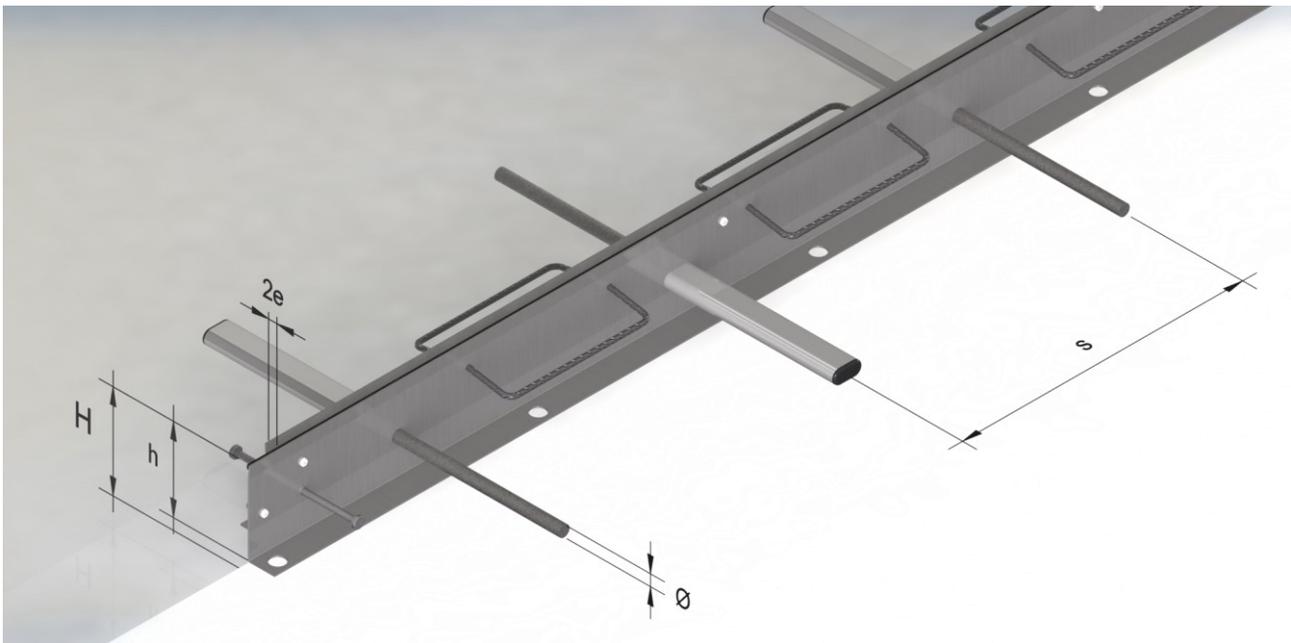


DESIGN TABLES

JOINT TYPE B – B ISO – BH – BB – FP – P – TWIN – Z – M | STEEL GRADE S275



The reported results are derived by following the sector-specific guidance of TR34.4, the previous TR34.3, and the more general requirements of the European regulation for structural design (Eurocodes).

Resistance design values concern the ultimate limit state (ULS) verification against:

- shear failure of the dowel (shear – P_{SH})
- bending failure of the dowel or bearing failure of the concrete (bending/bearing – $P_{B,MAX}$)
- concrete punching shear of the plate causing its expulsion for break-out (bursting – $P_{P,MAX}$).

The following concrete resistance classes and flooring thicknesses are considered:

- Concrete class – C25/30, C28/35, C30/37, C32/40, C35/45
- Flooring thickness – $H = 100, 120, 150, 170, 200, 220, 250, 270, 300$ mm

Horizontality tolerance of the subgrade forces the joint height to be 20 mm less than the floor thickness.

- Joint height, by producer catalogue – $h = 80, 100, 130, 150, 180, 200, 230, 250, 280$ mm

Based on bar geometry, site conditions and design evaluation (also made to produce the following tables) specific values are selected for:

- Dowel thickness “ t ” or diameter “ \emptyset ”
- Joint opening “ $2e$ ”

being “ e ” the half opening, the distance of application of load from the face of concrete.



Joint bearing bar is a round steel bar (grade S275). Bar diameter and maximum admissible joint opening are:

- H = 100, 120 – steel bar diameter \varnothing 16 mm, maximum joint opening 10 mm
- H = 150, 170, 200, 220 – steel bar diameter \varnothing 20 mm, maximum joint opening 10 mm
- H = 250, 270, 300 – steel bar diameter \varnothing 25 mm, maximum joint opening 10 mm

Bar (grade S275) Joint opening	\varnothing 16 mm 10 mm	C25/30	C28/35	C30/37	C32/40	C35/45	
Shear	P_{SH}	29.86	29.86	29.86	29.86	29.86	
Bending/Bearing	$P_{B,MAX}$	12.94	13.53	13.89	14.24	14.74	
Punching Shear	$P_{P,MAX}$	H = 100	9.42	9.97	10.32	10.66	11.15
		H = 120	12.36	13.08	13.54	13.98	14.62

Bar (grade S275) Joint opening	\varnothing 20 mm 10 mm	C25/30	C28/35	C30/37	C32/40	C35/45	
Shear	P_{SH}	46.65	46.65	46.65	46.65	46.65	
Bending/Bearing	$P_{B,MAX}$	21.08	22.09	22.72	23.33	24.18	
Punching Shear	$P_{P,MAX}$	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 (grade S275) Joint opening	\varnothing 25 mm 10 mm	C25/30	C28/35	C30/37	C32/40	C35/45	
Shear	P_{SH}	72.89	72.89	72.89	72.89	72.89	
Bending/Bearing	$P_{B,MAX}$	34.06	35.76	36.83	37.86	39.32	
Punching Shear	$P_{P,MAX}$	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

The design carried loads are expressed in kN, flooring thickness is in mm

Design loads from the tables are intended for a single bearing bar. For distributed loads is to be considered a spacing between bars "s" of 500 mm. The load transferred by the joint should not be greater than 50% of the design load for the floor. The remaining 50% should still be carried by the floor.

Design loads for not specified flooring thicknesses, different material mechanical properties or for different bar geometries cannot be obtained by interpolation of the provided data and they will necessarily need extra specific evaluations.

Accountability for a well-designed and properly verified joint, as well as for the flooring slab near the joint, is always held by the professional engineer in charge for the structural design of the entire flooring system. Any responsibility for a proper or not proper use of the presented resistance values cannot be ascribed to TIEPPO GROUP S.r.l. or the producer of this design tables.

