Sinus Armor Joint Profile JC-S-20

A unique corrugated armored joint profile used in the pouring of industrial floors.

The visible part of the profile is corrugated in the form of a sinus-wave profile, which allows for shock-free passage of machinery on any type of wheel, including steel wheels.

A distinctive feature is that the profile is corrugated to its full height, which ensures that the entire slab of concrete is poured evenly without breaks.

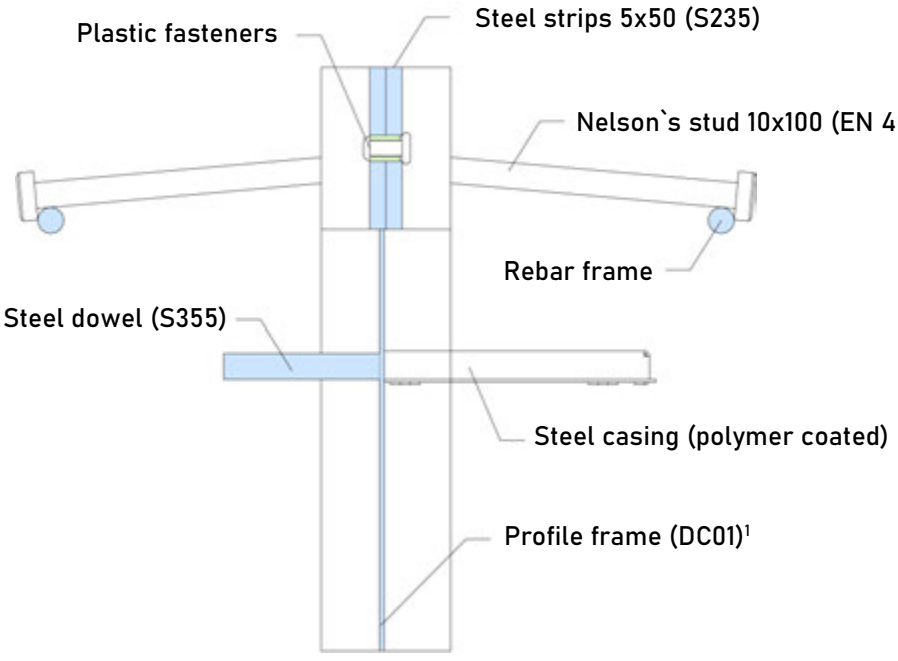
The load transfer system in the form of special dowels with sliding steel casing is based on Concrete Society Technical Report 34 version 4, section 6.5

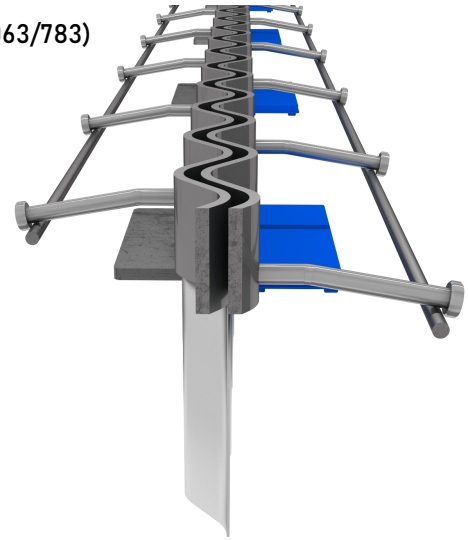
The profile is manufactured in accordance with EN 1090-2 and complies with all international standards.

The studs are welded using arc stud welding technology in strict compliance with EN 4063 (process 783).

The profile is suitable for all types of industrial floors and loads from light cars to the rigid steel wheels of heavy forklifts.

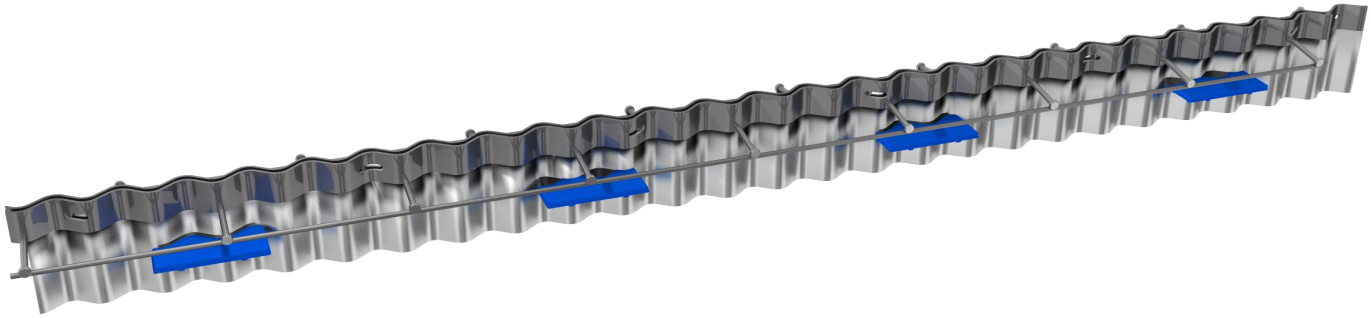
The size of the dowels allows a joint opening of up to 30 mm to be achieved.

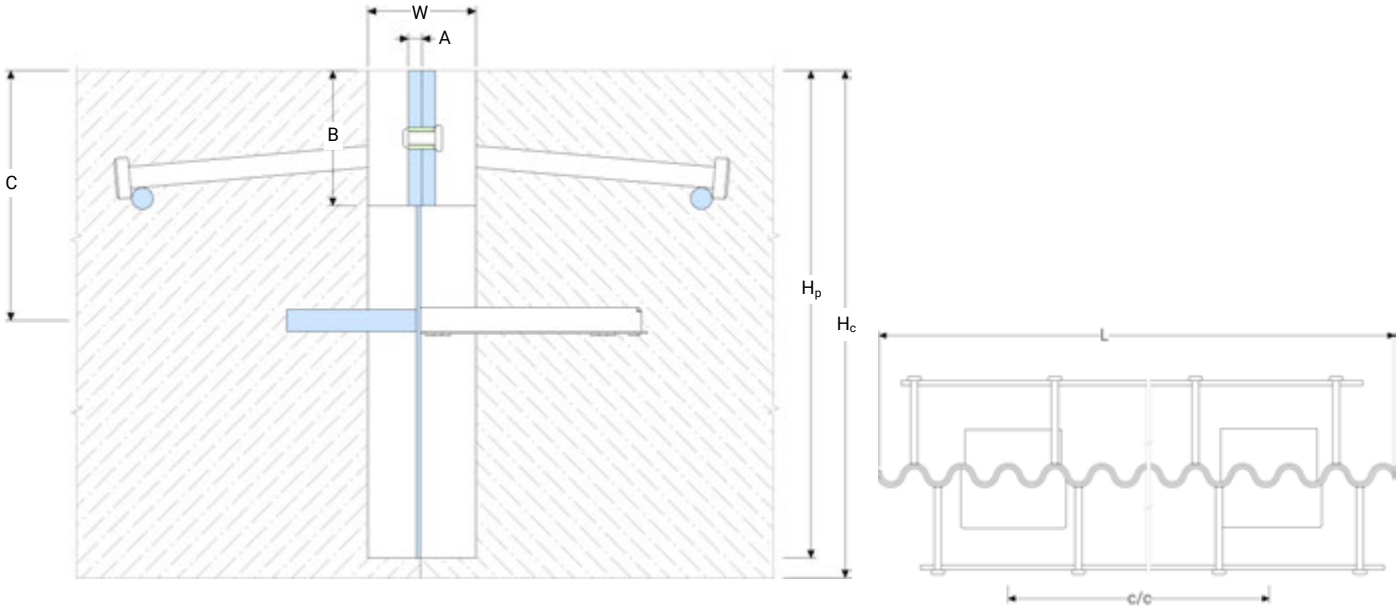




DUALINE armour joint

PROFILE SIZES





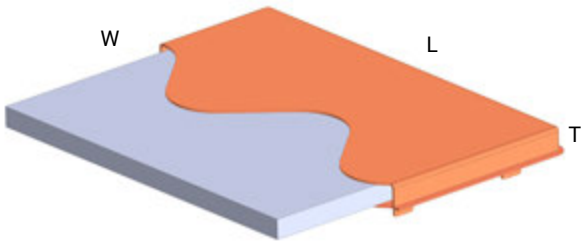
Profile	Dowel type	Profile height, H_p (mm)	Slab thickness, H_c (mm)	Visible width, W (mm)	Strip size, AxB (mm)	Dowel depth, C (mm)	Spacing, c/c (mm)	Length. L (mm)
JC-S-10-90	5 | 6 | 8 | 10	90	100-110	40	5x50	50	600	2300
JC-S-10-110	5 | 6 | 8 | 10	110	115-130	40	5x50	55	600	2300
JC-S-10-130	5 | 6 | 8 | 10	130	135-150	40	5x50	65	600	2300
JC-S-10-150	5 | 6 | 8 | 10	150	155-160	40	5x50	80	600	2300
JC-S-10-160	5 | 6 | 8 | 10	160	165-180	40	5x50	80	600	2300
JC-S-10-180	5 | 6 | 8 | 10	180	185-210	40	5x50	90	600	2300
JC-S-10-210	5 | 6 | 8 | 10	210	215-240	40	5x50	105	600	2300
JC-S-10-240	5 | 6 | 8 | 10	240	245-275	40	5x50	120	600	2300
JC-S-10-280	5 | 6 | 8 | 10	280	285-300	40	5x50	140	600	2300

FABRICATION TOLERANCES

Length	+30 mm	Height	±1 mm	Straightness	±1 mm/m	Twistability	<0,5⁰/m

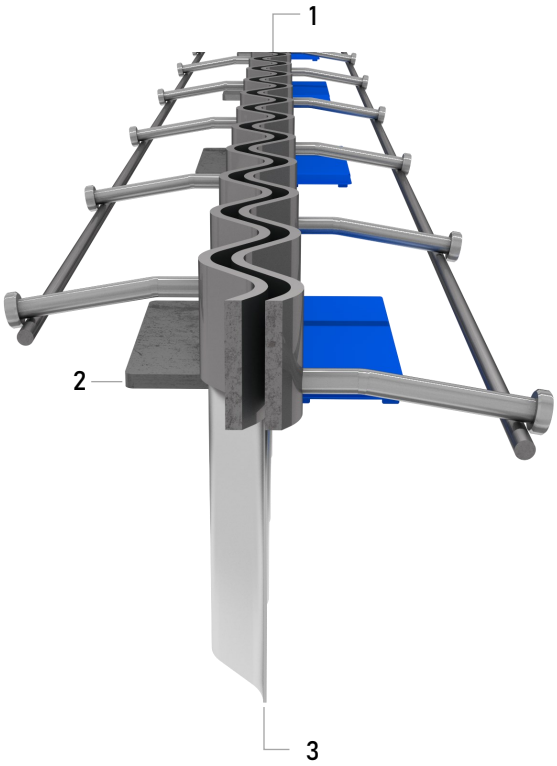
DOWEL SIZES

Type	Width, W (mm)	Length, L (mm)	Thick, T (mm)	Casing color
5	150	120	5	Green
6	150	130	6	Blue
8	150	130	8	Orange
10	150	140	10	Red



COMPONENT MANUFACTURING OPTIONS AND DESCRIPTION

The profile consists of three parts:
1 - 10x100 steel strips with welded studs (S235 construction steel).
2 - Load distribution dowel with sliding cover (S355 construction steel).
3 - Profile frame (Steel DC01).
The profile as a whole and each component individually can be made of other steel or additionally galvanized.



DESCRIPTION (example)

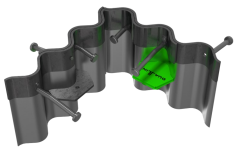
JC-S-10-180-5-3BB

- Specified if one or more components of the profile are in a non-standard version:
  - B — standard version,
  - 3 — Stainless steel AISI 304,
  - 4 — Stainless steel AISI 430
- Dowel Type
- Profile Height
- Profile Series

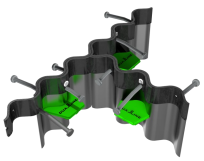
Component	Standard version (B)	AISI 304-1.4301 (3)	AISI 430-1.4016 (4)	HDG-EN 1461 (H)
1	S235	yes	yes	no
2	S355	yes	yes	no
3	DC01	yes	yes	no

EXECUTION OPTION

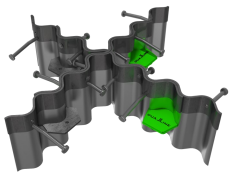
L – connector (JC-T-20-L)



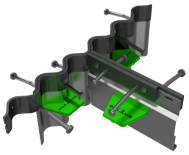
T – connector (JC-T-20-T)



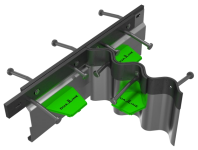
X – connector (JC-T-20-X)



T – connector S-T (JC-S(T)-10(20)-T)



T – connector T-S (JC-T(S)-20(10)-T)



Direct-to-sinus transition (JC-T-S)

Profile	Profile weight (dowel type — kg/pcs)[2]		Dimensions of package (LxWxH)	Pieces per package (dowel type — kg/pcs)[2]		Weight of package (dowel type — kg/pack)[2]		Total profiles in pack (dowel type — l.m./pack)[2]	
	6	8		6	8	6	8	6	8
JC-S-10-90	17,3	19,3	2300x1200x2000	106	106	1958,66	2161,83	243,80	243,80
JC-S-10-110	18,0	19,9	2300x1200x2000	90	90	1741,50	1914,00	207,00	207,00
JC-S-10-130	18,7	20,6	2300x1200x2100	88	88	1764,50	1933,17	202,40	202,40
JC-S-10-150	19,4	21,3	2300x1200x2250	80	80	1668,67	1822,00	184,00	184,00
JC-S-10-160	19,8	21,7	2300x1200x2250	80	80	1707,07	1860,40	184,00	184,00
JC-S-10-180	20,3	22,2	2300x1200x2250	72	72	1582,80	1720,80	165,60	165,60
JC-S-10-210	21,0	23,0	2300x1200x2250	72	72	1698,00	1836,00	165,60	165,60
JC-S-10-240	21,6	23,5	2300x1200x2250	56	56	1327,50	1434,83	128,80	128,80
JC-S-10-280	22,8	24,7	2300x1200x2250	48	48	1214,80	1306,80	110,40	110,40

[1] For type 5 and 10 dowels, request data.

DESIGN OF PERMISSIBLE LOADS

The use of dowels is a development of the evolution of Dewmark profiles used as expansion joints. Due to the quick-detachable casings, adjacent to the dowel body, and the increase in the contact area of the dowel and concrete, it was possible to increase the load-bearing capacity of the floor.

The dowels carry and transfer the load between two adjacent sections of the concrete floor, that is, the equipment with the "P" load moves along the finished floor without causing stress in the concrete slab.

A concrete slab usually has only about 50% of its bearing capacity at the edges, so the dowels support the slab at the edges and help to support and transfer weight from one slab to another, allowing the slabs to flex slightly, gently transferring the load along its surface.

The calculation of the bearing capacity of the dowels is given in the British methodological guidelines **TR34, version 4, clause 6.5 and Appendix D**.

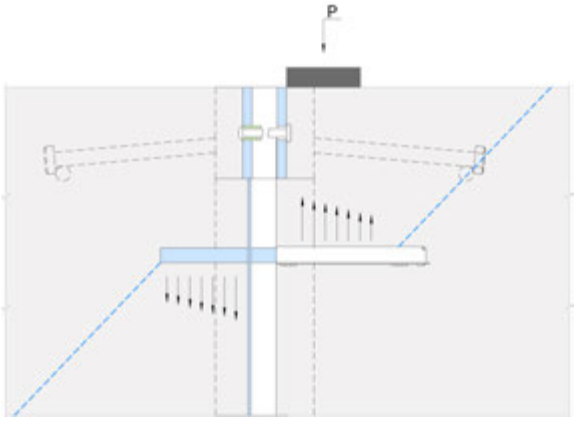
Standard dowels are made of steel S355 with yield strength $\sigma_{0.2}$=355 MPa and have the following dimensions:

TYPE	Width, W (mm)	Length, L (мм)	Thick, T (мм)	Spacing, c/c (мм)	Casing color
5	150	120	5	600	Green
6	150	130	6	600	Blue
7	150	130	8	600	Orange
8	150	140	10	600	Red

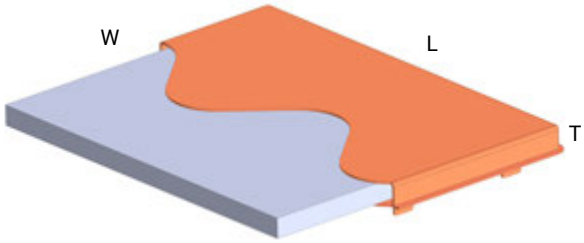
Bending (Pmax plate) and shear (Psh plate) single dowel for concrete C32/40 According to TR34 ver.4 point 6.5

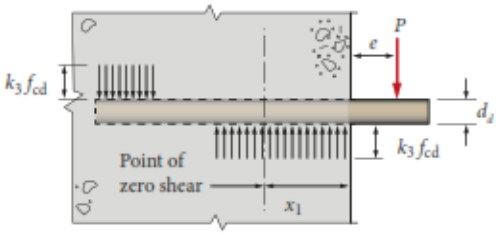
Dowel type	Joint opening, mm	Shear force, $P_{sh\ plate}$, кН	Bending force $P_{max\ plate}$, кН
5	10	150,03	48,07
	15		37,58
	20		30,44
6	10	180,03	63,12
	15		50,77
	20		41,89
8	10	240,04	94,73
	15		79,51
	20		67,69
	25		58,46
	30		51,18
10	10	300,05	127,44
	15		110,22
	20		96,13
	25		84,61
	30		75,17

The number of dowels involved in the work and the total perceived load directly depend on:
- The base on which the floor slab is poured,
- thickness of the floor slab,
- class of concrete.



By changing the geometry of concrete support on the dowel from straight to wavy, it was possible to increase the design values for loads by 20% when using a standard dowel.





External and internal forces affecting the dowel

The shear force on the dowel is determined by the formula:

$P_{sh\ plate} = A \times 0.9 \times 0.6 \times P_y$

Bearing / bending load on the dowel:

$P_{max\ plate} = 0.5[(b_1^2+c_1^2)^{0.5}-b_1]$

Where:

A — cross-sectional area of the dowel

P_y — yield strength of steel

$b_1 = 2ek_3\ f_{cd}\ P_b$

$c_1 = 2k_3 f_{cd}\ P_b^2 t_p^2 f_{yd}$

e — distance of application of load from concrete surface; with a symmetrical arrangement, this is equivalent to half the opening of the joint (see. Fig.5)

k_3=3 (const)

f_{cd} — concrete strength (cylinder)= f_{ck} /y_c

P_b — dowel width

$t_з$ — dowel thickness