

## OVERVIEW

**ARMOURJOINT** is a leave-in-place formwork & load transfer system designed specifically to meet the demanding needs of today's industrial concrete floors. **ARMOURJOINT** surpasses the requirements of TR34 3rd Edition.

**ARMOURJOINT** stands for superior performance through innovative design.

## SLAB PANEL EDGE ARMOURING

**ARMOURJOINT** provides heavy duty protection and armouring to slab panel edges by way of two solid, high specification, cold drawn steel sections each 40mm deep x 10mm thick. The steel armouring is anchored to the concrete with shear studs. Each and every shear stud is factory inspected and tested to ensure the integrity of it's weld to the steel armouring.

## DOWEL DESIGN

**ARMOURJOINT** leads the way with a unique and revolutionary 'asymmetrical dowel'. Most other traditional joint systems are designed such that the dowel is positioned centrally across the joint when the joint is closed. From the moment the joint opens, dowel engagement on the free side reduces, thus moving away from a condition of equal dowel engagement on both sides of the joint. Ultimately, with large joint openings there is a risk of the dowel becoming totally disengaged on the free side, the complete loss of load transfer across the joint and a failed floor. **ARMOURJOINT** works differently. As the joint opens, **ARMOURJOINT** moves towards a condition of equal dowel engagement. Even at a maximum joint opening of 30mm, each side of the joint has a class leading 60mm of dowel engagement. **ARMOURJOINT** dowels are made from a high grade S355 steel (355N/mm<sup>2</sup> yield strength).

*! Please note all opened joints must be filled with a suitable sealant to reduce the impact from traffic across the joint. This sealant must be periodically repaired or replaced as required in order to maintain joint service life.*

Traditional Joint

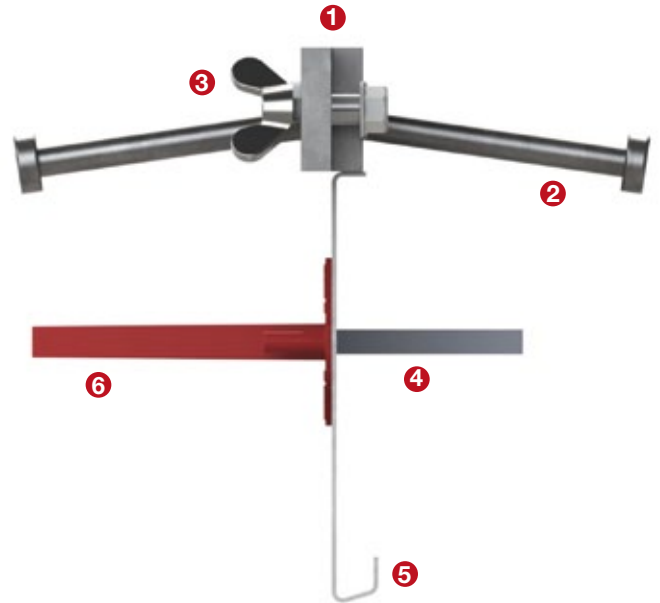


ARMOURJOINT



## SLEEVE DESIGN

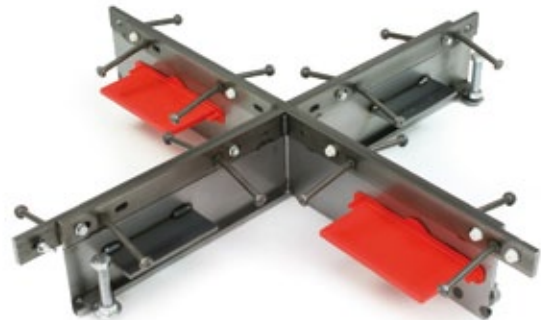
The sleeve's purpose is to form a barrier between the steel dowel and the concrete and allow the concrete to release in two horizontal planes (parallel to the joint and perpendicular to the joint) on the free side of the joint. Vertical displacement between adjacent slab panels is undesirable as this can lead to a reduction in floor and joint life. **ARMOURJOINT** sleeves are designed to allow up to ± 20mm parallel movement along the joint before the joint opens up. Other joint systems allow zero parallel movement between slab panels (i.e. along deck levellers) and can cause slab lock-up. The long term performance of a concrete floor is highly dependent upon the quality and performance of the joint system.



- 1 Two high specification solid, cold drawn 40mm deep x 10mm thick steel armour edge strips with sharp corners for clean finish to concrete.
- 2 Diameter 10mm x 100mm long, shear studs for anchorage into concrete.
- 3 Frangible fastening system temporarily holding steel armouring in place during concrete casting.
- 4 Unique asymmetric dowel, high grade 355N/mm<sup>2</sup> steel for superior load transfer and maximum 30mm joint openings. Available in 8mm or 12mm thickness at 600mm or 430mm centres.
- 5 Cold rolled steel plate.
- 6 High density plastic sleeve for release of dowel in concrete, with ± 20mm parallel movement along joint and 30mm perpendicular to joint.

## Other Features:

- Overlapping, joint-to-joint, joining arrangement with simple fastening system.
- Full range of intersections available and precision height adjustment at installation using **ARMOURFIX** Jack.
- Also available in stainless steel, hot dip galvanised and factory fitted foam strip.



Specify the best...

**ARMOURJOINT - THE NAME SAYS IT ALL**

## LOAD TRANSFER

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 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 its 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 its 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.

Theoretical ultimate load transfer (kN/m) across a 20mm joint opening (In accordance with TR34 3rd edition)									
Slab thickness			150mm	175mm	200mm	225mm	250mm	275mm	300mm
Dowel Details	8mm dowel @ 600mm centres	Re3 = 0	51.9	67.0	83.9	90.0	82.8	85.9	88.3
			Re3 = 0.8	89.6	116.0	123.0	123.0	123.0	123.0
Dowel Details	12mm dowel @ 600mm centres	Re3 = 0.8	N/R	N/R	N/R	N/R	140.0	144.0	149.0

**Note:** Re3 is the reinforcement enhancement factor for steel fibres taken from manufacturers literature.

It is possible to theoretically calculate the ultimate load at the joint using the methods set out in TR34 3rd Edition. The table above summarises the limit of load transfer for various slab thickness where 32N/mm<sup>2</sup> cylindrical strength concrete has been used and a long term joint opening of 20mm is anticipated.

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

**ARMOURJOINT** is available with either 8mm thick dowels or 12mm thick dowels at 600mm (5 dowels per 3m joint) or 430mm (7 dowels per 3m joint) centres. The 12mm dowel can transfer a higher load but is only required on thicker slabs with heavy dosages of steel fibre reinforcement.

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

Individual ARMOURJOINT weights (approx kg/joint)									
ARMOURJOINT SIZE (mm)									
Dowels	120	130	140	150	160	170	180	190	200
5 x 8mm	34.2	34.6	35.1	35.6	36.0	36.5	37.0	37.5	37.9
5 x 12mm	37.7	38.2	38.6	39.1	39.6	40.0	40.5	41.0	41.5
7 x 8mm	37.0	37.5	37.9	38.4	38.9	39.3	39.8	40.3	40.8
7 x 12mm	41.9	42.4	42.9	43.3	43.8	44.3	44.8	45.2	45.7

ARMOURJOINT quantities per pallet									
ARMOURJOINT SIZE (mm)									
120	130	140	150	160	170	180	190	200	
48	48	42	36	36	36	30	30	30	

Complete pallet weights (approx kg/full pallet)									
ARMOURJOINT SIZE (mm)									
Dowels	120	130	140	150	160	170	180	190	200
5 x 8mm	1751	1773	1585	1392	1408	1425	1220	1235	1249
5 x 12mm	1920	1943	1734	1519	1536	1553	1326	1341	1355
7 x 8mm	1886	1909	1704	1493	1510	1527	1305	1319	1334
7 x 12mm	2124	2146	1912	1671	1688	1705	1454	1468	1482

