

Table of Contents

Introduction and Disclaimers	2
How to Use this Book	3- 4
How to Buy Metal	5- 6
Angles	7-12
Bars—Round and Square	13-17
Beams	18-27
Channels	28-33
Flat Bars	34-40
Pipe	41-47
Round Tubing	48-51
Square/Rectangular Tubing	52-62
Sheet, Plate	63-66

Introduction and Disclaimers

A-1 Metal Supply Corp. is one of the three companies that make up the Turind.com group in Fort Pierce, Florida. For the past twenty years, we have serviced the agriculture, fishing, building and governmental industries and institutions of a part of Southeast Florida called the “Treasure Coast”.

For the past twenty years, we have often been asked for our “steel handbook”. This Internet publication is the result of twenty years work on making a truly different steel handbook that attempts to answer questions we are asked most often not found in the other handbooks.

This handbook is different in four ways. First, aluminum and steel are shown on the same chart. In fact, different types of steel and aluminum are shown on the same chart. Other books have steel beams on three separate charts and aluminum beams on three other separate charts. Our book has beams side by side in one chart.

Second, we have graded each item as to its likelihood of being found here or at our suppliers. Third, the beginning of each section has an introduction geared for non-engineers not found in other steel handbooks. Finally, our technical information section only gives information that customers ask for most often. In many cases, we have combined many different charts into one

This handbook was created from non-copyrighted material. In the spirit of the Internet, feel free to download and print this book as you wish. Despite much proofreading, this book may contain errors, for which we disclaim responsibility for your blindly following them. The warning of “look before you leap” is appropriate here.

Finally, this book is current as of April 30, 2002. It is the intention of the author to update this book on an annual basis. Please send your corrections and suggestions to handbook@turind.com.

TURIND.COM-----Page 2

How to Use This Book

"What do you mean you do not have 5/16 by 7 flat bar? It's in your book!" Every metals wholesaler has been asked that type of question. Engineers, hobbyists, and fabricators need a resource that not only tells them what is available, but also the likelihood of finding what they want.

Engineers seem to be famous for picking out the first thing they see in a book even though that item has not been made in twenty years. Once an engineer designed a project using a non-standard 9" channel when 10" channel would have been stronger and half the price. In this case, the whole project had to be redesigned.

Hobbyists are big steel and aluminum users when put together as a group. Very basic instruction on how to buy an item is found at the beginning of each section. Never again will you call up asking for "one and a third inch square pipe".

Fabricators come in two types: mass producers and quick fixer-uppers. Mass producers need to design a product using common materials if they want to be cost effective (or uncommon materials if they do not want it copied). "Quick fixer-uppers" need to choose common items they will know will be there when needed.

We have developed an objective and subjective grading system using our twenty years of steel and aluminum experience in Florida for the benefit of our customers. We have assigned the letter "A" after the weight of those items we normally stock. Items we do not stock are graded "B" or "C" based on an educated guess. We believe we can get a "B" item in less than a week. "C" items may take longer and be more costly. This does not mean that a "C" item is all that rare in other parts of the country. Conversely, there are some "A" items very common in Florida that cannot be easily found elsewhere.

There are some exceptions to the letter system. First, we only carry three sizes of beams, but we special order beams on a daily basis. Beams with the letter "A" are not necessarily stocked by us, but are made by cost-effective mini-mills.

Second, we only show round tubing that we stock. There is such a large variety of sizes and types of tubing that to include them would add clutter to this book. At the beginning of that section, we have included two formulas that you can use to calculate the weight of round tubing. Finally, we have not included a letter grading system for pipe and plate. The beginning of each section explains what we stock, what is easy to find and what is not.

To our knowledge, "C" items are made if you need enough material for a mill order. Usually, you only need 1000# for aluminum, 5000# for steel tubing and maybe a lot more for any other item. Mills will fill these orders in about six weeks during slow economic times and about six months in good times, if at all. The good news is that you can usually get any length you want without paying a penalty when you special order from a mill.

Please read the beginning of each section first. You will find important information on items in that section not found anywhere else.

This book contains some hard-to-find engineering charts. When I find two sources that disagree on technical information, I would choose the more current source. This information is not meant to replace engineers and we have only included information that we are asked for most often. Feel free to call us if you really need to know the manganese content of A-36 plate, but please do not ask us to design an overhead crane system.

We also recognize that engineering information in the hands of non-engineers can be dangerous. Some information, such as the Test pressure of A53/A120 pipe at the end of the pipe section came from a very old book and cannot be found in newer books. Although we are hesitant to publish that information, too many people have asked for the bursting pressure of pipe to exclude it here.

A-1 Metal Supply Corp.....1-800-354-9678

How to Buy Metal

To our knowledge, this is the first book to put aluminum and carbon steel together on one page in some sort of logical progression. We are often asked to figure a project in steel or aluminum.

Early drafts of this book also contained a column for stainless steel, which A-1 Metal Supply also stocks. As a general rule, any "A" item found as carbon steel is available or stocked in T304 stainless (except channels and beams). In most cases, stainless and carbon steel have the same weights. The beginning of each section discusses the availability of stainless within that section.

As for pricing, all metal is "figured" at the mill on a per pound or hundred pound basis. **In quoting customers**, however, the general rule is that any metal with a hole in it (expanded metal, pipe, tubing) is priced per foot. Other items are priced per pound or per "hundred weight (cwt)", meaning "dollars per hundred pounds" or "cents per pound".

The concept of "nominal sizes" is not what it seems. For example, a beam that measures 18" high may actually be a 14" beam (nominal size). Particularly tricky is the 3/8" Sch. 40 Pipe that nearly measures 1/2" on the inside and 1/4" Pipe that measures nearly 3/8". We urge a careful reading of the beginning of each section to uncover these problems.

We price everything based on theoretical weight. For example, for stainless, we measure the length and multiply it by its theoretical weight to arrive at its weight for pricing. This is the only way to get consistent pricing without surprises or accusations of "heavy scales".

The chart on the next page provides a quick overview on the different types of metal available for items other than plate (a separate chart is provided in that section).

TURIND.COM-----Page 5

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Steel, Aluminum and Stainless: A Comparison

Steel	Price Factor	Min Yield (000s)	Tensile (000s)	Machinability* (% 1212)
Commercial Quality (Typical Strength)	1.00	27.5	50	
A-36 Structural Grade	1.00-1.20	30	58-80	
A588 Corten®	2.00-4.00	50	70	
1018 Cold Finished	2.00-4.00	60/70	126	78
1045 Cold Finished	2.20-6.00	77/91	170	55
1144SR-Stressproof®	4.00-6.00	100	132 mean	83
4140 Cold Drawn	5.00-7.00	75	100	65
4140 Annealed	5.00-8.00	85/95	105/120	
ETD 150®	6.00-9.00	130	150	75

ALUMINUM

2024-T4	4.00-7.00	42	64	90
6063-T5 Architectural	4.00-6.00	21	27	
5086-H34 Marine Grade	6.00-10.00	37	47	
6061-T6 Structural	4.00-6.00	40	46	70/80

STAINLESS STEEL

Type 303	10.00-12.00	35	90	78
Type 304	8.00-11.00	35	85	45
Type 304L	8.00-11.00	30	80	45
Type 316	10.00-13.00	35	85	45
Type 316L	10.00-13.00	30	78	45

BRASS/BRONZE

C36000 Brass	12.00-15.00	45	58	100
C95400 Bronze	15.00-18.00	36	90	

® Stressproof and ETD 150 are registered trademarks of LaSalle Corporation ® Corten is a registered trademark of Armco Corporation.

TURIND.COM-----Page 6

How to Buy Angles

Aluminum Angles are available in a 6061-T6 Structural or a 6063-T5 architectural grade. Our specialty is to stock 6061-T6 where possible due to its additional strength from its rounded corners on the inside. On the other hand, 6063-T5 architectural angles are used by builders in window and doorframes (like in patio enclosures) and have square corners. There is little price difference between those two grades of aluminum. Structural angles are also available in a 5086 Marine Grade for those customers willing to pay twice as much for superior corrosion resistance and a duller finish.

About twenty years ago, all architectural angles came in 16-foot lengths. In many areas outside of Florida, that is still true. But in Florida, expect to find 20-foot lengths. Structural angles come in 25-foot lengths.

Carbon Steel angles are generally A-36 structural grade. For those needing extra strength, A-572 and A-588 grades are available in some sizes from specialty warehouses about 2000 miles away. Sometimes a mini-mill may find that their soup mix of scrap metal yielded a stronger steel than normally classified as A-36. They offer this as an "A-36 modified" at the same price as an A-36. Steel angles come in 20- or 40-foot lengths.

Stainless Steel angles in Type 304 and Type 316 are either stocked or easily obtained for "A-graded" Carbon Steel items. Stainless angles come in random lengths. That is, a bundle can have anything between 17- and 24-foot lengths in them.

Try to avoid buying unequal angles (angles that have unequal leg widths). They always cost more per pound than a comparable equal-angle. In other words, a 4 x 3 x 1/4 angle may cost more than a 4 x 4 x 1/4 angle on a per-length basis. Forget about finding unequal angles in stainless. For some reason, our suppliers laugh when we ask.

Angles—Bar Sizes		TABLE 1.1	
SIZE	ALUMINUM		STEEL
	6061-T6	6063-T5	A-36
1/2" x 1/2" x 1/16"	-----	.069 A	-----
1/2" x 1/2" x 1/8"	-----	-----	.38 A
3/4" x 3/4" x 1/16"	-----	.107 A	-----
3/4" x 3/4" x 1/8"	.201 C	.206 A	.59 A
1" x 1/2" x 1/8"	-----	.206 B	-----
1" x 3/4" x 1/8"	-----	.244 C	.70 C
1" x 1" x 1/16"	-----	.144 B	-----
1" x 1" x 1/8"	.280 A	.276 B	.80 A
1" x 1" x 3/16"	.406 A	.408 B	1.16 A
1" x 1" x 1/4"	.514 A	-----	1.49 A
1-1/4 x 1/2 x 1/8	-----	.244 C	-----
1-1/4 x 1-1/4 x 1/8	.343 C	.356 B	1.01 A
1-1/4 x 1-1/4 x 3/16	.522 B	.519 B	1.48 A
1-1/4 x 1-1/4 x 1/4	.656 C	-----	1.92 A
1-1/2 x 1/2 x 1/8	-----	.281 C	-----
1-1/2 x 3/4 x 1/8	-----	.319 B	-----
1-1/2 x 1" x 1/8	.356 B	.356 B	-----
1-1/2 x 1" x 1/4"	.662 C	-----	-----
1-1/2 x 1-1/4 x 3/16	-----	-----	1.65 C
1-1/2 x 1-1/2 x 1/16	-----	.219 A	-----
1-1/2 x 1-1/2 x 1/8	.440 A	.431 B	1.23 A
1-1/2 x 1-1/2 x 3/16	.640 A	.633 B	1.80 A
1-1/2 x 1-1/2 x 1/4	.830 A	-----	2.34 A
1-1/2 x 1-1/2 x 3/8	1.176 C	-----	3.42 C
1-3/4 x 1-3/4 x 1/8	.497 C	.506 B	1.44 A
1-3/4 x 1-3/4 x 3/16	.744 B	-----	1.80 A
1-3/4 x 1-3/4 x 1/4	.980 B	-----	2.77 A
2" x 1" x 1/16	-----	218 B	-----
2" x 1" x 1/8	-----	.431 B	-----
2" x 1-1/4 x 3/16	-----	-----	1.96 C
2" x 1-1/4 x 1/4	-----	-----	2.55 C

Angles		TABLE 1.2		L
SIZE	ALUMINUM		STEEL	
	6061-T6	6063-T5	A-36	
2" x 1-1/2 x 1/8	.496 C	.506 C	1.44 A	
2" x 1-1/2 x 3/16	.731 C	.731 C	2.12 A	
2" x 1-1/2 x 1/4"	.956 C	.956 C	2.77 A	
2" x 1-1/2 x 3/8	1.378 C	1.378 C	----	
2" x 2" x 1/16	----	.293 B	----	
2" x 2" x 1/8"	.588 A	.581 B	1.65 A	
2" x 2" x 3/16"	.870 A	.859 B	2.44 A	
2" x 2" x 1/4"	1.110 A	1.124 B	3.19 A	
2" x 2" x 5/16"	----	----	3.92 B	
2" x 2" x 3/8"	1.606 A	----	4.70 A	
2-1/2 x 1-1/2 x 3/16	----	----	2.44 B	
2-1/2 x 1-1/2 x 1/4	----	----	3.19 B	
2-1/2 x 1-1/2 x 5/16	----	----	3.92 B	
2-1/2 x 2" x 3/16	----	----	2.75 B	
2-1/2 x 2" x 1/4	----	----	3.62 B	
2-1/2 x 2" x 5/16	----	----	4.50 B	
2-1/2 x 2" x 3/8	1.828 B	----	5.30 B	
2-1/2 x 2-1/2 x 1/8	.724 B	----	----	
2-1/2 x 2-1/2 x 3/16	1.070 B	----	3.07 A	
2-1/2 x 2-1/2 x 1/4	1.404 B	----	4.10 A	
2-1/2 x 2-1/2 x 5/16	----	----	5.00 B	
2-1/2 x 2-1/2 x 3/8	2.047 C	----	5.90 A	
2-1/2 x 2-1/2 x 1/2	----	----	7.70 B	
3" x 1" x 1/8"	----	.582 B	----	
3" x 2" x 1/8	----	.750 B	----	
3" x 2" x 3/16	1.090 B	----	3.07 A	
3" x 2" x 1/4	1.405 B	----	4.1 A	
3" x 2" x 5/16	----	----	5.0 B	
3" x 2" x 3/8	2.046 B	----	5.9 B	
3" x 2" x 1/2	----	----	7.7 B	

Angles—Structural		TABLE 1.3		L
SIZE	ALUMINUM		STEEL	
	6061-T6	6063-T5	A-36	
3" x 2-1/2 x 3/16	----	----	3.39 B	
3" x 2-1/2 x 1/4	1.537 C	----	4.5 B	
3" x 2-1/2 x 5/16	----	----	5.6 B	
3" x 2-1/2 x 3/8	2.253 C	----	6.6 B	
3" x 2-1/2 x 1/2	----	----	8.5 B	
3" x 3" x 1/8	----	.881 B	----	
3" x 3" x 3/16	1.275 A	----	3.71 A	
3" x 3" x 1/4	1.730 A	1.725 B	4.9 A	
3" x 3" x 5/16	----	----	6.1 B	
3" x 3" x 3/8"	2.474 A	----	7.2 A	
3" x 3" x 1/2	3.227 C	----	9.4 A	
3-1/2 x 2-1/2 x 1/4	----	----	4.9 B	
3-1/2 x 2-1/2 x 5/16	----	----	6.1 B	
3-1/2 x 2-1/2 x 3/8	----	----	7.2 B	
3-1/2 x 2-1/2 x 1/2	----	----	9.4 B	
3-1/2 x 3" x 1/4	1.842 B	----	5.4 B	
3-1/2 x 3" x 5/16	----	----	6.6 B	
3-1/2 x 3" x 3/8	2.705 C	----	7.9 B	
3-1/2 x 3" x 1/2	3.532 C	----	10.2 B	
3-1/2 x 3-1/2 x 1/4	1.989 B	----	5.8 A	
3-1/2 x 3-1/2 x 5/16	----	----	7.2 B	
3-1/2 x 3-1/2 x 3/8	2.926 C	----	8.5 A	
3-1/2 x 3-1/2 x 1/2	3.826 C	----	11.1 B	
4" x 2" x 1/8	----	.881 B	----	
4" x 2" x 1/4	----	1.725 B	----	
4" x 3" x 1/4	1.988 B	----	5.8 A	
4" x 3" x 5/16	----	----	7.2 B	
4" x 3" x 3/8	2.926 B	----	8.5 B	
4" x 3" x 1/2	3.826 C	----	11.1 B	
4" x 3" x 5/8	----	----	13.6 B	

Angles—Structural		TABLE 1.4		L
SIZE	ALUMINUM		STEEL	
	6061-T6	6063-T5	A-36	
4" x 3-1/2 x 1/4	----	----	6.2 B	
4" x 3-1/2 x 5/16	----	----	7.7 B	
4" x 3-1/2 x 3/8	----	----	9.1 B	
4" x 3-1/2 x 1/2	----	----	11.9 B	
4" x 4" x 1/4"	2.350 A	----	6.6 A	
4" x 4" x 5/16	----	----	8.2 B	
4" x 4" x 3/8	3.366 A	----	9.8 A	
4" x 4" x 1/2	4.414 C	----	12.8 A	
4" x 4" x 5/8	----	----	15.7 B	
4" x 4" x 3/4	----	----	18.5 B	
5" x 2" x 1/8	----	1.031 B	----	
5" x 3" x 1/4"	----	----	6.6 A	
5" x 3" x 5/16	----	----	8.2 B	
5" x 3" x 3/8	3.349 B	----	9.8 B	
5" x 3" x 1/2	4.396 C	----	12.8 B	
5" x 3-1/2 x 1/4	----	----	7.0 B	
5" x 3-1/2 x 5/16	----	----	8.7 B	
5" x 3-1/2 x 3/8	----	----	10.4 B	
5" x 3-1/2 x 1/2	----	----	13.6 B	
5" x 3-1/2 x 5/8	----	----	16.8 B	
5" x 3-1/2 x 3/4	----	----	19.8 B	
5" x 5" x 5/16	----	----	10.3 B	
5" x 5" x 3/8	4.237 B	----	12.3 B	
5" x 5" x 1/2	5.578 B	----	16.2 B	
5" x 5" x 5/8	----	----	20.0 B	
5" x 5" x 3/4	----	----	23.6 B	
6" x 3-1/2 x 5/16	----	----	9.8 B	
6" x 3-1/2 x 3/8	----	----	11.7 B	
6" x 3-1/2 x 1/2	----	----	15.3 B	
6" x 3-1/2 x 5/8	----	----	18.8 B	

Angles—Structural		TABLE 1.5		L
SIZE	ALUMINUM		STEEL	
	6061-T6	6063-T5	A-36	
6" x 4" x 5/16	----	----	10.3 B	
6" x 4" x 3/8	4.237 B	----	12.3 B	
6" x 4" x 1/2	5.578 B	----	16.2 A	
6" x 4" x 5/8	----	----	20.0 B	
6" x 4" x 3/4	----	----	23.6 B	
6" x 6" x 5/16	----	----	12.5 B	
6" x 6" x 3/8	5.119 B	----	14.9 A	
6" x 6" x 1/2	6.754 B	----	19.6 A	
6" x 6" x 5/8	----	----	24.2 B	
6" x 6" x 3/4	----	----	28.7 B	
6" x 6" x 1"	----	----	37.4 B	
7" x 2" x 1/4	----	2.624 B	----	
7" x 4" x 3/8	----	----	13.6 B	
7" x 4" x 1/2	----	----	17.9 B	
7" x 4" x 5/8	----	----	22.1 B	
7" x 4" x 3/4	----	----	26.2 B	
8" x 4" x 1/2	----	----	19.6 B	
8" x 4" x 5/8	----	----	24.2 B	
8" x 4" x 3/4	----	----	28.7 B	
8" x 4" x 1"	----	----	37.4 B	
8" x 6" x 1/2	7.952 C	----	23.0 B	
8" x 6" x 3/4	11.679 C	----	33.8 B	
8" x 6" x 1"	----	----	44.2 B	
8" x 8" x 1/2	9.141 C	----	26.4 B	
8" x 8" x 5/8	----	----	32.7 B	
8" x 8" x 3/4	13.478 C	----	38.9 B	
8" x 8" x 1"	----	----	51.0 B	
8" x 8" x 1-1/8	----	----	56.9 B	

A-1 Metal Supply Corp.....1-800-354-9678
How to Buy Bars

This section contains solid round and square bars. Rectangular bars are contained in the "flat bar" section. Accept our apology if your search engine brought you here for any other kind of bars

We carry aluminum bars over 5/8" in the 6061-T6 structural grade and smaller sizes in the 6063-T5 architectural grade, which can be easily bent for the ornamental industry. Other grades are available from our suppliers. 6061-T6 and 5086-H14 aluminum come in 12-foot lengths. 6063-T5 grade comes in 20-foot lengths.

We generally stock Type 304 Stainless Bars for all sizes 1" and under and Type 316 Bars for sizes larger than 1". Other grades, such as Type 306, 312 and some of the 400 series are available from many places that specialize in these items, with specialty prices to match. Keep in mind, however, that unlike Cold Roll steel bars, stainless bars are true to size and do not have clearance for a bearing. You will need ground and polished stainless for that purpose. Stainless Bars come in 12-foot random lengths, which means they can run between 11 and 14 feet. For those willing to pay a premium, we can get longer lengths from suppliers that specialize in carrying longer lengths.

Hot roll carbon steel bars (CQ or A-36) are for the window bar industry. This is the same grade as reinforcing rods used in the concrete industry. They are not perfectly round, are oversized, and are cheap. Cold-Finished Steel bars (1018, 1045, 1144, 4140, etc) are .001 to .002 undersized to offer proper bearing clearance in most cases. They can be easily machined and threaded. Hot roll bars come in 20-foot lengths. Cold finished bars come in 12-foot or 20-foot lengths. Those wanting more than a 20-foot length must upgrade to 4140 where random lengths may go up to 24-foot long.

We stock either Type 1018 or 1045 cold roll in most sizes. We also stock an 1144-SR (Stress-Relieved) product for those wanting additional strength without losing machinability. Finally, for those needed a very strong alloy bar, we offer ETD-150®, a LaSalle product.

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Round Bars TABLE 2.1

SIZE	Alum. 6061 or 6063	Brass 360	Hot Roll A-36/CQ	Stainless		Cold Finish			
				T304	T316	1018	1045	1144SR	ETD150
1/8"	.015C	----	.042 --	C	--	C	--	--	--
3/16"	.032 C	.102 A	.094 --	A	C	C	--	--	--
1/4"	.059 A	.181 A	.167 B	A	C	A	C	C	--
5/16"	.090 C	.283 A	.261 B	A	C	A	--	C	--
3/8"	.133 A	.407 A	.376 B	A	C	A	C	C	--
7/16	.178 B	.554 C	.511 B	--	C	A	C	--	--
1/2	.235 A	.723 A	.668 A	A	B	A	C	A	A
9/16	.292 C	.915 A	.845 B	B	--	A	--	--	--
5/8	.368 A	1.13 A	1.040 A	A	B	A	C	A	A
11/16	-----	-----	1.260 --	--	--	B	--	--	--
3/4	.530 A	1.63 A	1.500 A	A	B	A	C	A	A
13/16	-----	-----	1.760 --	C	--	B	C	--	--
7/8	.716 C	2.22 A	2.040 B	A	B	A	C	A	A
15/16	-----	-----	2.350 --	C	--	B	C	--	--
1"	.943 A	2.89 A	2.670 A	A	B	A	C	A	A
1-1/16	-----	-----	3.010 --	C	C	B	--	B	--
1-1/8	1.169C	3.66 B	3.380 B	C	C	A	C	A	A
1-3/16	-----	4.08 C	3.770 --	A	C	A	C	B	B
1-1/4	1.472A	4.52 B	4.170 B	B	A	A	B	A	A
1-5/16	1.690B	-----	4.600 --	C	--	B	--	B	C
1-3/8	1.745B	5.47 C	5.050 B	B	B	A	B	A	A
1-7/16	1.925C	5.98 C	5.520 B	C	C	A	B	B	B
1-1/2	2.110A	6.51 A	6.010 B	B	A	A	B	A	A
1-9/16	-----	7.06 C	6.520 --	C	--	C	--	B	--
1-5/8	2.444B	7.64 B	7.050 B	B	B	A	B	B	B
1-11/16	-----	-----	7.600 --	C	C	A	--	C	--
1-3/4	2.826A	8.86 B	8.180 B	B	A	A	B	A	A
1-13/16	3.042C	-----	8.770 --	--	--	C	--	C	--
1-7/8	3.244B	-----	9.390 C	C	--	B	B	B	B
1-15/16	-----	-----	10.02 --	C	C	B	A	B	B

TURIND.COM-----Page 14

Round Bars

TABLE 2.2

D IAMETER	Alum. 6061-T6	Brass	Hot Roll A-36 or CQ	Stainless		Cold Finish			
				T304	T316	1018	1045	1144-SR ETD-150	
2"	3.691 A	11.6 B	10.68 B	B	A	A	B	A	A
2-1/16	-----	-----	11.36 --	--	--	C	C	--	--
2-1/8	4.166 C	-----	12.06 C	--	B	C	C	C	B
2-3/16	-----	-----	12.78 --	C	C	B	A	B	B
2-1/4	4.771 A	14.6 B	13.52 C	B	B	A	C	A	B
2-5/16	-----	-----	14.28 --	--	--	B	--	--	--
2-3/8	5.210 B	-----	15.06 C	C	C	B	C	B	--
2-7/16	-----	-----	15.87 --	--	C	B	A	A	B
2-1/2	5.767 A	18.1 B	16.69 B	B	A	A	B	A	A
2-9/16	-----	-----	17.53 --	--	--	C	C	--	--
2-5/8	6.358 C	-----	18.40 --	C	C	B	C	C	B
2-11/16	-----	-----	19.29 --	--	--	B	A	--	--
2-3/4	6.978 C	21.9 B	20.20 C	B	B	A	B	A	A
2-7/8	-----	-----	22.07 --	-	--	C	--	--	--
2-15/16	-----	-----	23.04 --	C	--	B	A	B	B
3"	8.304 A	26.0 B	24.03 C	B	A	B	A	A	A
3-1/8	-----	-----	26.08 --	--	--	C	--	--	--
3-3/16	-----	-----	27.13 --	--	--	B	C	--	--
3-1/4	9.746 B	-----	28.21 C	B	B	B	B	A	A
3-5/16	-----	-----	29.30 --	--	--	C	--	--	--
3-3/8	-----	-----	30.42 --	--	--	C	--	B	--
3-7/16	-----	-----	31.55 --	--	--	B	C	B	--
3-1/2	11.303A	35.4 C	32.71 C	B	A	A	B	A	A
3-9/16	-----	-----	33.89 --	--	--	C	--	--	--
3-5/8	12.14 C	-----	35.09 --	--	--	C	C	C	--
3-11/16	-----	-----	36.31 --	C	--	B	--	--	--
3-3/4	12.975C	-----	37.55 C	B	B	B	B	A	--

Round Bars

TABLE 2.3

D IAMETER	Alum. 6061-T6	Brass	Hot Roll A-36 or CQ	Stainless		Cold Finish			
				T304	T316	1018	1045	1144-SR 4140 ANN	
3-7/8	-----	-----	-----	-----	-----	40.10 C	--	--	B
3-15/16	-----	-----	-----	-----	-----	41.40 --	--	--	B
4"	14.763A	46.3 B	42.73 B	B	A	A	B	A	A
4-3/16	-----	-----	46.83 --	--	--	B	--	--	B
4-1/4	16.765C	-----	48.23 C	B	--	B	--	C	B
4-7/16	-----	-----	52.58 C	--	--	B	B	B	B
4-1/2	18.694A	-----	54.08 C	B	--	A	B	A	B
4-3/4	-----	-----	60.25 C	--	--	C	C	--	--
4-15/16	-----	-----	65.10 --	--	--	B	C	--	B
5"	23.067A	72.3 C	66.76 C	C	C	A	B	--	B
5-7/16	-----	-----	78.95 --	--	--	C	C	--	--
5-1/2	27.998B	-----	80.78 --	--	--	C	C	--	--
5-15/16	-----	-----	94.14 --	--	--	C	C	--	--
6"	33.219A	-----	96.13 B	B	B	A	B	--	B
6-1/4	-----	-----	104.3 C	--	--	C	--	--	--
6-1/2	38.988A	-----	112.8 C	--	--	B	--	--	--
7"	45.214A	-----	130.8 C	--	--	B	--	--	--
7-1/4	-----	-----	140.4 C	--	--	C	--	--	--
7-1/2	51.961B	-----	150.2 C	--	--	C	--	--	--
8"	59.091B	-----	170.9 C	--	--	B	--	--	--
8-1/2	-----	-----	192.9 C	--	--	C	--	--	--
9"	-----	-----	216.3 C	--	--	C	--	--	--
10"	-----	-----	267.0 C	--	--	C	--	--	--
12"	-----	-----	384.5 C	--	--	C	--	--	--

Square Bars		TABLE 2.4				
SIZE	Alum. 6061-T6 *6063-T5	Brass	Hot Roll A-36 or CQ	Stainless		Cold Finish 1018
				T304	T316	
1/8	-----	-----	.053 --	C	C	B
3/16	-----	-----	.120 --	B	B	B
1/4	.073 B*	.231 A	.213 --	A	B	A
5/16	-----	.360 B	.332 C	A	B	A
3/8	.169 B*	.518 A	.478 B	A	B	A
7/16	-----	-----	.652 --	--	C	B
1/2	.300 A*	.921 A	.850 A	A	B	A
9/16	-----	-----	1.080 --	--	--	A
5/8	.468 B*	1.44 A	1.330 B	A	B	A
11/16	-----	-----	1.610 --	--	--	B
3/4	.674 B	2.07 A	1.910 A	A	B	A
13/16	-----	-----	2.240--	--	--	B
7/8	-----	2.82 B	2.600 B	--	--	A
15/16	-----	-----	2.990--	--	--	B
1"	1.175 B	3.68 B	3.40 B	B	B	A
1-1/8	-----	4.66 B	4.300 B	--	--	A
1-3/16	-----	-----	4.795 --	--	--	B
1-1/4	1.875 B	5.76 B	5.310 B	B	--	A
1-3/8	-----	-----	6.43 --	--	--	B
1-1/2	2.745 B	8.29 B	7.65 B	B	--	A
1-3/4	3.598 C	11.3 C	10.41 B	--	--	A
2"	4.699 B	14.7 B	13.60 B	B	--	A
2-1/4	5.947C	-----	17.21 C	--	--	A
2-1/2	7.343 C	23.0 B	21.25 B	--	--	A
2-3/4	-----	-----	25.71 C	--	--	B
3"	10.584B	33.8 C	30.60 B	--	--	B
3-1/2"	14.396C	-----	41.65 C	--	--	B
4"	18.797C	-----	54.40 C	--	--	B
5"	-----	-----	85.00 C	--	--	B
6"	-----	-----	122.4 C	--	--	B

How to Buy Beams

Three things are necessary to know when ordering steel beams. First, you need to find the nominal size. You may find that a beam that measures 16" high may actually be a 14" beam. Second, you need to know what kind of beam it is. Third, you need to know the weight per foot. There are four kinds of beams:

- **J** = Junior Beam (M shape). Most likely found as a 40-ft length.
- **S** = I Beam (S shape). Found as a 20- or 40-footer. We stock only this beam in the lighter weight from 4" to 8".
- **W** = Wide Flange Beam (W Shape). Most likely found as a 40-footer, but 20s, 25s, 30s, 50s and 60s are often available.
- **H** = H Beam (M Shape). If found, likely to be 40ft.

The type of beam is shown in front of the weight per foot on the following tables. A 8" x 40# Wide Flange Beam is a common beam.

Aluminum beams are also described by its size, type (either Aluminum Association (AA) or American Standard (AS)), and weight per foot. These beams typically come in 25-foot lengths and are 6061-T6. Some beams are available in Florida with a special temper for boat trailers. They come in various lengths and are noted by an asterisk (*).

A-36 is the standard grade of steel beams. Some stronger beams are stocked in A-572 or A-588, but not without substantial freight to Florida. Area mini-mills only make 40-foot lengths noted as "A items". Sizes other than 40-foot lengths will likely be foreign material. "B items" are larger beams that are available from a mill that seems to produce as orders come in, or from foreign sources. In times of a booming economy or presidential import quotas, these may be hard to find.

"C items" are so hard to find that they may have been discontinued. Forget about finding stainless beams; they are not made.

BEAMS		TABLE 3.1				I
Size	Thickness	Size	Thickness	ALUMINUM		STEEL
WEB	FLANGE	AS	AA			A36
3" SIZE						
3.00	.170	2.330	.260	1.944 C	-----	S 5.7 B
3.00	.130	2.500	.200	-----	1.637 C	-----
3.00	.150	2.500	.260	-----	2.030 B	-----
3.00	.349	2.509	.260	2.670 C	-----	S 7.5 C
4" SIZE						
4.00	.193	2.660	.293	2.642 C	-----	S 7.7 A
4.00	.326	2.796	.293	3.373 C	-----	S 9.5 C
4.00	.150	3.000	.230	-----	2.331 B	-----
4.00	.170	3.000	.290	-----	2.793 B*	-----
4.16	.280	4.060	.345	-----	-----	W 13.0A
4-1/2" SIZE						
4.50	.175	3.00	.260	---	2.685 B*	---
5" SIZE						
5.00	.214	3.000	.326	3.508 C	-----	S 10.0 B
5.00	.494	3.284	.326	5.250 C	-----	S 14.75 C
5.00	.190	3.500	.320	-----	3.700 B*	-----
5.01	.240	5.000	.360	-----	-----	W 16.0 B
5.00	.316	5.003	.416	-----	-----	H 18.9 C
5.15	.270	5.030	.430	-----	-----	W 19.0 B
5-1/2" SIZE						
5.50	.195	3.500	.280	-----	3.524 B*	-----
6" SIZE						
6.00	.114	1.844	.171	-----	-----	J 4.4 A
6.00	.232	3.332	.359	4.421 C	-----	S 12.5 A
6.00	.343	3.443	.359	5.220 C	-----	-----
6.00	.465	3.565	.359	6.072 C	-----	S 17.25 C
5.90	.170	3.940	.215	-----	-----	W 9.0 A
6.03	.230	4.000	.280	-----	-----	W 12.0 A
6.00	.190	4.000	.290	-----	4.030 B	-----
6.00	.210	4.000	.350	-----	4.700 B*	-----
6.28	.260	4.030	.405	-----	-----	W 16.0 A
5.99	.230	5.990	.260	-----	-----	W 15.0 A
6.20	.260	6.020	.365	-----	-----	W 20.0 A
6.38	.320	6.080	.455	-----	-----	W 25.0 A

BEAMS		TABLE 3.2				I
Size	Thickness	Size	Thickness	ALUMINUM		STEEL
WEB	FLANGE	AS	AA			A36
6-1/2" SIZE						
6.50	.220	4.00	.310	-----	4.561 B*	-----
7" SIZE						
7.00	.252	3.662	.392	-----	-----	S 15.3 B
7.00	.450	3.860	.392	-----	-----	S 20.0 C
7.00	.230	4.500	.380	-----	5.880 B*	-----
7-1/2" SIZE						
7.500	.230	4.375	.350	-----	5.584 B*	-----
8" SIZE						
8.00	.135	2.281	.189	-----	-----	J 6.5 B
7.89	.170	3.940	.205	-----	-----	W 10.0 A
7.99	.230	4.000	.255	-----	-----	W 13.0 A
8.11	.245	4.015	.315	-----	-----	W 15.0 A
8.00	.271	4.000	.425	6.510 C	-----	S 18.4 A
8.00	.441	4.171	.425	8.124 C	-----	S 23.0 C
8.00	.230	5.000	.350	-----	6.181 C	-----
8.00	.250	5.000	.410	-----	7.023 B*	-----
8.14	.230	5.250	.330	-----	-----	W 18.0 A
8.28	.250	5.270	.400	-----	-----	W 21.0 A
7.93	.245	6.495	.400	-----	-----	W 24.0 A
8.06	.285	6.535	.465	-----	-----	W 28.0 B
8.00	.285	7.995	.435	-----	-----	W 31.0 B
8.12	.310	8.020	.495	-----	-----	W 35.0 B
8.25	.360	8.070	.560	-----	-----	W 40.0 B
8.00	.458	8.083	.521	-----	-----	H 40.0 C
8.50	.400	8.110	.685	-----	-----	W 48.0 B
8.75	.510	8.220	.810	-----	-----	W 58.0 B
9.00	.570	8.280	.935	-----	-----	W 67.0 B
9" SIZE						
9.00	.270	5.50	.440	-----	8.360 C	-----
* Boat Trailer Beam available in various lengths. (from 18'6" to 40 ft. Lengths)						

BEAMS		TABLE 3.3			I
Size	Thickness	Size	Thickness	ALUMINUM	STEEL
WEB	FLANGE	AS	AA	A36	
10" SIZE					
9.95	.141	2.690	.182	-----	J 8.0 C
10.00	.157	2.690	.206	-----	J 9.0 B
9.87	.190	3.960	.210	-----	W 12.0 A
9.99	.230	4.000	.270	-----	W 15.0 A
10.11	.240	4.010	.330	-----	W 17.0 A
10.24	.250	4.020	.395	-----	W 19.0 A
10.00	.311	4.661	.491	8.981 C	S 25.4 B
10.00	.594	4.944	.491	12.450 C	S 35.0 C
10.17	.240	5.750	.360	-----	W 22.0 B
10.33	.260	5.770	.440	-----	W 26.0 B
10.47	.300	5.810	.510	-----	W 30.0 B
10.00	.250	6.000	.410	-----	8.650 B
10.00	.290	6.000	.500	-----	10.286 C
9.73	.290	7.960	.435	-----	W 33.0 B
9.92	.315	7.985	.530	-----	W 39.0 B
10.10	.350	8.020	.620	-----	W 45.0 B
9.98	.340	10.000	.560	-----	W 49.0 B
10.09	.370	10.030	.615	-----	W 54.0 B
10.22	.420	10.080	.680	-----	W 60.0 B
10.40	.470	10.130	.770	-----	W 68.0 B
10.60	.530	10.190	.870	-----	W 77.0 B
10.84	.605	10.265	.990	-----	W 88.0 B
11.10	.680	10.340	1.120	-----	W 100.0 C
11.36	.755	10.415	1.250	-----	W 112.0 C
J = Junior Beam (M Shape) S = I Beam (S Shape) W = Wide Flange Beam (W Shape) H = H Beam (M Shape) AA = Aluminum Association AS = American Standard					

BEAMS		TABLE 3.4			I
Size	Thickness	Size	Thickness	ALUMINUM	STEEL
WEB	FLANGE	AS	AA	A36	
12" SIZE					
11.97	.160	3.065	.210	-----	J 10.8 B
12.00	.177	3.065	.225	-----	J 11.8 B
11.91	.200	3.970	.225	-----	W 14.0 A
11.99	.220	3.990	.265	-----	W 16.0 A
12.16	.235	4.005	.350	-----	W 19.0 A
12.31	.260	4.030	.425	-----	W 22.0 A
12.00	.350	5.000	.544	11.220 C	S 31.8 B
12.00	.428	5.078	.544	-----	S 35.0 B
12.00	.462	5.252	.659	-----	S 40.8 B
12.00	.687	5.477	.659	-----	S 50.0 B
12.22	.230	6.490	.380	-----	W 26.0 A
12.34	.260	6.520	.440	-----	W 30.0 B
12.50	.300	6.560	.520	-----	W 35.0 B
12.00	.290	7.00	.470	11.672 C	-----
12.00	.310	7.00	.620	14.292 B	-----
11.94	.295	8.005	.515	-----	W 40.0 B
12.06	.335	8.045	.575	-----	W 45.0 B
12.19	.370	8.080	.640	-----	W 50.0 B
12.06	.345	9.995	.575	-----	W 53.0 B
12.19	.360	10.010	.640	-----	W 58.0 B
12.12	.390	12.000	.605	-----	W 65.0 B
12.25	.430	12.040	.670	-----	W 72.0 B
12.38	.470	12.080	.735	-----	W 79.0 B
12.53	.515	12.125	.810	-----	W 87.0 B
12.71	.550	12.160	.900	-----	W 96.0 C
12.88	.610	12.220	.990	-----	W 106 C
13.12	.710	12.320	1.106	-----	W 120 C
13.41	.790	12.400	1.250	-----	W 136 C
13.71	.870	12.480	1.400	-----	W 152 C
14.03	.960	12.570	1.560	-----	W 170 C
14.38	1.060	12.670	1.736	-----	W 190 C

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BEAMS		TABLE 3.5			I
Size	Thickness	Size	Thickness	ALUMINUM	STEEL
WEB	FLANGE	AS	AA	A36	
14" SIZE					
13.74	.230	5.000	.335	----	W 22.0 A
13.91	.255	5.025	.420	----	W 26.0 B
13.84	.270	6.730	.385	----	W 30.0 B
13.98	.285	6.745	.455	----	W 34.0 B
14.10	.310	6.770	.515	----	W 38.0 B
13.66	.305	7.995	.530	----	W 43.0 B
13.79	.340	8.030	.595	----	W 48.0 B
13.92	.370	8.060	.660	----	W 53.0 B
13.89	.375	9.995	.645	----	W 61.0 B
14.04	.415	10.035	.720	----	W 68.0 B
14.17	.450	10.070	.785	----	W 74.0 B
14.31	.510	10.130	.855	----	W 82.0 B
14.02	.440	14.520	.710	----	W 90.0 C
14.16	.485	14.565	.780	----	W 99.0 C
14.32	.525	14.605	.860	----	W 109 C
14.48	.590	14.670	.940	----	W 120 C
14.66	.645	14.725	1.030	----	W 132 C
14.78	.680	15.500	1.090	----	W 145 C
14.98	.745	15.565	1.190	----	W 159 C
15.22	.830	15.650	1.310	----	W 176 C
15.48	.890	15.710	1.440	----	W 193 C
15.72	.980	15.800	1.560	----	W 211 C
16.04	1.070	15.890	1.720	----	W 233 C
16.38	1.175	15.995	1.890	----	W 257 C
16.74	1.290	16.110	2.070	----	W 283 C
17.12	1.410	16.230	2.260	----	W 311 C
17.54	1.540	16.360	2.470	----	W 342 C
17.92	1.655	16.475	2.660	----	W 370 C
18.29	1.770	16.590	2.845	----	W 398 C
18.67	1.875	16.695	3.035	----	W 426 C
19.02	2.015	16.835	3.210	----	W 455 C

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BEAMS		TABLE 3.6			I
Size	Thickness	Size	Thickness	ALUMINUM	STEEL
WEB	FLANGE	AS	AA	A36	
15" SIZE					
15.00	.411	5.501	.622	----	----
15.00	.550	5.640	.622	----	----
16" SIZE					
15.69	.250	5.500	345	----	----
15.88	.275	5.525	.440	----	----
15.86	.295	6.985	.430	----	----
16.01	.305	6.995	.505	----	----
16.13	.345	7.035	.565	----	----
16.26	.380	7.070	.630	----	----
16.43	.430	7.120	.715	----	----
16.33	.395	10.235	.665	----	----
16.52	.455	10.295	.760	----	----
16.75	.525	10.365	.875	----	----
16.97	.585	10.425	.985	----	----
18" SIZE					
17.70	.300	6.000	.425	----	----
17.90	.315	6.015	.525	----	----
18.05	.360	6.060	.605	----	----
18.00	.461	6.001	.691	----	----
18.00	.711	6.251	.691	----	----
17.99	.355	7.495	.570	----	----
18.11	.390	7.530	.630	----	----
18.24	.415	7.555	.695	----	----
18.35	.450	7.590	.750	----	----
18.47	.495	7.635	.810	----	----
18.21	.425	11.035	.680	----	----
18.39	.480	11.090	.770	----	----
18.59	.535	11.145	.870	----	----
18.73	.590	11.200	.940	----	----
18.97	.655	11.265	1.060	----	----

Continued on the next page

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BEAMS		TABLE 3.7		I
Size	Thickness	Size	Thickness	STEEL
WEB		FLANGE		A36
18" SIZE (Continued)				
19.25	.670	11.160	1.200	W 130 C
19.49	.730	11.220	1.320	W 143 C
19.72	.810	11.300	1.440	W 158 C
20.04	.890	11.375	1.590	W 175 C
20.35	.960	11.455	1.750	W 192 C
20.67	1.060	11.555	1.910	W 211 C
21.06	1.160	11.650	2.110	W 234 C
20" SIZE				
20.00	.505	6.255	.795	S 66.0 B
20.00	.635	6.385	.795	S 75.0 C
20.30	.660	7.060	.920	S 86.0 C
20.30	.800	7.200	.920	S 96.0 C
21" SIZE				
20.66	.350	6.500	.450	W 44.0 B
20.83	.380	6.530	.535	W 50.0 B
21.06	.405	6.555	.650	W 57.0 B
20.99	.400	8.240	.615	W 62.0 B
21.13	.430	8.270	.685	W 68.0 B
21.24	.455	8.295	.740	W 73.0 B
21.43	.515	8.355	.835	W 83.0 B
21.62	.580	8.420	.930	W 93.0 B
21.36	.500	12.290	.800	W 101 C
21.51	.550	12.340	.875	W 111 C
21.68	.600	12.390	.960	W 122 C
21.83	.650	12.440	1.035	W 132 C
22.06	.720	12.510	1.150	W 147 C
22.48	.750	12.42	1.360	W 166 C
22.72	.830	12.50	1.480	W 182 C

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BEAMS		TABLE 3.8		I
Size	Thickness	Size	Thickness	STEEL
WEB		FLANGE		A36
24" SIZE				
23.55	.396	7.005	.505	W 55 B
23.74	.430	7.040	.590	W 62 B
24.00	.500	7.000	.870	S 80 C
24.00	.625	7.125	.870	S 90 C
.24.00	.745	7.245	.870	S 100 C
24.50	.620	7.870	1.090	S 106 C
24.50	.800	8.050	1.090	S 121 C
23.73	.415	8.965	.585	W 68 B
23.92	.440	8.990	.680	W 76 B
24.10	.470	9.020	.770	W 84 B
24.31	.515	9.065	.875	W 94 B
24.06	.500	12.750	.750	W 104 C
24.26	.550	12.800	.850	W 117 C
24.48	.605	12.855	.960	W 131 C
24.74	.650	12.900	1.090	W 146 C
25.00	.705	12.955	1.220	W 162 C
25.24	.750	12.890	1.340	W 176 C
25.47	.810	12.950	1.460	W 192 C
25.71	.870	13.010	1.570	W 207 C
26.02	.960	13.110	1.730	W 229 C
26.34	1.040	13.185	1.890	W 250 C
27" SIZE				
26.71	.460	9.960	.640	W 84 B
26.92	.490	9.990	.745	W 94 B
27.09	.515	10.015	.830	W 102 B
27.29	.570	10.070	.930	W 114 C
27.38	.605	13.965	.975	W 146 C
27.59	.660	14.020	1.080	W 161 C
27.81	.725	14.085	1.190	W 178 C
28.43	.830	14.115	1.500	W 217 C

BEAMS		TABLE 3.8		I
Size	Thickness	Size	Thickness	STEEL
WEB		FLANGE		A36
30" SIZE				
29.53	.470	10.400	.610	W 90 B
29.65	.520	10.450	.670	W 99 B
29.83	.545	10.475	.760	W 108 B
30.01	.565	10.495	.850	W 116 B
30.17	.585	10.515	.930	W 124 B
30.31	.615	10.545	1.000	W 132 B
30.44	.655	14.985	1.065	W 173 B
30.68	.710	15.040	1.185	W 191 B
30.94	.775	15.105	1.315	W 211 B
31.30	.830	15.055	1.500	W 235 C
31.61	.930	15.155	1.650	W 261 C
32.01	1.020	15.255	1.850	W 292 C
32.40	1.140	15.370	2.050	W 326 C
33" SIZE				
32.86	.550	11.480	.740	W 118 B
33.09	.580	11.510	.855	W 130 B
33.30	.605	11.535	.960	W 141 B
33.49	.635	11.565	1.055	W 152 B
33.68	.715	15.745	1.150	W 201 B
33.93	.775	15.805	1.275	W 221 B
34.18	.830	15.860	1.400	W 241 B
34.53	.870	15.805	1.570	W 263 C
34.84	.960	15.905	1.730	W 291 C
35.16	1.040	15.985	1.890	W 318 C
35.55	1.160	16.100	2.090	W 354 C
36" SIZE				
35.55	.600	11.950	.790	W 135 B
35.84	.625	11.975	.940	W 150 B
36.01	.650	12.000	1.020	W 160 B
36.17	.680	12.030	1.100	W 170 B
36.33	.725	12.075	1.180	W 182 B
LARGER SIZES (196# TO 300#) DELETED FROM TABLE				

TURI IND.COM-----Page 27

There are two types of channels, each having a different description. **Bar channels and architectural channels** are described by their height, leg length and thickness. For example, 2" x 1" x 3/16 is a common bar channel.

Structural channels are larger channels. Both aluminum and steel structural channels are described by their height and the weight per foot. For example, a 3" x 4.1# Channel is a very common steel channel.

Bar Channels come in 20-foot lengths. Structural Channels are available in 20- and 40- foot lengths

Aluminum bar channels are available in the 6063-T5 architectural grade. These channels have square corners on the inside. Structural channels are made in the 6061-T6 grade as Aluminum Association (AA) or American Standard Channels (AS). For those willing to pay double for superior corrosion resistance and a duller finish, some structural channels are available in a 5086-H34 Marine Grade. Structural channels have a tapered inside corner for more strength. In Florida, architectural channels come in 20-foot lengths, but in some parts of the country, 16-ft lengths are still common. Structural aluminum channels come in 25-ft lengths.

Carbon steel channels are generally available in A-36 or a modified A-36 when a mini-mill will find that its soup mix of scrap metal yields slightly stronger steel. An "S" shown before the weight of the channel notes very heavy channels, called Ship Channels. A "J" shown before the weight of the channel notes very light channels, called Junior Channels. These two types of channels cost about twice as much per pound as regular channels.

Some competitors use a heavier theoretical weight for steel bar channels than are shown here. Companies do not agree with each other. The result is you could pay more for a channel that has the same price per pound. It is best to have bar channels quoted per length.

Extruded stainless channels are incredibly expensive (as much as 40 times the price of steel). If at all possible, it is best to make those channels from plate, which we can make up to 1/2" thick. Some of our suppliers offer two stainless angles welded together lengthwise. For example, two 2" x 2" x 1/4 angles are welded together the hard way to make a 4" x 2" x 1/4" channel.

TURI IND.COM-----Page 28

A-1 Metal Supply Corp.....1-800-354-9678

CHANNELS			TABLE 5.1			[
SIZE			ALUMINUM			STEEL
WEB	FLANGE	THICKNESS WEB	Arch 6063-T5	AS 6061-T6	AA 6061-T6	A36
1/2	3/8	1/8	150 C	-----	-----	-----
	1/2	.093	.148 A	-----	-----	-----
	3/4	1/8	.263 A	-----	-----	-----
3/4	3/8	1/8	.187 C	-----	-----	.560 C
	1/2	1/8	.226 B	-----	-----	-----
	3/4	1/8	.300 A	-----	-----	-----
1"	3/8	1/8	-----	-----	-----	.680 C
	1/2	1/8	.263 A	-----	-----	.840 A
	1"	1/8	.431 A	-----	-----	-----
1-1/4	1/2	1/8	300 B	-----	-----	1.01 C
	3/4	1/8	.376 B	-----	-----	-----
	1"	1/8	.431 C	-----	-----	-----
	1-1/4	1/8	.526 B	-----	-----	-----
1-1/2	1/2	1/8	.337 A	-----	-----	1.12 A
	3/4	1/8	.413 B	-----	-----	1.17C
	1"	1/8	.487 B	-----	-----	-----
	1-1/2	1/8	.637 A	-----	-----	-----
1-3/4	3/4	1/8	.450 B	-----	-----	-----
	1"	1/8	.524 B	-----	-----	-----
2"	7/16	.093	.294 B	-----	-----	-----
	1/2	1/8	.413 B	-----	-----	1.47 A
	3/4	.090	.440 B	-----	-----	-----
	1"	1/8	.564 A	-----	.577 B	1.78 A
	1"	3/16	-----	-----	-----	2.57 A
	1-1/4	.170	-----	-----	1.071C	-----
	2"	1/8	.861 A	-----	-----	-----
2-1/4	7/8	1/8	.563 B	-----	-----	-----
2-1/2	1-1/2	3/16	.787 C	-----	-----	-----

A-1 Metal Supply Corp.....1-800-354-9678

CHANNELS			TABLE 5.2			[
SIZE			ALUMINUM			STEEL
WEB	FLANGE	THICKNESS WEB	Arch 6063-T5	AS 6061-T6	AA 6061-T6	A36
3"	1/2"	1/8	.563 C	-----	-----	-----
	1"	1/8	.713 B	-----	-----	-----
	1.41	.125	-----	-----	-----	3.5 B
	1.41	.170	-----	-----	-----	4.1 A
	1.498	.258	-----	-----	-----	5.0 B
	1.500	.130	-----	-----	1.135B	-----
	1.596	.356	-----	2.074B	-----	6.0 B
	1.750	.170	-----	-----	1.597B	-----
	1.938	.313	-----	-----	-----	S 7.1 A
4"	1"	.115	.613 B	-----	-----	-----
	1.580	.125	-----	-----	-----	4.5 B
	1.580	.180	-----	-----	1.846A	-----
	1.647	.247	-----	2.161C	-----	-----
	1.720	.320	-----	2.504C	-----	7.25 B
	2.000	.150	-----	-----	1.738B	-----
	2.250	.190	-----	-----	2.331B	-----
	2.500	.500	-----	-----	-----	S13.8A
	1.750	.190	-----	-----	2.316A	-----
5"	1.885	.325	-----	3.108B	-----	6.7 A
	2.032	.472	-----	3.975C	-----	9.0 B
	2.250	.150	-----	-----	2.212B	-----
	2.750	.190	-----	-----	3.089B	-----
	-----	-----	-----	-----	-----	-----
AA = Aluminum Association—25 ft lengths						
AS = American Standard—25 ft Lengths						
Architectural Channels—20 ft Lengths Standard						
S = Ship Channels—40 ft Lengths Standard						
Other Steel Channels, 20 or 40 ft Lengths						

A-1 Metal Supply Corp.....1-800-354-9678

CHANNELS			TABLE 5.3				[
SIZE			ALUMINUM			STEEL	
WEB	FLANGE	THICKNESS	Arch 6063-T5	AS 6061-T6	AA 6061-T6	A36	
6"	1.840	.155	----	----	----	<i>J 6.5 C</i>	
	1.870	.179	----	----	----	<i>J 7.0 C</i>	
	1.920	.200	----	2.826 A	----	8.2 A	
	1.945	.225	----	<i>3.002 C</i>	----	----	
	2.034	.314	----	<i>3.631 B</i>	----	<i>10.5 B</i>	
	2.157	.437	----	<i>4.498 C</i>	----	<i>13.0 B</i>	
	2.500	.170	----	2.834 B	----		
	2.500	.310	----	----	----	<i>S 12.0 B</i>	
	2.941	.315	----	----	----	<i>S 15.1 C</i>	
	3.000	.375	----	----	----	<i>S 16.3 B</i>	
	3.250	.210	----	4.030 B	----		
	3.500	.340	----	----	----	<i>S 15.3 C</i>	
	3.500	.375	----	----	----	<i>S 18.0 C</i>	
7"	2.090	.210	----	----	----	9.8 A	
	2.110	.230	----	<i>3.541 C</i>	----	----	
	2.194	.314	----	<i>4.232 C</i>	----	<i>12.25 B</i>	
	2.299	.419	----	----	----	<i>14.75 C</i>	
	2.750	.170	----	3.205 B	----		
	3.450	.350	----	----	----	<i>S 19.1 C</i>	
	3.500	.210	----	4.715 C	----		
	3.600	.500	----	----	----	<i>S 22.7 C</i>	
8"	1.875	.180	----	----	----	<i>J 8.5 B</i>	
	2.260	.220	----	----	----	11.5 A	
	2.290	.250	----	4.252 A	----	----	
	2.343	.303	----	<i>4.951 C</i>	----	<i>13.75 B</i>	
	2.435	.395	----	<i>5.617 C</i>	----	----	
	2.527	.487	----	<i>6.484 B</i>	----	18.75 A	

(Continued on Next Page)

A-1 Metal Supply Corp.....1-800-354-9678

CHANNELS			TABLE 5.4				[
SIZE			ALUMINUM			STEEL	
WEB	FLANGE	THICKNESS	Arch 6063-T5	AS 6061-T6	AA 6061-T6	A36	
8"	2.975	.350	----	----	----		<i>S 18.7 C</i>
	3.000	.190	----	----	4.147 B	----	
	3.025	.400	----	----	----		<i>S 20.0 C</i>
	3.450	.375	----	----	----		<i>S 21.4 C</i>
	3.500	.425	----	----	----		<i>S 22.8 B</i>
	3.750	.250	----	----	5.789 C	----	
	9"	2.430	.230	----	<i>4.604 C</i>	----	<i>13.4 B</i>
9"	2.485	.285	----	----	----		<i>15.0 C</i>
	2.648	.448	----	<i>6.911 C</i>	----		<i>20.0 C</i>
	3.250	.230	----	----	4.983 C	----	
	3.450	.400	----	----	----		<i>S 23.9 C</i>
	3.500	.450	----	----	----		<i>S 25.4 B</i>
	4.000	.240	----	----	6.970 C	----	
	10"	1.125	.150	----	----	----	<i>J 6.5 C</i>
10"	1.500	.170	----	----	----		<i>J 8.4 B</i>
	2.600	.240	----	5.278 B	----		15.3 A
	2.739	.379	----	<i>6.915 C</i>	----		<i>20.0 B</i>
	2.886	.526	----	8.641 B	----		<i>25.0 B</i>
	3.033	.673	----	----	----		<i>30.0 B</i>
	3.315	.290	----	----	----		<i>S 22.0 C</i>
	3.405	.380	----	----	----		<i>S 25.0 C</i>
	3.500	.250	----	----	6.136 C	----	
	3.950	.425	----	----	----		<i>S 28.5 C</i>
	4.100	.575	----	----	----		<i>S 33.6 C</i>
	4.321	.796	----	----	----		<i>S 41.1 C</i>
	4.250	.310	----	----	8.360 C	----	

TURIND.COM-----Page 32

TURIND.COM-----Page 31

CHANNELS			TABLE 5.5			[
SIZE			ALUMINUM			STEEL
WEB	FLANGE	THICKNESS	Arch 6063-T5	AS 6061-T6	AA 6061-T6	A36
12"	1.500	.190	----	----	----	J 10.6 A
	2.940	.280	----	----	----	20.7 A
	2.960	.300	----	7.415 B	----	----
	3.047	.387	----	8.374 B	----	25.0 B
	3.170	.510	----	10.37 B	----	30.0 B
	3.670	.370	----	----	----	<i>S 31 C</i>
	3.767	.467	----	----	----	<i>S 35.0 C</i>
	3.890	.590	----	----	8.274 C	<i>S 40.0 C</i>
	4.000	.290	----	----	----	----
	4.012	.712	----	----	----	<i>S 45.0 C</i>
	4.135	.835	----	----	11.822C	<i>S 50.0 C</i>
	5.000	.350	----	----	----	----
13"	4.000	.375	----	----	----	<i>S 31.8 C</i>
	4.072	.447	----	----	----	<i>S 35.0 C</i>
	4.185	.560	----	----	----	<i>S 40.0 C</i>
	4.412	.787	----	----	----	<i>S 50.0 C</i>
15"	3.400	.400	----	11.708C	----	<i>33.9 B</i>
	3.520	.520	----	----	----	<i>40.0 C</i>
	3.716	.716	----	----	----	<i>50.0 C</i>
18"	3.950	.450	----	----	----	<i>S 42.7 B</i>
	4.000	.500	----	----	----	<i>S 45.8 C</i>
	4.100	.600	----	----	----	<i>S 51.9 C</i>
	4.200	.700	----	----	----	<i>S 58.0 C</i>

How to Buy Flats

We stock Aluminum Rectangular Bars (or Flat bars) in 6061-T6 grade of Aluminum where available. This grade cannot be easily bent without breaking. In some smaller sizes, we stock 6063-T5, which is a softer aluminum for bending.

In Florida, 6063-T5 (Architectural) flat bars are available in 20-foot lengths. In some parts of the country, 16-foot lengths are found. 6061-T6 flats are found in 12-foot lengths.

We stock Steel Flat bars as hot roll A-36. Some foreign material arrives as CQ (Commercial Quality), a softer grade than A-36 that seems to bend easier. Hot roll flats are oversized and come in 20-foot lengths.

If true size (.001 under) is important and you are willing to pay more than twice as much for it, order cold roll (1018 grade) flats. Cold roll flats are only marginally stronger than hot roll flats, theoretically, though some customers claim otherwise. Cold roll steel flats come in 12-foot lengths.

Some sizes are only available in cold finished. A "CF" in front of the weight marks these sizes. Cold Finished flats generally start at 1/4" thick.

Hot roll steel flats below 1/4" are produced by slitting a coil. Other hot roll flats are produced in mini-mills. The result is that flats under 1/4" cost more per pound than a 1/4" flat bar. A 1/4 x 3 flat bar may cost the same per length as a 3/16 x 3 flat bar.

We stock Stainless Flats in Type 304, but we can special order Type 316. It is more economical to shear flats over 3" wide from plate. Otherwise, only sizes marked as "A items" in steel are available in stainless. Stainless flats have the same theoretical weight as carbon steel. Stainless flat bars come in random 12-foot lengths, which means they can range from 10 feet to 14 feet long.

Flat Bars		TABLE 6.1		—
SIZE	ALUMINUM		STEEL	—
	6061-T6	6063-T5	A-36	—
1/8 x 1/2	.078 C	.078 A	.213 A	
1/8 x 3/4	.113 C	.113 A	.319 A	
1/8 x 1"	.150 B	.150 A	.425 A	
1/8 x 1-1/4	.188 B	.188 B	.531 A	
1/8 x 1-1/2	.225 B	.225 A	.638 A	
1/8 x 1-3/4	----	.263 B	.744 C	
1/8 x 2"	.300 B	.300 A	.850 A	
1/8 x 2-1/2	----	----	1.063B	
1/8 x 3"	----	.450 A	1.275A	
1/8 x 3-1/2	----	----	1.490C	
1/8 x 4"	----	.600 A	1.70 A	
1/8 x 5"	----	----	2.13 A	
1/8 x 6"	----	.900 A	2.55 A	
3/16 x 1/2	----	.113 B	.319 B	
3/16 x 3/4	.169 C	.169 B	.478 B	
3/16 x 1"	.226 B	.226 A	.638 A	
3/16 x 1-1/4	.275 C	.283 B	.797 A	
3/16 x 1-1/2	.338 B	.338 A	.956 A	
3/16 x 2"	.451 B	.451 A	1.28 A	
3/16 x 2-1/2	.561 C	.551 C	1.59 A	
3/16 x 3"	----	.677 A	1.91 A	
3/16 x 3-1/2	----	----	2.23 C	
3/16 x 4"	----	.902 A	2.55 A	
3/16 x 5"	----	----	3.19 A	
3/16 x 6"	----	----	3.83 A	

Flat Bars		TABLE 6.2		—
SIZE	ALUMINUM		STEEL	—
	6061-T6	6063-T5	A-36	—
1/4 x 3/8	----	----	CF.319 B	
1/4 x 1/2	.150 A	.150 A	.425 A	
1/4 x 5/8	----	.184 C	CF .531 B	
1/4 x 3/4	.226 A	.226 B	.638 A	
1/4 x 1"	.300 A	.300 B	.850 A	
1/4 x 1-1/4	.376 B	.376 B	1.063 A	
1/4 x 1-1/2	.450 A	.450 B	1.280 A	
1/4 x 1-3/4	.526 C	.524 C	1.488 C	
1/4 x 2"	.600 A	.600 B	1.700 A	
1/4 x 2-1/2	.750 C	.734 C	2.125 A	
1/4 x 3"	.900 A	.900 B	2.55 A	
1/4 x 3-1/2	----	----	2.975 B	
1/4 x 4"	1.200 A	1.200 C	3.400 A	
1/4 x 5"	1.500 B	----	4.250 A	
1/4 x 6"	1.800 A	1.800 C	5.100 A	
1/4 x 7"	----	----	5.950 A	
1/4 x 8"	2.400 B	----	6.800 A	
1/4 x 9"	----	----	7.650 C	
1/4 x 10"	3.000 B	----	8.500 A	
1/4 x 12"	3.600 B	----	10.200 A	

All 5/16" Steel Flats must be special ordered. Most are hard to find. Aluminum Flats are not available. Multiple 1/4" weight above by 1.25 to obtain the approximate/theoretical weight of 5/16" flats.

Flat Bars		TABLE 6.3		—
SIZE	ALUMINUM		STEEL	—
	6061-T6	6063-T5	A-36	—
3/8 x 1/2	.225 C	.225 B	.640 B	
3/8 x 3/4	.337 C	.337 B	.956 B	
3/8 x 1"	.450 A	.450 B	1.280 A	
3/8 x 1-1/4	.563 B	.563 B	1.594 B	
3/8 x 1-1/2	.675 A	.675 B	1.913 A	
3/8 x 1-3/4	----	----	2.231 C	
3/8 x 2"	.900 A	.900 B	2.550 A	
3/8 x 2-1/2	1.125 B	----	3.190 A	
3/8 x 3"	1.350 A	1.350 B	3.830 A	
3/8 x 3-1/2	----	----	4.463 C	
3/8 x 4"	1.800 A	1.800 B	5.100 A	
3/8 x 5"	2.250 B	----	6.380 A	
3/8 x 6"	2.700 A	----	7.650 A	
3/8 x 7"	----	----	8.930 A	
3/8 x 8"	3.600 B	----	10.200 A	
3/8 x 9"	----	----	11.475 B	
3/8 x 10"	4.500 B	----	12.75 A	
3/8 x 12"	5.400 B	----	15.30 A	
1/2 x 5/8	----	----	<i>CF 1.063C</i>	
1/2 x 3/4	.450 C	.450 B	1.28 A	
1/2 x 1"	.600 A	.600 B	1.700 A	
1/2 x 1-1/4	.750 C	.734 C	2.130 A	
1/2 x 1-1/2	.900 A	.900 B	2.550 A	
1/2 x 1-3/4	1.050 C	----	2.980 C	
1/2 x 2"	1.200 A	1.200 B	3.400 A	
1/2 x 2-1/2	1.500 B	1.500 B	4.250 A	
1/2 x 3"	1.800 A	1.800 B	5.100 A	

Flat Bars		TABLE 6.4		—
SIZE	ALUMINUM		STEEL	—
	6061-T6	6063-T5	A-36	—
1/2 x 3-1/2	----	----	5.950 C	
1/2 x 4"	2.400 A	2.400 C	6.800 A	
1/2 x 5"	3.000 B	----	8.500 A	
1/2 x 6"	3.600 A	----	10.200 A	
1/2 x 7"	----	----	11.900 A	
1/2 x 8"	4.800 A	----	13.600 A	
1/2 x 9"	----	----	15.300 C	
1/2 x 10"	6.000 B	----	17.00 A	
1/2 x 12"	7.200 A	----	20.40 A	
5/8 x 3/4	----	----	<i>CF 1.594 B</i>	
5/8 x 1"	----	----	2.130 B	
5/8 x 1-1/4	----	----	2.656 B	
5/8 x 1-1/2	----	----	3.190 B	
5/8 x 1-3/4	----	----	3.720 C	
5/8 x 2"	----	----	4.250 B	
5/8 x 2-1/2	----	----	5.313 C	
5/8 x 3"	----	----	6.375 B	
5/8 x 3-1/2	----	----	7.744 C	
5/8 x 4"	----	----	8.500 B	
5/8 x 5"	----	----	10.630 C	
5/8 x 6"	----	----	12.75 B	
5/8 x 7"	----	----	14.880 C	
5/8 x 8"	----	----	17.00 B	
5/8 x 10"	----	----	21.25 B	
5/8 x 12"	----	----	25.50 A	
6063-T5---Architectural grade---20 foot lengths				
6061-T6---Structural grade---12 foot lengths				
A-36---Hot roll---20 foot lengths				
1018---Cold finished---12 foot lengths.				

A-1 Metal Supply Corp.....1-800-354-9678

Flat Bars		TABLE 6.5		—
SIZE	ALUMINUM		STEEL	—
	6061-T6	6063-T5	A-36	—
3/4 x 1"	.900 B	----	2.55 B	
3/4 x 1-1/4	1.125 C	----	3.19 B	
3/4 x 1-1/2	1.350 B	1.350 C	3.83 B	
3/4 x 2"	1.800 B	1.800 C	5.10 A	
3/4 x 2-1/2	----	----	6.38 A	
3/4 x 3	2.700 C	----	7.65 A	
3/4 x 3-1/2	----	----	8.93 B	
3/4 x 4"	3.600 B	----	10.20 A	
3/4 x 5"	----	----	12.75 A	
3/4 x 6"	5.400 A	----	15.30 A	
3/4 x 7"	----	----	17.85 B	
3/4 x 8"	----	----	20.40 A	
3/4 x 9"	----	----	22.95 B	
3/4 x 10"	----	----	25.50 A	
3/4 x 12"	10.800 A	----	30.60 A	
1" x 1-1/4"	1.500 C	----	CF 4.25 B	
1" x 1-1/2	1.800 B	1.800 C	5.10 B	
1" x 1-3/4	----	----	CF 5.95 B	
1" x 2"	2.400 B	2.350 C	6.80 A	
1" x 2-1/2	3.000 C	----	8.50 C	
1" x 3	3.600 B	----	10.20 A	
1" x 3-1/2	4.200 C	----	11.90 C	
1" x 4"	4.800 B	----	13.60 A	
1" x 5"	----	----	17.00 A	
1" x 6"	7.200 A	----	20.40 A	
1" x 7"	----	----	23.80 C	
1" x 8"	----	----	27.20 A	
1" x 9"	----	----	30.60 B	
1" x 10"	----	----	34.00 A	
1" x 12"	14.400 B	----	40.80 A	

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Flat Bars		TABLE 6.5		—
SIZE	ALUMINUM		STEEL	—
	6061-T6	6063-T5	A-36	—
1-1/4 x 1-1/2	2.250 C	----	CF 6.38 B	
1-1/4 x 2"	3.000 C	----	CF 8.50 A	
1-1/4 x 2-1/2	----	----	CF 10.63 A	
1-1/4 x 3"	----	----	12.75 B	
1-1/4 x 4"	----	----	17.00 B	
1-1/4 x 5"	----	----	21.25 C	
1-1/4 x 6"	----	----	25.50 A	
1-1/4 x 8"	----	----	34.00 C	
1-1/4 x 10"	----	----	42.50 C	
1-1/4 x 12"	----	----	51.00 B	
1-1/2 x 2"	3.600 C	----	CF 10.20 A	
1-1/2 x 2-1/2	4.500 C	----	CF 12.75 B	
1-1/2 x 3"	----	----	CF 15.30 B	
1-1/2 x 4"	----	----	20.40 B	
1-1/2 x 5"	----	----	25.50 C	
1-1/2 x 6"	10.800 C	----	30.60 A	
1-1/2 x 8"	----	----	40.80 B	
1-1/2 x 10"	----	----	51.00 C	
1-1/2 x 12"	----	----	61.20 C	
2" x 3"	7.200 C	----	CF 20.4 A	
2" x 4"	9.600 C	----	CF 27.2 B	
2" x 5"	----	----	CF 34.00 B	
2" x 6"	----	----	40.80 B	
2" x 8"	----	----	54.40 C	
2" x 10"	----	----	68.00 C	
2" x 12"	----	----	81.60 B	

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How to Buy Pipe

The saying that you measure pipe from the inside is a guide, but untrue. For example, 3/8" Pipe always measures .675 on the outside. However, in Sch 40, it nearly measures 1/2" on the inside, and in Sch. 80 it nearly measures 3/8". All pipe sizes have the same outside diameter, or else you would need different threading dies for the same nominal size.

Steel pipe is available in A53/A120 Grade A "water" pipe and in A500 Grade B "structural" pipe. Because the nearest domestic mills of "water" pipe are in West Virginia or Texas, most "water" pipe sizes of 1/2" and over in Florida are foreign. Sizes under 1/2" are necessarily domestic and cost more than twice as much as 1/2" pipe. Try to use 1/2" instead of 3/8", if possible. At the present time, we stock galvanized pipe only as "water" pipe. We can special order seamless pipe (A106) that is required for hazardous lines, such as ammonia.

Structural pipe is produced in the US, but is not "hydrostatically tested". For this reason, structural pipe should not be threaded or be used in an liquid/air transfer application or an application under pressure. Structural pipe is slightly stronger than water pipe for use in columns and handrails. It also does not contain a protective lacquer than must/should be sandblasted before it should be painted or galvanized. Structural pipe is only available in Sch. 40 between 3/4" and 6", inclusive.

All Steel pipe is available in 21-foot lengths. Some larger sizes are available in either 40-foot or 42-foot lengths.

We stock Aluminum Pipe in 6063-T5 in sizes below 3" because it is bendable. We stock larger sizes in 6061-T6, which is stronger. Both pipes come in 20-foot lengths. For about twice the money, marine grade 5086 is available.

Stainless Pipe is generally available in Type 304 and Type 316, welded or seamless. Schedule 5 pipe is popular for use as exhaust pipes that resist rust. Stainless pipes come in 20-foot random lengths, which means the actual lengths may fall between 19 and 24 feet.

We do not carry other grades of aluminum pipe, like 1100 (pure aluminum offering nearly perfect conductivity) or 3003 (soft electrical conduit) grades.

TURI ND.COM-----Page 41

A-1 Metal Supply Corp.....1-800-354-9678

Pipe

TABLE 7.1



Common Pipe Sizes (Inside and Out) Schedule 5 to Schedule 80

Although pipe is not meant to telescope inside each other, we are often asked which pipe fits inside another. Parentheses mark sizes that should telescope into the next smaller size. This chart shows the outside and inside diameters of pipe and the wall thickness. Weights are presented on tables that follow this one. Pipe tolerances are very sloppy (+-10% on wall thickness), so allow plenty of margin in using this table. **Sch. 40 and Sch. 80 are standard sizes.**

Pipe Size Outside Diameter	Sch. 5 Wall/ Inside Diameter	Sch. 10 Wall/ Inside Diameter	Sch. 40 Wall/ Inside Diameter	Sch. 80 Wall/ Inside Diameter
1/8-----.405	.035----.335	.049----.307	.068----.269	.095----.215
1/4-----.540	.049----.442	.065----.410	.088----.364	.119----.302
3/8-----.675	.049----.577	.065----.545	.091----.493	.126----.423
1/2-----.840	.065----.710	.083----.674	.109----.622	.147----.546
3/4-----1.050	.065----.920	(.083----.884)	.113----.824	.154----.742
1"-----1.315	.065----1.185	(.109-1.097)	.133----1.049	.179----.957
1-1/4---1.660	.065----1.530	.109----1.442	(.140-1.380)	.191----1.278
1-1/2---1.900	.065----1.770	(.109-1.682)	.145----1.610	.200----1.500
2"-----2.375	.065----2.245	.109----2.157	.154----2.067	(.218-1.939)
2-1/2--2.875	.083---2.709	.120---2.635	(.203-2.469)	.276---2.323
3"-----3.500	.083---3.334	.120---3.260	(.216-3.068)	.300---2.900
3-1/2--4.000	.083---3.834	.120---3.760	(.226-3.548)	.318---3.364
4"-----4.500	.083---4.334	.120---4.260	(.237-4.026)	.337---3.826
5"-----5.563	.109---5.345	.134---5.295	.258---5.047	.375---4.813
6"-----6.625	.109---6.407	.134---6.357	.280---6.065	.432---5.761
8"-----8.625	.109---8.407	.148---8.329	.322---7.981	.500---7.625
10"---10.750	.134---10.482	.165---10.420	.365---10.020	.593---9.564
12"---12.75	.165---12.420	.180---12.390	.406---11.938	.687---11.376

*Note: 12" Sch 40 Pipe is not the same as 12" STANDARD Pipe, which has a .375 Wall and 12" I.D. We normally stock 12" Schedule 40.

TURI ND.COM-----Page 42

Pipe	TABLE 7.2		O	
Steel (Only) Pipe Sizes (Inside and Out) That must be special ordered				
Pipe Size	Sch. 60 Wall/	Sch. 120 Wall/	Sch. 160 Wall/	Double Extra Heavy Wall/ Inside Diameter
Outside Diameter	Inside Diameter	Inside Diameter	Inside Diameter	Inside Diameter
1/2-----.840	-----	-----	.187---.466	.294---.252
3/4-----1.050	-----	-----	.218---.614	.308---.434
1"-----1.315	-----	-----	.250---.815	.358---.599
1-1/4--1.660	-----	-----	.250---1.160	.382---.896
1-1/2--1.900	-----	-----	.281---1.338	.400---1.100
2"-----2.375	-----	-----	.343---1.689	.436---1.503
2-1/2--2.875	-----	-----	.375---2.125	.552---1.771
3"-----3.500	-----	-----	.437---2.626	.600---2.300
3-1/2--4.000	-----	-----	-----	.636---2.728
4"-----4.500	.281---3.938	.437---3.626	.531---3.438	.674---3.152
5"-----5.563	-----	.500---4.563	.625---4.313	.750---4.063
6"-----6.625	-----	.562---5.501	.718---5.189	.864---4.897
8"-----8.625	.406---7.813	.718---7.189	.906---6.813	.875---6.875
10"---10.750	.500---9.750	.843---9.064	1.125---8.500	-----
12"---12.75	.562-11.626	1.00---10.75	1.312-10.126	-----

Other Non-standard (Steel Only) Schedules				
Pipe Size	Sch. 20 Wall/	Sch. 30 Wall/	Sch. 100 Wall/	Sch. 140 Wall/
Outside Diameter	Inside Diameter	Inside Diameter	Inside Diameter	Inside Diameter
8"-----8.625	250---8.125	.277---8.071	.593---7.439	.812---7.001
10"---10.750	.250-10.250	.307-10.136	.718---9.314	1.000---8.75
12"---12.750	.250-12.250	.330-12.090	.843---11.064	1.125---10.50

Pipe	TABLE 7.3		O	
Pipe Weight (Schedule 40)				
Pipe Size Outside Diameter	Red Brass	Copper	Aluminum	Steel
1/8-----.405	.253	.259	.085	.2447
1/4-----.540	.447	.457	.147	.4248
3/8-----.675	.627	.641	.196	.5676
1/2-----.840	.934	.955	.294	.8510
3/4-----1.050	1.27	1.30	.391	1.131
1"-----1.315	1.78	1.82	.581	1.679
1-1/4--1.660	2.63	2.69	.786	2.273
1-1/2--1.900	3.13	3.20	.940	2.718
2"-----2.375	4.12	4.22	1.264	3.653
2-1/2--2.875	5.99	6.12	2.004	5.793
3"-----3.500	8.56	8.75	2.621	7.576
3-1/2--4.000	11.2	11.4	3.151	9.109
4"-----4.500	12.7	12.9	3.733	10.79
5"-----5.563	15.8	16.2	5.057	14.62
6"-----6.625	19.0	19.4	6.564	18.97
8"-----8.625	30.9	31.6	9.878	28.55
10"---10.750	45.2	----	14.004	40.48
12"---12.75	55.3	----	17.146	53.53*

(STD)

*Weight for 12" Aluminum is for Standard, not Sch 40 Pipe.
Weight for 12" Standard Steel Pipe is 49.56 lbs.

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Pipe	TABLE 7.4		O	
Pipe Weight (Schedule 80)				
Pipe Size Outside Diameter	Red Brass	Copper	Aluminum	Steel
1/8-----.405	.363	.371	----	.3145
1/4-----.540	.611	.625	----	.5351
3/8-----.675	.829	.847	----	.7388
1/2-----.840	1.23	1.25	.376	1.088
3/4-----1.050	1.67	1.71	.510	1.474
1"-----1.315	2.46	2.51	.751	2.172
1-1/4--1.660	3.39	3.46	1.037	2.997
1-1/2--1.900	4.10	4.19	1.256	3.631
2"-----2.375	5.67	5.80	1.737	5.022
2-1/2--2.875	8.66	8.85	2.650	7.661
3"-----3.500	11.6	11.8	3.547	10.25
3-1/2--4.000	14.1	----	4.326	12.51
4"-----4.500	16.9	17.3	5.183	14.98
5"-----5.563	32.2	----	7.188	20.78
6"-----6.625	48.4	32.9	9.884	28.57
8"-----8.625	---	49.5	15.010	43.39
10"---10.750	---	----	14.004	64.33
12"---12.75	---	----	30.620	88.51

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Pipe	TABLE 7.4		O	
Pipe Weight (Schedule 5 and 10)				
Pipe Size Outside Diameter	Schedule 5		Schedule 10	
	Aluminum	Steel	Aluminum	Steel
1/8-----.405	----	.1383	----	.1863
1/4-----.540	----	.2570	----	.3297
3/8-----.675	----	.3276	----	.4235
1/2-----.840	----	.5383	----	.6710
3/4----1.050	----	.6838	----	.8572
1"-----1.315	----	.8678	----	1.404
1-1/4--1.660	----	1.107	----	1.806
1-1/2--1.900	----	1.274	.721	2.085
2"-----2.375	.555	1.604	.913	2.638
2-1/2--2.875	----	2.475	1.221	3.531
3"-----3.500	1.047	3.029	1.498	4.332
3-1/2--4.000	----	3.472	----	4.973
4"-----4.500	1.354	3.915	1.942	5.613
5"-----5.563	----	6.349	2.688	7.770
6"-----6.625	----	7.585	3.213	9.289
8"-----8.625	----	9.914	4.635	13.40
10"---10.750	----	15.19	----	18.70
12"---12.75	----	22.18	----	24.20

Pipe

TABLE 7.5

O

Tensile and Yield Strengths of Pipe

A53/A120 Steel Pipe	Grade A	Grade B	Grade C
Tensile strength, min. psi	48,000	60,000	70,000
Yield point, min., psi	30,000	35,000	40,000
A500 Steel Pipe	Grade A	Grade B	
Tensile strength, min. psi	45,000	58,000	
Yield point, min., psi	33,000	42,000	
Aluminum Pipe	6061	6063	5086
Tensile strength, min. psi	45,000	27,000	36,000
Yield point, min., psi	40,000	21,000	21,000

Test Pressure of A53/A120 Pipe

Pipe Size	Schedule 40	Schedule 80	Double Extra Heavy
1/8 to 3/8	700	850	-----
1/2	700	850	1000
3/4	700	850	1000
1"	700	850	1800
1-1/4	1000	1500	1800
1-1/2	1000	1500	1800
2"	1000	1500	1800
2-1/2	1000	1500	1800
3"	1000	1500	1800
3-1/2	1200	1700	1800
4"	1200	1700	2000
5"	1200	1700	2000
6"	1200	1700	2000
8"	1300	1700	2800
10"	1200	1600	

How to Buy Round Steel Tubing

This section provides an exception to our book. There are so many sizes of tubing available that we have narrowed the listings to what we carry in stock smaller 1/2" wall and lighter. We have an extensive inventory of seamless tubing not listed that have a more than a 1/2"-wall thickness. In steel, we offer:

- **E = Hot roll electrical weld** is the cheapest tubing, although not a cheap as pipe per pound. This is popular tubing for roll cages used in autos that race.
- **P = Welded Pipe** (likely Schedule 5) is stocked for a tubing size when it is less expensive than tubing.
- **D = DOM (Drawn over Mandrel)** tubing is used for driveshafts and other applications where true size and roundness are important. It looks like it's seamless, but it is not.
- **H = Hydraulic tubing** is seamless 1010 steel made to the specifications under SAE J-524. Our hydraulic tubing is soft, annealed and pressure tested to 1000 psi.
- **C = Honed tubing** is typically a seamless or DOM tubing that has been honed for smoothness on the inside for use as a hydraulic cylinder.
- **S = Seamless tubing** is oversized/undersized so that it can be machined to size. In wall thickness of 5/8 or less, seamless tubing has been replaced by DOM tubing that is superior and less costly. Seamless tubing is the only choice for tubing greater than a 5/8" wall.

To allow you to compute the weight of tubing not in this book, we offer you the following formulas:

$$\text{Weight per foot} = ((\text{OD})^2 - (\text{ID})^2) \times 2.67$$

$$\text{Weight per foot} = ((\text{OD} \times \text{wall}) - (\text{wall})^2) \times 10.68$$

For example, the weight of 6" OD x 1-1/2" wall tubing (3" ID) would be determined as follows:

$$(36-9) \times 2.67 = 72.09 \text{ or } (9 - 2.25) \times 10.68 = 72.09$$

With this formula, it is easy to compute the weight of heavy wall seamless tubing, or any other tubing, that is not listed in this book.

Finally, tubing should be ordered by its outside diameter and its wall thickness, such as "1 inch x .219 wall DOM tubing".

Round Tubing		TABLE	O
SIZE O.D x wall	I.D.	STAINLESS	STEEL
3/16 x .035	.118	-----	.057 H
1/4 x .035	.180	-----	.080 H
5/16 x .035	.243	-----	.104 H
3/8 x .065	.245	.215 H	.215 H
1/2 x .049	.402	.236 H	.236 H
5/8 x .049	.527	.301 E	.301 H
3/4 x .049	.652	.367 E	.367 H
3/4 x .065	.620	.476 E	.476 H
7/8 x .049	.777	.432 E	.432 H
7/8 x .065	.745	.562 E	.562 H
1" x .049	.902	.498 E	.498 H
1" x .065	.870	.649 E	.649 H
1" x .120	.760	-----	1.128 DE
1" x .219	.562	-----	1.827 D
1-1/8 x .219	.688	-----	2.119 D
1-1/4 x .049	1.152	.629 E	.629
1-1/4 x .065	1.120	.823 E	.823
1-1/4 x .095	1.060	-----	1.172 D
1-1/4 x .219	.813	-----	2.411 D
1-3/8 x .219	.938	-----	2.704 D
1-1/2 x .065	1.370	.996	.996
1-1/2 x .095	1.310	-----	1.426 DE
1-1/2 x .120	1.260	-----	1.769 DE
1-1/2 x .219	1.062	-----	2.996 D
1-5/8 x .095	1.435	-----	1.552 DE
1-5/8 x .120	1.385	-----	1.929 DE
1-3/4 x .065	1.620	1.170 E	-----
1-3/4 x .095	1.560	-----	1.679 DE
1-3/4 x .120	1.510	-----	2.089 DE
1-3/4 x .219	1.312	-----	3.581 D
2" x .065	1.870	1.343 E	1.343 E
2" x .095	1.810	-----	1.933 D
2" x .120	1.760	-----	2.409 D
2" x .219	1.562	-----	4.166 D
2" x .500	1.000	-----	8.010 DS

Round Tubing		TABLE 8.2	O
SIZE O.D x wall	I.D.	STAINLESS	STEEL
2-1/8 x .120	1.885	-----	2.570 D
2-1/4 x .120	2.010	-----	2.730 D
2-1/4 x .375	1.500	-----	7.509 D
2-1/4 x .500	1.250	-----	9.345 DS
2-3/8 x .120	2.135	-----	2.890 D
2-3/8 x .1875	2.000	-----	4.391 C
2-3/8 x .375	1.625	-----	8.010 D
2-1/2 x .065	2.370	1.69 E	-----
2-1/2 x .095	2.310	-----	2.440 D
2-1/2 x .120	2.260	-----	3.050 D
2-1/2 x .134	2.232	-----	3.386 D
2-1/2 x .375	1.750	-----	8.511 D
2-1/2 x .500	1.500	-----	10.68 DS
2-5/8 x .375	1.875	-----	9.011 D
2-3/4 x .095	2.560	-----	2.694 D
2-3/4 x .120	2.510	-----	3.371 D
2-3/4 x .500	1.750	-----	12.015 DS
2-7/8 x .1875	2.500	-----	5.395 C
3" x .065	2.870	2.037 E	-----
3" x .095	2.810	-----	2.947 D
3" x .120	2.760	-----	3.691 D
3" x .500	2.000	-----	13.35 DS
3-1/4 x .500	2.250	-----	14.69 DS
3-1/2 x .083	3.334	3.029 P	-----
3-1/2 x .095	3.310	-----	3.455 D
3-1/2 x .120	3.260	-----	4.332 D
3-1/2 x .156	3.188	-----	5.571 D
3-1/2 x .188	3.125	-----	6.650 D
3-1/2 x .250	3.000	-----	8.678 C
3-1/2 x .500	2.500	-----	16.02 DS
3-3/4 x .500	2.750	-----	17.36 S
4" x .065	3.870	-----	2.732 E
4" x .083	3.834	3.47 P	-----
4" x .095	3.810	-----	3.962 D
4" x .120	3.760	-----	4.973 D
4" x .134	3.732	-----	5.533 D

Continued on Next Page

Round Tubing		TABLE 8.3	O
SIZE OD x Wall	ID	STAINLESS	STEEL
4" x .188	3.624	----	7.654 D
4" x .250	3.500	----	10.010 C
4" x .500	3.000	----	18.69 DS
4-1/4" x .500	3.250	----	20.03 DS
4-1/2 x .083	4.334	3.92 P	----
4-1/2 x .188	4.125	----	8.658 D
4-1/2 x .250	4.000	----	11.350 C
4-1/2 x .500	3.500	----	21.36 DS
4-3/4" x .250	4.250	----	12.020 C
4-3/4" x .500	3.750	----	22.70 DS
5" x .065	4.870	----	3.426 E
5" x .083	4.834	----	4.359 E
5" x .500	4.000	----	24.03 DS
5-1/4 x .375	4.500	----	19.520 C
5-1/4 x .500	4.250	----	25.370 C
5-1/2 x .500	4.500	----	26.70 S
5-3/4 x .375	5.000	----	21.530 C
5-3/4 x .500	4.750	----	28.04 DS
6" x .065	5.870	4.12 E	4.12 E
6" x .083	5.834	----	5.245 E
6" x .500	5.000	----	29.37 C
6-1/4x .375	5.500	----	23.53 C
6-5/8 x .134	6.357	9.29 E	9.29 E
6-3/4 x .375	6.000	----	25.53 C
7" x .500	6.000	----	34.71 C
7-1/2 x .250	7.000	----	19.360 C
8" x .125	7.750	----	10.51 E
8" x .500	7.000	----	40.05 C
8-3/4" x .375	8.000	----	33.540 C
10" x .125	9.750	----	13.18 E
12" x .134	11.732	----	16.98 E

How to Buy Square/Rectangular Tubing

We carry Square and Rectangular Tubing in Aluminum, Stainless and Carbon Steel. Most steel tubing is Grade A500 B, as described in the previous section under Structural pipe (see Table 7-5).

Square tubing with walls less than 3/16" thick (for steel, technically called "Mechanical tubing") does not come in the exact same thickness for steel/stainless as it does for aluminum. Mechanical tubing uses a gauge system because it is made from the same coils from which steel sheets are made. For example, aluminum tubing with a 1/8" thick wall will truly have a .125 inch wall. The closest match to 1/8" thick for steel/stainless tubing is 11-gauge thick, which is likely to have a .118 wall. Thicker-walled square tubing (for steel, technically called "structural tubing") is the same for aluminum and steel/stainless.

Aluminum tubing will likely (there are exceptions) have square corners, whereas steel/stainless tubing will have rounded corners. We stock steel tubing in 20- and 24-foot lengths. Structural sizes are also available in 40-foot lengths

Aluminum tubing is generally available in 6063-T5 material that is bendable. 6061-T6 material is usually more expensive, but it is stronger, though not bendable. 5053 material ("marine grade") is more corrosive resistant, but it comes at twice the price of 6061 and in a very limited range of sizes. In Florida, most 6063-T5 aluminum tubing come in 24-foot lengths. In other parts of the country, 21'1" (yep, that is 253 inches) is standard. Other grades of Aluminum tubing are available in 20-foot lengths.

Stainless square tubing is generally available in Type 304, although Type 316 can often be ordered. There are some rectangular tubing sizes available in stainless, but try to use square tubing instead if possible. Stainless square tubing comes in 20-foot random lengths. We have found that this tubing does come in between 20 and 21 feet long although some exceptions are possible.

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Square Tubing

TABLE 9.1



Outside Dimension	Aluminum			Steel A-500B	
	Wall	6061	6063	Wall	Weight
1/2" x 1/2"	.062 ----	-----	.131 A -----	16 ga. 14ga	.384 A .470 C
5/8 x 5/8	----	-----	-----	16ga 14ga.	.495 C .612 C
3/4 x 3/4	----- 045 .062 .093 .125	----- .168 B .206 B .293 B .374 A	----- 18ga 16ga 14ga -----	20ga 18ga 16ga 14ga	.340 C .467 B .605 A .753 C
1" x 1"	----- ----- .062 .090 .125	----- ----- .278 B .405 B .524 B	----- 18ga 16ga 14ga 11ga	20ga 18ga 16ga 14ga .524 A	.459 C .634 B .826 A 1.035 A 1.436 A
1-1/4 x 1-1/4	----- ----- .062 .090 .125 -----	----- ----- .353 B .516 B .675 A -----	----- 18ga 16ga. 14ga 11ga 3/16	20ga 18ga 16ga. 14ga 11ga 3/16	.578 C .800 B 1.047 B 1.317 A 1.844 A 2.62 C
1-1/2 x 1-1/2	----- ----- .062 .090 .125 ----- -----	----- ----- .430 B .632 B .824 B -----	----- 18ga 16ga 14ga 11ga 3/16	20ga 18ga 16ga 14ga 11ga 3/16	.697 C .967 B 1.268 B 1.599 A 2.252 A 3.22 A
					1/4 4.11 A

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Square Tubing

TABLE 9.2



Outside Dimension	Aluminum 6063-T5			Steel A-500B	
	Wall	6061	6063	Wall	Weight
1-3/4 x 1-3/4	----- .093 .125	----- .732 B -----	----- .732 B .975 B	16ga 14ga 11ga	1.489 C 1.881 B 2.660 B
2" x 2"	----- .062 .093 .125 3/16 1/4	----- .604 B .851 B 1.126 B 1.627 C 2.100 B	----- .851 B 1.126 A 1.627 A -----	18ga 16ga 14ga 11ga 3/16 1/4	1.300 C 1.710 B 2.164 A 3.067 A 4.32 A 5.41 A
2-1/4 x 2-1/4	.095	-----	.982 B	-----	-----
2-1/2 x 2-1/2	----- ----- .125 ----- .250	----- ----- 1.425 B 2.646 C	----- 1.425 B -----	16ga 14ga 11ga 3/16 1/4	2.152 C 2.728B 3.883 A 5.53 A 7.11 A
3" x 3"	----- .093 .125 3/16 1/4 ----- -----	----- 1.298 B 1.760 A 2.487 B 3.300 B -----	----- 1.298 B 1/8 3/16 1/4 5/16 3/8	16ga 14ga 1/8 3/16 1/4 5/16 12.17 A	2.594B 3.292B 4.75 A 6.87 A 8.81 A 10.58 B 12.17 A
3-1/2 X 3-1/2	----- ----- ----- ----- -----	----- ----- ----- ----- -----	----- ----- ----- ----- -----	14ga 11ga 3/16 1/4 5/16	2.594 C 5.610 B 8.150 A 10.510A 12.700B

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Square Tubing

TABLE 9.3



Outside Dimension	Aluminum			Steel A-500B	
	Wall	6061	6063	Wall	Weight
4" x 4"	-----	-----	-----	14ga	4.420 C
	.125	-----	2.324 B	11ga	6.460 B
	3/16	3.400 C	-----	3/16	9.420 A
	1/4	4.500 B	4.500 B	1/4	12.21 A
	-----	-----	-----	5/16	14.83 B
	-----	-----	-----	3/8	17.27 A
	1/2	8.232 C	-----	1/2	21.63 A
4-1/2 x 4-1/2	-----	-----	-----	3/16	10.70 B
	-----	-----	-----	1/4	13.91 C
5" x 5"	.125	-----	2.925 B	11ga	7.80 B
	-----	-----	-----	3/16	11.97 B
	.250	5.700 C	-----	1/4	15.62 B
	-----	-----	-----	5/16	19.08 B
	-----	-----	-----	3/8	22.37 B
	-----	-----	-----	1/2	28.43 B
	-----	-----	-----	3/16	13.27 C
6" x 6"	.125	-----	3.525	11ga	9.86 B
	-----	-----	-----	3/16	14.53 A
	1/4	6.762 C	-----	1/4	19.02 A
	-----	-----	-----	5/16	23.34 B
	-----	-----	-----	3/8	27.48 B
	1/2	12.936C	-----	1/2	35.24 B
	-----	-----	-----	3/16	17.08 B
7" x 7"	-----	-----	-----	1/4	22.42 B
	-----	-----	-----	5/16	27.59 C
	-----	-----	-----	3/8	32.58 B
	-----	-----	-----	1/2	42.05 B

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Square Tubing

TABLE 9.4



Outside Dimension	Aluminum 6063-T52		Steel A-500B	
	Wall	Weight	Wall	Weight
8" x 8"	3/16	6.909 B	3/16	19.63 B
	-----	-----	1/4	25.82 B
	-----	-----	5/16	31.84 B
	-----	-----	3/8	37.69 B
	-----	-----	1/2	48.85 B
	-----	-----	5/8	59.32 B
	-----	-----	-----	-----
10" x 10"	-----	-----	3/16	24.73 B
	-----	-----	1/4	32.63 B
	-----	-----	5/16	40.35 B
	-----	-----	3/8	47.90 B
	-----	-----	1/2	62.46 B
	-----	-----	5/8	76.33 B
	-----	-----	-----	-----
12" x 12"	-----	-----	1/4	39.43 B
	-----	-----	5/16	48.86 B
	-----	-----	3/8	58.10 B
	-----	-----	1/2	76.07 B
	-----	-----	-----	-----
14" x 14"	-----	-----	3/8	68.31 B
	-----	-----	1/2	89.68 B
	-----	-----	-----	-----
16" x 16"	-----	-----	1/2	103.30 B
	-----	-----	-----	-----

Rectangular Tubing			TABLE 9.5		
Outside Dimension	Aluminum		Steel A-500B		
	Wall	6061	6063	Wall	Weight
1" x 1/2	----	----	----	16ga	.605 C
1" x 1/2	.093	----	.293 B	-----	-----
1" x 3/4	----	----	----	11ga	1.24 C
1-1/4 x 1"	----	----	----	11ga	1.640 C
1-1/2 x 3/4	----	----	----	16ga	.937 C
1-1/2 x 3/4	----	----	----	14ga	1.176 C
1-1/2 x 3/4	1/8	----	.600 B	11ga	1.640 C
1-1/2 x 1"	----	----	----	16ga	1.047 C
1-1/2 x 1"	----	----	----	14ga	1.317 C
1-1/2 x 1"	1/8	----	676 B	11ga	1.844 C
1-3/4 x 3/4	1/8	----	675 B	-----	-----
2" x 3/4	----	----	----	14ga	1.169 C
2" x 3/4	----	----	----	13ga	1.715 C
2" x 1"	.062	----	.428 B	16ga	1.268 B
2" x 1"	----	----	----	14ga	1.599 B
2" x 1"	.093	----	.628 B	13ga	1.815 C
2" x 1"	.125	.824 C	.824 A	11ga	2.252 A
2" x 1-1/4	----	----	----	14ga	1.741 C
2" x 1-1/4	----	----	----	11ga	2.456 C
2" x 1-1/2	----	----	----	16ga	1.489 C
2" x 1-1/2	----	----	----	14ga	1.881 C
2" x 1-1/2	1/8	----	.976 B	11ga	2.660 B
2" x 1-1/2	----	----	----	3/16	4.32 B
2-1/2 x 1"	----	----	----	14ga	1.881 C
2-1/2 x 1"	----	----	----	11ga	2.660 C
2-1/2 x 1-1/4	----	----	----	14ga	2.023 C
2-1/2 x 1-1/4	.125	----	1.050B	-----	-----
2-1/2 x 1-1/2	----	----	----	14ga	2.164 C
2-1/2 x 1-1/2	----	----	----	11ga	3.067 C
2-1/2 x 1-1/2	----	----	----	3/16	4.32 C
2-1/2 x 1-1/2	----	----	----	1/4	5.41 C

Rectangular Tubing			TABLE 9.6		
Outside Dimension	Aluminum		Steel A-500B		
	Wall	6061	6063	Wall	Weight
3" x 1"	----	----	----	16ga	1.710 C
3" x 1"	----	----	----	14ga	2.164 B
3" x 1"	.125	----	1.125 A	11ga	3.067 A
3" x 1-1/2	----	----	----	16ga	1.931 C
3" x 1-1/2	----	----	----	14ga	2.45 C
3" x 1-1/2	.125	----	1.272 B	11ga	3.48 B
3" x 1-1/2	----	----	----	3/16	4.96 B
3" x 1-3/4	.125	----	1.350 B	-----	-----
3" x 2"	----	----	----	14ga	2.73 B
3" x 2"	.125	1.426 C	1.426 A	11ga	3.90 A
3" x 2"	----	----	----	3/16	5.59 A
3" x 2"	----	----	----	1/4	7.11 A
3" x 2"	----	2.646 C	-----	5/16	8.45 C
3-1/2 x 2-1/2	----	----	----	3/16	6.87 C
3-1/2 x 2-1/2	----	----	----	1/4	8.81 C
4" x 1"	.125	----	1.425 A	-----	-----
4" x 1-1/2	----	----	----	14ga	3.006 C
4" x 1-1/2	----	----	----	1/8	4.330 C
4" x 1-1/2	----	----	----	3/16	6.240 C
4" x 1-3/4	.093	----	1.242 B	-----	-----
4" x 1-3/4	.125	----	.1.650 B	-----	-----
4" x 2"	----	----	----	14ga	3.29 C
4" x 2"	.125	----	1.724 A	11ga	4.75 A
4" x 2"	----	----	----	3/16	6.87 A
4" x 2"	1/4	----	3.300 B	1/4	8.81 A
4" x 2"	----	----	----	5/16	10.58 C
4" x 2-1/2	----	----	----	11ga	5.18 C
4" x 2-1/2	----	----	----	3/16	7.482 C
4" x 3"	1/8	----	2.074 B	11ga	5.610 B
4" x 3"	----	----	----	3/16	8.150 A
4" x 3"	----	----	----	1/4	10.510 A
4" x 3"	----	----	----	5/16	12.700 C

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Rectangular Tubing TABLE 9.7

Outside Dimension	Aluminum			Steel A-500B	
	Wall	6061	6063	Wall	Weight
5" x 2"	1/8	----	2.025 A	11ga	5.61 B
5" x 2"	----	----	----	3/16	8.15 B
5" x 2"	1/4	3.900 B	----	1/4	10.51 B
5" x 2"	----	----	----	5/16	12.70 C
5" x 2-1/2	----	----	----	11ga	6.03 C
5" x 2-1/2	----	----	----	3/16	8.78 C
5" x 2-1/2	----	----	----	1/4	11.36 C
5" x 3"	----	----	----	11ga	6.46 B
5" x 3"	----	----	----	3/16	9.42 A
5" x 3"	----	----	----	1/4	12.21 A
5" x 3"	----	----	----	5/16	14.83 C
5" x 3"	----	----	----	3/8	17.27 B
5" x 3"	----	----	----	1/2	21.63 B
5" x 4"	----	----	----	3/16	10.70 B
5" x 4"	----	----	----	1/4	13.91 B
6" x 2"	1/8	----	2.327 B	11ga	6.46 B
6" x 2"	----	----	----	3/16	9.42 A
6" x 2"	1/4	4.500 B	----	1/4	12.21 A
6" x 2"	----	----	----	5/16	14.83 C
6" x 2"	----	----	----	3/8	17.27 C
6" x 3"	----	----	----	11ga	7.31 B
6" x 3"	----	----	----	3/16	10.70 A
6" x 3"	----	----	----	1/4	13.91 A
6" x 3"	----	----	----	5/16	16.96 C
6" x 3"	----	----	----	3/8	19.82 B
6" x 3"	----	----	----	1/2	25.03 C

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Rectangular Tubing TABLE 9.8

Outside Dimension	Aluminum			Steel A-500B	
	Wall	6061	6063	Wall	Weight
6" x 4"	----	----	----	11ga	7.964 B
6" x 4"	3/16	----	4.256 B	3/16	11.97 A
6" x 4"	1/4	5.700 B	----	1/4	15.62 A
6" x 4"	----	----	----	5/16	19.08 C
6" x 4"	----	----	----	3/8	22.37 B
6" x 4"	1/2	10.600 C	----	1/2	28.43 C
7" x 3"	----	----	----	3/16	11.97 C
7" x 3"	----	----	----	1/4	15.62 C
7" x 3"	----	----	----	3/8	22.37 C
7" x 4"	----	----	----	3/16	13.25 C
7" x 4"	----	----	----	1/4	17.32 C
7" x 4"	----	----	----	5/16	21.21 C
7" x 4"	----	----	----	3/8	24.93 C
7" x 5"	----	----	----	3/16	14.53 C
7" x 5"	----	----	----	1/4	19.02 C
7" x 5"	----	----	----	5/16	23.34 C
7" x 5"	----	----	----	3/8	27.48 C
7" x 5"	----	----	----	1/2	35.24 C
8" x 2"	1/8"	----	2.962 B	----	----
8" x 2"	----	----	----	3/16	11.97 B
8" x 2"	----	----	----	1/4	15.62 B
8" x 2"	----	----	----	5/16	19.08 C
8" x 2"	----	----	----	3/8	22.37 C
8" x 3"	----	----	----	3/16	13.25 B
8" x 3"	----	----	----	1/4	17.32 B
8" x 3"	----	----	----	5/16	21.21 C
8" x 3"	----	----	----	3/8	24.93 C
8" x 3"	----	----	----	1/2	31.84 C

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Rectangular Tubing TABLE 9.9

Outside Dimension	Aluminum 6061-T6		Steel A-500B	
	Wall	Weight	Wall	Weight
8" x 4"	----	----	3/16	14.53 B
8" x 4"	1/4	6.900 B	1/4	19.02 B
8" x 4"	----	----	5/16	23.34 C
8" x 4"	----	----	3/8	27.48 C
8" x 4"	----	----	1/2	35.24 C
8" x 6"	----	----	3/16	17.08 C
8" x 6"	----	----	1/4	22.42 C
8" x 6"	----	----	5/16	27.59 C
8" x 6"	----	----	3/8	32.58 C
8" x 6"	----	----	1/2	42.05 C
9" x 7"	----	----	3/16	19.63 C
9" x 7"	----	----	1/4	25.82 C
10" x 2"	----	----	3/16	14.53 C
10" x 2"	----	----	1/4	19.02 C
10" x 2"	----	----	3/8	27.46 C
10" x 3"	----	----	3/16	15.80 C
10" x 3"	----	----	1/4	20.72 C
10" x 4"	----	----	3/16	17.08 B
10" x 4"	----	----	1/4	22.42 B
10" x 4"	----	----	5/16	27.59 C
10" x 4"	----	----	3/8	32.58 B
10" x 4"	----	----	1/2	42.05 B
10" x 5"	----	----	1/4	24.12 C
10" x 6"	----	----	3/16	19.63 B
10" x 6"	----	----	1/4	25.82 B
10" x 6"	----	----	5/16	31.84 C
10" x 6"	----	----	3/8	37.69 C
10" x 6"	----	----	1/2	48.85 C
10" x 8"	----	----	3/16	22.18 C
10" x 8"	----	----	1/4	29.23 C
10" x 8"	----	----	5/16	36.10 C
10" x 8"	----	----	3/8	42.79 C
10" x 8"	----	----	1/2	55.66 C

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Rectangular Tubing TABLE 9.10

Outside Dimension	Aluminum		Steel A-500B	
	Wall	Weight	Wall	Weight
12" x 2"	----	----	3/16	17.08 B
12" x 2"	----	----	1/4	22.42 B
12" x 3"	----	----	1/4	24.12 C
12" x 4"	----	----	3/16	19.63 B
12" x 4"	----	----	1/4	25.82 B
12" x 4"	----	----	5/16	31.84 C
12" x 4"	----	----	3/8	37.69 C
12" x 4"	----	----	1/2	48.85 C
12" x 6"	----	----	3/16	22.18 C
12" x 6"	----	----	1/4	29.23 C
12" x 6"	----	----	5/16	36.10 C
12" x 6"	----	----	3/8	42.79 C
12" x 6"	----	----	1/2	55.66 C
12" x 8"	----	----	3/16	24.73 B
12" x 8"	----	----	1/4	32.63 B
12" x 8"	----	----	5/16	40.35 C
12" x 8"	----	----	3/8	47.90 C
12" x 8"	----	----	1/2	62.46 C
14" x 4"	----	----	1/4	29.23 C
14" x 6"	----	----	1/4	32.63 C
14" x 6"	----	----	3/8	47.90 C
14" x 6"	----	----	1/2	62.46 C
14" x 10"	----	----	5/16	48.86 C
14" x 10"	----	----	3/8	58.10 C
14" x 10"	----	----	1/2	76.07 C
16" x 4"	----	----	5/16	40.35 C
16" x 8"	----	----	5/16	48.86 C
16" x 8"	----	----	3/8	58.10 C
16" x 8"	----	----	1/2	76.07 C
16" x 12"	----	----	3/8	68.31 C
18" x 6"	----	----	3/8	58.10 C
18" x 6"	----	----	1/2	76.07 C
20" x 8"	----	----	3/8	68.31 C
20" x 8"	----	----	1/2	89.68 C

How to Buy Plate

There is a difference between sheet and plate. Sheets are formed out of a coil, whereas plates are not. Technology has allowed steel sheets to be made from coils up to 1/2" thick. Our aluminum sheets go up to 1/4" thick and our stainless sheets go up to 10 gauge. Everything we stock above those sizes (and all sizes more than 72" wide) is a true plate. To our customers, however, we call everything plate.

There is an incredible variety of steel, aluminum and stainless steel plates to choose from, each with its advantages and disadvantages. There are companies that specialize in unusual grades of plate. Table 10.1 offers technical information for the more common types of plate in steel, aluminum and stainless. On other tables, we show the sizes we stock in bold print.

Aluminum and steel/stainless do not come in the same sizes under 3/16" thick. Aluminum comes in thickness that can be expressed as a fraction, such as 1/8" thick (.125). Steel comes in a gauge thickness the same as wire. 11-gauge steel is slightly under .125 (figuring tolerance, it is likely to be .115 thick) and 10-gauge steel is slightly over .125 (likely to be .130). The higher the gauge number, the thinner the plate is. We choose to quote 10-gauge plate when a customer asks for 1/8" plate. Our competitors may be quoting 11-gauge plate, which is 10% less material. In addition, you should always ask for a "per plate" price. Different companies use different "theoretical" weights for the same material. This is particularly true for aluminum and stainless.

We stock aluminum plate in 4 x 10 or 4 x 12 sheets, and in some cases 5 x 12. Sheet sizes are stocked in a 3003 soft grade of aluminum. Plate sizes are stocked in 5086 marine grade. If you ever find a specification for a gauge thickness for aluminum, use caution: old books show aluminum having a different gauge system than steel does. You could make a very costly mistake.

We carry most sizes of steel sheets in a commercial grade (A570) as 4 x 8, 4 x 10, 5 x 10, and 6 x 12. 3/16 and over are available in 7 and 8 foot wide widths and are true A-36 plates. Steel plates are stocked in A-36 material as 4 x 8, 4 x 10 and 8 x 20. Galvanized and Galvannealed (galvanized with a phosphorus coating that can be painted) sheets are only available in 4 x 10s. We carry stainless sheets in either a 2B or #3 polished in 4 x 10 and 5 x 10 sheets. Plate sizes are stocked in a 4 x 10 mill finish.

Strength of Plate/Sheet

TABLE 10.1

2

Types of Steel Plate/Sheet	Yield Ksi	Tensile Ksi
A570 Gr 33 (similar to Commercial Quality, that is not rated)—low in cost, weldable and bendable	Typical 33	Typical 52
A36—Structural Quality Carbon Steel. We only stock plates over 1/2" with this grade.	36	58 to 80
A606 Corten—four to five times more corrosive resistant than regular steel..	50 min	75 min
Abrasive Resistant—Tensile strength given for T1, Type A (321 to 380 Brinnell hardness). AR 500 and AR 600 (Brinnell hardness) are also available.	100	110 to 130
Types of Aluminum Plate/Sheet		
2024T351—Aircraft Quality	47	68
3003H14—Pliable and bendable	21	22
5052H32/5052H34—Better corrosion H32 resistance with a little less pliability. H34	28 31	33 38
5086H34—"Marine grade" with superior corrosion resistance	37	47
6061T6—Heated treated aluminum that cannot be bent in an angle.	40	45
Types of Stainless Plates/Sheets		
Type 304—General purpose stainless	35 Avg	85 Avg
Type 304L—Lower carbon Type 304	30 Avg	80 Avg
Type 316—Molybdenum Added for better corrosion resistance	35 Avg	85 Avg
Type 316L—Lower carbon Type 316	30 Avg	75 Avg

Plate/Sheet Sizes			TABLE 10.2		2	
Decimal	G A.	Aluminum			Galva-nized	Steel*
		3003	5052	5086	6061	All
.019	26				.906	.750
.024	24	.356	.349		1.156	1.000
.025				.357		
.030	22				1.406	1.250
.032		.456	.447		.452	
.036	20				1.656	1.500
.040		.570	.563			
.047	18				2.156	2.000
.050		.713	.700		.706	
.058	16				2.656	2.500
.063		.900	.890			
.071	14				3.281	3.125
.080		1.140	1.130		1.13	
.090		1.283	1.280		1.270	
.100	12				4.531	4.375
.115	11				5.156	5.000
.125		1.782	1.750			
.130	10			1.76	5.781	5.625
3/16						7.66
.190		2.71	2.650		2.68	
1/4		3.564	3.500	3.456	3.53	10.21
5/16				4.329	4.41	12.76
3/8			5.04	5.184	5.29	15.32
1/2				6.912	7.06	20.42
5/8					8.82	25.53
3/4				10.37	10.58	30.63
1"				13.83	14.11	40.84
1-1/4					17.64	45.95
1-1/2					21.16	61.24
2"					28.22	81.68

*Multiply weight by 1.008 to obtain weight of 48" wide stainless.

Tread Plate Sizes			TABLE 10.2		2	
Decimal	Aluminum			Stain-less	Steel	
	3003*	6061	5086	304/316	All	
.019						3.75
.024						6.16
.025						8.71
.030						11.26
.032						13.81
.036						16.37
.040						21.47
.047						
.050						
.058						
.063						
.071						
.080						
.090						
.100						
.115						
.125						
.130						
3/16						
.190						
1/4						
5/16						
3/8						
1/2						
5/8						
3/4						
1"						
1-1/4						
1-1/2						
2"						

*3003 Tread-brite Deck Plate. Popular for its shiny finish.
Note: Theoretical aluminum weights vary so much among suppliers, it is best to get a "per sheet" price.

Expanded Metal/Grating			TABLE 10.3		2	
Flattened	Hole Size*	Strands	Alum	Stainless	Steel	
1/4" x 18	.255 x 1.03	.086x.040			1.11	
1/2" x #13	.500 x 1.26	.122 x .070			1.78	1.40
1/2" x .051	.500 x 1.27	.091 x .040	.250			
1/2" x .081	.500 x 1.27	.103 x .060	.410			
3/4" x #9	.923x 2.12	.164 x .120			1.95	1.71
3/4" x .081	.923x 2.12	.172 x .070	.380			
1-1/2" x #9	1.33x 3.20	.175 x .110				1.11
Standard (Raised)						
3/4" x #9	.923 x 2.00	.148 x .134				1.80
1-1/2" x #6	1.330x 3.00	.201 x .198				2.50
2# Grating	1.33 X 5.33	357 X .250	2.00			-----
3# Grating	1.333x5.33	.261 x .183				3.00
4# Grating	1.333x5.33	.297 x .215				4.00
4.5# Grat.	1.41 X 4.0	.300 X .250			4.500	-----
5# Grating	1.333x5.33	.327 x .250				5.00
7# Grating	1.412x5.33	.388 x .312				7.00
*Hole Size is Center to Center						