

STANDARD PROFILES

Imperial sizes

04/2015



Extruded alloys and tempers:

Cosmos aluminium can extrude the majority of 6XXX alloy series in various tempers but most common alloys & tempers used are:

The more the content of Mg and Si, the harder the alloy to extrude and the harder the final product. See datasheets.

- EN-AW 6060 (Al MgSi_{0,5}) DIN 3.3206
- EN-AW 6063 (Al Mg_{0,7}Si) DIN 3.2315
- EN-AW 6005 (Al MgSi_{0,7}) DIN 3.3210
- EN-AW 6082 (Al Si₁MgMn) DIN 3.2315

According to EN 573-3 (EN- AW chemical composition %)

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Other		Al
									Each	Total	
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	Rest
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	Rest
6005	0,50-0,90	0,35	0,30	0,50	0,40-0,70	0,30	0,20	0,10	0,05	0,15	Rest
6082	0,7-1,3	0,50	0,10	0,40-1,0	0,6-1,2	0,25	0,20	0,10	0,05	0,15	Rest

Alloys & Tempers			
6060	6063	6005	6082
O	O	O	O
T4	T4	T4	T4
T5	T5		T5
T6	T6	T6	T6
T64	T64		
T66	T66		

Temper designation (as per EN 515)	
O	Annealed wrought alloys
T4	Solution heat treated & naturally aged.
T5	Cooled from an elevated temperature forming operation & artificially aged (precipitation hardened)
T6	Solution heat treated & artificially aged (precipitation hardened). Press quenching required.
T64	Solution heat treated & artificially aged (precipitation hardened). Under aged to improve formability (bending temper)
T66	Cooled from an elevated temperature forming operation & artificially aged (precipitation hardened) to a higher level of mechanical properties through special control of manufacturing processes. Press quenching required.

Properties

Physical properties				
Alloys EN-AW	6060	6063	6005	6082
Melting range °C	585-650	585-650	585-650	585-650
Density g/cm ³	2,70	2,70	2,70	2,70
Electrical Conductivity MS/m	34-38		26-32	24-32
Thermal Conductivity W/(m K)	200-220		180-220	170-220
Specific Heat J/(Kg K)	898			896
Thermal Expansion Values				
-50 to 20 °C (10 ⁻⁶ /K)	21,8	23,4	23,4	23,4
20 to 100 °C (10 ⁻⁶ /K)	23,4			
20 to 200 °C (10 ⁻⁶ /K)	24,5			
20 to 300 °C (10 ⁻⁶ /K)	25,6			
Young's Modulus MPa	69500	69500	69500	70000
Shear Modulus MPa	26100	26100	26200	26400

Mechanical Properties (as per EN 755-2)							
Alloy	Wall Thickness	Tensile strength	Proof stress	Elongation		Brinell Hardness	Temper
	e mm*	R _m MPa min	R _{p0.2} MPa min	A _{50mm} % min	A % min	HB**	
EN-AW 6060	e ≤ 25	120	60	14	16	45	T4
	e ≤ 5	160	120	6	8	55	T5
	e ≤ 3	190	150	6	8	65	T6
	3 < e ≤ 25	170	140	6	8	60	
	e ≤ 3	215	160	6	8	70	T66
3 < e ≤ 25	195	150	6	8	65		
EN-AW 6063	e ≤ 25	130	65	12	14	45	T4
	e ≤ 3	175	130	6	8	55	T5
	3 < e ≤ 25	160	110	5	7	50	
	e ≤ 10	215	170	6	8	65	T6
	10 < e ≤ 25	195	160	6	8	60	
e ≤ 10	245	200	6	8	75		
EN-AW 6005	e ≤ 25	180	90	15	13	50	T4
	10 < e ≤ 25	250	200	8	6	85	T6 FLAT T6 FLAT T6 FLAT T6 HOLLOW
	e ≤ 5	270	225	8	6	90	
	5 < e ≤ 10	260	215	8	6	85	
5 < e ≤ 10	250	200	8	6	85		
EN-AW 6082	e ≤ 25	205	110	12	14	70	T4
	e ≤ 5	270	230	6	8	80	T5
	e ≤ 5	290	250	6	8	95	T6
	10 < e ≤ 25	310	260	8	10	95	

* For different wall thicknesses of a given profile, the lowest specified values of properties shall be considered as valid for the whole profile cross section.

** The values for the HB hardness are indicative only.

Product forms & Applications

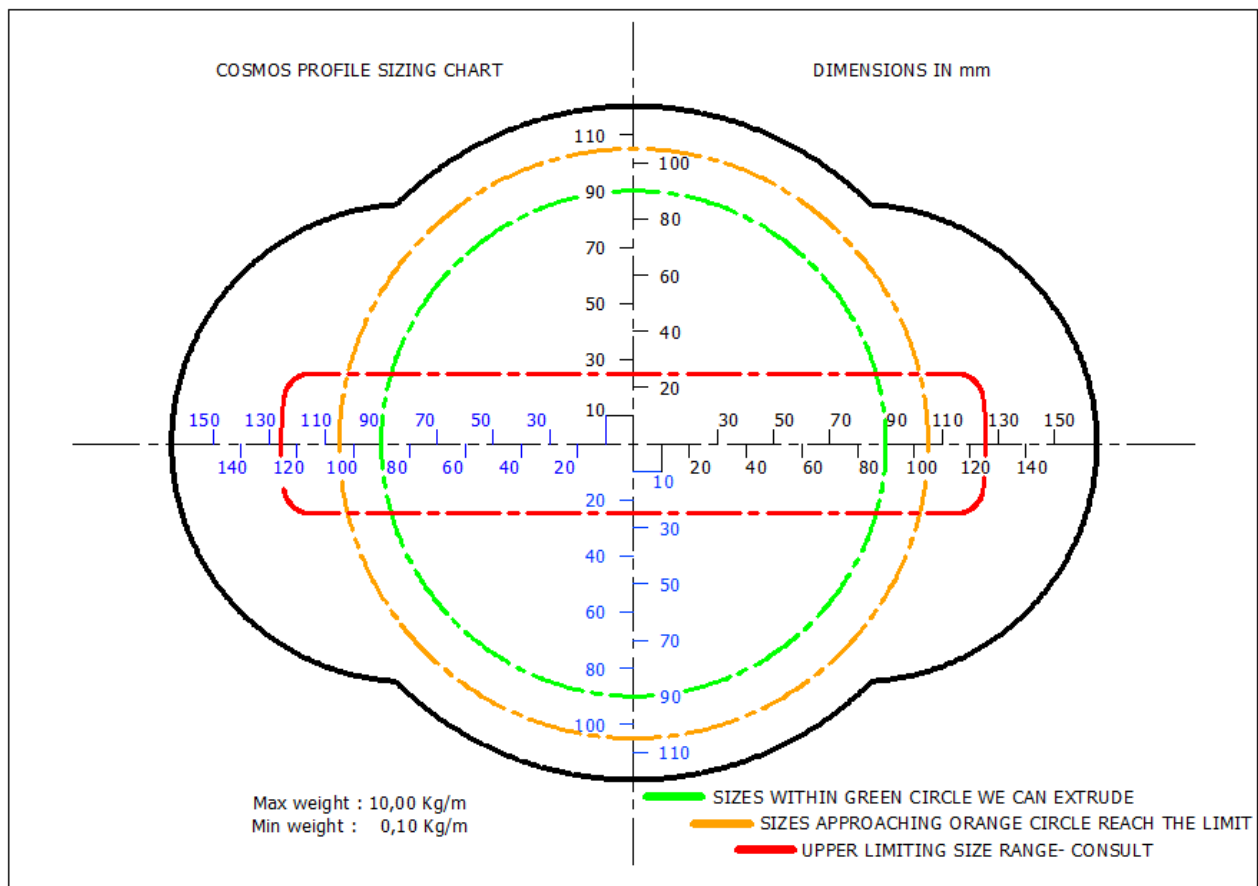
Alloys	Forms	Characteristic properties	Applications
EN-AW 6060	Extruded round rod/bar Extruded square, hexagonal, rectangular rod/bar Extruded tube Extruded profiles	V.good corrosion resistance Medium strength Complex sections Anodising quality	Architectural sections frames, lightings, railing, ladders, furniture, fences, flooring
EN-AW 6063		V.good corrosion resistance Medium strength Complex sections Anodising quality	Architectural sections frames, lightings, railing, ladders, furniture, fences, heat sink
EN-AW 6005 EN-AW 6082		V.good corrosion resistance Medium-High strength Not complex sections	Heavy duty structures, truck frames, bicycles, flanges, pylons, towers, scaffolding tubes

Tolerances & Certifications

The quality control department at Cosmos Aluminium abides with the following standards for the production quality control and delivery of aluminium profiles.

EN Standard	Description
Aluminium & aluminium alloys- Extruded rod/bar, tubes and profiles	
EN 755-1	Technical conditions for inspection & delivery
EN 755-2	Mechanical properties
EN 755-3	Round bars, tolerances on dimension & form
EN 755-4	Square bars, tolerances on dimension & form
EN 755-5	Rectangular bars, tolerances on dimension & form
EN 755-6	Hexagonal bars, tolerances on dimension & form
EN 755-7	Seamless tubes, tolerances on dimension & form
EN 755-9	Profiles, tolerances on dimension & form
Aluminium & aluminium alloys- Extruded precision profiles in alloys EN- AW 6060 & EN- AW 6063	
EN- 12020-1	Technical conditions for inspection & delivery (precision profiles)
EN- 12020-2	Tolerances on dimension & form (precision profiles)
Metallic products- Types of inspection documents	
Inspection	2.3, 3.1, 3.2

Profile size production range



Profile weight production range

Minimum profile weight: 100 gr/m	Maximum profile weight: 8000 gr/m
---	--

Rectangular bars (Flat bars)

Rechteckstangen (Flachstangen)

Notes:

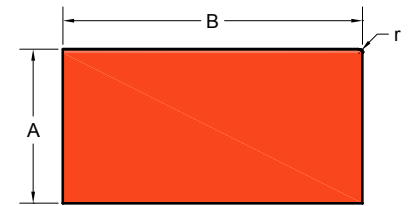
* The weight of each profile is calculated by measuring it's cross-sectional area and multiplying it by the material density. The aluminium density is considered to be 2,70

** Alloy and Length is subject to customer's request.

*** Corner Radii 0,0118 inch or 0,3 mm.

* Additional charge

A = Width
B = Height
r = Corner radius



Profile Code	A (inch)	B (inch)	r ^(***) (inch/mm)	Area Flaeche (inch ²)	Area Flaeche (mm ²)	Weight Gewicht (Kg/m)
020859	1/8"	5/8"		0,0781	50	0,136
020801	1/8"	3/4"		0,0936	60	0,163
020832	3/8"	3/4"		0,2807	181	0,489
020847	1/2"	3/4"		0,3749	242	0,653
020823	1/8"	1"		0,1251	81	0,218
020866	3/16"	1"		0,1894	122	0,330
020807	1/4"	1"		0,2497	161	0,435
020860	1/2"	1"		0,5000	323	0,871
020861	3/4"	1"		0,7497	484	1,306
020835	1/8"	1.1/4"		0,1561	101	0,272
020862	1/4"	1.1/4"		0,3129	202	0,545
020848	3/4"	1.1/4"		0,9375	605	1,633
020845	1"	1.1/4"		1,2498	806	2,177
020844	1/8"	1.1/2"		0,1871	121	0,326
020808	1/4"	1.1/2"		0,3749	242	0,653
020809	3/8"	1.1/2"		0,5626	363	0,980
020836	1/2"	1.1/2"		0,7497	484	1,306
020863	3/4"	1.1/2"		1,1252	726	1,960
020824	1"	1.1/2"		1,5001	968	2,613
020840	1.1/4"	1.1/2"		1,8755	1.210	3,267
020846	1/4"	1.3/4"		0,4374	282	0,762
020841	1.1/4"	1.3/4"		2,1872	1.411	3,810
020826	3/16"	2"		0,3749	242	0,653
020825	1/8"	2"		0,2503	161	0,436
020802	1/4"	2"		0,4999	323	0,871
020810	3/8"	2"		0,7497	484	1,306
020818	1/2"	2"		1,0000	645	1,742
020856	5/8"	2"		1,2498	806	2,177
020864	3/4"	2"		1,5001	968	2,613
020811	1"	2"		1,9995	1.290	3,483
020842	1.1/4"	2"		2,5001	1.613	4,355
020812	1.1/2"	2"		3,0001	1.936	5,226
020852	3/4"	2.1/4"		1,6872	1.089	2,939
020865	1.1/4"	2.1/4"		2,8124	1.814	4,899
020837	1/4"	2.1/2"		0,6246	403	1,088
020834	3/8"	2.1/2"		0,9375	605	1,633
020831	1/2"	2.1/2"		1,2498	806	2,177

Round bars (Rods)

standard

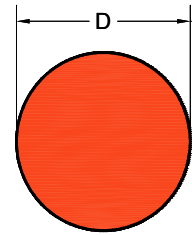
□ 3

Notes:

* The weight of each profile is calculated by measuring it's cross-sectional area and multiplying it by the material density. The aluminium density is considered to be 2,70

** Alloy and Length is subject to customer's request.

D = Diameter



* Additional charge

Profile Code	D (inch)			Area Flaeche (inch ²)	Area Flaeche (mm ²)	Weight Gewicht (Kg/m)
030807	5/8"			0,307	198	0,535
030805	1/2"			0,196	127	0,342
030806	3/4"			0,442	285	0,770
030808	7/8"			0,602	388	1,048
030801	1"			0,786	507	1,369
030804	1.1/4"			1,227	792	2,138
030809	1.3/8"			1,485	958	2,587
030810	1.1/2"			1,767	1140	3,078
030802	1.3/4"			2,405	1552	4,190
030811	1.7/8"			2,764	1783	4,814
030803	2"			3,142	2027	5,473
030815	2.1/4"			3,976	2565	6,926
030812	2.3/8"			4,431	2859	7,718
030813	2.1/2"			4,909	3167	8,551
030814	2.3/4"			5,939	3832	10,346

Symmetrical L-Profiles (Angles)

Gleichschenklige L-Profil (Winkelprofil)

Notes:

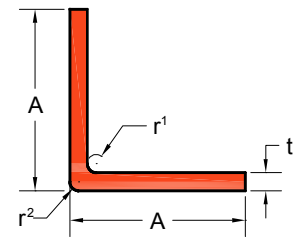
* The weight of each profile is calculated by measuring it's cross-sectional area and multiplying it by the material density. The aluminium density is considered to be 2,70

** Alloy and Length is subject to customer's request.

*** Corner Radii 0,0118 inch or 0,3 mm.

* Additional charge

A = Width
A = Height
t = thickness
 r^1, r^2 = Corner radius



Profile Code	A (inch)	A (inch)	t (inch)	Area Flaeche (inch ²)	Area Flaeche (mm ²)	Weight Gewicht (Kg/m)
040822	3/4"	3/4"	1/8"	0,1716	111	0,299
040816	1"	1"	1/16"	0,1211	78	0,211
040801	1"	1"	1/8"	0,2342	151	0,408
040811	1"	1"	3/16"	0,3393	219	0,591
040819	1"	1"	1/4"	0,4369	282	0,761
040818	1.1/4"	1.1/4"	1/16"	0,1521	98	0,265
040807	1.1/4"	1.1/4"	1/8"	0,2974	192	0,518
040820	1.1/4"	1.1/4"	1/4"	0,5626	363	0,980
040802	1.1/2"	1.1/2"	1/8"	0,3594	232	0,626
040817	1.1/2"	1.1/2"	3/16"	0,5270	340	0,918
040803	1.1/2"	1.1/2"	1/4"	0,6889	444	1,200
040824	1.3/4"	1.3/4"	3/16"	0,6200	400	1,084
040823	2"	2"	1/16"	0,2474	160	0,431
040804	2"	2"	1/8"	0,4839	312	0,843
040813	2"	2"	3/16"	0,7141	461	1,244
040805	2"	2"	1/4"	0,9375	605	1,633
040821	2"	2"	3/8"	1,3594	877	2,368
040815	2.1/2"	2.1/2"	3/16"	0,9019	582	1,571
040809	2.1/2"	2.1/2"	1/4"	1,1878	766	2,069
040808	3"	3"	1/8"	0,7331	473	1,277
040806	3"	3"	1/4"	1,4375	927	2,504
040810	3"	3"	3/8"	2,1086	1360	3,673
040814	4"	4"	1/4"	1,9375	1250	3,375
040812	4"	4"	3/8"	2,8589	1844	4,980

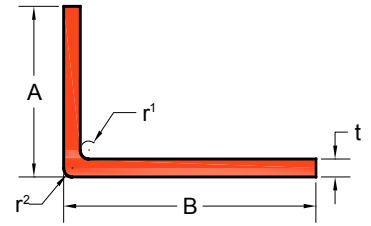
Asymmetrical L-Profiles (Angles)

Ungleichschenklige L-Profil (Winkelprofil)

Notes:

- * The weight of each profile is calculated by measuring it's cross-sectional area and multiplying it by the material density. The aluminium density is considered to be 2,70
- ** Alloy and Length is subject to customer's request.
- *** Corner Radii 0,0118 inch or 0,3 mm.

A = Height
B = Width
t = thickness
r¹, r² = Corner radius



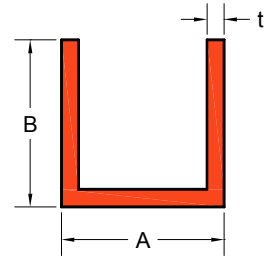
* Additional charge

Profile Code	A (inch)	B (inch)	t (inch)	Area Flaeche (inch ²)	Area Flaeche (mm ²)	Weight Gewicht (Kg/m)
050806	1"	1/2"	1/16"	0,0901	58	0,157
050808	1.1/2"	1"	1/8"	0,2968	191	0,517
050801	2"	1"	1/8"	0,3594	232	0,626
050809	2"	1"	1/4"	0,6872	443	1,197
050813	2"	1.1/2"	1/8"	0,4191	270	0,730
050810	2"	1.1/2"	1/4"	0,8123	524	1,415
050807	3"	1"	1/8"	0,4839	312	0,843
050811	3"	1.1/2"	1/8"	0,5471	353	0,953
050812	3"	2"	1/8"	0,6091	393	1,061
050805	3"	2"	3/16"	0,9019	582	1,571
050802	3"	2"	1/4"	1,1872	766	2,068
050803	4"	2"	1/4"	1,4369	927	2,503
050804	4"	3"	1/4"	1,6878	1089	2,940

U-Profiles (U-Channels)

U-Profile

□ 7



A = Base

B = Legs

t = thickness

Notes:

* The weight of each profile is calculated by measuring it's cross-sectional area and multiplying it by the material density. The aluminium density is

** Alloy and Length is subject to customer's request.

*** Corner Radii 0,0118 inch or 0,3 mm (otherwise stated)

* Additional charge

Profile Code	B (inch)	A (inch)	B (inch)	t (inch) leg/base	Area Flaeche (inch ²)	Area Flaeche (mm ²)	Weight Gewicht (Kg/m)
070801	1"	3/4"	1"	1/16-1/16"	0,1630	105	0,284
070802	2"	4"	2"	1/4-5/16"	2,0942	1351	3,648

Blank area for additional notes or calculations.

Square tubes

Vierkantrohre

Notes:

* The weight of each profile is calculated by measuring its cross-sectional area and multiplying it by the material density. The aluminium density is considered to be 2,70

** Alloy and Length is subject to customer's request.

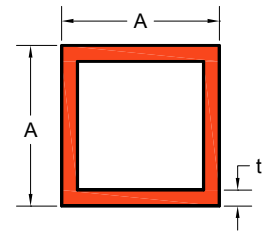
*** Corner Radii 0,0118 inch or 0,3 mm (otherwise stated).

* Additional charge

A = Width

A = Height

t = Thickness



Profile Code	A (inch)	t (inch)	t (SWG)	Area Flaeche (inch ²)	Area Flaeche (mm ²)	Weight Gewicht (Kg/m)
090811	1/2"		16	0,1114	72	0,194
090809	3/4"		16	0,1751	113	0,305
090808	1"		16	0,2394	154	0,417
090802	1"		10	0,4466	288	0,778
090803	1.1/4		10	0,5746	371	1,001
090813	1.1/2"		16	0,3674	237	0,640
090810	1.1/2"		10	0,7021	453	1,223
090801	2"		10	0,7021	453	1,223
090806	2"	1/4"		1,7498	1129	3,048
080812	2.1/2"		10	1,2142	783	2,115
090804	3"		10	1,4696	948	2,560
090805	4"		10	1,9829	1279	3,454
090807	4"	1/4"		3,7504	2420	6,533

S.W.G. Chart

This chart provides a cross reference between S.W.G. (Standard Wire Gauge), imperial sizes and metric equivalents, in terms of tube wall thickness.

S.W.G.	inches	mm	S.W.G.	inches	mm	S.W.G.	inches	mm
0	0.324"	8.23	9	0.144"	3.658	18	0.048"	1.219
1	0.300"	7.62	10	0.128"	3.251	19	0.040"	1.016
2	0.276"	7.01	11	0.116"	2.946	20	0.036"	0.914
3	0.252"	6.401	12	0.104"	2.642	21	0.032"	0.813
4	0.232"	5.893	13	0.092"	2.337	22	0.028"	0.711
5	0.212"	5.385	14	0.080"	2.032	23	0.024"	0.610
6	0.192"	4.877	15	0.072"	1.829	24	0.022"	0.559
7	0.176"	4.47	16	0.064"	1.626	25	0.020"	0.508
8	0.160"	4.064	17	0.056"	1.422			

Rectangular tubes

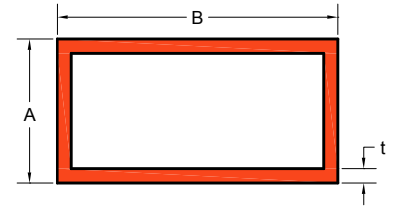
Rechteckrohre



Notes:

- * The weight of each profile is calculated by measuring it's cross-sectional area and multiplying it by the material density. The aluminium density is considered to be 2,70
- ** Alloy and Length is subject to customer's request.
- *** Corner Radii 0,0118 inch or 0,3 mm (otherwise stated).

A = Width
B = Height
t = thickness



* Additional charge

Profile Code	A (inch)	B (inch)	t (inch/SWG)	Area Flaeche (inch ²)	Area Flaeche (mm ²)	Weight Gewicht (Kg/m)
100802	2"	1"	/10	0,7021	453	1,223
100801	2"	1.1/2"	/10	0,8301	536	1,446
100803	3"	1"	/10	0,9581	618	1,669
100808	3"	1.1/2"	/10	1,0862	701	1,892
100807	3"	2"	/10	1,2136	783	2,114
100804	4"	1"	/10	1,2142	783	2,115
100805	4"	1.3/4"	/10	1,4059	907	2,449
100806	4"	2"	/10	1,4696	948	2,560

S.W.G. Chart

This chart provides a cross reference between S.W.G. (Standard Wire Gauge), imperial sizes and metric equivalents, in terms of tube wall thickness.

S.W.G.	inches	mm	S.W.G.	inches	mm	S.W.G.	inches	mm
0	0.324"	8.23	9	0.144"	3.658	18	0.048"	1.219
1	0.300"	7.62	10	0.128"	3.251	19	0.040"	1.016
2	0.276"	7.01	11	0.116"	2.946	20	0.036"	0.914
3	0.252"	6.401	12	0.104"	2.642	21	0.032"	0.813
4	0.232"	5.893	13	0.092"	2.337	22	0.028"	0.711
5	0.212"	5.385	14	0.080"	2.032	23	0.024"	0.610
6	0.192"	4.877	15	0.072"	1.829	24	0.022"	0.559
7	0.176"	4.47	16	0.064"	1.626	25	0.020"	0.508
8	0.160"	4.064	17	0.056"	1.422			

Round tubes

Rundrohre

Notes:

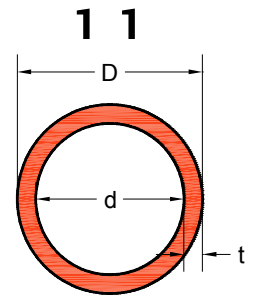
* The weight of each profile is calculated by measuring its cross-sectional area and multiplying it by the material density. The aluminium density is considered to be 2,70

** Alloy and Length is subject to customer's request.

D = Outer Diameter

d = Inner diameter

t = thickness



* Additional charge

Profile Code	D (inch)	t (inch)	t (SWG/mm)	Area Flaeche (inch ²)	Area Flaeche (mm ²)	Weight Gewicht (Kg/m)
110821	3/4"		10/3,251	0,2496	161	0,44
110802	1"		10/3,251	0,3503	226	0,61
110809	1.1/8"		10/3,251	0,4015	259	0,70
110817	1.1/4"		10/3,251	0,4511	291	0,79
110815	1.1/2"		10/3,251	0,5518	356	0,96
110810	1.1/2"	1/4"		0,9812	633	1,72
110822	1.3/8"		10/3,251	0,5007	323	0,88
110811	1 5/8"		10/3,251	0,6014	388	1,05
110820	1.3/4"		10/3,251	0,6526	421	1,14
110814	2"	*	16/1,626	0,3906	252	0,68
110806	2"		10/3,251	0,7518	485	1,31
110808	2"	3/16"		1,0680	689	1,87
110818	2"	1/4"		1,3749	887	2,40
110807	2.1/2"		10/3,251	0,9533	615	1,67
110812	2.1/2"	1/4"	1/4"	1,7670	1140	3,09
110813	3"	*	16/1,626	0,5921	382	1,04
110803	3"		10/3,251	1,1548	745	2,02
110805	3"	1/4"		2,1592	1393	3,78
110823	3.1/2"		10/3,251	1,3563	875	2,37
110824	3.1/2"	1/4"		2,5529	1647	4,46
110819	4"	*	/1,5	0,7316	472	1,28
110801	4"	*	16/1,626	0,7936	512	1,39
110804	4"	*	10/3,251	1,5562	1004	2,72
110816	6"	*	10/3,251	2,3607	1523	4,13

S.W.G. Chart

This chart provides a cross reference between S.W.G. (Standard Wire Gauge), imperial sizes and metric equivalents, in terms of tube wall thickness.

S.W.G.	inches	mm	S.W.G.	inches	mm	S.W.G.	inches	mm
0	0.324"	8.23	9	0.144"	3.658	18	0.048"	1.219
1	0.300"	7.62	10	0.128"	3.251	19	0.040"	1.016
2	0.276"	7.01	11	0.116"	2.946	20	0.036"	0.914
3	0.252"	6.401	12	0.104"	2.642	21	0.032"	0.813
4	0.232"	5.893	13	0.092"	2.337	22	0.028"	0.711
5	0.212"	5.385	14	0.080"	2.032	23	0.024"	0.610
6	0.192"	4.877	15	0.072"	1.829	24	0.022"	0.559
7	0.176"	4.47	16	0.064"	1.626	25	0.020"	0.508
8	0.160"	4.064	17	0.056"	1.422			