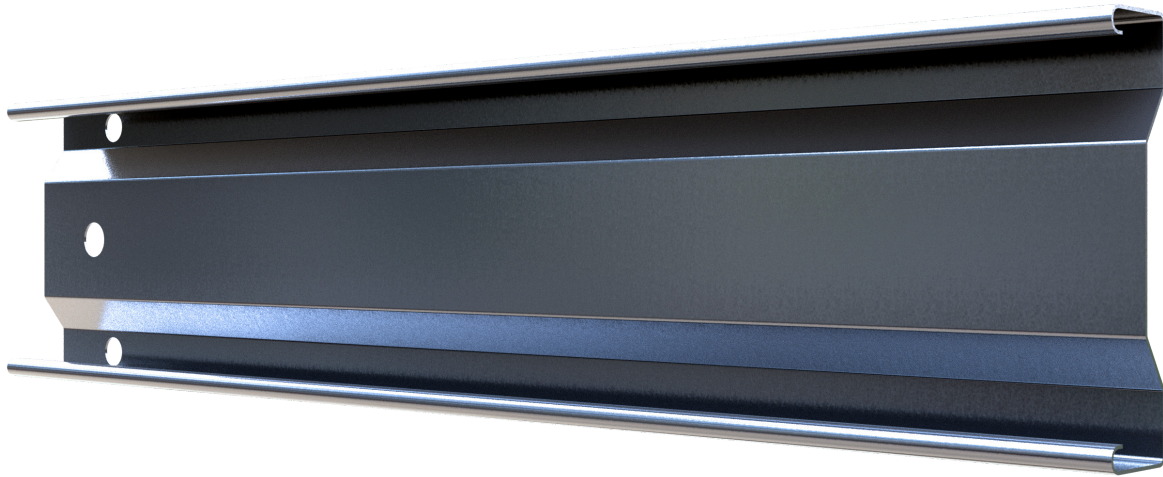


MetaLite M

Thin-walled open M-sections used as columns in light steel structures

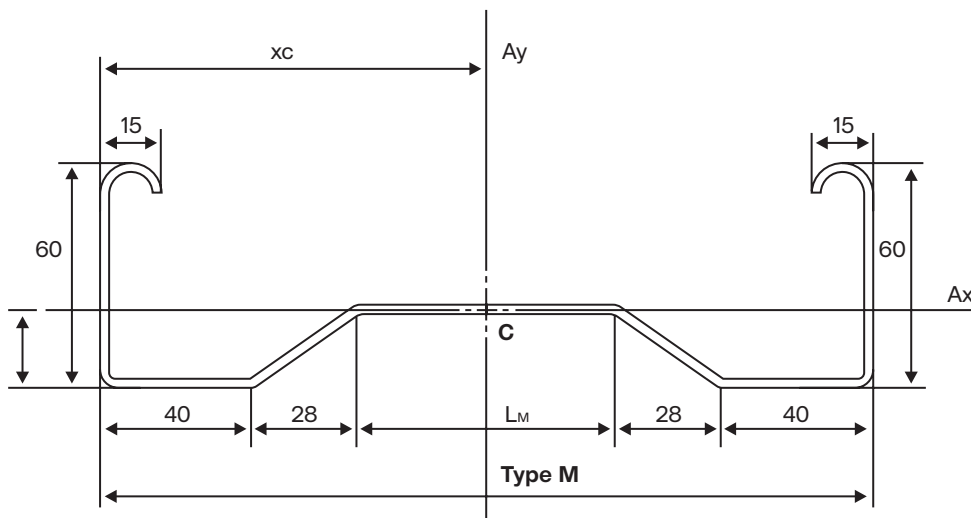


Available in

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

Bespoke lengths up to 14m, depending on project requirements

Provision for $\varnothing 6$, $\varnothing 8$, $\varnothing 10$, $\varnothing 12.5$, $\varnothing 14$, $\varnothing 16$, $\varnothing 18$, $\varnothing 20$ and $\varnothing 22$ holes in any position



Section Type M

Ax: 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)
C: Center of mass
LM: 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, r_{ii} , is given in Table 2, where:
 $r_{ii} \leq \pm 20\%$ and $r_{ii} \leq \pm 0.5 \text{ mm}$
- The minimum external dimensions of the section h , h' are defined as:
 $h_1, h'_1 = 10 \cdot t$, for dimensions between two internal radii. The tolerances for these dimensions are given in Table A.
 $h_2, h'_2 = r_{ii} + 3t$, 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 $0.002 \times l$ (length). There is no limitation for non-symmetrical sections.
- The permissible twist angle must not exceed $\leq 1^\circ$ per meter. There is no limitation for non-symmetrical sections.
- The permissible concavity or convexity must not exceed:
 $\leq 0,8\% \cdot h$ (h') $\eta \leq 0,5 \text{ mm}$.
- 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/m^3 .

Steel sheets: thickness $> 0,6 \text{ mm}$.

Aluminium sheets $> 0,7 \text{ mm}$.

Stainless steel sheets $0,7 \text{ mm}$.

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)

$h' \leq 10 \text{ mm}$	$\pm 3^\circ$
$10 \text{ mm} < h' \leq 40 \text{ mm}$	$\pm 1^\circ 45'$
$40 \text{ mm} < h' \leq 80 \text{ mm}$	$\pm 1^\circ 15'$
$80 \text{ mm} < h' \leq 110 \text{ mm}$	$\pm 1^\circ$
$h' > 110 \text{ mm}$	$\pm 0^\circ 45'$

Table 2. Permissible internal radius r_{ii}

(depending on the steel grade and the zinc coating, $Z < 450 \text{ g/m}^2$)

DX51D+Z	= t	S280GD+Z	= t
S220GD+Z	= $0.5 \cdot t$	S320GD+Z	= $1.5 \cdot t$
S250GD+Z	= $0.5 \cdot t$	S350GD+Z	= $1.5 \cdot t$

Where t is the sheet thickness $\leq 3.00 \text{ mm}$.

For thickness $t > 3.00 \text{ mm}$, there is no restriction.

Table A. Cross-section dimension tolerances (a)

Thickness t , mm	$\leq 1,50$	$> 1,50 \leq 3,00$	$> 3,00 \leq 6,00$
≤ 40	$\pm 0,50$	$\pm 0,75$	$\pm 1,00$
$> 40, \leq 100$	$\pm 0,50$	$\pm 0,75$	$\pm 1,00$
$> 100, \leq 200$	$\pm 0,75$	$\pm 1,00$	$\pm 1,25$
$> 200, \leq 400$	$\pm 1,25$	$\pm 1,50$	$\pm 1,75$
$h > 400$	*	$\pm 1,75$	$\pm 2,00$

No requirement, subject to agreement upon order.

Table B. Cross-section dimension tolerances (b)

Thickness t , mm	$\leq 1,50$	$> 1,50 \leq 3,00$	$> 3,00 \leq 6,00$
≤ 40	$\pm 0,75$	$\pm 0,80$	$\pm 1,00$
$> 40, \leq 100$	$\pm 0,75$	$\pm 1,00$	$\pm 1,25$
$> 100, \leq 150$	$\pm 1,00$	$\pm 1,25$	$\pm 1,50$
$> 150, \leq 200$	*	$\pm 1,50$	$\pm 1,75$
$h > 200$	*	*	$\pm 2,00$

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).

Type M	Thickness mm	Weight Kg/m	Area Moment of Inertia (J) – X & Y axes		Section Modulus (S)		Center of Mass (C)	
			Jx cm ⁴	Jy cm ⁴	Sx cm ³	Sy cm ³	xc mm	yc mm
175	1,50	3,90	18.122	221.055	4.606	25.263	87.5	20.7
	2,00	5,20	23.389	290.708	5.944	33.224	87.5	20.7
	2,50	6,50	28.293	358.367	7.191	40.956	87.5	20.7
	3,00	7,80	32.850	424.042	8.351	48.462	87.5	20.7
205	1,50	4,30	18.123	322.469	4.607	31.460	102.5	20.7
	2,00	5,70	23.392	424.520	5.950	41.417	102.5	20.7
	2,50	7,10	28.300	523.875	7.202	51.110	102.5	20.7
	3,00	8,50	32.862	620.549	8.369	60.541	102.5	20.7
235	1,50	4,60	18.124	448.065	4.608	38.133	117.5	20.7
	2,00	6,10	23.394	590.362	5.954	50.244	117.5	20.7
	2,50	7,70	28.306	729.157	7.212	62.056	117.5	20.8
	3,00	9,20	32.874	864.465	8.385	73.571	117.5	20.8
265	1,50	5,00	18.125	599.867	4.608	45.273	132.5	20.7
	2,00	6,60	23.397	790.935	5.958	59.693	132.5	20.7
	2,50	8,30	28.311	977.587	7.220	73.780	132.5	20.8
	3,00	9,90	32.885	1159.841	8.399	87.535	132.5	20.8

The weight per linear metre was calculated taking into account a steel density of 7850 kg/m³.

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.