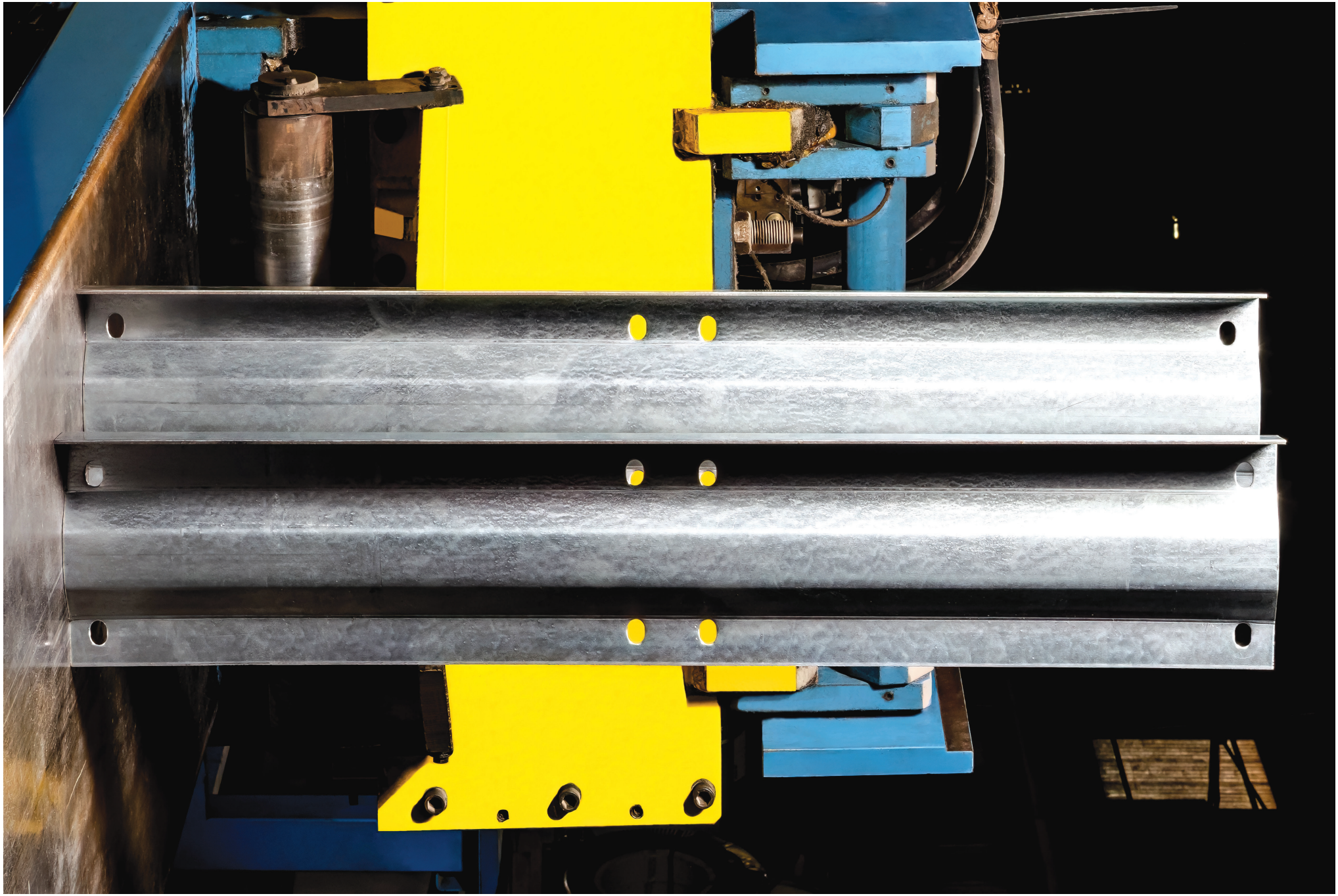
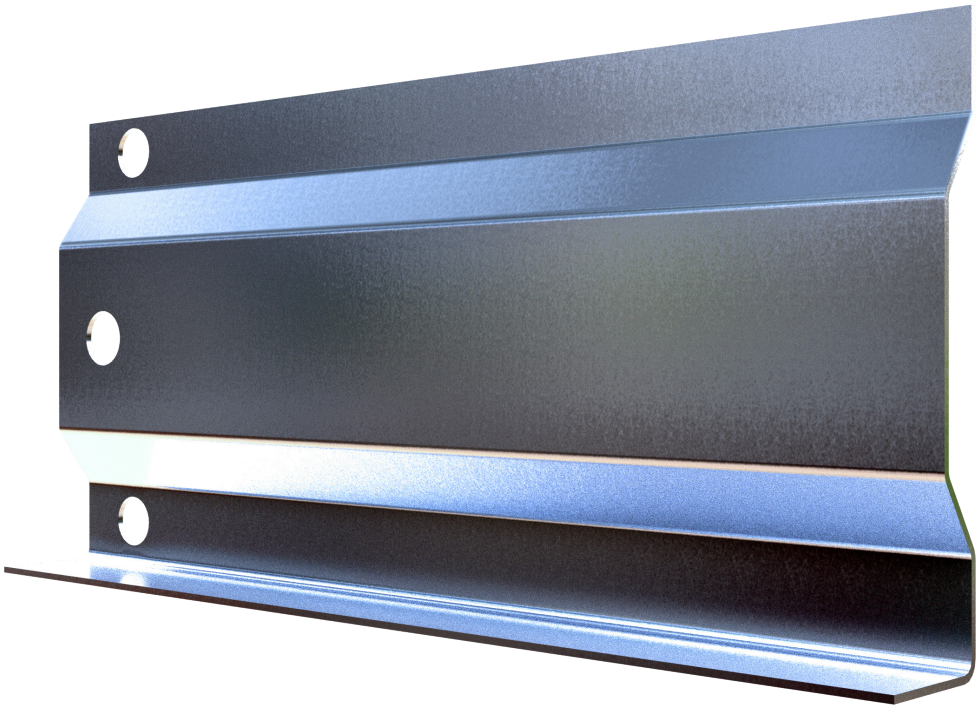


MetaLite J

Thin-walled open J-sections used as connecting elements for MetaLite M-sections

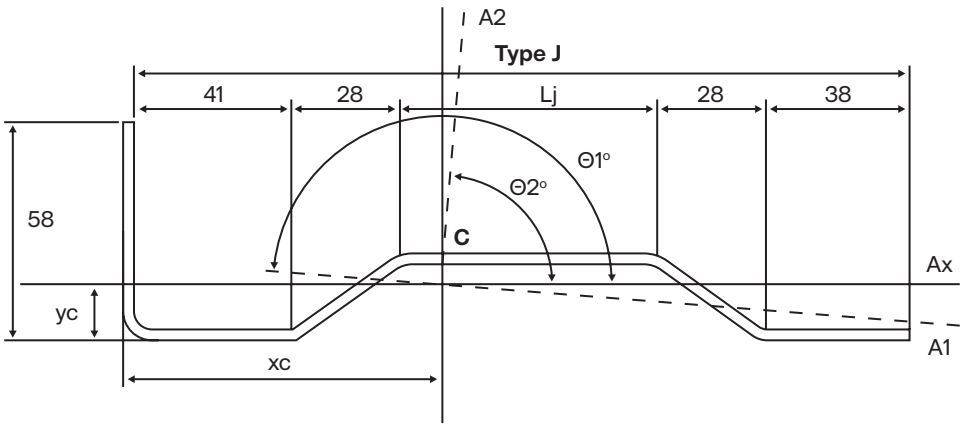


Available in

Effective cover width 175mm, 205mm, 235mm & 265mm | Nominal thickness 1,50mm, 2,00mm, 2,50mm & 3,00mm

Bespoke lengths, depending on project requirements

Provision for Ø6, Ø8, Ø10, Ø12.5, Ø14, Ø16, Ø18, Ø20 and Ø22 holes in any position



Section Type J

AAx: Neutral X-axis
Ay: Neutral Y-axis
yc: Distance of the extreme fiber from the neutral axis Ax (minimum case)
xc: Distance of the extreme fiber from the neutral axis Ay (minimum case)
A1: main axis 1
A2: main axis 2
Θ1°: angle of the main axis 1
Θ2°: angle of the main axis 2
C: center of mass
Lj: Type J - 136mm

Dimensional Tolerances

(Standards EN 1090 and EN 10162)

- The thickness of the section, t, is defined according to EN 10143 for steel. Variations in thickness may occur at the bending points.

- The nominal bending angle is defined as 90°. The angular tolerances are given in Table 1.

- The internal bending radius, rii, is given in Table 2, where:
  rii ≤ ±20% and rii ≤ ±0.5 mm

- The minimum external dimensions of the section h, h' are defined as:

  h1,h'1 = 10*t, for dimensions between two internal radii. The tolerances for these dimensions are given in Table A.

  h2, h'2 = rii+3t, for dimensions between one radius and a free edge.
  The tolerances are given in Table B.

- The length tolerances of the profile are given in Table 3.

- The permissible deviation from straightness must not exceed 0.002 × l (length).
  There is no limitation for non-symmetrical sections.

- The permissible twist angle must not exceed ≤ 1° per meter. There is no limitation for non-symmetrical sections.

- The permissible concavity or convexity must not exceed:
  ≤ 0,8%*h (h') ή ≤ 0,5mm.

- The weight per running meter is calculated based on: the length, the cross-sectional area at nominal dimensions, and the density of steel = 7850 kg/m³.

Steel sheets: thickness > 0,6 mm.
Aluminium sheets > 0,7mm.
Stainless steel sheets 0,7mm.
The tolerances for aluminium sheets are described in the EN 485-4 standard.

Table 1. Bend angle tolerances
(based on the length of the smaller side)

h' ≤ 10 mm	±3o
10 mm < h' ≤ 40 mm	±1o 45'
40 mm < h' ≤ 80 mm	±1o 15'
80 mm < h' ≤ 110 mm	±1o
h' > 110 mm	±0o 45'

Table 2. Permissible internal radius rii
(depending on the steel grade and the zinc coating, Z < 450 g/m²)

DX51D+Z	= t	S280GD+Z	= t
S220GD+Z	= 0.5*t	S320GD+Z	= 1.5*t
S250GD+Z	= 0.5*t	S350GD+Z	= 1.5*t

Where t is the sheet thickness ≤ 3.00 mm.
For thickness t > 3.00 mm, there is no restriction.

Table A. Cross-section dimension tolerances (a)

Πάχος t, mm	≤1,50	>1,50 ≤3,00	>3,00 ≤6,00
≤40	±0,50	±0,75	±1,00
>40, ≤100	±0,50	±0,75	±1,00
>100, ≤200	±0,75	±1,00	±1,25
>200, ≤400	±1,25	±1,50	±1,75
h>400	*	±1,75	±2,00

No requirement, subject to agreement upon order.

Table B. Cross-section dimension tolerances (b)

Πάχος t, mm	≤1,50	>1,50 ≤3,00	>3,00 ≤6,00
≤40	±0,75	±0,80	±1,00
>40, ≤100	±0,75	±1,00	±1,25
>100, ≤150	±1,00	±1,25	±1,50
>150, ≤200	*	±1,50	±1,75
h>200	*	*	±2,00

No requirement, subject to agreement upon order.

Table 3. Profile length tolerances

Standard length	6000 mm	0mm ~ +50mm
Fixed lengths	4000 ~ 24000mm	0mm ~ +50mm
Specific lengths	≤2000mm	±1,00mm
	>2000, ≤6000mm	±2,00mm
	>6000, ≤10000mm	±3,00mm
	>10000, ≤15000mm	±4,00mm

By agreement upon order, for specific lengths the tolerances may be only negative (-2* ~ 0 mm) or only positive (0 ~ +2* mm).

Metal profiles CMZJ of open section

Example of a bolted connection of an M-type section with a J-type section.

			Moment of Inertia of Area (J) – Axes X & Y		Principal Moments of Inertia of an Area (J) Principal Axes 1 & 2				Section Modulus (S)		Center of Mass (C)	
Type J	**Thickness mm**	**Weight Kg/m**	**Jx cm^4**	**Jy cm^4**	**J1 cm^4**	**Θ1°**	**J2 cm^4**	**Θ2°**	**Sx cm^3**	**Sy cm^3**	**xc mm**	**yc mm**
175	3,00	5.70	13.848	232.49	11.389	173.98	234.949	83.98	3.152	17.018	69.4	14.1
	4,00	7.50	18.932	312.841	15.524	173.89	316.249	83.89	4.364	22.844	70.1	14.6
205	3,00	6,40	14.297	357.619	12.382	175.74	359.535	85.74	3.316	23.459	83.6	14.9
	4,00	8,50	19.530	480.612	16.872	175.67	483.269	85.67	4.588	31.457	84.2	15.4
235	3,00	7,10	14.658	519.176	13.106	176.83	520.728	86.83	3.453	30.883	97.9	15.6
	4,00	9,40	20.012	697.238	17.856	176.78	699.238	86.78	4.775	41.391	98.5	16.1
265	3,00	7,80	14.954	721.233	13.659	177.55	722.528	87.55	3.568	39.059	112.3	16.1
	4,00	10,40	20.409	967.688	18.609	177.51	969.488	87.51	4.932	52.592	113.0	16.6

The weight per linear metre was calculated taking into account a steel density of 7850 kg/m^3.
The lower yield strength of S320GD steel is taken as 320 MPa.
Where Axo and A1o are taken as 0°, Ayo and A2o are taken as 90°.
The holes shown in the sketches are indicative and are not included in the calculations.
For structural applications, the reduction in strength due to holes shall be calculated in accordance with EN 1993-1-3.