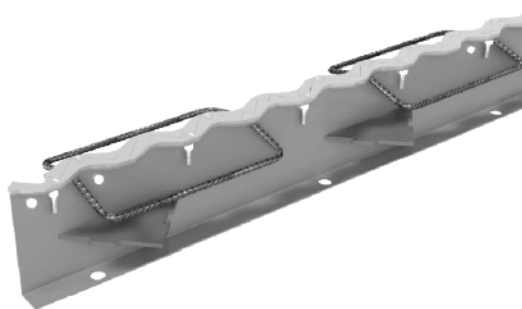




CONSTRUCTION JOINT type E

DESCRIPTION

The Isoplam Type C Construction Joint is a leak-proof pre-assembled construction joint and formwork, designed for use in concrete pavements.

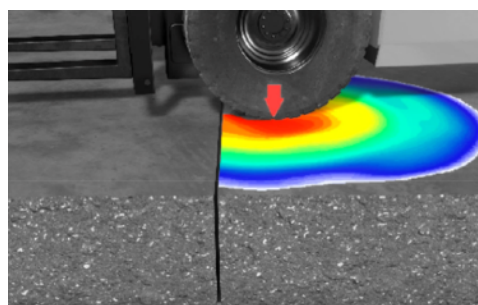
It is intended to transfer the load from one portion of the pavement to another. In addition to this function, it is designed to absorb thermal and hygrometric movements of the concrete screed, such as those caused by temperature changes or shrinkage during the drying phase (UNI 11146:2005 – point 3.3.3).

It is widely used in industrial flooring, both internal and external, where it aims to reduce vertical and/or rotary movements between two adjacent floor portions that would lead to non-flatness of the surface with consequent peeling and deterioration of the ends of the CLS plates, caused by the passage of heavy vehicles and loads.

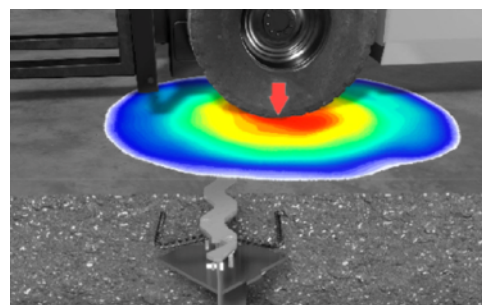
The joint consists of two 3 mm thick S235 steel sheets, connected with M6 plastic screws and galvanized nuts.

On the top of the blades are mounted corrugated combs made of S235 steel and on the sheets are welded downward-bent clods, which anchor themselves to the concrete casting.

There are also diamond-shaped co-participation bars, which act as bars, made of S235 steel, with a thickness that varies depending on the height of the joint and a diagonal length of 18 cm. Thanks to their particular knurling, these bars allow the CLS to anchor well, ensuring the transfer of the load to the nearby CLS plate.



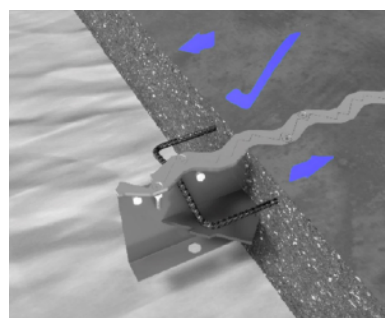
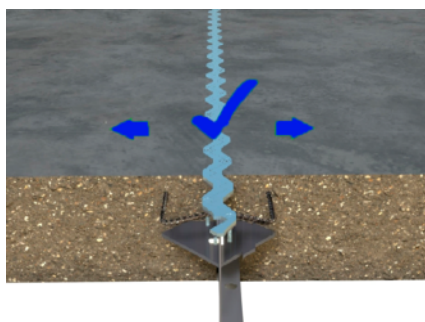
Without joint



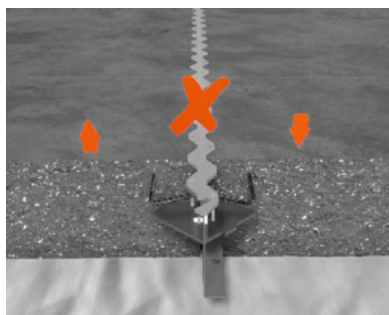
with joint

FUNCTIONING

Type E Construction Joints accommodate horizontal displacements of the cls plates due to expansion (caused by temperature variations) or shrinkage (during the drying phase of the cls) which can vary from a few millimetres up to even 2 cm.



Instead, vertically, the Type C Construction Joints constrain the cls plates preventing their upward or downward movement. In this way the surface of the two floor portions will remain coplanar and aligned even when subjected to the action of forces or loads



INSTALLATION

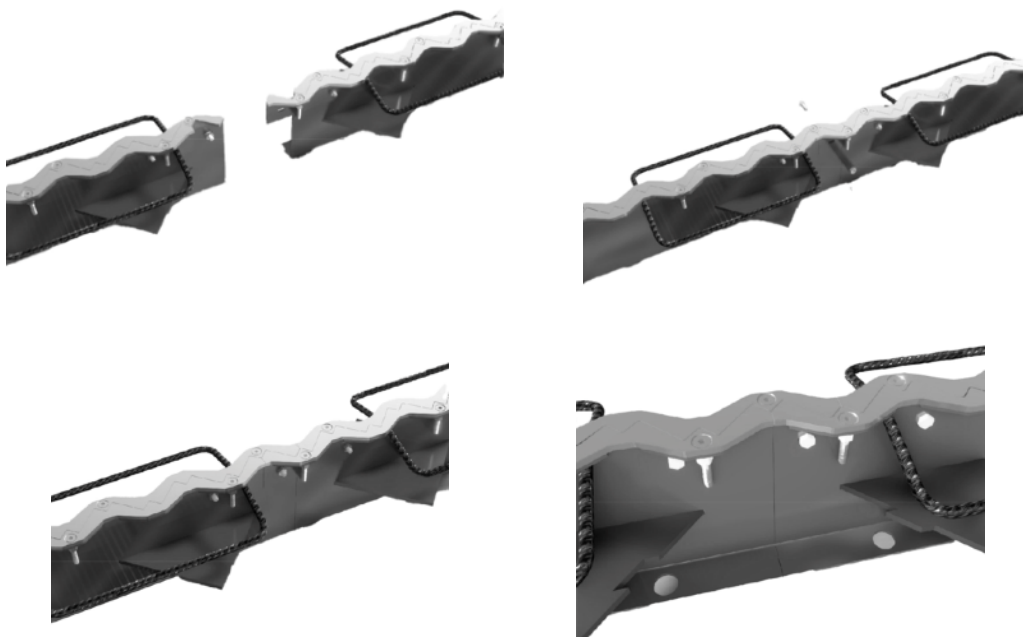
Type E Construction Joints must be installed before casting using pegs or using special metal support stands.

Unscrew the plastic screws and nuts that are on the protruding ends.

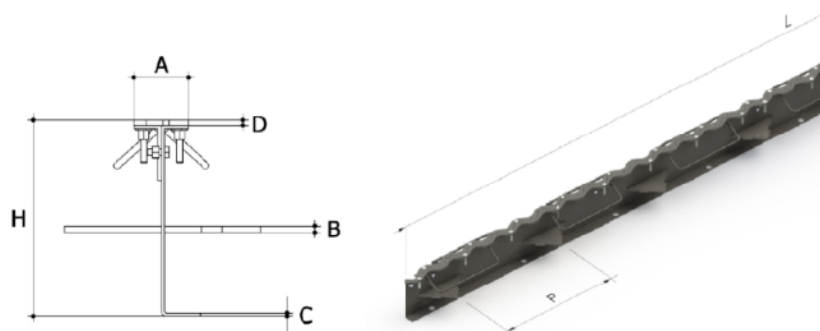
Slide the joints over each other until the top surfaces are continuous.

Insert the plastic screw through the slots and screw in the nut.

After carrying out the first casting on the side opposite the pegs or stands, the anchors must be removed to allow the second casting to be carried out



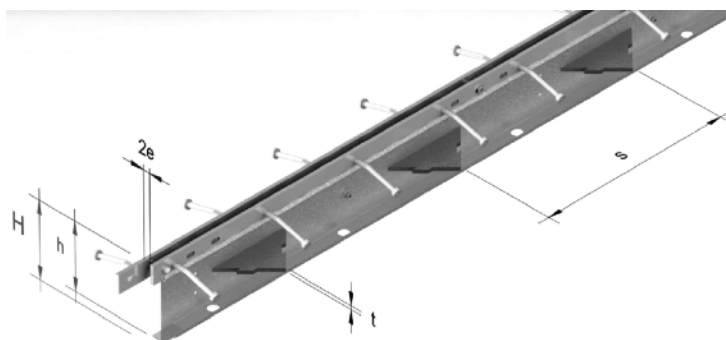
TECHNICAL FEATURES



H	100 ÷ 140 mm	150 ÷ 250 mm
A	48 mm	
B	6 mm	8 mm
C	3 mm standard – 4 mm (H>210)	
D	5 mm	
L	2860 mm	
P	428 mm	
Support sheet material	S235 standard	

<i>Upper comb material</i>	S235 standard – Inox AISI304 / 316 upon request – alluminium upon request
<i>Treatment of sheet metal and upper combs</i>	Galvanizing on request

Calculation Tables



Steel dowel bars performance:

Bar S235 spessore 6 mm - Joint opening 15 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	114.21	114.21	114.21	114.21	114.21
P _{B,MAX}	30.09	30.89	31.36	31.80	32.39
<i>Puncture</i> P _{P,MAX}					
H = 100	9.10	9.63	9.96	10.29	10.76
H = 120	10.40	11.00	11.39	11.76	12.30
H = 150	14.77	15.63	16.17	16.71	17.47

Bar S235 spessore 8 mm - Joint opening 20 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	142.13	142.13	142.13	142.13	142.13
P _{B,MAX}	37.83	38.57	39.06	39.53	40.19
<i>Puncture</i> P _{P,MAX}					
H = 170	17.63	18.65	19.31	19.94	20.86
H = 200	23.10	24.45	25.30	26.13	27.33
H = 220	27.14	28.72	29.73	30.71	32.12
H = 250	33.80	35.77	37.02	38.24	39.99

Bar S235 spessore 10 mm - Joint opening 20 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	177.66	177.66	177.66	177.66	177.66
P _{B,MAX}	49.08	54.72	58.48	58.68	58.32
<i>Puncture</i> P _{P,MAX}					
H = 270	38.63	40.88	42.31	43.70	45.94
H = 300	46.46	49.17	50.90	52.57	54.98

Design flow rates are expressed in kN, floor heights in mm.

The above values are intended for single crossbar. For distributed loads, it must be taken into account that the bars have a spacing of 428.5 mm: it is recommended to transfer only 50% of the total load via the joint bars (the remaining load must be supported by the flooring).

The above results are relevant and in accordance with sector documents TR34.4 and TR34.3 (as per European standards for structural design Eurocodes).

Strength values refer to failure at the ultimate limit state SLU:
 of the shear joint bearing element (shear – PSH);
 of the flexural load-bearing element or of the refluxing cls (bending/bearing – PB,MAX);
 of the cls for punching (bursting – PP, MAX) at the bar.

Resistance classes and heights taken into consideration:
 class of CLS C25/30, C28/35, C30/37, C32/40, C35/45;
 floor height 100,120,150,170,200,250,270,300 mm.

Since the joints are lower than 20 mm (due to the installation tolerance of the subgrade), the heights of the catalog joint are 80, 100, 130, 150, 180, 200, 230, 250, 280 mm.

Based on the geometry of the floor and the bar, the conditions in place and the appropriate evaluations, specific values of:
 thickness “t” or diameter of the bar;
 joint opening “2e” (“e” is the half opening, as well as the load application distance from the face of the cls.

The resistances are obtained with safety coefficients and standard parameters complying with TR34.4:
 for steel $\gamma_S = 1.15$;
 for cls $\gamma_C = 1.5$ and $\alpha_{CC} = 1$

The load-bearing bar is made of S235 steel and its thickness and joint opening are:
 H = 100, 120, 150, thickness 6 mm, max joint opening 15 mm;
 H = 170, 200, 220, 250, thickness 8 mm, max joint opening 20 mm;
 H = 270, 300 thickness 10 mm, max joint opening 20 mm.

Bar S355 spessore 6 mm - Joint opening 15 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	150.03	150.03	150.03	150.03	150.03
P _{B,MAX}	38.30	39.39	40.04	40.64	41.45
<i>Puncture</i> P _{P,MAX}					
H = 100	9.10	9.63	9.96	10.29	10.76
H = 120	10.40	11.00	11.39	11.76	12.30
H = 150	14.77	15.63	16.17	16.71	17.47

Bar S355 spessore 8 mm - Joint opening 20 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	186.70	186.70	186.70	186.70	186.70
P _{B,MAX}	46.38	47.81	48.66	49.44	50.50
<i>Puncture</i> P _{P,MAX}					
H = 170	17.63	18.65	19.31	19.94	20.86
H = 200	23.10	24.45	25.30	26.13	27.33
H = 220	27.14	28.72	29.73	30.71	32.12
H = 250	33.80	35.77	37.02	38.24	39.99

Bar S355 spessore 10 mm - Joint opening 20 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	233.37	233.37	233.37	233.37	233.37
P _{B,MAX}	63.19	65.60	67.05	68.40	70.24
<i>Puncture</i> P _{P,MAX}					
H = 270	38.63	40.88	42.31	43.70	45.94
H = 300	46.46	49.17	50.90	52.57	54.98

Design flow rates are expressed in kN, floor heights in mm.

The above values are intended for single crossbar. For distributed loads, it must be taken into account that the bars have a spacing of 428.5 mm: it is recommended to transfer only 50% of the total load via the joint bars (the remaining load must be supported by the flooring).

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Based on the geometry of the floor and the bar, the conditions in place and the appropriate evaluations, specific values of:

thickness “t” or diameter of the bar;

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H = 100, 120, 150, thickness 6 mm, max joint opening 15 mm;

H = 170, 200, 220, 250, thickness 8 mm, max joint opening 20 mm;

H = 270, 300 thickness 10 mm, max joint opening 20 mm.

IMPORTANT

All information in this sheet is based on best practical and laboratory experience. It is responsibility of the designer in charge of structural design to design and verify the joints, the flooring in proximity to them. Isoplam Srl is not responsible for any use of the values indicated in this data sheet.