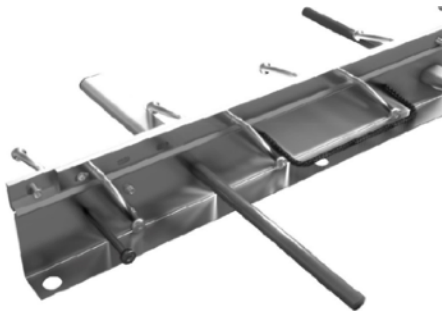


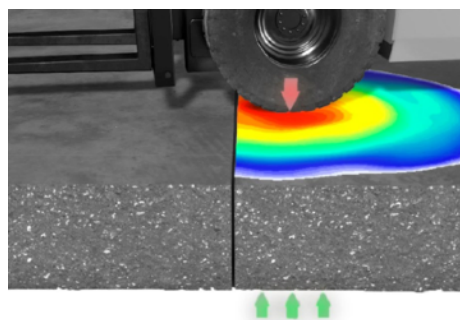
CONSTRUCTION JOINT type D

DESCRIPTION

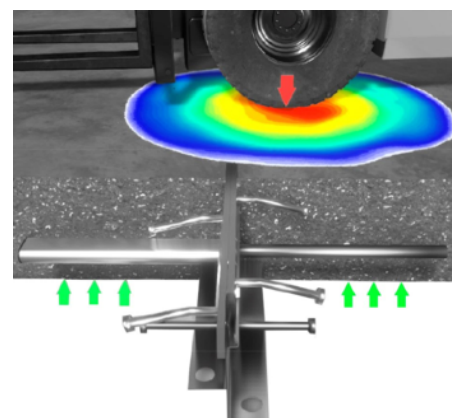
The Isoplam Type D Construction Joint is a leak-proof pre-assembled construction joint and formwork designed for use in concrete pavements.

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 crumbling and deterioration of the ends caused by the passage of heavy vehicles and loads.



Without joint



with joint

It consists of two S235 steel sheets, bent and 2 mm thick, welded at the top to 40×8 or 40×10 mm steel plates. The two sheets are joined together by M6 plastic screws with specific inserts. The upper elements are welded with metal anchors, bent downwards, which serve to fix the joint to the plate during the pouring of concrete.

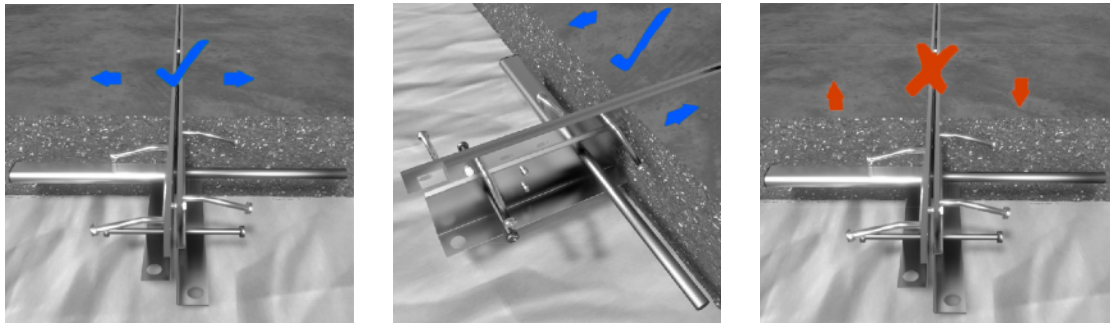
Inside the joint are inserted round bars made of S275 or S355 steel, with diameters varying according to the height of the joint and lengths between 400 and 600 mm. These bars are partially covered by sheaths,

oval metal tubes closed at one end, which prevent the concrete from adhering to the bar itself, but still allow it to support vertically during the expansion movements of the screed.

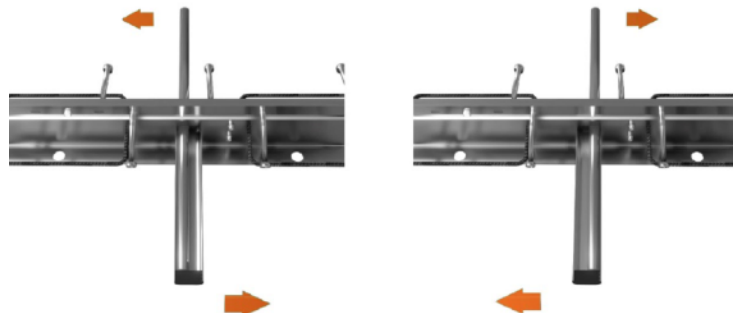
FUNCTIONING

Type D Construction Joints accommodate horizontal displacements of the cls plates due to expansion (due to temperature variations) or shrinkage (during the drying phase of the cls).

Instead, vertically, the Type D 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.



Oval tubes also perform the important function of allowing bidirectional movements of the plate in cls. They are metal elements welded to the sheet metal, which cover the round bars.



INSTALLATION

Remove the metal transport screws.

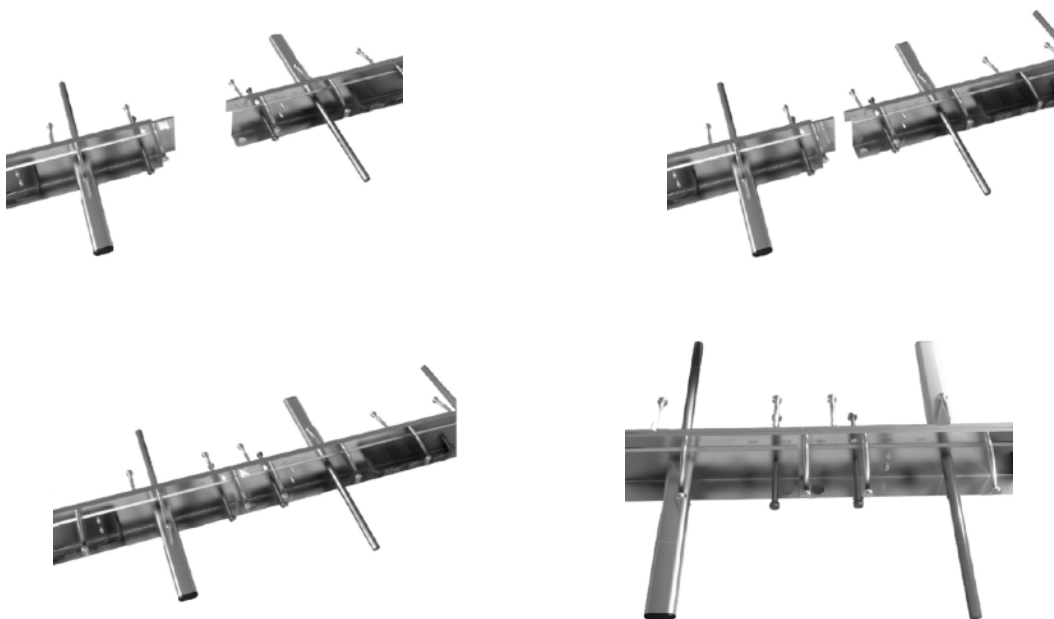
To properly join the joints and achieve structural continuity, you need to place them side by side, then remove the plastic screw and the nut with fins placed at the protruding ends.

Next, the joints should be slid over each other until the upper sheets are perfectly aligned.

At this point, you can reinsert the plastic screw into the slots of the upper sheets and tighten the nut with lugs, thus firmly locking the two joints together.

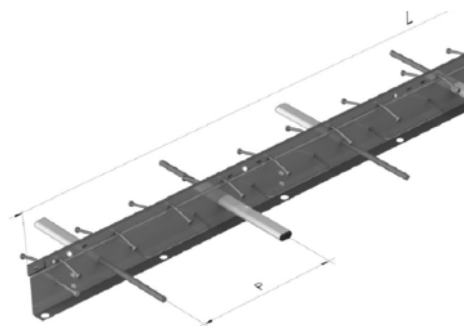
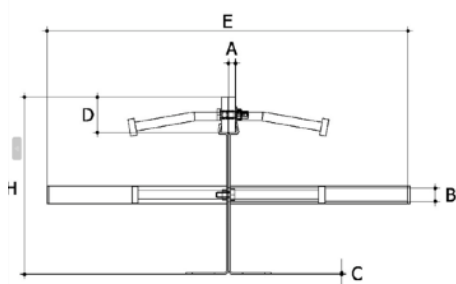
Position the stands or pegs through the appropriate holes on the base of the joint so as to ensure that the lateral thrust of the cls is contained.

Perform the first casting from one of the two sides of the joint. The next day remove the pegs or stands, break the plastic screws (only in the case of joints less than 10 cm high; for joints of greater height the screws are calibrated so that they break on their own) and perform the casting on the other side of the joint.



TECHNICAL FEATURES

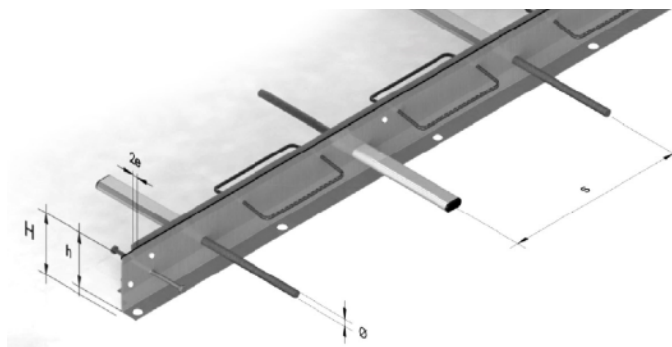
Isoplam D-type Construction Joints have a length of 3 m.



<i>H</i>	90 ÷ 100 mm	110 ÷ 200 mm	210 ÷ 300 mm
<i>A</i>	8 mm standard - 10 mm upon request		
<i>B</i>	Ø15 mm (S275/S355)	Ø20 mm (S275/S355)	Ø25 mm (S275/S355)
<i>C</i>	2 mm standard – 1,5 mm upon request		
<i>D</i>	40 mm standard		
<i>E</i>	600 mm standard – 400, 500 mm upon request		
<i>P interasse</i>	500 mm		
<i>Upper blade material</i>	Iron S235 standard – Inox Aisi 304 upon request		

<i>Support sheet material</i>	S235 standard
<i>Upper blade treatment</i>	Galvanizing on request

Calculation tables



Steel dowel bars performance

Bar S275 $\varnothing$ 15 mm – Joint opening 10 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	26.24	26.24	26.24	26.24	26.24
P _{B,MAX}	11.21	11.72	12.03	12.32	12.74
<i>Puncture</i> P _{P,MAX}					
H = 100	9.11	9.64	9.98	10.30	10.78
H = 120	11.98	12.68	13.12	13.55	14.17

Bar S275 $\varnothing$ 20 mm – Joint opening 10 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	46.65	46.65	46.65	46.65	46.65
P _{B,MAX}	21.08	22.09	22.72	23.33	24.18
<i>Puncture</i> P _{P,MAX}					
H = 150	19.31	20.43	21.15	21.84	22.84
H = 170	23.37	24.73	25.60	26.44	27.65
H = 200	30.12	31.87	32.99	34.07	35.63
H = 220	35.05	37.10	38.40	39.66	41.47

Bar S275 $\varnothing$ 25 mm – Joint opening 10 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P _{SH}	72.89	72.89	72.89	72.89	72.89
P _{B,MAX}	34.06	35.76	36.83	37.86	39.32
<i>Puncture</i> P _{P,MAX}					
H = 250	47.06	49.80	51.55	53.24	55.68
H = 270	53.18	56.28	58.26	60.17	62.93
H = 300	63.03	66.70	69.04	71.31	74.57

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 500 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 load-bearing bar is a smooth round made of S275 steel, Ø bar and joint opening are:
 H = 100, 120 bar Ø 15 mm, max joint opening 10 mm;
 H = 150, 170, 200, 220 bar Ø 20 mm, max joint opening 10 mm;
 H = 250, 270, 300 bar Ø 25 mm, max joint opening 10 mm.

Bar S355 $\varnothing$ 15 mm – Joint opening 10 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P_{SH}	33.88	33.88	33.88	33.88	33.88
$P_{B,MAX}$	13.08	13.69	14.07	14.43	14.94
<i>Puncture</i> $P_{P,MAX}$					
H = 100	9.11	9.64	9.98	10.30	10.78
H = 120	11.98	12.68	13.12	13.55	14.17

Bar S355 $\varnothing$ 20 mm - Joint opening 10 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P_{SH}	60.22	60.22	60.22	60.22	60.22
$P_{B,MAX}$	24.43	25.64	26.39	27.11	27.14
<i>Puncture</i> $P_{P,MAX}$					
H = 150	19.31	20.43	21.15	21.84	22.84
H = 170	23.37	24.73	25.60	26.44	27.65
H = 200	30.12	31.87	32.99	34.07	35.63
H = 220	35.05	37.10	38.40	39.66	41.47

Bar S355 $\varnothing$ 25 mm - Joint opening 10 mm

<i>cls</i>	C25/30	C28/35	C30/37	C32/40	C35/45
<i>Flexion Cut</i>					
P_{SH}	94.10	94.10	94.10	94.10	94.10
$P_{B,MAX}$	39.33	41.33	42.60	43.80	45.53
<i>Puncture</i> $P_{P,MAX}$					
H = 250	47.06	49.80	51.55	53.24	55.68
H = 270	53.18	56.28	58.26	60.17	62.93
H = 300	63.03	66.70	69.04	71.31	74.57

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 500 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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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.