

CATÁLOGO GERAL



temperfix

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CARACTERÍSTICAS ESPECÍFICAS

Liga	Resistência a corrosão	Anodização		Solda		Usinabilidade	Deformabilidade	Brasagem	Outras
		Decorativa	Protetiva	MIG	TIG				
1050	A	A	A	A	A	E	A	A	-
2011	C	E	B	N	N	A	C	N	Solda por resistência
3003	A	D	B	A	A	D	A	A	-
6005A	A	C	A	A	A	C	C	B	-
6060	A	A	A	A	A	C	C	A	-
6063	A	A	A	A	A	D	B	A	-
6061	A	D	A	A	A	C	B	B	-
6082	A	D	A	A	A	C	C	C	-
6101	A	A	A	A	A	D	B	A	-
6261	A	C	A	A	A	C	B	B	-
6262	B	C	A	A	A	A	C	A	-
6351	A	D	A	A	A	C	C	C	-
6463	A	A	A	A	A	D	B	A	-
7075	C	E	B	N	N	B	D	N	Solda por resistência

PROPRIEDADES FÍSICAS ESPECÍFICAS

Liga	Peso específico (g/cm ³)	Modulo de elasticidade (Mpa)	Modulo de rigidez (Mpa)	Temperatura de fusão (°C)	Calor específico entre 0-100°C (Cal/g°C)	Coefficiente de expansão linear (L/°C)	Condutibilidade térmica a 25°C (Cal/cm ² /C)	Condutibilidade elétrica (%IACS)
1050	2,70	70000	26500	650-660	0,22	24 x 10 ⁻⁶	0,50	60
2011	2,82	72500	27500	535-645	0,23	23 x 10 ⁻⁶	0,37	40
3003	2,73	70000	26500	640-655	0,22	23 x 10 ⁻⁶	0,38	43
6005A	2,71	70000	26000	570-655	0,22	23 x 10 ⁻⁶	0,44	48
6060	2,71	70000	26500	600-650	0,21	23 x 10 ⁻⁶	0,48	52
6063	2,71	70000	26500	600-650	0,21	23 x 10 ⁻⁶	0,48	52
6061	2,71	70000	26500	580-650	0,22	24 x 10 ⁻⁶	0,37	43
6082	2,71	70000	26500	555-650	0,21	24 x 10 ⁻⁶	0,44	46
6101	2,71	70000	26500	605-655	0,22	23 x 10 ⁻⁶	0,49	55
6261	2,71	70000	26000	570-655	0,22	23 x 10 ⁻⁶	0,44	48
6262	2,71	70000	26700	582-652	0,21	23 x 10 ⁻⁶	0,37	44
6351	2,71	70000	26500	555-650	0,21	24 x 10 ⁻⁶	0,44	46
6463	2,71	70000	26500	600-650	0,21	23 x 10 ⁻⁶	0,48	52
7075	2,80	73000	27500	475-630	0,23	24 x 10 ⁻⁶	0,29	30

PROPRIEDADES FÍSICAS ESPECÍFICAS

Propriedades Físicas	Alumínio	Aço	Cobre
Peso específico (g/cm ³)	2,71	7,86	8,96
Temperatura de fusão (°C)	655	1500	1083
Módulo de elasticidade (Mpa)	69000	205940	110325
Coefficiente de expansão linear (L/°C)	23 x 10 ⁻⁶	11,7 x 10 ⁻⁶	16,5 x 10 ⁻⁶
Condutibilidade térmica a 25°C (Cal/cm ² /C)	0,56	0,12	0,94
Condutibilidade elétrica (%IACS)	62	14,5	100

LIMITES DE COMPOSIÇÃO QUÍMICA, em porcentagem (1)

Liga	Si	Fe	Cu	Mn	Mg	Cr	Zn	V	Ti	Pb	Bi	Outros		Alumínio Mínimo
												Cada	Total	
1050	0,25	0,40	0,05	0,05	0,05	-	0,05	0,05	0,03	-	-	0,03	-	99,50 (2)
2011	0,40	0,70	5,0 - 6,0	-	-	-	0,30	0,05 - 0,15	-	0,20 - 0,60	0,20 - 0,60	0,05	0,15	Restante
3003	0,60	0,70	0,05 - 0,20	1,0 - 1,5	-	-	0,10	-	-	-	-	0,05	0,15	Restante
6005A	0,50 - 0,90	0,35	0,30	0,50	0,40 - 0,70	0,30	0,20	-	0,10	-	-	0,05	0,15	Restante
6060	0,30 - 0,60	0,10 - 0,30	0,10	0,10	0,35 - 0,60	0,05	0,15	-	0,10	-	-	0,05	0,15	Restante
6063	0,20 - 0,60	0,35	0,10	0,10	0,45 - 0,90	0,10	0,10	-	0,10	-	-	0,05	0,15	Restante
6061	0,40 - 0,80	0,7	0,15 - 0,40	0,15	0,80 - 1,20	0,04 - 0,35	0,25	-	0,15	-	-	0,05	0,15	Restante
6082	0,70 - 1,30	0,50	0,10	0,40 - 1,00	0,60 - 1,20	0,25	0,20	-	0,10	-	-	0,05	0,15	Restante
6101	0,30 - 0,70	0,50	0,10	0,03	0,35 - 0,80	0,03	0,10	-	-	-	-	0,03	0,10	Restante
6261	0,40 - 0,70	0,40	0,15 - 0,40	0,20 - 0,35	0,70 - 1,00	0,10	0,20	-	0,10	-	-	0,05	0,15	Restante
6262	0,40 - 0,80	0,70	0,15 - 0,40	0,15	0,80 - 1,20	0,04 - 0,14	0,25	-	0,15	0,40 - 0,70	0,40 - 0,70	0,05	0,15	Restante
6351	0,70 - 1,30	0,50	0,10	0,40 - 0,80	0,40 - 0,80	-	0,20	-	0,20	-	-	0,05	0,15	Restante
6463	0,20 - 0,60	0,15	0,20	0,05	0,45 - 0,90	-	0,05	-	-	-	-	0,05	0,15	Restante
7075	0,40	0,50	1,2 - 2,00	0,30	2,10 - 2,90	0,18 - 0,28	5,10 - 6,10	-	0,20	-	-	0,05	0,15	Restante

1) A composição é dada em porcentagem máxima, a menos que indicada como faixa ou mínimo

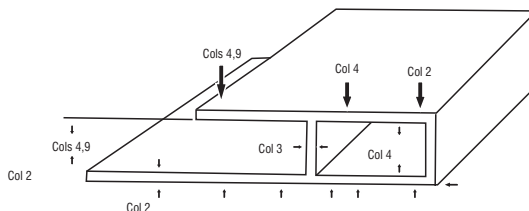
2) O conteúdo de alumínio é a diferença entre 100,00% e a soma de todos os outros elementos metálicos presentes, em quantidade de 0,010% ou mais cada um, arredondados para a segunda casa decimal antes de se processar a soma.

TOLERÂNCIAS DIMENSIONAIS

As tolerâncias dimensionais dos produtos extrudados estão baseadas na ABNT NBR 8116 - Alumínio e suas ligas - Tolerâncias dimensionais de produtos extrudados

Tolerâncias dimensionais nas seções transversais

Tolerâncias para mais e para menos

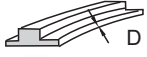


Dimensão Nominal (mm)	Dimensões do Metal				Dimensões entre superfície metálica													
	Desvio permissível da dimensão nominal, onde 75% ou mais é meta				Desvio permissível da dimensão nominal, quando mais de 25% de dimensão for vazio													
	Todas as dimensões, exceto aquelas incluídas na coluna 3		Espessura de parede. Circundando um vazio de 70 mm ou		De 5 a 15		De 15 a 30		De 30 a 60		De 60 a 100		De 100 a 150		De 150 a 200			
Coluna 1		Coluna 2		Coluna 3		Coluna 4		Coluna 5		Coluna 6		Coluna 7		Coluna 8		Coluna 9		
Acima de	Até	Ligas 5XXX cor Mg >_ 4,0%	Outras Ligas	Ligas 5XXX cor Mg >_ 4,0%	Outras Ligas	Ligas 5XXX cor Mg >_ 4,0%	Outras Ligas	Ligas 5XXX cor Mg >_ 4,0%	Outras Ligas	Ligas 5XXX cor Mg >_ 4,0%	Outras Ligas	Ligas 5XXX cor Mg >_ 4,0%	Outras Ligas	Ligas 5XXX cor Mg >_ 4,0%	Outras Ligas	Ligas 5XXX cor com Mg > 4,0%	Outras Ligas	
Diâmetro do círculo circunscrito até 250 mm, inclusive																		
-	3,20	0,23	0,15			0,33	0,25	0,38	0,30	-	-	-	-	-	-	-	-	
3,20	6,30	0,28	0,18			0,41	0,30	0,46	0,36	0,50	0,41	0,56	0,46	0,60	0,50	-	-	
6,30	12,50	0,30	0,20			0,48	0,36	0,50	0,41	0,56	0,46	0,60	0,50	-	-	-	-	
12,50	20,00	0,36	0,23			0,52	0,41	0,58	0,46	0,64	0,50	0,70	0,56	-	-	-	-	
20,00	25,00	0,38	0,25			0,58	0,46	0,64	0,50	0,70	0,56	0,76	0,64	0,88	0,76	-	-	
25,00	40,00	0,46	0,30			0,68	0,54	0,74	0,58	0,80	0,66	0,92	0,76	1,05	0,88	-	-	
40,00	50,00	0,54	0,36			0,78	0,60	0,84	0,66	0,96	0,78	1,10	0,92	1,25	1,05	1,45	1,25	
50,00	100,00	0,90	0,60			1,15	0,86	1,25	0,96	1,50	1,20	1,75	1,45	2,05	1,70	2,35	2,05	
100,00	150,00	1,30	0,86			1,55	1,10	1,70	1,25	2,05	1,65	2,40	2,00	2,80	2,40	3,25	2,80	
150,00	200,00	1,70	1,10			1,95	1,35	2,15	1,55	2,65	2,40	3,05	2,50	3,60	3,05	4,10	3,55	
200,00	250,00	2,05	1,35			2,30	1,65	2,55	1,90	3,25	2,50	3,75	3,05	4,60	3,70	5,00	4,30	
Diâmetro do círculo circunscrito acima de 250 mm																		
-	3,20	0,54	0,36			0,64	0,46	0,68	0,50	-	-	-	-	-	-	-	-	
3,20	6,30	0,56	0,38			0,66	0,48	0,74	0,56	0,88	0,72	-	-	-	-	-	-	
6,30	12,50	0,60	0,41			0,72	0,50	0,80	0,60	0,96	0,76	1,45	1,25	-	-	-	-	
12,50	20,00	0,64	0,43			0,76	0,56	0,88	0,68	1,25	1,00	1,75	1,50	-	-	-	-	
20,00	25,00	0,68	0,46			0,78	0,58	1,00	0,76	1,45	1,25	2,00	1,80	2,50	2,30	-	-	
25,00	40,00	0,72	0,48			0,84	0,60	1,10	0,86	1,75	1,50	2,25	2,05	2,75	2,55	-	-	
40,00	50,00	0,92	0,60			1,15	0,86	1,40	1,10	2,10	1,80	2,60	2,30	3,10	2,80	4,60	4,30	
50,00	100,00	1,30	0,86			1,55	1,10	1,80	1,35	2,45	2,05	2,95	2,55	3,50	3,05	5,00	4,55	
100,00	150,00	1,70	1,10			1,95	1,35	2,20	1,65	2,85	2,30	3,35	2,80	3,85	3,30	5,40	4,85	
150,00	200,00	2,05	1,35			2,30	1,65	2,55	1,90	3,25	2,55	3,75	3,05	4,25	3,55	5,75	5,10	
200,00	250,00	2,45	1,65			2,70	1,90	2,95	2,15	3,60	2,80	4,10	3,30	4,60	3,80	6,15	5,35	
250,00	300,00	2,80	1,90			3,05	2,15	3,35	2,40	4,00	3,05	4,50	3,55	5,00	4,05	6,55	5,60	
300,00	350,00	3,20	2,15			3,45	2,40	3,70	2,65	4,35	3,30	4,90	3,80	5,40	4,30	6,90	5,85	
350,00	400,00	3,60	2,40			3,85	2,65	4,10	2,90	4,75	3,55	5,25	4,05	5,75	4,55	7,30	6,10	
400,00	450,00	3,95	2,65			4,20	2,90	4,45	3,15	5,15	3,80	5,65	4,30	6,15	4,85	7,65	6,35	
450,00	500,00	4,35	2,90			4,60	3,15	4,85	3,40	5,50	4,05	6,00	4,55	6,55	5,10	8,05	6,60	
500,00	550,00	4,70	3,15			5,00	3,40	5,25	3,35	5,90	4,30	6,40	4,85	6,90	5,35	8,45	6,85	
550,00	600,00	5,10	3,40			5,35	3,65	5,60	3,90	6,25	4,55	6,80	5,10	7,30	5,60	8,80	7,10	

Tolerâncias de retilidade para barras, vergalhões e perfis somente extrudados

Dimensões em milímetro

Produto	Diâmetro ou largura nominal (vergalhões ou barras) DCC (perfis)		Espessura nominal (barras retangulares) Espessura mínima (perfis)		Desvio permissível da retilidade (D máximo) no comprimento total ou qualquer trecho de 300 mm ou mais
	Acima de	Até	Acima de	Até	
Vergalhões e barras quadrados, hexagonais e octogonais	Todos	Todos	-	-	1
Barras retangulares	-	40,00	-	2,50	4
	40,00	-	2,50	-	1
Perfis	-	40,00	-	2,50	4
	40,00	-	2,50	-	1




Obs.: Todas as temperas exceto O, TX510 e TX511

Tolerâncias de torção para barras e perfis somente extrudados

Dimensões em milímetro

Produto	Largura nominal (barras), DCC (perfis) mm		Espessura nominal (barras retangulares) Espessura mínima (perfis) mm		Torção máxima permissível no comprimento total ou em qualquer trecho de 300 mm ou mais
	Acima de	Até	Acima de	Até	
Barras retangulares	-	40,00	Todas	Todas	3°/m, máximo 7°
	40,00	80,00	Todas	Todas	1,5°/m, máximo 5°
	80,00	-	Todas	Todas	1°/m, máximo 3°
Perfis	-	40,00	Todas	Todas	3°/m, máximo 7°
	40,00	80,00	Todas	Todas	1,5°/m, máximo 5°
	80,00	-	Todas	Todas	1°/m, máximo 3°



Obs.: Todas as temperas exceto O, TX510 e TX511

Tolerâncias no comprimento de arames, vergalhões, barras e perfis somente extrudados

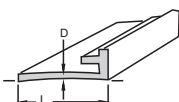
Dimensões em milímetro

Diâmetro ou largura nominal (arames, barras ou vergalhões), DCC (perfis)		Desvio permissível do comprimento nominal - Tolerância somente para mais			
Acima de	Até	Até 5.000	Acima de 5.000 até 10.000	Acima de 10.000 até 15.000	Acima de 15.000
-	70,00	4	7	10	25
70,00	200,00	6	9	11	25
200,00	-	7	10	13	25

Tolerâncias na planicidade para barras e perfis sólidos e semitubulares somente extrudados

Dimensões em milímetros

Largura nominal da superfície (L)		Desvio permissível D (máximo)
Acima de	Até	
-	25,00	0,10
25,00	150,00	0,004 x L
Em qualquer trecho de 25 de largura		0,10

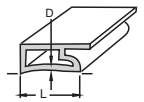


A tolerância para materiais na tempera "O" deve ser quatro vezes a tolerância padrão indicada

Tolerâncias na planicidade para perfis tubulares somente extrudados

Dimensões em milímetros

Menor espessura do metal que forma a superfície		Desvio permissível D (máximo)	
Acima de	Até	Largura (L) até 25, inclusive ou qualquer trecho de 25 de superfícies mais largas	Largura (L) acima de 25 até 150
-	5,00	0,15	0,006 x L
5,00	-	0,10	0,004 x L



A tolerância para materiais na tempera "O" deve ser quatro vezes a tolerância padrão indicada

Tolerâncias no diâmetro externo nominal de tubos redondos somente extrudados

Dimensões em milímetros

Diâmetro nominal		Tolerâncias para mais e para menos			
		Desvio permissível entre o diâmetro médio e o nominal - Diferença entre $\frac{1}{2}(AA + BB)$ e o diâmetro nominal		Desvio permissível entre o diâmetro em qualquer ponto e o diâmetro nominal - Diferença entre AA ou BB e o diâmetro nominal	
Coluna 1		Coluna 2		Coluna 3	
Acima de	Até	Ligas 5xxx com Mg > 4,0%		Outras ligas	
12,50	25,00	0,38	0,25	0,76	0,50
25,00	50,00	0,46	0,30	0,96	0,64
50,00	100,00	0,58	0,38	1,15	0,76
100,00	150,00	0,96	0,64	1,90	1,25
150,00	200,00	1,35	0,88	2,85	1,90
200,00	250,00	1,75	1,15	3,80	2,55
250,00	300,00	2,10	1,40	4,80	3,20
300,00	350,00	2,50	1,65	5,70	3,80
350,00	400,00	2,85	1,90	6,70	4,45
400,00	450,00	3,25	2,15	7,60	5,10

Tolerâncias na espessura da parede de tubos redondos somente extrudados

Dimensões em milímetros

Diâmetro nominal		Tolerâncias para mais e para menos								
		Desvio permissível entre a espessura média de parede e a espessura nominal da parede - Diferença entre $\frac{1}{2}(AA + BB)$ e a espessura nominal da parede								
		Diâmetro externo								
		Até 30	Acima de 30 até 80		Acima de 80 até 130		Acima de 130			
Coluna 1		Coluna 2		Coluna 3		Coluna 4		Coluna 5		Coluna 6
Acima de	Até	Ligas 5xxx com Mg > 4,0%		Ligas 5xxx com Mg > 4,0%		Ligas 5xxx com Mg > 4,0%		Ligas 5xxx com Mg > 4,0%		Qualquer liga
-	1,20	0,23	0,15	-	-	-	-	-	-	Mais ou menos 10% da espessura média de parede Máximo $\pm 1,50$ Mínimo $\pm 0,25$
1,20	1,60	0,28	0,18	0,30	0,20	0,30	0,20	0,38	0,25	
1,60	2,00	0,30	0,20	0,30	0,20	0,36	0,23	0,46	0,30	
2,00	3,20	0,36	0,23	0,36	0,23	0,38	0,25	0,58	0,38	
3,20	6,30	0,36	0,23	0,36	0,23	0,50	0,33	0,76	0,50	
6,30	10,00	0,43	0,28	0,43	0,28	0,60	0,41	0,96	0,64	
10,00	12,50	-	-	0,58	0,38	0,80	0,54	1,35	0,88	
12,50	20,00	-	-	0,76	0,50	1,05	0,72	1,75	1,15	
20,00	25,00	-	-	-	-	1,35	0,88	2,10	1,40	
25,00	30,00	-	-	-	-	1,75	1,15	2,50	1,65	
30,00	50,00	-	-	-	-	-	-	2,85	1,90	

Código	Peso (kg/m)	Pagina
78719	1,555	16
78-1153C	0,377	23
781730C	1,490	24
A-058	0,203	23
A-144	0,730	22
AF-018	0,103	32
BG-057	0,172	46
CG-074	0,242	12
CG-075	0,519	12
CG-077	0,488	12
CG-083	1,321	12
CL-006	1,047	14
CL-011	0,335	14
CM-012	0,260	15
CM-060	0,220	14
CM-063	0,175	14
CM-151	0,322	14
CRV-201	0,232	19
CX-003	0,198	23
CX-185	0,841	21
D-055	0,510	18
D-069	1,053	16
D-078	0,720	17
D-079	0,576	16
D-082	0,342	18
D-103	0,779	17
DES-004	0,392	18
DES-015	0,275	50
FA-200	1,968	53
FA-204	1,046	55

Código	Peso (kg/m)	Pagina
FA-211	0,998	55
FA-228	0,558	55
FA-230	0,770	54
FA-232	0,603	55
FA-245	0,742	54
FA-255	0,765	54
FA-256	0,800	54
FA-347	1,330	56
FA-400	1,870	53
FA-515	1,470	56
FA-516	0,894	56
FC-085	0,241	18
FC-202	1,900	51
FC-225	0,640	52
FC-227	0,740	52
FC-228	0,600	52
FC-243	1,033	51
L-521	0,331	25
LG-002	0,632	37
LG-003	0,754	37
LG-006	0,664	37
LG-007	1,200	38
LG007/B	1,280	38
LG-016	0,330	38
LG-017	0,995	38
LG-018	1,580	39
LG-021	1,782	39
LG-026	0,150	40
LG-027	0,144	40
LG-028	0,464	40

Código	Peso (kg/m)	Pagina
LG-037	0,651	40
LG-042	0,959	41
LG-043	0,933	41
LG-044	1,230	41
LG-047	1,165	42
LG-048	0,959	42
LG-049	0,959	42
LG-050	0,787	43
LG-052	1,675	43
LG-055	0,757	43
LG-056	0,652	43
LG-059	0,174	48
LG-062	1,780	44
LG-066	1,523	44
LG-068	0,392	48
LG-079	0,753	45
LG-083	0,422	45
LG-085	0,558	45
LG-124	0,773	46
LG-128	0,872	47
LG-129	1,241	47
LG-130	0,656	47
LG-132	0,774	47
LG-158	0,876	44
LG-162	1,074	48
LG-201	1,200	48
ME-013	0,217	15
MN-001	1,314	49
MN-002	0,669	49
MN-003	1,307	49

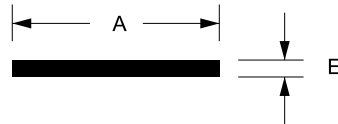


Código	Peso (kg/m)	Pagina
MN-007	0,707	50
MN-014	0,220	15
MN-014	0,220	50
MN-015	0,790	50
MN-055	0,382	50
MP-347	0,200	15
P-227A	0,295	23
P-264	1,222	22
P-268	1,362	24
P-270	0,800	22
P-273	0,552	22
P-280	0,825	25
RAL-020	0,215	15
RAL-021	0,176	15
RAL-021C	0,155	15
RAL-022	0,145	15
RAL-048	0,167	57
RAL-049	0,137	57
RAL-1120	0,721	18
RAL-1472	0,360	18
RAL-285	0,265	18
RAL-286	0,265	18
RAL-501	1,176	17
RAL-669	0,653	21
RAL-689	0,990	20
RAL-782	0,951	20
RM-110	0,125	15
SU-001	0,733	26
SU-002	0,691	26
SU-003	0,500	26

Código	Peso (kg/m)	Pagina
SU-004	0,506	27
SU-007	0,396	27
SU-008	0,244	27
SU-009	0,980	27
SU-010	1,021	28
SU-011	0,990	28
SU-012	0,536	28
SU-013	0,710	29
SU-014	0,587	29
SU-039	0,575	30
SU-040	0,470	30
SU-041	0,478	30
SU-042	0,545	30
SU-053	0,489	30
SU-055	0,517	30
SU-056	0,560	31
SU-068	0,552	31
SU-069	0,538	31
SU-070	0,485	31
SU-079	0,352	31
SU-080	0,357	31
SU-081	0,409	32
SU-082	0,386	32
SU0-86	0,628	32
SU-102	0,104	32
SU-103	0,137	32
SU-111	0,619	33
SU-123	0,996	33
SU-186	0,467	33
SU-187	0,485	34

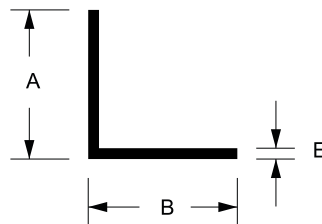
Código	Peso (kg/m)	Pagina
SU-200	0,398	34
SU-225	1,005	34
SU-227	0,548	34
SU-228	0,667	35
SU-230	0,899	35
SU-241	0,567	35
SU-242	0,660	35
SU-243	0,618	36
SU-245	0,597	36
SU-276	0,168	36
SU-279	0,522	36
SU-280	0,875	36
SU-302	0,225	36
TMP-010	0,439	58
TMP-011	0,518	58
TMP-012	0,362	58
TMP-016	0,529	58
TMP-026	0,419	58
U-1049	1,500	13
U-1076	0,190	25
U-555	0,200	13
U-555G	0,333	13
U-681	0,113	23
U-990	0,650	16
VUS-201	0,260	19
VUS-285	0,560	19
VUS-294	0,260	19
VZ-006	0,560	19
VZ-051	0,270	19
Z-201	0,275	19

Barra chata



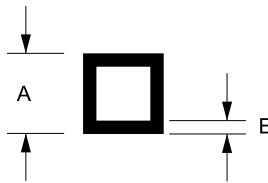
Código	Milímetro		Polegadas		Peso (Kg/m)
	A	E	A	E	
BAR-012	12,70	3,18	1/2"	1/8"	0,109
BAR-013	15,87	3,18	5/8"	1/8"	0,136
BAR-049	15,87	4,76	5/8"	3/16"	0,209
BAR-014	19,05	3,18	3/4"	1/8"	0,163
BAR-016	25,40	3,18	1"	1/8"	0,22
BAR-022	38,10	3,18	1.1/2"	1/8"	0,324
BAR-027	50,80	3,18	2"	1/8"	0,437

Cantoneira de abas iguais



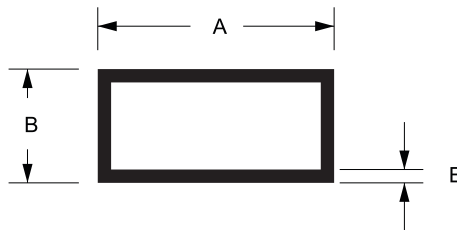
Código	Milímetro			Polegadas			Peso (Kg/m)
	A	B	E	A	B	E	
L-002	12,70	12,70	1,59	1/2"	1/2"	1/16"	0,100
L-405	15,87	15,87	1,59	5/8"	5/8"	1/16"	0,132
L-009	19,05	19,05	19,05	3/4"	3/4"	1/16"	0,167
CL-022	22,00	6,30	2,00				0,852
L-013	25,40	25,40	1,59	1"	1"	1/16"	0,210
L-014	25,40	25,40	3,18	1"	1"	1/8"	0,410
L-744	38,10	38,10	1,59	1.1/2"	1.1/2"	1/16"	0,334
L-022	38,10	38,10	3,18	1.1/2"	1.1/2"	1/8"	0,673
L-612	50,80	50,80	2,00	2"	2"	-	0,567
L-025	50,80	50,80	3,18	2"	2"	1/8"	0,840

Tubo Quadrado



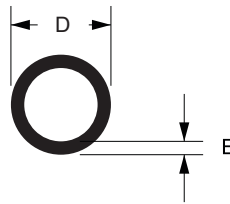
Código	Milímetro		Polegadas		Peso (Kg/m)
	A	E	A	E	
TUB-4002	15,88	1,58	5/8"	1/16"	0,232
TUB-4003L	19,05	1,00	3/4"	-	0,199
TUB-4003	19,05	1,58	3/4"	1/16"	0,284
TUB-4008L	25,40	1,00	1"	-	0,273
TUB-4008	25,40	1,58	1"	1/16"	0,400
TUB-4011	31,75	1,58	1.1/4"	1/16"	0,519
TUB-4014	38,10	1,58	1.1/2"	1/16"	0,593
TUB-4021	50,80	1,30	2"	-	0,793
TUB-4020	50,80	1,50	2"	1/16"	0,843
TQ-017	50,80	2,00	2"	-	1,057
TQ-075	75,00	1,20	-	-	0,960

Tubo Retângular



Código	Milímetro			Polegadas			Peso (Kg/m)
	A	B	E	A	B	E	
TMP-031	19,05	12,70	1,00	3/4"	1/2"	-	0,161
TUB-4501L	25,40	12,70	1,00	1"	1/2"	-	0,196
TUB-4545L	38,10	25,40	1,20	1,1/2"	1"	-	0,395
TUB-4536L	50,80	12,70	1,00	2"	1/2"	-	0,365
TUB-4536	50,80	12,70	1,58	2"	1/2"	1/16"	0,375
TUB-4576	50,80	25,40	1,00	2"	1"	-	0,467
TUB-4569	50,80	25,40	1,50	2"	1"	-	0,615
TUB-4591	76,20	25,40	1,58	3"	1"	1/16"	0,603
TUB-4517	76,20	38,10	1,40	3"	1.1/2"	-	0,846
TUB-4537L	101,60	38,10	2,00	4"	1.1/2"	-	1,471
TUB-4599	101,60	50,80	1,80	4"	2"	-	1,372
TUB-4530	101,60	50,80	3,05	4"	2"	-	2,23

Tubos Redondo



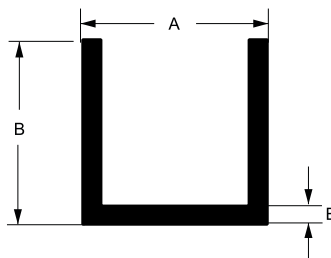
Código	Milímetro		Polegadas		Peso (Kg/m)
	D	E	D	E	
TR3/8*1,58	9,53	1,58	3/8"	1/16"	0,100
TR11*1	11,00	1,00	-	-	0,085
TR1/2*1,00	12,70	1,00	1/2"	-	0,100
TR1/2*1,58	12,70	1,58	1/2"	1/16"	0,150
TR5/8*1,58	15,88	1,58	5/8"	1/16"	0,182
TR3/4*1	19,05	1,00	3/4"	-	0,154
TR3/4*1,58	19,05	1,58	3/4"	1/16"	0,190
TR7/8*1	19,05	1,00	7/8"	-	0,161
TR22,20*1,58	22,20	1,58	-	1/16"	0,277
TR7/8*1,58	22,23	1,58	7/8"	1/16"	0,279
TR1*1	25,40	1,00	1"	-	0,208
TR1*1,58	25,40	1,58	1"	1/16"	0,338
TR26*2	26,00	2,00	-	-	0,658
TR1.1/4*1,58	31,75	1,58	1.1/4"	1/16"	0,405
TR1.1/4*2,25	31,75	2,25	1.1/4"	-	0,583
TR34,95*2,18	34,95	2,18	-	-	0,606
TR36,5*1,5	36,50	1,50	-	-	0,447
TR1.1/2*1,10	38,20	1,10	1.1/2"	-	0,315
TR44/5,5	44,00	5,50	-	-	1,802
TR44,45*1,58	44,45	1,58	-	1/16"	0,576
TR2*1,20	50,80	1,20	2"	-	0,506
TR2*2	50,80	2,00	2"	-	0,830
TR2*4	50,80	4,00	2"	-	1,428

Vergalhão Redondo

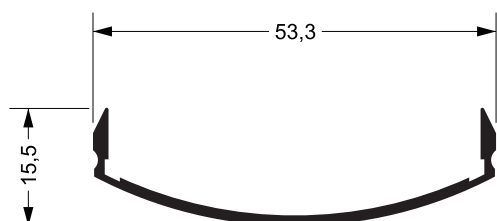


Código	Milímetro	Polegadas	Peso (Kg/m)
	D	D	
VER-002	6,35	1/4"	0,085
VER-011	12,70	1/2"	0,343

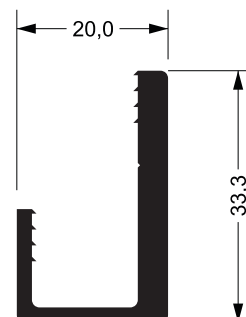
Perfil U



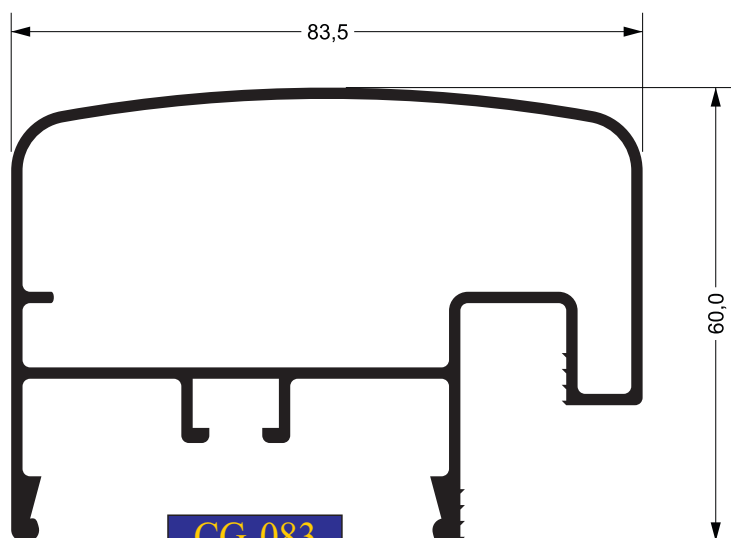
Código	Milímetro			Polegadas			Peso (Kg/m)
	A	B	E	A	B	E	
U-036	9,53	9,53	1,59	3/8"	3/8"	1/16"	0,108
U-044	12,70	12,70	1,59	1/2"	1/2"	1/16"	0,133
U-306	12,70	12,70	3,18	1/2"	1/2"	1/8"	0,266
U-509	15,87	15,87	1,59	5/8"	5/8"	1/16"	0,187
PU-041	22,00	11,00	1,00	-	-	-	0,144
PU-042	22,00	13,80	1,00	-	-	-	0,157
U-555	25,00	15,00	1,20	-	-	-	0,200
U-555G	50,00	16,00	1,40	-	-	-	0,333



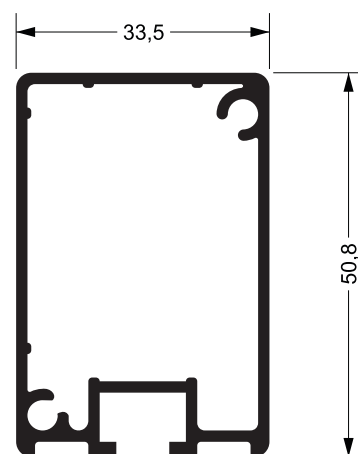
CG-074
0,242 kg/m



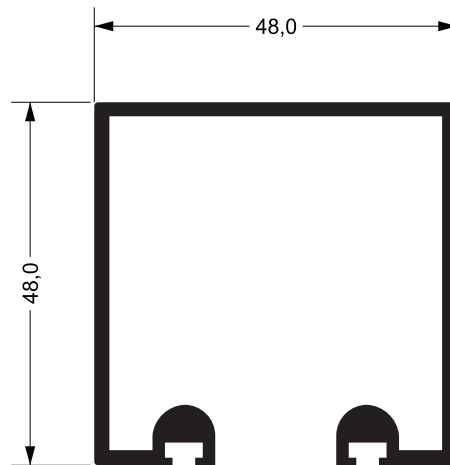
CG-075
0,519 kg/m



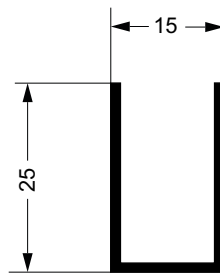
CG-083
1,321 kg/m



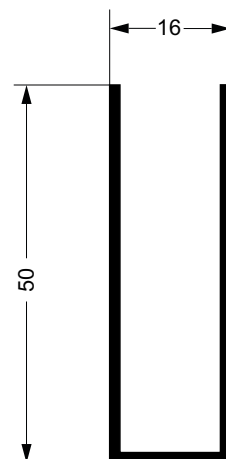
CG-077
0,488 kg/m



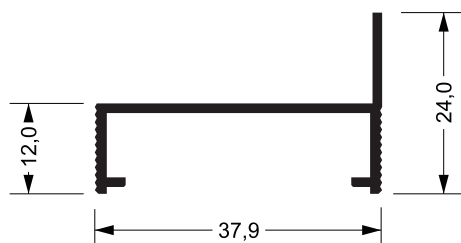
U-1049
1,500 kg/m



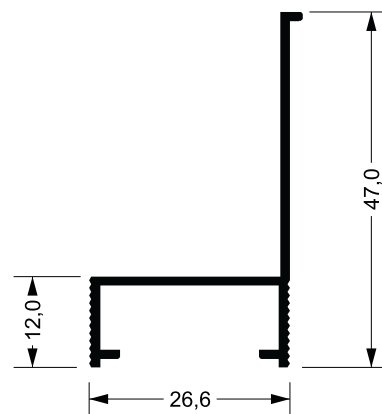
U-555
0,200 kg/m



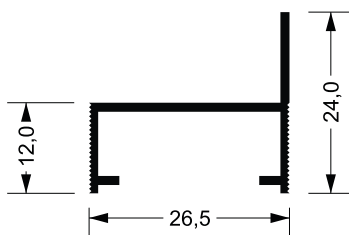
U-555G
0,333 kg/m



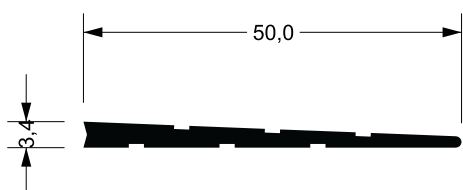
CM-060
0,220 kg/m



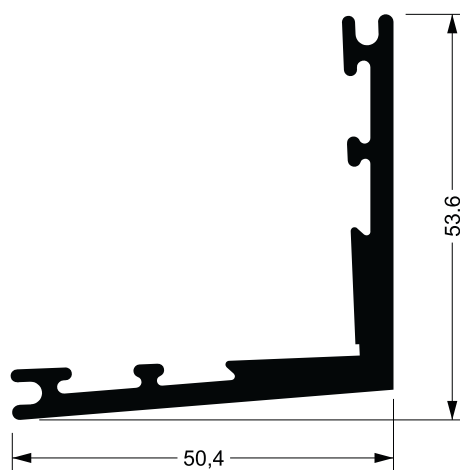
CM-151
0,322 kg/m



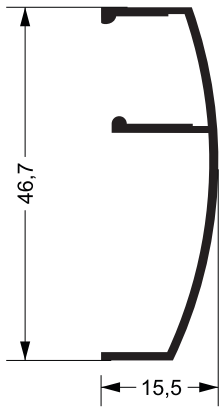
CM-063
0,175 kg/m



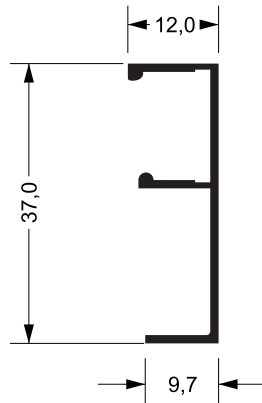
CL-011
0,335 kg/m



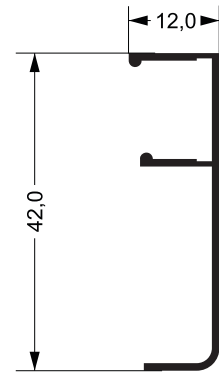
CL-006
1,047 kg/m



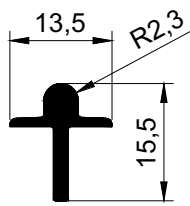
CM-012
0,260 kg/m



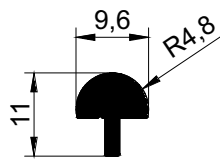
MP-347
0,200 kg/m



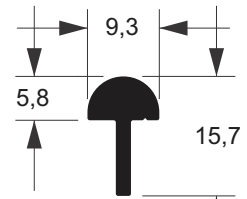
MN-014
0,220 kg/m



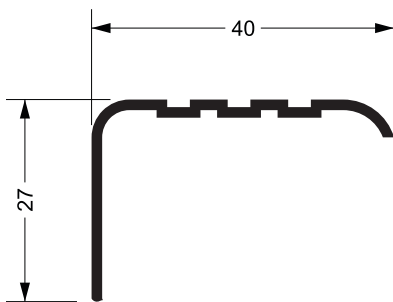
RAL-022
0,145 kg/m



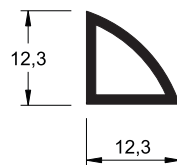
RAL-021C
0,155 kg/m



RAL-021
0,176 kg/m



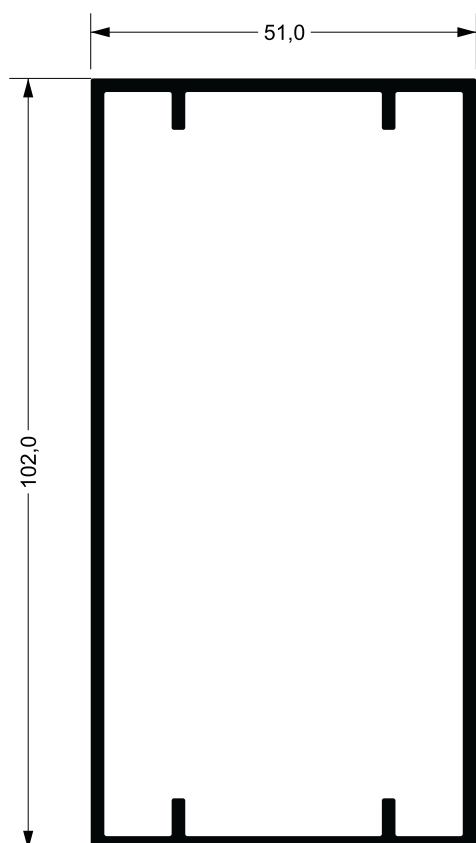
ME-013
0,217 kg/m



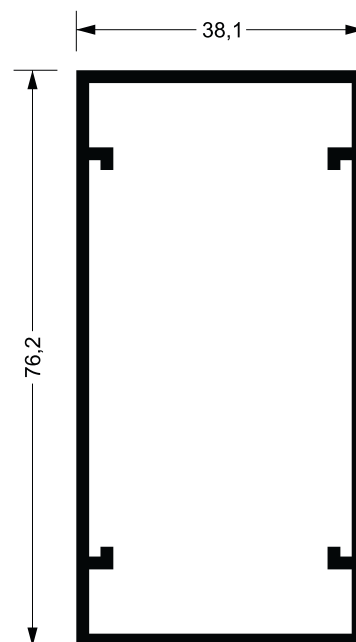
RM-110
0,125 kg/m



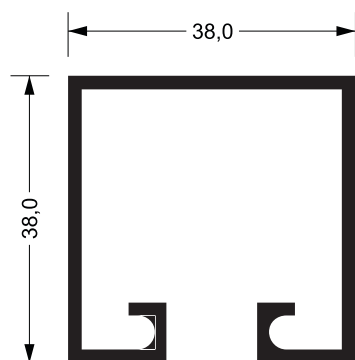
RAL-020
0,215 kg/m



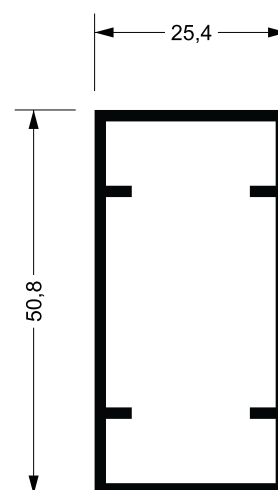
78719
1,555 kg/m



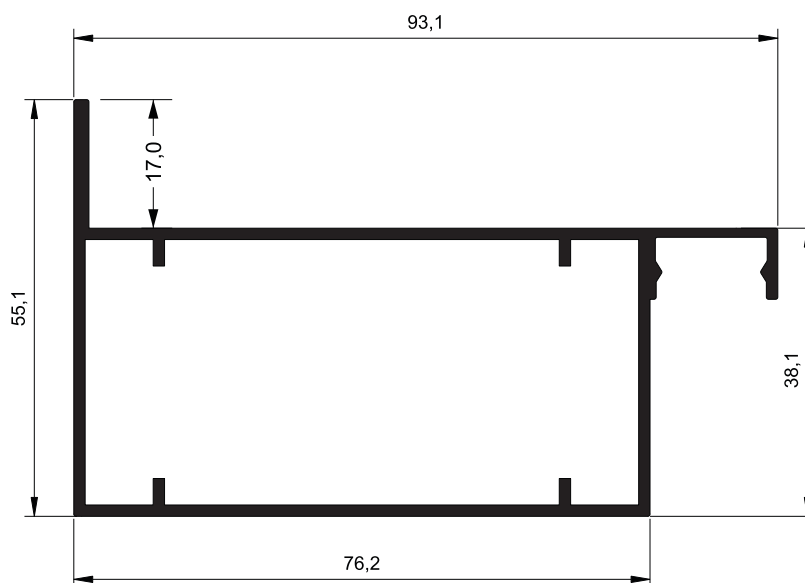
D-069
1,053 kg/m



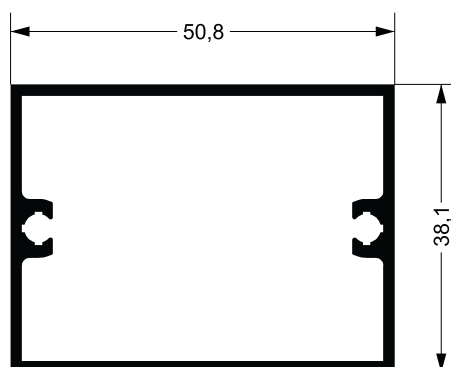
U-990
0,650 kg/m



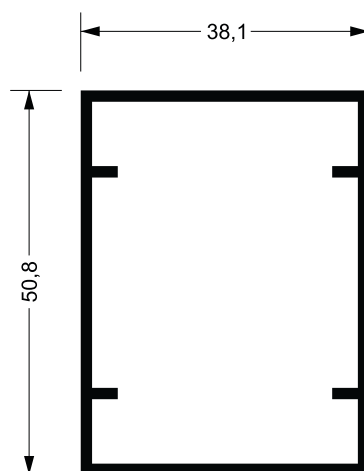
D-079
0,576 kg/m



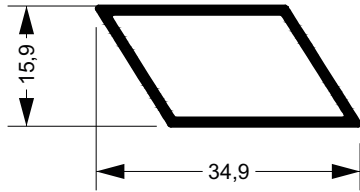
RAL-501
1,176 kg/m



D-103
0,779 kg/m

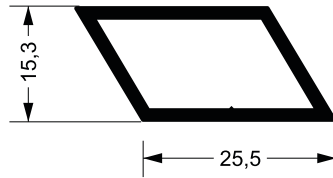


D-078
0,720 kg/m



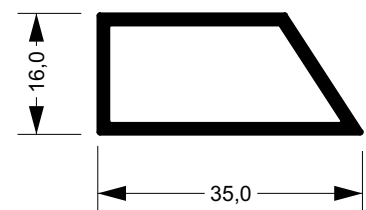
RAL-285

0,248 kg/m



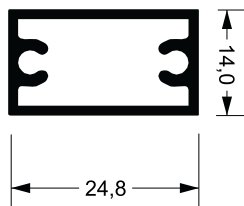
RAL-286

0,265 kg/m



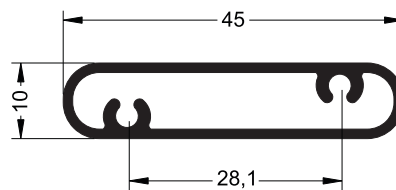
RAL-1472

0,360 kg/m



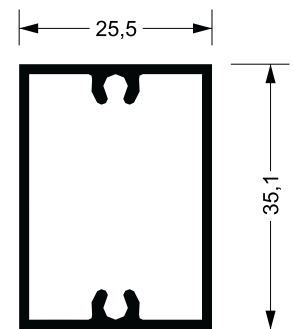
D-082

0,342 kg/m



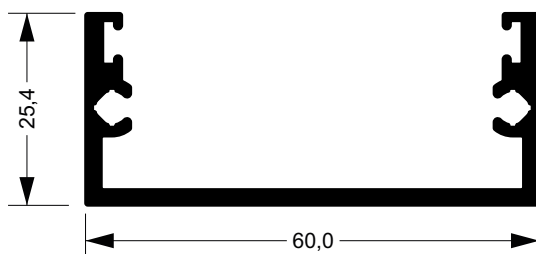
DES-004

0,392 kg/m



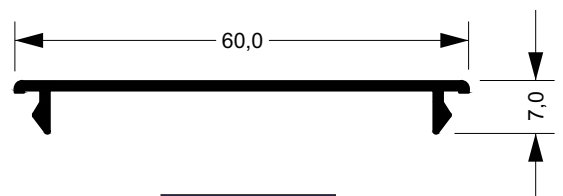
D-055

0,510 kg/m



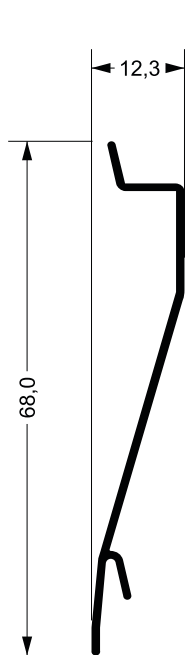
RAL-1120

0,721 kg/m

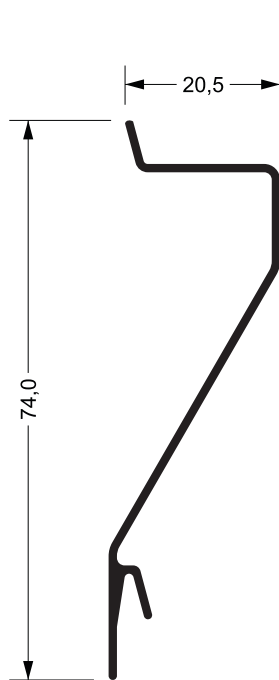


FC-085

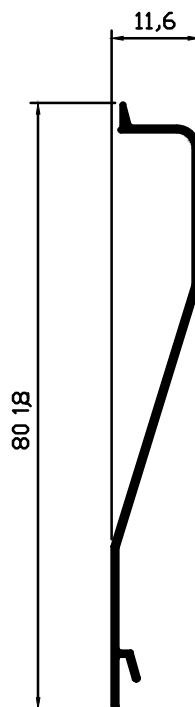
0,241 kg/m



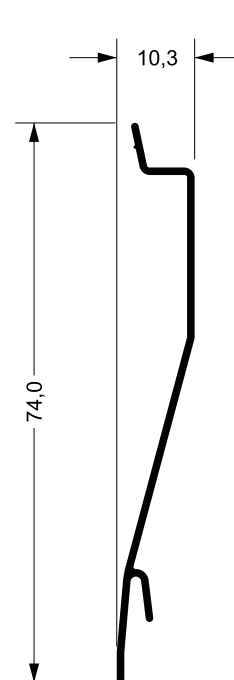
VZ-051
0,270 kg/m



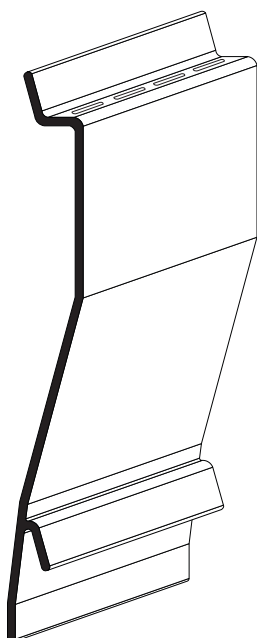
VZ-006
0,560 kg/m



CRV-201
0,232 kg/m

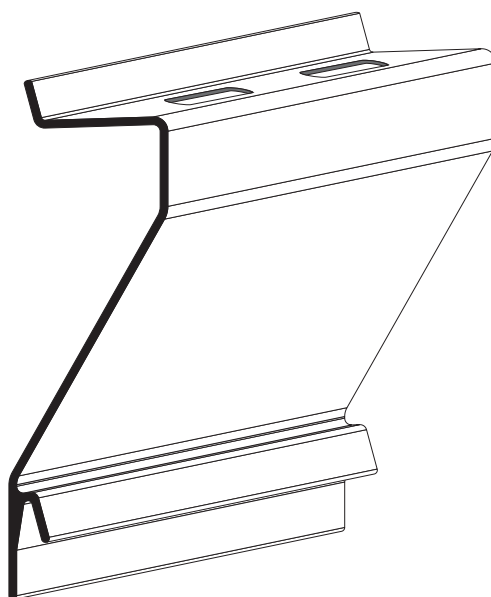


Z-201
0,275 kg/m



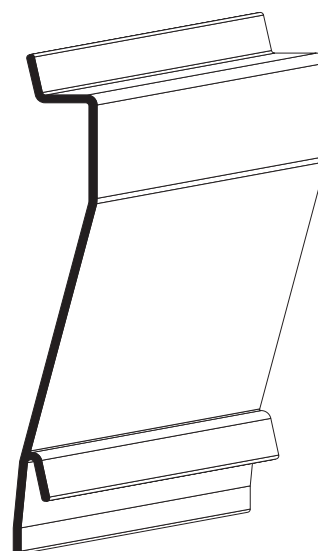
VUS-201
0,260 kg/m

* VENTILADA



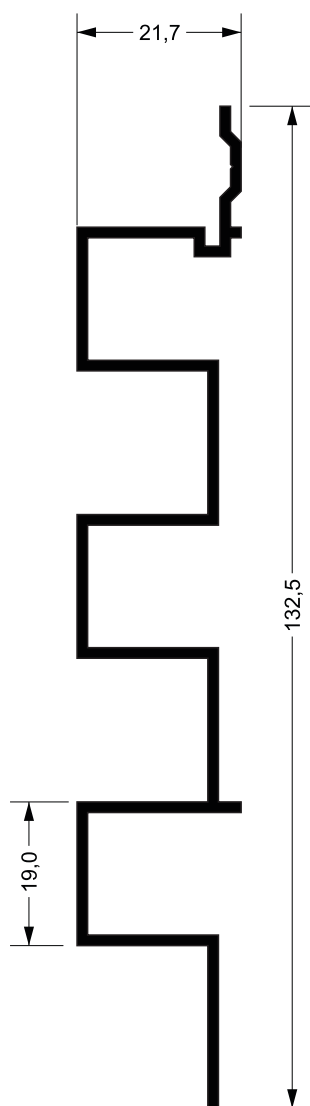
VUS-285
0,560 kg/m

* VENTILADA



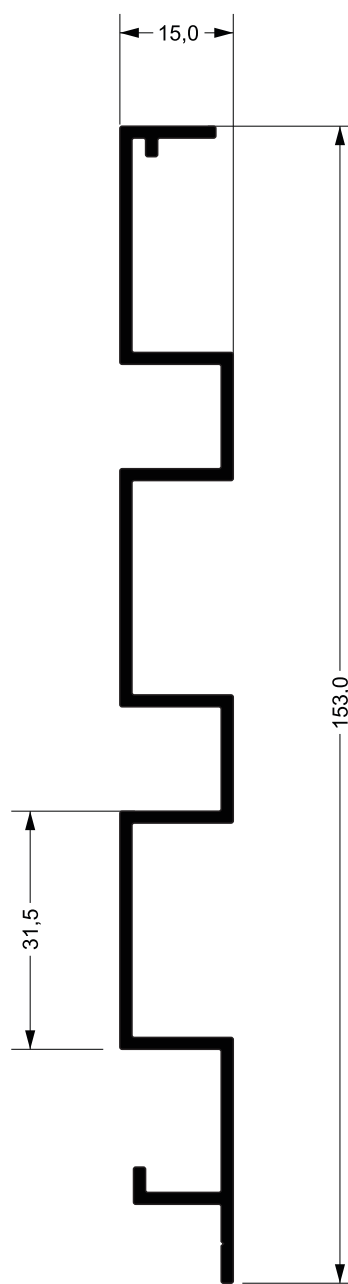
VUS-294
0,260 kg/m

* VENTILADA



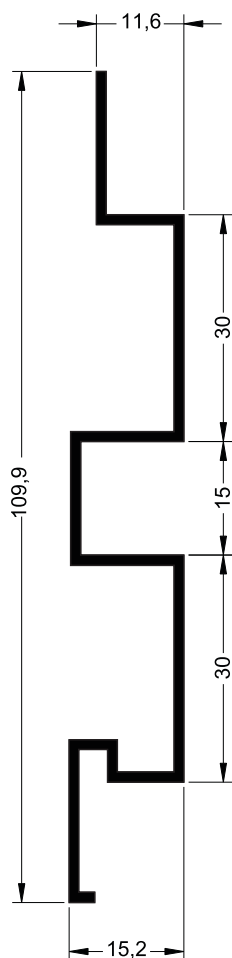
RAL-689

0,990 kg/m



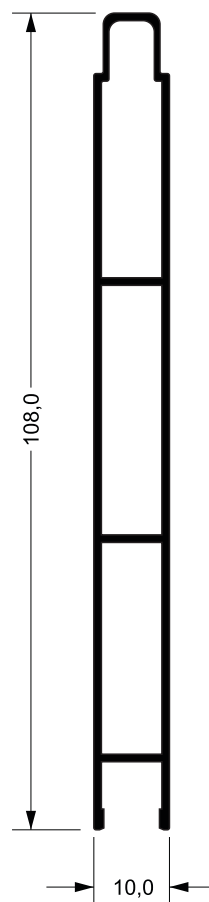
RAL-782

0,951 kg/m



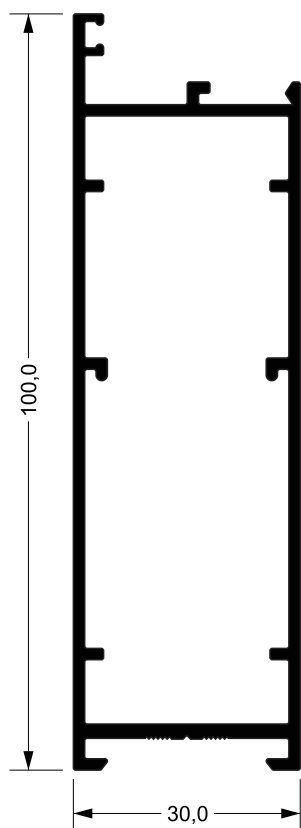
RAL-669

0,653 kg/m

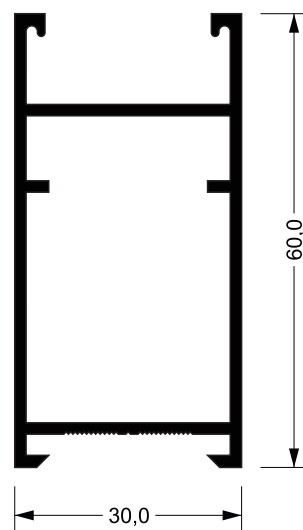


CX-185

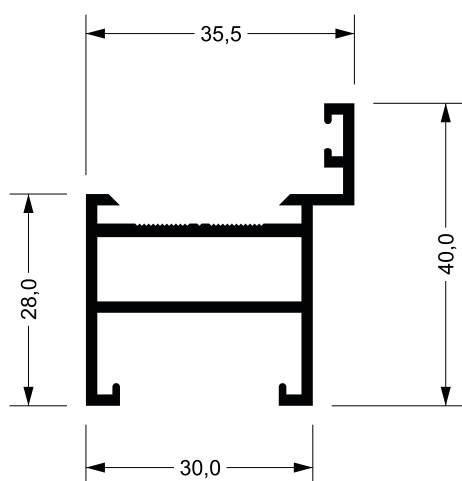
0,841 kg/m



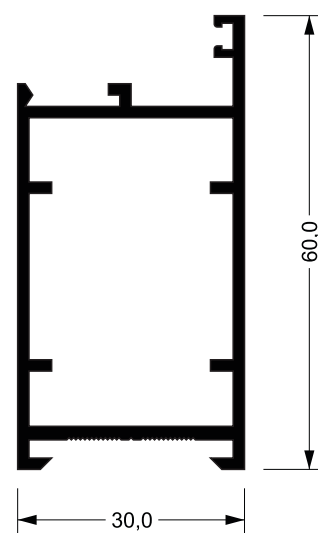
P-264
1,222 kg/m



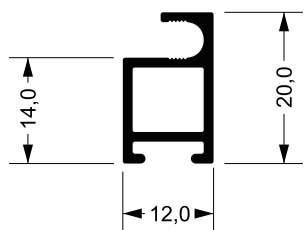
A-144
0,730 kg/m



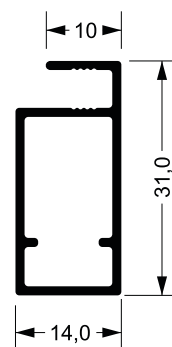
P-273
0,552 kg/m



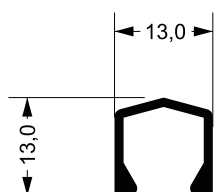
P-270
0,800 kg/m



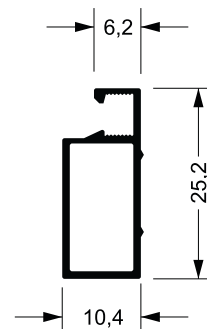
A-058
0,203 kg/m



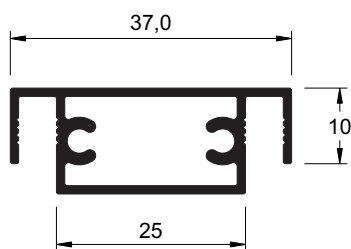
P-227A
0,295 kg/m



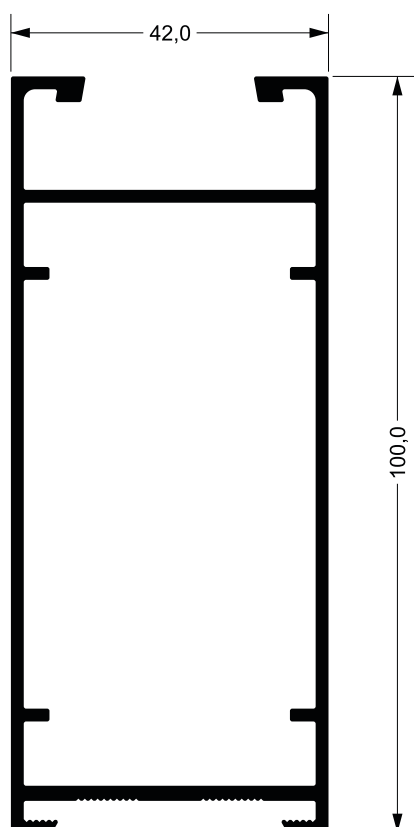
U-681
0,113 kg/m



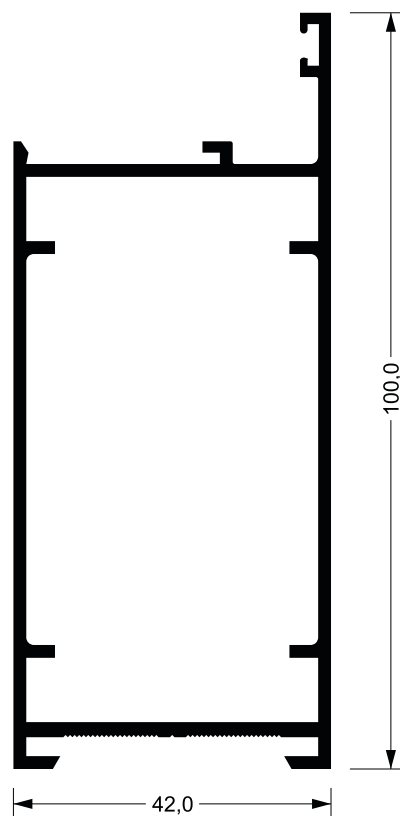
CX-003
0,198 kg/m



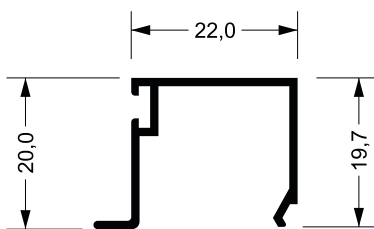
78-1153C
0,377 kg/m



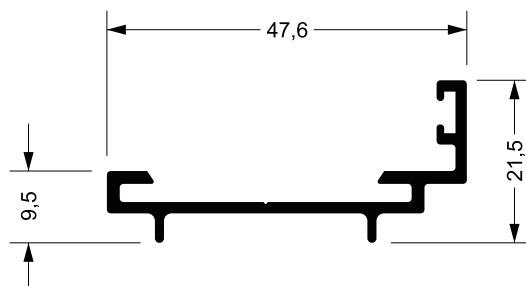
781730C
1,490 kg/m



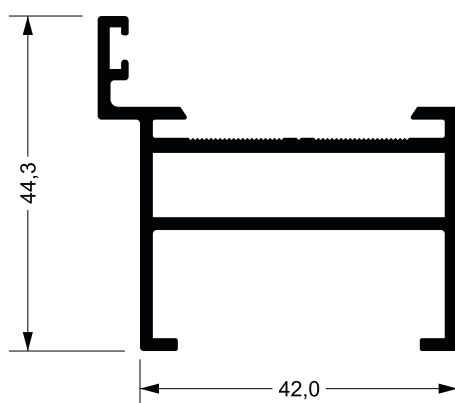
P-268
1,362 kg/m



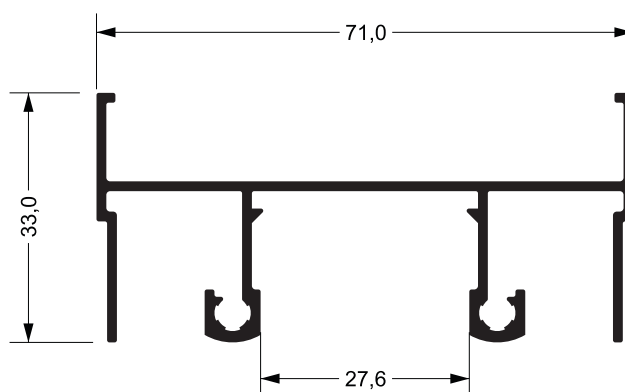
U-1076
0,190 kg/m



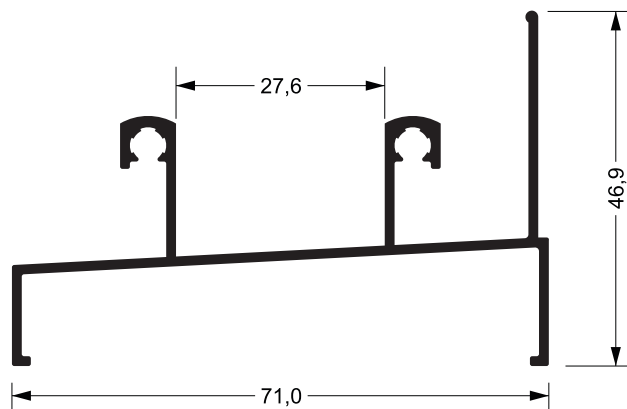
L-521
0,331 kg/m



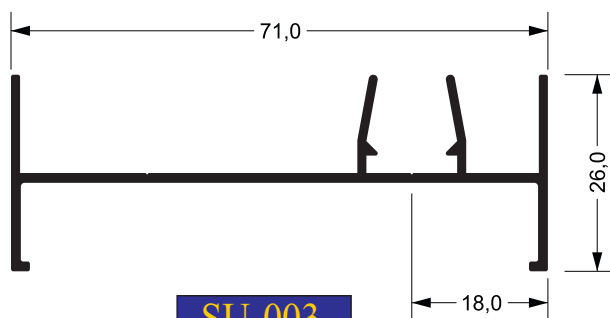
P-280
0,825 kg/m



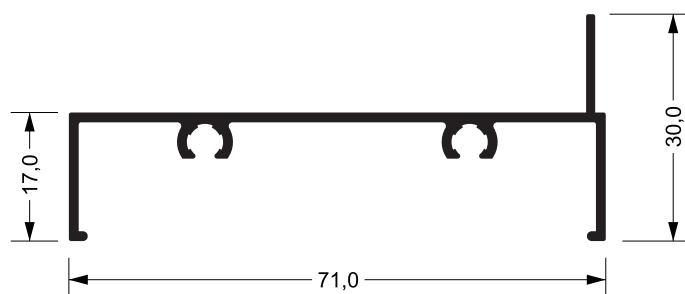
SU-001
0,733 kg/m



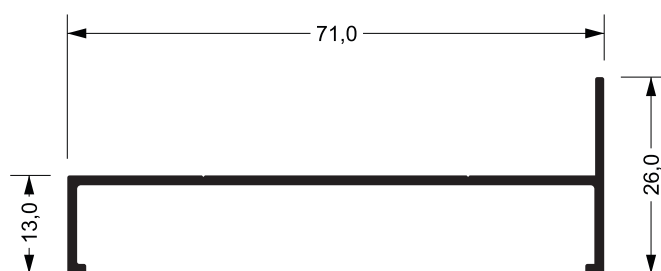
SU-002
0,691 kg/m



SU-003
0,500 kg/m



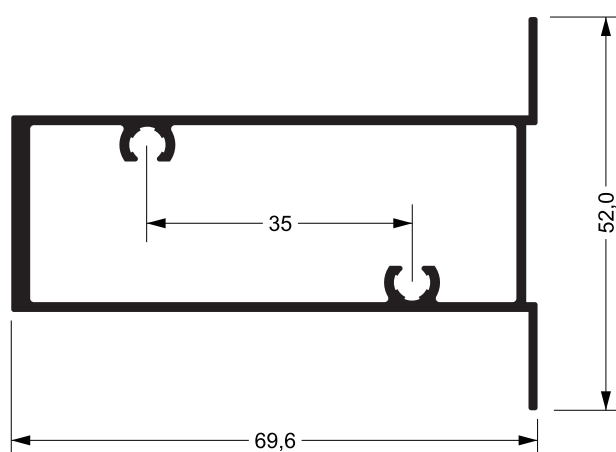
SU-004
0,506 kg/m



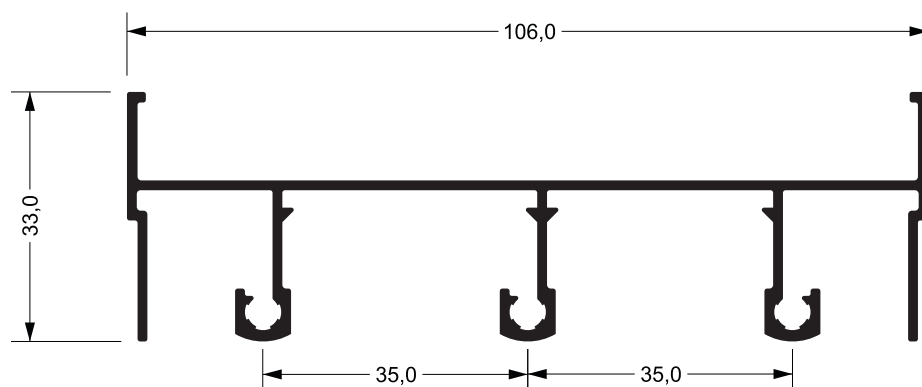
SU-007
0,396 kg/m



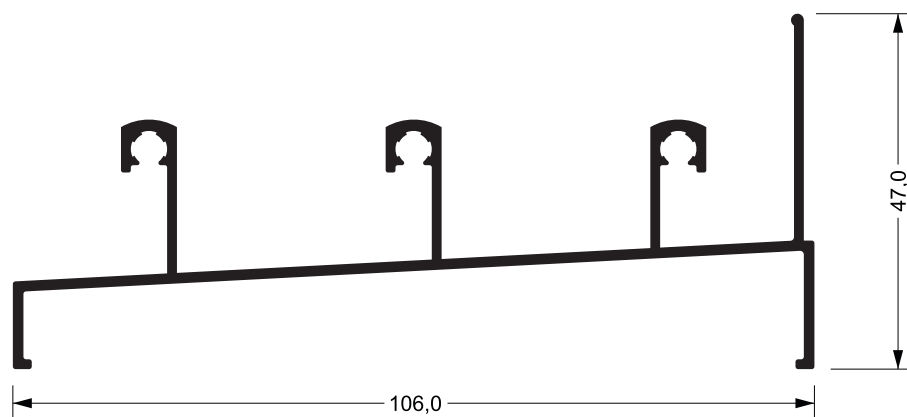
SU-008
0,244 kg/m



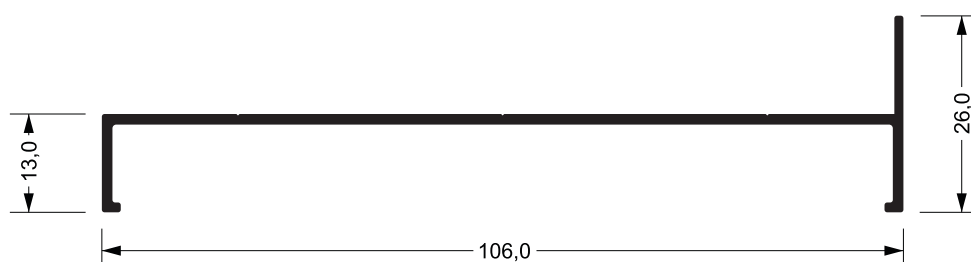
SU-009
0,980 kg/m



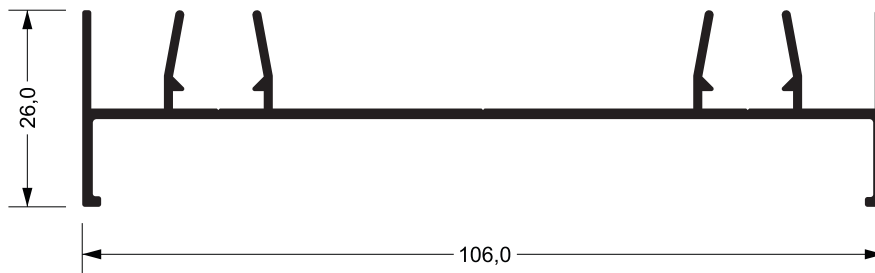
SU-010
1,021 kg/m



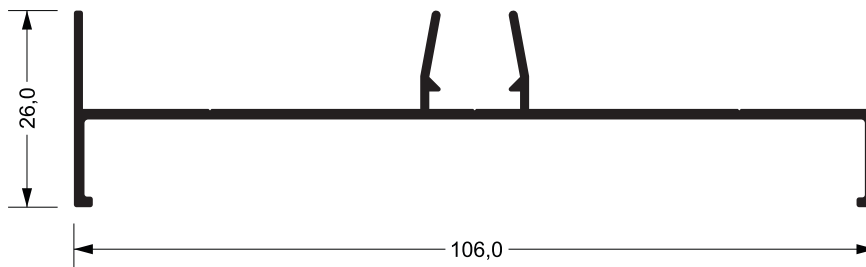
SU-011
0,990 kg/m



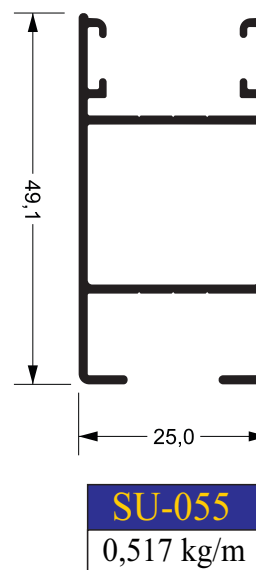
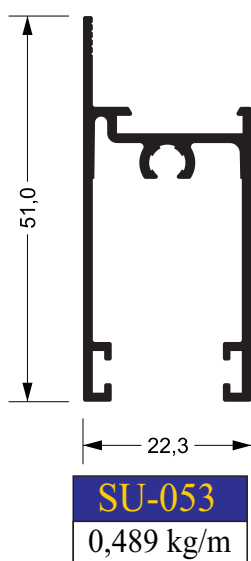
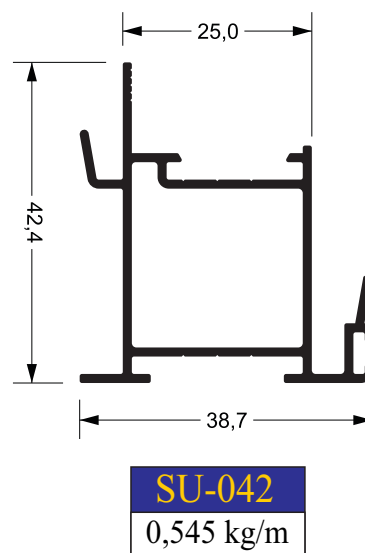
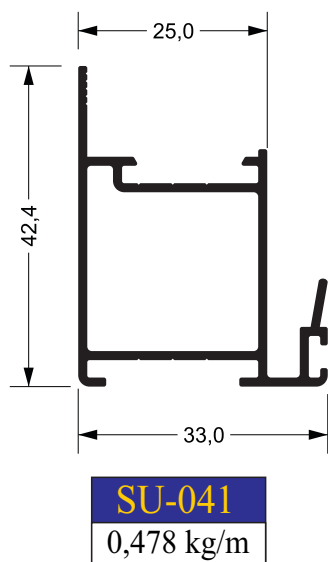
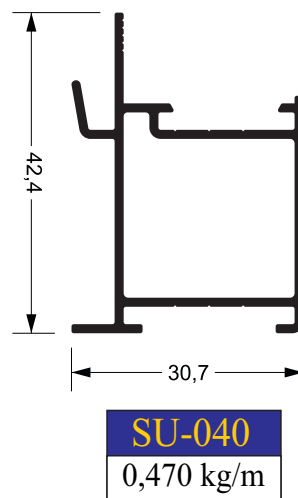
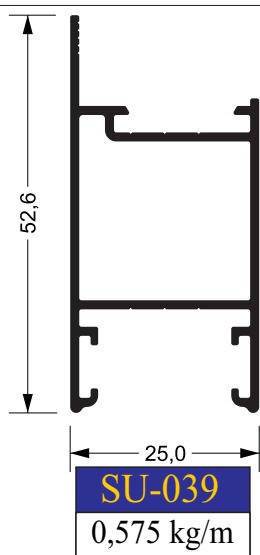
SU-012
0,536 kg/m

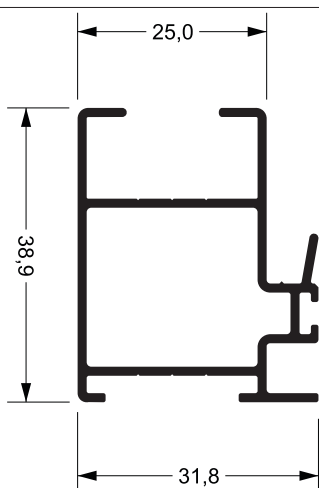


SU-013
0,710 kg/m

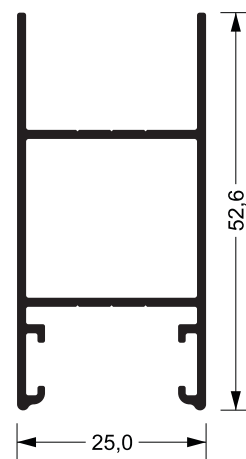


SU-014
0,587 kg/m

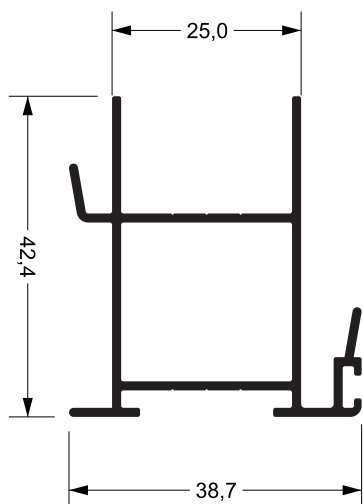




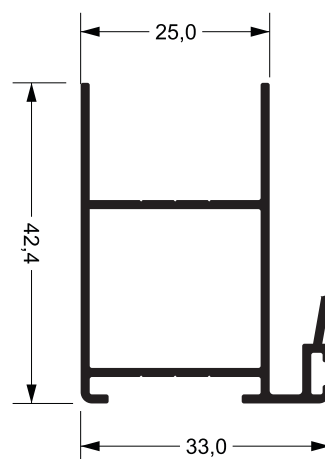
SU-056
0,560 kg/m



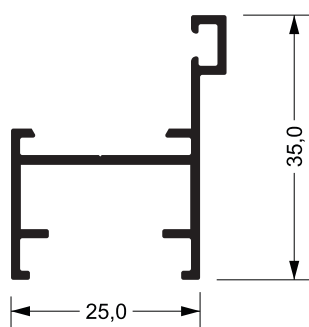
SU-068
0,552 kg/m



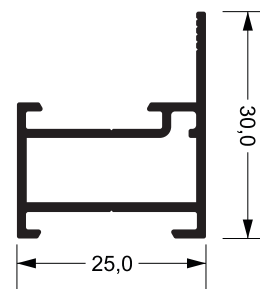
SU-069
0,538 kg/m



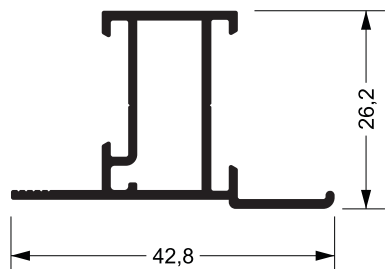
SU-070
0,485 kg/m



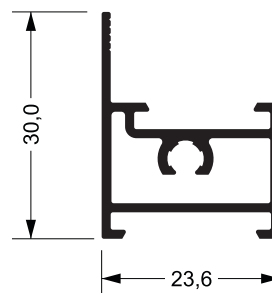
SU-079
0,352 kg/m



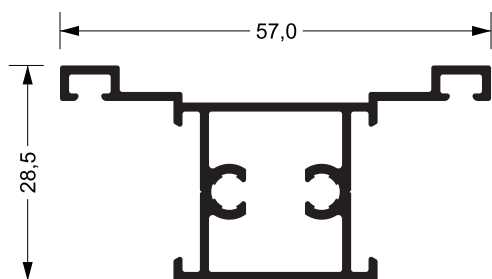
SU-080
0,357 kg/m



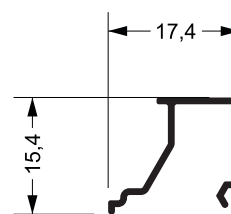
SU-081
0,409 kg/m



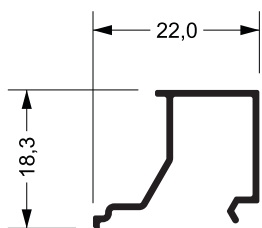
SU-082
0,386 kg/m



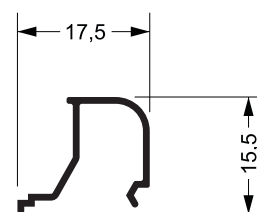
SU-086
0,628 kg/m



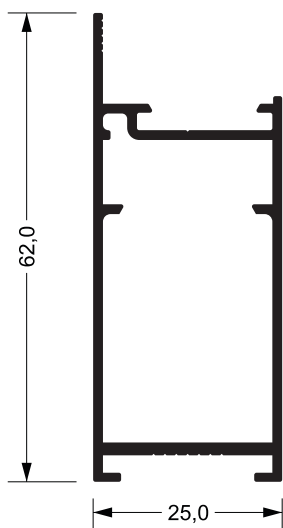
SU-102
0,104 kg/m



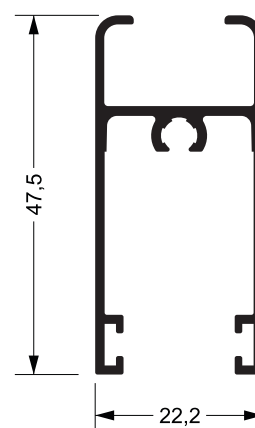
SU-103
0,137 kg/m



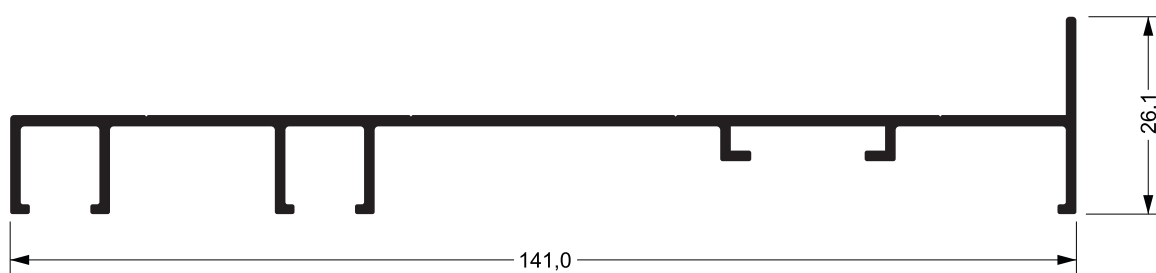
AF-018
0,103 kg/m



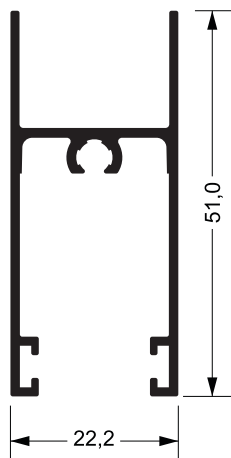
SU-111
0,619 kg/m



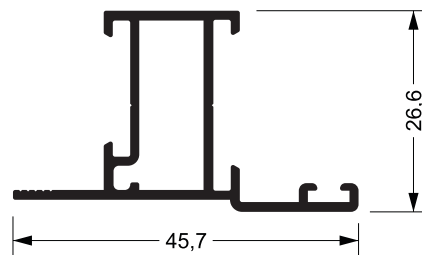
SU-186
0,467 kg/m



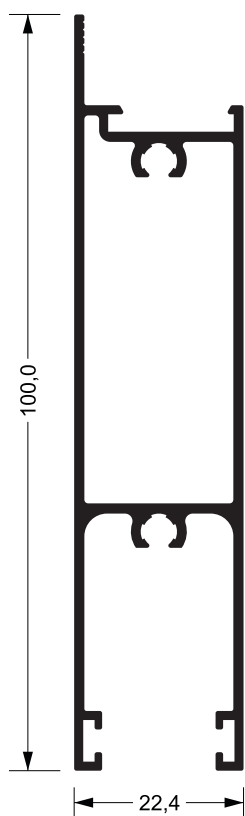
SU-123
0,996 kg/m



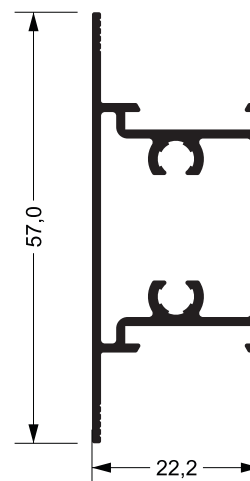
SU-187
0,485 kg/m



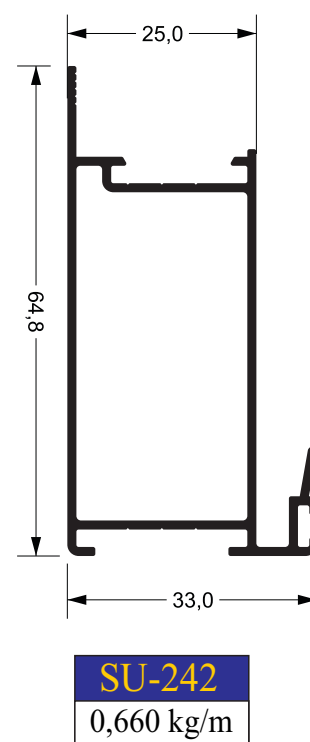
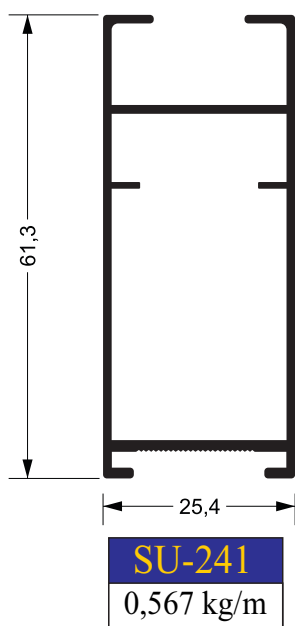
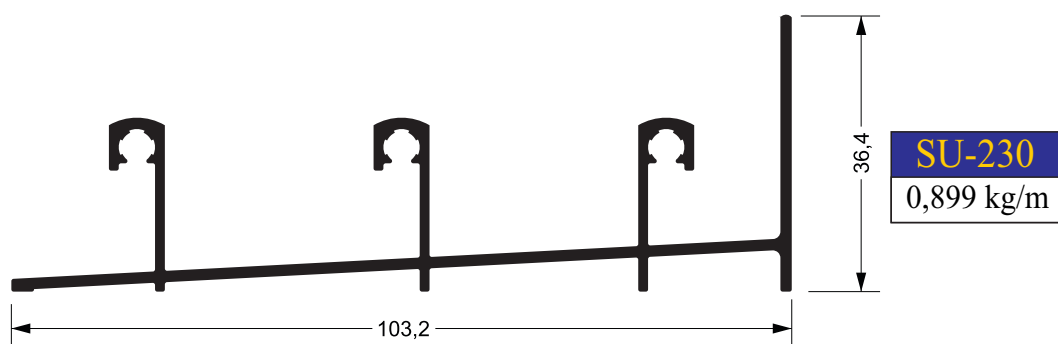
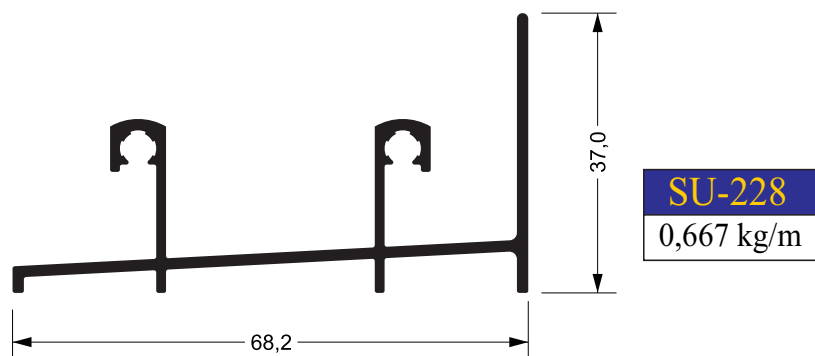
SU-200
0,398 kg/m

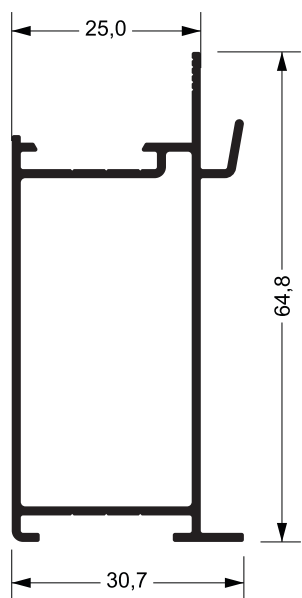


SU-225
1,005 kg/m

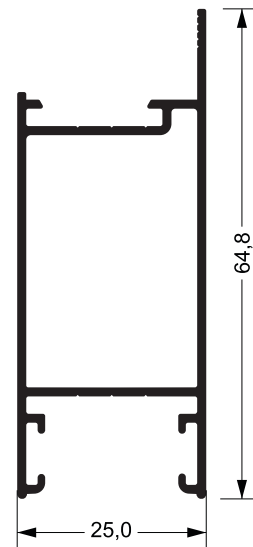


SU-227
0,548 kg/m

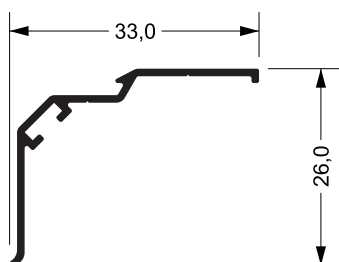




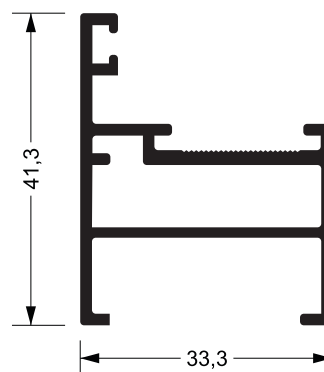
SU-243
0,618 kg/m



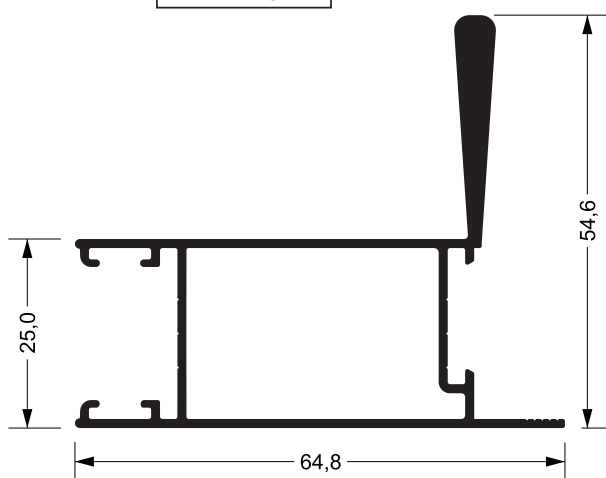
SU-245
0,597 kg/m



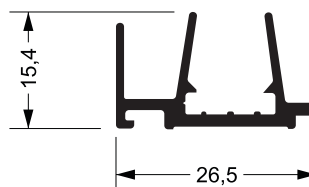
SU-276
0,168 kg/m



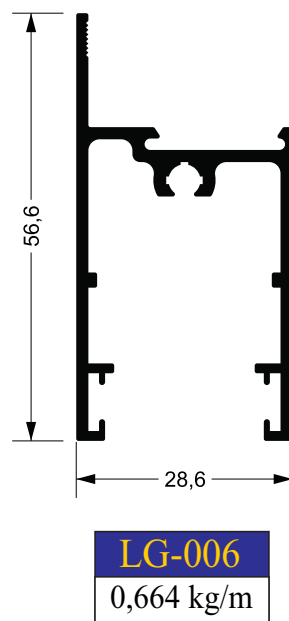
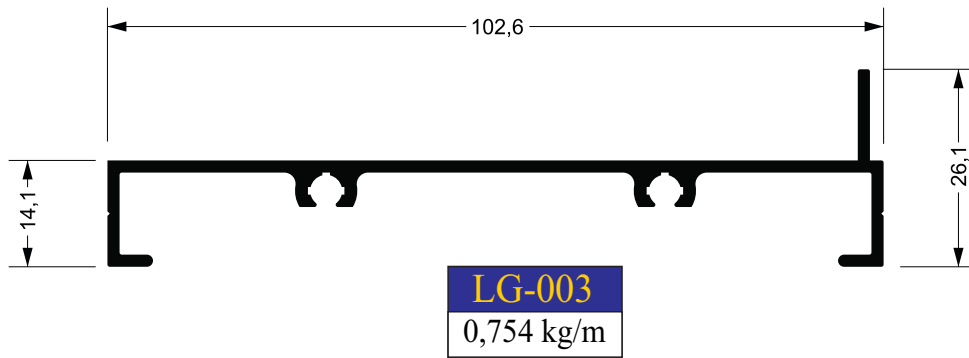
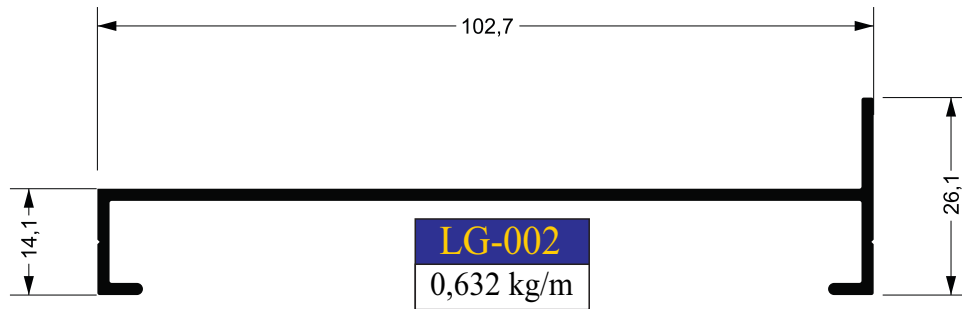
SU-279
0,522 kg/m

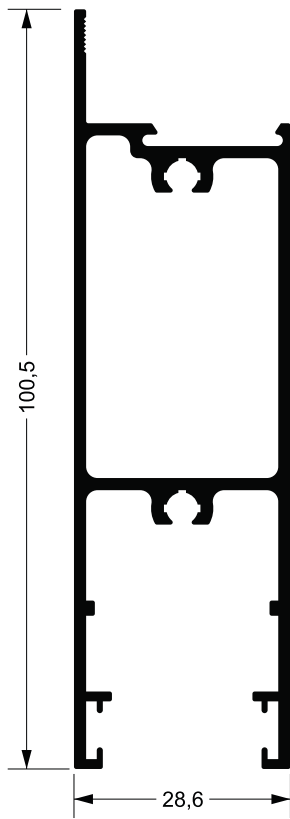


SU-280
0,875 kg/m

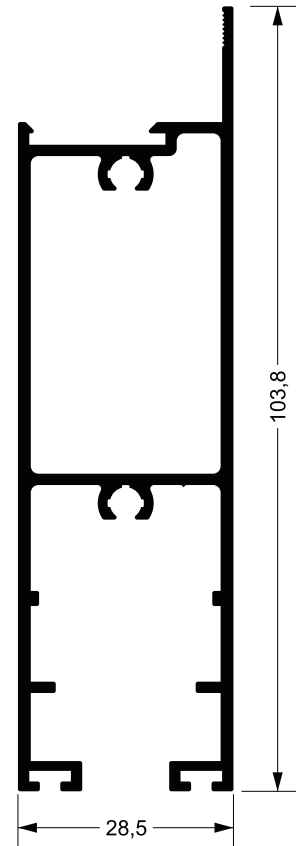


SU-302
0,225 kg/m

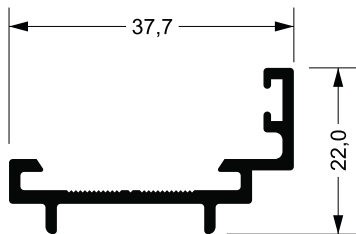




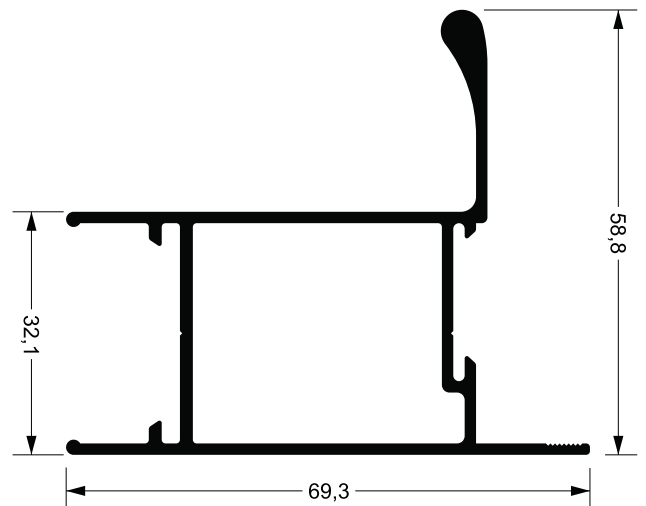
LG-007
1,200 kg/m



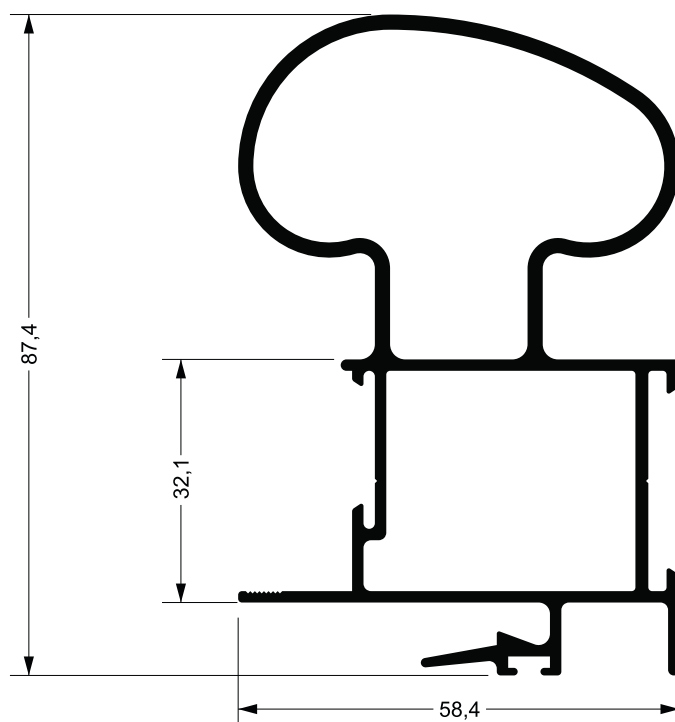
LG-007/B
1,280 kg/m



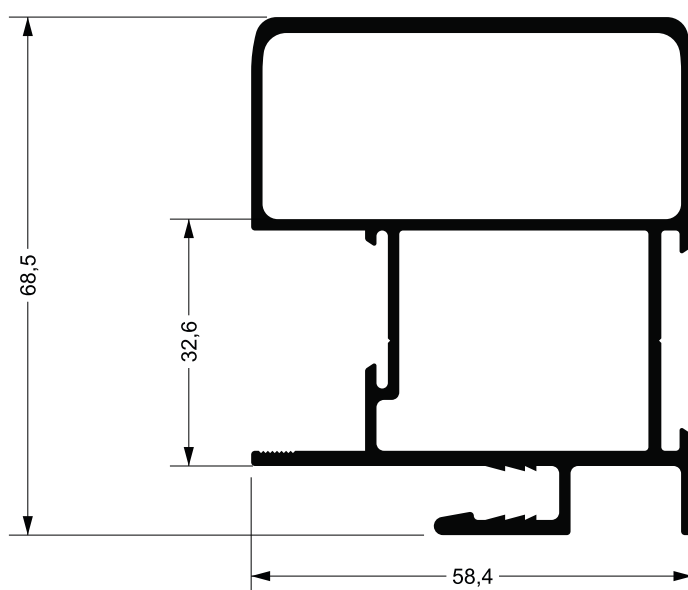
LG-016
0,330 kg/m



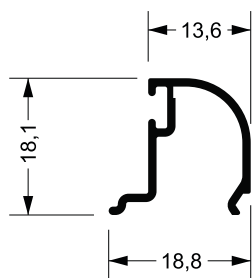
LG-017
0,995 kg/m



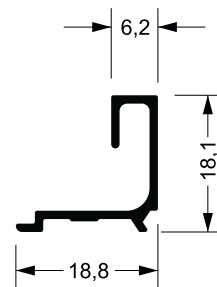
LG-021
1,782 kg/m



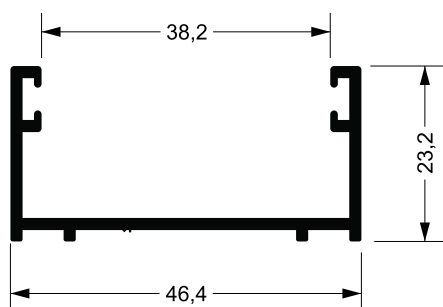
LG-018
1,580 kg/m



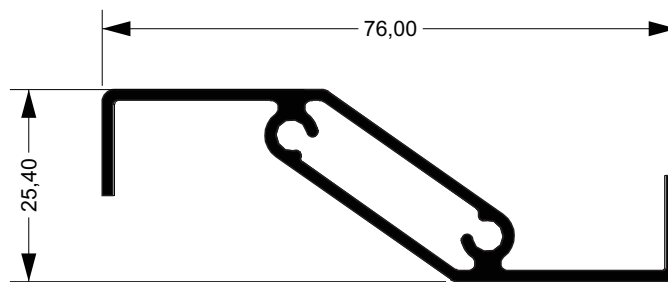
LG-026
0,150 kg/m



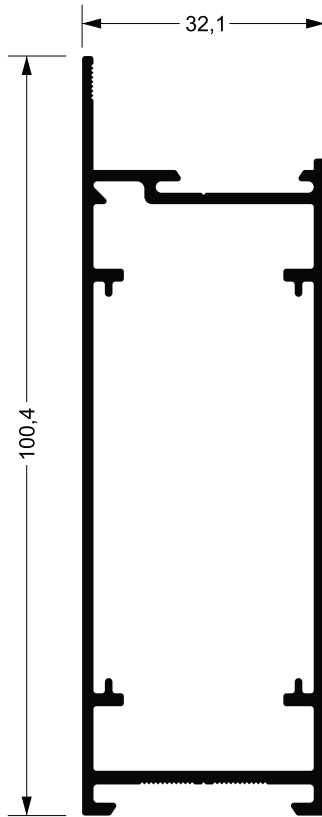
LG-027
0,144 kg/m



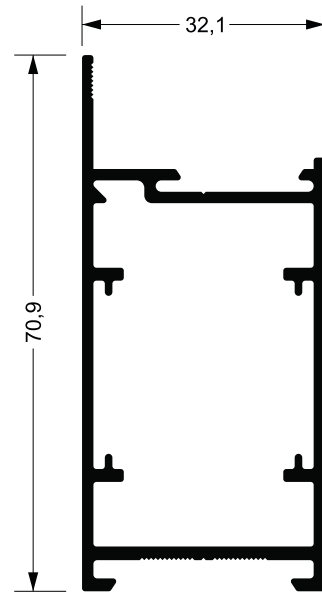
LG-028
0,464 kg/m



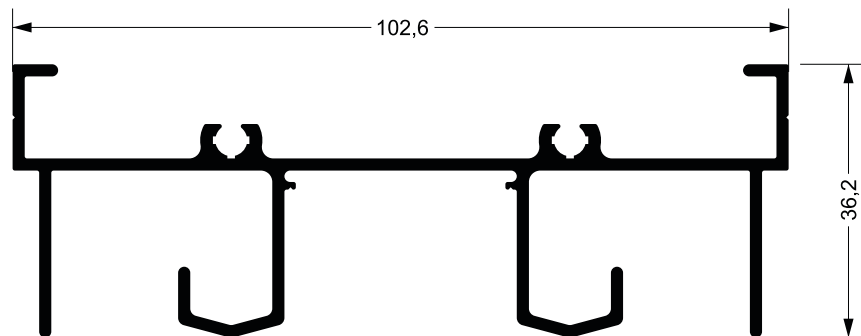
LG-037
0,651 kg/m



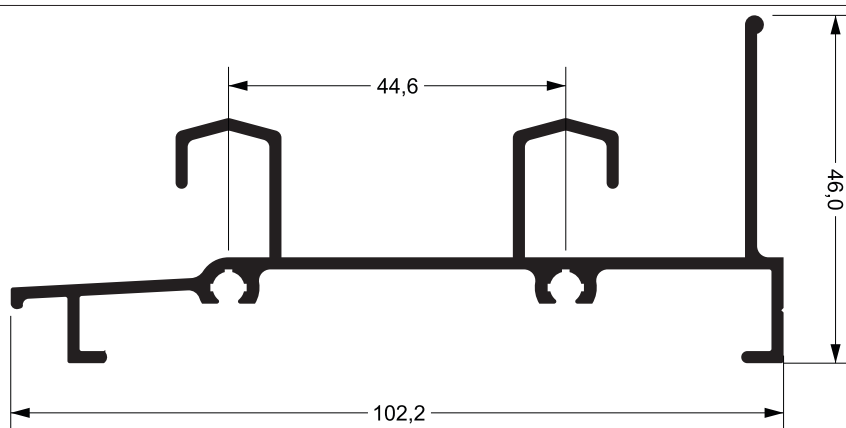
LG-042
0,959 kg/m



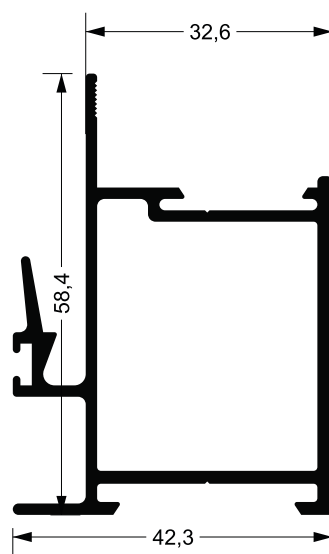
LG-043
0,933 kg/m



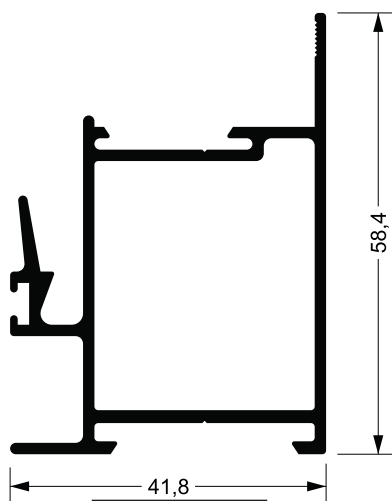
LG-044
1,230 kg/m



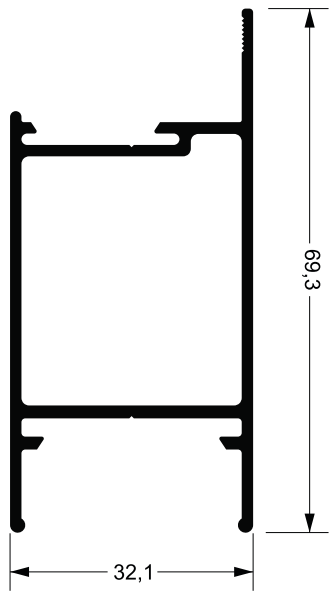
LG-047
1,165 kg/m



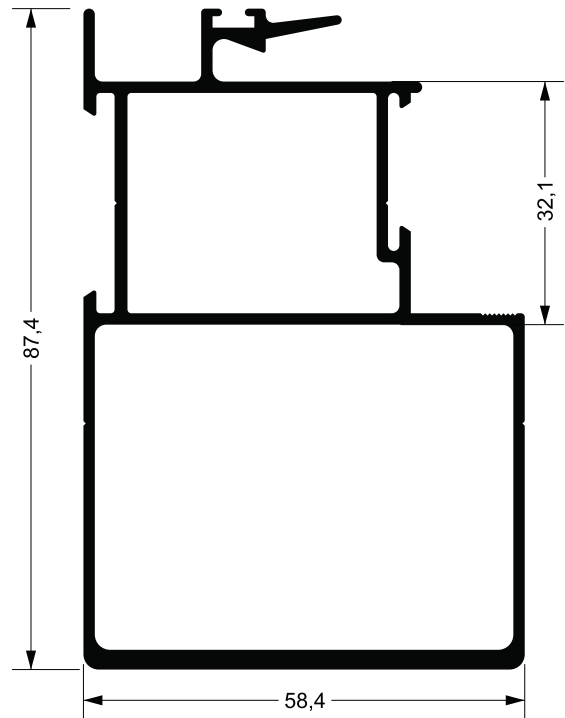
LG-048
0,959 kg/m



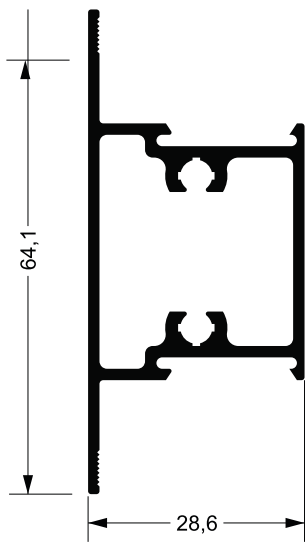
LG-049
0,959 kg/m



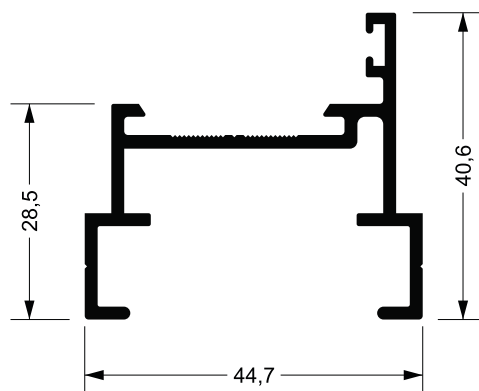
LG-050
0,787 kg/m



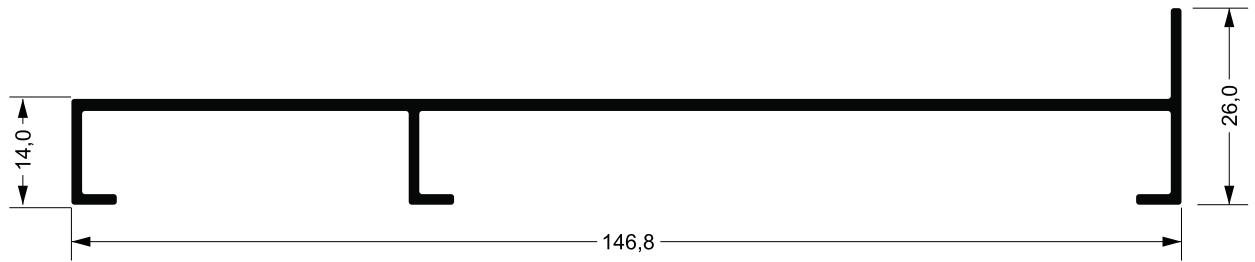
LG-052
1,675 kg/m



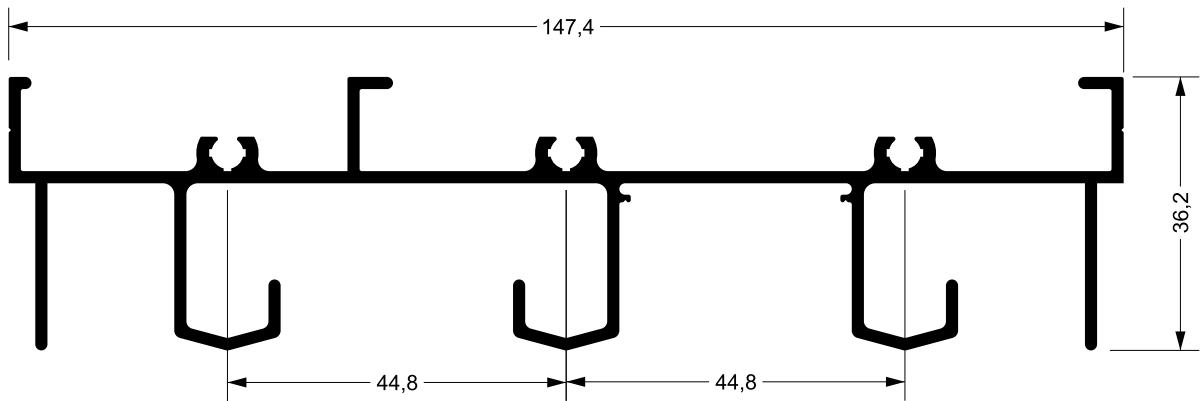
LG-055
0,757 kg/m



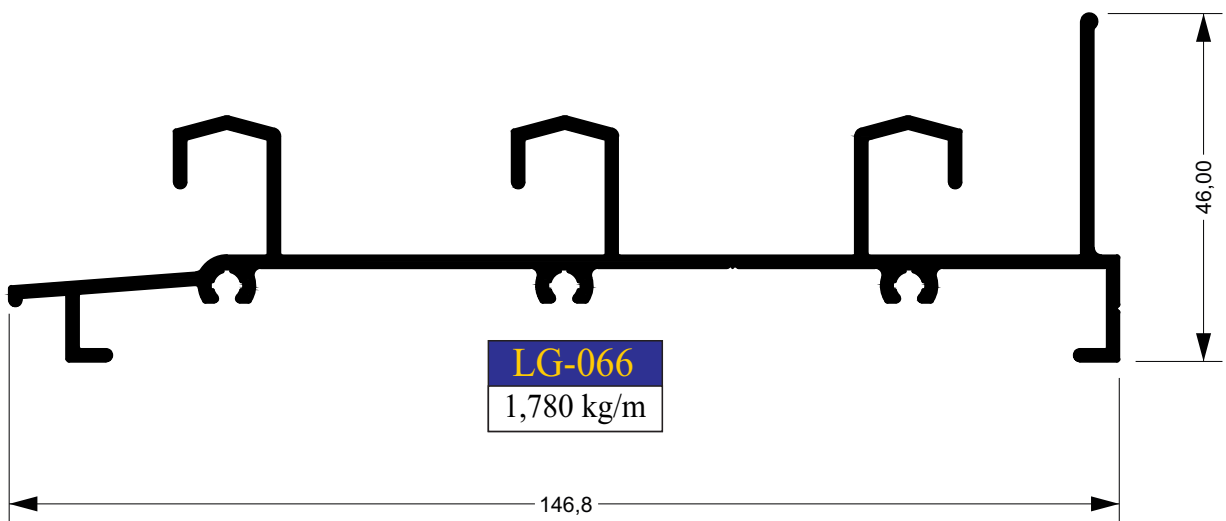
LG-056
0,652 kg/m



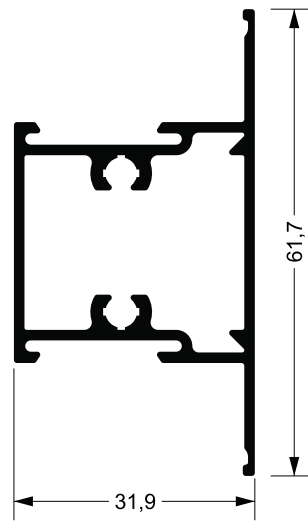
LG-158
0,876 kg/m



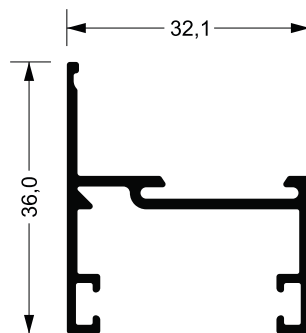
LG-062
1,780 kg/m



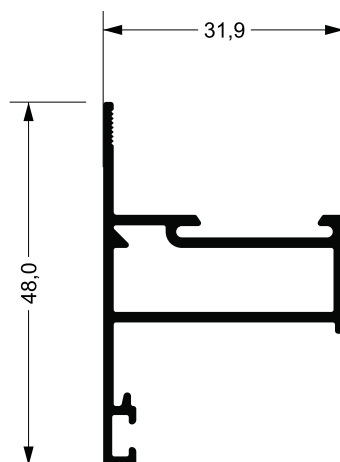
LG-066
1,780 kg/m



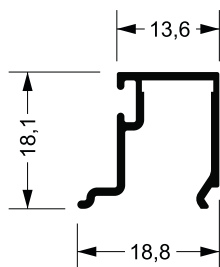
LG-079
0,753 kg/m



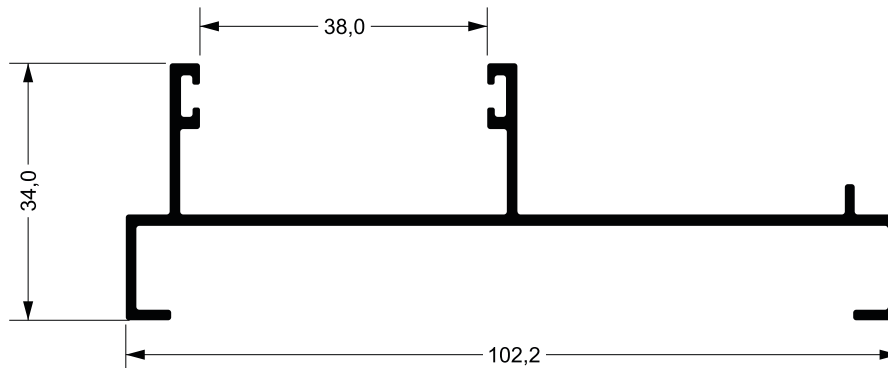
LG-083
0,422 kg/m



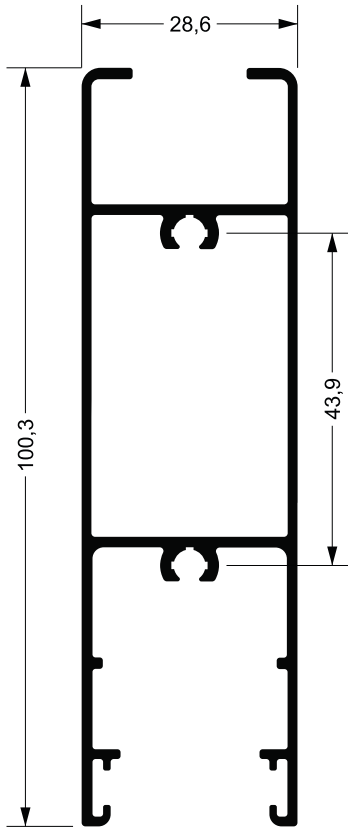
LG-085
0,558 kg/m



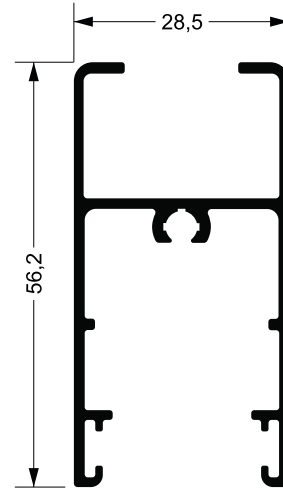
BG-057
0,172 kg/m



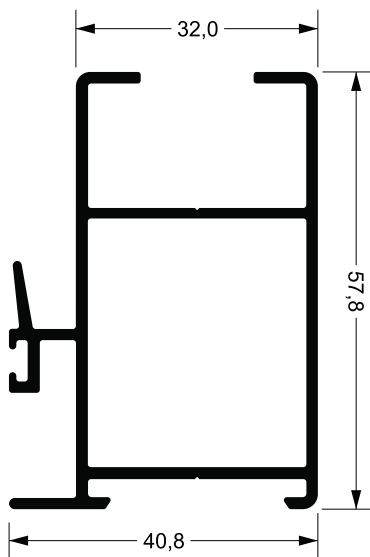
LG-124
0,773 kg/m



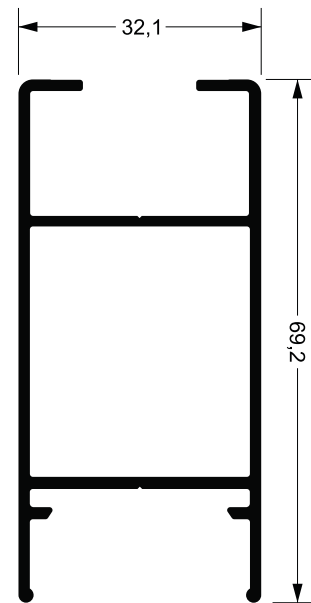
LG-129
1,241 kg/m



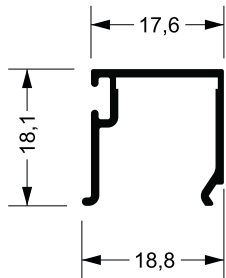
LG-130
0,656 kg/m



LG-128
0,872 kg/m

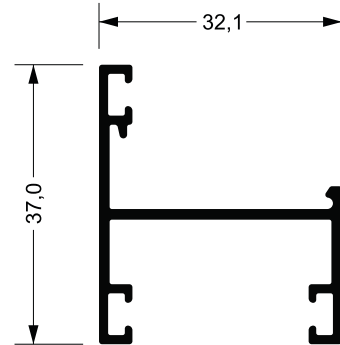


LG-132
0,774 kg/m



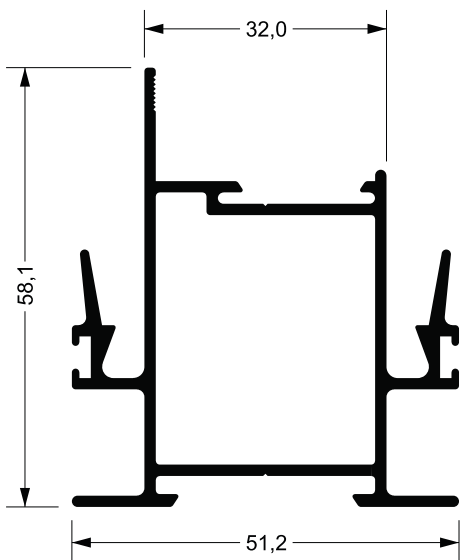
LG-059

0,174 kg/m



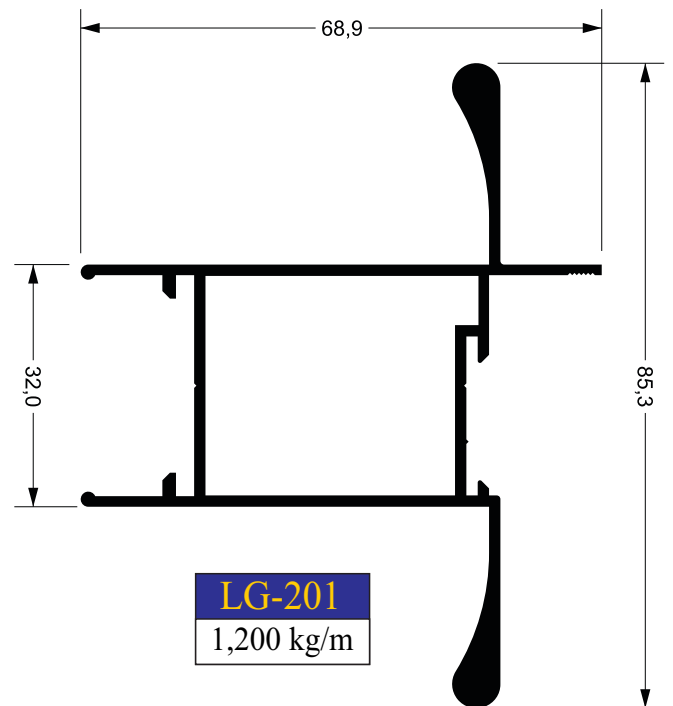
LG-068

0,392 kg/m



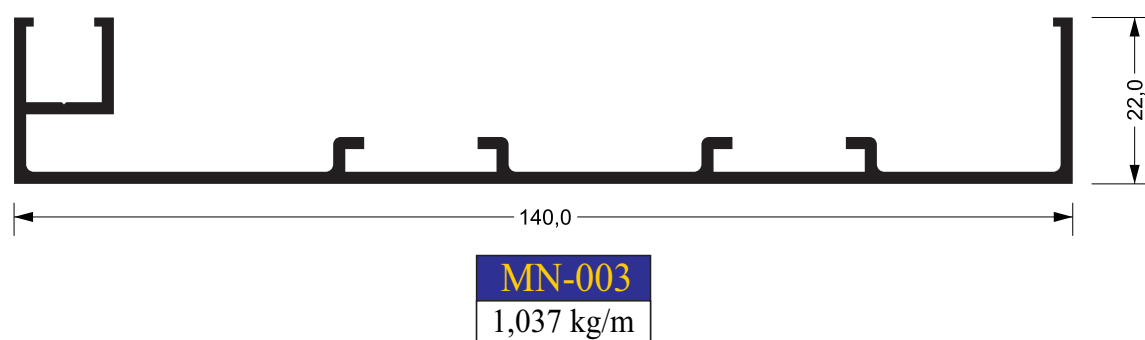
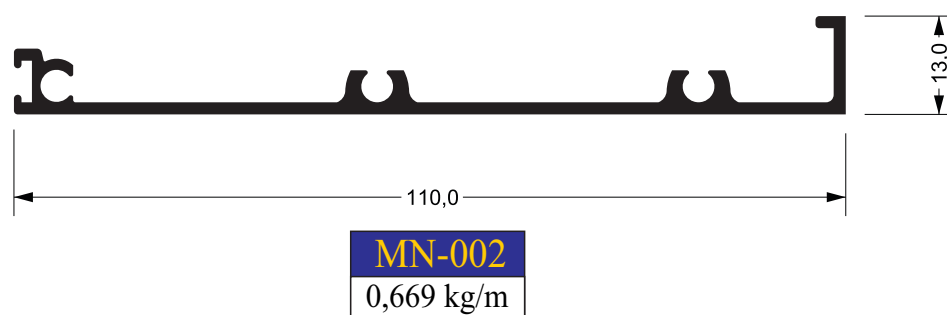
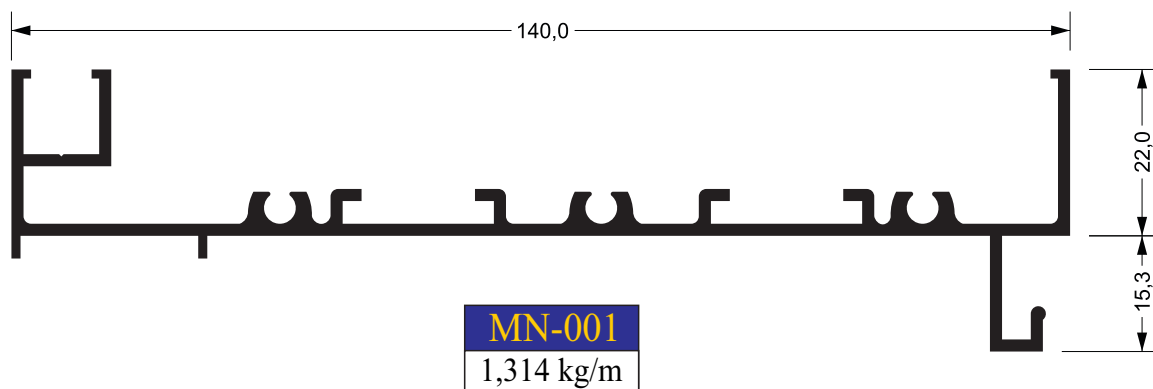
LG-162

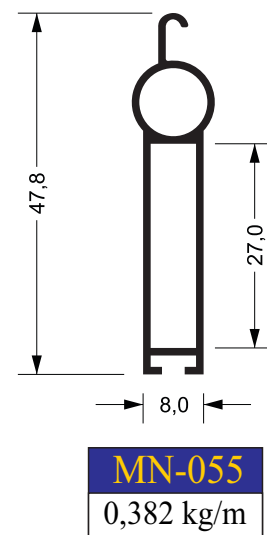
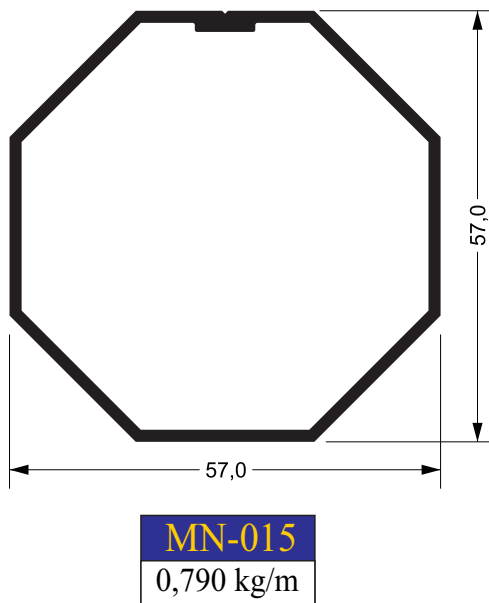
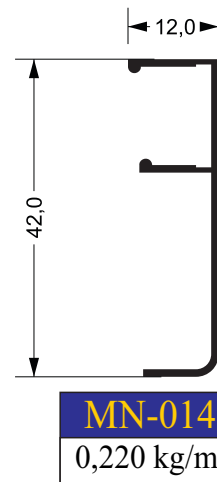
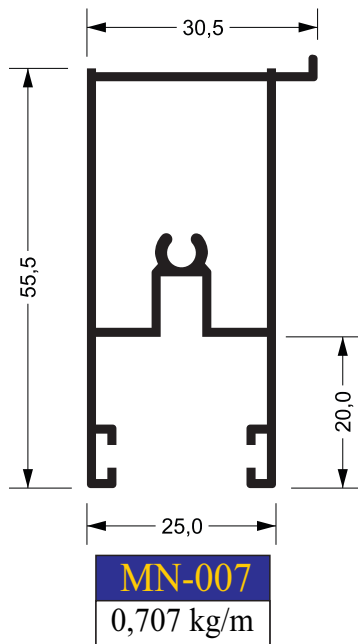
1,074 kg/m

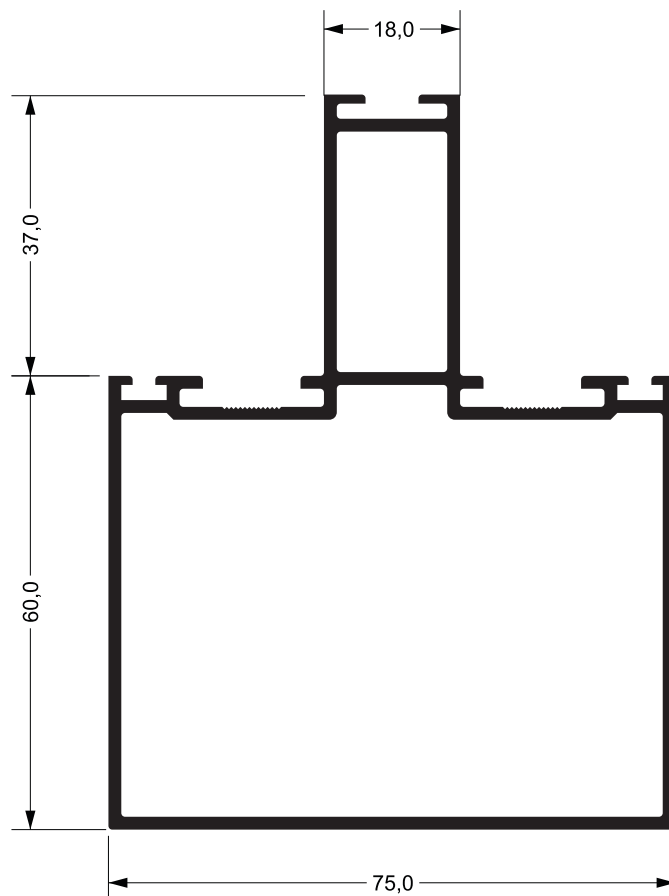


LG-201

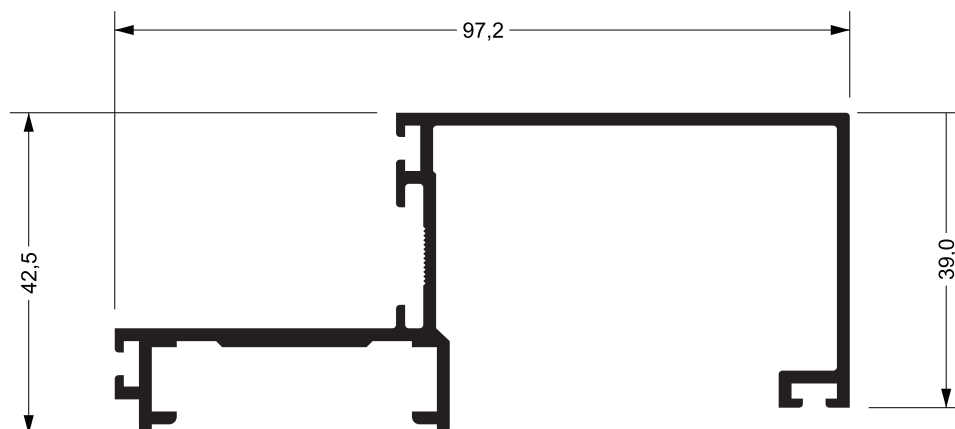
1,200 kg/m



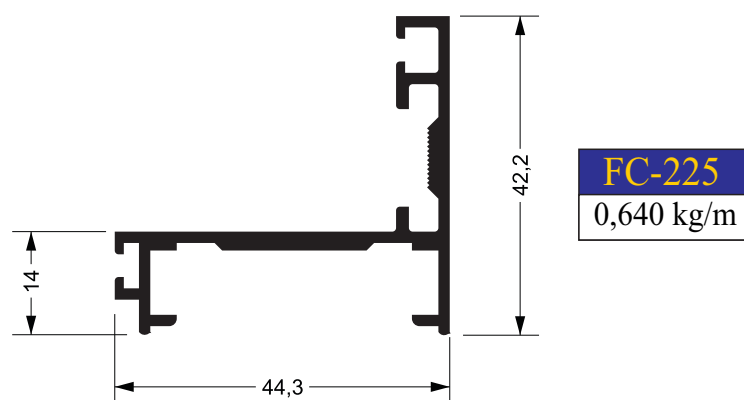
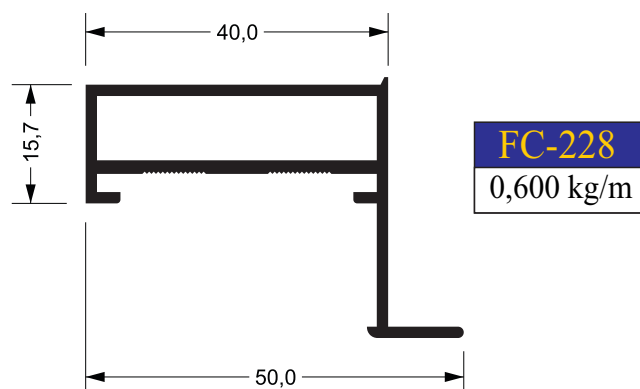
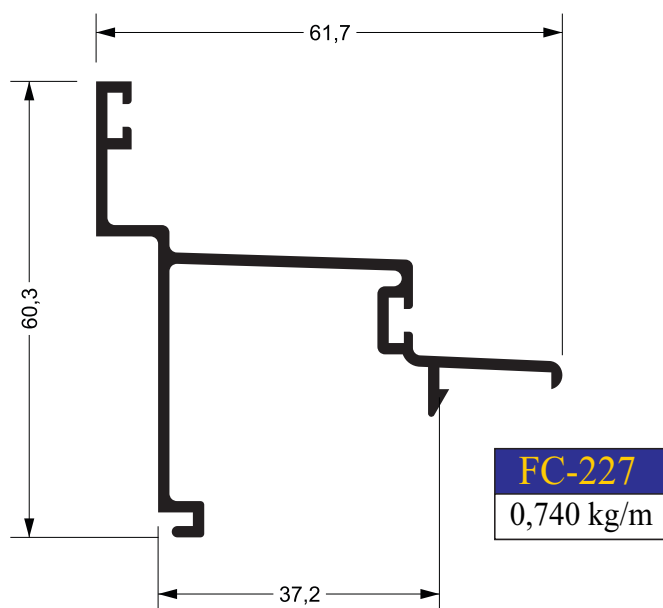


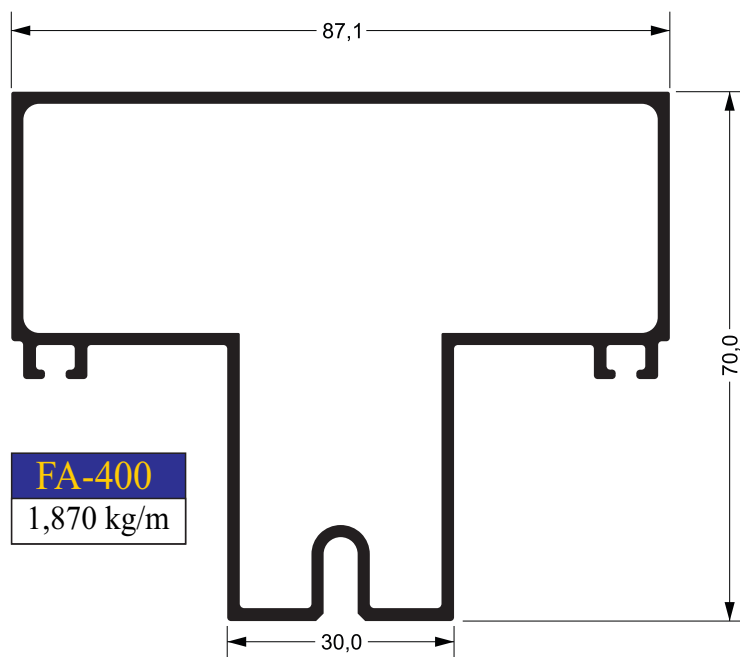
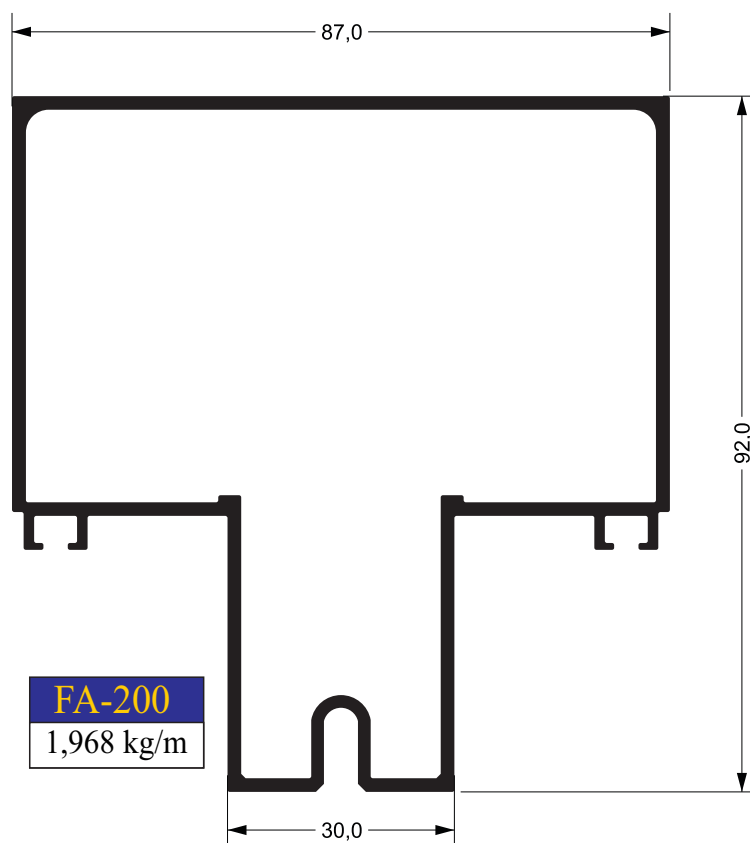


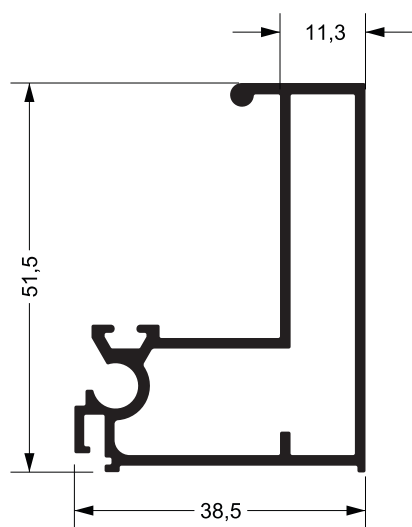
FC-202
1,900 kg/m



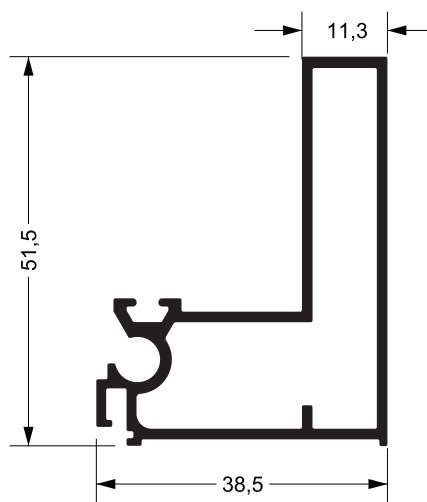
FC-243
1,033 kg/m



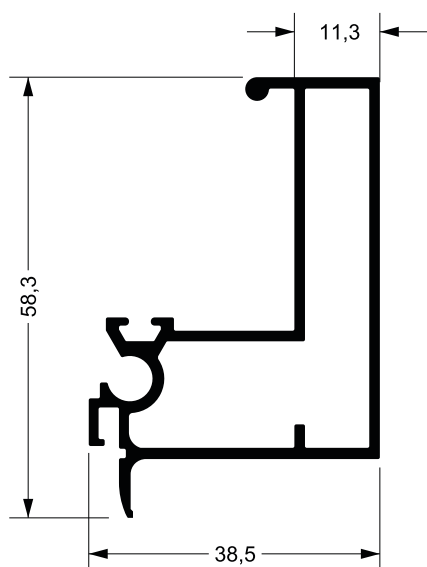




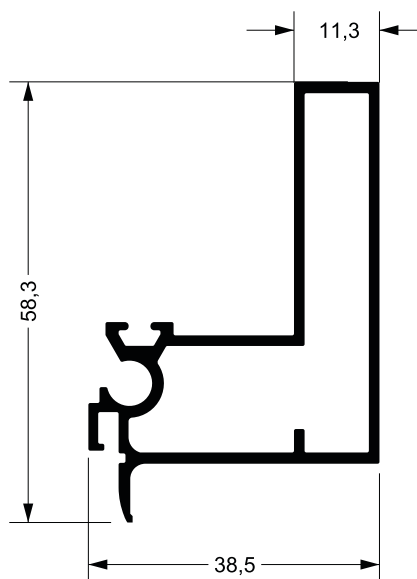
FA-230
0,770 kg/m



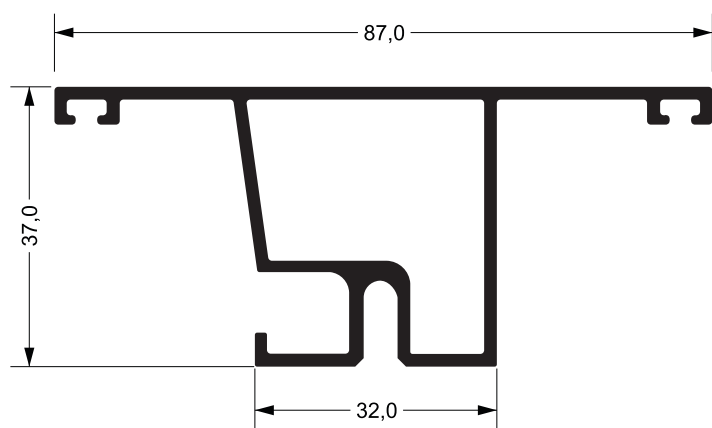
FA-245
0,742 kg/m



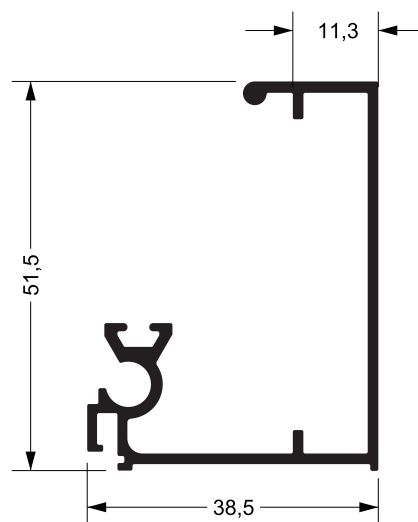
FA-256
0,800 kg/m



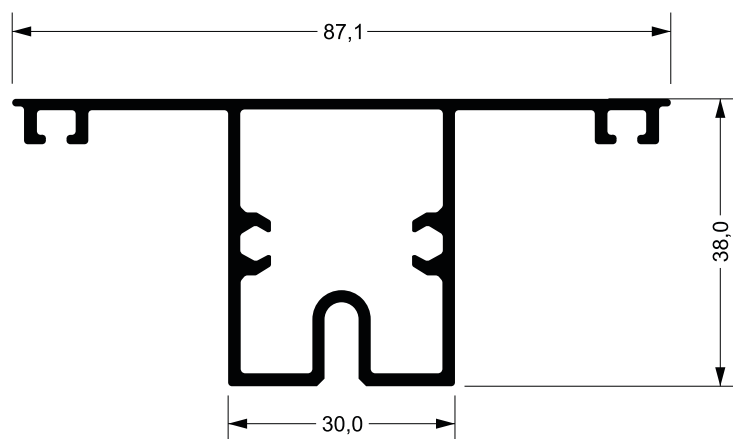
FA-255
0,765kg/m



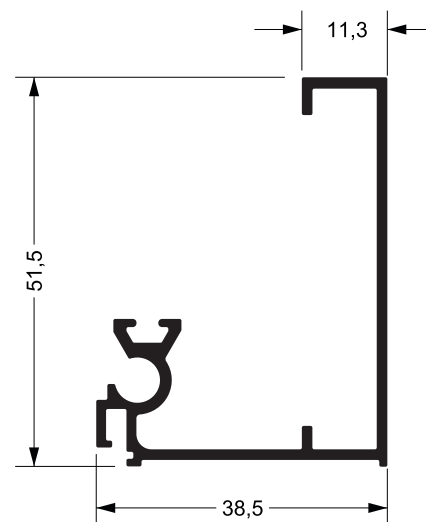
FA-211
0,998 kg/m



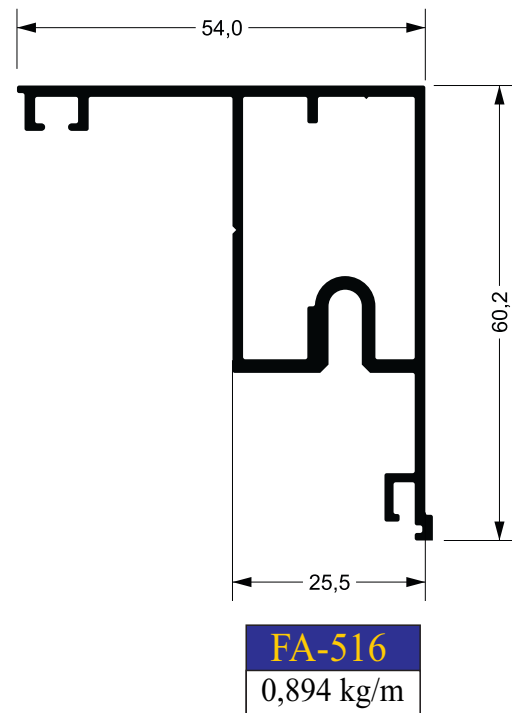
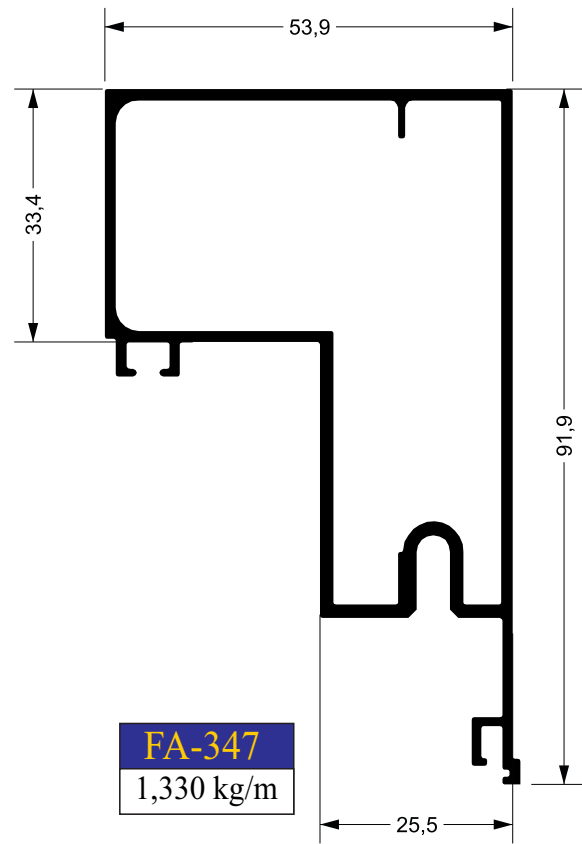
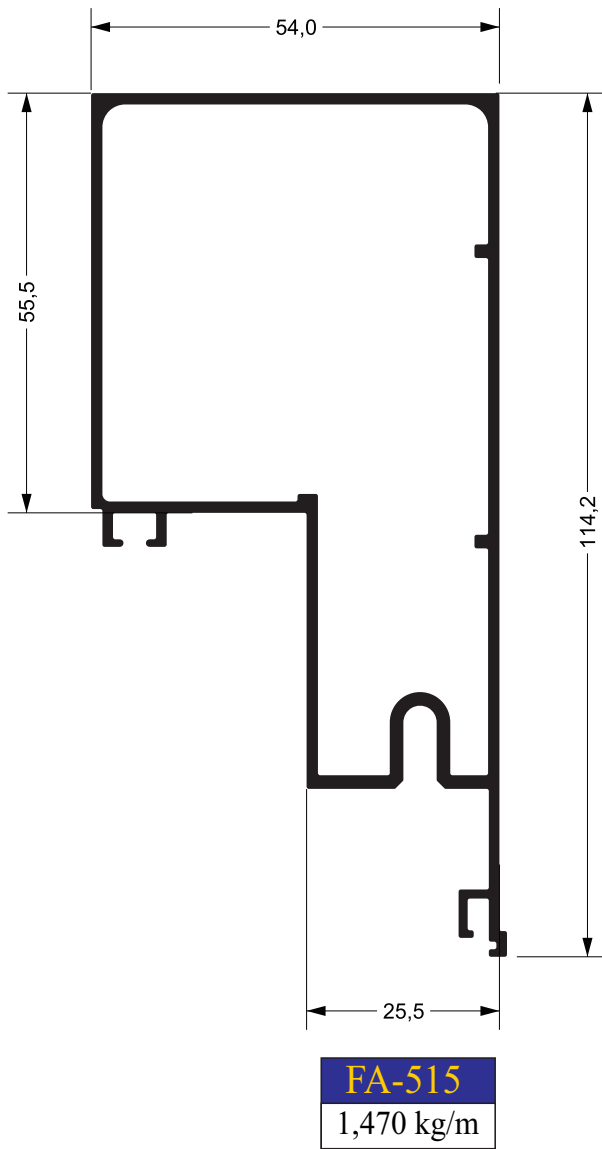
FA-232
0,603 kg/m

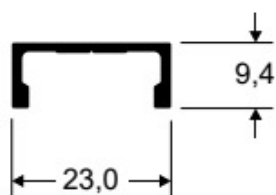


FA-204
1,046 kg/m



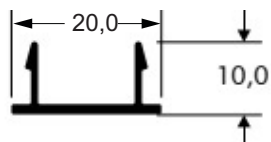
FA-228
0,588 kg/m





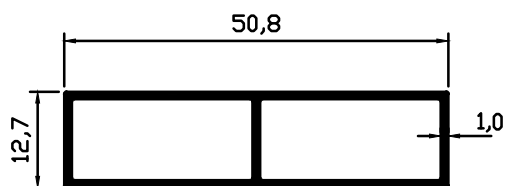
RAL-048

0,167 kg/m

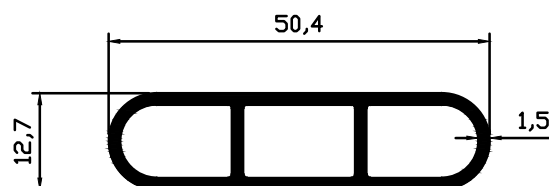


RAL-049

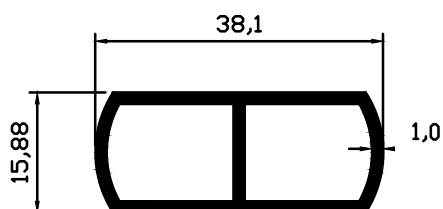
0,137 kg/m



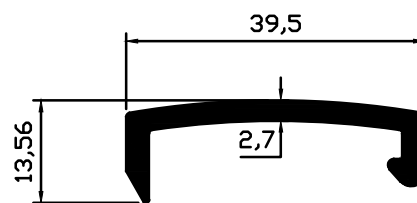
TMP-012
0,362 kg/m



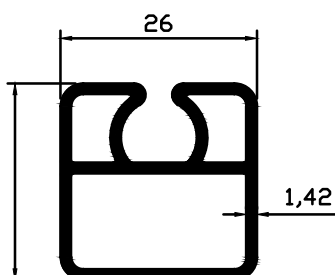
TMP-016
0,529 kg/m



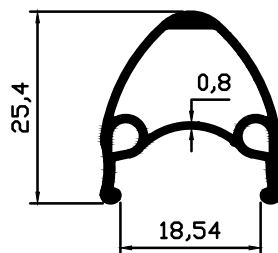
TMP-010
0,439 kg/m



TMP-026
0,419 kg/m



TMP-011
0,518 kg/m



DES-015

0,275 kg/m