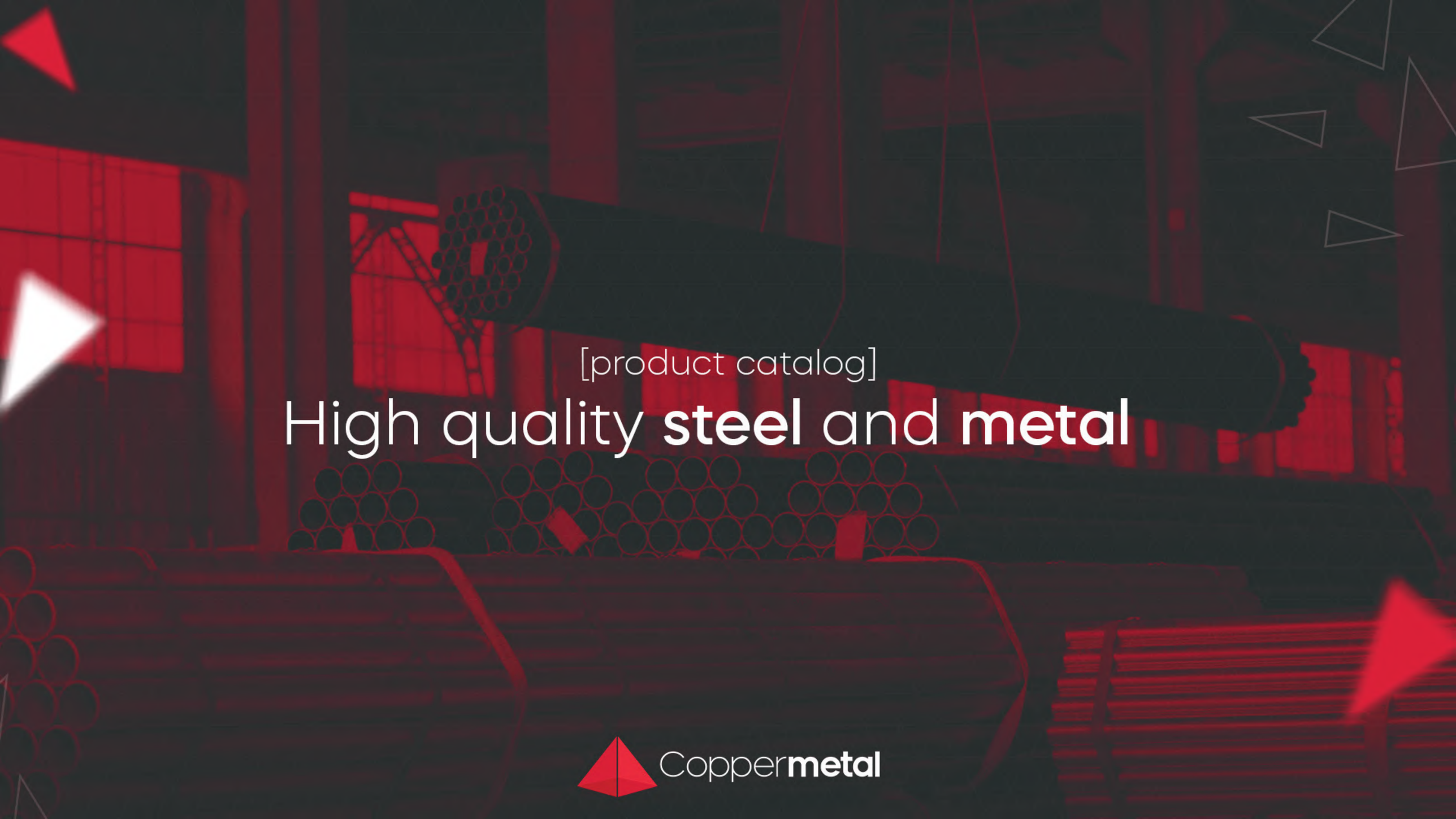

[product catalog]

High quality **steel** and **metal**

Coppermetal

Introduction

Founded in 1991, with almost 30 years of history, COPPERMETAL is greatly committed to quality and excellent service with its more than 30,000 customers already served.

We are ISO 9001 certified and this means that we are ready to meet your demand with high process efficiency, deliver quality products and provide a duly satisfactory after-sales service.

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copper

Copper

Cooper is the 3rd most widely used metal in the world! A highly versatile and efficient material that has numerous advantages, some of which are:

- Easy to form High corrosion
- resistance High mechanical
- strength High durability
- Antimicrobial activity
- Withstands high temperatures
- Reduced characteristic thermal expansion
- Dimensional stability
- Recyclable
- Low incrustation tendency

Its field of application extends to practically all industrial segments and its properties make it key in the production of the most varied products. Furthermore, it is an infinitely recyclable material and has antimicrobial properties capable of eliminating up to 99.9% of bacteria from its surface.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

Name	Alloy ASTM/UNS	Shape	Characteristics	Applications
Copper Elox	C10200	Strips	Excellent cold formability and good hot formability. Excellent weldability and brazing.	Electrical conductors, wave guides, and electronic applications.
Electrolytic Copper	C11000	Coils, Sheets, Strips, Rectangular Bars, Rods, Pipes, Anodes	Excellent cold formability and good hot formability. Excellent weldability and good brazability.	Cables, conductors, engines, generators, transformers. Contacts, conductive wires, radio and television components, boilers, vessels, automotive joints, radiators, gutters, nails, rivets, anodes.
Phosphorous Copper (DLP)	C12000	Coils, Sheet, Strips	Excellent cold and hot formability. Excellent weldability and brazing.	Engine joints, sealing washers, handicraft parts, building facades, solar heater panels, electric heaters, residential gutters and conductors, rivets.
Phosphorous Copper (DLP)	C12200	Tubes, Anodes	Excellent cold formability and good hot formability. Excellent weldability and brazing.	Air conditioning and refrigeration appliances, pipes for conducting hot, cold and gas water, evaporators, heat exchangers, radiators.
Copper Chrome	C18400	Barras	Good cold and hot formability. Good weldability and brazability.	Welding electrodes, torch tips and welding irons, in all those requiring mechanical characteristics superior to those of copper, while retaining high thermal and electrical conductivity.
Cupronickel 90/10	C70600	Rods	Good cold and hot formability. Excellent weldability and brazing.	Pipes and connections for condensers and heat exchangers, evaporators, pipes for salt water.
Cuproníquel 70/30	C71500	Tubos	Good cold and hot formability. Excellent weldability and brazing.	Condensers, distillery pipes, evaporator and heat exchanger pipes, salt water pipes.

CHEMICAL COMPOSITION OF COPPER

Name	Alloys	Cu	Zn	Pb	P	Sn	Fe	Si	Ni	Mn	Others
	ASTM / UNS	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Electrolytic Copper	C11000	99.9 (mín.)									
Phosphorous Copper (DLP)	C12000	99.9 (mín.)			0,004 0,012						
Phosphorous Copper (DHP)	C12200	99.9 (mín.)			0.015 0.040						
Copper Chrome	C18400	99.8 (mín.)	0.7		0.05		0.15	0.10			Cr=0,40 1.2
Cuproníquel 90/10	C70600	remaining	1.00	0.05			1.00 1.8		9 11	1.00	
Cuproníquel 70/30	C71500	remaining	1.00	0.05			0.4 1.00		29 33	1.00	
Copper Elox	C10200	99.95 (mín.)									

Notas:
1. The mentioned values represent maximum limits per chemical element, except when minimum and maximum ranges are indicated.
2. The indicated values do not imply a formal guarantee.

MECHANICAL PROPERTIES OF COPPER

Name	Alloy ASTM/UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strenght (kgf/mm²)	Minimum Elongation “50.80 mm” (%)	Brinell Hardness (HB)
Copper Elox	C10200	Strips	Soft	22	5	48	45
			1/2 Hard	32	27	12	90
Electrolytic Copper	C11000	Coils, sheets, strips, rectangular bars	Soft	22	5	48	45
			1/2 Hard	32	27	12	90
Electrolytic Copper	C11000	Rods	1/2 Hard	28	19	20	75
Electrolytic Copper	C11000	Tubes	1/2 Hard	32	27	15	90
Phosphorous Copper (DLP)	C12000	Coils, sheets, strips	Soft	22	5	48	45
			1/2 Hard	32	27	12	90
Phosphorous Copper (DHP)	C12200	Tubes	Soft	24	6	45	45
			1/2 Hard	35	30	8	100
			Hard	38	35	6	105
Copper Chrome	C18400	Rod (drawn)	Hard	52	52	15	137
Cuproníquel 90/10	C70600	Tubes	Soft	31	11	42	60
Cuproníquel 70/30	C71500	Tubes	Soft	42	18	45	74

Notes: The values indicated do not imply a formal guarantee.

PHYSICAL PROPERTIES OF COPPER

Name	Alloys ASTM / UNS	Density at 20 °C p=specific weight (g/cm³)	Melting Point (°C)	Thermal conductivity at 20 °C (cal/cm/sec °C)	Specific Heat at 20 °C (cal/g °C)	Electrical Resistivity at 20 °C (annealed material) (μΩ cm)	Electrical Conductivity at 20 °C (annealed material) (IACS %)	Coefficient of Thermal Expansion 20 to 300 °C (10-6 °C)	Modulus of Elasticity at 20 °C (kg/mm²)	Modulus of Rigidity at 20 °C (kg/ mm²)
Copper Elox	C10200	8.90	1,083	0.94	0.092	1.710	101	17.7	12,000	4,500
Electrolytic Copper	C11000	8.90	1,083	0.94	0.092	1.710	101	17.7	12,000	4,500
Phosphorous Copper (DLP)	C12000	8.94	1,083	0.91	0.092	1.760	98	17.7	12,000	4,500
Phosphorous Copper (DHP)	C12200	8.94	1,083	0.81	0.092	2.030	85	17.7	12,000	4,500
Copper Chrome	C18400	8.89	1,080	0.75	0.092	2.100	82	18	16,000	5,900
Cuproníquel 90/10	C70600	8.94	1,150	0.11	0.090	19.100	9	17.1	12,700	4,800
Cuproníquel 70/30	C71500	8.94	1,240	0.07	0.090	37.500	5	16.2	15,500	5,800

Notes: The values indicated do not imply a formal guarantee

REBAR - WEIGHT PER LINEAR METER

Inch	Millimeter	●	⬢	■
3/32"	2,38	0,040	0,044	0,050
1/8"	3,17	0,070	0,077	0,089
5/32"	3,97	0,110	0,121	0,140
3/16"	4,76	0,158	0,175	0,202
7/32"	5,56	0,216	0,238	0,275
1/4"	6,35	0,282	0,311	0,359
9/32"	7,14	0,356	0,393	0,454
5/16"	7,94	0,441	0,486	0,561
3/8"	9,53	0,635	0,700	0,808
7/16"	11, 11	0,863	0,951	1,099
1/2"	12,70	1,127	1,243	1,435
9/16"	14,28	1,425	1,572	1,815
5/8"	15,87	1,760	1,941	2,242
11/16"	17,46	2,131	2,350	2,713
3/4"	19,05	2,537	2,797	3,230
13/16"	20,63	2,975	3,280	3,788
7/8"	22,22	3,451	3,805	4,394

Inch	Millimeter	●	⬢	■
15/16"	23,81	3,963	4,369	5,046
1"	25,40	4,510	4,973	5,742
1.1/16"	26,97	5,084	5,606	6,474
1.1 /8"	28,57	5,706	6,291	7,265
1.3/16"	30,16	6,358	7,011	8,096
1.1 /4"	31,75	7,046	7,770	8,972
1.5/16"	33,34	7,770	8,567	9,893
1.3/8"	34,92	8,524	9,398	10,853
1.7/16"	36,51	9,318	10,274	11,864
1.1/2"	38,10	10,147	11,188	12,919
1.9/16"	39,69	11,011	12,141	14,020
1.5/8"	41,27	11,906	13,127	15,159

REBAR - WEIGHT PER LINEAR METER

Inch	Millimeter	●	⬢	■
1.3/4"	44,45	13,811	15,228	17,585
1.7/8"	47,62	15,851	17,478	20,182
2"	50,80	18,039	19,890	22,968
2.1/16"	52,39	19,186	21,155	24,428
2.1/8"	53,97	20,360	22,450	25,924
2.3/16"	55,56	21,578	23,792	27,474
2.1/4"	57,15	22,830	25,173	29,068
2.5/16"	58,73	24,110	26,584	30,698
2.3/8"	60,33	25,442	28,053	32,393
2.7/16"	61,91	26,792	29,541	34,112
2.1/2"	63,50	28,186	31,078	35,887
2.5/8"	66,67	31,070	34,259	39,560
2.3/4"	69,85	34,105	37,605	43,423
2.7/8"	73,03	37,281	41,106	47,467
3"	76,20	40,587	44,753	51,677
3.1/8"	79,37	44,035	48,554	56,066

Inch	Millimeter	●	⬢	■
3.3/8"	85,73	51,374	56,647	65,412
3.1/2"	88,90	55,244	60,913	70,339
3.5/8"	92,07	59,254	65,335	75,444
3.3/4"	95,25	63,418	69,926	80,746
3.7/8"	98,42	67,709	74,658	86,210
4"	101,60	72,155	79,560	91,871
4.1/2"	114,30	91,322	100,693	116,274
5"	127,00	112,743	124,313	143,548
6"	152,40	162,349	179,010	206,709
7"	177,80	220,976	243,653	281,354
8"	203,20	288,621	318,240	367,483

RECTANGULAR BARS - WEIGHT PER LINEAR METER

Inch/mm		1/16” 1,58mm	3/32” 2,38mm	1/8” 3,17mm	3/16” 4,76mm	1/4” 6,35mm	5/16” 7,94mm	3/8” 9,53mm	1/2” 12,70mm	5/8” 15,87mm	3/4” 19,05mm	1” 25,40mm
1/4"	6,35	1,180	0,135	0,179	0,269	---	---	---	---	---	---	---
5/16"	7,94	0,112	0,168	0,224	0,336	0,449	---	---	---	---	---	---
3/8"	9,53	0,134	0,202	0,269	0,404	0,539	0,673	---	---	---	---	---
7/16"	11, 11	0,156	0,235	0,313	0,471	0,628	0,785	0,942	---	---	---	---
1/2"	12,70	0,179	0,269	0,358	0,538	0,718	0,897	1,077	---	---	---	---
9/16"	14,29	0,201	0,303	0,403	0,605	0,808	1,010	1,212	1,615	---	---	---
5/8"	15,87	0,223	0,336	0,448	0,672	0,897	1,121	1,346	1,794	---	---	---
11 /16"	17,46	0,246	0,370	0,493	0,740	0,987	1,234	1,481	1,974	2,466	---	---
3/4"	19,05	0,268	0,404	0,537	0,807	1,077	1,346	1,616	2,153	2,691	---	---
7/8"	22,22	0,312	0,471	0,627	0,941	1,256	1,570	1,885	2,512	3,138	3,767	---
1"	25,40	0,357	0,538	0,717	1,076	1,435	1,795	2,154	2,871	3,588	4,306	---
1.1/8"	28,57	0,402	0,605	0,806	1,210	1,615	2,019	2,423	3,229	4,035	4,844	---
1.1/4"	31,75	0,446	0,673	0,896	1,345	1,794	2,244	2,693	3,589	4,484	5,383	7,177
1.3/8"	34,93	0,491	0,740	0,985	1,480	1,974	2,468	2,963	3,948	4,934	5,922	7,896
1.1/2"	38,10	0,536	0,807	1,075	1,614	2,153	2,692	3,232	4,306	5,381	6,460	8,613

RECTANGULAR BARS - WEIGHT PER LINEAR METER

Inch/mm		1/16” 1,58mm	3/32” 2,38mm	1/8” 3,17mm	3/16” 4,76mm	1/4” 6,35mm	5/16” 7,94mm	3/8” 9,53mm	1/2” 12,70mm	5/8” 15,87mm	3/4” 19,05mm	1” 25,40mm
1.5/8"	41,27	0,580	0,874	1,164	1,748	2,332	2,916	3,500	4,665	5,829	6,997	9,329
1.3/4"	44,45	0,625	0,942	1,254	1,883	2,512	3,141	3,770	5,024	6,278	7,536	10,048
1.7/8"	47,62	0,670	1,009	1,344	2,017	2,691	3,365	4,039	5,382	6,726	8,074	10,765
2"	50,80	0,714	1,076	1,433	2,152	2,871	3,590	4,309	5,742	7,175	8,613	11,484
2.1/4"	57,15	0,804	1,211	1,612	2,421	3,230	4,039	4,847	6,460	8,072	9,689	12,919
2.1/2"	63,50	0,893	1,345	1,792	2,690	3,589	4,487	5,386	7,177	8,969	10,766	14,355
2.3/4"	69,85	0,982	1,480	1,971	2,959	3,948	4,936	5,924	7,895	9,866	11,843	15,790
3"	76,20	1,072	1,614	2,150	3,228	4,306	5,385	6,463	8,613	10,763	12,919	17,226
3.1/4"	82,55	1,161	1,749	2,329	3,497	4,665	5,833	7,002	9,331	11,660	13,996	18,661
3.1/2"	88,90	1,250	1,883	2,508	3,766	5,024	6,282	7,540	10,048	12,557	15,073	20,097
3.3/4"	95,25	1,339	2,018	2,687	4,035	5,383	6,731	8,079	10,766	13,453	16,149	21,532
4"	101,60	1,429	2,152	2,866	4,304	5,742	7,180	8,617	11,484	14,350	17,226	22,968

RECTANGULAR BARS - WEIGHT PER LINEAR METER

Inch/mm		1/16” 1,58mm	3/32” 2,38mm	1/8” 3,17mm	3/16” 4,76mm	1/4” 6,35mm	5/16” 7,94mm	3/8” 9,53mm	1/2” 12,70mm	5/8” 15,87mm	3/4” 19,05mm	1” 25,40mm
4.1/2"	114,30	1,607	2,421	3,225	4,842	6,460	8,077	9,695	12,919	16,144	19,379	25,839
5"	127,00	1,786	2,690	3,583	5,380	7,177	8,975	10,772	14,355	17,938	21,532	28,710
5.1/2"	139,70	1,964	2,959	3,941	5,918	7,895	9,872	11,849	15,790	19,732	23,685	31,581
6"	152,40	2,143	3,228	4,300	6,456	8,613	10,769	12,926	17,226	21,525	25,839	34,452
6.1/2"	165, 10			4,658	6,994	9,331	11,667	14,003	18,661	23,319	27,992	37,323
7"	177,80			5,016	7,532	10,048	12,564	15,080	20,097	25,113	30,145	40,193
7.1/2"	190,50			5,375	8,070	10,766	13,462	16,158	21,532	26,907	32,298	43,064
8"	203,20			5,733	8,608	11,484	14,359	17,235	22,968	28,701	34,452	45,935

AMPERAGE FOR RECTANGULAR BARS - CURRENT AMPERE PER MM²

Inch/mm		1/16” 1,58mm	3/32” 2,38mm	1/8” 3,17mm	3/16” 4,76mm	1/4” 6,35mm	5/16” 7,94mm	3/8” 9,53mm	1/2” 12,70mm	5/8” 15,87mm	3/4” 19,05mm	1” 25,40mm
1/4"	6,35	20	30	40	---	---	---	---	---	---	---	---
5/16"	7,94	25	38	50	---	---	---	---	---	---	---	---
3/8"	9,53	30	45	60	91	121	---	---	---	---	---	---
1/2"	12,70	40	60	81	121	161	202	242	---	---	---	---
5/8"	15,87	50	76	101	151	202	252	302	403	---	---	---
3/4"	19,05	60	91	121	181	242	303	363	484	---	---	---
7/8"	22,22	70	106	141	212	282	353	423	564	---	---	---
1"	25,40	80	121	161	242	323	403	484	645	806	968	---
1.1/4"	31,75	100	151	201	302	403	504	605	806	1008	1210	1613
1.1/2"	38,10	120	181	242	363	484	605	725	968	1209	1452	1935
1.5/8"	41,27	130	196	262	393	524	655	786	1048	1310	1572	2097
1.3/4"	44,45	140	212	282	423	565	706	846	1129	1411	1694	2258
2"	50,80	161	242	322	484	645	807	967	1290	1612	1935	2581
2.1/4"	57,15	181	272	362	544	726	908	1088	1452	1814	2177	2903
2.1/2"	63,50	201	302	403	605	806	1008	1209	1613	2015	2419	3226
2.3/4"	69,85	221	332	443	665	887	1109	1330	1774	2217	2661	3548

AMPERAGE FOR RECTANGULAR BARS - CURRENT AMPERE PER MM²

Inch/mm		1/16” 1,58mm	3/32” 2,38mm	1/8” 3,17mm	3/16” 4,76mm	1/4” 6,35mm	5/16” 7,94mm	3/8” 9,53mm	1/2” 12,70mm	5/8” 15,87mm	3/4” 19,05mm	1” 25,40mm
3"	76,20	241	363	483	725	968	1210	1451	1935	2419	2903	3871
3.1/4"	82,55	261	393	523	786	1048	1311	1572	2097	2620	3145	4194
3.1/2"	88,90	281	423	564	846	1129	1412	1693	2258	2822	3387	4516
3.3/4"	95,25	301	453	604	907	1210	1513	1814	2419	3023	3629	4839
4"	101,60	321	484	644	967	1290	1613	1934	2581	3225	3871	5161
4.1/2"	114,30	---	---	725	1088	1452	1815	2176	2903	3628	4355	5806
5"	127,00	---	---	805	1209	1613	2017	2418	3226	4031	4839	6452
5.1/2"	139,70	---	---	886	1330	1774	2218	2660	3548	4434	5323	7097
6"	152,40	---	---	966	1451	1935	2420	2902	3871	4837	5806	7742
6.1/2"	165, 10	---	---	1047	1572	2097	2622	3144	4194	5240	6290	8387
7"	177,80	---	---	1127	1693	2258	2823	3385	4516	5643	6774	9032
7.1/2"	190,50	---	---	1208	1814	2419	3025	3627	4839	6046	7258	9677
8"	203,20	---	---	1288	1934	2581	3227	3869	5161	6450	7742	10323

Notas: Coeficiente de amperaje utilizado 2A/mm²

TUBES - WEIGHT PER LINEAR METER

Outside Diameter		Wall Thickness				
In.	Mm	1/32” 0,79 mm	1,00 mm	1/16” 1,58 mm	3/32” 2,38 mm	1/8” 3,17 mm
1/8"	3,17	0,053	0,061	---	---	---
5/32"	3,97	0,070	0,083	0,105	---	---
3/16"	4,76	0,088	0,105	0,141	---	---
1/4"	6,35	0,123	0,150	0,212	0,264	---
5/16"	7,94	0,158	0,194	0,282	0,370	0,422
3/8"	9,53	0,193	0,238	0,353	0,475	0,563
7/16"	11, 11	0,228	0,283	0,423	0,581	0,704
1/2"	12,70	0,263	0,327	0,494	0,687	0,844
9/16"	14,28	0,298	0,372	0,565	0,793	0,985
5/8"	15,87	0,333	0,416	0,635	0,898	1,130
3/4"	19,05	0,403	0,505	0,776	1,110	1,410
7/8"	22,22	0,473	0,593	0,918	1,320	1,609
1"	25,40	0,544	0,682	1,060	1,530	1,970
1.1/8"	28,57	0,614	0,771	1,200	1,740	2,250
1.1/4"	31,75	0,684	0,860	1,340	1,950	2,530
1.3/8"	34,92	0,754	0,948	1,480	2,170	2,810

Outside Diameter		Wall Thickness				
In.	Mm	1/32” 0,79 mm	1,00 mm	1/16” 1,58 mm	3/32” 2,38 mm	1/8” 3,17 mm
1.1/2"	38,10	0,824	1,040	1,620	2,380	3,100
1.5/8"	41,27	0,893	1,130	1,760	2,590	3,380
1.3/4"	44,45	0,964	1,210	1,910	2,800	3,660
1.7/8"	47,62	1,030	1,300	2,050	3,010	3,940
2"	50,80	1,100	1,390	2,190	3,220	4,220
2.1/8"	53,97	1,170	1,480	2,330	3,430	4,500
2.1/4"	57,15	1,240	1,570	2,470	3,640	4,780
2.3/8"	60,33	1,310	1,660	2,610	3,860	5,070
2.1/2"	63,50	1,390	1,750	2,750	4,060	5,350
2.5/8"	66,67	1,460	1,840	2,890	4,280	5,630
2.3/4"	69,85	1,530	1,930	3,030	4,490	5,910
3"	76,20	1,670	2,100	3,320	4,910	6,470
3.1/4"	82,55	---	---	---	5,392	7,111
3.1/2"	88,90	---	---	---	5,910	7,830
3.3/4"	95,25	---	---	---	6,243	8,300
4"	101,60	---	---	---	6,673	8,719

HIDROLAR PIPES - WEIGHT PER LINEAR METER

Class “E”			
Nominal Diameter	**Outside diameter x Thickness of the wall (mm)**	**Weight (kg/m)**	**Internal Pressure (kgf/cm²)**
1/2”	15,00 x 0,50	1,213	41
3/4"	22,00 X 0,60	0,360	34
1"	28,00 X 0,60	0,460	26
1.1/4"	35,00 X 0,70	0,673	25
1.1 /2"	42,00 X 0,80	0,923	24
2"	54,00 X 0,90	1,339	21
2.1/2"	66,70 X 1,00	1,839	20
3"	79,40 X 1,20	2,627	19
4"	104,80 X 1,20	3,480	14

Class “A”			
Nominal Diameter	**Outside diameter x Thickness of the wall (mm)**	**Weight (kg/m)**	**Internal Pressure (kgf/cm²)**
1/2”	15,00 X 1,50	0,318	65
3/4"	22,00 X 0,90	0,532	50
1"	28,00 X 0,90	0,683	40
1.1/4"	35,00 X 1,10	1,045	40
1.1 /2"	42,00 X 1,10	1,261	35
2"	54,00 X 1,20	1,775	28
2.1/2"	66,70 X 1,20	2,200	24
3"	79,40 X 1,50	3,271	24
4"	104,80 X 1,50	4,337	18

Class “I”			
Nominal Diameter	**Outside diameter x Thickness of the wall (mm)**	**Weight (kg/m)**	**Internal Pressure (kgf/cm²)**
1/2"	15,00 X 1,00	0,392	88
3/4"	22,00x1,10	0,644	60
1"	28,00 X 1,20	0,901	55
1.1/4"	35,00 X 1,40	1,318	45
1.1/2"	42,00 X 1,40	1,593	42
2"	54,00 X 1,50	2,206	34
2.1/2"	66,70x1,50	2,737	28
3"	79,40 X 1,90	4,122	27
4"	104,80x2,00	5,755	20

SHEETS - WEIGHT PER PIECE

Nº. (BWG)	Mm	1.200 X 600mm	2.000 X 1.000mm
30	0,30	1,92	---
28	0,36	2,31	---
27	0,41	2,63	---
26	0,46	2,95	---
25	0,51	3,27	9,08
24	0,56	3,59	9,97
23	0,64	4,10	11,39
22	0,71	4,55	12,64
21	0,81	5,19	14,42
20	0,89	5,70	15,84
19	1,07	6,86	19,05
18	1,24	7,95	22,07
17	1,47	9,42	26,17

Nº. (BWG)	Mm	1.200 X 600mm	2.000 X 1.000mm
16	1,65	10,57	29,37
15	1,83	11,73	32,57
14	2, 11	13,52	37,56
13	2,41	15,44	42,90
12	2,77	17,75	49,31
11	3,04	19,48	54,11
---	3,17	20,31	56,43
10	3,40	21,79	60,52
---	3,97	25,44	70,67
---	4,76	30,50	84,73
---	6,35	40,69	113,03
---	7,93	50,82	141,15
---	9,53	61,07	169,63

Nº. (BWG)	Mm	1.200 X 600mm	2.000 X 1.000mm
---	12,70	81,38	226,06
---	15,87	101,69	282,49
---	19,05	122,07	339,09
---	22,22	142,39	395,52
---	25,40	162,76	452,12
---	31,75	205,74	---
---	38,10	246,89	---
---	44,45	288,04	---
---	50,80	329,18	---
---	55,58	360,16	---
---	63,50	411,48	---
---	76,20	493,78	---
---	101,4	657,07	---


aluminum

Aluminum

Aluminum is the most abundant metallic element in Earth's crust. Its properties give it a high versatility. In most applications, two or more of these characteristics come into play, for example: low weight combined with mechanical strength; high corrosion resistance and high thermal conductivity. Some of its characteristics are:

- Lightness
- High energy conduction
- Impermeability
- High strength-to-weight ratio
- Beauty
- Durability
- Malleability and Weldability
- Corrosion Resistance
- Strength and Hardness
- Infinitely Recyclable

The density of aluminum is about one-third that of steel or copper. It is very malleable, and its high ductility makes it an excellent choice for machining and casting. y fundición.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 1/5

Alloys	Shapes	Characteristics	Applications
1050	Sheets Coils Tubes	High resistance to corrosion. Good formability and weldability. Low mechanical resistance. Suitable for decorative anodizing.	Reflectors, fixtures, household items, structural vessels and vats for the chemical and food industries, heat exchangers.
1100	Sheets Coils	High resistance to corrosion. Good formability and weldability. Low mechanical resistance. Suitable for decorative anodizing. Decorative panels, metal labels,	Decorative panels, metal labels, household items, reflectors, fins.
1200	Sheets Coils		
1350	Rods Flat Bars Tubes	Suitable for decorative anodizing. High weldability and corrosion resistance. High electrical conductivity. Good formability.	Electrical Conductors.
2011	Rods	High mechanical resistance. Good machinability. Medium corrosion resistance. Not recommended for welding.	Parts machined on automatic lathe.
3003	Sheets Coils	High resistance to corrosion. Good formability. Good weldability.	Heat exchangers, thermal insulation, chemical industry, household items, bodies.
3104	Sheets Bobinas	Good resistance to corrosion. Good formability. Moderate mechanical resistance	Bus and truck bodies, household items, equipment for the chemical and food industry, beverage and food cans, covers, gutters.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 2/5

Alloys	Shapes	Characteristics	Applications
3105	Sheets Coils Checkered Sheets	Good mechanical resistance. High resistance to corrosion. Good formability. Good weldability.	Bus and truck bodies, anti-skid flooring.
5052	Sheets Coils Blocks	High mechanical and corrosion resistance. High weldability. Good formability.	Bus and truck bodies, signs, naval industry, shutters, eyelets, stamped parts with high mechanical stress, railway wagons, anti-skid flooring, coverings.
5083	Sheets Blocks	Material with excellent acceptance for anodizing and welding processes, free of internal stresses.	Thermoplastic molding - (injection, blowing, RIM, ABS, PVC, PE, PU and others); Automotive molding; Footwear molding; Agricultural molding; Prototypes; Metal-mechanical; Arms industry; Marine industry; Textile industry; Aeronautical industry; Others.
5754	Sheets Anti-skid Sheets	Excellent corrosion resistance, particularly in industrial environments. It has reasonable mechanical strength and good anodizing properties.	Marine and automotive industry, fishing equipment, food industry, welded structures, architectural applications.
6060	Rods Flat Bars Tubes Profiles	High resistance to corrosion. Medium mechanical resistance. Good formability. Suitable for decorative matte anodizing.	Profiles in general, irrigation pipes, furniture, lighting, and ornamental pieces.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

Alloys	Shapes	Characteristics	Applications
6061	Tubes	High mechanical and corrosion resistance. Good formability and weldability.	Structures, shipbuilding, vehicles, furniture industry, rivets, wagons, pipelines.
	Rods		
	Sheets		
	Profiles		
6063	Rods	High resistance to corrosion. Medium mechanical resistance. Good formability. Suitable for decorative matte anodizing.	Profiles in general, irrigation pipes, furniture, lighting, and ornamental pieces.
	Flat Bars		
	Tubes		
	Profiles		
6082	Rods	Medium to high resistance. Offers good weldability, brazability, some corrosion resistance, formability, and machinability.	Piping; railings; furniture; architectural extrusions; truck and trailer flooring; doors; windows; irrigation. Structural engineering, shipbuilding, vehicles and equipment, parts machined on automatic lathes, cold forging.
	Bars		
	Tubes		
	Profiles		
6101	Rods	High electrical conductivity. Good corrosion resistance. Medium mechanical resistance.	Electrical conductors and busbars.
	Bars		
	Tubes		
	Profiles		

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

Alloys	Shapes	Characteristics	Applications
6261	Round bars	Good mechanical resistance. High resistance to corrosion. Good formability. Medium industry.	Vehicle bodies, structures and equipment.
	Tubes		
	Profiles		
6262	Rods	Excellent machinability. High mechanical resistance. High resistance to corrosion. Suitable for decorative anodizing.	Parts machined on automatic lathe.
	Profiles		
6351	Rods	High mechanical resistance. High resistance to corrosion. Good formability. Good machinability.	Structural engineering, shipbuilding, vehicles and equipment, parts machined on automatic lathes, cold forging.
	Tubes		

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 5/5

Alloys	Shapes	Characteristics	Applications
7021	Blocks	Extremely low internal stress. Good shape stability. High resistance. Good homogeneity.	Thermoplastic molding - (injection, blowing, RIM, TPU, PP, PE, among others), automotive molding, footwear molding, agricultural molding, prototype molding, metal-mechanical, arms industry, aeronautical industry.
7028	Sheets	Corrosion resistance. Good machinability. Good polishing.	Parts that require a high degree of machining, base sheets or sheets for workbenches of all types, thermoplastic injection molding for prototypes, blowing molding, cast resins molding, storage blocks and support resistant to high impacts and load, chassis for machinery, bottle (PET) sealing machines, automobile molding, footwear molding, agricultural molding, arms and aeronautical industries, among others.
	Blocks		
7075	Sheets	Highest mechanical strength value; Medium corrosion resistance; Good forgeability; Good machinability; Hardness 150 to 180HB; Highest mechanical strength value. Medium corrosion resistance. Good forgeability. Good machinability. Hardness 150 to 180HB. Fast response to polishing.	Parts subjected to the highest mechanical stress, military industry, aeronautical industry, machinery and equipment, plastic injection molding, development of tools.
	Round bar		
8011	Coils	High weldability. Good corrosion resistance. Good formability. Low mechanical resistance.	Packaging for pharmaceutical, food, and flexible products in general, lids, disposable plates and trays, cooling fins, helical pipes.
	Foils		
	Profiles		

CHEMICAL COMPOSITION OF ALUMINUM

part 1/3

Alloy	Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	Others
ABNT/ ASTM	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	Each (%)	Total (%)
1050	99.50 mín.	0.25	0.40	0.05	0.05	0.05	-	0.05	0.03	0.03	-
1100	99.00 mín.	0,95 (Si+Fe)		0.05 – 0.20	0.05			0.10		0.05	0.15
1200	99.00 mín.	1,00 (Si+Fe)		0.05	0.05			0.10	0.05	0.05	0.15
1350	99.50 mín.	0.10	0.40	0.05	0.01		0.01	0.05		0.03	0.10
2011	restante	0.40	0.70	5.00 – 6.00				0.30		0.05	0.15
3003	restante	0.60	0.70	0.05 – 0.20	1.00 – 1.50			0.10		0.05	0.15
3104	restante	0.60	0.80	0.05 – 0.25	0.80 – 1.40	0.80 – 1.30		0.25	0.10	0.05	0.15

CHEMICAL COMPOSITION OF ALUMINUM

part 2/3

Alloy	Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	Others
ABNT/ ASTM	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	Each (%)	Total (%)
3105	restante	0.60	0.70	0.30	0.30 0.80	0.20 0.80	0.20	0.40	0.10	0.05	0.15
5052	Balanço	0,25	0,40	0,10	1,00	2,20-2,80	0,15-0,35	0,10	--	--	--
5083	Restante	0,40	0,40	0,10	1,00	4,90	0,25	0,25	0,15	--	--
5754	Restante	0,25	0,40	0,10	0,10	2,80	0,35	0,10	--	--	--
6061	restante	0.40 0.80	0.70	0.15 0.40	0.15	0.80 1.20	0.04 0.35	0.25	0.15	0.05	0.15
6063	restante	0.20 0.60	0.35	0.10	0.10	0.45 0.90	0.10	0.10	0.10	0.05	0.15
6082	Restante	1,30	0,50	0,10	1,00	1,20	0,25	0,20	0,10	--	--
6101	restante	0.30 0.70	0.50	0.10	0.03	0.35 0.80	0.03	0.10		0.03	0.10
6262	restante	0.40 0.80	0.70	0.15 0.40	0.15	0.80 1.20	0.04 0.14	0.25	0.15	0,05*	0,15*

CHEMICAL COMPOSITION OF ALUMINUM

part 3/3

Alloy	Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	Others
ABNT/ ASTM	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	Each (%)	Total (%)
6351	restante	0.70	0.50	0.10	0.40	0.40		0.20	0.20	0.05	0.15
		1.30			0.80	0.80					
7021	restante	0.25	0.40	0.25	0.10	1.20	0.05	5.00	0.10	0.05	0.15
						1.80		6.00			
7028	restante	0.35	0.50	0.10	0.15	1.50	0.20	4.50	0.05	0.05	0.15
				0.30	0.60	2.30		5.20			
7075	restante	-	0.35	1.20	0.20	2.10	0.18	5.10	0.30	0.05	0.15
		0.30		1.60		2.50	0.23	5.60			
8011	restante	0.50	0.60	0.10	0.20	0.05	0.05	0.10		0.05	0.15
		0.90	1.00								

* Bismuto (Bi) y Plomo (Pb) que van desde 0,4% a 0,7% cada uno, no incluidos en otros elementos.

Los grados:

1. Los valores mencionados representan límites máximos por elemento químico, excepto cuando se indiquen intervalos entre el mínimo y el máximo.
2. Composición química equivalente a la norma ASTM B-221 (ABNT-NBR 6834).
3. Los valores indicados no implican garantía formal.

MECHANICAL PROPERTIES OF ALUMINUM

part 1/3

Alloy ABNT ASTM	DIN	Tempe-ring	Tensile Strength Limit Mpa (N/mm²)Min	Tensile Strength Limit Mpa (N/mm²)Max	Yield Strenght Mpa (N/mm²)Min	Minimum Elongation “50mm”(%)	Brinell Hardness (HB)
1050	Al 99,5	O	55	95	15	22	20
		Temper-ing	95	130	70	3	26
1100	–	O	75	105	25	22	23
		(N/mm²) Min	110	145	95	3	32
1200	Al 99,0	O	75	105	25	22	23
		(N/mm²) Max	110	145	95	3	32
1350	E-Al	O	55	95	-	22	20
		Mpa (N/mm²)Min	95	130	-	3	30
2011	Al Cu Pb Bi	T4	275	–	125	16	–
			370	–	275	10	100
3003	Al Mn Cu	O	95	130	35	22	28
		H14	140	180	115	3	40
3104	Al Mn	O	150	200	60	15	45
		H32	190	240	145	3	58
			220	265	170	3	66

MECHANICAL PROPERTIES OF ALUMINUM

part 2/3

Aleación ABNT ASTM	DIN	Tempe-ring	Tensile Strength Limit Mpa (N/mm²)Min	Tensile Strength Limit Mpa (N/mm²)Max	Yield Strenght Mpa (N/mm²)Min	Minimum Elongation “50mm”(%)	Brinell Hardness (HB)
3105	Al Mn0,5 Mg0,5	O	95	145	35	19	28
		H14	150	200	125	2	40
5052	Al Mg2,5	O	170	215	65	17	47
		H34	235	285	180	4	68
5083	DIN (AlMg4,5Mn)	H111	285	--	135	10	70
		O	275	350	125	16	60
		F	280	360	125	--	68
5754	AlMg3	H111	190	260	80	10	55
6060	Al Mg Si0,5	T5	145	–	105	8	60
6061	Al Mg Si Cu	T4	180	–	110	16	65
		T6	260	–	240	8	95
6063	Al Mg Si0,5	T5	145	–	105	8	60
6082	--	T-6	300	--	255	--	90-110
6101	E-Al Mg Si0,5	T6	200	–	172	8	78
6262	–	T6	260	–	240	10	90

MECHANICAL PROPERTIES OF ALUMINUM

part 3/3

Aleación ABNT ASTM	DIN	Tempe-ring	Tensile Strength Limit Mpa (N/mm²)Min	Tensile Strength Limit Mpa (N/mm²)Max	Yield Strenght Mpa (N/mm²)Min	Minimum Elongation “50mm”(%)	Brinell Hardness (HB)
6351	Al Mg Si1,0	T6	290	–	255	10	95
7021	Al Zn5,5 Mg1,5	T6	350	380	310	2.5	110
7028	Al Zn5,5 Mg1,5		300	320	240	3	100
7075	Al Zn5,6 Mg2,5 Cu1,6 Fe0,35 Cr0,23 Mn0,20 Si0,30 Ti0,30	T651	480	540	390	4	150
8011	Al Fe Si	O	80	120	50	12	28
		H14/H24	120	210	110	4	35

Notes:

1. The indicated values do not imply a formal guarantee.

2. Stress data are expressed in megapascal units (Mpa), equivalent to 1N/mm2. To obtain the unit measurement in kgf/mm2, the indicated value is divided by 9.807.

Classification of Tempering:

O - Annealed: Applies to finished products, in the state in which they present the lowest value of mechanical resistance.

H - Hardened: Applies to non-heat treatable alloy products, i.e., alloys where the increase in mechanical strength is achieved only by cold plastic deformation (hardening).

F - As Manufactured: Applies to products obtained by forming processes in which no special control is employed over thermal or hardening conditions. Limits are not specified for the mechanical properties.

T - Heat Treated:

Applies to products that undergo heat treatment with or without complementary plastic deformation, which produces stable physical properties different from those obtained with “F”, “O”, and “H”.

3. For alloys with H114 tempering, use the limits specified in the “O” tempering.

4. For alloys with H154 tempering, use the limits specified in the “H14” tempering.

5. For rolled materials, the elongation values correspond to thicknesses from 0.63 to 1.20m.

6.

Mechanical Properties according to the ABNT-NBR 7823 (rolled) and ABNT-NBR 7000:2005 (extruded) standards.

PHYSICAL PROPERTIES OF ALUMINIUM

part 1/2

Alloy ABNT/ASTM	Density at 20 °C (p=Specific Weight) (g/cm^3)	Melting Temperature (°C)	Specific Heat 0 to 100 °C (cal/g °C)	Coefficient of Thermal Expansion 20 ° at 100 °C (10-6 °C)	Thermal Conductivity at 25 °C (cal/cm/cm^2/sec °C)	Electrical Conductivity at 20 °C (IACS %)	Modulus of Elasticity (MPA)	Modulus of Rigidity (MPA)
1050	2.7	650 - 660	0.22	24	0.50	60	70,000	26,500
1100	2.71	643 - 657	0.22	24	0.53	59	70,000	26,500
1350	2.7	650 - 660	0.22	23	0.54	62	70,000	26,500
2011	2.82	535 - 645	0.23	23	0.37	40	72,500	27,500
3003	2.73	640 - 655	0.22	23	0.38	43	70,000	26,500
3104	2.72	630 - 655	0.21	24	0.41	42	69,000	26,000
3105	2.71	635 - 654	0.22	24	0.41	45	70,000	26,500
5052	2.68	595 - 650	0.23	23	0.33	35	72,000	27,500
5083 - F	2,66	--	900	24	0,34	15-18	~ 70	--
5083 H111	2,66	--	900	24	0,34	15-18	~ 70	--
5083 - O	2,66	--	900	24	0,34	15-18	~ 70	--
5754	2,67	595°C	900	23,9	0,30	20-23	~ 70	--
6060	2.71	600 - 650	0.21	23	0.48	52	70,000	26,500

PHYSICAL PROPERTIES OF ALUMINIUM

part 2/2

Alloy ABNT/ASTM	Density at 20 °C (p=Specific Weight) (g/cm³)	Melting Temperature (°C)	Specific Heat 0 to 100 °C (cal/g °C)	Coefficient of Thermal Expansion 20 ° at 100 °C (10-6 °C)	Thermal Conductivity at 25 °C (cal/cm/cm²/sec °C)	Electrical Conductivity at 20 °C (IACS %)	Modulus of Elasticity (MPA)	Modulus of Rigidity (MPA)
6061	2.71	580 - 650	0.22	24	0.37	43	70,000	26,500
6063	2.71	600 - 650	0.21	23	0.48	52	70,000	26,500
6082	2,7	--	896	23,4	0,38	24-32	~ 70	--
6101	2.71	605 - 655	0.22	23	0.49	55	70,000	26,500
6262	2.71	582 - 652	0.21	23	0.37	44	70,000	26,700
6351	2.71	555 - 650	0.21	24	0.44	46	70,000	26,500
7021	2.80	510 - 630	0.21	23	0.33	37	70,000	26,500
7028	2.77	510 - 630	0.21	23	0.33	37	70,000	26,500
7075	2.75	475 - 630	0.22	23	0.35	40	73,000	27,500

Notas: Los valores indicados no darán lugar a garantía formal.

FLAT SHEET - WEIGHT PER M²

part 1/2

Inch	Millimeter	Line 1000	Line 5000	Line 6000	Line 7000
--	0,30	0,810	--	--	--
--	0,40	1,080	--	--	--
--	0,50	1,350	--	--	--
--	0,60	1,620	--	--	--
--	0,70	1,890	--	--	--
--	0,80	2,160	--	--	--
--	0,90	2,430	--	--	--
--	1,00	2,700	2,700	--	--
--	1,20	3,240	3,240	--	--
--	1,50	4,050	4,050	--	--
--	2,00	5,400	5,400	--	--
--	2,50	2,700	2,700	--	--
--	3,00	8,100	8,100	--	--
1/8”	3,17	8,559	8,559	--	--
--	4,00	10,800	10,800	--	--
3/16”	4,76	12,852	12,852	--	--

Pulgada	Millimeter	Line 1000	Line 5000	Line 6000	Line 7000
1/4”	6,35	---	17,145	--	17,780
5/16”	7,94	---	21,438	--	--
3/8”	9,53	---	25,731	--	26,684
1/2”	12,70	---	34,290	--	35,560
5/8”	15,87	---	42,849	--	44,436
3/4”	19,05	---	51,435	--	53,340
7/8”	22,22	---	59,994	--	62,216
1”	25,40	---	68,580	--	71,120
1.1/4”	31,75	---	85,725	--	88,900
1.1/2”	38,10	---	102,870	--	106,680
2”	50,80	---	137,160	--	142,240
2.1/4”	57,15	---	154,305	--	160,020
2.1/2”	63,50	---	171,450	--	177,800
3”	76,20	---	205,740	--	213,360

FLAT SHEET - WEIGHT PER M²

Inch	Millimeter	Line 1000	Line 5000	Line 6000	Line 7000
3.1/2”	88,90	---	240,030	--	248,920
4”	101,60	---	274,320	--	284,480
5”	127,00	---	342,900	--	355,600
6”	152,40	---	411,480	--	426,720
---	260,00	---	702,000	704,600	728,000
---	300,00	---	810,000	813,000	840,000

STUCCO SHEET WEIGHT/PIECE

Base Thickness (mm)	Square Meter	2000x1000mm	2000x1100mm	3000x1250mm
0,40	1,080	2,160	2,376	4,050
0,50	1,350	2,700	2,970	5,063
0,70	1,890	3,780	4,158	7,088
0,80	2,160	4,320	4,752	8,100
1,00	2,700	5,400	5,940	10,125
1,20	3,240	6,480	7,128	12,150

CHECKERED SHEET - WEIGHT/PIECE

Base Thickness (mm)	Height of Shoulders	M²	2500 X 1000mm	3000 X 1000mm	3000 X 1250mm
1,00	0,50 a 1,30	3,880	9,700	11,640	14,550
1,20	0,50 a 1,30	4,600	11,500	13,800	17,250
1,50	0,50 a 1,30	5,320	13,300	15,960	19,950
1,80	0,50 a 1,30	6,160	15,400	18,480	23,100
2,00	0,50 a 1,30	6,800	17,000	20,400	25,500
2,20	0,50 a 1,30	7,200	18,000	21,600	27,000
2,70	0,50 a 1,30	8,400	21,000	25,200	31,500

REBAR - WEIGHT/METER

part 1/3

Inch	Milimeter	●	■	⬢
1/4"	6,35	0,086	0,109	0,095
5/16"	7,94	0,134	0,171	---
3/8"	9,53	0,193	0,246	0,213
7/16"	11,11	0,263	0,335	0,290
1/2"	12,70	0,343	0,437	0,379
9/16"	14,28	0,434	---	0,479
5/8"	15,87	0,536	0,683	0,591
11/16"	17,46	0,649	---	---
3/4"	19,05	0,772	0,983	0,852
7/8"	22,22	1,051	1,338	1,159
1"	25,40	1,373	1,748	1,514
1.1/16"	26,97	1,548	---	1,707
1.1/8"	28,57	1,737	---	1,916
1.1/4"	31,75	2,146	2,732	2,366
1.3/8"	34,92	2,595	3,305	2,862
1.1/2"	38,10	3,090	3,934	3,407
1.5/8"	41,27	3,625	4,616	3,997

REBAR - WEIGHT/METER

part 2/3

Inch	Milimeter	●	■	⬢
1.3/4"	44,45	4,205	5,354	4,637
1.7/8"	47,62	4,827	---	5,322
2"	50,80	5,493	6,994	6,056
2.1/8"	53,97	6,200	---	---
2.1/4"	57,15	6,952	8,851	---
2.1/2"	63,50	8,582	10,927	9,463
2.3/4"	69,85	10,385	---	---
3"	76,20	12,359	15,735	---
3.1/4"	82,55	14,504	---	---
3.1/2"	88,90	16,821	21,418	---
4"	101,60	21,971	27,974	---
4.1/2"	114,30	27,807	---	---
5"	127,00	34,330	---	---
5.1/2"	139,70	41,539	---	---
6"	152,40	49,434	---	---
6.1/2"	165,10	58,017	---	---
7"	177,80	67,286	---	---

REBAR - WEIGHT/METER

part 2/3

Inch	Milimeter	●	■	⬢
8"	203,20	4,205	---	---
9"	228,60	4,827	---	---
10"	254,00	5,493	---	---
11"	279,40	6,200	---	---
13"	330,20	6,952	---	---

ANGLE BRACKETS - EQUAL FLAPS (WEIGHT/METER)

part 1/2

Width/thickness		1/16” 1,58 mm	3/32” 2,38 mm	1/8” 3,17 mm	3/16” 4,76 mm	1/4” 6,35 mm	1/2” 12,70 mm
1/2"	12,70	0,102	0,148	0,191	---	---	---
5/8"	15,87	0,129	---	0,245	---	---	---
3/4"	19,05	0,156	0,230	0,300	---	---	---
7/8"	22,22	---	0,271	0,355	---	---	---
1"	25,40	0,211	0,312	0,409	0,594	0,765	---
1.1/4"	31,75	---	---	0,518	0,758	---	---

ANGLE BRACKETS - EQUAL FLAPS (WEIGHT/METER)

part 2/2

Width/thickness		1/16” 1,58 mm	3/32” 2,38 mm	1/8” 3,17 mm	3/16” 4,76 mm	1/4” 6,35 mm	1/2” 12,70 mm
1.1/2"	38,10	0,320	---	0,627	0,922	1,202	---
2"	50,80	---	0,640	0,846	1,249	1,639	---
2.1/2"	63,50	---	---	1,064	---	2,076	---
3"	76,20	---	---	1,282	1,904	2,513	---
4"	101,60	---	---	1,718	---	3,387	6,556

FLAT BAR (WEIGHT/METER)

part 1/2

Width/thickness		1/8” 3,17 mm	3/16” 4,76 mm	1/4” 6,35 mm	3/8” 9,53 mm	1/2” 12,70 mm	5/8” 15,87 mm	3/4” 19,05 mm	1” 25,40 mm
3/8"	9,53	0,082	---	0,164	---	---	---	---	---
1/2"	12,70	0,109	0,164	0,219	0,328	---	---	---	---
5/8"	15,87	0,136	0,205	0,273	0,410	---	---	---	---
3/4"	19,05	0,164	0,246	0,328	0,492	0,656	---	---	---
7/8"	22,22	0,191	0,287	0,382	---	---	---	---	---

FLAT BAR (WEIGHT/METER)

part 1/2

Width/thickness		1/8” 3,17 mm	3/16” 4,76 mm	1/4” 6,35 mm	3/8” 9,53 mm	1/2” 12,70 mm	5/8” 15,87 mm	3/4” 19,05 mm	1” 25,40 mm
1"	25,40	0,218	0,328	0,437	0,656	0,874	1,092	1,311	---
1.1/4"	31,75	0,273	0,410	0,546	0,820	1,093	---	---	---
1.1/2"	38,10	0,327	0,491	0,656	0,984	1,311	1,639	1,967	2,623
2"	50,80	0,436	0,655	0,874	1,312	1,748	2,185	2,623	3,497
2.1/2"	63,50	0,546	0,819	1,093	1,640	2,185	3,277	3,278	---
3"	76,20	0,655	0,983	1,311	1,968	2,623	4,370	3,934	5,245
4"	101,60	0,873	1,311	1,748	2,624	3,497	5,462	5,245	6,994
5"	127,00	---	1,638	2,185	3,280	4,371	---	6,556	8,742
6"	152,40	---	---	2,623	3,936	5,245	---	7,868	10,490

ROUND PIPE (WEIGHT/METER)

part 1/2

Outside Diameter		Wall Thickness					
Inch	Milimeter	1/32" 0,79 mm	1,00 mm	1/16" 1,58 mm	2,00 mm	3/32" 2,38 mm	1/8" 3,17 mm
3/8"	9,53	0,059	0,073	0,107	---	---	---
1/2"	12,70	0,080	0,100	0,150	0,182	---	0,257
5/8"	15,87	0,101	0,127	0,192	0,236	0,273	0,343
3/4"	19,05	0,123	0,154	0,235	0,290	0,338	0,429
7/8"	22,22	0,144	0,181	0,278	0,344	0,402	0,514
1"	25,40	0,166	0,208	0,320	0,398	0,466	0,600
1.1/8"	28,57	0,187	0,235	0,363	---	---	0,686
1.1/4"	31,75	0,208	0,262	0,406	0,507	0,595	0,771
1.3/8"	34,93	0,230	---	0,449	---	---	---
1.1/2"	38,10	0,251	0,316	0,491	0,615	0,724	0,943
1.5/8"	41,27	0,272	---	0,534	0,669	0,788	---
1.3/4"	44,45	0,294	---	0,577	0,723	0,852	1,114
1.7/8"	47,62	0,315	---	0,619	0,777	---	---
2"	50,80	0,336	---	0,662	0,831	0,981	1,285

ROUND PIPE (WEIGHT/METER)

part 2/2

Outside Diameter		Wall Thickness					
Inch	Milimeter	1/32” 0,79 mm	1,00 mm	1/16” 1,58 mm	2,00 mm	3/32” 2,38 mm	1/8” 3,17 mm
2.1/4"	57,15	0,379	---	0,748	---	---	1,457
2.3/8"	60,32	0,400	---	0,790	---	---	---
2.1/2"	63,50	0,422	---	0,833	1,047	1,238	1,628
2.3/4"	69,85	0,464	---	---	---	---	1,800
3"	76,20	0,507	---	1,004	1,263	1,496	1,971
3.1/4"	82,55	0,550	---	---	---	---	2,142
3.1/2"	88,90	0,593	---	---	1,480	---	2,314
4"	101,60	0,678	---	---	1,696	2,010	2,656
4.1/2"	114,30	0,763	---	---	---	---	2,999
5"	127,00	0,849	---	---	2,128	---	3,342
5.1/2"	139,70	0,934	---	---	---	---	3,685
6"	152,40	1,020	---	---	2,561	---	4,028

PIPE SCHEDULE 40 (WEIGHT/METER)

Nominal Diameter (inch)	Outside Diameter (millimeter)	Inside Diameter (millimeter)	Wall thickness (millimeter)	Weight/meter
3/8"	17,15	12,52	2,31	0,292
1/2"	21,34	15,80	2,77	0,438
3/4"	26,67	20,93	2,87	0,582
1"	33,40	26,64	3,38	0,864
1.1/4"	42,16	35,05	3,56	1,170
1.1/2"	48,26	40,90	3,68	1,397
2"	60,33	52,51	3,91	1,878
2.1/2"	73,03	62,71	5,16	2,982
3"	88,90	77,92	5,49	3,899
3.1/2"	101,60	90,12	5,74	4,685
4"	114,30	102,26	6,02	5,550
4.1/2"	127,00	114,46	6,27	6,445
5"	141,30	128,20	6,55	7,514
6"	168,28	154,05	7,11	9,756

PIPE SCHEDULE 80 (WEIGHT/METER)

Nominal Diameter (inch)	Outside Diameter (millimeter)	Inside Diameter (millimeter)	Wall thickness (millimeter)	Weight/meter
3/8"	17,15	10,74	3,20	0,380
1/2"	21,34	13,87	3,73	0,559
3/4"	26,67	18,85	3,91	0,758
1"	33,40	24,31	4,55	1,118
1.1/4"	42,16	32,46	4,85	1,541
1.1/2"	48,26	38,10	5,08	1,868
2"	60,33	49,25	5,54	2,584
2.1/2"	73,03	59,00	7,01	3,940
3"	88,90	73,66	7,62	5,273
3.1/2"	101,60	85,45	8,08	6,433
4"	114,30	97,18	8,56	7,706
5"	141,30	122,25	9,53	10,691
6"	168,28	146,33	10,97	14,692

SQUARE PIPE (WEIGHT/METER)

Outside Diameter		Wall Thickness				
Inch	Milimeter	1,00 mm	1/16” 1,58 mm	2,00 mm	1/8” 3,17 mm	1/4 6,35mm
1/2"	12,70	---	0,190	---	---	---
5/8"	15,87	---	0,245	---	---	---
3/4"	19,05	0,196	0,299	0,370	0,546	---
1"	25,40	---	0,408	0,507	0,764	---
1.1/4"	31,75	---	0,517	0,645	---	---
1.1/2"	38,10	---	0,625	0,783	---	---
2"	50,80	---	---	1,058	1,637	---
2.1/2"	63,50	---	---	---	2,073	---
3"	76,20	---	---	---	---	---
4"	101,60	---	---	---	---	6,532

RECTANGULAR PIPE (WEIGHT/METER)

Dimensional				Wall Thickness		
Base		Height				
Inch	Milimeter	Inch	Milimeter	1/16” 1,58 mm	2,00 mm	1/8 3,17mm
1"	25,40	1/2"	12,70	0,299	---	---
1.1/	38,10	1"	25,40	0,517	0,645	---
2"	50,80	1/2"	12,70	0,517	---	---
2"	50,80	1"	25,40	0,625	0,783	---
2"	50,80	1.1/2"	38,10	---	0,920	---
3"	76,20	1"	25,40	0,843	1,054	---
3"	76,20	1.1/2"	38,10	0,952	1,196	---
4"	101,60	1.1/2"	38,10	---	1,471	---
4"	101,60	2"	50,80	---	1,609	---
5"	127,00	2"	50,80	---	1,884	---
6"	152,40	1.1/2"	38,10	---	---	3,152
6"	152,40	3"	76,20	---	---	3,805

ALLOY 2011

“T” SECTION (WEIGHT / METER)

Side (S)			Thickness (T)	
In.	mm	1/16” 1,58 mm	1/8” 3,17 mm	3/16” 4,76 mm
1/2''	12,70	---	0,191	---
5/8"	15,87	---	0,245	---
3/4"	19,05	0,156	0,299	---
7/8"	22,22	---	0,353	---
1"	25,40	0,210	0,408	---
1.1/4"	31,75	---	0,516	0,755
1.1/2"	38,10	---	0,625	0,918
2"	50,80	---	0,842	---

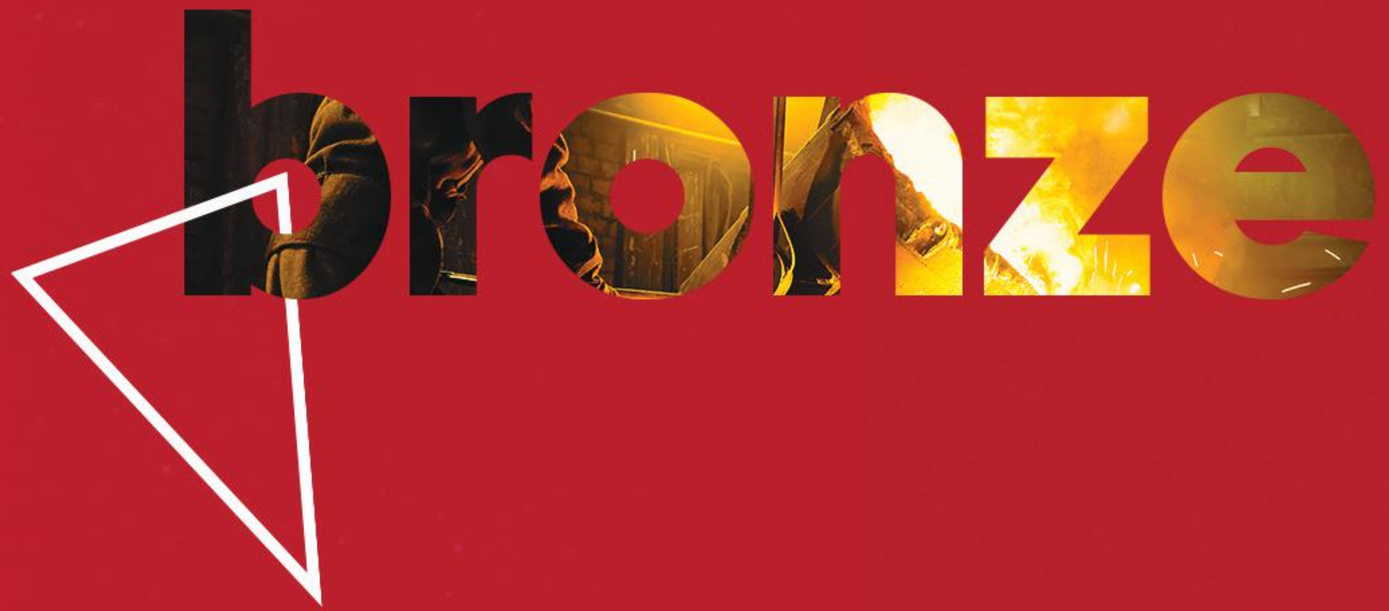
“U” SECTION EQUAL FLAPS (WEIGHT/METER)

Side (S)			Thickness (T)	
In.	mm	1/16” 1,58 mm	3/32'' 2,38 mm	1/8” 3,17 mm
3/8"	9,53	0,108	---	0,190
1/2"	12,70	0,149	0,214	0,272
5/8"	15,87	0,190	---	0,353
3/4"	19,05	0,230	0,337	0,435
7/8"	22,22	---	0,398	0,516
1"	25,40	---	0,459	0,598
1.1/4"	31,75	---	---	0,761
1.1/2"	38,10	---	---	0,924

ALLOY 2011
“U” SECTION UNEQUAL FLAPS (WEIGHT/METER)

Base (B)		Height (H)	
Inches	mm	Pulgadas	mm
3/8"	9,53	1/2"	12,70
1/2"	12,70	3/8"	9,53
5/8"	15,87	1"	25,40
5/8"	15,87	3/8"	9,53
3/4"	19,05	1/2"	12,70
3/4"	19,05	3/8"	9,53
3/4"	19,05	1/2"	12,70
1"	25,40	3/8"	9,53
1"	25,40	1/2"	12,70
1.1/2"	38,10	1/2"	12,70
2"	50,80	1"	25,40
3"	76,20	1"	25,40
4"	101,60	1.1/2"	38,10
4"	101,60	2"	50,80

Thickness (T)		
1/16” 1,58 mm	3/32’’ 2,38 mm	1/8’’ 3,17 mm
0,135	---	---
0,122	---	---
0,271	---	---
---	0,194	---
0,176	---	---
---	0,214	---
---	0,255	---
---	-	0,326
---	-	0,381
---	0,377	---
---	---	0,815
---	---	1,033
---	---	---
---	---	---

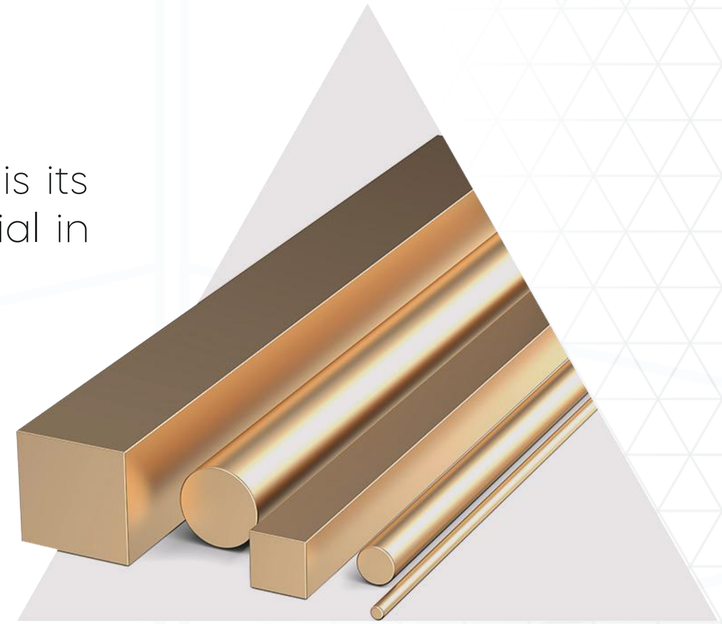

bronze

Bronze

Bronze is a versatile metal alloy based on copper and varying proportions of other elements such as tin (Sn), zinc (Zn), lead (Pb), and phosphorus (P). Some of its characteristics are:

- High mechanical strength;
- High ductility;
- High wear resistance;
- High corrosion resistance;
- High thermal and electrical conductivity;
- Easy to polish.

One of the factors for this raw material to be so essential to the industry is its high resistance to friction wear, which makes bronze a widely used material in bearings, gears, and related parts.



MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 1/3

Name	Alloy ASTM/UNS	Shape	Characteristics	Applications
Phosphor Bronze	C51000	Coils, sheets, strips	Excellent cold formability and limited hot formability. Excellent weldability and brazing.	Stirrer propellers, bellows, friction discs, keys, diaphragms, nuts and rivets, lock washers, components for the Chemical, Textile, and Paper industries. Springs, contacts, parts for switches, fuse holders.
Phosphor Bronze	C51100	Coils, sheets, strips	Excellent cold formability and poor hot formability. Excellent weldability and brazing.	Bells, clutch disks, keys, connectors, diaphragms, tie rods, springs, switch parts, terminals.
Phosphor Bronze	C52100	Coils, sheets, strips	Good cold formability and poor hot formability. Excellent weldability and brazing.	Stirrer propellers, bellows, friction discs, keys, diaphragms, nuts and rivets, lock washers, components for the Chemical, Textile, and Paper industries. Springs, contacts, parts for switches, fuse holders.
Bronze SAE 65 Bz 12 Bz 14 CuSn	C90700 C90800 C91000	Bushings, billets, rectangular bars	Tenacious hardness with good resistance against wear, corrosion, and surface fatigue. Allows working with high specific loads. It is important that they are well lubricated.	Gears, bushings, bearings, crowns, slide guides, piston rings.
Bronze SAE 62 SAE 620 SAE 622 CuSnZn	C90500 C90300 C92200	Bushings, billets, rectangular bars	Corrosion and seawater resistant. Allows working with medium specific loads.	O-rings, valves, stem seats, flanges and connections, pump housing and rotors, pressure and temperature resistant parts.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 2/3

Name	Alloy ASTM/UNS	Shape	Characteristics	Applications
Bronze SAE 64 SAE 66 SAE 67 CuSnPb	C93700 C93500 C93800	Bushings, billets, rectangular bars	Excellent resistance to abrasion, corrosion, anti-friction and pressure sealing. Good capacity for working precariously without momentary lubrication.	Bushings for press, shoes, bearings, bushings for clutch pins, slide sleeves.
Bronze SAE 40 SAE 660 CuSnPbZn	C83600 C93200	Bushings, billets, rectangular bars	Good anti-friction properties and medium strengths. Use on parts that require moderate surface pressure and speed.	Small parts such as bearings, bushes, sleeves, crowns, rings, hydraulic material and gaskets, coupling elements.
Bronze SAE 6z-A SAE 68-B SAE CA-624 SAE CA-630 SAE CA-954 SAE CA-955 CuAl	C95200 C95300 C62400 C63000 C95400 C95500	Bushings, billets, rectangular bars	Excellent mechanical properties. Vibration, wear, corrosion, and cavitation resistant. Heat treatable, require good lubrication.	Sliding bearings with extremely high loads and shocks, highly stressed crowns, bushings, gears, valve seats and housing, guides, pinions, rings, shoes, parts for stirrers, and anti-sparking tools.
Bronze SAE 430-A SAE 430-B SAE 43 CuZnAlMn	C86200 C86300 C86500	Bushings, billets, rectangular bars	Excellent corrosion resistance and excellent properties to withstand extremely high static loads at low speeds.	Indicated for heavily demanded bearings and crowns and internal components of high pressure valves, bushings, nuts for presses, parts for hydraulic cylinders, overhead crane components, high resistance supports.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 3/3

Name	Alloy ASTM/UNS	Shape	Characteristics	Applications
Bronze TM-23		Bushings, billets	Good formability and fatigue resistance. Medium corrosion resistance. Excellent weldability. Allows working in systems with poor lubrication.	Bearings, bushings, sleeves for the automotive, sugar-alcohol and heavy machinery industries, valves.
Bronze TM-620		Bushings, billets	Good fatigue resistance. Allows working with high specific loads. Should be used for works in systems with constant lubrication.	Bearings, bushings, sleeves for the automotive, sugar-alcohol and heavy machinery industries, wear plates, decorative lines.

CHEMICAL COMPOSITION OF BRONZE

part 1/4

Name	Alloy	Cu	Zn	Pb	P	Sn	Fe	Al	Ni	Mn	Si	Others
	ASTM / UNS	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Phosphor Bronze	C51000	remaining	0.30	0.05	0.03 0.35	4.20 5.80	0.10					
Phosphor Bronze	C51100	remaining	0.30	0.05	0.03 0.35	3.50 4.90	0.10					
Phosphor Bronze	C52100	remaining	0.20	0.05	0.03 0.35	7.00 9.00	0.10					
Bronze SAE 65 CuSn	C90700	88.00 90.00		0.5	0.30	10.00 12.00		0.005	0.500		0.005	0.3
Bronze Bz 12 CuSn	C90800	84.00 88.00	0.25	0.25	0.15	11.00 13.00	0.15		0.500			Sb=0,20
Bronze Bz 14 CuSn	C91000	85.00 87.00	0.50	1.00	0.20	13.00 14.00	0.20		1.000			
Bronze SAE 62 CuSnZn	C90500	86.00 89.00	1.00 3.00	0.3	0.05	9.00 11.00	0.15	0.005	1.000		0.005	0.3

CHEMICAL COMPOSITION OF BRONZE

part 2/4

Name	Alloy	Cu	Zn	Pb	P	Sn	Fe	Al	Ni	Mn	Si	Othersx
	ASTM / UNS	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Bronze SAE 622	C92200	86.00	3.00	1.00	0.05	5.50	0.30	0.005	1.000		0.005	0.3
CuSnZn		90.00	5.00	2.00		6.50						
Bronze SAE 64	C93700	78.00	0.80	8.00	0.50	9.00	0.15	0.005	1.000		0.005	Sb=0,60
CuSnPb		82.00		11.00		11.00						out-ros=0,20
Bronze SAE 66	C93500	83.00	2.00	8.00	0.05	4.50	0.20	0.005	0.800		0.005	Sb=0,35
CuSnPb		86.00		10.00		6.00						out-ros=0,30
Bronze SAE 67	C93800	75.00	0.80	13.00	0.05	6.30	0.15	0.005	0.800		0.005	Sb=0,80
CuSnPb		79.00		16.00		7.50						out-ros=0,20
Bronze SAE 40	C83600	84.00	4.00	4.00	0.05	4.00	0.30	0.005	1.000		0.005	0.35
CuSnPbZn		86.00	6.00	6.00		6.00						
Bronze SAE 660	C93200	81.00	2.00	6.00	0.50	6.20	0.20	0.005	0.800		0.005	Sb=0,35
CuSnPbZn		85.00	4.00	8.00		7.50						out-ros=0,20

bronze

CHEMICAL COMPOSITION OF BRONZE

part 3/4

Name	Alloys	Cu	Zn	Pb	P	Sn	Fe	Al	Ni	Mn	Si	Others
	ASTM / UNS	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Bronze SAE 68-A	C95200	86.00					2.50	8.50				1.00
CuAl		(mín.)					4.00	9.50				
Bronze SAE 68-B	C95300	86					0.70	9.00				1.00
CuAl		(mín.)					1.50	11.00				
Bronze SAE CA-624	C62400	99.5				0.20	2.00	10.00		0.30	0.250	
CuAl		(mín.)					4.00	11.50				
Bronze SAE CA-630	C63000	78.00				0.20	2.00	9.00	4.000	1.50	0.250	0.50
CuAl		85.00					4.00	11.00	5.500			
Bronze SAE CA-954	C95400	83.00					3.00	10.00	2.500	0.50		0.50
CuAl		(mín.)					5.00	11.50				
Bronze SAE CA-955	C95500	78.00					3.00	10.00	3.000	3.50		0.50
CuAl		(mín.)					5.00	11.50	5.500			
Bronze SAE 430-A	C86200	60.00	restante	0.20		0.20	2.00	3.00	1.000	2.50		0.30
CuZnAlMn		66.00					4.00	4.90		5.00		

CHEMICAL COMPOSITION OF BRONZE

part 4/4

Name	Alloys	Cu	Zn	Pb	P	Sn	Fe	Al	Ni	Mn	Si	Others
	ASTM / UNS	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Bronze SAE 430-A	C86200	60.00	remaining	0.20		0.20	2.00	3.00	1.000	2.50		0.30
CuZnAlMn		66.00					4.00	4.90		5.00		
Bronze SAE 430-B	C86300	60.00	remaining	0.20		0.20	2.00	5.00	1.000	2.50		0.30
CuZnAlMn		66.00					4.00	7.50		5.00		
Bronze SAE 43	C86500	55.00	remaining	0.40		1.00	0.40	0.50	1.000	1.50		0.30
CuZnAlMn		60.00					2.00	1.50				
Bronze TM-23	–	70.00	9.00	20.00		4.00						
		(mín.)	(máx.)	(máx.)		(mín.)						
Bronze TM-620	–	86.00	5.00	1.00		7.00						
		(mín.)	(máx.)	(máx.)		(mín.)						

Notas:
1. The mentioned values represent maximum limits per chemical element, except when minimum and maximum ranges are indicated.
2. The indicated values do not imply a formal guarantee.

MECHANICAL PROPERTIES OF BRONZE

part 1/5

Name	Alloy ASTM / UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strength (kgf/mm²)	Minimum Elongation “50,80 mm” (%)	Brinell Hardness (HB)
Phosphor Bronze	C51000	Coils,	Hard	58	53	10	150
		sheets, strips	Extra Hard	67	56	6	164
Phosphor Bronze	C51100	Coils,	Hard	56	52	7	142
		sheets, strips	Extra Hard	65	-	4	156
Phosphor Bronze	C52100	Coils,	Hard	65	51	10	166
		sheets, strips	Extra Hard	73	56	4	172
Bronze SAE 65	C90700	Bushings, billets, rectangular bars		25	13	10	95
Bronze Bz 12	C90800	Bushings, billets, rectangular bars		32	17	15	100
Bronze Bz 14	C91000	Bushings, billets, rectangular bars	-	25	17	5	110

MECHANICAL PROPERTIES OF BRONZE

part 2/5

Name	Alloy ASTM / UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strength (kgf/mm²)	Minimum Elongation “50,80 mm” (%)	Brinell Hardness (HB)
Bronze SAE 62	C90500	Bushings, billets, rectangular bars	-	28	13	20	90
Bronze SAE 620	C90300	Bushings, billets, rectangular bars	-	28	13	20	70
Bronze SAE 622	C92200	Bushings, billets, rectangular bars	-	23	10	24	65
Bronze SAE 64	C93700	Bushings, billets, rectangular bars	-	21	8	15	82
Bronze SAE 66	C93500	Bushings, billets, rectangular bars	-	19	8	15	60

MECHANICAL PROPERTIES OF BRONZE

Name	Alloy ASTM / UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strength (kgf/mm²)	Minimum Elongation “50,80 mm” (%)	Brinell Hardness (HB)
Bronze SAE 67	C93800	Bushings, billets, rectangular bars	-	18	9	12	50
Bronze SAE 40	C83600	Bushings, billets, rectangular bars	-	21	10	20	70
Bronze SAE 660	C93200	Bushings, billets, rectangular bars	-	21	10	12	75
Bronze SAE 68-A	C95200	Bushings, billets, rectangular bars	-	46	18	20	120
Bronze SAE 68-B	C95300	Bushings, billets, rectangular bars	-	46	18	20	130

MECHANICAL PROPERTIES OF BRONZE

part 4/5

Name	Alloy ASTM / UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strength (kgf/mm²)	Minimum Elongation “50,80 mm” (%)	Brinell Hardness (HB)
Bronze SAE CA-624	C62400	Bushings, billets, rectangular bars	-	56	32	7	164
Bronze SAE CA-630	C63000	Bushings, billets, rectangular bars	-	63	32	6	228
Bronze SAE CA-954	C95400	Bushings, billets, rectangular bars	-	53	21	12	165
Bronze SAE CA-955	C95500	Bushings, billets, rectangular bars	-	63	28	6	190
Bronze SAE 430-A	C86200	Bushings, billets, rectangular bars	-	63	31	18	150

MECHANICAL PROPERTIES OF BRONZE

part 5/5

Name	Alloy ASTM / UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strength (kgf/mm²)	Minimum Elongation “50,80 mm” (%)	Brinell Hardness (HB)
Bronze SAE 430-B	C86300	Bushings, billets, rectangular bars	-	77	42	12	200
Bronze SAE 43	C86500	Bushings, billets, rectangular bars	-	45	17	20	98
Bronze TM-23	-	Billets, bushings	-	28	16	23	75
Bronze TM-620	-	Billets, bushings	-	36	17	32	92

Notes: The values indicated do not imply a formal guarantee

PHYSICAL PROPERTIES OF BRONZE

Name	Alloys ASTM / UNS	Density at 20 °C ?=specific weight (g/cm³)	Melting Point (°C)	Thermal Conductivity at 20 °C (cal/cm/sec °C)	Specific Heat 20 °C (cal/g °C)	Electrical Resistivity at 20 °C (annealed material) (μΩ cm)	Electrical Conductivity at 20 °C (annealed material) (IACS %)	Coefficient of Thermal Expansion 20 to 300 °C (10-6 °C)	Modulus of Elasticity at 20 °C (kg/mm²)	Modulus of Rigidity at 20 °C (kg/mm²)
Phosphor Bronze	C51000	8.86	1,050	0.17	0.09	11.5	15	17.8	11,200	4,200
Phosphor Bronze	C51100	8.86	1,060	0.2	0.09	8.7	20	17.8	11,200	4,200

Notes: The values indicated do not imply a formal guarantee

BILLET WEIGHT PER PIECE WITH 500MM

Diameter	Weight	Diameter	Weight	Diameter	Weight	Diameter	Weight	Diameter	Weight
3/8"	0,44	2.1/8"	10,91	4.1/8"	39,97	6.1/8"	87,28	8.1/8"	1473,66
7/16"	0,57	2.1/4"	12,19	4.1/4"	42,40	6.1/4"	90,85	8.1/4"	157,54
1/2"	0,72	2.3/8"	13,54	4.3/8"	44,90	6.3/8"	94,49	8.3/8"	162,33
9/16"	0,89	2.1/2"	14,97	4.1/2"	47,46	6.1/2"	98,19	8.1/2"	167, 16
5/8"	1,08	2.5/8"	16,46	4.5/8"	50,09	6.5/8"	101,96	8.5/8"	172,07
3/4"	1,50	2.3/4"	18,03	4.3/4"	52,80	6.3/4"	105,81	8.3/4"	177,07
7/8"	2,00	2.7/8"	19,67	4.7/8"	55,58	6.7/8"	109,73	8.7/8"	182, 12
1"	2,57	3"	21,38	5"	58,43	7"	113,72	9"	187,26
1.1/8"	3,21	3.1/8"	23,17	5.1/8"	61,35	7.1/8"	117,78	9.1/8"	192,45
1.1/4"	3,93	3.1/4"	25,02	5.1/4"	64,35	7.1/4"	121,92	9.1/4"	197,73
1.3/8"	4,71	3.3/8"	26,97	5.3/8"	67,41	7.3/8"	126, 13	9.3/8"	203,08
1.1/2"	5,56	3.1/2"	28,93	5.1/2"	70,54	7.1/2"	130,40	9.1/2"	208,49
1.5/8"	6,49	3.5/8"	31,00	5.5/8"	73,75	7.5/8"	134,74	9.5/8"	213,97
1.3/4"	7,49	3.3/4"	33,14	5.3/4"	77,03	7.3/4"	139,16	9.3/4"	219,54
1.7/8"	8,56	3.7/8"	35,35	5.7/8"	80,37	7.7/8"	143,64	9.7/8"	225,16
2"	9,70	4"	37,63	6"	83,80	8"	148,21	10"	230,86

BILLET WEIGHT PER PIECE WITH 500MM

Diameter	Weight
10.1/8"	236,63
10.1/4"	248,38
10.3/8"	248,40
10.1/2"	36813,20
10.5/8"	260,43
10.3/4"	266,56
10.7/8"	272,75
11"	279,03
11.1/8"	285,36
11.1/4"	291,79
11.3/8"	298,28
11.1/2"	304,83
11.5/8"	311,44
11.3/4"	318,15
11.7/8"	324,91
12"	331,76

Diameter	Weight
12.1/8"	338,66
12.1/4"	345,65
12.3/8"	367,04
12.1/2"	359,83
12.5/8"	367,02
12.3/4"	374,30
12.7/8"	381,63
13"	389,05
13.1/4"	404,08
13.1/2"	419,40
13.3/4"	435,01
14"	451,12
14.1/4"	467,07
14.1/2"	483,53
14.3/4"	500,28
15"	517,31

Diameter	Weight
12.1/8"	338,66
12.1/4"	345,65
12.3/8"	367,04
12.1/2"	359,83
12.5/8"	367,02
12.3/4"	374,30
12.7/8"	381,63
13"	389,05
13.1/4"	404,08
13.1/2"	419,40
13.3/4"	435,01
14"	451,12
14.1/4"	467,07
14.1/2"	483,53
14.3/4"	500,28
15"	517,31

Diameter	Weight
15.1/4"	534,62
15.1/2"	552,22
15.3/4"	570,11
16"	588,28
16.1/4"	606,73
16.1/2"	625,47
16.3/4"	644,50
17"	663,81
17.1/2"	703,28
18"	743,90
18.1/2"	785,65
19"	828,55
19.1/2"	872,58
20"	917,76
21"	1011,53
22"	1109,86

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
7/8"	1/2"	1,56
7/8"	5/8"	1,28
1"	1/2"	2,14
1"	5/8"	1,85
1"	3/4"	1,49
1.1/8"	1/2"	2,78
1.1/8"	5/8"	2,49
1.1/8"	3/4"	2,13
1.1/8"	7/8"	1,71
1.1/4"	1/2"	3,49
1.1/4"	5/8"	3,20
1.1/4"	3/4"	2,85
1.1/4"	7/8"	2,42
1.1/4"	1"	1,92
1.3/8"	1/2"	4,27

Outside Diameter	Inside diameter	Weight
1.3/8"	5/8"	3,99
1.3/8"	3/4"	3,63
1.3/8"	7/8"	3,20
1.3/8"	1"	2,70
1.3/8"	1.1/8"	2,13
1.1/2"	1/2"	5,13
1.1/2"	5/8"	4,84
1.1/2"	3/4"	4,49
1.1/2"	7/8"	4,06
1.1/2"	1"	3,56
1.1/2"	1.1/8"	2,99
1.1/2"	1.1/4"	2,35
1.5/8"	1/2"	6,05
1.5/8"	5/8"	5,77
1.5/8"	3/4"	5,41

Outside Diameter	Inside diameter	Weight
1.5/8"	7/8"	4,98
1.5/8"	1"	4,48
1.5/8"	1.1/8"	3,91
1.5/8"	1.1/4"	3,27
1.5/8"	1.3/8"	2,56
1.3/4"	1/2"	7,05
1.3/4"	5/8"	6,77
1.3/4"	3/4"	6,41
1.3/4"	7/8"	5,98
1.3/4"	1"	5,48
1.3/4"	1.1/8"	4,91
1.3/4"	1.1/4"	4,27
1.3/4"	1.3/8"	3,56
1.3/4"	1.1/2"	2,77
1.7/8"	1/2"	8,12

Outside Diameter	Inside diameter	Weight
1.7/8"	5/8"	7,83
1.7/8"	3/4"	7,48
1.7/8"	7/8"	7,05
1.7/8"	1"	6,55
1.7/8"	1.1/8"	5,98
1.7/8"	1.1/4"	5,34
1.7/8"	1.3/8"	4,63
1.7/8"	1.1/2"	3,84
1.7/8"	1.5/8"	2,99
2"	1/2"	9,26
2"	5/8"	8,97
2"	3/4"	8,62
2"	7/8"	8,19
2"	1"	7,69
2"	1.1/8"	7,12

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
2"	1.1/4"	6,48
2"	1.3/8"	5,77
2"	1.1/2"	4,98
2"	1.5/8"	4,13
2"	1.3/4"	3,20
2.1/8"	1/2"	10,47
2.1/8"	5/8"	10, 18
2.1/8"	3/4"	9,83
2.1/8"	7/8"	9,40
2.1/8"	1"	8,90
2.1/8"	1.1/8"	8,33
2.1/8"	1.1/4"	7,69
2.1/8"	1.3/8"	6,98
2.1/8"	1.1/2"	6,19
2.1/8"	1.5/8"	5,34

Outside Diameter	Inside diameter	Weight
2.1/8"	1.3/4"	4,41
2.1/4"	1/2"	11,75
2.1/4"	5/8"	11,47
2.1/4"	3/4"	11, 11
2.1/4"	7/8"	10,68
2.1/4"	1"	10, 18
2.1/4"	1.1/8"	9,62
2.1/4"	1.1/4"	8,97
2.1/4"	1.3/8"	8,26
2.1/4"	1.1/2"	7,48
2.1/4"	1.5/8"	6,62
2.1/4"	1.3/4"	5,69
2.1/4"	1.7/8"	4,70
2.3/8"	1/2"	13, 10
2.3/8"	5/8"	12,82

Outside Diameter	Inside diameter	Peso
2.3/8"	3/4"	12,46
2.3/8"	7/8"	12,04
2.3/8"	1"	11,54
2.3/8"	1.1/8"	10,97
2.3/8"	1.1/4"	10,32
2.3/8"	1.3/8"	9,61
2.3/8"	1.1/2"	8,83
2.3/8"	1.5/8"	7,97
2.3/8"	1.3/4"	7,05
2.3/8"	1.7/8"	6,05
2.3/8"	2"	4,98
2.1/2"	1/2"	14,53
2.1/2"	5/8"	14,25
2.1/2"	3/4"	13,89
2.1/2"	7/8"	13,46

Outside Diameter	Inside diameter	Weight
2.1/2"	1"	12,96
2.1/2"	1.1/8"	12,39
2.1/2"	1.1/4"	11,75
2.1/2"	1.3/8"	11,04
2.1/2"	1.1/2"	10,25
2.1/2"	1.5/8"	9,40
2.1/2"	1.3/4"	8,47
2.1/2"	1.7/8"	7,48
2.1/2"	2"	5,27
2.1/2"	2.1/8"	16,02
2.5/8"	1/2"	15,74
2.5/8"	5/8"	15,38
2.5/8"	3/4"	14,96
2.5/8"	7/8"	14,46
2.5/8"	1"	13,46

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
2.5/8"	1.1/8"	13,89
2.5/8"	1.1/4"	13,24
2.5/8"	1.3/8"	12,53
2.5/8"	1.1/2"	11,75
2.5/8"	1.5/8"	10,89
2.5/8"	1.3/4"	9,97
2.5/8"	1.7/8"	8,97
2.5/8"	2"	7,90
2.5/8"	2.1/8"	6,76
2.5/8"	2.1/4"	5,55
2.3/4"	1/2"	17,59
2.3/4"	5/8"	17,31
2.3/4"	3/4"	16,95
2.3/4"	7/8"	16,53
2.3/4"	1"	16,03

Outside Diameter	Inside diameter	Weight
2.3/4"	1.1/8"	15,46
2.3/4"	1.1/4"	14,81
2.3/4"	1.3/8"	14,10
2.3/4"	1.1/2"	13,32
2.3/4"	1.5/8"	12,46
2.3/4"	1.3/4"	11,54
2.3/4"	1.7/8"	10,54
2.3/4"	2"	9,47
2.3/4"	2.1/8"	8,33
2.3/4"	2.1/4"	7,12
2.3/4"	2.3/8"	5,84
2.7/8"	1/2"	19,23
2.7/8"	5/8"	18,95
2.7/8"	3/4"	18,59
2.7/8"	7/8"	18,16

Outside Diameter	Inside diameter	Weight
2.7/8"	1"	17,66
2.7/8"	1.1/8"	17,09
2.7/8"	1.1/4"	16,45
2.7/8"	1.3/8"	15,74
2.7/8"	1.1/2"	14,95
2.7/8"	1.5/8"	14,10
2.7/8"	1.3/4"	13,17
2.7/8"	1.7/8"	12,18
2.7/8"	2"	11, 11
2.7/8"	2.1/8"	9,97
2.7/8"	2.1/4"	8,75
2.7/8"	2.3/8"	7,47
2.7/8"	2.1/2"	6,12
3"	1/2"	20,94
3"	5/8"	20,66

Outside Diameter	Inside diameter	Weight
3"	3/4"	20,30
3"	7/8"	19,87
3"	1"	19,37
3"	1.1/8"	18,81
3"	1.1/4"	18,16
3"	1.3/8"	17,45
3"	1.1/2"	16,66
3"	1.5/8"	15,81
3"	1.3/4"	14,88
3"	1.7/8"	13,89
3"	2"	12,82
3"	2.1/8"	11,68
3"	2.1/4"	10,46
3"	2.3/8"	9,18
3"	2.1/2"	7,83

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
3"	2.5/8"	6,41
3.1/8"	1/2"	22,72
3.1/8"	5/8"	22,44
3.1/8"	3/4"	22,08
3.1/8"	7/8"	21,65
3.1/8"	1"	21,15
3.1/8"	1.1/8"	20,59
3.1/8"	1.1/4"	19,94
3.1/8"	1.3/8"	19,23
3.1/8"	1.1/2"	18,45
3.1/8"	1.5/8"	17,59
3.1/8"	1.3/4"	16,67
3.1/8"	1.7/8"	15,67
3.1/8"	2"	14,60
3.1/8"	2.1/8"	13,46

Outside Diameter	Inside diameter	Weight
3.1/8"	2.1/4"	12,25
3.1/8"	2.3/8"	10,97
3.1/8"	2.1/2"	9,61
3.1/8"	2.5/8"	8,19
3.1/4"	1/2"	24,57
3.1/4"	5/8"	24,29
3.1/4"	3/4"	23,93
3.1/4"	7/8"	23,50
3.1/4"	1"	23,00
3.1/4"	1.1/8"	22,43
3.1/4"	1.1/4"	21,79
3.1/4"	1.3/8"	21,08
3.1/4"	1.1/2"	20,30
3.1/4"	1.5/8"	19,44
3.1/4"	1.3/4"	18,52

Outside Diameter	Inside diameter	Peso
3.1/4"	1.7/8"	17,52
3.1/4"	2"	16,45
3.1/4"	2.1/8"	15,31
3.1/4"	2.1/4"	14,10
3.1/4"	2.3/8"	12,82
3.1/4"	2.1/2"	11,46
3.1/4"	2.5/8"	10,04
3.1/4"	2.3/4"	8,54
3.3/8"	1/2"	26,53
3.3/8"	5/8"	26,24
3.3/8"	3/4"	25,89
3.3/8"	7/8"	25,46
3.3/8"	1"	24,96
3.3/8"	1.1/8"	24,39
3.3/8"	1.1/4"	23,75

Outside Diameter	Inside diameter	Weight
3.3/8"	1.3/8"	23,04
3.3/8"	1.1/2"	22,25
3.3/8"	1.5/8"	21,40
3.3/8"	1.3/4"	20,48
3.3/8"	1. 7/8"	19,48
3.3/8"	2"	18,41
3.3/8"	2.1/8"	17,27
3.3/8"	2.1/4"	16,06
3.3/8"	2.3/8"	14,78
3.3/8"	2.1/2"	13,42
3.3/8"	2.5/8"	12,00
3.3/8"	2.3/4"	10,50
3.3/8"	2.7/8"	8,93
3.1/2"	1/2"	28,49
3.1/2"	5/8”	28,21

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
3.1/2"	3/4"	27,85
3.1/2"	7/8"	27,43
3.1/2"	1"	26,93
3.1/2"	1.1/8"	26,36
3.1/2"	1.1/4"	25,71
3.1/2"	1.3/8"	25,00
3.1/2"	1.1/2"	24,22
3.1/2"	1.5/8"	23,36
3.1/2"	1.3/4"	22,44
3.1/2"	1. 7/8"	21,44
3.1/2"	2"	20,37
3.1/2"	2.1/8"	19,23
3.1/2"	2.1/4"	18,02
3.1/2"	2.3/8"	16,74
3.1/2"	2.1/2"	15,38

Outside Diameter	Inside diameter	Weight
3.1/2"	2.5/8"	13,96
3.1/2"	2.3/4"	12,46
3.1/2"	2.7/8"	10,90
3.1/2"	3"	9,25
3.5/8"	1/2"	30,56
3.5/8"	5/8"	30,28
3.5/8"	3/4"	29,92
3.5/8"	7/8"	29,50
3.5/8"	1.	29,00
3.5/8"	1.1/8"	28,43
3.5/8"	1.1/4"	27,78
3.5/8"	1.3/8"	27,07
3.5/8"	1.1/2"	26,29
3.5/8"	1.5/8"	25,43
3.5/8"	1.3/4"	24,51

Outside Diameter	Inside diameter	Weight
3.5/8"	1.7/8"	23,51
3.5/8"	2"	22,44
3.5/8"	2.1/8"	21,30
3.5/8"	2.1/4"	20,09
3.5/8"	2.3/8"	18,81
3.5/8"	2.1/2"	17,45
3.5/8"	2.5/8"	16,03
3.5/8"	2.3/4"	14,53
3.5/8"	2.7/8"	12,96
3.5/8"	3"	11,32
3.5/8"	3.1/8"	9,61
3.3/4"	1/2"	32,70
3.3/4"	5/8"	32,41
3.3/4"	3/4"	32,06
3.3/4"	7/8”	31,63

Outside Diameter	Inside diameter	Weight
3.3/4"	1"	31,13
3.3/4"	1.1/8"	30,56
3.3/4"	1.1/4"	29,92
3.3/4"	1.3/8"	29,21
3.3/4"	1.1/2"	28,42
3.3/4"	1.5/8"	27,57
3.3/4"	1.3/4"	26,64
3.3/4"	1.7/8"	25,64
3.3/4"	2"	24,57
3.3/4"	2.1/8"	23,44
3.3/4"	2.1/4"	22,22
3.3/4"	2.3/8"	20,94
3.3/4"	2.1/2"	19,59
3.3/4"	2.5/8"	18,16
3.3/4"	2.3/4"	16,66

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
4"	1.7/8"	30,13
4"	2"	29,06
4"	2.1/8"	27,92
4"	2.1/4"	26,71
4"	2.3/8"	25,43
4"	2.1/2"	24,07
4"	2.5/8"	22,65
4"	2.3/4"	21,15
4"	2.7/8"	19,58
4"	3"	17,94
4"	3.1/8"	16,23
4"	3.1/4"	14,45
4"	3.3/8"	12,57
4"	3.1/2"	10,68
4.1/8"	1/2”	39,53

Outside Diameter	Inside diameter	Weight
4.1/8"	5/8"	39,24
4.1/8"	3/4"	38,89
4.1/8"	7/8"	38,46
4.1/8"	1"	37,96
4.1/8"	1.1/8"	37,39
4.1/8"	1.1 /4"	36,75
4.1/8"	1.3/8"	36,04
4.1/8"	1.1 /2"	35,25
4.1/8"	1.5/8"	34,40
4.1/8"	1.3/4"	33,47
4.1/8"	1.7/8"	32,47
4.1/8"	2"	31,40
4.1/8"	2.1/8"	30,27
4.1/8"	2.1/4"	29,05
4.1/8"	2.3/8"	27,77

Outside Diameter	Inside diameter	Weight
4.1/8"	2.1/2"	26,42
4.1/8"	2.5/8"	24,99
4.1/8"	2.3/4"	23,50
4.1/8"	2.7/8"	21,93
4.1/4"	3"	22,72
4.1/4"	3.1/8"	21,01
4.1/4"	3.1/4"	19,23
4.1/4"	3.3/8"	17,34
4.1/4"	3.1/2"	15,45
4.1/4"	3.5/8"	13,45
4.1/4"	3.3/4"	11,39
4.3/8"	1/2"	44,46
4.3/8"	5/8"	44,17
4.3/8"	3/4"	43,82
4.3/8"	7/8"	43,39

Outside Diameter	Inside diameter	Weight
4.3/8"	1"	42,89
4.3/8"	1.1 /8"	42,32
4.3/8"	1.1/4"	41,68
4.3/8"	1.3/8"	40,97
4.3/8"	1.1/2"	40,18
4.3/8"	1.5/8"	39,33
4.3/8"	1.3/4"	38,40
4.3/8"	1.7/8"	37,40
4.3/8"	2"	36,33
4.3/8"	2.1/8"	35,19
4.3/8"	2.1/4"	33,98
4.3/8"	2.3/8"	32,70
4.3/8"	2.1/2"	31,34
4.3/8"	2.5/8"	29,92
4.3/8"	2.3/4"	28,42

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
4.3/8"	2.7/8"	26,86
4.3/8"	3"	25,22
4.3/8"	3.1/8"	23,50
4.3/8"	3.1/4"	21,72
4.3/8"	3.3/8"	19,84
4.3/8"	3.1/2"	17,95
4.3/8"	3.5/8"	15,95
4.3/8"	3.3/4"	13,89
4.3/8"	3.7/8"	11,75
4.1/2"	1"	45,45
4.1/2"	1.1 /8"	44,88
4.1/2"	1.1/4"	44,24
4.1/2"	1.3/8"	43,53
4.1/2"	1.1/2"	42,74
4.1/2"	1.5/8"	41,89

Outside Diameter	Inside diameter	Weight
4.1/2"	1.3/4"	40,96
4.1/2"	1.7/8"	39,96
4.1/2"	2"	38,89
4.1/2"	2.1/8"	37,76
4.1/2"	2.1/4"	36,54
4.1/2"	2.3/8"	35,26
4.1/2"	2.1/2"	33,91
4.1/2"	2.5/8"	32,48
4.1/2"	2.3/4"	30,98
4.1/2"	2.7/8"	29,42
4.1/2"	3"	27,78
4.1/2"	3.1/8"	26,06
4.1/2"	3.1/4"	24,29
4.1/2"	3.3/8"	22,40
4.1/2"	3.1/2”	20,51

Outside Diameter	Inside diameter	Weight
4.1/2"	3.5/8"	18,51
4.1/2"	3.3/4"	16,45
4.1/2"	3.7/8"	14,31
4.1/2"	4"	12,10
4.5/8"	1"	48,08
4.5/8"	1.1/8"	47,51
4.5/8"	1.1/4"	46,87
4.5/8"	1.3/8"	46,16
4.5/8"	1.1/2"	45,37
4.5/8"	1.5/8"	44,52
4.5/8"	1.3/4"	43,59
4.5/8"	1.7/8"	42,60
4.5/8"	2"	41,53
4.5/8"	2.1/8"	40,39
4.5/8"	2.1/4"	39,17

Outside Diameter	Inside diameter	Weight
4.5/8"	2.3/8"	37,89
4.5/8"	2.1/2"	36,54
4.5/8"	2.5/8"	35,11
4.5/8"	2.3/4"	33,62
4.5/8"	2.7/8"	32,05
4.5/8"	3"	30,41
4.5/8"	3.1/8"	28,70
4.5/8"	3.1/4"	26,92
4.5/8"	3.3/8"	25,03
4.5/8"	3.1/2"	23,14
4.5/8"	3.5/8"	21,14
4.5/8"	3.3/4"	19,08
4.5/8"	3.7/8"	16,94
4.5/8"	4"	14,73
4.5/8"	4.1/8"	12,46

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
4.3/4"	1"	50,79
4.3/4"	1.1/8"	50,22
4.3/4"	1.1/4"	49,58
4.3/4"	1.3/8"	48,87
4.3/4"	1.1/2"	48,09
4.3/4"	1.5/8"	47,23
4.3/4"	1.3/4"	46,30
4.3/4"	1.7/8"	45,31
4.3/4"	2"	44,24
4.3/4"	2.1/8"	43,10
4.3/4"	2.1/4"	41,89
4.3/4"	2.3/8"	40,60
4.3/4"	2.1/2"	39,25
4.3/4"	2.5/8"	37,83
4.3/4"	2.3/4"	36,33

Outside Diameter	Inside diameter	Weight
4.3/4"	2.7/8"	34,76
4.3/4"	3"	33,12
4.3/4"	3.1/8"	31,41
4.3/4"	3.1/4"	29,63
4.3/4"	3.3/8"	27,74
4.3/4"	3.1/2"	25,85
4.3/4"	3.5/8"	23,85
4.3/4"	3.3/4"	21,79
4.3/4"	3.7/8"	19,65
4.3/4"	4"	17,44
4.3/4"	4.1/8"	15,17
4.3/4"	4.1/4"	12,81
4.7/8”	1”	53,56
4.7/8”	1.1/8"	52,99
4.7/8”	1.1/4"	52,35

Outside Diameter	Inside diameter	Weight
4.7/8"	1.3/8"	51,64
4.7/8"	1.1/2"	50,85
4.7/8"	1.5/8"	50,00
4.7/8"	1.3/4"	49,07
4.7/8"	1.7/8"	48,07
4.7/8"	2"	47,00
4.7/8"	2.1/8"	45,87
4.7/8"	2.1/4"	44,65
4.7/8"	2.3/8"	43,37
4.7/8"	2.1/2"	42,02
4.7/8"	2.5/8"	40,59
4.7/8"	2.3/4"	39,09
4.7/8"	2.7/8"	37,53
4.7/8"	3"	35,89
4.7/8"	3.1/8"	34,18

Outside Diameter	Inside diameter	Weight
4.7/8"	3.1/4"	32,40
4.7/8"	3.3/8"	30,51
4.7/8"	3.1/2"	28,62
4.7/8"	3.5/8"	26,62
4.7/8"	3.3/4"	24,56
4.7/8"	3.7/8"	22,42
4.7/8"	4"	20,22
4.7/8"	4.1/8"	17,94
4.7/8"	4.1/4"	15,58
4.7/8"	4.3/8"	13,16
5"	1"	56,41
5"	1.1/8"	55,84
5"	1.1/4"	55,20
5"	1.3/8"	54,49
5"	1.1/2"	53,70

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
5"	1.5/8"	52,85
5"	1.3/4"	51,92
5"	1.7/8"	50,93
5"	2"	49,86
5"	2.1/8"	48,72
5"	2.1/4"	47,51
5"	2.3/8"	46,23
5"	2.1/2"	44,87
5"	2.5/8"	43,45
5"	2.3/4"	41,95
5"	2.7/8"	40,38
5"	3"	38,74
5"	3.1/8"	37,03
5"	3.1/4"	35,25
5"	3.3/8"	33,37

Outside Diameter	Inside diameter	Weight
5"	3.1/2"	31,48
5"	3.5/8"	29,48
5"	3.3/4"	27,41
5"	3.7/8"	25,27
5"	4"	23,07
5"	4.1/8"	20,79
5"	4.1/4"	18,44
5"	4.3/8"	16,01
5"	4.1/2"	13,52
5.1/8”	1”	59,34
5.1/8"	1.1/8"	58,77
5.1/8"	1.1/4"	58,13
5.1/8"	1.3/8"	57,42
5.1/8"	1.1/2"	56,63
5.1/8"	1.5/8"	55,78

Outside Diameter	Inside diameter	Weight
5.1/8"	1.3/4"	54,85
5.1/8"	1.7/8"	53,85
5.1/8"	2"	52,78
5.1/8"	2.1/8"	51,64
5.1/8"	2.1/4"	50,43
5.1/8"	2.3/8"	49,15
5.1/8"	2.1/2"	47,79
5.1/8"	2.5/8"	46,37
5.1/8"	2.3/4"	44,87
5.1/8"	2.7/8"	43,31
5.1/8"	3"	41,67
5.1/8"	3.1/8"	39,95
5.1/8"	3.1/4"	38,17
5.1/8"	3.3/8"	36,29
5.1/8"	3.1/2"	34,40

Outside Diameter	Inside diameter	Weight
5.1/8"	3.5/8"	32,40
5.1/8"	3.3/4"	30,34
5.1/8"	3.7/8"	28,19
5.1/8"	4"	25,99
5.1/8"	4.1/8"	23,71
5.1/8"	4.1/4"	21,36
5.1/8"	4.3/8"	18,93
5.1/8"	4.1/2"	16,44
5.1/8"	4.5/8"	13,88
5.1/4"	1"	62,34
5.1/4"	1.1/8"	61,77
5.1/4"	1.1/4"	61,12
5.1/4"	1.3/8"	60,41
5.1/4"	1.1/2"	59,63
5.1/4"	1.5/8"	58,77

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
5.1/4"	1.3/4"	57,85
5.1/4"	1.7/8"	56,85
5.1/4"	2"	55,78
5.1/4"	2.1/8"	54,64
5.1/4"	2.1/4"	53,43
5.1/4"	2.3/8"	52,15
5.1/4"	2.1/2"	50,79
5.1/4"	2.5/8"	49,37
5.1/4"	2.3/4"	47,87
5.1/4"	2.7/8"	46,30
5.1/4"	3"	44,66
5.1/4"	3.1/8"	42,95
5.1/4"	3.1/4"	41,17
5.1/4"	3.3/8"	39,29
5.1/4"	3.1/2"	37,39

Outside Diameter	Inside diameter	Weight
5.1/4"	3.5/8"	35,40
5.1/4"	3.3/4"	33,33
5.1/4"	3.7/8"	31,19
5.1/4"	4"	28,99
5.1/4"	4.1/8"	26,71
5.1/4"	4.1/4"	24,35
5.1/4"	4.3/8"	21,93
5.1/4"	4.1/2"	19,44
5.1/4"	4.5/8"	16,88
5.1/4"	4.3/4"	14,24
5.3/8"	1.	65,40
5.3/8"	1.1/8"	64,83
5.3/8"	1.1/4"	64,19
5.3/8"	1.3/8"	63,48
5.3/8"	1.1/2"	62,70

Outside Diameter	Inside diameter	Weight
5.3/8"	1.5/8"	61,84
5.3/8"	1.3/4"	60,91
5.3/8"	1.7/8"	59,92
5.3/8"	2"	58,85
5.3/8"	2.1/8"	57,71
5.3/8"	2.1/4"	56,50
5.3/8"	2.3/8"	55,22
5.3/8"	2.1/2"	53,86
5.3/8"	2.5/8"	52,44
5.3/8"	2.3/4"	50,94
5.3/8"	2.7/8"	49,37
5.3/8"	3"	47,73
5.3/8"	3.1/8"	46,02
5.3/8"	3.1/4"	44,24
5.3/8"	3.3/8"	42,35

Outside Diameter	Inside diameter	Weight
5.3/8"	3.1/2"	40,46
5.3/8"	3.5/8"	38,46
5.3/8"	3.3/4"	36,40
5.3/8"	3.7/8"	34,26
5.3/8"	4"	32,05
5.3/8"	4.1/8"	29,78
5.3/8"	4.1/4"	27,42
5.3/8"	4.3/8"	25,00
5.3/8"	4.1/2"	22,51
5.3/8"	4.5/8"	19,95
5.3/8"	4.3/4"	17,30
5.3/8"	4.7/8"	14,60
5.1/2"	1”	68,53
5.1/2"	1.1/8"	67,96
5.1/2"	1.1/4"	67,32

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
5.1/2"	1.3/8"	66,61
5.1/2"	1.1/2"	65,83
5.1/2"	1.5/8"	64,97
5.1/2"	1.3/4"	64,04
5.1/2"	1.7/8"	63,05
5.1/2"	2"	61,98
5.1/2"	2.1/8"	60,84
5.1/2"	2.1/4"	59,63
5.1/2"	2.3/8"	58,35
5.1/2"	2.1/2"	56,99
5.1/2"	2.5/8"	55,57
5.1/2"	2.3/4"	54,07
5.1/2"	3"	50,86
5.1/2"	3.1/8"	49,15
5.1/2"	3.1/4"	47,37
5.1/2"	3.3/8"	45,48
5.1/2"	3.1/2"	43,59

Outside Diameter	Inside diameter	Weight
5.1/2"	3.5/8"	41,59
5.1/2"	3.3/4"	39,52
5.1/2"	3.7/8"	37,38
5.1/2"	4"	35,18
5.1/2"	4.1/8"	32,90
5.1/2"	4.1/4"	30,55
5.1/2"	4.3/8"	28,12
5.1/2"	4.1/2"	25,63
5.1/2"	4.5/8"	23,07
5.1/2"	4.3/4"	20,43
5.1/2"	4.7/8"	17,73
5.1/2"	5"	14,95
5.5/8"	1"	71,72
5.5/8"	1.1/8"	71,15
5.5/8"	1.1 /4"	70,51
5.5/8"	1.3/8"	69,80
5.5/8”	1.1 /2"	69,01

Outside Diameter	Inside diameter	Peso
5.5/8"	1.5/8"	68,16
5.5/8"	1.3/4"	67,23
5.5/8"	1.7/8"	66,24
5.5/8"	2"	65,17
5.5/8"	2.1/8"	64,03
5.5/8"	2.1/4"	62,82
5.5/8"	2.3/8"	61,54
5.5/8"	2.1/2"	60,18
5.5/8"	2.5/8"	58,76
5.5/8"	2.3/4"	57,26
5.5/8"	2.7/8"	55,69
5.5/8"	3"	54,05
5.5/8"	3.1/8"	52,34
5.5/8"	3.1/4"	50,56
5.5/8"	3.3/8"	48,68
5.5/8"	3.1/2"	46,79
5.5/8"	3.5/8"	44,79

Outside Diameter	Inside diameter	Weight
5.5/8"	3.3/4"	42,72
5.5/8"	3.7/8"	40,58
5.5/8"	4"	38,38
5.5/8"	4.1/8"	36,10
5.5/8"	4.1/4"	33,75
5.5/8"	4.3/8"	31,32
5.5/8"	4.1/2"	28,83
5.5/8"	4.5/8"	26,27
5.5/8"	4.3/4"	23,63
5.5/8"	4.7/8"	20,93
5.5/8"	5"	18,15
5.5/8"	5.1/8"	15,30
5.3/4"	1"	75,00
5.3/4"	1.1/8"	74,44
5.3/4"	1.1 /4"	73,79

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
5.3/4"	1.3/8"	73,08
5.3/4"	1.1 /2"	72,30
5.3/4"	1.5/8"	71,44
5.3/4"	1.3/4"	70,52
5.3/4"	1.7/8"	69,52
5.3/4"	2"	68,45
5.3/4"	2.1/8"	67,32
5.3/4"	2.1/4"	66,11
5.3/4"	2.3/8"	64,83
5.3/4"	2.1/2"	63,47
5.3/4"	2.5/8"	62,05
5.3/4"	2.3/4"	60,55
5.3/4"	2.7/8"	58,99
5.3/4"	3"	57,34
5.3/4"	3.1/8"	55,63
5.3/4"	3.1/4"	53,85
5.3/4"	3.3/8"	51,97

Outside Diameter	Inside diameter	Weight
5.3/4"	3.1/2"	50,08
5.3/4"	3.5/8"	48,08
5.3/4"	3.3/4"	46,01
5.3/4"	3.7/8"	43,87
5.3/4"	4"	41,67
5.3/4"	4.1/8"	39,39
5.3/4"	4.1/4"	37,04
5.3/4"	4.3/8"	34,61
5.3/4"	4.1/2"	32,12
5.3/4"	4.5/8"	29,56
5.3/4"	4.3/4"	26,92
5.3/4"	4.7/8"	24,21
5.3/4"	5"	21,43
5.3/4"	5.1/8"	18,59
5.3/4"	5.1/4"	15,66
5.7/8"	2"	71,80
5.7/8"	2.1/8"	70,67

Outside Diameter	Inside diameter	Peso
5.7/8"	2.1/4"	69,45
5.7/8"	2.3/8"	68,17
5.7/8"	2.1/2"	66,82
5.7/8"	2.5/8"	65,39
5.7/8"	2.3/4"	63,89
5.7/8"	2.7/8"	62,33
5.7/8"	3"	60,69
5.7/8"	3.1/8"	58,97
5.7/8"	3.1/4"	57,20
5.7/8"	3.3/8"	55,31
5.7/8"	3.1/2"	53,42
5.7/8"	3.5/8"	51,42
5.7/8"	3.3/4"	49,36
5.7/8"	3.7/8"	47,22
5.7/8"	4"	45,01
5.7/8"	4.1/8"	42,73
5.7/8"	4.1/4"	40,38

Outside Diameter	Inside diameter	Weight
5.7/8"	4.3/8"	37,95
5.7/8"	4.1/2"	35,46
5.7/8"	4.5/8"	32,90
5.7/8"	4.3/4"	30,26
5.7/8"	4.7/8"	27,56
5.7/8"	5"	24,77
5.7/8"	5.1/8"	21,93
5.7/8"	5.1/4"	19,00
5.7/8"	5.3/8"	16,01
6"	2”	75,23
6"	2.1/8"	74,09
6"	2.1/4"	72,88
6"	2.3/8"	71,60
6"	2.1/2"	70,24
6"	2.5/8"	68,82

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
6"	2.3/4"	67,32
6"	2.7/8"	65,75
6"	3"	64,11
6"	3.1/8"	62,40
6"	3.1/4"	60,62
6"	3.3/8"	58,74
6"	3.1/2"	56,84
6"	3.5/8"	54,85
6"	3.3/4"	52,78
6"	3.7/8"	50,64
6"	4"	48,44
6"	4.1/8"	46,16
6"	4.1/4"	43,80
6"	4.3/8"	41,38
6"	4.1/2"	38,89
6"	4.5/8"	36,33
6"	4.3/4"	33,69

Outside Diameter	Inside diameter	Weight
6"	4.7/8"	30,98
6"	5"	28,20
6"	5.1/8"	25,35
6"	5.1/4"	22,43
6"	5.3/8"	19,43
6"	5.1/2"	16,37
6.1/4"	2"	82,28
6.1/4"	2.1/4"	79,93
6.1/4"	2.1/2"	77,29
6.1/4"	2.3/4"	74,37
6.1/4"	3"	71,17
6.1/4"	3.1/4"	67,67
6.1/4"	3.1/2"	63,90
6.1/4"	3.3/4"	59,84
6.1/4"	4"	55,49
6.1/4"	4.1/4"	50,86
6.1/4"	4.1/2"	45,94

Outside Diameter	Inside diameter	Weight
6.1/4"	4.3/4"	40,74
6.1/4"	5"	35,25
6.1/4"	5.1/4"	29,48
6.1/2"	2"	89,62
6.1/2"	2.1/4"	87,27
6.1/2"	2.1/2"	84,63
6.1/2"	2.3/4"	81,71
6.1/2"	3"	78,50
6.1/2"	3.1/4"	75,01
6.1/2"	3.1/2"	71,24
6.1/2"	3.3/4"	67,17
6.1/2"	4"	62,83
6.1/2"	4.1/4"	58,20
6.1/2"	4.1/2"	53,28
6.1/2”	4.3/4”	48,07
6.1/2"	5"	42,58
6.1/2"	5.1/4"	36,81

Outside Diameter	Inside diameter	Weight
6.1/2"	5.1/2"	30,76
6.3/4"	2"	97,23
6.3/4"	2.1/4"	94,88
6.3/4"	2.1/2"	92,24
6.3/4"	2.3/4"	89,32
6.3/4"	3"	86,11
6.3/4"	3.1/4"	82,62
6.3/4"	3.1/2"	78,85
6.3/4"	3.3/4"	74,79
6.3/4"	4"	70,44
6.3/4"	4.1/4"	65,81
6.3/4"	4.1/2"	60,89
6.3/4"	4.3/4"	55,69
6.3/4"	5"	50,21
6.3/4"	5.1/4"	44,44

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
6.3/4"	5.1/2"	38,38
6.3/4"	5.3/4"	32,04
7"	2"	105, 13
7"	2.1/4"	102,78
7"	2.1/2"	100, 15
7"	2.3/4"	97,23
7"	3"	94,02
7"	3.1/4"	90,53
7"	3.1/2"	86,75
7"	3.3/4"	82,69
7"	4"	78,35
7"	4.1/4"	73,72
7"	4.1/2"	68,80
7"	4.3/4"	63,60
7"	5"	58,11
7"	5.1/4"	52,34
7"	5.1/2"	46,29

Outside Diameter	Inside diameter	Weight
7.1/2"	3"	110,69
7.1/2"	3.1/2"	103,42
7.1/2"	4"	95,02
7.1/2"	4.1/2"	85,47
7.1/2"	5"	74,78
7.1/2"	5.1/2"	62,96
7.1/2"	6"	49,99
7.1/2"	6.1/2"	35,88
8"	3"	128,50
8"	3.1/2"	121,23
8"	4"	112,82
8"	4.1/2"	103,28
8"	5"	92,59
8"	5.1/2"	80,77
8"	6"	67,80
8"	6.1/2"	53,69
8.1/2”	3"	147,45

Outside Diameter	Inside diameter	Peso
8.1/2"	3.1/2"	140,20
8.1/2"	4"	131,80
8.1/2"	4.1/2"	122,25
8.1/2"	5"	111,56
8.1/2"	5.1/2"	99,73
8.1/2"	6"	86,76
8.1/2"	6.1/2"	72,65
9"	4"	151,89
9"	4.1/2"	142,34
9"	5"	131,65
9"	5.1/2"	119,82
9"	6"	106,85
9.1/2"	4"	173, 12
9.1/2"	4.1/2"	163,57
9.1/2"	5"	152,88
9.1/2"	5.1/2"	141,05
9.1/2"	6"	128,09

Outside Diameter	Inside diameter	Weight
9.1/2"	6.1/2"	113,98
9.1/2"	7"	98,73
9.1/2"	7.1/2"	82,34
9.1/2"	8"	64,81
9.1/2"	8.1/2"	46,15
10"	4"	195,49
10"	4.1/2"	185,94
10"	5"	175,25
10"	5.1/2"	163,43
10"	6"	150,46
10"	6.1/2"	136,35
10"	7"	121,10
10"	7.1/2"	104,71
10"	8"	87,19
10.1/2”	4"	219,00

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
10.1/2"	4.1/2"	209,45
10.1/2"	5"	198,77
10.1/2"	5.1/2"	186,94
10.1/2"	6"	173,97
10.1/2"	6.1/2"	159,86
10.1/2"	7"	144,61
10.1/2"	7.1/2"	128,23
10.1/2"	8"	110,70
10.1/2"	9"	72,22
11"	4"	243,65
11"	4.1/2"	234, 11
11"	5"	223,42
11"	5.1/2"	211,59
11"	6"	198,62
11"	6.1/2"	184,51
11"	7"	169,27
11"	7.1/2"	152,88

Outside Diameter	Inside diameter	Weight
11"	8"	135,35
11"	8.1/2"	116,68
11"	9"	96,87
11.1/2"	4"	270,69
11.1/2"	4.1/2"	261, 14
11.1/2"	5"	250,46
11.1/2"	5.1/2"	238,63
11.1/2"	6"	225,66
11.1/2"	6.1/2"	211,55
11.1/2"	7"	196,30
11.1/2"	7.1/2"	179,92
11.1/2"	8"	162,39
11.1/2"	8.1/2	143,72
12"	4"	296,38
12"	4.1/2"	286,83
12"	5"	276, 14
12"	5.1/2"	264,31

Outside Diameter	Inside diameter	Weight
12"	6"	251,35
12"	6.1/2"	237,24
12"	7"	221,99
12"	7.1/2"	205,60
12"	8"	188,07
12"	8.1/2	169,40
12"	9"	149,60
12"	9.1/2"	128,65
12"	10"	106,56
12"	10.1/2"	83,33
12"	11"	58,96
13"	5"	333,43
13"	6"	308,63
13"	7"	279,27
13"	8"	245,36
13"	9"	206,88
13"	10"	163,84

BUSHING WEIGHT PER PIECE WITH 500MM

Outside Diameter	Inside diameter	Weight
13"	11"	116,25
13"	12"	64,09
14"	5"	395,27
14"	6"	370,47
14"	7"	341, 12
14"	8"	307,20
14"	9"	268,72
14"	10"	225,69
14"	11"	178,09
14"	12"	125,93
14"	13"	69,22

Outside Diameter	Inside diameter	Weight
15	5"	461,67
15	6"	436,88
15	7"	407,52
15	8"	373,60
15	9"	335,13
15	10"	292,09
15	11"	244,49
15	12"	192,34
15	13"	135,62
15	14"	74,35


brass

Brass

Brass is a metal alloy composed of copper (Cu) and zinc (Zn) atoms. Widely used by mankind for over 4,000 years, this alloy has a luster similar to gold and it is highly malleable. Some of its characteristics are:

- High resistance to corrosion.
- Ease machining
- Ductility
- Wear resistance
- Electrical and thermal conductivity
- Corrosion resistance

Brass is a product that can be found in arms, taps, valves, electrical terminals, vehicle radiators, screws, musical instruments, medical and dental devices, jewelry, among others.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 1/3

Name	Alloy ASTM/UNS	Shape	Characteristics	Applications
Tombac Brass 90/10	C22000	Coils, sheets, strips	Excellent cold formability and good hot formability. Excellent weldability and brazing.	Jewelry in general, ornamental decoration, enameled items, ammunition cartridges.
Tombac Brass 85/15	C23000	Coils, sheets, strips	Excellent cold formability and reasonable hot formability. Excellent weldability and brazing.	Fire extinguishers, eyelets, zippers, push buttons, jewelry, ammunition cartridges.
Cartridge Brass 70/30	C26000	Coils, Sheets, Strips, Tubes	Excellent cold formability and reasonable hot formability. Excellent weldability and brazing.	Pipes for radiators, musical instruments, rivets, screws, reflectors, sockets, push buttons, zippers, hinges, ammunition cartridges, sanitary metals.
Wire Rod Brass 67/33	C26800	Coils, sheets, strips, rectangular bars	Excellent cold formability and reasonable hot formability. Excellent weldability and brazing.	Reflectors, lamp sockets, eyelets, hinges, locks, components made by deep drawing and spinning, fins, rivets, pins, screws, springs.
Wire Rod Brass 65/35	C27000	Wires, Rectangular Bars	Excellent cold formability and poor hot formability. Excellent weldability and brazing.	Pins, rivets, screws, springs, hinges, eyelets, decorative objects.
Latón 63/37	C27200	Tubes	Buena confortabilidad a frio y a caliente. Excelente soldadura y brazaje.	Pipes for radiators, antennas for radio, television and vehicles, sanitary metals.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 2/3

Name	Alloy ASTM/UNS	Shape	Characteristics	Aplicaciones
Forjaflex Brass	C35300	Strips	Reasonable cold and hot formability. Excellent weldability and good brazability.	Keys, lock components, gears in general, engraved plates.
American Free-Cutting Brass CLA	C36000	Rods, Rectangular Bars	Limited cold formability and reasonable hot formability. Excellent weldability and good brazability.	Parts to be produced on automatic lathes with high cutting speed, such as: Screws, pins, nuts, washers, bushings, bearings, tubular parts, machined parts in general.
Forge Brass	C37700	Rods	Limited cold formability and excellent hot formability. Excellent weldability and good brazability.	Parts to be forged or hot pressed, such as: Sanitary metals, hardware for doors and windows, valves and stopcocks, automotive parts, gears, nuts, joints, etc. Gears and similar products that require high precision machining.
European Free-Cutting Brass CLE	C38500	Rods	Limited cold formability and good hot formability. Excellent weldability and good brazability.	Parts to be machined on automatic high-speed cutting lathes such as: Screws, pins, nuts, washers, bushings, bearings, hinges, padlocks, sockets, switches.
Admiralty Brass (Arsenical)	C44300	Tubes	Good cold formability and reasonable hot formability. Excellent weldability and brazing.	Condensers, evaporators, heat exchangers, salt water pipes.

MAIN ALLOYS, SHAPES, CHARACTERISTICS AND APPLICATIONS

part 3/3

Name	Alloy ASTM/UNS	Shape	Characteristics	Applications
Admiralty Brass (Phosphorous)	C44500	Tubes	Good cold formability and reasonable hot formability. Excellent weldability and brazing.	Condensers, evaporators, heat exchangers, salt water pipes.
Marine Brass	C46500	Rolled Products	Poor cold formability and excellent hot formability. Excellent weldability and good brazability.	Components for marine equipment, propellers, mirrors for condensers and heat exchangers.
Weld Brass	C47100	Slim Rods	Reasonable cold formability and excellent hot formability. Excellent weldability and good brazability.	Welding
Aluminum Brass	C68700	Tubes	Good cold formability and reasonable hot formability. Reasonable weldability and good brazability.	Condensers, evaporators, heat exchangers, salt water pipes.

BRASS COMPOSITION

part 1/2

Name	Alloy ASTM/UNS	Cu (%)	Zn (%)	Pb (%)	P (%)	Sn (%)	Fe (%)	Al (%)	Ni (%)	Mn (%)	As (%)	Others (%)
Tombac Brass 90/10	C22000	89.00 91.00	remaining	0.05			0.05					0.10
Tombac Brass 85/15	C23000	84.00 86.00	remaining	0.05			0.05					0.15
Cartridge Brass 70/30	C26000	68.50 71.50	remaining	0.07			0.05					0.15
Wire Rod Brass 67/33	C26800	64.00 68.50	remaining	0.15			0.05					0.15
Wire Rod Brass 65/35	C27000	63.00 68.50	remaining	0.10			0.05					0.15
Wire Rod Brass 63/37	C27200	62.00 65.00	remaining	0.07			0.05					0.15
Forjaflex Brass	C35300	59.00 64.50	remaining	1.30 2.30			0.1					0.50

BRASS COMPOSITION

part 2/2

Name	Alloy ASTM/UNS	Cu (%)	Zn (%)	Pb (%)	P (%)	Sn (%)	Fe (%)	Al (%)	Ni (%)	Mn (%)	As (%)	Others (%)
Free-Cutting Brass	C36000	60.00	restante	2.50			0.35					0.50
American CLA		63.00		3.70								
Forge Brass	C37700	58.00	restante	1.50			0.3					0.50
		62.00		2.50								
Free-Cutting Brass	C38500	55.00	restante	2.50			0.35					0.50
European CLE		59.00		3.50								
Admiralty Brass	C44300	70.00	restante	0.07		0,9 1 ,20	0.06				0.02	0.15
(Arsenical)		73.00									0.06	
Admiralty Brass (Phosphorous)	C44500	70 73	restante	0.07	0,02 0,10	0,9 1 ,20	0.06					0.15
Marine Brass	C46500	59.00	restante	0.20		0.5	0.10				0.02	
		62.00				1.00					0.06	
Weld Brass	C47100	62.00 (mín.)	restante			0.50						Si=0,35

Notes:

1. The mentioned values represent maximum limits per chemical element, except when minimum and maximum ranges are indicated.

2. The indicated values do not imply a formal guarantee.

MECHANICAL PROPERTIES OF BRASS

part 1/3

Name	Alloy ASTM/UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strength (kgf/mm²)	Minimum Elongation "50,80 mm" (%)	Brinell Hardness (HB)
Tombac Brass 90/10	C22000	Coils, sheets, strips	Soft	28	10	48	60
			1/2 Hard	43	35	10	120
Tombac Brass 85/15	C23000	Coils, sheets, strips	Soft	31	13	40	80
			1/2 Hard	38	30	22	105
Cartridge Brass 70/30	C26000	Coils, strips	Soft	35	14	57	80
			1/2 Hard	42	32	32	120
Cartridge Brass 70/30	C26000	Tubes	1/2 Hard	48	42	15	135
Wire Rod Brass 67/33	C26800	Coils, sheets, strips, rectangular bars	Soft	34	13	58	65
			1/2 Hard	43	33	30	120
Wire Rod Brass 65/35	C27000	Wires	Soft	35	-	60	-
			1/2 Hard	62		15	
Wire Rod Brass 65/35	C27000	Rectangular bars	1/2 Hard	43	35	23	112

MECHANICAL PROPERTIES OF BRASS

part 2/3

Name	Alloy ASTM/UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strength (kgf/mm²)	Minimum Elongation "50,80 mm" (%)	Brinell Hardness (HB)
Wire Rod Brass 63/37	C27200	Tubes	1/2 Hard	42	33	28	110
Forjaflex Brass	C35300	Strips	Hard	51	-	-	74
Free-Cutting Brass	C36000	Rods, rectangular bars	1/2 Hard	44	30	25	115
American CLA							
Forge Brass	C37700	Rods	1/2 Hard	45	30	20	120
Free-Cutting Brass	C38500	Rods	3/4 Hard	55	50	8	145
European CLE							
Admiralty Brass (Arsenical)	C44300	Tubes	Soft	37	15	65	70
Admiralty Brass (Phosphorous)	C44500	Tubes	Soft	31	10	-	-
Marine Brass	C46500	Rolled Products	Hot Rolled	35	14	35	87

MECHANICAL PROPERTIES OF BRASS

part 3/3

Name	Alloy ASTM/UNS	Shape	Tempering	Tensile Strength Limit (kgf/mm²)	Yield Strength (kgf/mm²)	Minimum Elongation "50,80 mm" (%)	Brinell Hardness (HB)
Weld Brass	C47100	Slim Rods	Soft	38	18	50	100
Aluminum Brass	C68700	Tubes	Soft	38	14	60	76

Notas: The values indicated do not imply a formal guarantee.

PHYSICAL PROPERTIES OF BRASS

part 1/3

Name	Alloy ASTM/ UNS	Density at 20 °C ? = specific weight (g/cm³)	Melting Point (°C)	Thermal Conductivity at 20 °C (cal/cm/ sec °C)	Specific Heat 20 °C (cal/g °C)	Electrical Resistivity at 20 °C (annealed material) (μΩ cm)	Electrical Conductivity at 20 °C (annealed material) (IACS %)	Coefficient of Thermal Expansion 20 to 300 °C (10-6 °C)	Modulus of Elasticity at 20 °C (kg/mm²)	Modulus of Rigidity at 20 °C (kg/ mm²)
Tombac Brass 90/10	C22000	8.80	1,045	0.45	0.090	3.920	44	18.4	12,000	4,500
Tombac Brass 85/15	C23000	8.75	1,025	0.38	0.090	4.660	37	18.7	12,000	4,500
Cartridge Brass 70/30	C26000	8.53	955	0.29	0.090	6.160	28	19.9	11,200	4,200
Wire Rod Brass 67/33	C26800	8.47	930	0.28	0.090	6.390	27	20.3	10,500	3,900
Wire Rod Brass 65/35	C27000	8.47	930	0.28	0.090	6.390	27	20.3	10,500	3,900
Wire Rod Brass 63/37	C27200	8.45	920	0.30	0.090	6.600	26	21.0	10,500	3,900

PHYSICAL PROPERTIES OF BRASS

part 2/3

Name	Alloy ASTM/ UNS	Density at 20 °C ? = specific weight (g/cm³)	Melting Point (°C)	Thermal Conductivity at 20 °C (cal/cm/ sec °C)	Specific Heat 20 °C (cal/g °C)	Electrical Resistivity at 20 °C (annealed material) (μΩ cm)	Electrical Conductivity at 20 °C (annealed material) (IACS %)	Coefficient of Thermal Expansion 20 to 300 °C (10-6 °C)	Modulus of Elasticity at 20 °C (kg/mm²)	Modulus of Rigidity at 20 °C (kg/ mm²)
Forjaflex Brass	C35300	8.47	908	0.28	0.090	6.630	26	20.3	10,500	3,900
American Free-Cutting Brass CLA	C36000	8.50	900	0.28	0.090	6.600	26	20.0	10,100	3,700
Forge Brass	C37700	8.40	895	0.28	0.090	6.400	27	21.0	9,800	3,600
European Free-Cutting Brass CLE	C38500	8.50	890	0.29	0.090	6.200	28	21.0	9,750	3,600
Admiralty Brass (Arsenical)	C44300	8.55	970	0.26	0.090	6.900	25	20.0	11,200	4,100

PHYSICAL PROPERTIES OF BRASS

part 3/3

Name	Alloy ASTM/ UNS	Density at 20 °C ? = specific weight (g/cm³)	Melting Point (°C)	Thermal Conductivity at 20 °C (cal/cm/ sec °C)	Specific Heat 20 °C (cal/g °C)	Electrical Resistivity at 20 °C (annealed material) (μΩ cm)	Electrical Conductivity at 20 °C (annealed material) (IACS %)	Coefficient of Thermal Expansion 20 to 300 °C (10-6 °C)	Modulus of Elasticity at 20 °C (kg/mm²)	Modulus of Rigidity at 20 °C (kg/ mm²)
Admiralty Brass (Phospho-rous)	C44500	8.55	970	0.26	0.090	6.900	25	20.0	11,200	4,100
Marine Brass	C46500	8.41	900	0.28	0.090	6.630	26	21.2	10,500	3,900
Weld Brass	C47100	8.45	900	0.24	-	-	22	20.9	-	-
Aluminum Brass	C68700	8.35	1,010	0.24	0.090	7.500	23	20.0	11,200	4,100

Notas: Los valores indicados no darán lugar a garantía formal.

REBAR - WEIGHT PER LINEAR METER

part 1/2

Inch	Millimeter	●	⬢	■
3/32"	2,38	0,038	0,042	0,048
1/8"	3,17	0,067	0,074	0,085
5/32"	3,97	0,105	0,116	0,134
3/16"	4,76	0,151	0,167	0,193
7/32"	5,55	0,206	0,227	0,262
1/4"	6,35	0,269	0,297	0,343
9/32"	7,1 4	0,340	0,375	0,433
5/16"	7,94	0,421	0,464	0,536
3/8"	9,53	0,606	0,669	0,772
7/16"	11,11	0,824	0,909	1,049
1/2"	12,70	1,077	1,1 87	1 ,371
9/16"	1 4,28	1,361	1,501	1 ,733
5/8"	15,87	1,681	1 ,854	2,1 41
11/16"	17,46	2,035	2,244	2,591
3/4"	19,05	2,423	2,671	3,085
13/16"	20,63	2,841	3,133	3,618
7/8"	22,22	3,296	3,634	4,197

Inch	Millimeter	●	⬢	■
1 5/16"	23,81	3,785	4,173	4,819
1 "	25,40	4,307	4,749	5,484
1.1/16"	26,97	4,856	5,354	6,183
1 .1/8"	28,57	5,449	6,008	6,938
1.3/16"	30,16	6,073	6,696	7,732
1 .1/4"	31,75	6,730	7,420	8,569
1.5/1 6"	33,34	7,421	8,182	9,448
1.3/8"	34,92	8,1 41	8,976	10,365
1.7/16"	36,51	8,899	9,812	11,330
1 .1/2"	38,10	9,691	10,685	12,339
1.9/16"	39,69	1 0,51 7	11 ,596	13,390
1 .5/8"	41,27	11,370	12,537	1 4,477
5/8"	15,87	1,681	1 ,854	2,1 41
1.3/4"	44,45	13,190	1 4,544	16,794
1.7/8"	47,62	15,139	16,692	19,275
2"	50,80	17,228	18,996	21,935
2.1/16"	52,39	18,323	20,204	23,330

REBAR - WEIGHT PER LINEAR METER

part 2/2

Inch	Millimeter	●	⬢	■
2.1/8"	53,97	1 9,445	21,441	24,758
2.3/16"	55,56	20,608	22,723	26,239
2.1/4"	57,15	21 ,804	24,042	27,762
2.5/16"	58,73	23,027	25,390	29,318
2.3/8"	60,33	24,298	26,792	30,938
2.7/16"	61,91	25,588	28,21 4	32,579
2.1/2"	63,50	26,919	29,681	34,274
2.5/8"	66,68	29,683	32,729	37,793
2.3/4"	69,85	32,572	35,91 4	41,472
2.7/8"	73,03	35,605	39,259	45,334
3"	76,20	38,763	42,741	49,355
3.1/8"	79,39	42,077	46,395	53,574
3.1/4"	82,55	45,493	50,162	57,923
3.3/8"	85,73	49,065	54,101	62,472
3.1/2"	88,90	52,761	58,176	67,177
3.5/8"	92,08	56,603	62,412	72,069
3.3/4"	95,25	60,568	66,738	77,117

Inch	Millimeter	●	⬢	■
3.7/8"	98,43	64,679	71,319	82,352
4"	101,60	68,912	75,984	87,742
4.1/2"	11 4,30	87,212	96,168	111,048
5"	127,00	107,676	1 18,726	1 37,097
6"	152,40	1 55,053	1 70,965	1 97,419
7"	1 77,80	211,044	232,702	268,709
8"	203,20	275,650	303,937	350,967
9"	228,60	348,869	384,671	444,193

RECTANGULAR BARS - WEIGHT PER LINEAR METER

part 1/2

Width x Thickness		1/16” 1,58mm	3/32” 2,38mm	1/8” 3,17mm	3/16” 4,76mm	1/4” 6,35mm	5/16” 7,94mm	3/8” 9,53mm	1/2” 12,70mm	5/8” 15,87mm	3/4” 19,05mm
1,4”	6,35	0,085	0,128	0,171	0,257	--	--	--	--	--	--
5/16"	7,94	0,107	0,161	0,214	0,321	0,429	--	--	--	--	--
3/8"	9,53	0,128	0,193	0,257	0,386	0,514	0,643	--	--	--	--
7/16"	11,11	0,149	0,225	0,299	0,450	0,600	0,750	0,900	--	--	--
1/2 "	12,70	0,171	0,257	0,342	0,514	0,685	0,857	1,029	--	--	--
9/16"	1 4,28	0,192	0,289	0,385	0,578	0,771	0,964	1,157	1,542	--	--
5/8"	15,87	0,213	0,321	0,428	0,642	0,857	1,071	1,286	1,713	--	--
11/16"	1 7,46	0,234	0,353	0,470	0,706	0,942	1,1 78	1,414	1,885	2,355	--
3/4"	19,05	0,256	0,385	0,513	0,771	1,028	1,286	1,543	2,056	2,570	--
7/8"	2 2,22	0,298	0,450	0,599	0,899	1,199	1,500	1,800	2,399	2,997	3,598
1"	25,40	0,341	0,514	0,684	1,028	1,371	1,714	2,058	2,742	3,426	4,11 3
1.1/8"	28,57	0,384	0,578	0,770	1,156	1,542	1,928	2,3 1 4	3,084	3,854	4,626
1.1/4"	31,75	0,426	0,642	0,856	1,285	1,714	2,143	2,572	3,427	4,283	5,1 41
1.3/8"	34,92	0,469	0,706	0,941	1,413	1,885	2,357	2,829	3,770	4,711	5,654
1.1/2"	38,10	0,512	0,771	1,0 27	1,542	2,056	2,571	3,086	4,11 3	5,1 39	6,169
1.5/8"	41,27	0,554	0,835	1,112	1,670	2,228	2,785	3,343	4,455	5,567	6,683

RECTANGULAR BARS - WEIGHT PER LINEAR METER

part 2/2

Width x Thickness		1/16” 1,58mm	3/32” 2,38mm	1/8” 3,17mm	3/16” 4,76mm	1/4” 6,35mm	5/16” 7,94mm	3/8” 9,53mm	1/2” 12,70mm	5/8” 15,87mm	3/4” 19,05mm
1.3/4"	44,45	0,597	0,899	1,198	1,798	2,399	3,000	3,601	4,798	5,996	7,198
1.7/8"	47,62	0,640	0,963	1,283	1,927	2,570	3,214	3,857	5,1 41	6,424	7,711
2"	50,80	0,682	1,028	1,369	2,055	2,742	3,428	4,115	5,484	6,853	8,2 26
2.1/4"	57,15	0,768	1,156	1,540	2,3 12	3,085	3,857	4,629	6,169	7,70 9	9,254
2.1/2"	63,50	0,853	1,285	1,711	2,569	3,427	4,286	5,144	6,855	8,566	10,282
2.3/4"	69,85	0,938	1,413	1,882	2,826	3,770	4,71 4	5,658	7,540	9,42 2	11,3 10
3"	76,20	1,023	1,542	2,053	3,083	4,11 3	5,143	6,173	8,2 2 6	10,279	12,33 9
3.1/4"	82,55	1,109	1,670	2,2 24	3,340	4,456	5,571	6,687	8,911	11,1 36	13,367
3.1/2"	88,90	1,194	1,798	2,395	3,597	4,798	6,000	7,201	9,597	11,992	14,395
3.3/4"	95,25	1,279	1,927	2,567	3,854	5,141	6,428	7,716	10,282	12,849	15,423
4"	10 1,60	1,364	2,055	2,738	4,111	5,484	6,857	8,2 30	10,968	13,705	16,452
4.1/2 "	114,30	1,535	2,3 12	3,080	4,62 5	6,169	7,71 4	9,2 59	12,3 39	15,418	18,508
5"	1 2 7,00	1,706	2,569	3,422	5,1 38	6,855	8,571	10,288	13,710	17,1 32	20,564
5.1/2 "	139,70	1,876	2,826	3,764	5,652	7,540	9,428	11,3 16	15,081	18,845	2 2,621
6"	152,40	2,047	3,083	4,10 6	6,166	8,226	10,285	12,345	16,452	20,558	24,677

PIPES - WEIGHT PER LINEAR METER

part 1/2

Outside Diameter		Wall Thickness				
In.	Mm	1/32” 0,79mm	1,00mm	1/16” 1,58mm	3/32” 2,38mm	1/18” 3,17mm
1/8"	3,17	0,050	0,058	---	---	---
5/32"	3,97	0,067	0,079	0,101	---	---
3/16"	4,76	0,084	0,100	0,134	---	---
1/4"	6,35	0,117	0,143	0,201	0,252	---
5/16"	7,94	0,151	0,185	0,268	0,353	0,404
3/8"	9,53	0,184	0,228	0,335	0,454	0,538
7/16"	11, 11	0,218	0,270	0,402	0,555	0,672
1/2"	12,70	0,251	0,312	0,469	0,656	0,807
9/16"	14,28	0,285	0,355	0,536	0,756	0,940
5/8"	15,87	0,318	0,397	0,603	0,857	1,075
3/4"	19,05	0,385	0,482	0,737	1,059	1,344
7/8"	22,22	0,452	0,567	0,871	1,261	1,613
1"	25,40	0,519	0,652	1,005	1,463	1,882
1.1/8"	28,57	0,586	0,736	1,139	1,664	2,150

Outside Diameter		Wall Thickness				
In.	Mm	1/32” 0,79mm	1,00mm	1/16” 1,58mm	3/32” 2,38mm	1/18” 3,17mm
1.1/4"	31,75	0,653	0,821	1,273	1,867	2,419
1.3/8"	34,92	0,720	0,906	1,407	2,068	2,688
1.1/2"	38,10	0,787	0,991	1,541	2,270	2,957
1.5/8"	41,27	0,854	1,075	1,675	2,472	3,225
1.3/4"	44,45	0,921	1,160	1,809	2,674	3,494
1.7/8"	47,62	0,988	1,245	1,943	2,875	3,763
2"	50,80	1,055	1,330	2,077	3,077	4,032
2.1/8"	53,97	1,122	1,414	2,210	3,279	4,300
2.1/4"	57,15	1,189	1,499	2,345	3,481	4,569
2.3/8"	60,33	1,256	1,584	2,479	3,683	4,839
2.1/2"	63,50	1,323	1,669	2,613	3,884	5,107
2.5/8"	66,67	1,390	1,754	2,746	4,086	5,375
2.3/4"	69,85	1,457	1,839	2,880	4,288	5,644
3"	76,20	1,591	2,008	3,148	4,692	6,182

PIPES - WEIGHT PER LINEAR METER

part 2/2

Outside Diameter		Wall Thickness				
In.	Mm	1/32” 0,79mm	1,00mm	1/16” 1,58mm	3/32” 2,38mm	1/18” 3,17mm
3.1/4"	82,55	---	---	3,416	5,095	6,720
3.1/2"	88,90	---	---	3,684	5,499	7,257
3.3/4"	95,25	---	---	3,952	5,902	7,795
4"	101,60	---	---	4,220	6,306	8,332
4.1/4"	107,95	---	---	4,488	6,709	8,870
4.1/2"	114,30	---	---	4,756	7,113	9,407
4.3/4"	120,65	---	---	5,024	7,517	9,945
5"	127,00	---	---	5,292	7,920	10,482

SHEETS - WEIGHT PER PIECE

(BWG)	Mm	1.200x 600mm	2.000x 1.000mm
---	25,40	155,45	431,80
---	22,22	135,99	377,74
---	19,05	116,59	323,85
---	15,87	97,12	269,79
---	12,70	77,72	215,90
---	9,52	58,26	161,84
---	7,93	48,53	134,81
---	6,35	38,86	107,95
---	4,76	29,13	80,92
---	3,97	24,30	67,49
10	3,40	20,81	57,80
---	3,17	19,40	53,89
11	3,04	18,60	51,68
12	2,77	16,95	47,09
13	2,41	14,75	40,97
14	2, 11	12,91	35,87

(BWG)	Mm	1.200x 600mm	2.000x 1.000mm
15	1,83	11,20	31, 11
16	1,65	10,10	28,05
17	1,47	9,00	24,99
18	1,24	7,59	21,08
19	1,07	6,55	18,19
20	0,89	5,45	15,13
21	0,81	4,96	13,77
22	0,71	4,35	12,07
23	0,64	3,92	10,88
24	0,56	3,43	9,52
25	0,51	3,12	8,67
26	0,46	2,82	---
27	0,41	2,51	---
28	0,36	2,20	---
30	0,30	1,84	---

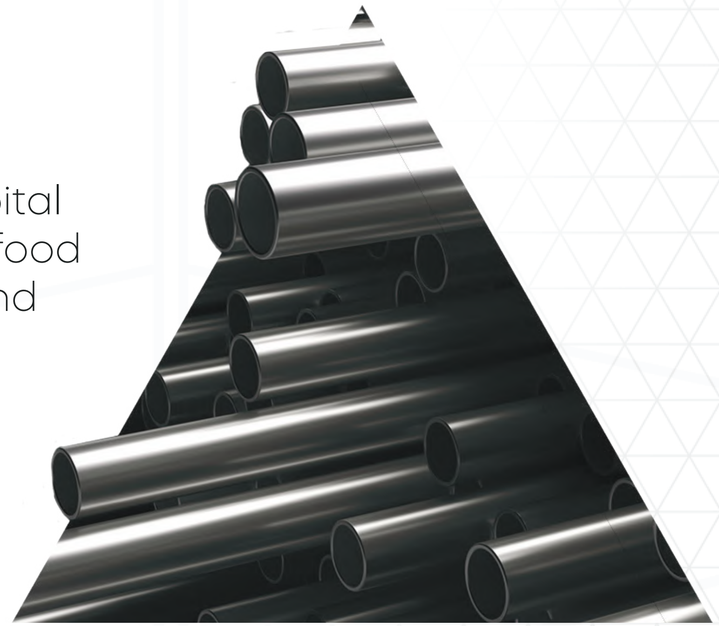

stainless
steel

Stainless Steel

Stainless steel is an alloy of iron and chromium that may also contain nickel, molybdenum, and other elements, with physicochemical properties superior to those of ordinary steels. Its main characteristic is the oxidation resistance. Some of its other characteristics are:

- Resistance to high temperatures;
- Easy cleaning;
- Hygienic material;
- Highly resistance to corrosion;
- Durability;
- 100% recyclable.

The main markets that use stainless steels are: Household utensils; hospital equipment, production of vehicle parts such as exhausts; construction; food industry, chemical and petroleum industry; and the sector of facades and visual signs.



THE CHEMICAL AND MECHANICAL COMPOSITION

	AISI	ASTM (UNS0)	DIN	DIN EQUIVALENTS	C	Mn	Si	P	S	Cr	Ni	Mo	N2	Others	Tensile Strength (Mpa)	Yield Strength (Mpa)	Elongation 50mm(%)	HBR[3] HARD-NESS
AUSTENITIC	301	S30100	14,310	X12 Cr Ni 17 7	0.15	2.00	1.0	0.045	0.03	16,0 a 18,0	6,0 a 8,0	-	0.10	-	750	250	40	95
	304	S30400	14,301	X5 Cr Ni 18 9	0.07	2.00	0.75	0.045	0.03	17,5 a 19,5	8,0 a 10,5	-	0.10	-	700	300	54	92
	304	S30400	14,301	X5 Cr Ni 18 9	0.07	2.00	0.75	0.045	0.03	17,5 a 19,5	8,0 a 10,5	-	0.10	-	600	280	58	92
	304L	S30403	14,307	X2 Cr Ni 18 9	0.03	2.00	0.75	0.045	0.03	17,5 a 19,5	8,0 a 12,0	-	0.10	-	600	240	45	92
	304H	S30409	-	X5 Cr Ni 18 9	0,04 a 0,10	2.00	0.75	0.045	0.03	18,0 a 20,0	8,0 a 10,5	-	-	-	530	240	50	92
	310S	S31008	14,845	X8 Cr Ni 25 21	0.08	2.00	1.5	0.045	0.03	24,0 a 26,0	19,0 a 22,0	-	-	-	515	205	40	95
	316	S31600	14,401	X5 Cr Ni Mo 18 10	0.08	2.00	0.75	0.045	0.03	16,0 a 18,0	10,0 a 14,0	2,0 a 3,0	0.10	-	620	300	52	95
	316L	S31603	14,404	X5 Cr Ni Mo 18 10	0.03	2.00	0.75	0.045	0.03	16,0 a 18,0	10,0 a 14,0	2,0 a 3,0	0.10	-	530	260	45	95
	321	S32100	14,541	X10 Cr Ni Ti 18 9	0.08	2.00	0.75	0.045	0.03	17,0 a 19,0	9,0 a 12,0	-	0.10	5(C+N2)≤Ti≤ 0,70	530	240	40	95
	317L	S31703	-	X2 Cr Ni Mo 18 15 4	0.03	2.00	0.75	0.045	0.03	18,0 a 20,0	11,0 a 15,0	3,0 a 4,0	0.1	-	5515	205	40	95
	347/347H	S34709	-	X10 Cr Ni Mb 18 9	0,04 a 0,10	2.00	0.75	0.045	0.03	17 a 19,0	9,0 a 13,0	-	-	Nb 8xC min. 1,00 máx.	515	205	40	92
FERRITIC	-	S41003	14,003	-	0.03	1.50	1.0	0.04	0.03	10,5 a 12,5	1.5	-	0.03	-	455	275	18	20 HRC
	409	S40910	14,512	X2 Cr Ti 12	0.03	1.00	1.0	0.04	0.02	10,50 a 11,7	0.50	-	0.030	6(C+N2)≤ Ti≤0,50	330	200	32	88
	430	S43003	14,016	X6 Cr 17	0.12	1.00	1.0	0.04	0.03	16,0 a 18,0	0.75	-	-	-	450	250	22	89
	-	S43000	14,016	-	0.12	1.00	1.0	0.04	0.03	16,0 a 18,0	0.75	-	-	Nb = 0,60 máx.	450	250	28	89
	-	S43932	-	-	0.03	1.00	1.0	0.04	0.03	17,0 a 19,0	0.50	-	0.030	0,20 + 4(C+N2) ≤ Ti + Nb ≤ 0,75	420	240	28	89
	-	-	14,509	-	0.03	1.00	1.0	0.04	0.015	17,5 a 18,5	0.50	-	0.030	3C + 0,30 ≤ Nb ≤ 1,00 Ti= 0,10 a 0,60	440	250	20	0
	-	S44400	-	-	0.025	1.00	1.0	0.04	0.03	17,5 a 19,5	1.00	1,75 a 2,50	0.035	0,20 + 4(C+N2) ≤ Ti + Nb ≤ 0,80	490	337	32	96
MAR-TENSIT-IC	420	S42000	-	-	0,15 Min.	1.00	1.0	0.04	0.03	12,0 a 14,0	0.75	0.50	-		530	300	20	96
	-	-	14,116	-	0,42 a 0,47	0.50	0,30 a 0,70	0.035	0.006	14,0 a 14,5	-	0,50 a 0,55	0,020 a 0,040	V = 0,10 a 0,20	0	0	0	0
DUPLEX	-	S32304	14,362	-	0.03	2.50	1.0	0.04	0.03	21,5 a 24,5	3,0 a 5,5	0,05 a 0,6	0,05 a 0,020		600	400	25	32 HRC
	-	S32205/ S31803	14,462	-	0.03	2.00	1.0	0.03	0.02	22,0 a 23,0	4,5 a 6,5	3,0 a 3,50	0,14 a 0,20		655	450	25	31 HRC
	201	S20100	14,618	-	0.15	5,50 a 7,50	1.0	0.06	0.03	16,0 a 18,0	3,5 a 5.5	-	0.25		515	260	40	95

ROUND, SQUARE AND HEX ROUND BARS

parte 1/2

Gauge		Kg/m			Gauge		Kg/m		
In.	mm	●	■	⬢	In.	mm	●	■	⬢
1/8	3,17	0,062	-	-	1		3,97	5,06	4,38
5/32	3,97	0,097	-	-	1.1/16		4,49	5,71	4,95
3/16	4,76	0,140	0,18	0,15	1.1/8		5,03	6,4	5,55
1/4	6,35	0,25	0,32	0,27	1.3/16		5,60	7,14	6,18
5/196	7,94	0,39	0,49	0,43	1.1/4	31,75	6,21	7,91	6,85
3/8	9,53	0,56	0,71	0,62	1.5/16		6,85	8,72	7,55
7/16	11,11	0,76	0,97	0,84	1.3/16		7,51	9,57	8,29
1/2	12,7	0,99	1,22	1,10	1.7/16		8,21	10,46	9,06
9/16	14,29	1,26	1,60	1,39	1.1/2		8,94	11,39	9,86
5/8	15,87	1,55	1,98	1,71	1.9/16		9,70	12,35	10,7
11/16	17,46	1,88	2,36	2,07	1.5/8		10,49	13,36	11,57
3/4	19,05	2,24	2,85	2,46	1.11/16		11,32	14,41	12,48
13/16	20,64	2,62	3,34	2,89	1.3/4		12,17	15,5	13,42
7/8	22,22	3,04	3,87	3,35	1.13/16		13,06	16,62	14,4
15/16	23,81	3,49	4,45	3,85	1.7/8		13,97	17,79	15,41

Gauge		Kg/m		
In.	mm	●	■	⬢
1.15/16	49,21	14,92	18,99	16,45
2	50,8	15,9	20,24	17,53
2.1/16	53,39	16,91	21,52	18,64
2.1/8	53,97	17,95	22,85	19,79
2.3/16	55,56	19,02	24,21	20,97
2.1/4	57,15	20,12	25,62	22,19
2.6/16	58,74	21,25	27,06	23,44
2.3/8	60,32	22,42	28,54	24,72
2.7/16	61,91	23,61	30,06	26,03
2.1/2	63,50	24,84	31,62	27,38
2.9/16	65,09	26,10	33,22	28,78
2.5/8	66,67	27,38	34,87	30,79
2.11/16	68,26	28,70	36,55	31,67
2.3/4	69,85	30,05	38,27	33,14
2.13/16	71,44	31,44	40,02	34,22

Gauge		Kg/m		
In.	mm	●	■	⬢
2.7/8	73,02	32,85	41,82	36,22
2.15/16	74,61	34,29	43,66	37,81
3	76,20	35,77	45,54	39,43
3.1/8	79,38	38,81	49,41	42,79
3.1/4	82,55	41,88	53,44	46,34
3.3/8	85,73	42,27	57,63	49,98
3.1/2	88,90	48,68	61,98	53,74
3.5/8	92,08	52,22	66,49	-
3.3/4	95,25	55,88	71,15	-
3.7/8	94,43	60,67	75,98	-
4	101,6	63,58	80,96	-
4.1/8	104,78	67,62	86,10	-

ROUND, SQUARE AND HEX ROUND BARS

parte 2/2

Gauge		Kg/m		
In.	mm	●	■	⬢
4.1/4	107,95	71,78	91,39	-
4.3/8	111,13	76,06	96,85	-
4.1/2	114,30	80,47	102,46	-
4.5/8	117,48	85,01	108,23	-
4.3/4	120,65	89,66	114,16	-
4.7/8	123,83	94,44	120,25	-
5	127,00	99,80	126,50	-
5.1/4	133,35	109,50	139,50	-
5.1/2	139,70	120,20	153,10	-
5.3/4	146,05	131,40	167,20	-
6	152,40	143,10	182,50	-
6.1/4	158,75	155,20	197,80	-
6.1/2	165,10	167,90	213,50	-
6.3/4	171,45	181,10	231,00	-
7	177,80	194,70	284,10	-

Gauge		Kg/m		
In.	mm	●	■	⬢
7.1/4	184,15	209,70	266,20	-
7.1/2	190,50	223,80	285,00	-
7.3/4	196,85	238,90	304,00	-
8	203,20	254,60	324,00	-
8.1/4	209,55	270,70	345,00	-
8.1/2	215,90	287,40	365,90	-
8.3/4	222,25	304,60	388,50	-
9	228,60	322,10	410,20	-
9.1/4	234,95	340,30	433,50	-
9.1/2	241,30	359,00	457,10	-
9.3/4	247,65	378,10	481,40	-
10	254,00	397,80	506,50	-
10.1/4	260,35	417,90	532,00	-
10.1/2	266,70	438,50	558,40	-
10.3/4	273,05	459,70	585,30	-

Gauge		Kg/m		
In.	mm	●	■	⬢
11	279,40	481,20	612,80	-
11.1/4	285,75	503,40	641,00	-
11.1/2	292,70	526,00	669,80	-
11.3/4	298,45	549,00	699,20	-
12	304,80	572,70	729,30	-
12.1/2	317,50	620,90	790,60	-
13	330,20	672,60	355,80	-
13.1/2	342,90	724,30	922,20	-
14	355,60	779,70	992,60	-
14.1/2	368,30	835,50	1063,80	-
15	381,00	894,90	1139,50	-
15.1/2	393,70	954,70	1215,60	-
16	406,50	1017,30	1295,30	-
17	431,80	1148,60	1462,30	-
18	457,20	1287,60	1639,40	-

Gauge		Kg/m		
In.	mm	●	■	⬢
19	482,60	1434,60	1826,60	-
20	508,00	1589,50	2023,90	-
21	533,40	1752,61	2230,60	-
22	558,80	1932,50	2448,09	-
23	584,20	2102,34	2675,71	-
24	609,60	2289,13	2913,43	-
25	635,00	2483,86	3161,28	-
26	660,40	2686,54	3419,24	-
27	685,80	2897,18	3687,32	-
28	711,20	3115,76	3965,51	-
29	736,60	3342,29	4253,82	-
30	762,00	3576,76	4552,24	-

ANGLES BRACKETS

parte 1/1

Gauge	Kg/m
1/8" x 3/4"	0,86
1/8" x 1"	1,27
1/8" x 1.1/4"	1,52
1/8" x 1.1/2"	1,83
1/8" x 2"	2,46
3/16" x 1"	1,73
3/16" x 1.1/4"	2,19
3/16" x 1.1/2"	2,66
3/16" x 2"	3,63
3/16" x 2.1/2"	4,57
1/4" x 1"	2,24

Gauge	Kg/m
1/4" x 1.1/4"	2,86
1/4" x 1.1/2"	3,48
1/4" x 2"	4,75
1/4" x 2.1/2"	6,10
1/4" x 3"	7,29
5/16" x 2"	5,83
5/16" x 3"	8,99
3/8" x 2"	6,99
3/8" x 2.1/2"	8,78
3/8" x 3"	10,69
3/8" x 4"	14,41

RECTANGULAR BARS

parte 1/1

Gauge	Kg/m
1/8" x 3/4"	0,47
1/8" x 1"	0,63
1/8" x 1.1/4"	0,79
1/8" x 1.1/2"	0,94
1/8" x 2"	1,26
1/8" x 3"	1,90
1/8" x 4"	2,54
3/16" x 3/4"	0,71
3/16" x 1"	0,94
3/16" x 1.1/4"	1,18
3/16" x 1.1/2"	1,42
3/16" x 2"	1,89
3/16" x 3"	2,85
3/16" x 4"	3,80
1/4" x 3/4"	0,94
1/4" x 1"	1,26
1/4" x 1.1/4"	1,58

Gauge	Kg/m
1/4" x 1.1/2"	1,89
1/4" x 2"	2,53
1/4" x 2.1/2"	3,16
1/4" x 3"	3,79
1/4" x 4"	5,06
5/16" x 3/4"	1,20
5/16" x 1"	1,58
5/16" x 1.1/4"	1,97
5/16" x 1.1/2"	2,37
5/16" x 2"	3,16
5/16" x 2.1/2"	4,00
5/16" x 3"	4,80
5/16" x 4"	6,33
3/8" x 3/4"	1,42
3/8" x 1"	1,98
3/8" x 1.1/4"	2,37
3/8" x 1.1/2"	2,84

Gauge	Kg/m
3/8" x 2"	3,79
3/8" x 2.1/2"	4,74
3/8" x 3"	5,69
3/8" x 4"	7,60
1/2" x 3/4"	1,90
1/2" x 1"	2,53
1/2" x 1.1/4"	3,16
1/2" x 1.1/2"	3,79
1/2" x 1.3/4"	4,42
1/2" x 2"	5,06
1/2" x 2.1/2"	6,32
1/2" x 3"	7,59
1/2" x 4"	10,10
5/8" x 1"	3,16
5/8" x 1.1/4"	3,95
5/8" x 1.1/2"	4,74
5/8" x 2"	6,32

Gauge	Kg/m
5/8" x 2.1/2"	7,91
5/8" x 3"	9,48
5/8" x 4"	12,65
3/4" x 1"	3,80
3/4" x 1.1/4"	4,75
3/4" x 1.1/2"	5,70
3/4" x 2"	7,59
3/4" x 2.1/2"	9,48
3/4" x 3"	11,58
3/4" x 4"	15,18
1" x 1.1/2"	7,59
1" x 1.3/4"	8,86
1" x 2"	10,12
1" x 2.1/2"	12,65
1" x 3"	15,18
1" x 4"	20,24
1.1/4" x 2"	12,65

Gauge	Kg/m
1.1/4" x 3"	18,87
1.1/4" x 4"	23,30
1.1/2" x 4"	15,20
1.1/2" x 2"	22,80
1.1/2" x 3"	30,40
2" x 3"	30,30

SHEET

parte 1/3

Thickness		Weight per m²	Theoretical weight per sheets				
Nº (USG)	mm		2 x 1 m	2 x 1,2 m	3 x 1 m	3 x 1,2 m	3 x 1,5 m
-	50,80	406,40	812,80	975,36	1219,20	1463,04	1828,8
-	44,45	355,60	711,20	853,44	1066,80	1280,16	1600,20
-	38,10	304,80	609,60	731,52	914,40	1097,28	1371,60
-	31,75	254,00	508,00	609,60	762,00	914,40	1143,00
-	25,40	202,27	405,00	486,00	607,00	728,00	910,00
-	22,22	176,99	354,00	425,00	531,00	637,00	796,00
-	19,05	152,40	304,80	365,76	457,20	548,64	685,80
-	15,87	136,43	273,00	327,00	410,00	491,00	614,00
-	12,70	101,13	203,00	243,00	304,00	364,00	455,00
-	11,11	88,49	177,00	212,00	566,00	318,00	398,00
-	9,53	75,84	152,00	182,00	228,00	273,00	341,00
-	7,93	63,20	127,00	152,00	190,00	227,00	284,00
3	6,35	53,50	107,00	128,00	161,00	192,00	240,00
5	5,66	44,24	89,00	106,00	133,00	159,00	199,00
7	4,76	37,92	76,00	91,00	114,00	136,00	170,00

SHEET

parte 2/3

Thickness		Weight per m²	Theoretical weight per sheets				
Nº (USG)	mm		2 x 1 m	2 x 1,2 m	3 x 1 m	3 x 1,2 m	3 x 1,5 m
8	4,37	35,32	71,00	85,00	106,00	127,00	159,00
9	3,97	32,10	65,00	77,00	97,00	115,00	144,00
10	3,57	28,90	58,00	69,00	86,00	104,00	130,00
11	3,18	25,66	52,00	62,00	77,00	92,00	115,00
12	2,78	22,48	45,00	54,00	67,00	81,00	101,00
13	2,37	19,27	38,00	46,00	57,00	69,00	86,00
14	1,98	15,80	32,00	38,00	48,00	57,00	71,00
15	1,79	14,44	29,00	35,00	43,00	52,00	65,00
16	1,56	12,24	25,00	30,00	37,00	44,00	55,00
17	1,43	11,56	23,00	28,00	35,00	41,00	52,00
18	1,27	10,27	20,50	25,00	30,80	36,90	46,00
19	1,11	8,99	18,00	22,00	27,00	32,30	40,00
20	0,95	7,71	15,40	18,00	23,10	27,70	34,60
21	0,87	7,06	14,10	17,00	21,20	25,40	31,70
22	0,79	6,42	12,80	15,00	19,30	23,10	27,90

SHEET

parte 3/3

Thickness		Weight per m²	Theoretical weight per sheets				
Nº (USG)	mm		2 x 1 m	2 x 1,2 m	3 x 1 m	3 x 1,2 m	3 x 1,5 m
23	0,71	5,77	11,60	14,00	17,30	20,70	25,90
24	0,64	5,14	10,30	12,00	15,40	18,50	23,10
25	0,56	4,49	9,00	11,00	13,50	16,20	20,20
26	0,46	3,85	7,70	9,00	11,60	13,90	17,30
27	0,44	3,63	7,00	8,70	10,60	13,10	16,30
28	0,40	3,20	6,40	7,70	9,60	11,50	14,40

SQUARE AND RECTANGULAR PIPES

parte 1/2

Outer Measurements (mm)		Wall Thickness - mm							
Squares	**Rectangular**	1,0	1,2	1,5	2,0	2,5	2,8	3,8	3,5
15 x 15	10 x 20	0,5	0,6	0,7	-	-	-	-	-
20 x 20	15 x 25	0,6	0,7	0,9	1,2	-	-	-	-
25 x 25	15 x 35	0,8	0,9	1,1	1,5	1,8	-	-	-
	20 x 30								
-	20 x 35	0,8	1,0	1,2	1,6	2,0	2,1	2,4	-
30x 30	20 x 40	0,9	1,1	1,4	1,8	2,2	2,4	2,6	-
	25 x 35								
35 x 35	20 x 50	1,1	1,3	1,6	2,1	2,6	2,8	3,1	-
	30 x 40								
-	25 x 50	1,2	1,4	1,7	2,3	2,8	3,0	3,3	-
	30 x 50	1,2	1,5	1,8	2,4	3,0	3,3	3,5	-
40 x 40	20 x 70	1,4	1,7	2,1	2,7	3,4	3,0	4,0	-
	30 x 60								
	40 x 50								

SQUARE AND RECTANGULAR PIPES

parte 2/2

Outer Measurements (mm)		Wall Thickness - mm							
Squares	Rectangular								
-	25 x 70	1,5	1,8	2,2	2,9	3,6	3,7	4,2	4,9
	35 x 60								
50x 50	30 x 70	-	1,8	2,3	3,0	3,8	4,1	4,5	5,2
	30 x 90								
60 x 60	40 x 80	-	2,2	2,8	3,7	4,5	5,0	5,4	6,3
	50 x 70								
	40 x 100								
70 x 70	50 x 90	-	2,6	3,2	4,3	5,3	6,0	6,4	7,6
	60 x 80								
80 x 80	60 x 100	-	3,0	3,7	4,9	6,1	6,8	7,4	8,7
-	100 x 50	-	-	3,5	4,7	5,8	-	7,0	-
90 x 90	100 x 80	-	-	-	5,6	7,0	-	8,4	-
100 x 100	120 x 80	-	-	-	6,3	7,8	-	9,4	-


carbon
steel

Carbon Steel (Ferrous)

Carbon steel can vary in terms of the content of this element, which directly implies its functions as a raw material. It is subdivided as below for different applications. Check it out:

Low carbon: Up to 0.30% carbon in composition.

It has low strength and hardness, high toughness and ductility, and its is machinable and weldable with low production cost.

Applications: automotive metal sheets, structural profiles, plates for pipe production, construction, bridges and tinplate sheets.

Medium carbon: From 0.30% to 0.60% carbon in composition

Higher strength and hardness, lower toughness and ductility than low carbon.
They present a quantity of carbon that allows them to receive tempering and annealing heat treatment.

Applications: wheels and railway equipment, gears, crankshafts, and other machinery parts that require high mechanical and wear resistance and toughness.

High carbon: From 0.60% to 1% carbon in composition

It has higher strength and hardness and lower ductility among carbon steels. They are most often tempered or annealed.

Applications: chisels, saw blades, hammers and knives.

ALLOYS AND SHAPES

parte 1/2

Shape	Alloys	Finishing
Coil	SAE-1006 a 1045, EM, EP, EEP, LN28, LNE26, LNE38, entre otros	Cold rolling
Coil	SAE-1006 a 1045, EM, EP, EEP, LN28, LNE26, LNE38, entre otros	Hot rolling
Sheets	A36, A283C, A285C, A516G 60/70, CO-AR-COR 500, COSAR 50/60, SAC-50, SAR-60, RST-37.2, RTS-52-3, COMERCIAL, entre otros	Cold rolling
Sheets	A36, A283C, A285C, A516G 60/70, CO-AR-COR 500, COSAR 50/60, SAC-50, SAR-60, RST-37.2, RTS-52-3, COMERCIAL, entre otros	Hot rolling
Checkered coil	A36, A283C, A285C, A516G 60/70, CO-AR-COR 500, COSAR 50/60 SAC-50, SAR-60, RST-37.2, RTS-52-3, COMERCIAL, entre otros	
Checkered coil	A36, A283C, A285C, A516G 60/70, CO-AR-COR 500, COSAR 50/60, SAC-50, SAR-60, RST-37.2, RTS-52-3, COMERCIAL, entre otros	
Thick sheet	A36, A283C, A285C, A516G 60/70, CO-AR-COR 500, COSAR 50/60, SAC-50, SAR-60, RST-37.2, RTS-52-3, COMERCIAL, entre otros	
Angle plate	A36 e ASTM A572 G50 ou G60	
Profile w	ASTM A572 GRAU 50	
Profile i / u	A36 / ASTM A572	
Round bar	SAE 5160	Rolled/drawn
Round bar	SAE 1020 / SAE 1045 / SAE 1060 / SAE 4140 / SAE 4340 / SAE 8620	Rolled/drawn

ALLOYS AND SHAPES

parte 2/2

Shape	Alloys	Finishing
Square bar	SAE 1020 / SAE 1045 / SAE 1060 / SAE 4140 / SAE 4340 / SAE 8620	Laminada/Trefilada
Hex bar	SAE 1020 / SAE 1045 / SAE 1060 / SAE 4140 / SAE 4340 / SAE 8620	Laminada/Trefilada
Flat bar	ASTM A36 / SAE 1020 / SAE 1045	
Tube	API 5L / NBR 5580 (DIN2440) / NBR 5590/ NBR 6591 / ASTM A-53 / ASTM A-106 / ASTM A-333 / ASTM A 178 Grau A / ASTM A 135 / ASTM A 214 (NBR 5585)	Con soldadura
Tube	API 5L / NBR 5580 (DIN2440) / NBR 5590/ NBR 6591 / ASTM A-53 / ASTM A-106 / ASTM A-333 / ASTM A 178 Grau A / ASTM A 135 / ASTM A 214 (NBR 5585)	Sin soldadura

CHEMICAL PROPERTIES

parte 1/6

Standard	Steel	Chemical Composition %								
		C	Mn	P. máx	S. Máx	Si	Ni	Cr	Mo	Cu
5590 (ASTM A53)	GrA	Máx 0,25	Máx 0,95	0.05	0.045	-	Máx 0,40	Máx 0,40	0.15	Máx 0,40
	GrB	Máx 0,30	Máx 1,20	0.05	0.045	-	Máx 0,40	Máx 0,40	0.15	Máx 0,40
A 106	GrA	Máx 0,25	0,27/0,93	0.035	0.035	-	Máx 0,40	Máx 0,40	0.15	Máx 0,40
	GrB	Máx 0,30	0,29/1,06	0.035	0.035	Mín 0,10	Máx 0,40	Máx 0,40	0.15	Máx 0,40
	GrC	Máx 0,35	0,29/1,06	0.035	0.035	Mín 0,10	Máx 0,40	Máx 0,40	0.15	Máx 0,40
A 161	GrLC	0,10/0,20	0,30/0,80	0.035	0.035	Mín 0,10	-	-	-	-
	GrT1	0,10/0,20	0,30/0,80	0.025	0.025	Máx 0,25	-	-	0,44/0,65	-
A 178	GrA	0,06/0,18	0,27/0,63	0.035	0.035	0,10/0,50	-	-	-	-
	GrC	Máx 0,35	Máx 0,80	0.035	0.035	-	-	-	-	-
	SAC 50	Máx 0,18	Máx 1,40	0.03	0.015	-	-	-	-	-
A 179	A 179	0,06/0,18	0,27/0,63	0.035	0.035	Mín 0,10	-	-	-	-
A 192	A 192	0,06/0,18	0,27/0,63	0.035	0.035	-	-	-	-	-
A 199/200	GrT5	Máx 0,15	0,30/0,60	0.025	0.025	Máx 0,25	-	4,00/6,00	0,45/0,65	-
	GrT11	0,05/0,15	0,30/0,60	0.025	0.025	Máx 0,50	-	1,00/1,50	0,44/0,65	-
	GrT22	0,05/0,15	0,30/0,60	0.025	0.025	0,50/1,00	-	1,90/2,60	0,87/1,13	-

CHEMICAL PROPERTIES

parte 2/6

Standard	Steel	Chemical Composition %								
		C	Mn	P. máx	S. Máx	Si	Ni	Cr	Mo	Cu
A 209	GrT1	0,10/0,20	0,30/0,80	0.025	0.025	Máx 0,50	-	-	0,44/0,65	-
	GrT1a	0,15/0,25	0,30/0,80	0.025	0.025	0,10/0,50	-	-	0,44/0,65	-
	GrT1b	Máx 0,14	0,30/0,80	0.025	0.025	0,10/0,50	-	-	0,44/0,65	-
A 210	GrA1	Máx 0,27	Máx 0,93	0.035	0.035	0,10/0,50	-	-	-	-
	GrC	Máx 0,35	0,29/1,06	0.035	0.035	Mín 0,10	-	-	-	-
A 213	GrT2	0,10/0,20	0,30/0,61	0.025	0.025	Mín 0,10	-	0,50/0,81	0,44/0,65	-
	GrT5	Máx 0,15	0,30/0,60	0.025	0.025	0,10/0,30	-	4,00/6,00	0,45/0,65	-
	GrT11	0,05/0,15	0,30/0,60	0.025	0.025	Máx 0,50	-	1,00/1,50	0,44/0,65	-
	GrT12	0,05/0,15	0,30/0,60	0.025	0.025	0,50/1,00	-	0,80/1,25	0,44/0,65	-
	GrT22	0,05/0,15	0,30/0,60	0.025	0.025	Máx 0,50	-	1,90/2,60	0,87/1,13	-
A 214	A 214	Máx 0,18	0,27/0,63	0.035	0.035	Máx 0,50	-	-	-	-
A 226	A 226	0,06/0,18	0,27/0,63	0.035	0.035	-	-	-	-	-
A 333/334	Gr1	Máx 0,30	0,40/1,06	0.025	0.025	Máx 0,25	-	-	-	-
	Gr3	Máx 0,19	0,31/0,64	0.025	0.025	-	3,18/3,82	-	-	-
	Gr6	Máx 0,30	0,29/1,06	0.025	0.025	0,18/0,37	-	-	-	-
	Gr7	Máx 0,19	Máx 0,90	0.025	0.025	Mín 0,10	2,03/2,57	-	-	-

CHEMICAL PROPERTIES

parte 3/6

Standard	Steel	Chemical Composition %								
		C	Mn	P. máx	S. Máx	Si	Ni	Cr	Mo	Cu
A 335	GrP1	0,10/0,20	0,30/0,80	0.025	0.025	0,13/0,32	-	-	0,44/0,65	-
	GrP2	0,10/0,20	0,30/0,61	0.025	0.025	0,10/0,50	-	0,50/0,81	0,44/0,65	-
	GrP5	Máx 0,15	0,30/0,60	0.025	0.025	0,10/0,30	-	4,00/6,00	0,45/0,65	-
	GrP11	0,05/0,15	0,30/0,60	0.025	0.025	Máx 0,50	-	1,00/1,50	0,44/0,65	-
	GrP12	0,05/0,15	0,30/0,61	0.025	0.025	0,50/1,00	-	0,80/1,25	0,44/0,65	-
	GrP22	0,05/0,15	0,30/0,60	0.025	0.025	Máx 0,50	-	1,90/2,60	0,87/1,13	-
A 423	Gr1	Máx 0,15	Máx 0,55	0,06/0,16	0.06	Máx 0,50	0,20/0,70	0,24/1,31	-	0,20/0,60
	Gr2	Máx 0,15	0,50/1,00	0.04	0.05	Mín 0,10	0,40/1,10	-	Mín 0,10	0,30/1,00
A 500	GrA	Máx 0,30	-	0.05	0.063	-	-	-	-	Mín 0,18
	GrB	Máx 0,30	-	0.05	0.063	-	-	-	-	Mín 0,18
	GrC	Máx 0,27	Máx 1,40	0.05	0.063	-	-	-	-	Mín 0,18
A 501	A 501	Máx 0,30	-	0.05	0.063	-	-	-	-	-
DIN 1626	St 37.0	Máx 0,17	-	0.04	0.04	-	-	-	-	-

CHEMICAL PROPERTIES

parte 4/6

Standard	Steel	Chemical Composition %								
		C	Mn	P. máx	S. Máx	Si	Ni	Cr	Mo	Cu
DIN 1629	St 44.0	Máx 0,21	-	0.04	0.04	-	-	-	-	-
	St 52.0	Máx 0,22	Máx 1,60	0.04	0.035	-	-	-	-	-
DIN 2391	St 35.0	Máx 0,17	Mín 0,40	0.05	0.05	Máx 0,80	-	-	-	-
	St 45.0	Máx 0,21	Mín 0,40	0.05	0.05	Máx 0,35	-	-	-	-
	St 52.0	Máx 0,22	Máx 1,60	0.05	0.05	Máx 0,35	-	-	-	-
	VMec 134AP	Máx 0,22	Máx 1,60	0.04	0,010/0,030	Máx 0,55	-	-	-	-
DIN 2393	St 34.2	Máx 0,15	-	0.05	0.05	Máx 0,55	-	-	-	-
	St 37.2	Máx 0,18	-	0.05	0.05	-	-	-	-	-
	St 42.0	Máx 0,25	-	0.05	0.05	Máx 0,55	-	-	-	-
	St 52.3	Máx 0,22	Máx 1,60	0.05	0.05	-	-	-	-	-
DIN 17175	VMec 134AP	Máx 0,22	Máx 1,60	0.025	0.025	-	-	-	-	-
	St 35.8	Máx 0,17	0,40/0,80	0.04	0.04	Máx 0,55	-	-	-	-
	St 45.8	Máx 0,21	0,40/1,20	0.04	0.04	0,10/0,35	-	-	-	-

CHEMICAL PROPERTIES

parte 5/5

Standard	Steel	Chemical Composition %								
		C	Mn	P. máx	S. Máx	Si	Ni	Cr	Mo	Cu
DIN 17175	15Mo3	0,12/0,20	0,40/0,80	0.035	0.035	0,10/0,35	-	-	-	-
	13CrMo44	0,10/0,18	0,40/0,70	0.035	0.035	0,10/0,35	-	-	-	-
	10CrMo910	0,08/0,15	0,40/0,70	0.035	0.035	0,10/0,35	-	0,70/1,10	-	-
API 5L	GrA	Máx 0,22	Máx 0,90	0.04	0.05	Máx 0,50	-	2,00/2,50	-	-
	GrB	Máx 0,27	Máx 1,15	0.04	0.05	-	-	-	-	-
SAE 4140	-	Máx 0,38	Máx 0,75	0.03	0.04	Máx 0,15	-	Máx 0,80	Máx 0,15	-
	-	Máx 0,43	Máx 1,00			Mín 0,35	-	Mín 1,10	Mín 0,25	-
SAE 4340	-	Máx 0,38	Máx 0,60	0.03	0.04	Máx 0,15	Máx 1,65	Máx 0,70	Máx 0,20	-
	-	Máx 0,43	Máx 0,80			Mín 0,35	Mín 2,00	Mín 0,90	Mín 0,90	-
SAE 8620	-	Máx 0,18	Máx 0,70	0.03	0.04	Máx 0,15	Máx 0,40	Máx 0,40	Máx 0,15	-
	-	Máx 0,23	Máx 0,90			Mín 0,35	Mín 0,70	Mín 0,60	Mín 0,25	-
SAE 5160	-	Máx 0,56	Máx 0,75	0.03	0.04	Máx 0,15	-	Máx 0,70	-	-
	-	Máx 0,64	Máx 1,00			Mín 0,35	-	Mín 0,90	-	-

CHEMICAL PROPERTIES

parte 5/6

Standard	Steel	Chemical Composition %								
		C	Mn	P. máx	S. Máx	Si	Ni	Cr	Mo	Cu
SAE 1020	-	Máx 0,18	Máx 0,30	0.03	0.05	-	-	-	-	-
	-	Máx 0,23	Máx 0,60			-	-	-	-	-
SAE 1045	-	Máx 0,43	Máx 0,60	0.03	0.05	-	-	-	-	-
	-	Máx 0,50	Máx 0,90			-	-	-	-	-
SAE 1060	-	Máx 0,55	Máx 0,60	0.03	0.05	-	-	-	-	-
	-	Máx 0,65	Máx 0,90			-	-	-	-	-

MECHANICAL PROPERTIES

parte 1/5

Standard	Steel	Mechanical Properties		
		RT Mpa Mín.	Le Mpa Mín.	Hardness Max.
5590 (ASTM A53)	GrA	330	205	-
	GrB	415	240	-
A 106	GrA	330	205	-
	GrB	415	240	-
	GrC	485	275	-
A 161	GrLC	324	179	-
	GrT1	379	207	-
A 178	GrA	325	180	-
	GrC	415	255	-
	SAC 50	490/602	373	-
A 179	A 179	415	170	72HB
A 192	A 192	-	-	137HB
A 199/200	GrT5	415	170	163HB
	GrT11	415	170	163HB
	GrT22	415	170	163HB

MECHANICAL PROPERTIES

Standard	Steel	Mechanical Properties		
		RT Mpa Mín.	Le Mpa Mín.	Hardness Max.
A 209	GrT1	380	225	146HB
	GrT1a	415	220	153HB
	GrT1b	365	195	137HB
A 210	GrA1	415	255	143HB
	GrC	485	275	179HB
A 213	GrT2	415	205	163HB
	GrT5	415	205	179HB
	GrT11	415	205	163HB
	GrT12	415	205	163HB
	GrT22	415	205	163HB
A 214	A 214	-	-	72HB
A 226	A 226	325	180	125HB
A 333/334	Gr1	380	205	-
	Gr3	450	240	-

MECHANICAL PROPERTIES

Standard	Steel	Mechanical Properties		
		RT Mpa Mín.	Le Mpa Mín.	Hardness Max.
A 333/334	Gr6	415	240	-
	Gr7	450	240	-
A 335	GrP1	380	205	-
	GrP2	380	205	-
	GrP5	415	205	-
	GrP11	415	205	-
	GrP12	415	205	-
	GrP22	415	205	-
A 423	Gr1	415	255	170HB
	Gr2	415	255	170HB
A 500	GrA	310	228	-
	GrB	400	290	-
	GrC	427	317	-
A 501	A 501	400	250	-

MECHANICAL PROPERTIES

parte 4/5

Standard	Steel	Mechanical Properties		
		RT Mpa Mín.	Le Mpa Mín.	Hardness Max.
DIN 1626	St 37.0	350/480	253	-
DIN 1629	St 44.0	420/550	275	-
	St 52.0	500/650	355	-
DIN 2391	St 35.0	340/470	235	-
	St 45.0	440/570	255	-
	St 52.0	490/630	355	-
	VMec 134AP	510	345	-
DIN 2393	St 34.2	310/410	205	145
	St 37.2	340/470	235	-
	St 42.0	-	-	-
	St 52.3	490/630	355	-
DIN 17175	VMec 134AP	510	343	-
	St 35.8	360/480	235	145

MECHANICAL PROPERTIES

parte 5/5

Standard	Steel	Mechanical Properties		
		RT Mpa Mín.	Le Mpa Mín.	Hardness Max.
DIN 17175	St 45.8	410/530	255	-
	15Mo3	450/600	270	-
	13CrMo44	440/590	290	-
	10CrMo910	450/600	280	-
API 5L	GrA	331	207	-
	GrB	413	241	-
SAE 4140	-	655	415	197HB
SAE 4340	-	745	470	217HB
SAE 8620	-	1157	833	341HB
SAE 5160	-	724	275	219HB
SAE 1020	-	420	350	121 HB
SAE 1045	-	585	450	163HB
SAE 1060	-	620	485	183HB

BEAMS I AND H

parte 1/5

Gauge	"Linear Mass [kg/m]"	"Area A [cm²]"	Thickness						AXIS X - X			
			d [mm]	d [mm]	t_w [mm]	t_f [mm]	h mm	d' [mm]	I_x [cm⁴]	W_x [cm³]	r_x [cm]	Z_x [cm⁴]
W 150 x 13,0	13,0	16,6	148	100	4,3	4,9	138,2	118,20	635	86	6,18	96
W 150 x 18,4	18,4	23,4	153	102	5,8	7,1	138,8	118,80	939	123	6,34	139
W 150 x 22,5	22,5	29,0	152	152	5,8	6,6	139,0	119,00	1229	162	6,51	180
W 150 x 29,8	29,8	38,5	157	153	6,6	9,3	138,0	118,00	1739	222	6,72	248
W 150 x 37,1	37,1	47,8	162	154	8,1	11,6	139,0	119,00	2224	277	6,85	314
W 200 x 15,0	15,2	19,4	200	100	4,3	5,2	189,6	169,60	1305	130	8,20	148
W 200 x 19,3	19,7	25,1	203	102	5,8	6,5	190,0	170,00	1686	166	8,19	191
W 200 x 22,5	22,7	29,0	206	102	6,2	8,0	190,0	170,00	2029	197	8,37	226
W 200 x 26,6	26,9	34,2	207	133	5,8	8,4	190,2	170,20	2611	252	8,73	282
W 200 x 31,3	31,7	40,3	210	134	6,4	10,2	189,6	169,60	3168	302	8,86	339
W 200 x 35,9	35,9	45,7	201	165	6,2	10,2	181,0	161,00	3437	342	8,67	380

BEAMS I AND H

parte 2/5

Gauge	"Linear Mass [kg/m]"	"Area A [cm²]"	Thickness						AXIS X - X			
			d [mm]	d [mm]	t_w [mm]	t_f [mm]	h mm	d' [mm]	I_x [cm⁴]	W_x [cm³]	r_x [cm]	Z_x [cm⁴]
W 200 x 46,1	46,0	58,6	203	203	7,2	11,0	181,0	161,00	4543	448	8,81	495
W 250 x 17,9	18,1	23,1	251	101	4,8	5,3	240,4	220,40	2291	183	9,96	211
W 250 x 22,3	22,7	28,9	254	102	5,8	6,9	240,2	220,20	2939	231	10,09	268
W 250 x 25,3	25,6	32,6	257	102	6,1	8,4	240,2	220,20	3473	270	10,31	311
W 250 x 28,4	28,7	36,6	260	102	6,4	10,0	240,0	220,00	4046	311	10,51	357
W 250 x 32,7	33,0	42,1	258	146	6,1	9,1	239,8	219,80	4937	383	10,83	429
W 250 x 38,5	38,9	49,6	262	147	6,6	11,2	239,6	219,60	6057	462	11,05	518
W 250 x 44,8	45,2	57,6	266	148	7,6	13,0	240,0	220,00	7158	538	11,15	606
W 250 x 73,0	72,8	92,7	253	254	8,6	14,2	224,6	200,60	11257	890	11,02	983
W 250 x 80,0	80,0	101,9	256	255	9,4	15,6	224,8	200,80	12550	980	11,10	1089
W 250 x 89,0	89,4	113,9	260	256	10,7	17,3	225,4	201,40	14237	1095	11,18	1224
W 310 x 21,0	21,4	27,2	303	101	5,1	5,7	291,6	271,60	3776	249	11,77	292
W 310 x 23,8	24,1	30,7	305	101	5,6	6,7	291,6	271,60	4346	285	11,89	333

BEAMS I AND H

parte 3/5

Gauge	"Linear Mass [kg/m]"	"Area A [cm²]"	Thickness						AXIS X - X			
			d [mm]	d [mm]	t_w [mm]	t_f [mm]	h mm	d' [mm]	I_x [cm⁴]	W_x [cm³]	r_x [cm]	Z_x [cm⁴]
W 310 x 28,3	28,6	36,5	309	102	6,0	8,9	291,2	271,20	5500	356	12,28	412
W 310 x 32,7	33,1	42,1	313	102	6,6	10,8	291,4	271,40	6570	420	12,49	485
W 310 x 38,7	39,0	49,7	310	165	5,8	9,7	290,6	270,60	8581	554	13,14	615
W 310 x 44,5	44,9	57,2	313	166	6,6	11,2	290,6	270,60	9997	639	13,22	713
W 310 x 52,0	52,6	67,0	317	167	7,6	13,2	290,6	270,60	11909	751	13,33	842
W 310 x 97,0	97,0	123,6	308	305	9,9	15,4	277,2	245,20	22284	1447	13,43	1594
W 310 x 107,0	107,1	136,4	311	306	10,9	17,0	277,0	245,00	24839	1597	13,49	1768
W 310 x 117,0	117,7	149,9	314	307	11,9	18,7	276,6	244,60	27563	1756	13,56	1953
W 360 x 32,9	33,0	42,1	349	127	5,8	8,5	332,0	308,00	8358	479	14,09	548
W 360 x 39,0	39,4	50,2	353	128	6,5	10,7	331,6	307,60	10331	585	14,35	668
W 360 x 44,0	45,3	57,7	352	171	6,9	9,8	332,4	308,40	12258	696	14,58	784
W 360 x 51,0	50,9	64,8	355	171	7,2	11,6	331,8	307,80	14222	801	14,81	900
W 360 x 57,8	56,9	72,5	358	172	7,9	13,1	331,8	307,80	16143	902	14,92	1015

BEAMS I AND H

parte 4/5

Gauge	"Linear Mass [kg/m]"	"Area A [cm²]"	Thickness						AXIS X - X			
			d [mm]	d [mm]	t_w [mm]	t_f [mm]	h mm	d' [mm]	I_x [cm⁴]	W_x [cm³]	r_x [cm]	Z_x [cm⁴]
W 360 x 64,0	64,1	81,7	347	203	7,7	13,5	320,0	288,00	17890	1031	14,80	1146
W 360 x 72,0	71,7	91,3	350	204	8,6	15,1	319,8	287,80	20169	1152	14,86	1286
W 360 x 79,0	79,4	101,2	354	205	9,4	16,8	320,4	288,40	22713	1283	14,98	1437
W 410 x 38,8	39,5	50,3	399	140	6,4	8,8	381,4	357,40	12777	640	15,94	737
W 410 x 46,1	46,5	59,2	403	140	7,0	11,2	380,6	356,60	15690	779	16,27	891
W 410 x 53,0	53,7	68,4	403	177	7,5	10,9	381,2	357,20	18734	930	16,55	1052
W 410 x 60,0	59,8	76,2	407	178	7,7	12,8	381,4	357,40	21707	1067	16,88	1201
W 410 x 67,0	67,8	86,3	410	179	8,8	14,4	381,2	357,20	24678	1204	16,91	1363
W 410 x 75,0	75,2	95,8	413	180	9,7	16,0	381,0	357,00	27616	1337	16,98	1519
W 460 x 52,0	52,3	66,6	450	152	7,6	10,8	428,4	404,40	21370	950	17,91	1096
W 460 x 60,0	59,8	76,2	455	153	8,0	13,3	428,4	404,40	25652	1128	18,35	1292
W 460 x 68,0	68,8	87,6	459	154	9,1	15,4	428,2	404,20	29851	1301	18,46	1495

BEAMS I AND H

parte 5/5

Gauge	"Linear Mass [kg/m]"	"Area A [cm²]"	Thickness						AXIS X - X			
			d [mm]	d [mm]	t_w [mm]	t_f [mm]	h mm	d' [mm]	I_x [cm⁴]	W_x [cm³]	r_x [cm]	Z_x [cm⁴]
W 460 x 74,0	74,5	94,9	457	190	9,0	14,5	428,0	404,00	33415	1462	18,77	1657
W 460 x 82,0	82,2	104,7	460	191	9,9	16,0	428,0	404,00	37157	1616	18,84	1836
W 460 x 89,0	89,6	114,1	463	192	10,5	17,7	427,6	403,60	41105	1776	18,98	2019
W 530 x 66,0	65,6	83,6	525	165	8,9	11,4	502,2	478,20	34971	1332	20,46	1558
W 530 x 72,0	71,9	91,6	524	207	9,0	10,9	502,2	478,20	39969	1526	20,89	1756
W 530 x 74,0	74,6	95,1	529	166	9,7	13,6	501,8	477,80	40969	1549	20,76	1805
W 530 x 82,0	82,0	104,5	528	209	9,5	13,3	501,4	477,40	47569	1802	21,34	2059
W 530 x 85,0	84,6	107,7	535	166	10,3	16,5	502,0	478,00	48453	1811	21,21	2100
W 530 x 92,0	92,3	117,6	533	209	10,2	15,6	501,8	477,80	55157	2070	21,65	2360
W 610 x 101,0	102,3	130,3	603	228	10,5	14,9	573,2	541,20	77003	2554	24,31	2923
W 610 x 113,0	114,1	145,3	608	228	11,2	17,3	573,4	541,40	88196	2901	24,64	3313
W 610 x 155,0	155,5	198,1	611	324	12,7	19,0	573,0	541,00	129583	4242	25,58	4749
W 610 x 174,0	174,9	222,8	616	325	14,0	21,6	572,8	540,80	147754	4797	25,75	5383

RECTANGULAR BARS FLAT IRON

parte 1/2

Dimensions in inches		Kg/m	Dimensions in inches		Kg/m
Thickness	Width		Thickness	Width	
1/8”	5/8"	0,4	3/8”	1"	1,9
	3/4"	0,48		1.1/4"	2,38
	7/8"	56		1.1/2"	2,85
	1"	0,63		2"	3,8
	1.1/4"	0,79		2.1/2"	4,74
	1.1/2"	0,95		3"	5,7
	1.3/4"	1,11		4"	7,6
	2"	1,27	1/2”	1"	2,53
3/16”	3/4"	0,71		1.1/4"	3,17
	7/8"	0,83		1.1/2"	3,8
	1"	0,95		2"	5,06
	1.1/4"	1,19		2.1/2"	6,33
	1.1/2"	1,42		3"	7,6
	2"	1,66		4"	10,13

Dimensions in inches		Kg/m	Dimensions in inches		Kg/m
Thickness	Width		Thickness	Width	
1/4”	3/4"	0,95	5/8”	1"	3,16
	7/8"	1,11		1.1/4"	3,95
	1"	1,27		1.1/2"	4,75
	1.1/4"	1,58		2"	6,33
	1.1/2"	1,9		2.1/2"	7,91
	2"	2,53		3"	9,5
	2.1/2"	3,17		3.1/2"	11,08
	3"	3,8		4"	12,66
	4"	5,06			

RECTANGULAR BARS FLAT IRON

parte 2/2

Dimensions in inches		Kg/m	Dimensions in inches		Kg/m
Thickness	Width		Thickness	Width	
5/16”	3/4"	1,19	3/4”	1"	3,8
	7/8"	1,4		1.1/4"	4,74
	1"	1,58		1.1/2"	5,7
	1.1/4"	1,98		2"	7,6
	1.1/2"	2,38		2.1/2"	9,5
	2"	3,17		3"	11,4
	2.1/2"	3,96		3.1/2"	13,29
	3"	4,75		4"	15,19
	4"	6,33	1”	2"	10,12
3/8”	3/4"	1,42		2.1/2"	12,66
	7/8"	1,68		3"	15,19
				4"	20,26

ROUND, RECTANGULAR AND HEXAGONAL BARS

parte 1/2

Gauge		Kg/m			Gauge		Kg/m			Gauge		Kg/m			Gauge		Kg/m		
In.	mm	●	■	⬢	In.	mm	●	■	⬢	In.	mm	●	■	⬢	In.	mm	●	■	⬢
1/8	3,17	0,062	-	-	1	25,40	3,97	5,06	4,38	1.15/16	49,21	14,92	18,99	16,45	2.7/8	73,02	32,85	41,82	36,22
5/32	3,97	0,097	-	-	1.1/16	26,99	4,49	5,71	4,95	2	50,8	15,9	20,24	17,53	2.15/16	74,61	34,29	43,66	37,81
3/16	4,76	0,140	0,18	0,15	1.1/8	28,57	5,03	6,4	5,55	2.1/16	53,39	16,91	21,52	18,64	3	76,20	35,77	45,54	39,43
1/4	6,35	0,25	0,32	0,27	1.3/16	30,16	5,60	7,14	6,18	2.1/8	53,97	17,95	22,85	19,79	3.1/8	79,38	38,81	49,41	42,79
5/196	7,94	0,39	0,49	0,43	1.1/4	31,75	6,21	7,91	6,85	2.3/16	55,56	19,02	24,21	20,97	3.1/4	82,55	41,88	53,44	46,34
3/8	9,53	0,56	0,71	0,62	1.5/16	33,34	6,85	8,72	7,55	2.1/4	57,15	20,12	25,62	22,19	3.3/8	85,73	42,27	57,63	49,98
7/16	11,11	0,76	0,97	0,84	1.3/16	34,92	7,51	9,57	8,29	2.6/16	58,74	21,25	27,06	23,44	3.1/2	88,90	48,68	61,98	53,74
1/2	12,7	0,99	1,22	1,10	1.7/16	36,51	8,21	10,46	9,06	2.3/8	60,32	22,42	28,54	24,72	3.5/8	92,08	52,22	66,49	-
9/16	14,29	1,26	1,60	1,39	1.1/2	38,10	8,94	11,39	9,86	2.7/16	61,91	23,61	30,06	26,03	3.3/4	95,25	55,88	71,15	-
5/8	15,87	1,55	1,98	1,71	1.9/16	39,69	9,70	12,35	10,7	2.1/2	63,50	24,84	31,62	27,38	3.7/8	94,43	60,67	75,98	-
11/16	17,46	1,88	2,36	2,07	1.5/8	41,27	10,49	13,36	11,57	2.9/16	65,09	26,10	33,22	28,78	4	101,6	63,58	80,96	-
3/4	19,05	2,24	2,85	2,46	1.11/16	42,86	11,32	14,41	12,48	2.5/8	66,67	27,38	34,87	30,79	4.1/8	104,78	67,62	86,10	-
13/16	20,64	2,62	3,34	2,89	1.3/4	44,45	12,17	15,5	13,42	2.11/16	68,26	28,70	36,55	31,67					
7/8	22,22	3,04	3,87	3,35	1.13/16	46,04	13,06	16,62	14,4	2.3/4	69,85	30,05	38,27	33,14					
15/16	23,81	3,49	4,45	3,85	1.7/8	47,62	13,97	17,79	15,41	2.13/16	71,44	31,44	40,02	34,22					

ROUND, RECTANGULAR AND HEXAGONAL BARS

parte 2/2

Gauge		Kg/m			Gauge		Kg/m			Gauge		Kg/m			Gauge		Kg/m		
In.	mm	●	▬	⬢	In.	mm	●	▬	⬢	In.	mm	●	▬	⬢	In.	mm	●	▬	⬢
4.1/4	107,95	71,78	91,39	-	7.1/4	184,15	209,70	266,20	-	11	279,40	481,20	612,80	-	19	482,60	1434,60	1826,60	-
4.3/8	111,13	76,06	96,85	-	7.1/2	190,50	223,80	285,00	-	11.1/4	285,75	503,40	641,00	-	20	508,00	1589,50	2023,90	-
4.1/2	114,30	80,47	102,46	-	7.3/4	196,85	238,90	304,00	-	11.1/2	292,70	526,00	669,80	-	21	533,40	1752,61	2230,60	-
4.5/8	117,48	85,01	108,23	-	8	203,20	254,60	324,00	-	11.3/4	298,45	549,00	699,20	-	22	558,80	1932,50	2448,09	-
4.3/4	120,65	89,66	114,16	-	8.1/4	209,55	270,70	345,00	-	12	304,80	572,70	729,30	-	23	584,20	2102,34	2675,71	-
4.7/8	123,83	94,44	120,25	-	8.1/2	215,90	287,40	365,90	-	12.1/2	317,50	620,90	790,60	-	24	609,60	2289,13	2913,43	-
5	127,00	99,80	126,50	-	8.3/4	222,25	304,60	388,50	-	13	330,20	672,60	355,80	-	25	635,00	2483,86	3161,28	-
5.1/4	133,35	109,50	139,50	-	9	228,60	322,10	410,20	-	13.1/2	342,90	724,30	922,20	-	26	660,40	2686,54	3419,24	-
5.1/2	139,70	120,20	153,10	-	9.1/4	234,95	340,30	433,50	-	14	355,60	779,70	992,60	-	27	685,80	2897,18	3687,32	-
5.3/4	146,05	131,40	167,20	-	9.1/2	241,30	359,00	457,10	-	14.1/2	368,30	835,50	1063,80	-	28	711,20	3115,76	3965,51	-
6	152,40	143,10	182,50	-	9.3/4	247,65	378,10	481,40	-	15	381,00	894,90	1139,50	-	29	736,60	3342,29	4253,82	-
6.1/4	158,75	155,20	197,80	-	10	254,00	397,80	506,50	-	15.1/2	393,70	954,70	1215,60	-	30	762,00	3576,76	4552,24	-
6.1/2	165,10	167,90	213,50	-	10.1/4	260,35	417,90	532,00	-	16	406,50	1017,30	1295,30	-					
6.3/4	171,45	181,10	231,00	-	10.1/2	266,70	438,50	558,40	-	17	431,80	1148,60	1462,30	-					
7	177,80	194,70	284,10	-	10.3/4	273,05	459,70	585,30	-	18	457,20	1287,60	1639,40	-					

SCHEDULE STANDARD PIPES

part 1/5

Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
1/4"	13,72	STD	40	2,24	0,63
		XS	80	3,02	0,80
			160	3,30	0,82
3/8"	17,15	STD	40	2,31	0,85
		XS	80	3,20	1,10
			160	4,75	1,56
1/2"	21,34	STD	40	2,77	1,25
		XS	80	3,73	1,62
			160	4,78	1,95
		XXS		7,47	2,54
3/4"	26,67	STD	40	2,87	1,68
		XS	80	3,91	2,19
			160	5,56	2,89
		XXS		7,82	3,63
1"	33,40	STD	40	3,38	2,50
		XS	80	4,55	3,23
			160	6,36	4,23
		XXS		9,09	5,45
1.1/4"	42,16	STD	40	3,56	3,38
		XS	80	4,85	4,46
			160	6,35	5,60
		XXS		9,70	7,75
1.1/2"	48,26	STD	40	3,68	4,05
		XS	80	5,08	5,40
			160	7,14	7,23
		XXS		10,16	9,54
2"	60,33	STD	40	3,91	5,43
		XS	80	5,54	7,47
			160	8,74	11,10
		XXS		11,07	13,41

Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
2.1/2"	73,03	STD	40	5,16	8,62
		XS	80	7,01	11,40
			160	9,52	14,90
		XXS		14,02	20,37
2.1/2"	73,03	STD	40	5,16	8,62
		XS	80	7,01	11,40
			160	9,52	14,90
		XXS		14,02	20,37
3"	88,90	STD	40	5,49	11,28
		XS	80	7,62	15,25
			160	11,13	21,31
		XXS		15,25	27,65
3.1/2"	101,60	STD	40	5,74	13,56
		XS	80	8,08	18,60
4"	114,30	STD	40	6,02	16,06
		XS	80	8,56	22,29
			120	11,13	28,27
			160	13,49	33,49
		XXS		17,12	40,98

SCHEDULE STANDARD PIPES

part 2/5

Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
5"	141,30	STD	40	6,55	21,75
		XS	80	9,52	30,92
			120	12,70	40,25
			160	15,88	49,01
		XXS		19,05	57,36
6"	168,28	STD		6,35	25,33
			40	7,11	28,23
		XS	80	10,97	42,51
			120	14,27	54,15
			160	18,26	67,48
		XXS		21,95	79,10
8"	219,08		20	6,35	33,27
			30	7,04	36,75
		STD	40	8,18	42,48
			60	10,31	53,03
		XS	80	12,70	64,56
			100	15,09	75,81
			120	18,26	90,47
			140	20,62	100,83
		XXS		22,22	107,76
			160	23,01	111,14

Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
10"	273,05		20	6,35	41,74
			30	7,80	50,95
		STD	40	9,27	60,23
		XS	60	12,70	81,45
			80	15,09	95,87
			100	18,26	114,62
			120	21,44	132,86
		XXS	140	25,40	154,95
			160	28,57	172,07
12"	323,85		20	6,35	49,67
			30	8,38	65,13
		STD		9,52	73,75
			40	10,31	79,64
		XS		12,70	97,34
			60	14,27	108,85
			80	17,47	131,88
			100	21,44	159,69
		XXS	120	25,40	186,73
			140	28,57	207,83
			160	33,32	238,49

SCHEDULE STANDARD PIPES

part 3/5

Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
14"	355,60		10	6,35	54,68
			20	7,92	67,87
		STD	30	9,52	81,20
			40	11,13	94,40
		XS		12,70	107,27
			60	15,19	126,56
			80	19,05	157,92
			100	23,82	194,70
			120	27,79	224,38
			140	31,75	253,27
			160	35,71	281,40
16"	406,40		10	6,35	62,57
			20	7,92	77,78
		STD	30	9,52	93,16
		XS	40	12,70	123,16
			60	16,66	159,96
			80	21,44	203,28
			100	26,19	245,25
			120	30,96	286,34
			140	36,53	332,78
			160	40,49	364,93

Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
18"	457,20		10	6,35	70,52
			20	7,92	87,70
		STD		9,52	105,04
			30	11,13	122,24
		XS		12,70	139,05
			40	14,27	155,75
			60	19,05	205,60
			80	23,83	254,33
			100	29,36	309,44
			120	34,92	363,28
			140	39,67	408,04
			160	45,25	459,05
20"	508,00		10	6,35	78,47
		STD	20	9,53	116,97
		XS	30	12,70	154,97
			40	15,09	183,14
			60	20,62	247,78
			80	26,19	310,91
			100	32,54	381,20
			120	38,10	441,06
			140	44,45	507,63
			160	50,01	564,24

SCHEDULE STANDARD PIPES

part 4/5

Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
22"	558,80		10	6,35	86,41
			20	9,52	128,88
		XS	30	12,70	182,32
			40	15,88	212,31
			60	22,22	293,75
			80	28,57	373,21
			100	34,92	450,69
			120	41,27	526,17
			140	47,62	599,66
			160	53,97	671,15
24"	609,60		10	6,35	94,35
		STD	20	9,52	140,80
		XS		12,70	186,73
			30	14,27	209,33
			40	17,48	254,88
			60	24,61	354,66
			80	30,96	441,31
			100	38,89	546,68
			120	46,02	638,93
			140	52,37	718,88
			160	59,53	807,50

Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
26"	660,40			6,35	102,30
		STD		9,52	152,71
		XS	20	12,70	202,62
				15,88	252,04
				17,48	276,75
				19,05	300,95
28"	711,20			6,35	110,25
		STD		9,53	164,63
		XS	20	12,70	218,51
			30	15,88	271,90
				17,48	298,61
				19,05	324,79
30"	762,00			6,35	118,19
		STD		9,53	176,55
		XS	20	12,70	234,40
				15,88	291,77
			30	17,48	320,49
				19,05	350,62
32"	812,80			6,35	126,14
		STD		9,53	188,47
		XS	20	12,70	250,30
			30	15,88	311,63
			40	17,48	342,36
				19,05	372,46

SCHEDULE STANDARD PIPES

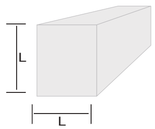
Ø Nominal	Ø External (mm)	Denomination	Schedule	Wall thickness (mm)	Weight per meter
34"	863,60			6,35	134,08
		STD	20	9,53	200,39
		XS	30	12,70	266,16
			40	15,88	331,50
				17,48	364,22
				19,05	396,74
36"	914,40			6,35	142,03
		STD		9,53	212,31
		XS	20	12,70	282,08
			30	15,88	351,36
				17,48	386,09
				19,05	420,14
38"	965,20			6,35	151,29
		STD		9,53	224,23
		XS		12,70	297,97
				15,88	371,23
				17,48	407,95
				19,05	443,97
40"	1016,00			6,35	159,34
		STD		9,53	236,15
		XS		12,70	313,86
				15,88	391,09
				17,48	429,82
				19,05	467,81

formulas for calculation

FORMULAS FOR CALCULATION

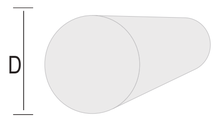
BARS

Square



Weight in kg/m = $\frac{L^2 \times \rho}{1.000}$

Round

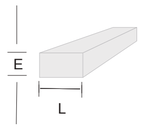


Weight in kg/m = $\frac{D^2 \times 0.7854 \times \rho}{1.000}$

Hexagonal

Weight in kg/m = $\frac{F^2 \times 0.8660 \times \rho}{1.000}$

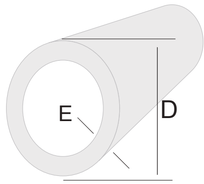
Rectangular with sharp edges



Weight in kg/m = $\frac{L \times E \times \rho}{1,000}$

TUBES

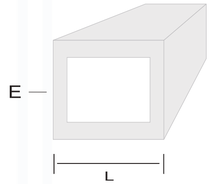
Round



Weight in kg/m =

$\frac{(D - E) \times E \times \pi \times \rho}{1.000}$

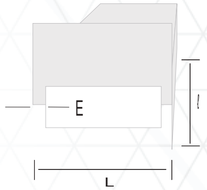
Square



Weight in kg/m =

$\frac{[(2 \times L) - (2 \times E)] \times 2 \times E \times \rho}{1.000}$

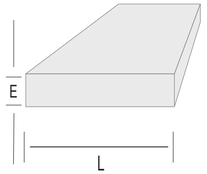
Rectangular with sharp edges



Weight in kg/m =

$\frac{[(L + \ell) - (2 \times E)] \times (2 \times E) \times \rho}{1.000}$

SHEETS

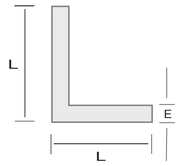


Weight in kg/m /piece =

$\frac{C \times L \times E \times \rho}{1.000.000}$

PROFILES

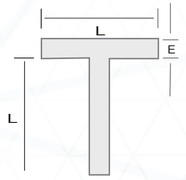
Profile "L" = Angle Plate



Weight in kg/m =

$\frac{(2 \times L \times E - E^2) \times p}{1.000}$

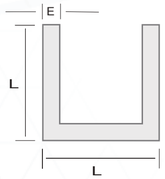
Profile "T"



Weight in kg/m =

$\frac{(2 \times L \times E - E^2) \times p}{1.000}$

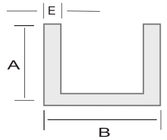
Profile "U" - Equal flaps



Weight in kg/m =

$\frac{(3 \times L \times E) - (2 \times E^2) \times p}{1.000}$

Perfil "U" - Unequal flaps



Weight in kg/m =

$\frac{[(2 \times A + B) \times E] - (2 \times E^2) \times p}{1.000}$

CONVERSION TABLE

inches	MM
1/32"	0,79
1/16"	1,58
3/32"	2,38
1/8"	3,18
5/32"	3,97
3/16"	4,76
7/32"	5,56
1/4"	6,35
9/32"	7,14
5/16"	7,94
11/32"	8,73
3/8"	9,53
13/32"	10,32
7/16"	11,11
15/32"	11,91
1/2"	12,7
17/32"	13,49
9/16"	14,29
19/32"	15,08
5/8"	15,87
21/32"	16,67
11/16"	17,46
23/32"	18,26
3/4"	19,05
25/32"	19,84
13/16"	20,64
27/32"	21,43
7/8"	22,22

inches	MM
29/32"	23,02
15/16"	23,81
31/32"	24,61
1"	25,4
1.1/32"	26,19
1.1/16"	26,99
1.3/32"	27,78
1.1/8"	28,57
1.5/32"	29,37
1.3/16"	30,16
1.7/32"	30,95
1.1/4"	31,75
1.9/32"	32,54
1.5/16"	33,34
1.11/32"	34,13
1.3/8"	34,92
1.13/32"	35,72
1.7/16"	36,51
1.15/32"	37,30
1.1/2"	38,10
1.17/32"	38,89
1.9/16"	39,69
1.19/32"	40,48
1.5/8"	41,27
1.21/32"	42,07
1.11/16"	42,86
1.23/32"	43,65
1.3/4"	44,45

inches	MM
1.25/32"	45,24
1.13/16"	46,04
1.27/32"	46,83
1.7/8"	47,62
1.29/32"	48,42
1.15/16"	49,21
1.31/32"	50,00
2"	50,80
2.1/16"	52,39
2.1/8"	53,97
2.3/16"	55,58
2.1/4"	57,15
2.5/16"	58,74
2.3/8"	60,32
2.7/16"	61,91
2.1/2"	63,50
2.9/16"	65,09
2.5/8"	66,67
2.11/16"	68,26
2.3/4"	69,85
2.13/16"	71,44
2.7/8"	73,02
2.15/16"	74,61
3"	76,20
3.1/8"	79,38
3.1/4"	82,55
3.3/8"	85,78
3.1/2"	88,90

inches	MM
3.5/8"	92,08
3.3/4"	95,25
3.7/8"	98,43
4"	101,60
4.1/4"	107,95
4.1/2"	114,30
4.3/4"	120,65
5"	127,00
5.1/4"	133,35
5.1/2"	139,70
5.3/4"	146,05
6"	152,40
6.1/4"	158,75
6.1/2"	165,10
6.3/4"	171,45
7"	177,80
7.1/4"	184,15
7.1/2"	190,50
7.3/4"	196,85
8"	203,20
8.1/4"	209,55
8.1/2"	215,90
8.3/4"	222,25
9"	228,60
9.1/4"	234,95
9.1/2"	241,30
9.3/4"	247,65
10"	254,00

inches	MM
10.1/4"	260,35
10.1/2"	266,70
10.3/4"	273,05
11"	279,40
11.1/4"	285,75
11.1/2"	292,70
11.3/4"	298,45
12"	304,80
12.1/4"	311,15
12.1/2"	317,50
12.3/4"	323,85
13"	330,20
13.1/4"	336,55
13.1/2"	342,90
13.3/4"	349,25
14"	355,60
14.1/4"	361,95
14.1/2"	368,30
14.3/4"	374,65
15"	381,00
15.1/4"	387,35
15.1/2"	393,70
15.3/4"	400,05
16"	406,40
16.1/4"	412,75
16.1/2"	419,10
16.3/4"	425,45
17"	431,80

inches	MM
17.1/4"	438,15
17.1/2"	444,50
17.3/4"	450,85
18"	457,20
18.1/4"	463,55
18.1/2"	469,90
183/4"	476,25
19"	482,60
19.1/4"	488,95
19.1/2"	495,30
19.3/4"	501,65
20"	508,00
20.1/4"	514,35
20.1/2"	520,70
20.3/4"	527,05
21"	533,40
21.1/4"	539,75
21.1/2"	546,10
21.3/4"	552,45
22"	558,80
22.1/4"	565,15
22.1/2"	571,50
22.3/4"	577,85
23"	584,20
23.1/4"	590,55
23.1/2"	596,90
23.3/4"	603,25
24"	609,60

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CONTACTS

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Thank you!

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