LOAD TRANSFER CAPACITIES

The ultimate load transfer is the theoretical maximum load transfer that can be experienced by a floor joint up to the point at which either the concrete or dowel starts to fail. It is necessary to determine the ultimate load transfer capacity for each slab design in order to ensure the required maximum working load will not exceed the ultimate load.

In most situations, at the point of ultimate load, the concrete would typically fail before the dowel. The concrete may fail in two ways; bursting or bearing (which is far less likely). Bursting (a tensile failure of the concrete) is where the dowel breaks out of the slab and the concrete is ruptured. Bearing is where the concrete fails due to compression under the surface of the dowel when loaded.

Failure of the dowel can be in three forms; bending, shear or combined bending and shear. Bending is where the dowel becomes overloaded and bends, beyond it's elastic limit, across the joint. Shear is where the dowel fails to carry the load across the joint and starts to shear at the joint. Combined bending and shear, as it's name suggests, is a combination of both failure modes.

The ultimate load transfer across a floor joint is dependent upon a number of factors; the shape and size of the dowel, the strength of the dowel materials, the concrete strength, the size of the joint opening etc.

It is possible to theoretically calculate the ultimate load at the joint using the methods set out in TR34 4th Edition.

The tables shown summarise the limit of load transfer for **ARMOURJOINT®** and **SHIELDJOINT®** for various slab thickness where 32 N/mm^2 cylindrical strength concrete has been used and a long term joint opening of 20mm or 30mm is anticipated.

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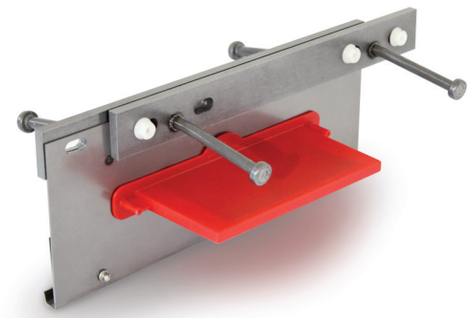
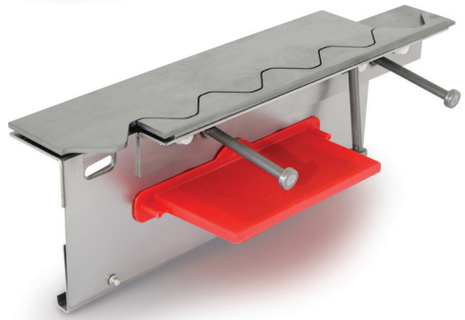
LOAD TRANSFER CAPACITIES





TECHNICAL DATA SHEET

ARMOURJOINT®
HEAVY-DUTY REINFORCEMENT

NOTES:

- Dowels are set at 600mm centres.
- 8mm dowels are suggested for use on ground bearing slabs and piled slabs.
- 12mm dowels are suggested for use on piled slabs, large area pour slabs or SFRC slabs where greater joint openings are expected.
- The load transfer capacities are based on plain, unreinforced C32/40 concrete (32 N/mm² cylinder or 40 N/mm² cube).
- In accordance with TR34 4th Edition, the use of steel fibres has no enhancement factor on load transfer capacities.
- The load transfer figures will change with concrete grade.

ARMOURJOINT® THEORETICAL ULTIMATE LOAD TRANSFER (kN/m) IN ACCORDANCE WITH TR34 4TH EDITION

Failure mode:	
	Bursting of concrete
	Combined bearing/bending of dowel

		Slab depth (mm)											
		100	125	150		175	200		225	250		275	300
		Joint size (mm)											
		Fixed divider plate			Adjustable divider plate								
Dowel thickness	**Joint opening**	**80**	**110**	**135**	**150-200**	**150-200**	**150-200**	**200-250**	**200-250**	**200-250**	**250-300**	**250-300**	**250-300**
8mm	20mm	17.7	24.7	32.7	32.7	39.2	42.5	51.9	63.0	68.0	75.2	88.4	94.4
	30mm	17.7	24.7	32.7	32.7	39.2	42.5	51.9	63.0	68.0	75.2	81.0	81.0
12mm	Up to 30mm	17.7	24.7	32.7	32.7	39.2	42.5	51.9	63.0	68.0	75.2	88.4	94.4

SHIELDJOINT®
IMPACT AND SEALANT-FREE PROTECTION

NOTES:

- Dowels are set at 650mm centres.
- 8mm dowels are suggested for use on ground bearing slabs and piled slabs.
- 12mm dowels are suggested for use on piled slabs, large area pour slabs or SFRC slabs where greater joint openings are expected.
- The load transfer capacities are based on plain, unreinforced C32/40 concrete (32 N/mm² cylinder or 40 N/mm² cube).
- In accordance with TR34 4th Edition, the use of steel fibres has no enhancement factor on load transfer capacities.
- The load transfer figures will change with concrete grade.

SHIELDJOINT® THEORETICAL ULTIMATE LOAD TRANSFER (kN/m) IN ACCORDANCE WITH TR34 4TH EDITION

Failure mode:	
	Bursting of concrete
	Combined bearing/bending of dowel

		Slab depth (mm)						
		200		225	250		275	300
		Joint size (mm)						
		Adjustable divider plate						
Dowel thickness	**Joint opening**	**150-200**	**200-250**	**200-250**	**200-250**	**250-300**	**250-300**	**250-300**
8mm	20mm	39.3	47.9	58.2	62.7	69.4	81.6	87.1
	30mm	39.3	47.9	58.2	62.7	69.4	74.8	74.8
12mm	Up to 30mm	39.3	47.9	58.2	62.7	69.4	81.6	87.1

Isedio can assist with determining the ultimate load transfer capacities for any given slab design.

ARMOURJOINT® is available with either 8mm thick dowels or 12mm thick dowels at 600mm centres (5 dowels per 3m joint). **SHIELDJOINT®** is available with either 8mm thick dowels or 12mm thick dowels at 650mm centres (3 dowels per 1.95m joint). The 12mm dowels can transfer higher loads but are generally only required on thicker slabs over 250mm.

Please note that the engineer responsible for the floor slab design must check that the required maximum working load transfer capacity across the joint does not exceed the ultimate load transfer capacity.