

Straight Armour Joint Profile

Dewmark Concrete SG 61



Classic straight profile armoured joints for all types of industrial concrete 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

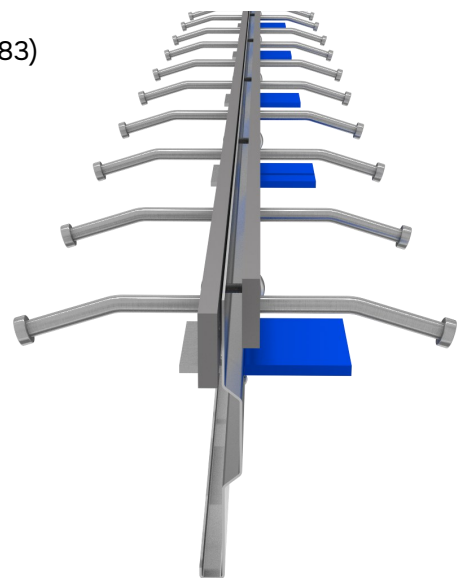
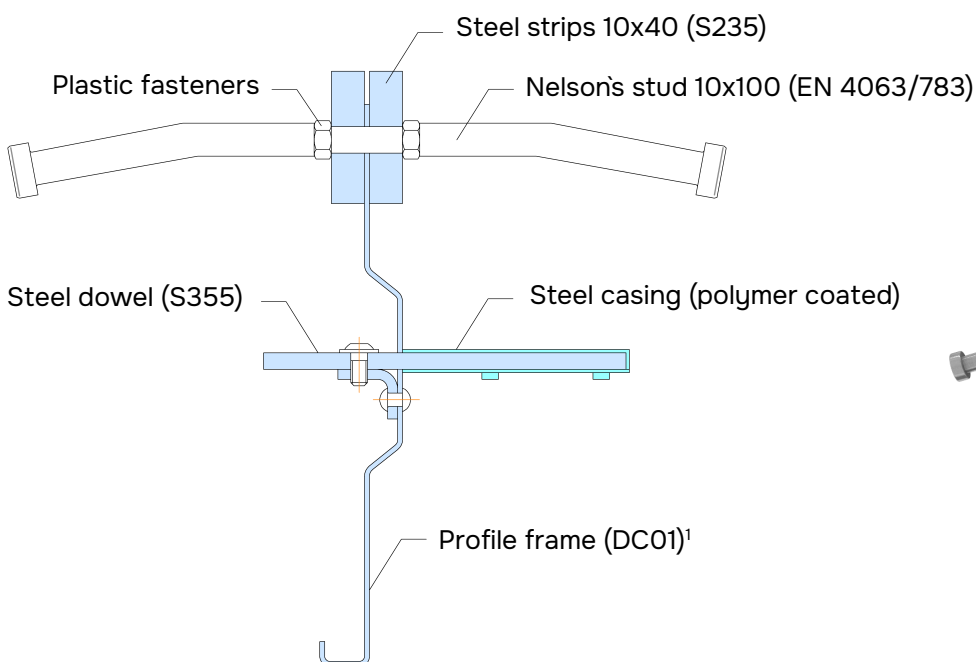
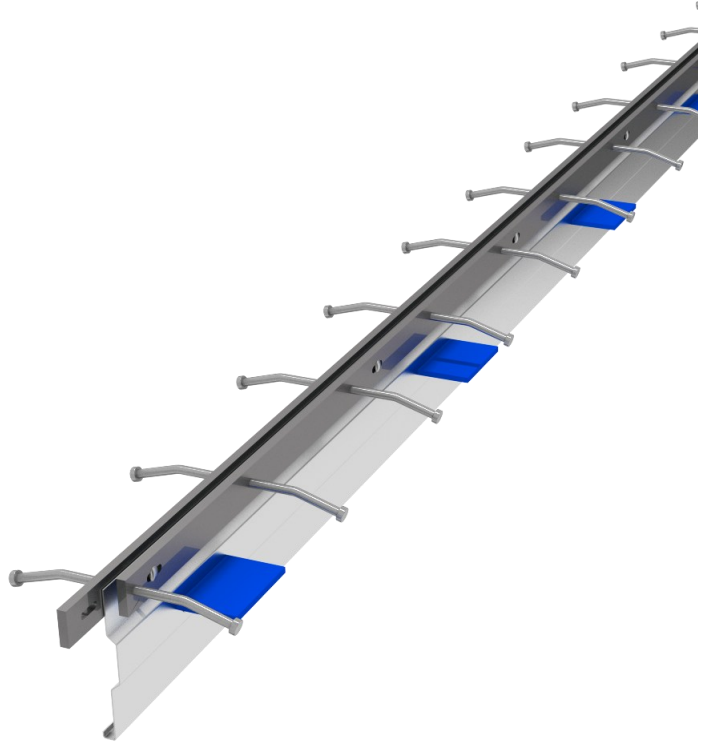
The profile is manufactured in accordance with EN 1090-2 and complies with all international standards.

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

The omega shape¹ 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.

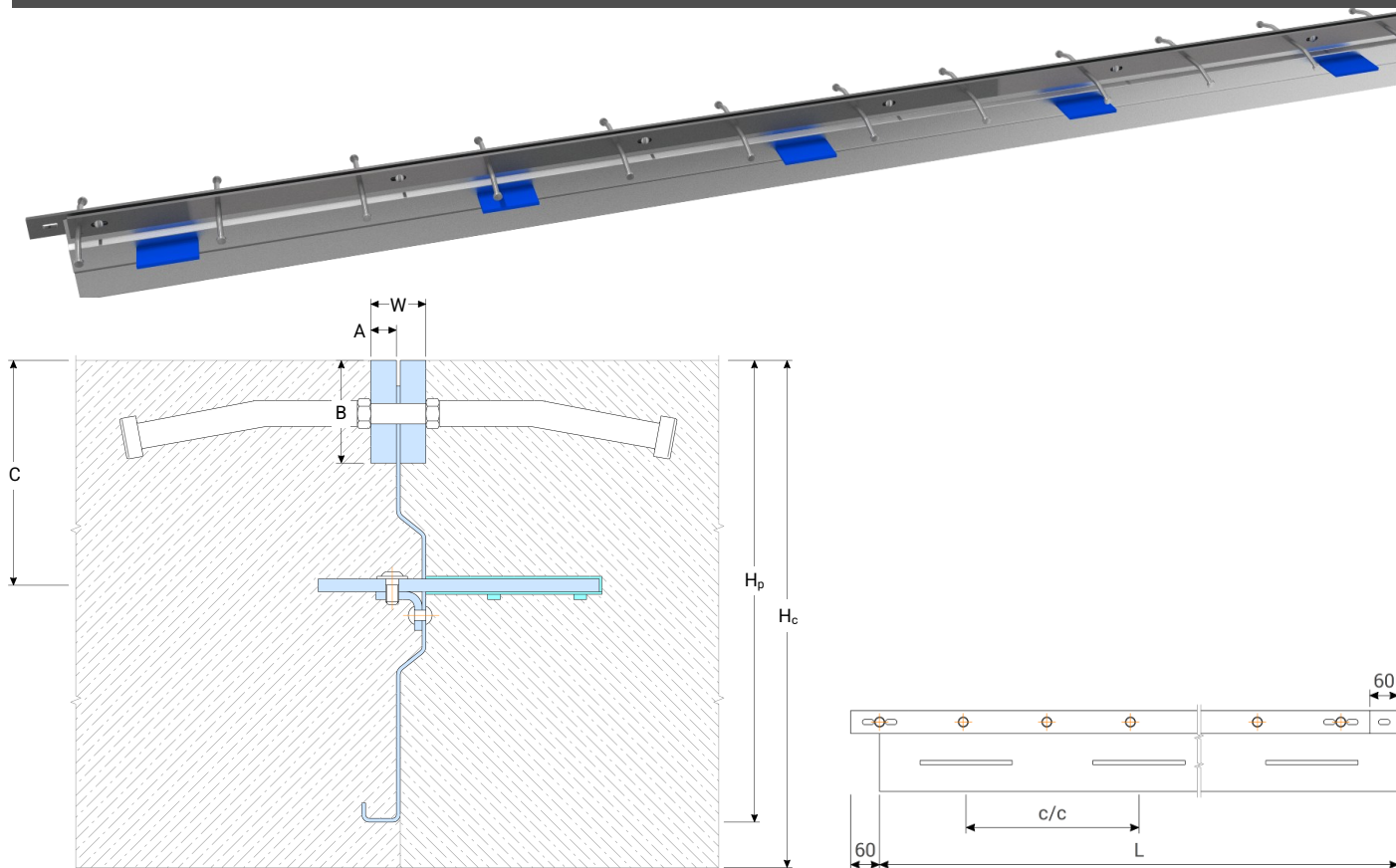
The profile is suitable for all types of industrial floors and loads from light cars to the rigid steel wheels of heavy forklifts.

The size of the dowels allows a joint opening of up to 40 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.

PROFILE SIZES



Profile	Dowel type	Profile height, H_p (mm)	Slab thickness, H_c (mm)	Visible width, W (mm)	Strip size, $A \times B$ (mm)	Maximum opening, J_{wmax} (mm)	Dowel depth, C (mm)	Spacing, c/c (mm)	Length, L (mm)
SG 61/90	5 6 8 10	90 ¹	100-110	21,5	10x40	40	50	600	3000
SG 61/110	5 6 8 10	110 ¹	115-130	21,5	10x40	40	55	600	3000
SG 61/130	5 6 8 10	130 ¹	135-150	21,5	10x40	40	65	600	3000
SG 61/150	5 6 8 10	150 ¹	155-160	21,5	10x40	40	80	600	3000
SG 61/160	5 6 8 10	160 ¹	165-180	21,5	10x40	40	80	600	3000
SG 61/180	5 6 8 10	180 ¹	185-210	21,5	10x40	40	90	600	3000
SG 61/210	5 6 8 10	210 ¹	215-240	21,5	10x40	40	105	600	3000
SG 61/240	5 6 8 10	240 ¹	245-275	21,5	10x40	40	120	600	3000
SG 61/280	5 6 8 10	280 ¹	285-300	21,5	10x40	40	140	600	3000

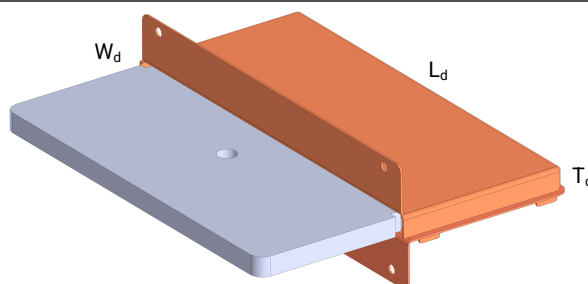
¹ For heights from 90 to 145 mm the profile is produced with a straight frame, for heights from 150 and above the profile is produced with a corrugated frame (omega).

FABRICATION TOLERANCES

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

Type	Length, L_d (mm)	Width, W_d (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

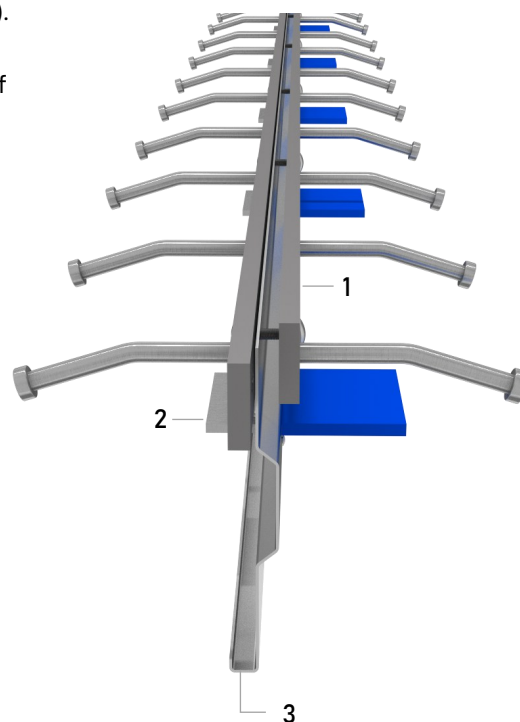


COMPONENT MANUFACTURING OPTIONS AND DESCRIPTION

The profile consists of three parts:

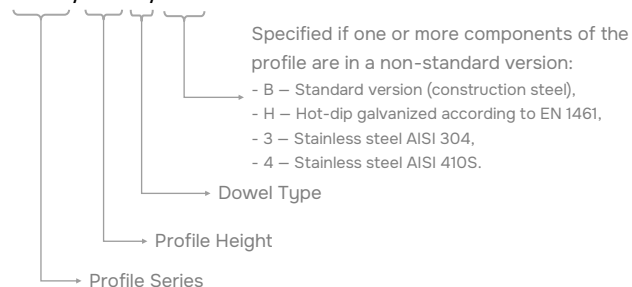
- 1 - 10x40 steel strips with welded studs 10x100 (S235 construction steel).
- 2 - Load distribution dowel with sliding cover (S355 construction steel).
- 3 - Profile frame (Steel DC01).

The profile as a whole and each component individually can be made of other steel or additionally galvanized.



DESCRIPTION (example)

SG 61/180-5/3BB



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)

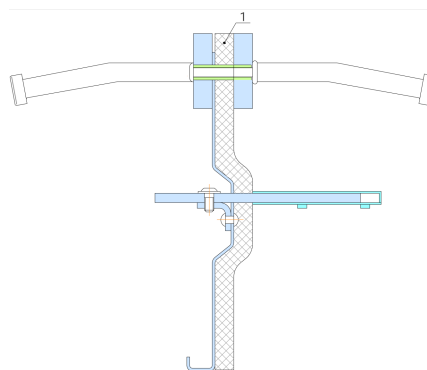
The profile can be supplied with a foam gasket (closed-cell expanded PPE) (1).

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: Dewmark Concrete SG 61-180-5+Foam/5



PACKAGE DIMENSIONS

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
SG 61/90	28,1	30,6	3100x1150x1150	84	77	2480,40	2476,20	252	231
SG 61/110	28,8	31,3	3100x1250x1150	82	75	2481,60	2467,50	246	225
SG 61/130	29,5	32	3100x1200x1400	80	74	2480,00	2488,00	240	222
SG 61/150	30,5	33	3100x1200x1400	76	71	2438,00	2463,00	228	213
SG 61/160	30,8	33,3	3100x1200x1400	76	71	2448,40	2468,90	228	213
SG 61/180	31,6	34,1	3100x1230x1650	74	69	2458,40	2472,90	222	207
SG 61/210	32,7	35,2	3100x1200x1650	72	67	2474,40	2478,40	216	201
SG 61/240	33,8	36,3	3100x1150x1850	70	65	2486,00	2479,50	210	195
SG 61/280	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**.

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

TYPE	Width, W_d (mm)	Length, L_d (mm)	Thick, T_d (mm)	Spacing, c/c (mm)	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

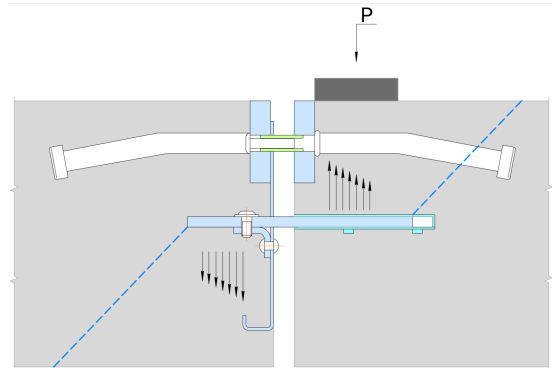
Bending (P_{max} plate) and shear (P_{sh} plate) single dowel for concrete C32/40

Dowel type	Joint opening, mm	Shear force, P_{sh} plate, kN	Bending force P_{max} plate, kN
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

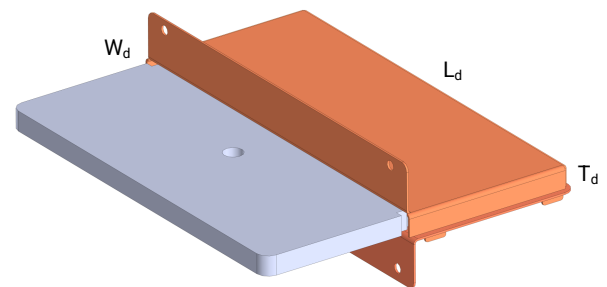
The number of Dowels involved and the total load absorbed are directly dependent on:

- the substrate on which the slab is poured,
- the thickness of the slab,
- the class of concrete.

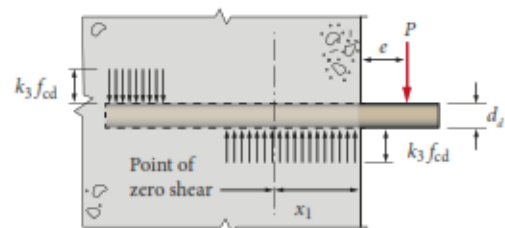
Dewmark can make calculations based on the technical data provided by the customer. To do this, please fill in the questionnaire in appendix 1 and send it to info@dewmark-joint.com.



Force diagram



Dimensions of dowel



External and internal forces affecting the dowel

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

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

Bearing / bending load on the dowel:

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

Where: 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

$$k_3 = 3 \text{ (const)}$$

$$f_{cd} \text{ — concrete strength (cylinder)} = f_{ck} / \gamma_c$$

$$P_b \text{ — dowel width}$$

$$t_p \text{ — dowel thickness}$$

DESIGN OF PERMISSIBLE LOADS

Calculated ultimate loads at failure (bending) of the dowel or concrete penetration.

In accordance with TR34 ver.4 clause 6.5.

Joint opening, mm	Slab thick, mm	60/OP-5 (S355)	60/OP-6 (S355)	60/OP-8 (S355)	60/OP-10 (S355)
		Dowel bending, kN/m	Dowel bending, kN/m	Dowel bending, kN/m	Dowel bending, kN/m
0	150	116,60	139,92	186,56	233,20
	175	130,89	157,07	209,42	261,78
	200	144,68	173,61	231,48	289,36
	250	171,03	205,24	273,66	342,07
5	150	88,05	110,62	156,31	202,37
	175	98,84	124,18	175,46	227,17
	200	109,25	137,26	193,95	251,10
	250	129,15	162,26	229,28	296,84
10	150	67,80	88,50	131,65	176,09
	175	76,11	99,34	147,78	197,68
	200	84,13	109,81	163,35	218,50
	250	99,45	129,81	193,11	258,31
15	150	53,77	72,17	111,91	154,01
	175	60,36	81,02	125,63	172,89
	200	66,71	89,55	138,86	191,10
	250	78,87	105,87	164,16	225,91
20	150	43,94	60,13	96,23	135,60
	175	49,33	67,50	108,02	152,22
	200	54,52	74,61	119,40	168,25
	250	64,46	88,20	141,15	198,90
25	150	36,87	51,12	83,75	120,29
	175	41,39	57,39	94,02	135,03
	200	45,75	64,43	103,92	149,25
	250	54,09	74,99	122,85	176,44

The table shows the load for an unreinforced concrete slab C32/40 resulting in bending of the base plate (failure)

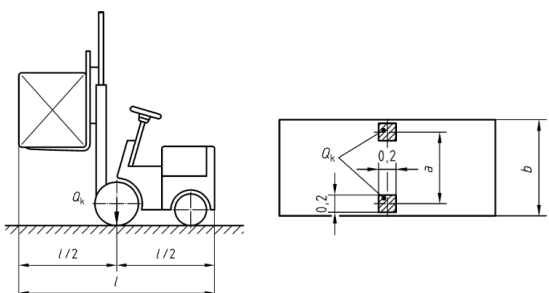
The data are calculated for different joint opening values assuming that the backing plate is in the middle of the slab. To calculate other data values, please contact us (info@dewmark-joint.com).

Calculation request

We use a calculation program in accordance with TR 34 to determine the thickness and size of the dowels and the number of support plates required to support the design loads. On request, we can make a design calculation for you or check whether the calculations made for the projects you are working on comply with the standard we use to optimize the design of our profiles.

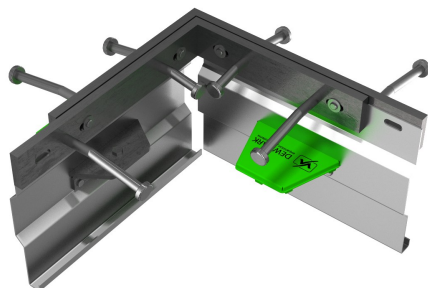
To do this, please fill out ANNEX 1 and send it to info@dewmark-joint.com.

Forklift type according to DIN 1055-3

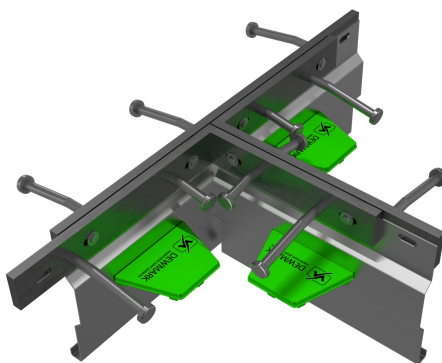
	Type	Max weight, kN	Payload, kN	Axle load (without impact loads), $2 \times Q_k$ kN	Wheel load (without impact loads), Q_k kN
	G1	31	10	26	12,5
	G2	46	15	40	15
	G3	69	25	63	31,5
	G4	100	40	90	45
	G5	150	60	140	70
	G6	190	80	170	85

ACCESSORIES AND COMPONENTS

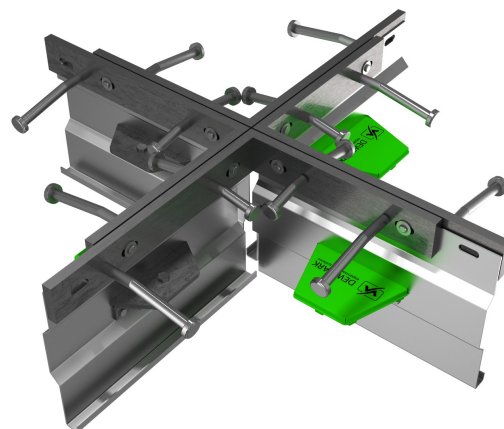
L-connector profile SG 61



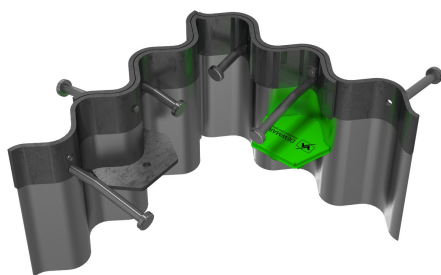
T-connector profile SG 61



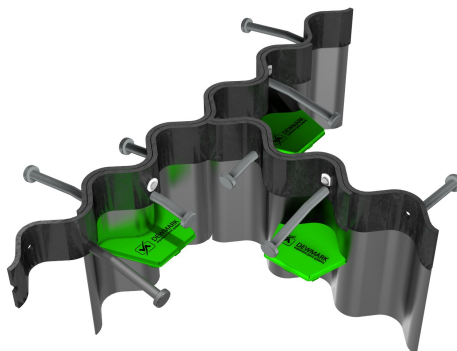
X-connector profile SG 61



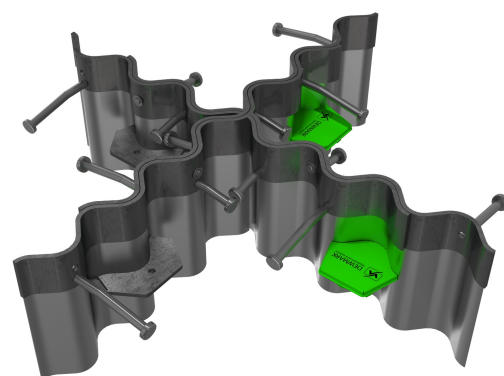
L-connector profile SG 62



T-connector profile SG 62



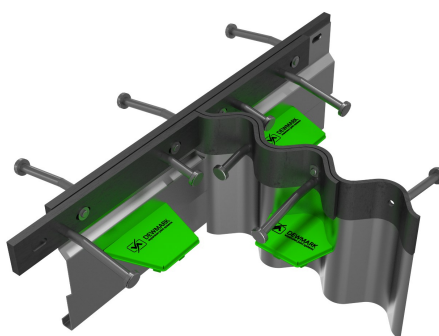
X-connector profile SG 62



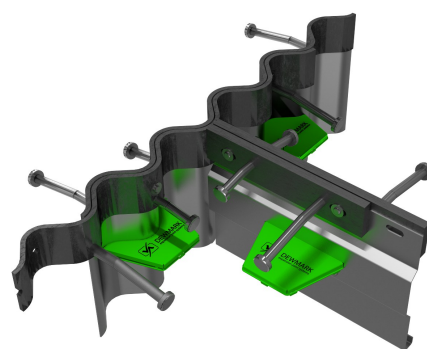
Direct transition from profile SG 61 to profile



T-connector between SG 61 and SG 62

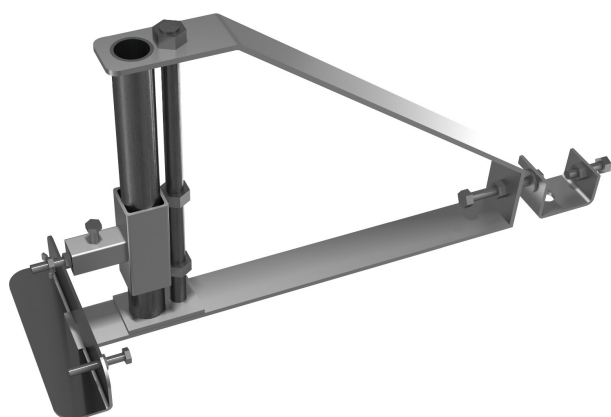


T-connector between SG 62 and SG 61



Mounting element for fixing and installing Dewmark Concrete profiles:

- **Holder 300** (for profiles up to 300 mm height)
- **Holder 400** (for profiles up to 400 mm height)



PHOTOS

