

TABLE 2. EXTRA STRONG WROUGHT PIPE
Table of Standard Dimensions

SIZE INCHES	DIAMETERS		NOMINAL THICKNESS INCHES	CIRCUMFERENCE		TRANSVERSE AREA			LENGTH OF PIPE PER SQUARE FOOT OF		LENGTH OF PIPE CONTAINING ONE CONIC FOOT PLAIN ENDS FOOT	NOMINAL WEIGHT PER FOOT PLAIN ENDS FOOT
	External Inches	Approximate Internal Inches		External Inches	Internal Inches	External Sq. In.	Internal Sq. In.	Metal Sq. In.	External Surface	Internal Surface		
1/8	0.405	0.215	0.095	1.272	0.675	0.129	0.036	0.093	9.431	17.766	3966.392	0.314
1/4	0.540	0.302	0.119	1.696	0.949	0.229	0.072	0.157	7.073	12.648	2010.290	0.535
3/8	0.675	0.423	0.126	2.121	1.329	0.358	0.141	0.217	5.658	9.030	1024.689	0.738
1/2	0.840	0.546	0.147	2.639	1.715	0.554	0.234	0.320	4.547	6.995	615.017	1.087
3/4	1.050	0.742	0.154	3.299	2.331	0.866	0.433	0.433	3.637	5.147	333.016	1.473
1	1.315	0.957	0.179	4.131	3.007	1.358	0.719	0.639	2.904	3.991	200.193	2.171
1 1/4	1.660	1.278	0.191	5.215	4.015	2.164	1.283	0.881	2.301	2.988	112.256	2.996
1 1/2	1.900	1.500	0.200	5.969	4.712	2.835	1.767	1.068	2.010	2.546	81.487	3.631
2	2.375	1.939	0.218	7.461	6.092	4.430	2.953	1.477	1.608	1.969	48.766	5.022
2 1/2	2.875	2.323	0.276	9.032	7.298	6.492	4.238	2.254	1.328	1.644	33.976	7.661
3	3.500	2.900	0.300	10.996	9.111	9.621	6.605	3.016	1.091	1.317	21.801	10.252
3 1/2	4.000	3.364	0.318	12.566	10.568	12.566	8.888	3.678	0.954	1.135	16.202	12.505
4	4.500	3.826	0.337	14.137	12.020	15.904	11.497	4.407	0.848	0.998	12.525	14.983
5	5.563	4.813	0.375	17.477	15.120	24.306	18.194	6.112	0.686	0.793	7.915	20.778
6	6.625	5.761	0.432	20.813	18.099	34.472	26.067	8.405	0.576	0.663	5.524	28.573
8	8.625	7.625	0.500	27.096	23.955	58.426	45.663	12.763	-0.442	0.500	3.154	43.388
9	9.625	8.625	0.500	30.238	27.096	72.760	58.426	14.334	0.396	0.442	2.464	48.728
10	10.750	9.750	0.500	33.772	30.631	90.763	74.662	16.101	0.355	0.391	1.929	54.735
11	11.750	10.750	0.500	36.914	33.772	108.434	90.763	17.671	0.325	0.355	1.587	60.075
12	12.750	11.750	0.500	40.055	36.914	127.676	108.434	19.242	0.299	0.325	1.328	65.415

The oxy-acetylene torch, both for welding and for cutting, and the electric arc may be used to cut the pipe to the proper length and to bevel the ends for welding. It can also be used for cutting out the walls of the pipe to receive the branches.

The torch may be used for joining piping, both with lapped and butt welds and for welding branches into the main lines.

The electric arc may be used where welding is to be done on flanges, making a fillet weld.

Fittings often cause so much friction as to impair seriously the smooth and rapid transportation of the piped material. With the application of pipe bending and welds all branches and all changes in direction can be made with long sweep turns, greatly reducing friction at the bends.

Whenever a branch is joined to a main, templates should be used for cutting the hole through the wall of the main pipe and for preparing the end of the branch pipe. The branch pipe should not project inside the main but should fit snugly against the main so that with the process of welding no surplus metal will drop into the interior of the main.

When a branch is taken off from a main line and there is very little room for expansion it is good practice and very easy to weld in a reinforced brace between the branch and the main line. This is particularly true on large piping where high temperatures occur.

In changing the direction of the run of pipe it is better to use bends than to use fittings and nipples.

Special welding-fittings of uniform thickness are manufactured in all pipe sizes. These bends can be cut with the welding torch to any desired angle.

Welding rods of high grade material should be used on all welds. The more complicated the turn and the more severe the strain and service the better quality the rod must be.

Expert workmanship and correct engineering are of no avail if the welding rod is of improper character.

Steamfitters are now being trained as rapidly as possible in various schools throughout the country to handle the welding and cutting torch and to perform the electric arc weld. Since welding is a new industry there is some danger that failures may occur unless great care is taken with the workmanship.

The following rules are basic in welding practice and should be followed rigidly:

1. A skilled operator with the torch or arc, preferably a steamfitter, should be employed.
2. The proper welding rod and electrode must be supplied.
3. The choice of oxygen-acetylene or electric arc will be governed by the adaptability of each for the particular installation.
4. Templates shall be used for all cuts, with joints which are to be welded fitted closely, prior to starting the welding.
5. Standard welding tools and equipment of recognized make should be used.

The cost on small installations using welding is said to be higher than that using threaded fittings.