



The future of sustainable and fire-resistant construction

Document

Flooring design and load tables

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

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

These load tables are based on the following assumptions:

- The MAGOXX floor boards will be installed in accordance with the details described in the Installation guide including:
 - Their lengths will be laid across the joists;
 - their short edges will be fully supported on joists;
 - they will be dry when being installed and thereafter.
 - The design will include 1kPa of super-imposed dead load as well as the weight of the board. The design will adopt a deflection limit of span/200.

1. Concentrated loads

A AS 1170.1 (Table 3.1) specifies the following reference values of concentrated floor loads:

- For residential applications, a concentrated load of 1.8kN applied to an area of 350mm².
- For commercial and other applications, concentrated loads of 2.7kN or above (depending on the specific application) applied to an area of 0.01m² (100mm x 100mm).

B In the context of AS 1170.1's requirements, TABLE 1 below reflects the maximum allowable concentrated loads to be applied to the 16mm and 19mm thick floor boards. Note: A safety factor of 1.5 applies – ie: At no time shall the designed ultimate load exceed 1.5 x allowable load.

Table 1: Maximum allowable concentrated load - kN

Thickness (mm)	Joist Spacing (mm)	Residential - Load applied to area of 350mm ²	Commercial etc - Load applied to area of 0.01m ²
16	300	2.7	3.6
	450	1.8	2.7
19	300	3.6	4.5
	450	2.7	3.6
	600	1.8	N/A

2. Uniformly Distributed Loads

- A AS 1170.1 (Table 3.1) also specifies reference values of uniformly distributed floor loads which vary depending on the specific application.
- B In the context of AS 1170.1's requirements, TABLE 2 below reflects the maximum allowable uniformly distributed loads to be applied to the 16mm and 19mm thick MAGOXX floor boards. Note: A safety factor of 1.5 applies – ie: At no time shall the designed ultimate load exceed 1.5 x allowable load.

Table 1: Maximum allowable uniformly distributed live load - kPa

Thickness (mm)	Span / Joist Spacing (mm)		
	300	450	600
16	33	10	N/A
19	38	12	5

3. Applications for which the MAGOXX floor boards are suitable using Table 3.1 in AS 1170. as the basis

✓ = suitable;
✗ = not suitable

Type of activity / occupancy for part of building or structure	Specific uses	Uniformly distributed actions (kPa)	Concentrated actions (kN)	MAGOXX Flooring Boards				
				16mm Flooring		19mm Flooring		
				JOISTS (MM)				
				450	300	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 (b) other	1.5	1.5kN/m run along edge	✓	✓	✓	✓	✓
		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	✓	✓	✓	✓	✓
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	5.0	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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				JOISTS (MM)				
				450	300	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⁾ etc subject to wheeled vehicles, trolleys etc	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, gymnasias	5.0	3.6	✗	✓	✗	✓	✓
	Drill halls and drill rooms	5.0	9.0	✗	✗	✗	✗	✗
C5 Areas susceptible to over-crowding	Assembly areas without fixed seating (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	✗	✗	✗	✗	✓
D Shopping areas								
	Shop floors for the sale and display of merchandise.	4.0	3.6	✗	✓	✗	✓	✓

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				450	300	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	x	x	x	x	✓
	General storage other than those specified in this table.	2.4 for each metre of storage height	7.0	x	x	x	x	x
	Free rolling office compactus, for general filing, up to 2m high.	3.0 for each metre of storage height	to be calculated	To be calculated specifically and selection made				
	File rooms, office storage space, vaults and strongrooms	5.0	4.5	x	x	x	x	✓
	Stack rooms (books)	3.3 for each metre of storage height	7.0	x	x	x	x	x
	Paper storage for printing plants and stationery stores, packed book storage.	4.0 for each metre of storage height	9.0	x	x	x	x	x
	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	To be calculated specifically and selection made				
	Cold storage	4.5 for each metre of storage height, but not less than 15.0	9.0	x	x	x	x	x
	Plant rooms, fan rooms etc, including weight of machinery.	5.0	4.5	x	x	x	x	✓
	Areas around equipment in boiler rooms (weight of equipment to be determined)	5.0	4.5	x	x	x	x	✓

Notes:

1. The concentrated load of 1.8kN for domestic & residential activities shall be applied over an area of 350mm².
Note: All other concentrated loads are applied over an area of 100mm x 100mm (0.01m²).
2. Where a stair tread or landing is structurally independent of the adjoining elements, it shall be capable of withstanding a line load of 2.2 kN/m of span of tread or landing.
3. A concentrated load of 6.7 kN shall be used where a general allowance for safes is made.
4. The concentrated load shall be applied over an area of 0.025m² for calculation of punching or crushing.
5. Where these same areas may be subjected to loads due to physical activities or overcrowding (for example a hotel dining room used as a dance floor), imposed loads 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.



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