



TABLE 3

PROPERTIES OF STEEL PIPE USED IN INDIRECT HEATERS

Nominal Pipe Size	Schedule	O.D. in.	I.D. in.	Wall Thickness in.	Wt, lb/ft	External Surface Sq ft/ft	Internal Surface Sq ft/ft
1"	80X	1.315	0.957	0.179	2.171	0.344	0.251
2"	40S 80X XX	2.375	2.067 1.939 1.503	0.154 0.218 0.436	3.652 5.022 9.029	0.622 0.622 0.622	0.541 0.508 0.393
2-1/2"	40S 80X XX - - -	2.875	2.469 2.323 1.771 1.375 1.125 0.875	0.203 0.276 0.552 0.750 0.875 1.000	5.79 7.66 13.70 17.02 18.69 20.03	0.753 0.753 0.753 0.753 0.753 0.753	0.646 0.608 0.464 0.360 0.295 0.229
3"	40S 80X XX	3.500	3.068 2.900 2.300	0.216 0.300 0.600	7.58 10.25 18.58	0.916 0.916 0.916	0.803 0.759 0.602
4"	40S 80X XX	4.500	4.026 3.826 3.152	0.237 0.337 0.674	10.79 14.98 27.54	1.178 1.178 1.178	1.054 1.002 0.825

TABLE 4

PROPERTIES OF CAST IRON PIPE USED IN INDIRECT HEATER COILS

Nominal Pipe Size	O.D., in.	I.D., in.	Wall Thickness in.	Wt per Ft., lb	Sq Ft Outside Surface per ft	Sq Ft Inside Surface per ft
2"	2.375	1.955	.21	4.8	.622	.512
3"	3.500	2.86	.32	10.0	.916	.749
4"	4.500	3.86	.32	13.1	1.178	1.011



TABLE 5
STANDARD INDIRECT HEATERS
WITH STEEL PIPE COILS

Size Dia x Len.	Firebox Rating BTU/hr	No. of Tubes	Tube Size	Coil Area sq ft	Split Pass		Equivalent Len. of Pipe for Press. Drop, ft
					Tubes Split	Split Areas	
24" x 3'	100,000	Spiral	1" X	21.5	-	-	93.2
30" x 6'	250,000	14 8	1" X	26.2	8/6	15.0/11.2	96.4
			2" X or XX	28.9	4/4	14.5/14.4	68.3
30" x 10'	500,000	8	2" X or XX	48.8	4/4	24.4/24.4	100.3
36" x 10'	750,000	14	2" X or XX	85.3	8/6 10/4	48.7/36.6 60.9/24.4	177.7
		8	3" X or XX	72.3	4/4	36.1/36.2	112.7
48" x 10'	1,000,000	18	2" X or XX	109.7	12/6	73.1/36.6	229.3
		14	3" X or XX	126.4	8/6 10/4 12/2	72.2/54.2 90.3/36.1 108.3/18.1	200.7
60" x 12'	1,500,000	24 20	2" X or XX	176.1	16/8	117.4/58.7	354.7
			3" X or XX	217.1	12/8	130.3/86.8	328.7
		14	4" X or XX	196.4	14/6 8/6 10/4 12/2	152.0/65.1 112.2/84.2 140.3/56.1 168.3/28.1	243.8
72" x 12'	2,000,000	38	2" X or XX	278.7	20/18 28/10 30/8	146.7/132.0 205.4/73.3 220.0/58.7	563.3
		30	3" X or XX	325.6	22/8 26/4	238.8/86.8 282.2/43.4	495.4
		18	4" X or XX	252.5	12/6	168.3/84.2	315.1
60" x 20'	2,500,000	24 20	2" X or XX	295.5	16/8	197.0/98.5	546.7
			3" X or XX	363.7	12/8	218.2/145.5	488.7
		14	4" X or XX	328.4	14/6 8/6 10/4 12/2	254.6/109.1 187.7/140.7 234.6/93.8 281.5/46.9	355.8
60" x 24'	3,000,000	24 20	2" X or XX	355.2	16/8	236.8/118.4	642.7
			3" X or XX	437.0	12/8	262.2/174.8	568.7
		14	4" X or XX	394.3	14/6 8/6 10/4 12/2	305.9/131.1 225.3/169.0 281.6/112.7 338.0/56.3	411.8
72" x 24'	4,000,000	30	3" X or XX	655.4	22/8 26/4	480.6/174.8 568.0/87.4	855.4
		18	4" X or XX	507.0	12/6	338.0/169.0	531.1



TABLE 6
STANDARD INDIRECT HEATERS WITH CAST IRON COILS

Size Dia x Len.	Rating BTU/hr	No. of Tubes	Tube Size	Coil Area sq ft (outside tube surface)	Equivalent Len. of Pipe for Press. Drop, ft
30" x 10'	500,000	6	2" C.I.	33.6	65.4
		4	3" C.I.	33.3	47.7
36" x 10'	750,000	14	2" C.I.	77.4	154.0
		8	3" C.I.	65.6	97.9
48" x 10'	750,000	20	2" C.I.	110.2	220.5
48" x 10'	1,000,000	18	2" C.I.	99.3	198.4
		12	3" C.I.	97.8	148.2
		18	3" C.I.	146.2	223.5
60" x 12'	1,500,000	24	2" C.I.	162.0	312.8
		24	3" C.I.	238.5	346.9
		16	4" C.I.	209.6	250.5
72" x 12'	2,000,000	38	2" C.I.	256.0	496.0
		38	3" C.I.	377.1	550.7
		20	4" C.I.	261.8	314.1

TABLE 7
INDIRECT HEATERS WITH 10,000 PSI COILS

Size Dia. x Len.	Firebox Rating BTU/hr	No. of Tubes and Size		Coil Area, sq ft			Equivalent Len. of Pipe for Press. Drop, ft
		Preheat Coil*	Exp. Coil**	Preheat	Exp.	Total	
36" x 10'	750,000	8-2-1/2"	2-3"	58.4	18.2	76.6	126.9
48" x 10'	1,000,000	8-2-1/2"	6-3"	58.4	54.3	112.7	185.6
60" x 12'	1,500,000	10-2-1/2"	8-3"	88.0	86.9	174.9	277.2
72" x 12'	2,000,000	16-2-1/2"	12-3"	140.6	130.3	270.9	434.9
60" x 12'	2,500,000	10-2-1/2"	8-3"	148.2	145.6	293.8	421.2
60" x 24'	3,000,000	10-2-1/2"	8-3"	178.3	174.9	353.2	493.2
72" x 24'	4,000,000	20-2-1/2"	14-3"	356.4	305.9	662.3	973.0

*2-1/2" 0.750" wall pipe is used.

**3" X-Hvy pipe is used.