

Product Data Sheet

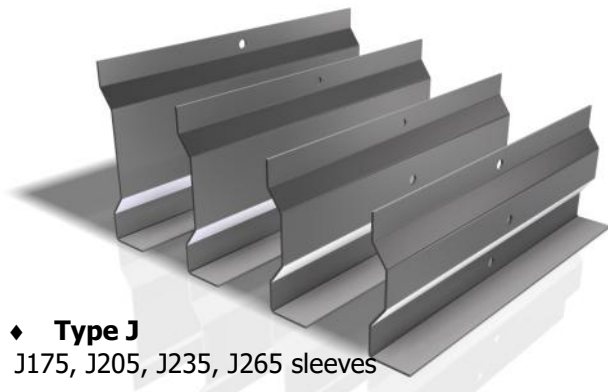
Metal Profiles CMZJ Open Sections

Independent structural elements, open section metal profiles, galvanized rarely pre painted, for metal constructions.

Open Sections Options

The standardized roll forming thin sections are produced based on the high quality standards of the company, covering a wide range of applications.

- Application in all types of buildings.
- Structural element with an excellent bearing capacity, suitable for carrying loads.
- Resistance to operating conditions and corrosion due to the galvanic coating.
- Easy and fast standard mounting, reducing construction costs.
- Holes capability **Ø6, Ø8, Ø10, Ø12.5, Ø14, Ø16, Ø18, Ø20, Ø22**



◆ Type J

J175, J205, J235, J265 sleeves

Ability of punching holes Ø6, Ø8, Ø10, Ø12.5, Ø14, Ø16, Ø18, Ø20, Ø22, in any quantity and anywhere with great precision, open sections have the ability to be connected by screws with other metal and not only structural elements.

Type C open sections are commonly used as girts to support sidewall covering.

Type Z open sections are commonly used as purlins. They have the ability to overlap and therefore no sleeves are required.

In contrast, type J open sections are the connection sleeves of type M open sections.

Type M open sections, due to their design typically carry the largest loads and they can rarely be used as columns, beams and rafters in light constructions.

Type C20.40 and C40.40 open sections are basically used to fasten the construction as roof and wall bracings.

Obviously the range of these open sections applications is unlimited.

◆ Type C

C140, C180, C210 with length up to **14 m**



◆ Type M

M175, M205, M235, M265 with length up to **14 m**

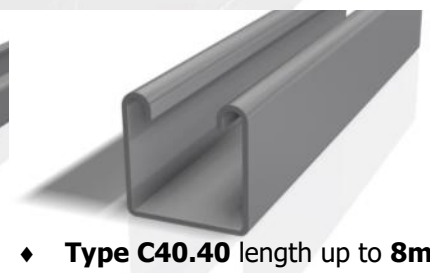


◆ Type Z

Z140, Z180, Z210 with length up to **14 m**

◆ Type C20.40

Length up to **8m**



◆ Type C40.40 length up to **8m**

Metal Profiles CMZJ - Open Sections

Metal Sheets Options

They are mainly produced out of high quality and durable steel sheets, with galvanic heat protection, according to the EN 10346 and EN 10143 standards.

- Metal garde from DX51D up to S350GD
- Warm zinc coating, up to Z275 gr/m²
- AluZinc protection AZ70 up to AZ265 gr/m²
- Nominal thickness from 1,0mm **up to 4,0mm**

Rarely, especially for special applications, can be produced with pre painted steel sheets, aluminum with or without color coating and stainless steel.

Typical Dimensional Tolerances

(according to the EN 1090 and EN 10162 standards)

- The thickness of the open section, t , is defined according to the EN10143 standard for steel. There may be variations in thicknesses at the bending points.
- The nominal bending angle is set at 90°. Angle tolerances are given in Table 1.
- The inner bending radius, r_{ii} , is given in Table 2
Where $r_{ii} \leq \pm 20\%$ & $r_{ii} \leq \pm 0,5 \text{ mm}$
- The minimum outer dimensions of the open section h, h' , are:
 - a. $h_1, h'_1 = 10*t$, dimensions between two inner rays. Their tolerances are given in Table A.
 - b. $h_2, h'_2 = r_{ii} + 3t$, for dimensions between a radius and a free edge. Tolerances are given in Table B
- The profile length tolerances are given in Table 3.
- The permissible deviation from straightness shall not exceed **0,002*I** (length) and without limitation for the non-symmetrical open sections.
- The permissible torsion angle should not be greater than $\leq 1^\circ/m$. There is no limit to the non-symmetrical open sections.
- The permitted bowing, may not be greater than $\leq 0,8\%*h$ (h') or $\leq 0,5\text{mm}$
- The weight per current meter shall be calculated taking into account the length, the surface area of the open section in nominal dimensions and the specific weight of the steel = 7850 kg/m³.

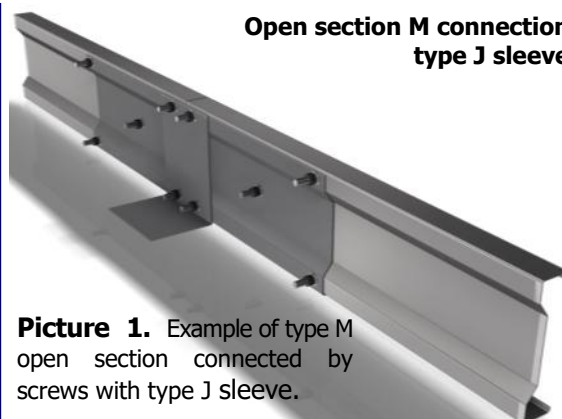
It concerns, steel sheet thickness > 0,6 mm, aluminum sheet thickness > 0,7mm & stainless steel thickness 0,7mm. The tolerances for aluminum sheets are described in the EN 485-4 standard. The tolerances for stainless steel sheets are given based on the EN 10088-1 standard.

Table 3. Profile length tolerances

Standard length	6000 mm	0mm ~ +50mm
Fixed lengths	4000 ~ 24000mm	0mm ~ +50mm
Specific lengths	$\leq 2000\text{mm}$	$\pm 1,00\text{mm}$
	$> 2000, \leq 6000\text{mm}$	$\pm 2,00\text{mm}$
	$> 6000, \leq 10000\text{mm}$	$\pm 3,00\text{mm}$
	$> 10000, \leq 15000\text{mm}$	$\pm 4,00\text{mm}$

Depending on the buyer in these lengths the tolerances can be only negative ($-2* \sim 0\text{mm}$) or only positive ($0 \sim +2*\text{mm}$).

Open section M connection type J sleeve



Picture 1. Example of type M open section connected by screws with type J sleeve.

Table 1. Bending angle tolerances
(based on the length of the shorter 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. Allowed inner radius r_{ii}
(depending on the grade of steel and the zinc coating, $Z < 450 \text{ gr/m}^2$)

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 , the steel sheet thickness $\leq 3,00 \text{ mm}$.
For thicknesses $t > 3,00 \text{ mm}$, without restriction.

Table A. Open section dimensional tolerances (a)

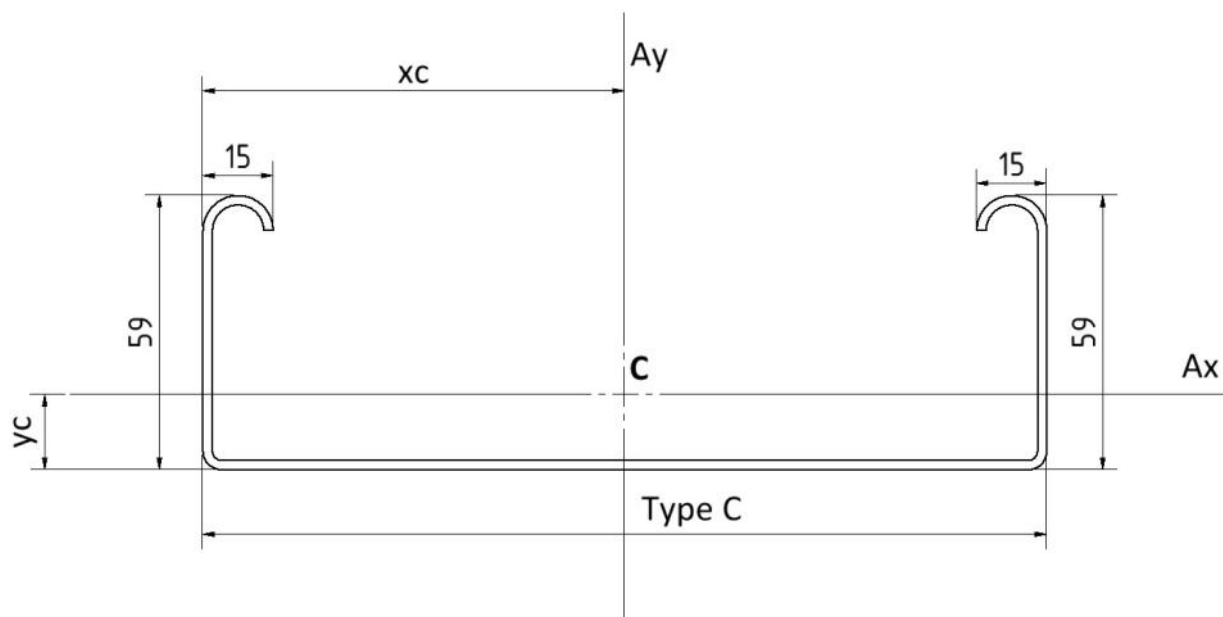
Thickness t , mm	$\leq 1,50$	$> 1,50 \leq 3,00$	$> 3,00 \leq 6,00$
≤ 40	$\pm 0,50$	$\pm 0,75$	$\pm 1,00$
$> 40, \leq 100$	$\pm 0,50$	$\pm 0,75$	$\pm 1,00$
$> 100, \leq 200$	$\pm 0,75$	$\pm 1,00$	$\pm 1,25$
$> 200, \leq 400$	$\pm 1,25$	$\pm 1,50$	$\pm 1,75$
$h > 400$	*	$\pm 1,75$	$\pm 2,00$

* No requirement, on request upon order.

Table B. Open section dimensional tolerances (b)

Πάχος 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, on request upon order.

Metal Profiles CMZJ - Open Sections**Type C Open Section**

Ax:neutral X Axis

Ay:neutral Y axis

yc: distance of profile edge from neutral axis on Y Axis (minimum)

xc: distance of profile edge from neutral axis on X Axis (minimum)

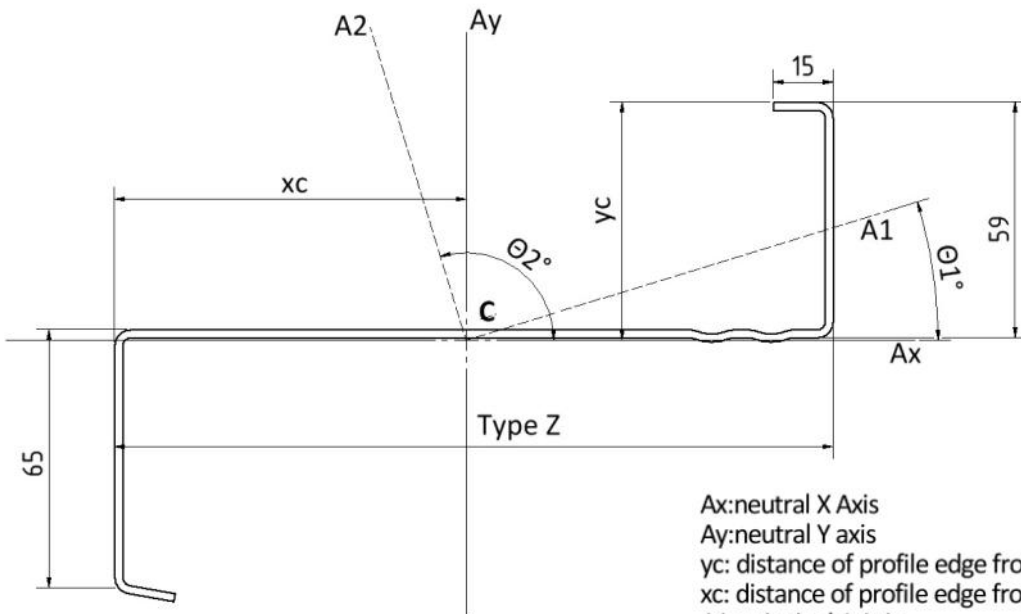
C: center of gravity

Type C	Thickness mm	Weight Kg/m	Area Moments of Inertia (J)- Axis X & Y		Section Modulus (S)		Center of Gravity (C)	
			Jx cm ⁴	Jy cm ⁴	Sx cm ³	Sy cm ³	xc mm	yc mm
140	1,50	3,40	19,091	129.106	4.664	18.444	70.0	18.1
	2,00	4,50	24,599	168.642	6.010	24.092	70.0	18.1
	2,50	5,60	29,704	206.457	7.259	29.494	70.0	18.1
	3,00	6,70	34,420	242.567	8.413	34.652	70.0	18.1
180	1,50	3,80	20.666	232.306	4.795	25.812	90.0	15.9
	2,00	5,10	26.636	304.092	6.180	33.788	90.0	15.9
	2,50	6,40	32.172	373.089	7.466	41.454	90.0	15.9
	3,00	7,70	37.290	439.315	8.654	48.813	90.0	15.9
210	1,50	4,20	21.611	334.602	4.867	31.867	105.0	14.6
	2,00	5,60	27.855	438.538	6.275	41.766	105.0	14.6
	2,50	7,00	33.646	538.713	7.582	51.306	105.0	14.6
	3,00	8,40	39.001	635.150	8.792	60.490	105.0	14.6

The weight per current meter was calculated taking into account the specific weight of the steel = 7850 kg/m³.

Metal Profiles CMZJ - Open Sections

Type Z Open Section



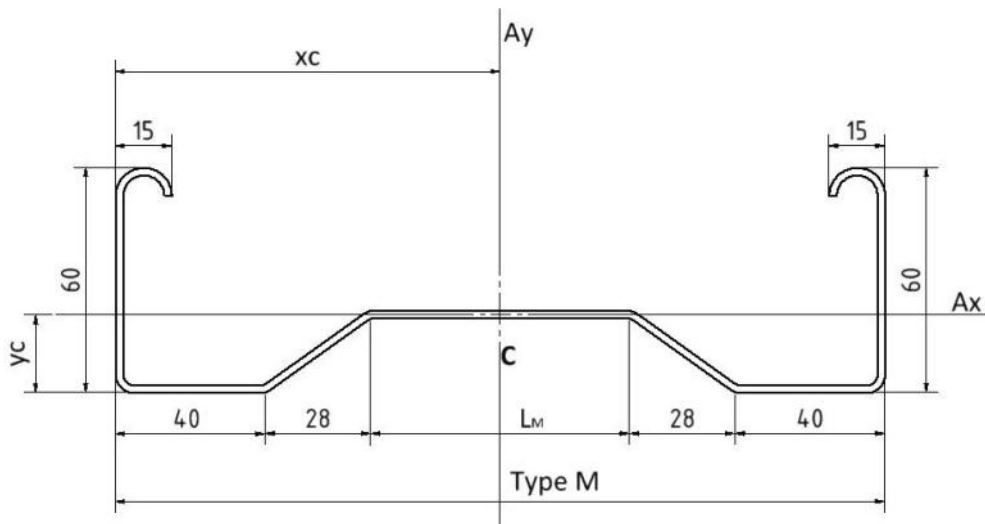
Ax:neutral X Axis
 Ay:neutral Y axis
 yc: distance of profile edge from neutral axis on Y Axis (minimum)
 xc: distance of profile edge from neutral axis on X Axis (minimum)
 A1: principal 1 Axis
 A2: principal 2 Axis
 Θ1°: angle of principal 1 Axis
 Θ2°: angle of principal 2 Axis
 C: center of gravity

Type Z	Thickness mm	Weight Kg/m	Area Moments of Inertia (J) - Axis X & Y		Area Moments of Inertia (J) - Principal Axis 1 & 2				Section Modulus (S)		Center of Gravity (C)	
			Jx cm ⁴	Jy cm ⁴	J1 cm ⁴	Θ1 °	J2 cm ⁴	Θ2 °	Sx cm ³	Sy cm ³	xc mm	yc mm
140*	1,50	3,40	36.406	132.548	13.702	23.61	155.252	123.61	5.875	18.524	68.4	56.0
	2,00	4,50	47.222	173.239	17.784	23.52	202.678	123.52	7.604	24.167	68.3	55.9
	2,50	5,60	70.186	219.959	26.085	25.50	264.060	125.50	11.206	30.524	67.9	55.4
	3,00	6,70	82.616	259.081	30.705	25.49	310.993	125.49	13.179	35.863	67.8	55.3
180	1,50	3,80	37.613	240.966	16.219	17.15	262.36	107.15	5.772	26.274	88.3	59.8
	2,00	5,00	48.794	315.774	21.066	17.05	343.502	107.05	7.473	34.368	88.1	59.7
	2,50	6,30	59.326	387.875	25.646	16.96	421.555	106.96	9.068	42.139	88.0	59.6
	3,00	7,50	69.227	457.296	29.967	16.86	496.557	106.86	10.560	49.589	87.8	59.4
210	1,50	4,00	37.624	346.104	17.507	13.90	366.222	113.90	5.763	32.401	103.2	59.7
	2,00	5,40	48.812	454.176	22.749	13.81	480.238	113.81	7.460	42.446	103.0	59.6
	2,50	6,80	59.353	558.655	27.708	13.72	590.300	113.72	9.051	52.123	102.8	59.4
	3,00	8,10	69.265	659.577	32.391	13.63	696.451	113.63	10.540	61.434	102.6	59.3

The weight per current meter was calculated taking into account the specific weight of the steel = 7850 kg/m³.

Metal Profiles CMZJ - Open Sections

Type M Open Section



Ax:neutral X Axis

Ay:neutral Y axis

yc: distance of profile edge from neutral axis on Y Axis (minimum)

xc: distance of profile edge from neutral axis on X Axis (minimum)

C: center of gravity

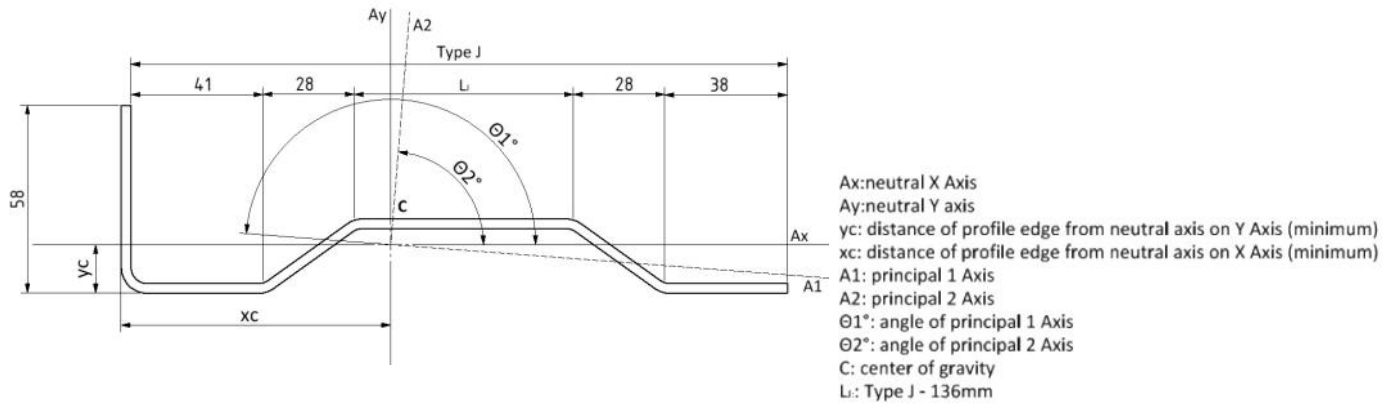
Lm: Type M - 136mm

Type M	Thickness mm	Weight Kg/m	Area Moments of Inertia (J) - Axis X & Y		Section Modulus (S)		Center of Gravity (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 current meter was calculated taking into account the specific weight of the steel = 7850 kg/m³.

Metal Profiles CMZJ - Open Sections

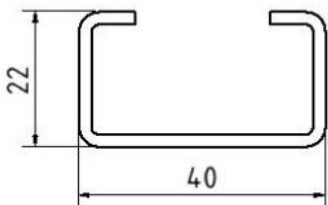
Type J Open Section



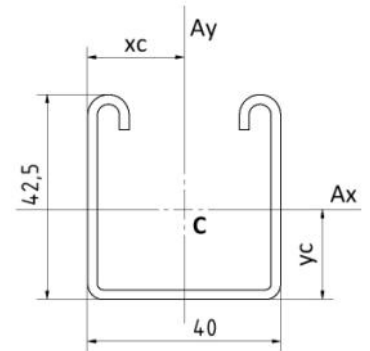
Type J	Thickness mm	Weight Kg/m	Area Moments of Inertia (J)-Axis X & Y		Area Moments of Inertia (J) - Principal Axis 1 & 2				Section Modulus (S)		Center of Gravity C	
			Jx cm ⁴	Jy cm ⁴	J1 cm ⁴	θ1 °	J2 cm ⁴	θ2 °	Sx cm ³	Sy cm ³	xc mm	yc mm
175	3,00	5.70	13.848	232.49	11.389	173.98	234.949	83.98	3.152	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 current meter was calculated taking into account the specific weight of the steel = 7850 kg/m³.

Type C 20 40 & C 40 40 open sections



Type	Thickness mm	Weight Kg/m
C 40 40	2,00	2,15
	3,00	3,15
Type	Thickness mm	Weight Kg/m
C 20 40	2,00	1,35
	3,00	2,00



Polyurethane and Mineral Wool Production and Steel Processing Industry TH. MAKRIS S.A.

60 klm Larisas - Sikouriou, Larisa, P.C. 41500 / 90 klm Larisas - Agias, Larisa, P.C. 41500 / Greece

+30 2410 575 207

+30 2410 575 206

sales@metallemporiki.gr

www.metallemporiki.gr