Straight Armor Joint Profile JC-T-20

Classic straight profile armored joints for all types of industrial concrete floors.

The profile has been produced for more than 10 years and has proven itself successfully on numerous poured floors.

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

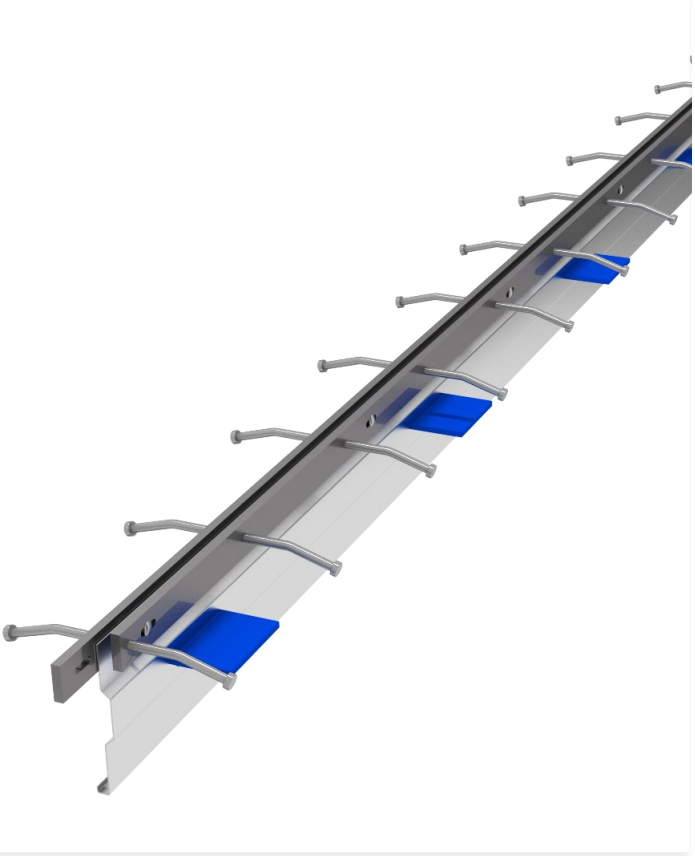
The profile is manufactured in accordance with EN 1090-2 and complies with all international standards.

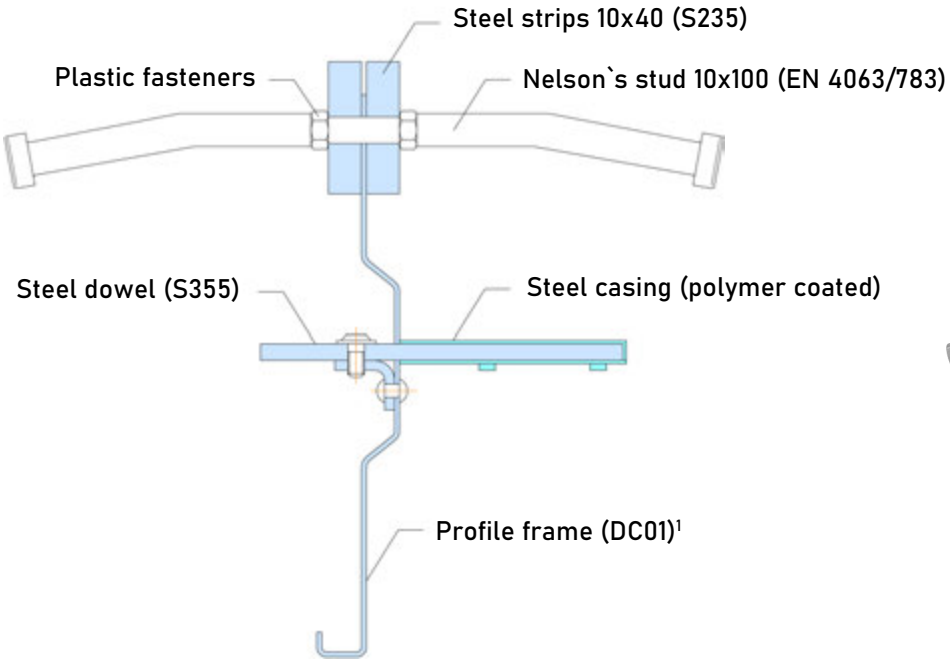
The studs are welded using arc stud welding technology in strict compliance with EN 4063 (process 783).

The omega shape[1] of the main frame of the profile increases the rigidity of the structure several times along its length, preventing the profile from bending during concrete pouring.

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.

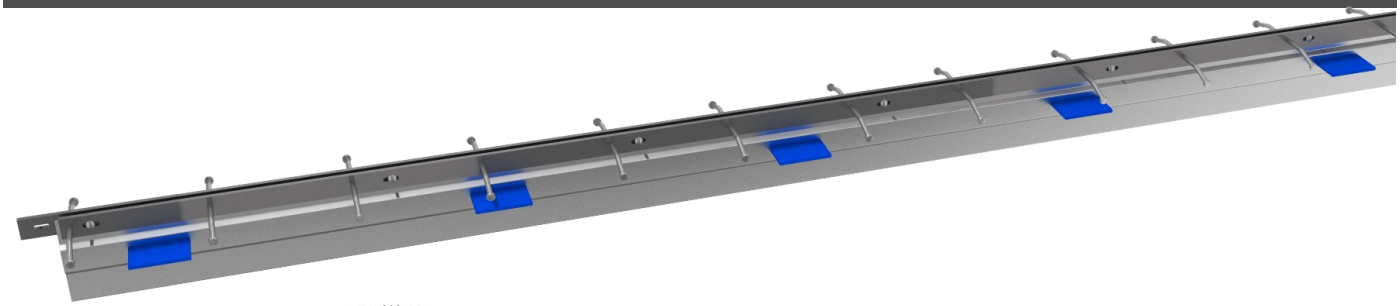


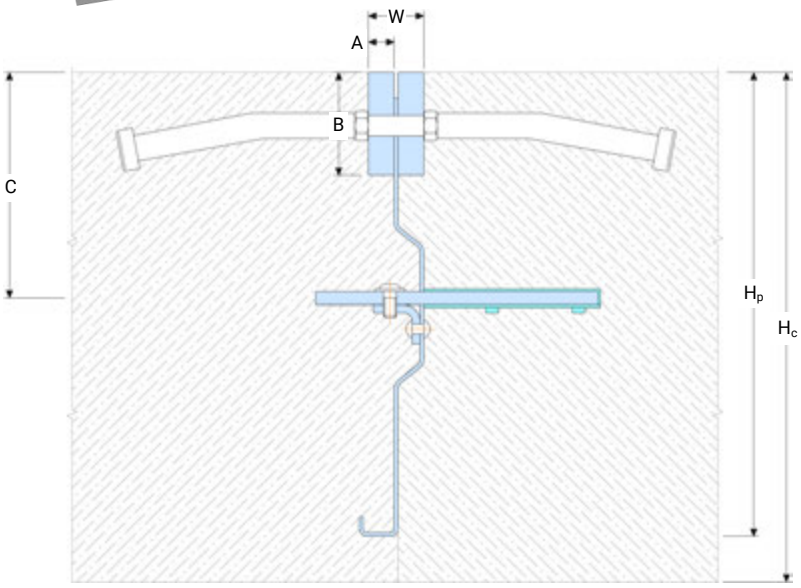


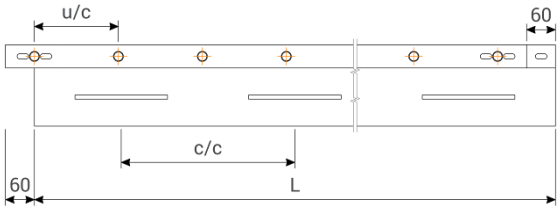
[1] Omega frame shape is produced for profiles with a height of more than 150 mm. Profiles of less height are supplied with a standard straight frame.

DUA LINE
armour joint

PROFILE SIZES







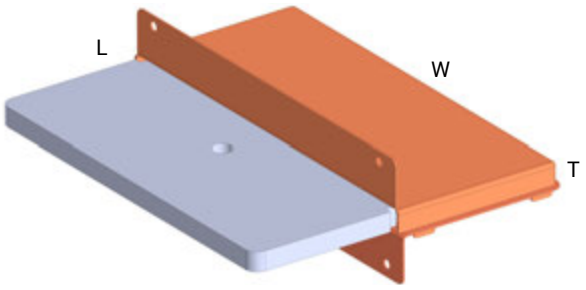
Profile	Dowel type	Profile height, H_p (mm)	Slab thickness, H_c (mm)	Visible width, W (mm)	Strip size, AxB (mm)	Dowel depth, C (mm)	Spacing, c/c (mm)	Length. L (mm)
JC-T-20-90	5 | 6 | 8 | 10	90	100-110	21,5	10x40	50	600	3000
JC-T-20-110	5 | 6 | 8 | 10	110	115-130	21,5	10x40	55	600	3000
JC-T-20-130	5 | 6 | 8 | 10	130	135-150	21,5	10x40	65	600	3000
JC-T-20-150	5 | 6 | 8 | 10	150	155-160	21,5	10x40	80	600	3000
JC-T-20-160	5 | 6 | 8 | 10	160	165-180	21,5	10x40	80	600	3000
JC-T-20-180	5 | 6 | 8 | 10	180	185-210	21,5	10x40	90	600	3000
JC-T-20-210	5 | 6 | 8 | 10	210	215-240	21,5	10x40	105	600	3000
JC-T-20-240	5 | 6 | 8 | 10	240	245-275	21,5	10x40	120	600	3000
JC-T-20-280	5 | 6 | 8 | 10	280	285-300	21,5	10x40	140	600	3000

FABRICATION TOLERANCES

Length	±0,1 mm	Height	±1 mm	Straightness	±1 mm/m	Twistability	<0,5°/m

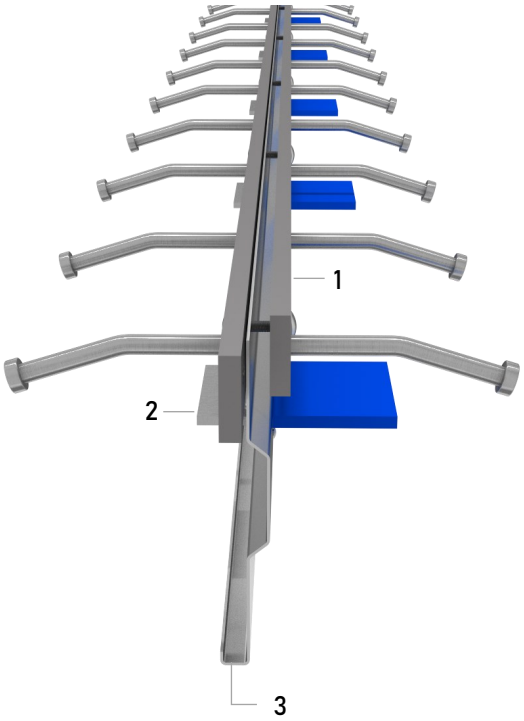
DOWEL SIZES

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-T-20-180-5-3BB

- Specified if one or more components of the profile are in a non-standard version:
  - B — Standard version (construction steel),
  - H — Hot-dip galvanized according to EN 1461,
  - 3 — Stainless steel AISI 304,
  - 4 — Stainless steel AISI 410S.
- 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	yes
2	S355	yes	yes	yes
3	DC01	yes	yes	yes

ADDITIONAL OPTION (FOAM)

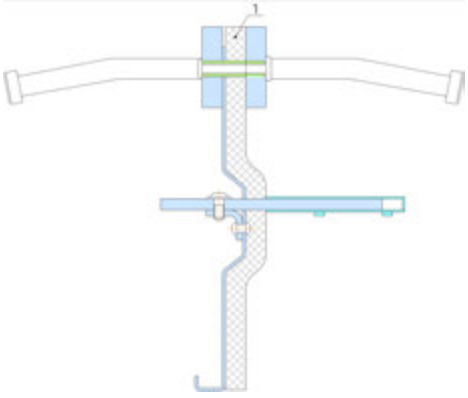
The profile can be supplied with a foam gasket (closed-cell expanded PPE) (1).

This material is preferred when the floor slabs are poured in cold weather or used in cold rooms where significant temperature fluctuations are possible.

Thickness 5/10 mm.

The profile has the designation: +Foam-10 (where the last digit indicates the thickness of the foam material).

Example: DUALLINE JC-T-20-180-5+Foam/5



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-T-20-90	28,1	30,6	3100x1150x1150	84	77	2480,40	2476,20	252	231
JC-T-20-110	28,8	31,3	3100x1250x1150	82	75	2481,60	2467,50	246	225
JC-T-20-130	29,5	32	3100x1200x1400	80	74	2480,00	2488,00	240	222
JC-T-20-150	30,5	33	3100x1200x1400	76	71	2438,00	2463,00	228	213
JC-T-20-160	30,8	33,3	3100x1200x1400	76	71	2448,40	2468,90	228	213
JC-T-20-180	31,6	34,1	3100x1230x1650	74	69	2458,40	2472,90	222	207
JC-T-20-210	32,7	35,2	3100x1200x1650	72	67	2474,40	2478,40	216	201
JC-T-20-240	33,8	36,3	3100x1150x1850	70	65	2486,00	2479,50	210	195
JC-T-20-280	34,9	37,4	3100x1250x1850	67	63	2458,30	2476,20	201	189

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

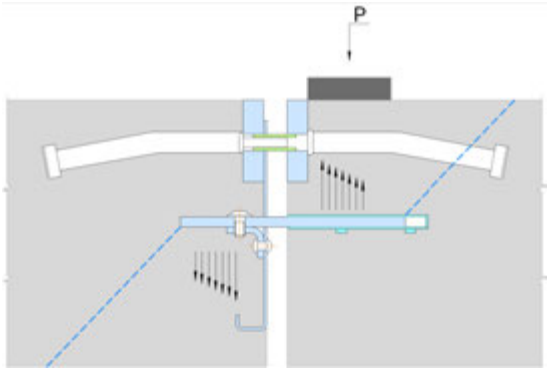
DESIGN OF PERMISSIBLE LOADS

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.

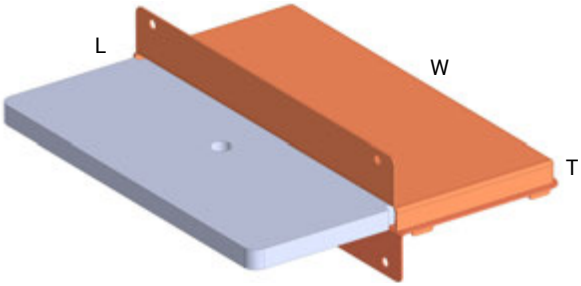
The dowels carry and transfer the load between two adjacent sections of the concrete floor, that is, the equipment with the "P" load moves along the finished floor without causing stress in the concrete slab.

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.

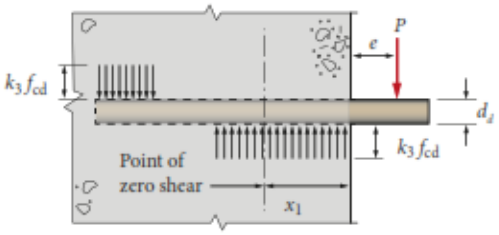
The calculation of the bearing capacity of the dowels is given in the British methodological guidelines **TR34, version 4, clause 6.5 and Appendix D**.



Force diagram



Dimensions of dowel



External and internal forces affecting the dowel

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	125,02	40,05
	15		31,32
	20		25,37
6	10	150,03	52,60
	15		42,31
	20		34,91
8	10	200,03	78,94
	15		66,26
	20		56,41
	25		48,72
	30		42,65
10	10	250,04	106,20
	15		91,85
	20		80,11
	25		70,51
	30		62,64

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.

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)

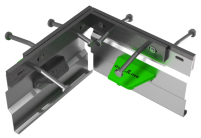
f_{cd} — concrete strength (cylinder)= f_{ck} /y_c

P_b — dowel width

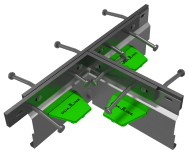
t_3 — dowel thickness

EXECUTION OPTION

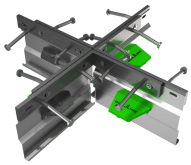
L – connector (JC-T-20-L)



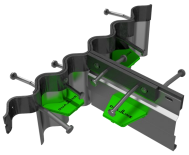
T – connector (JC-T-20-T)



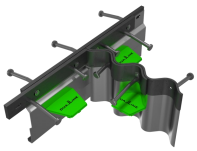
X – connector (JC-T-20-X)



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)

PHOTOS FROM THE SITE