.8	✔	✔	✔
C4 Areas with possible physical activities	Dance halls and studios, gymnasia	5.0	3.6	✔	✔	✔
	Drill halls and drill rooms	5.0	9.0	✖	✖	✖
C5 Areas susceptible to overcrowding	Assembly areas without fixed seating[6] (concert halls, bars, vestibules, public lounges, places of worship, shopping malls) and grandstands.	5.0	3.6	✔	✔	✔
	Stages in public assembly areas	7.5	4.5	✔	✔	✔

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				30mm FloorSure Flooring		
				Maximum Joist Centres (mm)		
				600	450	300
D Shopping areas						
	Shop floors for the sale and display of merchandise.	4.0	3.6	✔	✔	✔

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				30mm FloorSure Flooring		
				Maximum Joist Centres (mm)		
				600	450	300
E Warehousing & storage areas. Areas subject to accumulation of goods. Areas for equipment and plant						
	Reading rooms with book storage eg libraries.	4.0	4.5	✔	✔	✔
	General storage other than those specified in this table.	2.4 for each metre of storage height	7.0	✖	✖	✖
	Free rolling office compactus, for general filing, up to 2m high.	3.0 for each metre of storage height	to be calculated	✖	✖	✖
	File rooms, office storage space, vaults and strongrooms	5.0	4.5	✔	✔	✔
	Stack rooms (books)	3.3 for each metre of storage height	7.0	✖	✖	✖
	Paper storage for printing plants and stationery stores, packed book storage.	4.0 for each metre of storage height	9.0	✖	✖	✖
	Mobile stacking, mechanically operated heavy shelving (wheels on rails eg compactus).	4.0 for each metre of storage height, but not less than 10.0	to be calculated	✖	✖	✖
	Cold storage	4.5 for each metre of storage height, but not less than 15.0	9.0	✖	✖	✖
	Plant rooms, fan rooms etc, including weight of machinery.	5.0	4.5	✔	✔	✔
	Areas around equipment in boiler rooms (weight of equipment to be determined).	5.0	4.5	✔	✔	✔

✔- suitable, ✖- not suitable

Notes:

1. The maximum concentrated action of 1.8kN for domestic & residential activities shall be applied over a minimum area of 350mm2 for calculation of punching or crushing. Note: All other concentrated actions are applied over a minimum area of 100mm x 100mm ($0.01m^2$)
2. Where a stair tread or landing is structurally independent of the adjoining elements, it shall be capable of withstanding a line load of 2.2kN/m of span of tread or landing. FloorSure floor boards shall be fully supported at stair treads or landings.
3. A concentrated action of 6.7 kN shall be used where a general allowance for safes is made.
4. N/A
5. Where these same areas may be subjected to actions due to physical activities or overcrowding (for example a hotel dining room used as a dance floor), imposed actions shall be based on occupancy C4 or C5, as appropriate.
6. Fixed seating is seating where the removal of the seating and the use of the space for other purposes is not likely.