A53 and A120 combines the schedule thicknesses of the *American Standard for Wrought-Iron and Wrought-Steel Pipe, A.S.A.* B36.10, and the old series designations.

Standard-weight pipe is generally furnished with threaded ends in random lengths of 16 to 22 ft, although when ordered with plain ends, 5 per cent may be in lengths of 12 to 16 ft. Five per cent of the total number of lengths ordered may be *jointers* which are two pieces coupled together. Extra-strong pipe is generally furnished with plain ends in

TABLE 2. DIMENSIONS OF SCHEDULES 60 AND 80 AND EXTRA-STRONG PIPE[a]

Size	Diameter, In.		Thickness[b], In.	Weight per Ft Plain Ends, Lb	Circumference, In.		Transverse Area, Sq In.			Length of Pipe, Ft per Sq Ft		Length of Pipe, Ft Containing 1 Cu Ft	Weight of Water, Lb per Ft
	External	Internal			External	Internal	External	Internal	Metal	External Surface	Internal Surface		
⅛	0.405	0.215	0.095	0.314	1.272	0.675	0.129	0.036	0.093	9.431	17.766	3966.39	0.016
¼	0.540	0.302	0.119	0.535	1.696	0.949	0.229	0.072	0.157	7.073	12.648	2010.290	0.031
⅜	0.675	0.423	0.126	0.738	2.121	1.329	0.358	0.141	0.217	5.658	9.030	1024.689	0.061
½	0.840	0.546	0.147	1.087	2.639	1.715	0.554	0.234	0.320	4.547	6.995	615.017	0.102
¾	1.050	0.742	0.154	1.473	3.299	2.331	0.866	0.433	0.433	3.637	5.147	333.016	0.188
1	1.315	0.957	0.179	2.171	4.131	3.007	1.358	0.719	0.639	2.904	3.991	200.193	0.312
1¼	1.660	1.278	0.191	2.996	5.215	4.015	2.164	1.283	0.881	2.301	2.988	112.256	0.56
1½	1.900	1.500	0.200	3.631	5.969	4.712	2.835	1.767	1.068	2.010	2.546	81.487	0.77
2	2.375	1.939	0.218	5.022	7.461	6.092	4.430	2.953	1.477	1.608	1.969	48.766	1.28
2½	2.875	2.323	0.276	7.661	9.032	7.298	6.492	4.238	2.254	1.328	1.644	33.976	1.87
3	3.500	2.900	0.300	10.252	10.996	9.111	9.621	6.605	3.016	1.091	1.317	21.801	2.86
3½	4.000	3.364	0.318	12.505	12.566	10.568	12.566	8.888	3.678	0.954	1.135	16.202	3.84
4	4.500	3.826	0.337	14.983	14.137	12.020	15.904	11.497	4.407	0.848	0.998	12.525	4.98
5	5.563	4.813	0.375	20.778	17.477	15.120	24.306	18.194	6.112	0.686	0.793	7.915	7.88
6	6.625	5.761	0.432	28.573	20.813	18.099	34.472	26.067	8.405	0.576	0.663	5.524	11.29
8	8.625	7.625	0.500	43.388	27.096	23.955	58.426	45.663	12.763	0.443	0.500	3.154	19.78
10[c]	10.750	9.750	0.500	54.735	33.772	30.631	90.763	74.662	16.101	0.355	0.391	1.929	32.35
12	12.750	11.750	0.500	65.415	40.055	36.914	127.676	108.434	19.242	0.299	0.325	1.328	46.92

[a]Extra-strong wrought-iron pipe has approximately the same wall thicknesses and weights as contained herein for steel pipe. For exact dimensions, see *American Standard for Wrought-Iron and Wrought-Steel Pipe, A.S.A.* B36.10.

[b]Thicknesses shown in bold face type are identical with thicknesses for Schedule 80 pipe for *A.S.A* B36.10.

[c]Same as Schedule 60, *A.S.A.* B36.10.

random lengths of 12 to 22 ft, although 5 per cent may be in lengths of 6 to 12 ft.

In addition to *IPS* copper pipe, several varieties of copper tubing are in use with either flared or compression couplings or soldered joints. Dimensions of copper water tubing intended for plumbing, underground water service, fuel-oil lines, gas lines, etc., have been standardized by the U. S. Government and the *American Society for Testing Materials*. There are three standard wall-thickness schedules of copper water tubing classified in accordance with their principal uses as follows:

Type *K*—Designed for underground services and general plumbing service.
Type *L*—Designed for general plumbing purposes.
Type *M*—Designed for use with soldered fittings only.

In general, Type *K* is used where corrosion conditions are severe, and Types *L* and *M* where such conditions may be considered normal as, for instance, in heating work. Types *K* and *L* are available in both hard and soft tempers; Type *M* is available only in hard temper. Where flexibility is essential as in hidden replacement work or where as few joints as possible are desired as in fuel-oil lines, the soft temper is commonly used. New or exposed work generally employs copper pipe of a hard temper. All three classes are extensively used with soldered fittings.

TABLE 3. STANDARD WEIGHTS AND DIMENSIONS OF WELDED AND SEAMLESS STEEL PIPE[a]

Size	Outside Diameter, In.	No. of Threads per In.	Standard-Weight Pipe				Extra-Strong Pipe				Double Extra-Strong Pipe[b]	
			Schedule 30		Schedule 40		Schedule 60		Schedule 80			
			Wall Thickness, In.	Weight per Ft, Lb T & C	Wall Thickness, In.	Weight per Ft, Lb T & C	Wall Thickness, In.	Weight per Ft, Lb Plain Ends	Wall Thickness, In.	Weight per Ft, Lb Plain Ends	Wall Thickness, In.	Weight per Ft, Lb Plain Ends
⅛	0.405	27	.....	.....	0.068	0.25	.....	.....	0.095	0.31	.....	.....
¼	0.540	18	.....	.....	0.088	0.43	.....	.....	0.119	0.54	.....	.....
⅜	0.675	18	.....	.....	0.091	0.57	.....	.....	0.126	0.74	.....	.....
½	0.840	14	.....	.....	0.109	0.85	.....	.....	0.147	1.09	0.294	1.71
¾	1.050	14	.....	.....	0.113	1.13	.....	.....	0.154	1.47	0.308	2.44
1	1.315	11½	.....	.....	0.133	1.68	.....	.....	0.179	2.17	0.358	3.66
1¼	1.660	11½	.....	.....	0.140	2.28	.....	.....	0.191	3.00	0.382	5.21
1½	1.900	11½	.....	.....	0.145	2.73	.....	.....	0.200	3.63	0.400	6.41
2	2.375	11½	.....	.....	0.154	3.68	.....	.....	0.218	5.02	0.436	9.03
2½	2.875	8	.....	.....	0.203	5.82	.....	.....	0.276	7.66	0.552	13.70
3	3.500	8	.....	.....	0.216	7.62	.....	.....	0.300	10.25	0.600	18.58
3½	4.000	8	.....	.....	0.226	9.20	.....	.....	0.318	12.51	0.636	22.85
4	4.500	8	.....	.....	0.237	10.89	.....	.....	0.337	14.98	0.674	27.54
5	5.563	8	.....	.....	0.258	14.81	.....	.....	0.375	20.78	0.750	38.55
6	6.625	8	.....	.....	0.280	19.19	.....	.....	0.432	28.57	0.864	53.16
8	8.625	8	0.277	25.00	0.322	28.81	.....	.....	0.500	43.39	0.875	72.42
10[c]	10.750	8	0.307	35.00	0.365	41.13	0.500	54.74	.....	.....	.....	.....
12[d]	12.750	8	0.330	45.00	0.375	50.71	0.500[d]	65.41	.....	.....	.....	.....

From Standard Specifications for Welded and Seamless Steel Pipe of the *American Society for Testing Materials, A.S.T.M.* Designation A120.

[a]Sizes larger than those shown in the table are measured by their outside diameter, such as 14 in. outside diameter, etc. These larger sizes will be furnished with plain ends, unless otherwise specified. The weights will correspond to the manufacturers' published standards although it is possible to calculate the theoretical weights for any given size and wall thickness on the basis of 1 cu in. of steel weighing 0.2833 lb.

[b]The American Standard for Wrought-Iron and Wrought-Steel Pipe *A.S.A.* B36.10-1939 has assigned no schedule number to *Double Extra-Strong pipe.*

[c]A 10 in. Standard Weight pipe is also available with 0.279 in. wall thickness, but this wall is not covered by a Schedule Number.

[d]Owing to a departure from the *Standard-Weight* and *Extra-Strong* wall thicknesses for the 12 in. nominal size, Schedules 40 and 60, Table 2 of the *A.S.A.* B36.10-1939, Standard for Wrought-Iron and Wrought-Steel pipe, the regular *Standard* and *Extra-Strong* wall thicknesses (0.375 in. and 0.500 in.) have been substituted.

Standard dimensions, weights, and diameter and wall-thickness tolerances for these classes of copper tubing are given in Table 4. Copper pipe is also available with dimensions of steel pipe.

Refrigeration lines used in connection with air conditioning equipment also employ copper tubing extensively. For refrigeration use where tubing absolutely free from scale and dirt is required, bright annealed copper tubing that has been deoxidized is used. This tubing is available in a variety of sizes and wall thicknesses.