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LAMPIRAN A

PROPERTIS BAHAN BAKAR

No	Tipe Bahan Bakar	Parameter Analisis Proximate (%)				Parameter Analisa Ultimate (%)					Nilai Kalori (kcal/kg)	Nilai Kalori (Kj/kg)
		IM	A	VM	FC	C	H	O	S	N		
1	Jerami Padi	8.17	22.51	54.68	14.64	32.6	4.59	39.55	0.13	0.62	3131	13108.87
2	Sekam Padi	8.01	24.74	53.24	14.01	32.85	4.79	37.17	0.06	0.39	3226	13506.62
3	Kertas	5.95	8.74	74.5	10.81	39.38	5.62	46.04	0.07	0.15	3714	15549.78
4	Kotoran Sapi	8.92	20.97	55.5	14.61	36.47	5.8	34.65	0.23	1.88	3781	15830.29
5	Sampah Organik Pasar	5.45	9.39	69.29	15.87	41.12	6.77	40.66	0.3	1.76	3865	16181.98
6	Rumput Liar Ilalang	9.23	6.48	67.23	17.06	44.37	6.65	41.59	0.18	0.73	3923	16424.82
7	Sabut Kelapa	14.84	4.03	57.48	23.65	45.08	5.77	44.63	0.18	0.31	3933	16466.68
8	Bagas Tebu	9.37	3.08	74.23	13.32	41.7	6.19	42.68	0.16	6.19	4138	17324.98
9	Bambu	8.89	2.71	72.34	16.06	46.73	6	43.92	0.15	0.49	4186	17525.94
10	Kayu	11.03	1.54	72.55	14.88	42.97	6.47	48.76	0.09	0.17	4198	17576.19
11	Batok Kelapa	10.39	0.53	70.77	18.31	46.52	6.78	45.96	0.1	0.11	4419	18501.47
12	Kulit Sawit	10.35	2.14	69.32	18.19	49.96	6.36	41.07	0.07	0.4	4587	19204.85
13	Kulit Buah Jarak	5.87	4.88	65.85	23.4	46.62	5.88	41.3	0.07	1.25	4658	19502.11
14	Bungkil Buah Jarak	5.04	7.45	75.66	11.85	47.32	6.79	33.04	0.23	5.17	5211	21817.41
15	Plastik	0.89	0.28	92.9	5.93	-	-	-	-	-	5551	23240.93
16	Batubara Peringkat Rendah	25.99	5.25	34.11	34.65	51.66	6.92	35.15	0.48	0.54	4601	19263.47
17	Briket Batubara Karbonisasi	6.42	15.82	24.64	53.12	65.19	3.87	13.96	0.29	0.87	5891	24664.44
18	Arang Kayu	6.97	5.14	11.64	76.25	80.44	4.5	9.44	0.21	0.27	6889	28842.87
19	**Arang Batok**	**6.32**	**1.85**	**8.93**	**82.9**	**85.65**	**2.37**	**9.87**	**0.02**	**0.21**	**7399**	**30978.13**
20	Kokas Minyak Bumi	0.53	0.85	14.72	83.9	79.74	3.31	10.6	4.47	1.61	8634	36148.83
21	Ban Bekas	0.73	4.04	67.97	27.26	83.8	7.6	3.1	1.4	0.4	9345	39125.65

LAMPIRAN B

SIFAT-SIFAT AIR

Note: The following steam tables and Fig. 1 have been abstracted from *ASME Steam Tables: Thermodynamic and Transport Properties of Steam* (copyright 1983 by the American Society of Mechanical Engineers).

Table 1
Properties of Saturated Steam and Saturated Water (Temperature)[1]

Temp F	Press. psia	Volume, ft³/lb			Enthalpy,° Btu/lb			Entropy, Btu/lb F			Temp F
		Water	Evap	Steam	Water	Evap	Steam	Water	Evap	Steam	
		v_f	v_{fg}	v_g	H_f	H_{fg}	H_g	s_f	s_{fg}	s_g	
32	0.08859	0.01602	3305	3305	−0.02	1075.5	1075.5	0.0000	2.1873	2.1873	32
35	0.09991	0.01602	2948	2948	3.00	1073.8	1076.8	0.0061	2.1706	2.1767	35
40	0.12163	0.01602	2446	2446	8.03	1071.0	1079.0	0.0162	2.1432	2.1594	40
45	0.14744	0.01602	2037.7	2037.8	13.04	1068.1	1081.2	0.0262	2.1164	2.1426	45
50	0.17796	0.01602	1704.8	1704.8	18.05	1065.3	1083.4	0.0361	2.0901	2.1262	50
60	0.2561	0.01603	1207.6	1207.6	28.06	1059.7	1087.7	0.0555	2.0391	2.0946	60
70	0.3629	0.01605	868.3	868.4	38.05	1054.0	1092.1	0.0745	1.9900	2.0645	70
80	0.5068	0.01607	633.3	633.3	48.04	1048.4	1096.4	0.0932	1.9426	2.0359	80
90	0.6981	0.01610	468.1	468.1	58.02	1042.7	1100.8	0.1115	1.8970	2.0086	90
100	0.9492	0.01613	350.4	350.4	68.00	1037.1	1105.1	0.1295	1.8530	1.9825	100
110	1.2750	0.01617	265.4	265.4	77.98	1031.4	1109.3	0.1472	1.8105	1.9577	110
120	1.6927	0.01620	203.25	203.26	87.97	1025.6	1113.6	0.1646	1.7693	1.9339	120
130	2.2230	0.01625	157.32	157.33	97.96	1019.8	1117.8	0.1817	1.7295	1.9112	130
140	2.8892	0.01629	122.98	123.00	107.95	1014.0	1122.0	0.1985	1.6910	1.8895	140
150	3.718	0.01634	97.05	97.07	117.95	1008.2	1126.1	0.2150	1.6536	1.8686	150
160	4.741	0.01640	77.27	77.29	127.96	1002.2	1130.2	0.2313	1.6174	1.8487	160
170	5.993	0.01645	62.04	62.06	137.97	996.2	1134.2	0.2473	1.5822	1.8295	170
180	7.511	0.01651	50.21	50.22	148.00	990.2	1138.2	0.2631	1.5480	1.8111	180
190	9.340	0.01657	40.94	40.96	158.04	984.1	1142.1	0.2787	1.5148	1.7934	190
200	11.526	0.01664	33.62	33.64	168.09	977.9	1146.0	0.2940	1.4824	1.7764	200
210	14.123	0.01671	27.80	27.82	178.15	971.6	1149.7	0.3091	1.4509	1.7600	210
212	14.696	0.01672	26.78	26.80	180.17	970.3	1150.5	0.3121	1.4447	1.7568	212
220	17.186	0.01678	23.13	23.15	188.23	965.2	1153.4	0.3241	1.4201	1.7442	220
230	20.779	0.01685	19.364	19.381	198.33	958.7	1157.1	0.3388	1.3902	1.7290	230
240	24.968	0.01693	16.304	16.321	208.45	952.1	1160.6	0.3533	1.3609	1.7142	240
250	29.825	0.01701	13.802	13.819	218.59	945.4	1164.0	0.3677	1.3323	1.7000	250
260	35.427	0.01709	11.745	11.762	228.76	938.6	1167.4	0.3819	1.3043	1.6862	260
270	41.856	0.01718	10.042	10.060	238.95	931.7	1170.6	0.3960	1.2769	1.6729	270
280	49.200	0.01726	8.627	8.644	249.17	924.6	1173.8	0.4098	1.2501	1.6599	280
290	57.550	0.01736	7.443	7.460	259.4	917.4	1176.8	0.4236	1.2238	1.6473	290
300	67.005	0.01745	6.448	6.466	269.7	910.0	1179.7	0.4372	1.1979	1.6351	300
310	77.67	0.01755	5.609	5.626	280.0	902.5	1182.5	0.4506	1.1726	1.6232	310
320	89.64	0.01766	4.896	4.914	290.4	894.8	1185.2	0.4640	1.1477	1.6116	320
340	117.99	0.01787	3.770	3.788	311.3	878.8	1190.1	0.4902	1.0990	1.5892	340
360	153.01	0.01811	2.939	2.957	332.3	862.1	1194.4	0.5161	1.0517	1.5678	360
380	195.73	0.01836	2.317	2.335	353.6	844.5	1198.0	0.5416	1.0057	1.5473	380
400	247.26	0.01864	1.8444	1.8630	375.1	825.9	1201.0	0.5667	0.9607	1.5274	400
420	308.78	0.01894	1.4808	1.4997	396.9	806.2	1203.1	0.5915	0.9165	1.5080	420
440	381.54	0.01926	1.1976	1.2169	419.0	785.4	1204.4	0.6161	0.8729	1.4890	440
460	466.9	0.0196	0.9746	0.9942	441.5	763.2	1204.8	0.6405	0.8299	1.4704	460
480	566.2	0.0200	0.7972	0.8172	464.5	739.6	1204.1	0.6648	0.7871	1.4518	480
500	680.9	0.0204	0.6545	0.6749	487.9	714.3	1202.2	0.6890	0.7443	1.4333	500
520	812.5	0.0209	0.5386	0.5596	512.0	687.0	1199.0	0.7133	0.7013	1.4146	520
540	962.8	0.0215	0.4437	0.4651	536.8	657.5	1194.3	0.7378	0.6577	1.3954	540
560	1133.4	0.0221	0.3651	0.3871	562.4	625.3	1187.7	0.7625	0.6132	1.3757	560
580	1326.2	0.0228	0.2994	0.3222	589.1	589.9	1179.0	0.7876	0.5673	1.3550	580
600	1543.2	0.0236	0.2438	0.2675	617.1	550.6	1167.7	0.8134	0.5196	1.3330	600
620	1786.9	0.0247	0.1962	0.2208	646.9	506.3	1153.2	0.8403	0.4689	1.3092	620
640	2059.9	0.0260	0.1543	0.1802	679.1	454.6	1133.7	0.8686	0.4134	1.2821	640
660	2365.7	0.0277	0.1166	0.1443	714.9	392.1	1107.0	0.8995	0.3502	1.2498	660
680	2708.6	0.0304	0.0808	0.1112	758.5	310.1	1068.5	0.9365	0.2720	1.2086	680
700	3094.3	0.0366	0.0386	0.0752	822.4	172.7	995.2	0.9901	0.1490	1.1390	700
705.5	3208.2	0.0508	0	0.0508	906.0	0	906.0	1.0612	0	1.0612	705.5

Lanjutan B.1

Table 2
Properties of Saturated Steam and Saturated Water (Pressure)[1]

Press. psia	Temp F	Volume, ft³/lb			Enthalpy,[2] Btu/lb			Entropy, Btu/lb F			Energy, Btu/lb		Press. psia
		Water v_f	Evap v_{fg}	Steam v_g	Water H_f	Evap H_{fg}	Steam H_g	Water s_f	Evap s_{fg}	Steam s_g	Water u_f	Steam u_g	
0.0886	32.018	0.01602	3302.4	3302.4	0.00	1075.5	1075.5	0	2.1872	2.1872	0	1021.3	**0.0886**
0.10	35.023	0.01602	2945.5	2945.5	3.03	1073.8	1076.8	0.0061	2.1705	2.1766	3.03	1022.3	**0.10**
0.15	45.453	0.01602	2004.7	2004.7	13.50	1067.9	1081.4	0.0271	2.1140	2.1411	13.50	1025.7	**0.15**
0.20	53.160	0.01603	1526.3	1526.3	21.22	1063.5	1084.7	0.0422	2.0738	2.1160	21.22	1028.3	**0.20**
0.30	64.484	0.01604	1039.7	1039.7	32.54	1057.1	1089.7	0.0641	2.0168	2.0809	32.54	1032.0	**0.30**
0.40	72.869	0.01606	792.0	792.1	40.92	1052.4	1093.3	0.0799	1.9762	2.0562	40.92	1034.7	**0.40**
0.5	79.586	0.01607	641.5	641.5	47.62	1048.6	1096.3	0.0925	1.9446	2.0370	47.62	1036.9	**0.5**
0.6	85.218	0.01609	540.0	540.1	53.25	1045.5	1098.7	0.1028	1.9186	2.0215	53.24	1038.7	**0.6**
0.7	90.09	0.01610	466.93	466.94	58.10	1042.7	1100.8	0.3	1.8966	2.0083	58.10	1040.3	**0.7**
0.8	94.38	0.01611	411.67	411.69	62.39	1040.3	1102.6	0.1117	1.8775	1.9970	62.39	1041.7	**0.8**
0.9	98.24	0.01612	368.41	368.43	66.24	1038.1	1104.3	0.1264	1.8606	1.9870	66.24	1042.9	**0.9**
1.0	101.74	0.01614	333.59	333.60	69.73	1036.1	1105.8	0.1326	1.8455	1.9781	69.73	1044.1	**1.0**
2.0	126.07	0.01623	173.74	173.76	94.03	1022.1	1116.2	0.1750	1.7450	1.9200	94.03	1051.8	**2.0**
3.0	141.47	0.01630	118.71	118.73	109.42	1013.2	1122.6	0.2009	1.6854	1.8864	109.41	1056.7	**3.0**
4.0	152.96	0.01636	90.63	90.64	120.92	1006.4	1127.3	0.2199	1.6428	1.8626	120.90	1060.2	**4.0**
5.0	162.24	0.01641	73.515	73.53	130.20	1000.9	1131.1	0.2349	1.6094	1.8443	130.18	1063.1	**5.0**
6.0	170.05	0.01645	61.967	61.98	138 03	996.2	1134.2	0.2474	1.5820	1.8294	138.01	1065.4	**6.0**
7.0	176.84	0.01649	53.634	53.65	144.83	992.1	1136.9	0.2581	1.5587	1.8168	144.81	1067.4	**7.0**
8.0	182.86	0.01653	47.328	47.35	150.87	988.5	1139.3	0.2676	1.5384	1.8060	150.84	1069.2	**8.0**
9.0	188.27	0.01656	42.385	42.40	156.30	985.1	1141.4	0.2760	1.5204	1.7964	156.28	1070.8	**9.0**
10	193.21	0.01659	38.404	38.42	161.26	982.1	1143.3	0.2836	1.5043	1.7879	161.23	1072.3	**10**
14.696	212.00	0.01672	26.782	26.80	180.17	970.3	1150.5	0.3121	1.4447	1.7568	180.12	1077.6	**14.696**
15	213.03	0.01673	26.274	26.29	181.21	969.7	1150.9	0.3137	1.4415	1.7552	181.16	1077.9	**15**
20	227.96	0.01683	20.070	20.087	196.27	960.1	1156.3	0.3358	1.3962	1.7320	196.21	1082.0	**20**
30	250.34	0.01701	13.7266	13.744	218.9	945.2	1164.1	0.3682	1.3313	1.6995	218.8	1087.9	**30**

40	267.25	0.01715	10.4794	10.497	236.1	933.6	1169.8	0.3921	1.2844	1.6765	236.0	1092.1	40
50	281.02	0.01727	8.4967	8.514	250.2	923.9	1174.1	0.4112	1.2474	1.6586	250.1	1095.3	50
60	292.71	0.01738	7.1562	7.174	262.2	915.4	1177.6	0.4273	1.2167	1.6440	262.0	1098.0	60
70	302.93	0.01748	6.1875	6.205	272.7	907.8	1180.6	0.4411	1.1905	1.6316	272.5	1100.2	70
80	312.04	0.01757	5.4536	5.471	282.1	900.9	1183.1	0.4534	1.1675	1.6208	281.9	1102.1	80
90	320.28	0.01766	4.8777	4.895	290.7	894.6	1185.3	0.4643	1.1470	1.6113	290.4	1103.7	90
100	327.82	0.01774	4.4133	4.431	298.5	888.6	1187.2	0.4743	1.1284	1.6027	298.2	1105.2	100
120	341.27	0.01789	3.7097	3.728	312.6	877.8	1190.4	0.4919	1.0960	1.5879	312.2	1107.6	120
140	353.04	0.01803	3.2010	3.219	325.0	868.0	1193.0	0.5071	1.0681	1.5752	324.5	1109.6	140
160	363.55	0.01815	2.8155	2.834	336.1	859.0	1195.1	0.5206	1.0435	1.5641	335.5	1111.2	160
180	373.08	0.01827	2.5129	2.531	346.2	850.7	1196.9	0.5328	1.0215	1.5543	345.6	1112.5	180
200	381.80	0.01839	2.2689	2.287	355.5	842.8	1198.3	0.5438	1.0016	1.5454	354.8	1113.7	200
250	400.97	0.01865	1.8245	1.8432	376.1	825.0	1201.1	0.5679	0.9585	1.5264	375.3	1115.8	250
300	417.35	0.01889	1.5238	1.5427	394.0	808.9	1202.9	0.5882	0.9223	1.5105	392.9	1117.2	300
350	431.73	0.01913	1.3064	1.3255	409.8	794.2	1204.0	0.6059	0.8909	1.4968	408.6	1118.1	350
400	444.60	0.0193	1.14162	1.1610	424.2	780.4	1204.6	0.6217	0.8630	1.4847	422.7	1118.7	400
450	456.28	0.0195	1.01224	1.0318	437.3	767.5	1204.8	0.6360	0.8378	1.4738	435.7	1118.9	450
500	467.01	0.0198	0.90787	0.9276	449.5	755.1	1204.7	0.6490	0.8148	1.4639	447.7	1118.8	500
550	476.94	0.0199	0.82183	0.8418	460.9	743.3	1204.3	0.6611	0.7936	1.4547	458.9	1118.6	550
600	486.20	0.0201	0.74962	0.7698	471.7	732.0	1203.7	0.6723	0.7738	1.4461	469.5	1118.2	600
700	503.08	0.0205	0.63505	0.6556	491.6	710.2	1201.8	0.6928	0.7377	1.4304	488.9	1116.9	700
800	518.21	0.0209	0.54809	0.5690	509.8	689.6	1199.4	0.7111	0.7051	1.4163	506.7	1115.2	800
900	531.95	0.0212	0.47968	0.5009	526.7	669.7	1196.4	0.7279	0.6753	1.4032	523.2	1113.0	900
1000	544.58	0.0216	0.42436	0.4460	542.6	650.4	1192.9	0.7434	0.6476	1.3910	538.6	1110.4	1000
1100	556.28	0.0220	0.37863	0.4006	557.5	631.5	1189.1	0.7578	0.6216	1.3794	553.1	1107.5	1100
1200	567.19	0.0223	0.34013	0.3625	571.9	613.0	1184.8	0.7714	0.5969	1.3683	566.9	1104.3	1200
1300	577.42	0.0227	0.30722	0.3299	585.6	594.6	1180.2	0.7843	0.5733	1.3577	580.1	1100.9	1300
1400	587.07	0.0231	0.27871	0.3018	598.8	576.5	1175.3	0.7966	0.5507	1.3474	592.9	1097.1	1400
1500	596.20	0.0235	0.25372	0.2772	611.7	558.4	1170.1	0.8085	0.5288	1.3373	605.2	1093.1	1500
2000	635.80	0.0257	0.16266	0.1883	672.1	466.2	1138.3	0.8625	0.4256	1.2881	662.6	1068.6	2000
2500	668.11	0.0286	0.10209	0.1307	731.7	361.6	1093.3	0.9139	0.3206	1.2345	718.5	1032.9	2500
3000	695.33	0.0343	0.05073	0.0850	801.8	218.4	1020.3	0.9728	0.1891	1.1619	782.8	973.1	3000
3208.2	705.47	0.0508	0	0.0508	906.0	0	906.0	1.0612	0	1.0612	875.9	875.9	3208.2

1. See Note 1, Table 1.
2. See Note 2, Table 1.

LAMPIRAN C

PEMILIHAN BAHAN

Table 1 Dimensions and Weights of Welded and Seamless Wrought Steel Pipe

	Customary Units			Identification [Standard (STD), Extra-Strong (XS), or Double Extra Strong (XXS)]			SI Units		
NPS [Note (1)]	Outside Diameter, in.	Wall Thickness, in.	Plain End Weight, lb/ft		Schedule No.	DN [Note (2)]	Outside Diameter, mm	Wall Thickness, mm	Plain End Mass, kg/m
1/8	0.405	0.049	0.19	...	10	6 (3)	10.3	1.24	0.28
1/8	0.405	0.057	0.21	...	30	6 (3)	10.3	1.45	0.32
1/8	0.405	0.068	0.24	STD	40	6 (3)	10.3	1.73	0.37
1/8	0.405	0.095	0.31	XS	80	6 (3)	10.3	2.41	0.47
1/4	0.540	0.065	0.33	...	10	8 (3)	13.7	1.65	0.49
1/4	0.540	0.073	0.36	...	30	8 (3)	13.7	1.85	0.54
1/4	0.540	0.088	0.43	STD	40	8 (3)	13.7	2.24	0.63
1/4	0.540	0.119	0.54	XS	80	8 (3)	13.7	3.02	0.80
3/8	0.675	0.065	0.42	...	10	10	17.1	1.65	0.63
3/8	0.675	0.073	0.47	...	30	10	17.1	1.85	0.70
3/8	0.675	0.091	0.57	STD	40	10	17.1	2.31	0.84
3/8	0.675	0.126	0.74	XS	80	10	17.1	3.20	1.10
1/2	0.840	0.065	0.54	...	5	15	21.3	1.65	0.80
1/2	0.840	0.083	0.67	...	10	15	21.3	2.11	1.00
1/2	0.840	0.095	0.76	...	30	15	21.3	2.41	1.12
1/2	0.840	0.109	0.85	STD	40	15	21.3	2.77	1.27
1/2	0.840	0.147	1.09	XS	80	15	21.3	3.73	1.62
1/2	0.840	0.188	1.31	...	160	15	21.3	4.78	1.95
1/2	0.840	0.294	1.72	XXS	...	15	21.3	7.47	2.55

Lampiran C.2 Tegangan maksimum yang diijinkan untuk berbagai bahan.

TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Sheet	SA-620	...	K00040	...	...	1	1
2	Carbon steel	Bar	SA-675	45	...	...	...	1	1
3	Carbon steel	Wld. pipe	SA-134	A283A	...	...	...	1	1
4	Carbon steel	Plate	SA-283	A	...	...	...	1	1
5	Carbon steel	Plate	SA-285	A	K01700	...	...	1	1
6	Carbon steel	Plate	SA-285	A	K01700	...	...	1	1
7	Carbon steel	Wld. pipe	SA-672	A45	K01700	...	...	1	1
8	Carbon steel	Sheet	SA-414	A	K01501	...	...	1	1
9	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1	1
10	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1	1
11	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1	1
12	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1	1
13	Carbon steel	Smls. tube	SA-179	...	K01200	...	...	1	1
14	Carbon steel	Smls. tube	SA-192	...	K01201	...	...	1	1
15	Carbon steel	Smls. tube	SA-192	...	K01201	...	...	1	1
16	Carbon steel	Wld. tube	SA-214	...	K01807	...	...	1	1
17	Carbon steel	Wld. tube	SA-226	...	K01201	...	...	1	1
18	Carbon steel	Wld. tube	SA-226	...	K01201	...	...	1	1
19	Carbon steel	Wld. tube	SA-226	...	K01201	...	...	1	1
20	Carbon steel	Wld. tube	SA-226	...	K01201	...	...	1	1
21	Carbon steel	Smls. tube	SA-556	A2	K01807	...	...	1	1
22	Carbon steel	Wld. tube	SA-557	A2	K01807	...	...	1	1
23	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1	1
24	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1	1
25	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1	1
26	Carbon steel	Wld. pipe	SA-53	F	...	...	...	1	1
27	Carbon steel	Smls. pipe	SA-53	S/A	K02504	...	...	1	1
28	Carbon steel	Smls. pipe	SA-53	S/A	K02504	...	...	1	1
29	Carbon steel	Smls. pipe	SA-106	A	K02501	...	...	1	1
30	Carbon steel	Smls. pipe	SA-106	A	K02501	...	...	1	1
31	Carbon steel	Wld. pipe	SA-135	A	...	...	...	1	1
32	Carbon steel	Forged pipe	SA-369	FPA	K02501	...	...	1	1
33	Carbon steel	Wld. pipe	SA-587	...	K11500	...	...	1	1
34	Carbon steel	Wld. pipe	SA-587	...	K11500	...	...	1	1

Lanjutan C.2

TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	40	20	NP	NP	650	CS-6	...
2	45	22.5	NP	650 (Cl. 3 only)	900	CS-6	G10, G22, G35, T2
3	45	24	NP	300 (Cl. 3 only)	NP	CS-1	G37, W12
4	45	24	NP	300 (Cl. 3 only)	650	CS-1	G34, G37
5	45	24	900	NP	NP	CS-1	G10, T2
6	45	24	NP	700	900	CS-1	G10, G35, T2
7	45	24	NP	700	NP	CS-1	S6, W10, W12
8	45	25	NP	NP	900	CS-1	G10, G35, T2
9	47	26	1000	NP	NP	CS-1	G10, S1, T2, W13
10	47	26	1000	NP	NP	CS-1	G4, G10, S1, T2
11	47	26	1000	NP	NP	...	G3, G10, S1, T2
12	47	26	NP	NP	1000	CS-1	G24, G35, T2, W6
13	47	26	NP	NP	900	CS-1	G10, G35, T2
14	47	26	1000	NP	NP	CS-1	G10, S1, T2
15	47	26	NP	NP	1000	CS-1	G10, T2
16	47	26	NP	NP	1000	CS-1	G24, G35, T2, W6
17	47	26	1000	NP	NP	CS-1	G10, S1, T2, W13
18	47	26	1000	NP	NP	CS-1	G4, G10, S1, T2
19	47	26	1000	NP	NP	CS-1	G3, G10, S1, T2
20	47	26	NP	NP	1000	CS-1	G24, G35, T2, W6
21	47	26	NP	NP	1000	CS-1	G10, T2
22	47	26	NP	NP	1000	CS-1	G24, G35, T2, W6
23	48	30	900	NP	NP	CS-2	G3, G10, S1, T2
24	48	30	900	300 (Cl. 3 only)	NP	CS-2	G10, S1, T2, W12, W13
25	48	30	NP	NP	900	CS-2	G24, G35, T2, W6
26	48	30	750	NP	NP	...	G2, G10, G18, T2
27	48	30	900	300 (Cl. 3 only)	NP	CS-2	G10, S1, T2
28	48	30	NP	700 (SPT)	900	CS-2	G10, G35, T2
29	48	30	1000	700	NP	CS-2	G10, S1, T2
30	48	30	NP	NP	1000	CS-2	G10, T1
31	48	30	NP	NP	900	CS-2	G24, G35, T2, W6
32	48	30	1000	NP	NP	CS-2	G10, S1, T1
33	48	30	NP	300 (Cl. 3 only)	NP	CS-2	G37
34	48	30	NP	NP	850	CS-2	G24, T2, W6

Lanjutan C.2

TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	11.4	11.4	11.4	...	11.4	11.4	10.9	10.2	9.9	...	...	...	...	...
2	12.9	12.9	12.9	...	12.9	12.8	12.2	11.5	11.1	10.7	*10.4*	*9.0*	*7.8*	*5.0*
3	12.9	...	12.9	...	12.9	...	...	...	...	...	...	...	...	...
4	12.9	12.9	12.9	...	12.9	12.9	12.9	12.3	11.9	...	...	...	...	...
5	12.9	...	12.9	...	12.9	12.9	12.9	12.3	11.9	11.5	*10.7*	*8.3*	*6.6*	*5.0*
6	12.9	12.9	12.9	...	12.9	12.9	12.9	12.3	11.9	11.5	*10.7*	*9.0*	*7.8*	*6.5*
7	12.9	...	12.9	...	12.9	12.9	12.9	12.3	11.9	11.5	...	...	...	...
8	12.9	12.9	12.9	...	12.9	12.9	12.9	12.8	12.4	11.9	*10.7*	*9.0*	*7.8*	*6.5*
9	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	*10.7*	*9.0*	*7.1*	*5.0*
10	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	*10.7*	*9.0*	*7.1*	*4.3*
11	11.4	...	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	*9.1*	*7.7*	*6.1*	*4.3*
12	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	*9.1*	*7.8*	*6.7*	*5.5*
13	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	*10.7*	*9.2*	*7.9*	*6.5*
14	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	*10.7*	*9.0*	*7.1*	*5.0*
15	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	*10.7*	*9.2*	*7.9*	*6.5*
16	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	*9.1*	*7.8*	*6.7*	*5.5*
17	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	*10.7*	*9.0*	*7.1*	*5.0*
18	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	*10.7*	*9.0*	*7.1*	*4.3*
19	11.4	...	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	*9.1*	*7.7*	*6.1*	*4.3*
20	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	*9.1*	*7.8*	*6.7*	*5.5*
21	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	*10.7*	*9.2*	*7.9*	*6.5*
22	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	*9.1*	*7.8*	*6.7*	*4.3*
23	11.7	...	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	*9.1*	*7.7*	*6.1*	*4.3*
24	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	*10.7*	*9.0*	*7.1*	*5.0*
25	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	*9.1*	*7.9*	*6.7*	*5.5*
26	8.2	...	8.2	...	8.2	8.2	8.2	8.2	8.2	7.5	*6.4*	...	...	...
27	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	*10.7*	*9.0*	*7.1*	*5.0*
28	13.7	13.7	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	*10.7*	*9.3*	*7.9*	*6.5*
29	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	*10.7*	*9.0*	*7.1*	*5.0*
30	13.7	13.7	13.7	...	13.7	13.7	13.7	13.7	13.7	*12.5*	*10.7*	*9.3*	*7.9*	*6.5*
31	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	*9.1*	*7.9*	*6.7*	*5.5*
32	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	*12.5*	*10.7*	*9.0*	*7.1*	*5.0*
33	13.7	...	13.7	...	13.7	...	...	...	...	...	...	...	...	...
34	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	*9.1*	*7.9*	*6.7*	...
35	14.3	...	14.3	...	14.3	14.2	13.6	12.8	12.4	11.9	*10.7*	*9.4*	*7.3*	...

Lanjutan C.2

TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	*3.0*	*1.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
10	*2.6*	*1.3*	...	...	...	...	...	...	...	...	...	...	...	...	...
11	*2.6*	*1.3*	...	...	...	...	...	...	...	...	...	...	...	...	...
12	*3.8*	*2.1*	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	*3.0*	*1.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
15	*4.5*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
16	*3.8*	*2.1*	...	...	...	...	...	...	...	...	...	...	...	...	...
17	*3.0*	*1.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
18	*2.6*	*1.3*	...	...	...	...	...	...	...	...	...	...	...	...	...
19	*2.6*	*1.3*	...	...	...	...	...	...	...	...	...	...	...	...	...
20	*3.8*	*2.1*	...	...	...	...	...	...	...	...	...	...	...	...	...
21	*4.5*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
22	*2.6*	*1.3*	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	*3.0*	*1.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
30	*4.5*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	*3.0*	*1.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Wld. pipe	SA-134	A283B	...	...	...	1	1
2	Carbon steel	Plate	SA-283	B	...	...	...	1	1
3	Carbon steel	Plate	SA-285	B	K02200	...	...	1	1
4	Carbon steel	Plate	SA-285	B	K02200	...	...	1	1
5	Carbon steel	Wld. pipe	SA-672	A50	K02200	...	...	1	1
6	Carbon steel	Sheet	SA-414	B	K02201	...	...	1	1
7	Carbon steel	Bar	SA-675	55	...	...	...	1	1
8	Carbon steel	Bar	SA-675	55	...	...	...	1	1
9	Carbon steel	Wld. pipe	SA-134	A283C	K02401	...	...	1	1
10	Carbon steel	Plate	SA-283	C	K02401	...	...	1	1
11	Carbon steel	Plate	SA-285	C	K02801	...	...	1	1
12	Carbon steel	Smls. & wld. pipe	SA-333	1	K03008	...	...	1	1
13	Carbon steel	Smls. & wld. tube	SA-334	1	K03008	...	...	1	1
14	Carbon steel	Wld. tube	SA-334	1	K03008	...	...	1	1
15	Carbon steel	Plate	SA-516	55	K01800	...	...	1	1
16	Carbon steel	Smls. pipe	SA-524	II	K02104	...	...	1	1
17	Carbon steel	Wld. pipe	SA-671	CA55	K02801	...	...	1	1
18	Carbon steel	Wld. pipe	SA-671	CE55	K02202	...	...	1	1
19	Carbon steel	Wld. pipe	SA-672	A55	K02801	...	...	1	1
20	Carbon steel	Wld. pipe	SA-672	B55	K02001	...	...	1	1
21	Carbon steel	Wld. pipe	SA-672	C55	K01800	...	...	1	1
22	Carbon steel	Wld. pipe	SA-672	E55	K02202	...	...	1	1
23	Carbon steel	Sheet	SA-414	C	K02503	...	...	1	1
24	Carbon steel	Bar	SA-36	...	K02600	...	...	1	1
25	Carbon steel	Bar	SA-36	...	K02600	...	...	1	1
26	Carbon steel	Plate, sheet	SA-36	...	K02600	...	...	1	1
27	Carbon steel	Plate, sheet	SA-662	A	K01701	...	...	1	1
28	Carbon steel	Forgings	SA-181	...	K03502	60	...	1	1
29	Carbon steel	Castings	SA-216	WCA	J02502	...	...	1	1
30	Carbon steel	Forgings	SA-266	1	K03506	...	...	1	1
31	Carbon steel	Forgings	SA-350	LF1	K03009	1	...	1	1
32	Carbon steel	Castings	SA-352	LCA	J02504	...	...	1	1
33	Carbon steel	Cast pipe	SA-660	WCA	J02504	...	...	1	1

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	50	27	NP	300 (Cl. 3 only)	NP	CS-1	G37, W12
2	50	27	NP	300 (Cl. 3 only)	650	CS-1	G34, G37
3	50	27	900	NP	NP	CS-1	G10, S1, T1
4	50	27	NP	700	900	CS-1	G10, G35, T1
5	50	27	NP	700	NP	CS-1	S6, T1, W10, W12
6	50	30	NP	NP	900	CS-2	G10, G35, T1
7	55	27.5	850	700 (SPT)	900	CS-1	G10, G15, G18, G22, S1, T2
8	55	27.5	NP	650 (Cl. 3 only)	NP	...	...
9	55	30	NP	300 (Cl. 3 only)	NP	CS-2	G37, W12
10	55	30	NP	300 (Cl. 3 only)	650	CS-2	G34, G37
11	55	30	900	700	900	CS-2	G10, G35, S1, T2
12	55	30	NP	700	650	CS-2	W12
13	55	30	NP	700	650	CS-2	W12
14	55	30	NP	NP	650	CS-2	G24, W6
15	55	30	850	700	1000	CS-2	G10, S1, T2
16	55	30	NP	NP	1000	CS-2	G10, T2
17	55	30	NP	700	NP	CS-2	S6, W10, W12
18	55	30	NP	700	NP	CS-2	S6, W10, W12
19	55	30	NP	700	NP	CS-2	S6, W10, W12
20	55	30	NP	700	NP	CS-2	S6, W10, W12
21	55	30	NP	700	NP	CS-2	S6, W10, W12
22	55	30	NP	700	NP	CS-2	S6, W10, W12
23	55	33	NP	700	900	CS-2	G10, G35, T1
24	58	36	650	NP	NP	...	G10, G15, G18
25	58	36	NP	650 (SPT)	900	CS-2	G10, G35, T1
26	58	36	NP	700	650	CS-2	G10, G34, G35, G36, T1
27	58	40	NP	NP	700	CS-3	T1
28	60	30	1000	700	1000	CS-2	G10, G18, G35, S1, T2
29	60	30	1000	700	1000	CS-2	G1, G10, G17, G18, S1, T2
30	60	30	1000	700	1000	CS-2	G10, G18, S1, T2
31	60	30	NP	700	1000	CS-2	G10, T2
32	60	30	NP	700	NP	...	G17
33	60	30	1000	700	NP	CS-2	G1, G10, G17, G18, S1, T2

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	14.3	...	14.3	...	14.3	...	...	...	...	...	...	...	...	...
2	14.3	14.3	14.3	...	14.3	14.3	14.3	13.8	13.3	...	...	...	...	...
3	14.3	...	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	11.0	9.4	7.3	5.0
4	14.3	14.3	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	11.2	9.6	8.1	5.9
5	14.3	...	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	...	...	...	...
6	14.3	14.3	14.3	...	14.3	14.3	14.3	14.3	14.3	12.5	11.2	9.6	8.1	5.9
7	15.7	15.7	15.7	...	15.7	15.7	14.9	14.1	13.6	13.1	12.7	10.8	8.7	5.9
8	15.7	...	15.7	...	15.7	15.7	14.9	14.1	13.6	...	...	...	...	...
9	15.7	...	15.7	...	15.7	...	...	...	...	...	...	...	...	...
10	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	...	...	...	...	...
11	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
12	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
13	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
14	13.4	13.4	13.4	...	13.4	13.4	13.4	13.0	12.6	...	...	...	...	...
15	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
16	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
17	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
18	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
19	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
20	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
21	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
22	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
23	15.7	15.7	15.7	...	15.7	15.7	15.7	15.7	15.7	15.6	13.0	10.8	8.7	5.9
24	15.2	...	15.2	...	15.2	15.2	15.2	15.2	15.2	...	...	...	...	...
25	16.6	16.6	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	13.0	10.8	8.7	5.9
26	16.6	...	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	...	...	...	...
27	16.6	16.6	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	...	...	...	...
28	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
29	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
30	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
31	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
32	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	...	...	...	...
33	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
16	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
29	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
30	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
31	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Castings	SA-352	LCB	J03003	...	...	1	1
2	Carbon steel	Plate	SA-515	65	K02800	...	...	1	1
3	Carbon steel	Plate	SA-516	65	K02403	...	...	1	1
4	Carbon steel	Wld. pipe	SA-671	CB65	K02800	...	...	1	1
5	Carbon steel	Wld. pipe	SA-671	CC65	K02403	...	...	1	1
6	Carbon steel	Wld. pipe	SA-672	B65	K02800	...	...	1	1
7	Carbon steel	Wld. pipe	SA-672	C65	K02403	...	...	1	1
8	Carbon steel	Sheet	SA-414	E	K02704	...	...	1	1
9	Carbon steel	Plate	SA-662	B	K02203	...	...	1	1
10	Carbon steel	Plate	SA-537	...	K12437	1	$2\frac{1}{2} < t \leq 4$	1	2
11	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	$2\frac{1}{2} < t \leq 4$	1	2
12	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$2\frac{1}{4} < t \leq 4$	1	1
13	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$\leq 2\frac{1}{4}$	1	1
14	...	...	...	...	...	...	...	...	...
15	Carbon steel	Plate	SA-455	...	K03300	...	$0.58 < t \leq \frac{3}{4}$	1	2
16	Carbon steel	Bar	SA-675	70	...	...	...	1	2
17	Carbon steel	Forgings	SA-105	...	K03504	...	...	1	2
18	Carbon steel	Forgings	SA-181	...	K03502	70	...	1	2
19	Carbon steel	Castings	SA-216	WCB	J03002	...	...	1	2
20	Carbon steel	Forgings	SA-266	2	K03506	...	...	1	2
21	Carbon steel	Forgings	SA-266	4	K03017	...	...	1	2
22	Carbon steel	Forgings	SA-350	LF2	K03011	...	...	1	2
23	Carbon steel	Forgings	SA-508	1	K13502	...	...	1	2
24	Carbon steel	Forgings	SA-508	1A	K13502	...	...	1	2
25	Carbon steel	Forgings	SA-541	1	K03506	...	...	1	2
26	Carbon steel	Forgings	SA-541	1A	K03506	...	...	1	2
27	Carbon steel	Cast pipe	SA-660	WCB	J03003	...	...	1	2
28	Carbon steel	Forgings	SA-765	II	K03047	...	...	1	2
29	Carbon steel	Plate	SA-515	70	K03101	...	...	1	2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	65	35	NP	700	650	CS-2	G1, G17
2	65	35	1000	700	1000	CS-2	G10, S1, T2
3	65	35	850	700	1000	CS-2	G10, S1, T2
4	65	35	NP	700	NP	CS-2	S6, W10, W12
5	65	35	NP	700	NP	CS-2	S6, W10, W12
6	65	35	NP	700	NP	CS-2	S6, W10, W12
7	65	35	NP	700	NP	CS-2	S6, W10, W12
8	65	38	NP	NP	900	CS-2	G10, G35, T1
9	65	40	NP	NP	700	CS-3	T1
10	65	45	NP	700	650	CS-4	T1
11	65	45	NP	700	NP	CS-4	G26, T1, W10, W12
12	66.5	37.5	850	NP	1000	CS-2	G10, S1, T1
13	66.5	...	850	NP	1000	CS-2	G10, G43, S1, T1
14	...	...	...	...	...	...	...
15	70	35	NP	400 (Cl. 3 only)	650	CS-2	...
16	70	35	850	650 (Cl. 3 only)	1000	CS-2	G10, G15, G18, G22, G35, S1, T2
17	70	36	1000	700	1000	CS-2	G10, G18, G35, S1, T2
18	70	36	1000	700	1000	CS-2	G10, G18, G35, S1, T2
19	70	36	1000	700	1000	CS-2	G1, G10, G17, G18, S1, T2
20	70	36	1000	700	1000	CS-2	G10, G18, S1, T2
21	70	36	NP	NP	1000	CS-2	G10, T2
22	70	36	NP	700	1000	CS-2	G10, T2
23	70	36	NP	700	1000	CS-2	G10, T2
24	70	36	NP	700	1000	CS-2	G10, T2
25	70	36	NP	700	1000	CS-2	G10, T2
26	70	36	NP	700	1000	CS-2	G10, T2
27	70	36	1000	700	NP	CS-2	G1, G10, G17, G18, S1, T2
28	70	36	NP	NP	650	CS-2	...
29	70	38	1000	700	1000	CS-2	G10, S1, T2
30	70	38	850	700	1000	CS-2	G10, S1, T2

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
2	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	13.9	11.4	8.7	5.9
3	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	13.9	11.4	8.7	5.9
4	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
5	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
6	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
7	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
8	18.6	18.6	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	13.9	11.4	8.7	5.9
9	18.6	18.6	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
10	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
11	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
12	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.5	16.9	13.9	11.4	8.7	5.9
13	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	16.9	13.9	11.4	8.7	5.9
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	...	...	...	...	...
16	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.7	14.8	12.0	9.3	6.7
17	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
18	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
19	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
20	20.0	...	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
21	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
22	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
23	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
24	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
25	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
26	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
27	20.0	...	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
28	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	...	...	...	...	...
29	20.0	20.0	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	14.8	12.0	9.3	6.7
30	20.0	20.0	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	14.8	12.0	9.3	6.7
31	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...
32	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...
33	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
3	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
13	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
17	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
18	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
19	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
20	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
21	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
22	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
23	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
24	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
25	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
26	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
27	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
30	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Smls. pipe	SA-106	C	K03501	...	...	1	2
2	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
3	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
4	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
5	Carbon steel	Smls. tube	SA-210	C	K03501	...	...	1	2
6	Carbon steel	Castings	SA-216	WCC	J02503	...	...	1	2
7	Carbon steel	Smls. & wld. fittings	SA-234	WPC	K03501	...	...	1	2
8	Carbon steel	Castings	SA-352	LCC	J02505	...	...	1	2
9	Carbon steel	Castings	SA-487	16	...	A	...	1	2
10	Carbon steel	Plate	SA-537	...	K12437	3	$4 < t \le 6$	1	3
11	Carbon steel	Smls. tube	SA-556	C2	K03006	...	...	1	2
12	Carbon steel	Tube	SA-557	C2	K03505	...	...	1	2
13	Carbon steel	Cast pipe	SA-660	WCC	J02505	...	...	1	2
14	Carbon steel	Bar	SA-695	B/40	K03504	...	...	1	2
15	Carbon steel	Bar	SA-696	C	K03200	...	...	1	2
16	Carbon steel	Sheet	SA-414	F	K03102	...	...	1	2
17	Carbon steel	Plate	SA-662	C	K02007	...	...	1	2
18	Carbon steel	Plate	SA-537	...	K12437	2	$4 < t \le 6$	1	3
19	Carbon steel	Plate	SA-738	C	...	...	$4 < t \le 6$	1	3
20	Carbon steel	Plate	SA-537	...	K12437	1	$\le 2\frac{1}{2}$	1	2
21	Carbon steel	Wld. pipe	SA-671	CD70	K12437	...	$\le 2\frac{1}{2}$	1	2
22	Carbon steel	Wld. pipe	SA-672	D70	K12437	...	$\le 2\frac{1}{2}$	1	2
23	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	$\le 2\frac{1}{2}$	1	2
24	Carbon steel	Plate	SA-455	...	K03300	...	$\frac{3}{8} < t \le 0.58$	1	2
25	Carbon steel	Forgings	SA-266	3	K05001	...	...	1	2
26	Carbon steel	Plate	SA-455	...	K03300	...	$\le \frac{3}{8}$	1	2
27	Carbon steel	Plate	SA-299	...	K02803	...	> 1	1	2
28	Carbon steel	Wld. pipe	SA-671	CK75	K02803	...	> 1	1	2
29	Carbon steel	Wld. pipe	SA-672	N75	K02803	...	> 1	1	2
30	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...	> 1	1	2
31	Carbon steel	Plate	SA-299	...	K02803	...	≤ 1	1	2
32	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...	≤ 1	1	2
33	Carbon steel	Forgings	SA-372	B	K04001	...	...	1	2
34	Carbon steel	Sheet	SA-414	G	K03103	...	...	1	2
35	Carbon steel	Plate	SA-738	A	K12447	...	...	1	2
36	Carbon steel	Plate	SA-537	...	K12437	3	$2\frac{1}{2} < t \le 4$	1	3

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	70	40	1000	700	1000	CS-3	G10, S1, T1
2	70	40	1000	NP	NP	...	G10, S1, T1, W13
3	70	40	1000	NP	NP	...	G4, G10, S1, T4
4	70	40	1000	NP	NP	...	G3, G10, S1, T2
5	70	40	1000	NP	1000	CS-3	G10, S1, T1
6	70	40	1000	700	1000	CS-3	G1, G10, G17, G18, S1, T1
7	70	40	800	700	800	CS-3	G10, G18, T1
8	70	40	NP	700	NP	...	G17, T1
9	70	40	NP	700	NP	...	...
10	70	40	NP	NP	700	CS-3	G21, G23, W11
11	70	40	NP	NP	800	CS-3	G10, T1
12	70	40	NP	NP	1000	CS-3	G24, G35, T2, W6
13	70	40	1000	700	NP	...	G1, G10, G17, G18, S1, T1
14	70	40	NP	700	800	CS-3	G10, T1
15	70	40	NP	700	NP	...	T1
16	70	42	NP	NP	900	CS-3	G10, G35, T1
17	70	43	NP	NP	700	CS-3	T1
18	70	46	NP	700	700	CS-4	G21, G23, T1, W11
19	70	46	NP	650	650	CS-4	G21, G23, W11
20	70	50	NP	700	650	CS-4	G23, T1
21	70	50	NP	700	NP	...	S6, T1, W10, W12
22	70	50	NP	700	NP	...	S6, T1, W10, W12
23	70	50	NP	700	NP	CS-4	S6, T1, W10, W12
24	73	37	NP	400 (Cl. 3 only)	650	CS-2	...
25	75	37.5	1000	700	1000	CS-2	G10, G18, S1, T2, W2, W8, W11
26	75	38	NP	400 (Cl. 3 only)	650	CS-2	...
27	75	40	1000	700	1000	CS-3	G10, S1, T2
28	75	40	NP	700	NP	...	S6, W10, W12
29	75	40	NP	700	NP	...	S6, W10, W12
30	75	40	NP	700	NP	...	S6, W10, W12
31	75	42	1000	700	1000	CS-3	G10, S1, T1
32	75	42	NP	700	NP	...	T1, W10, W12
33	75	45	NP	NP	650	CS-3	W2, W11
34	75	45	NP	NP	900	CS-3	G10, G35, T1
35	75	45	NP	NP	700	CS-4	T1
36	75	50	NP	NP	700	CS-3	G23, T1, W11

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
2	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
3	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	9.3	*5.7*
4	17.0	...	17.0	...	17.0	17.0	17.0	17.0	16.8	15.5	*12.6*	*10.2*	*7.9*	*5.7*
5	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
6	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
7	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	...	...
8	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	...	...	...	...
9	20.0	...	19.9	...	18.8	18.1	17.9	17.9	17.9	17.9	...	...	...	...
10	20.0	20.0	20.0	...	19.7	19.5	18.9	18.0	17.6	17.2	...	...	...	...
11	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	...	...
12	17.0	17.0	17.0	...	17.0	17.0	17.0	17.0	16.8	15.5	*12.6*	*10.2*	*7.9*	*5.7*
13	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
14	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	...	...
15	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	...	...	...	...
16	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
17	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	*18.3*	...	...	...	...
18	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
19	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	...	...	...	...	...
20	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
21	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
22	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
23	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
24	20.9	20.9	20.9	...	20.9	20.9	20.1	18.9	18.3	...	...	...	...	...
25	21.4	21.4	21.4	...	21.4	21.4	20.4	19.2	18.5	17.9	*15.7*	*12.6*	*9.3*	*6.7*
26	21.4	21.4	21.4	...	21.4	21.4	20.6	19.4	18.8	...	...	...	...	...
27	21.4	21.4	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	*15.7*	*12.6*	*9.3*	*6.7*
28	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
29	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
30	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
31	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	20.8	*19.6*	*15.7*	*12.6*	*9.3*	*6.7*
32	21.4	...	21.4	...	21.4	21.4	21.4	21.4	20.8	*19.6*	...	...	...	...
33	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	...	...	...	...	...
34	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	21.4	*19.6*	*15.7*	*12.6*	*9.3*	*6.7*
35	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	*19.6*	...	...	...	...
36	21.4	...	21.4	...	21.1	20.9	20.9	20.9	20.9	*18.3*	...	...	...	...
37	21.4	...	21.4	...	21.1	20.9	20.9	20.9	20.9	*19.6*	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
2	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
3	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
4	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
5	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
13	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	1Cr–½Mo	Plate	SA-387	12	K11757	1	...	4	1
2	1Cr–½Mo	Wld. pipe	SA-691	1CR	K11757	...	...	4	1
3	1Cr–½Mo	Cast pipe	SA-426	CP12	J11562	...	...	4	1
4	1Cr–½Mo	Forgings	SA-182	F12	K11562	1	...	4	1
5	1Cr–½Mo	Smls. tube	SA-213	T12	K11562	...	...	4	1
6	1Cr–½Mo	Smls. & wld. fittings	SA-234	WP12	K12062	1	...	4	1
7	1Cr–½Mo	Smls. pipe	SA-335	P12	K11562	...	...	4	1
8	1Cr–½Mo	Forged pipe	SA-369	FP12	K11562	...	...	4	1
9	1Cr–½Mo	Plate	SA-387	12	K11757	2	...	4	1
10	1Cr–½Mo	Wld. pipe	SA-691	1CR	K11757	...	...	4	1
11	1Cr–½Mo	Forgings	SA-182	F12	K11564	2	...	4	1
12	1Cr–½Mo	Forgings	SA-336	F12	K11564	...	...	4	1
13	1Cr–V	Smls. tube	SA-213	T17	K12047	...	...	10B	1
14	1¼Cr–½Mo	Castings	SA-217	WC6	J12072	...	...	4	1
15	1¼Cr–½Mo	Cast pipe	SA-426	CP11	J12072	...	...	4	1
16	1¼Cr–½Mo	Bar	SA-739	B11	K11797	...	...	4	1
17	1¼Cr–½Mo–Si	Smls. tube	SA-199	T11	K11597	...	...	4	1
18	1¼Cr–½Mo–Si	Forgings	SA-182	F11	K11597	1	...	4	1
19	1¼Cr–½Mo–Si	Smls. tube	SA-213	T11	K11597	...	...	4	1
20	1¼Cr–½Mo–Si	Smls. & wld. fittings	SA-234	WP11	...	1	...	4	1
21	1¼Cr–½Mo–Si	Smls. pipe	SA-335	P11	K11597	...	...	4	1
22	1¼Cr–½Mo–Si	Forgings	SA-336	F11	K11597	1	...	4	1
23	1¼Cr–½Mo–Si	Forged pipe	SA-369	FP11	K11597	...	...	4	1
24	1¼Cr–½Mo–Si	Plate	SA-387	11	K11789	1	...	4	1
25	1¼Cr–½Mo–Si	Wld. pipe	SA-691	1¼CR	K11789	...	...	4	1
26	1¼Cr–½Mo–Si	Wld. pipe	SA-691	1¼CR	K11789	...	...	4	1
27	1¼Cr–½Mo–Si	Forgings	SA-182	F11	K11572	2	...	4	1
28	1¼Cr–½Mo–Si	Forgings	SA-336	F11	K11572	2	...	4	1
29	1¼Cr–½Mo–Si	Forgings	SA-336	F11	K11572	3	...	4	1
30	1¼Cr–½Mo–Si	Plate	SA-387	11	K11789	2	...	4	1
31	1¼Cr–½Mo–Si	Wld. pipe	SA-691	1¼CR	K11789	...	...	4	1
32	1¾Cr–½Mo–Cu	Forgings	SA-592	E	K11695	...	$2\frac{1}{2} < t \leq 4$	11B	2
33	1¾Cr–½Mo–Cu	Forgings	SA-592	E	K11695	...	$\leq 2\frac{1}{2}$	11B	2
34	1¾Cr–½Mo–Ti	Plate	SA-517	E	K21604	...	$2\frac{1}{2} < t \leq 6$	11B	2
35	1¾Cr–½Mo–Ti	Plate	SA-517	E	K21604	...	$\leq 2\frac{1}{2}$	11B	2
36	2¼Cr–1Mo	Tube	SA-199	T22	K21590	...	...	5A	1
37	2¼Cr–1Mo	Forgings	SA-182	F22	K21590	1	...	5A	1
38	2¼Cr–1Mo	Smls. tube	SA-213	T22	K21590			5A	1

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	55	33	1200	700	1200	CS-2	S4, T5
2	55	33	NP	700	NP	...	G26, W10, W12
3	60	30	NP	700	NP	...	G17
4	60	32	1200	NP	1200	CS-2	T5
5	60	32	1200	700	1200	CS-2	S4, T5
6	60	32	1200	700	1200	CS-2	G18, S4, T5
7	60	32	1200	700	1200	CS-2	S4, T5
8	60	32	1200	700	1200	CS-2	S4, T5
9	65	40	1200	700	1200	CS-3	S4, T5
10	65	40	NP	700	NP	...	G26, W10, W12
11	70	40	1200	700	1200	CS-3	G18, S4, T4
12	70	40	1200	700	1200	CS-3	G18, S4, T4
13	60	30	NP	NP	650	CS-2	...
14	70	40	1100	700	1100	CS-3	G1, G17, G18, T4
15	70	40	NP	700	NP	...	G17
16	70	45	NP	700	1200	CS-3	T4
17	60	25	NP	NP	1200	CS-1	T5
18	60	30	1200	NP	1200	CS-2	G18, S4, T5
19	60	30	1200	700	1200	CS-2	S4, T5
20	60	30	1200	700	1200	CS-2	G18, S4, T5
21	60	30	1200	700	1200	CS-2	S4, T5
22	60	30	1200	NP	NP	...	G18, S4, T5
23	60	30	1200	700	1200	CS-2	S4, T5
24	60	35	1200	700	1200	CS-2	S4, T4
25	60	35	NP	300 (Cl. 3 only)	NP	CS-2	G27, W10, W12
26	60	35	NP	700	NP	CS-2	G26, W10, W12
27	70	40	1200	700	1200	CS-3	G18, S4, T4
28	70	40	1200	NP	1200	CS-2	G18, S4, T4
29	75	45	NP	NP	1200	CS-2	T3
30	75	45	1200	700	1200	CS-3	S4, T3
31	75	45	NP	700	NP	CS-3	G26, W10, W12
32	105	90	NP	650 (SPT)	650	CS-3	S7
33	115	100	NP	NP	650	HT-1	...
34	105	90	NP	700 (SPT)	650	CS-3	...
35	115	100	NP	650 (SPT)	650	HT-1	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	15.7	...	15.4	...	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	14.7
2	15.7	...	15.4	...	15.1	15.1	15.1	15.1	15.1	15.1	...	...	...	...
3	17.1	...	16.8	...	16.5	16.2	15.7	15.2	15.0	14.8	...	...	...	...
4	17.1	17.1	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
5	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
6	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
7	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
8	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
9	18.6	18.6	18.2	...	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.4
10	18.6	...	18.2	...	17.9	17.9	17.9	17.9	17.9	17.9	...	...	...	...
11	20.0	...	19.6	...	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.1	18.6	*18.0*
12	20.0	20.0	19.6	...	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.1	18.6	*18.0*
13	17.1	17.1	17.1	...	17.1	16.8	16.2	15.7	15.4	...	...	...	...	...
14	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	*13.7*
15	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...
16	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.4	*13.7*
17	16.7	...	15.4	...	14.6	14.0	13.5	13.1	12.8	12.6	12.3	12.0	11.7	11.3
18	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
19	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
20	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
21	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
22	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
23	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
24	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	17.1	17.1	16.8	16.4	*13.7*
25	17.1	...	17.1	...	17.1	...	...	...	...	...	...	...	...	...
26	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...
27	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	*13.7*
28	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	*13.7*
29	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	*20.2*	*13.7*
30	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	*20.2*	*13.7*
31	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	...	...	...	...
32	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	...	...	...	...	...
33	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.9	...	...	...	...	...
34	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	...	...	...	...
35	32.9	...	32.9	32.9	32.9	32.9	32.9	32.9	32.9	...	...	...	...	...
36	16.7	15.9	15.6	...	15.1	15.0	15.0	15.0	15.0	15.0	14.9	14.8	14.5	*13.6*
37	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	*13.6*

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
5	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
6	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
7	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
8	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
9	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
12	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	9.3	6.3	4.2	2.8	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
17	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
18	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
19	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
20	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
21	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
22	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
23	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
24	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
28	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
29	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
30	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	16Cr–12Ni–2Mo	Forgings	SA-182	F316H	S31609	...	> 5	8	1
2	16Cr–12Ni–2Mo	Forgings	SA-182	F316H	S31609	...	> 5	8	1
3	16Cr–12Ni–2Mo	Forgings	SA-336	F316H	S31609	...	...	8	1
4	16Cr–12Ni–2Mo	Forgings	SA-336	F316H	S31609	...	...	8	1
5	16Cr–12Ni–2Mo	Forged pipe	SA-430	FP316H	S31609	...	...	8	1
6	16Cr–12Ni–2Mo	Forged pipe	SA-430	FP316H	S31609	...	...	8	1
7	16Cr–12Ni–2Mo	Forgings	SA-182	F316	S31600	...	≤ 5	8	1
8	16Cr–12Ni–2Mo	Forgings	SA-182	F316	S31600	...	≤ 5	8	1
9	16Cr–12Ni–2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
10	16Cr–12Ni–2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
11	16Cr–12Ni–2Mo	Plate	SA-240	316	S31600	...	...	8	1
12	16Cr–12Ni–2Mo	Plate	SA-240	316	S31600	...	...	8	1
13	16Cr–12Ni–2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
14	16Cr–12Ni–2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
15	16Cr–12Ni–2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
16	16Cr–12Ni–2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
17	16Cr–12Ni–2Mo	Smls. & wld. pipe	SA-312	TP316	S31600	...	...	8	1
18	16Cr–12Ni–2Mo	Smls. & wld. pipe	SA-312	TP316	S31600	...	...	8	1
19	16Cr–12Ni–2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
20	16Cr–12Ni–2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
21	16Cr–12Ni–2Mo	Wld. pipe	SA-358	316	S31600	1	...	8	1
22	16Cr–12Ni–2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	8	1
23	16Cr–12Ni–2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	8	1
24	16Cr–12Ni–2Mo	Smls. & wld. fittings	SA-403	316	S31600	...	...	8	1
25	16Cr–12Ni–2Mo	Wld. pipe	SA-409	TP316	S31600	...	...	8	1
26	16Cr–12Ni–2Mo	Bar	SA-479	316	S31600	...	...	8	1
27	16Cr–12Ni–2Mo	Bar	SA-479	316	S31600	...	...	8	1
28	16Cr–12Ni–2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
29	16Cr–12Ni–2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
30	16Cr–12Ni–2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
31	16Cr–12Ni–2Mo	Wld. pipe	SA-813	TP316	S31600	...	...	8	1
32	16Cr–12Ni–2Mo	Wld. pipe	SA-814	TP316	S31600	...	...	8	1
33	16Cr–12Ni–2Mo	Forgings	SA-182	F316H	S31609	...	≤ 5	8	1

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	70	30	1500	800	1500	HA-2	G5, G12, G18, T8
2	70	30	1500	NP	1500	HA-2	G18, T9
3	70	30	NP	800	1500	HA-2	G5, T8
4	70	30	NP	NP	1500	HA-2	T9
5	70	30	1500	800	1500	HA-2	G5, G18, H1, T8
6	70	30	1500	NP	1500	HA-2	G18, H1, T9
7	75	30	1500	800	1500	HA-2	G5, G12, G18, T8
8	75	30	1500	NP	1500	HA-2	G12, G18, T9
9	75	30	1500	800	1500	HA-2	G5, G12, G18, T8
10	75	30	1500	NP	1500	HA-2	G12, G18, T9
11	75	30	1500	800	1500	HA-2	G5, G12, G18, T8
12	75	30	1500	NP	1500	HA-2	G12, G18, T9
13	75	30	1500	NP	NP	...	G12, G18, T9, W13
14	75	30	1500	800	NP	HA-2	G5, G12, G18, T8, W12, W13
15	75	30	1500	NP	1500	HA-2	G3, G5, G12, G18, G24, T7
16	75	30	1500	NP	1500	HA-2	G3, G12, G18, G24, T9
17	75	30	1500	800	1500	HA-2	G5, G12, G18, T8, W12, W13
18	75	30	1500	NP	1500	HA-2	G12, G18, T9, W13
19	75	30	1500	NP	1500	HA-2	G3, G5, G12, G18, G24, T7
20	75	30	1500	NP	1500	HA-2	G3, G12, G18, G24, T9
21	75	30	NP	800	NP	HA-2	G5, W12
22	75	30	1500	800	1500	HA-2	G5, G12, G18, H1, T8, W12
23	75	30	1500	NP	1500	HA-2	G12, G18, H1, T9
24	75	30	NP	800	1500	HA-2	G5, G12, T8, W12, W14
25	75	30	NP	800	NP	HA-2	G5, W12
26	75	30	1500	800	1500	HA-2	G5, G12, G18, G22, H1, T8
27	75	30	1500	NP	1500	HA-2	G12, G18, G22, H1, T9
28	75	30	NP	800	NP	...	G5, W12
29	75	30	NP	NP	1500	HA-2	G5, G12, G24, T7
30	75	30	NP	NP	1500	HA-2	G12, G24, T9
31	75	30	NP	800	NP	HA-2	G5, W12
32	75	30	NP	800	NP	HA-2	G5, W12
33	75	30	1500	800	1500	HA-2	G5, G18, T8

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
2	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
3	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
4	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
5	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
6	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
7	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
8	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
9	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
10	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
11	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
12	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
13	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
14	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
15	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
16	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
17	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
18	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
19	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
20	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
21	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
22	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
23	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
24	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
25	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
26	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
27	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
28	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
29	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
30	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
31	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
32	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
33	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
34	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
2	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
3	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
4	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
5	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
6	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
7	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
8	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
9	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
10	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
11	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
12	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
13	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
14	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
15	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
16	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
17	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
18	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
19	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
20	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
23	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
24	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
27	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
30	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...

LAMPIRAN A

PROPERTIS BAHAN BAKAR

No	Tipe Bahan Bakar	Parameter Analisis Proximate (%)				Parameter Analisa Ultimate (%)					Nilai Kalori (kcal/kg)	Nilai Kalori (Kj/kg)
		IM	A	VM	FC	C	H	O	S	N		
1	Jerami Padi	8.17	22.51	54.68	14.64	32.6	4.59	39.55	0.13	0.62	3131	13108.87
2	Sekam Padi	8.01	24.74	53.24	14.01	32.85	4.79	37.17	0.06	0.39	3226	13506.62
3	Kertas	5.95	8.74	74.5	10.81	39.38	5.62	46.04	0.07	0.15	3714	15549.78
4	Kotoran Sapi	8.92	20.97	55.5	14.61	36.47	5.8	34.65	0.23	1.88	3781	15830.29
5	Sampah Organik Pasar	5.45	9.39	69.29	15.87	41.12	6.77	40.66	0.3	1.76	3865	16181.98
6	Rumput Liar Ilalang	9.23	6.48	67.23	17.06	44.37	6.65	41.59	0.18	0.73	3923	16424.82
7	Sabut Kelapa	14.84	4.03	57.48	23.65	45.08	5.77	44.63	0.18	0.31	3933	16466.68
8	Bagas Tebu	9.37	3.08	74.23	13.32	41.7	6.19	42.68	0.16	6.19	4138	17324.98
9	Bambu	8.89	2.71	72.34	16.06	46.73	6	43.92	0.15	0.49	4186	17525.94
10	Kayu	11.03	1.54	72.55	14.88	42.97	6.47	48.76	0.09	0.17	4198	17576.19
11	Batok Kelapa	10.39	0.53	70.77	18.31	46.52	6.78	45.96	0.1	0.11	4419	18501.47
12	Kulit Sawit	10.35	2.14	69.32	18.19	49.96	6.36	41.07	0.07	0.4	4587	19204.85
13	Kulit Buah Jarak	5.87	4.88	65.85	23.4	46.62	5.88	41.3	0.07	1.25	4658	19502.11
14	Bungkil Buah Jarak	5.04	7.45	75.66	11.85	47.32	6.79	33.04	0.23	5.17	5211	21817.41
15	Plastik	0.89	0.28	92.9	5.93	-	-	-	-	-	5551	23240.93
16	Batubara Peringkat Rendah	25.99	5.25	34.11	34.65	51.66	6.92	35.15	0.48	0.54	4601	19263.47
17	Briket Batubara Karbonisasi	6.42	15.82	24.64	53.12	65.19	3.87	13.96	0.29	0.87	5891	24664.44
18	Arang Kayu	6.97	5.14	11.64	76.25	80.44	4.5	9.44	0.21	0.27	6889	28842.87
19	**Arang Batok**	**6.32**	**1.85**	**8.93**	**82.9**	**85.65**	**2.37**	**9.87**	**0.02**	**0.21**	**7399**	**30978.13**
20	Kokas Minyak Bumi	0.53	0.85	14.72	83.9	79.74	3.31	10.6	4.47	1.61	8634	36148.83
21	Ban Bekas	0.73	4.04	67.97	27.26	83.8	7.6	3.1	1.4	0.4	9345	39125.65

LAMPIRAN B

SIFAT-SIFAT AIR

Lampiran 4 B. 2. Sifat-sifat air dan uap jenuh pada temperatur tertentu

Note: The following steam tables and Fig. 1 have been abstracted from *ASME Steam Tables: Thermodynamic and Transport Properties of Steam* (copyright 1983 by the American Society of Mechanical Engineers).

Table 1
Properties of Saturated Steam and Saturated Water (Temperature)[1]

Temp F	Press. psia	Volume, ft³/lb			Enthalpy,° Btu/lb			Entropy, Btu/lb F			Temp F
		Water	Evap	Steam	Water	Evap	Steam	Water	Evap	Steam	
		v_f	v_{fg}	v_g	H_f	H_{fg}	H_g	s_f	s_{fg}	s_g	
32	0.08859	0.01602	3305	3305	−0.02	1075.5	1075.5	0.0000	2.1873	2.1873	32
35	0.09991	0.01602	2948	2948	3.00	1073.8	1076.8	0.0061	2.1706	2.1767	35
40	0.12163	0.01602	2446	2446	8.03	1071.0	1079.0	0.0162	2.1432	2.1594	40
45	0.14744	0.01602	2037.7	2037.8	13.04	1068.1	1081.2	0.0262	2.1164	2.1426	45
50	0.17796	0.01602	1704.8	1704.8	18.05	1065.3	1083.4	0.0361	2.0901	2.1262	50
60	0.2561	0.01603	1207.6	1207.6	28.06	1059.7	1087.7	0.0555	2.0391	2.0946	60
70	0.3629	0.01605	868.3	868.4	38.05	1054.0	1092.1	0.0745	1.9900	2.0645	70
80	0.5068	0.01607	633.3	633.3	48.04	1048.4	1096.4	0.0932	1.9426	2.0359	80
90	0.6981	0.01610	468.1	468.1	58.02	1042.7	1100.8	0.1115	1.8970	2.0086	90
100	0.9492	0.01613	350.4	350.4	68.00	1037.1	1105.1	0.1295	1.8530	1.9825	100
110	1.2750	0.01617	265.4	265.4	77.98	1031.4	1109.3	0.1472	1.8105	1.9577	110
120	1.6927	0.01620	203.25	203.26	87.97	1025.6	1113.6	0.1646	1.7693	1.9339	120
130	2.2230	0.01625	157.32	157.33	97.96	1019.8	1117.8	0.1817	1.7295	1.9112	130
140	2.8892	0.01629	122.98	123.00	107.95	1014.0	1122.0	0.1985	1.6910	1.8895	140
150	3.718	0.01634	97.05	97.07	117.95	1008.2	1126.1	0.2150	1.6536	1.8686	150
160	4.741	0.01640	77.27	77.29	127.96	1002.2	1130.2	0.2313	1.6174	1.8487	160
170	5.993	0.01645	62.04	62.06	137.97	996.2	1134.2	0.2473	1.5822	1.8295	170
180	7.511	0.01651	50.21	50.22	148.00	990.2	1138.2	0.2631	1.5480	1.8111	180
190	9.340	0.01657	40.94	40.96	158.04	984.1	1142.1	0.2787	1.5148	1.7934	190
200	11.526	0.01664	33.62	33.64	168.09	977.9	1146.0	0.2940	1.4824	1.7764	200
210	14.123	0.01671	27.80	27.82	178.15	971.6	1149.7	0.3091	1.4509	1.7600	210
212	14.696	0.01672	26.78	26.80	180.17	970.3	1150.5	0.3121	1.4447	1.7568	212
220	17.186	0.01678	23.13	23.15	188.23	965.2	1153.4	0.3241	1.4201	1.7442	220
230	20.779	0.01685	19.364	19.381	198.33	958.7	1157.1	0.3388	1.3902	1.7290	230
240	24.968	0.01693	16.304	16.321	208.45	952.1	1160.6	0.3533	1.3609	1.7142	240
250	29.825	0.01701	13.802	13.819	218.59	945.4	1164.0	0.3677	1.3323	1.7000	250
260	35.427	0.01709	11.745	11.762	228.76	938.6	1167.4	0.3819	1.3043	1.6862	260
270	41.856	0.01718	10.042	10.060	238.95	931.7	1170.6	0.3960	1.2769	1.6729	270
280	49.200	0.01726	8.627	8.644	249.17	924.6	1173.8	0.4098	1.2501	1.6599	280
290	57.550	0.01736	7.443	7.460	259.4	917.4	1176.8	0.4236	1.2238	1.6473	290
300	67.005	0.01745	6.448	6.466	269.7	910.0	1179.7	0.4372	1.1979	1.6351	300
310	77.67	0.01755	5.609	5.626	280.0	902.5	1182.5	0.4506	1.1726	1.6232	310
320	89.64	0.01766	4.896	4.914	290.4	894.8	1185.2	0.4640	1.1477	1.6116	320
340	117.99	0.01787	3.770	3.788	311.3	878.8	1190.1	0.4902	1.0990	1.5892	340
360	153.01	0.01811	2.939	2.957	332.3	862.1	1194.4	0.5161	1.0517	1.5678	360
380	195.73	0.01836	2.317	2.335	353.6	844.5	1198.0	0.5416	1.0057	1.5473	380
400	247.26	0.01864	1.8444	1.8630	375.1	825.9	1201.0	0.5667	0.9607	1.5274	400
420	308.78	0.01894	1.4808	1.4997	396.9	806.2	1203.1	0.5915	0.9165	1.5080	420
440	381.54	0.01926	1.1976	1.2169	419.0	785.4	1204.4	0.6161	0.8729	1.4890	440
460	466.9	0.0196	0.9746	0.9942	441.5	763.2	1204.8	0.6405	0.8299	1.4704	460
480	566.2	0.0200	0.7972	0.8172	464.5	739.6	1204.1	0.6648	0.7871	1.4518	480
500	680.9	0.0204	0.6545	0.6749	487.9	714.3	1202.2	0.6890	0.7443	1.4333	500
520	812.5	0.0209	0.5386	0.5596	512.0	687.0	1199.0	0.7133	0.7013	1.4146	520
540	962.8	0.0215	0.4437	0.4651	536.8	657.5	1194.3	0.7378	0.6577	1.3954	540
560	1133.4	0.0221	0.3651	0.3871	562.4	625.3	1187.7	0.7625	0.6132	1.3757	560
580	1326.2	0.0228	0.2994	0.3222	589.1	589.9	1179.0	0.7876	0.5673	1.3550	580
600	1543.2	0.0236	0.2438	0.2675	617.1	550.6	1167.7	0.8134	0.5196	1.3330	600
620	1786.9	0.0247	0.1962	0.2208	646.9	506.3	1153.2	0.8403	0.4689	1.3092	620
640	2059.9	0.0260	0.1543	0.1802	679.1	454.6	1133.7	0.8686	0.4134	1.2821	640
660	2365.7	0.0277	0.1166	0.1443	714.9	392.1	1107.0	0.8995	0.3502	1.2498	660
680	2708.6	0.0304	0.0808	0.1112	758.5	310.1	1068.5	0.9365	0.2720	1.2086	680
700	3094.3	0.0366	0.0386	0.0752	822.4	172.7	995.2	0.9901	0.1490	1.1390	700
705.5	3208.2	0.0508	0	0.0508	906.0	0	906.0	1.0612	0	1.0612	705.5

Lanjutan B.1

Table 2
Properties of Saturated Steam and Saturated Water (Pressure)[1]

Press. psia	Temp F	Volume, ft³/lb			Enthalpy,[2] Btu/lb			Entropy, Btu/lb F			Energy, Btu/lb		Press. psia
		Water v_f	Evap v_{fg}	Steam v_g	Water H_f	Evap H_{fg}	Steam H_g	Water s_f	Evap s_{fg}	Steam s_g	Water u_f	Steam u_g	
0.0886	32.018	0.01602	3302.4	3302.4	0.00	1075.5	1075.5	0	2.1872	2.1872	0	1021.3	**0.0886**
0.10	35.023	0.01602	2945.5	2945.5	3.03	1073.8	1076.8	0.0061	2.1705	2.1766	3.03	1022.3	**0.10**
0.15	45.453	0.01602	2004.7	2004.7	13.50	1067.9	1081.4	0.0271	2.1140	2.1411	13.50	1025.7	**0.15**
0.20	53.160	0.01603	1526.3	1526.3	21.22	1063.5	1084.7	0.0422	2.0738	2.1160	21.22	1028.3	**0.20**
0.30	64.484	0.01604	1039.7	1039.7	32.54	1057.1	1089.7	0.0641	2.0168	2.0809	32.54	1032.0	**0.30**
0.40	72.869	0.01606	792.0	792.1	40.92	1052.4	1093.3	0.0799	1.9762	2.0562	40.92	1034.7	**0.40**
0.5	79.586	0.01607	641.5	641.5	47.62	1048.6	1096.3	0.0925	1.9446	2.0370	47.62	1036.9	**0.5**
0.6	85.218	0.01609	540.0	540.1	53.25	1045.5	1098.7	0.1028	1.9186	2.0215	53.24	1038.7	**0.6**
0.7	90.09	0.01610	466.93	466.94	58.10	1042.7	1100.8	0.3	1.8966	2.0083	58.10	1040.3	**0.7**
0.8	94.38	0.01611	411.67	411.69	62.39	1040.3	1102.6	0.1117	1.8775	1.9970	62.39	1041.7	**0.8**
0.9	98.24	0.01612	368.41	368.43	66.24	1038.1	1104.3	0.1264	1.8606	1.9870	66.24	1042.9	**0.9**
1.0	101.74	0.01614	333.59	333.60	69.73	1036.1	1105.8	0.1326	1.8455	1.9781	69.73	1044.1	**1.0**
2.0	126.07	0.01623	173.74	173.76	94.03	1022.1	1116.2	0.1750	1.7450	1.9200	94.03	1051.8	**2.0**
3.0	141.47	0.01630	118.71	118.73	109.42	1013.2	1122.6	0.2009	1.6854	1.8864	109.41	1056.7	**3.0**
4.0	152.96	0.01636	90.63	90.64	120.92	1006.4	1127.3	0.2199	1.6428	1.8626	120.90	1060.2	**4.0**
5.0	162.24	0.01641	73.515	73.53	130.20	1000.9	1131.1	0.2349	1.6094	1.8443	130.18	1063.1	**5.0**
6.0	170.05	0.01645	61.967	61.98	138.03	996.2	1134.2	0.2474	1.5820	1.8294	138.01	1065.4	**6.0**
7.0	176.84	0.01649	53.634	53.65	144.83	992.1	1136.9	0.2581	1.5587	1.8168	144.81	1067.4	**7.0**
8.0	182.86	0.01653	47.328	47.35	150.87	988.5	1139.3	0.2676	1.5384	1.8060	150.84	1069.2	**8.0**
9.0	188.27	0.01656	42.385	42.40	156.30	985.1	1141.4	0.2760	1.5204	1.7964	156.28	1070.8	**9.0**
10	193.21	0.01659	38.404	38.42	161.26	982.1	1143.3	0.2836	1.5043	1.7879	161.23	1072.3	**10**
14.696	212.00	0.01672	26.782	26.80	180.17	970.3	1150.5	0.3121	1.4447	1.7568	180.12	1077.6	**14.696**
15	213.03	0.01673	26.274	26.29	181.21	969.7	1150.9	0.3137	1.4415	1.7552	181.16	1077.9	**15**
20	227.96	0.01683	20.070	20.087	196.27	960.1	1156.3	0.3358	1.3962	1.7320	196.21	1082.0	**20**
30	250.34	0.01701	13.7266	13.744	218.9	945.2	1164.1	0.3682	1.3313	1.6995	218.8	1087.9	**30**

40	267.25	0.01715	10.4794	10.497	236.1	933.6	1169.8	0.3921	1.2844	1.6765	236.0	1092.1	40
50	281.02	0.01727	8.4967	8.514	250.2	923.9	1174.1	0.4112	1.2474	1.6586	250.1	1095.3	50
60	292.71	0.01738	7.1562	7.174	262.2	915.4	1177.6	0.4273	1.2167	1.6440	262.0	1098.0	60
70	302.93	0.01748	6.1875	6.205	272.7	907.8	1180.6	0.4411	1.1905	1.6316	272.5	1100.2	70
80	312.04	0.01757	5.4536	5.471	282.1	900.9	1183.1	0.4534	1.1675	1.6208	281.9	1102.1	80
90	320.28	0.01766	4.8777	4.895	290.7	894.6	1185.3	0.4643	1.1470	1.6113	290.4	1103.7	90
100	327.82	0.01774	4.4133	4.431	298.5	888.6	1187.2	0.4743	1.1284	1.6027	298.2	1105.2	100
120	341.27	0.01789	3.7097	3.728	312.6	877.8	1190.4	0.4919	1.0960	1.5879	312.2	1107.6	120
140	353.04	0.01803	3.2010	3.219	325.0	868.0	1193.0	0.5071	1.0681	1.5752	324.5	1109.6	140
160	363.55	0.01815	2.8155	2.834	336.1	859.0	1195.1	0.5206	1.0435	1.5641	335.5	1111.2	160
180	373.08	0.01827	2.5129	2.531	346.2	850.7	1196.9	0.5328	1.0215	1.5543	345.6	1112.5	180
200	381.80	0.01839	2.2689	2.287	355.5	842.8	1198.3	0.5438	1.0016	1.5454	354.8	1113.7	200
250	400.97	0.01865	1.8245	1.8432	376.1	825.0	1201.1	0.5679	0.9585	1.5264	375.3	1115.8	250
300	417.35	0.01889	1.5238	1.5427	394.0	808.9	1202.9	0.5882	0.9223	1.5105	392.9	1117.2	300
350	431.73	0.01913	1.3064	1.3255	409.8	794.2	1204.0	0.6059	0.8909	1.4968	408.6	1118.1	350
400	444.60	0.0193	1.14162	1.1610	424.2	780.4	1204.6	0.6217	0.8630	1.4847	422.7	1118.7	400
450	456.28	0.0195	1.01224	1.0318	437.3	767.5	1204.8	0.6360	0.8378	1.4738	435.7	1118.9	450
500	467.01	0.0198	0.90787	0.9276	449.5	755.1	1204.7	0.6490	0.8148	1.4639	447.7	1118.8	500
550	476.94	0.0199	0.82183	0.8418	460.9	743.3	1204.3	0.6611	0.7936	1.4547	458.9	1118.6	550
600	486.20	0.0201	0.74962	0.7698	471.7	732.0	1203.7	0.6723	0.7738	1.4461	469.5	1118.2	600
700	503.08	0.0205	0.63505	0.6556	491.6	710.2	1201.8	0.6928	0.7377	1.4304	488.9	1116.9	700
800	518.21	0.0209	0.54809	0.5690	509.8	689.6	1199.4	0.7111	0.7051	1.4163	506.7	1115.2	800
900	531.95	0.0212	0.47968	0.5009	526.7	669.7	1196.4	0.7279	0.6753	1.4032	523.2	1113.0	900
1000	544.58	0.0216	0.42436	0.4460	542.6	650.4	1192.9	0.7434	0.6476	1.3910	538.6	1110.4	1000
1100	556.28	0.0220	0.37863	0.4006	557.5	631.5	1189.1	0.7578	0.6216	1.3794	553.1	1107.5	1100
1200	567.19	0.0223	0.34013	0.3625	571.9	613.0	1184.8	0.7714	0.5969	1.3683	566.9	1104.3	1200
1300	577.42	0.0227	0.30722	0.3299	585.6	594.6	1180.2	0.7843	0.5733	1.3577	580.1	1100.9	1300
1400	587.07	0.0231	0.27871	0.3018	598.8	576.5	1175.3	0.7966	0.5507	1.3474	592.9	1097.1	1400
1500	596.20	0.0235	0.25372	0.2772	611.7	558.4	1170.1	0.8085	0.5288	1.3373	605.2	1093.1	1500
2000	635.80	0.0257	0.16266	0.1883	672.1	466.2	1138.3	0.8625	0.4256	1.2881	662.6	1068.6	2000
2500	668.11	0.0286	0.10209	0.1307	731.7	361.6	1093.3	0.9139	0.3206	1.2345	718.5	1032.9	2500
3000	695.33	0.0343	0.05073	0.0850	801.8	218.4	1020.3	0.9728	0.1891	1.1619	782.8	973.1	3000
3208.2	705.47	0.0508	0	0.0508	906.0	0	906.0	1.0612	0	1.0612	875.9	875.9	3208.2

1. See Note 1, Table 1.
2. See Note 2, Table 1.

LAMPIRAN C

PEMILIHAN BAHAN

Table 1 Dimensions and Weights of Welded and Seamless Wrought Steel Pipe

	Customary Units			Identification [Standard (STD), Extra-Strong (XS), or Double Extra Strong (XXS)]			SI Units		
NPS [Note (1)]	Outside Diameter, in.	Wall Thickness, in.	Plain End Weight, lb/ft		Schedule No.	DN [Note (2)]	Outside Diameter, mm	Wall Thickness, mm	Plain End Mass, kg/m
1/8	0.405	0.049	0.19	...	10	6 (3)	10.3	1.24	0.28
1/8	0.405	0.057	0.21	...	30	6 (3)	10.3	1.45	0.32
1/8	0.405	0.068	0.24	STD	40	6 (3)	10.3	1.73	0.37
1/8	0.405	0.095	0.31	XS	80	6 (3)	10.3	2.41	0.47
1/4	0.540	0.065	0.33	...	10	8 (3)	13.7	1.65	0.49
1/4	0.540	0.073	0.36	...	30	8 (3)	13.7	1.85	0.54
1/4	0.540	0.088	0.43	STD	40	8 (3)	13.7	2.24	0.63
1/4	0.540	0.119	0.54	XS	80	8 (3)	13.7	3.02	0.80
3/8	0.675	0.065	0.42	...	10	10	17.1	1.65	0.63
3/8	0.675	0.073	0.47	...	30	10	17.1	1.85	0.70
3/8	0.675	0.091	0.57	STD	40	10	17.1	2.31	0.84
3/8	0.675	0.126	0.74	XS	80	10	17.1	3.20	1.10
1/2	0.840	0.065	0.54	...	5	15	21.3	1.65	0.80
1/2	0.840	0.083	0.67	...	10	15	21.3	2.11	1.00
1/2	0.840	0.095	0.76	...	30	15	21.3	2.41	1.12
1/2	0.840	0.109	0.85	STD	40	15	21.3	2.77	1.27
1/2	0.840	0.147	1.09	XS	80	15	21.3	3.73	1.62
1/2	0.840	0.188	1.31	...	160	15	21.3	4.78	1.95
1/2	0.840	0.294	1.72	XXS	...	15	21.3	7.47	2.55

Lampiran C.2 Tegangan maksimum yang diijinkan untuk berbagai bahan.

TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Sheet	SA-620	...	K00040	...	...	1	1
2	Carbon steel	Bar	SA-675	45	...	...	...	1	1
3	Carbon steel	Wld. pipe	SA-134	A283A	...	...	...	1	1
4	Carbon steel	Plate	SA-283	A	...	...	...	1	1
5	Carbon steel	Plate	SA-285	A	K01700	...	...	1	1
6	Carbon steel	Plate	SA-285	A	K01700	...	...	1	1
7	Carbon steel	Wld. pipe	SA-672	A45	K01700	...	...	1	1
8	Carbon steel	Sheet	SA-414	A	K01501	...	...	1	1
9	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1	1
10	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1	1
11	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1	1
12	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1	1
13	Carbon steel	Smls. tube	SA-179	...	K01200	...	...	1	1
14	Carbon steel	Smls. tube	SA-192	...	K01201	...	...	1	1
15	Carbon steel	Smls. tube	SA-192	...	K01201	...	...	1	1
16	Carbon steel	Wld. tube	SA-214	...	K01807	...	...	1	1
17	Carbon steel	Wld. tube	SA-226	...	K01201	...	...	1	1
18	Carbon steel	Wld. tube	SA-226	...	K01201	...	...	1	1
19	Carbon steel	Wld. tube	SA-226	...	K01201	...	...	1	1
20	Carbon steel	Wld. tube	SA-226	...	K01201	...	...	1	1
21	Carbon steel	Smls. tube	SA-556	A2	K01807	...	...	1	1
22	Carbon steel	Wld. tube	SA-557	A2	K01807	...	...	1	1
23	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1	1
24	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1	1
25	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1	1
26	Carbon steel	Wld. pipe	SA-53	F	...	...	...	1	1
27	Carbon steel	Smls. pipe	SA-53	S/A	K02504	...	...	1	1
28	Carbon steel	Smls. pipe	SA-53	S/A	K02504	...	...	1	1
29	Carbon steel	Smls. pipe	SA-106	A	K02501	...	...	1	1
30	Carbon steel	Smls. pipe	SA-106	A	K02501	...	...	1	1
31	Carbon steel	Wld. pipe	SA-135	A	...	...	...	1	1
32	Carbon steel	Forged pipe	SA-369	FPA	K02501	...	...	1	1
33	Carbon steel	Wld. pipe	SA-587	...	K11500	...	...	1	1
34	Carbon steel	Wld. pipe	SA-587	...	K11500	...	...	1	1

Lanjutan C.2

TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	40	20	NP	NP	650	CS-6	...
2	45	22.5	NP	650 (Cl. 3 only)	900	CS-6	G10, G22, G35, T2
3	45	24	NP	300 (Cl. 3 only)	NP	CS-1	G37, W12
4	45	24	NP	300 (Cl. 3 only)	650	CS-1	G34, G37
5	45	24	900	NP	NP	CS-1	G10, T2
6	45	24	NP	700	900	CS-1	G10, G35, T2
7	45	24	NP	700	NP	CS-1	S6, W10, W12
8	45	25	NP	NP	900	CS-1	G10, G35, T2
9	47	26	1000	NP	NP	CS-1	G10, S1, T2, W13
10	47	26	1000	NP	NP	CS-1	G4, G10, S1, T2
11	47	26	1000	NP	NP	...	G3, G10, S1, T2
12	47	26	NP	NP	1000	CS-1	G24, G35, T2, W6
13	47	26	NP	NP	900	CS-1	G10, G35, T2
14	47	26	1000	NP	NP	CS-1	G10, S1, T2
15	47	26	NP	NP	1000	CS-1	G10, T2
16	47	26	NP	NP	1000	CS-1	G24, G35, T2, W6
17	47	26	1000	NP	NP	CS-1	G10, S1, T2, W13
18	47	26	1000	NP	NP	CS-1	G4, G10, S1, T2
19	47	26	1000	NP	NP	CS-1	G3, G10, S1, T2
20	47	26	NP	NP	1000	CS-1	G24, G35, T2, W6
21	47	26	NP	NP	1000	CS-1	G10, T2
22	47	26	NP	NP	1000	CS-1	G24, G35, T2, W6
23	48	30	900	NP	NP	CS-2	G3, G10, S1, T2
24	48	30	900	300 (Cl. 3 only)	NP	CS-2	G10, S1, T2, W12, W13
25	48	30	NP	NP	900	CS-2	G24, G35, T2, W6
26	48	30	750	NP	NP	...	G2, G10, G18, T2
27	48	30	900	300 (Cl. 3 only)	NP	CS-2	G10, S1, T2
28	48	30	NP	700 (SPT)	900	CS-2	G10, G35, T2
29	48	30	1000	700	NP	CS-2	G10, S1, T2
30	48	30	NP	NP	1000	CS-2	G10, T1
31	48	30	NP	NP	900	CS-2	G24, G35, T2, W6
32	48	30	1000	NP	NP	CS-2	G10, S1, T1
33	48	30	NP	300 (Cl. 3 only)	NP	CS-2	G37
34	48	30	NP	NP	850	CS-2	G24, T2, W6

Lanjutan C.2

TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	11.4	11.4	11.4	...	11.4	11.4	10.9	10.2	9.9	...	...	...	...	...
2	12.9	12.9	12.9	...	12.9	12.8	12.2	11.5	11.1	10.7	10.4	9.0	7.8	5.0
3	12.9	...	12.9	...	12.9	...	...	...	...	...	...	...	...	...
4	12.9	12.9	12.9	...	12.9	12.9	12.9	12.3	11.9	...	...	...	...	...
5	12.9	...	12.9	...	12.9	12.9	12.9	12.3	11.9	11.5	10.7	8.3	6.6	5.0
6	12.9	12.9	12.9	...	12.9	12.9	12.9	12.3	11.9	11.5	10.7	9.0	7.8	6.5
7	12.9	...	12.9	...	12.9	12.9	12.9	12.3	11.9	11.5	...	...	...	...
8	12.9	12.9	12.9	...	12.9	12.9	12.9	12.8	12.4	11.9	10.7	9.0	7.8	6.5
9	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.0	7.1	5.0
10	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.0	7.1	4.3
11	11.4	...	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.7	6.1	4.3
12	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.8	6.7	5.5
13	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.2	7.9	6.5
14	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.0	7.1	5.0
15	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.2	7.9	6.5
16	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.8	6.7	5.5
17	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.0	7.1	5.0
18	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.0	7.1	4.3
19	11.4	...	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.7	6.1	4.3
20	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.8	6.7	5.5
21	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.2	7.9	6.5
22	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.8	6.7	4.3
23	11.7	...	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	9.1	7.7	6.1	4.3
24	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.0	7.1	5.0
25	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	9.1	7.9	6.7	5.5
26	8.2	...	8.2	...	8.2	8.2	8.2	8.2	8.2	7.5	6.4	...	...	...
27	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.0	7.1	5.0
28	13.7	13.7	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.3	7.9	6.5
29	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.0	7.1	5.0
30	13.7	13.7	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.3	7.9	6.5
31	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	9.1	7.9	6.7	5.5
32	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.0	7.1	5.0
33	13.7	...	13.7	...	13.7	...	...	...	...	...	...	...	...	...
34	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	9.1	7.9	6.7	...
35	14.3	...	14.3	...	14.3	14.2	13.6	12.8	12.4	11.9	10.7	9.4	7.3	...

Lanjutan C.2

TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	3.0	1.5	...	...	...	...	...	...	...	...	...	...	...	...	...
10	2.6	1.3	...	...	...	...	...	...	...	...	...	...	...	...	...
11	2.6	1.3	...	...	...	...	...	...	...	...	...	...	...	...	...
12	3.8	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	3.0	1.5	...	...	...	...	...	...	...	...	...	...	...	...	...
15	4.5	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
16	3.8	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
17	3.0	1.5	...	...	...	...	...	...	...	...	...	...	...	...	...
18	2.6	1.3	...	...	...	...	...	...	...	...	...	...	...	...	...
19	2.6	1.3	...	...	...	...	...	...	...	...	...	...	...	...	...
20	3.8	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
21	4.5	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
22	2.6	1.3	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	3.0	1.5	...	...	...	...	...	...	...	...	...	...	...	...	...
30	4.5	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	3.0	1.5	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Wld. pipe	SA-134	A283B	...	...	...	1	1
2	Carbon steel	Plate	SA-283	B	...	...	...	1	1
3	Carbon steel	Plate	SA-285	B	K02200	...	...	1	1
4	Carbon steel	Plate	SA-285	B	K02200	...	...	1	1
5	Carbon steel	Wld. pipe	SA-672	A50	K02200	...	...	1	1
6	Carbon steel	Sheet	SA-414	B	K02201	...	...	1	1
7	Carbon steel	Bar	SA-675	55	...	...	...	1	1
8	Carbon steel	Bar	SA-675	55	...	...	...	1	1
9	Carbon steel	Wld. pipe	SA-134	A283C	K02401	...	...	1	1
10	Carbon steel	Plate	SA-283	C	K02401	...	...	1	1
11	Carbon steel	Plate	SA-285	C	K02801	...	...	1	1
12	Carbon steel	Smls. & wld. pipe	SA-333	1	K03008	...	...	1	1
13	Carbon steel	Smls. & wld. tube	SA-334	1	K03008	...	...	1	1
14	Carbon steel	Wld. tube	SA-334	1	K03008	...	...	1	1
15	Carbon steel	Plate	SA-516	55	K01800	...	...	1	1
16	Carbon steel	Smls. pipe	SA-524	II	K02104	...	...	1	1
17	Carbon steel	Wld. pipe	SA-671	CA55	K02801	...	...	1	1
18	Carbon steel	Wld. pipe	SA-671	CE55	K02202	...	...	1	1
19	Carbon steel	Wld. pipe	SA-672	A55	K02801	...	...	1	1
20	Carbon steel	Wld. pipe	SA-672	B55	K02001	...	...	1	1
21	Carbon steel	Wld. pipe	SA-672	C55	K01800	...	...	1	1
22	Carbon steel	Wld. pipe	SA-672	E55	K02202	...	...	1	1
23	Carbon steel	Sheet	SA-414	C	K02503	...	...	1	1
24	Carbon steel	Bar	SA-36	...	K02600	...	...	1	1
25	Carbon steel	Bar	SA-36	...	K02600	...	...	1	1
26	Carbon steel	Plate, sheet	SA-36	...	K02600	...	...	1	1
27	Carbon steel	Plate, sheet	SA-662	A	K01701	...	...	1	1
28	Carbon steel	Forgings	SA-181	...	K03502	60	...	1	1
29	Carbon steel	Castings	SA-216	WCA	J02502	...	...	1	1
30	Carbon steel	Forgings	SA-266	1	K03506	...	...	1	1
31	Carbon steel	Forgings	SA-350	LF1	K03009	1	...	1	1
32	Carbon steel	Castings	SA-352	LCA	J02504	...	...	1	1
33	Carbon steel	Cast pipe	SA-660	WCA	J02504	...	...	1	1

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	50	27	NP	300 (Cl. 3 only)	NP	CS-1	G37, W12
2	50	27	NP	300 (Cl. 3 only)	650	CS-1	G34, G37
3	50	27	900	NP	NP	CS-1	G10, S1, T1
4	50	27	NP	700	900	CS-1	G10, G35, T1
5	50	27	NP	700	NP	CS-1	S6, T1, W10, W12
6	50	30	NP	NP	900	CS-2	G10, G35, T1
7	55	27.5	850	700 (SPT)	900	CS-1	G10, G15, G18, G22, S1, T2
8	55	27.5	NP	650 (Cl. 3 only)	NP	...	...
9	55	30	NP	300 (Cl. 3 only)	NP	CS-2	G37, W12
10	55	30	NP	300 (Cl. 3 only)	650	CS-2	G34, G37
11	55	30	900	700	900	CS-2	G10, G35, S1, T2
12	55	30	NP	700	650	CS-2	W12
13	55	30	NP	700	650	CS-2	W12
14	55	30	NP	NP	650	CS-2	G24, W6
15	55	30	850	700	1000	CS-2	G10, S1, T2
16	55	30	NP	NP	1000	CS-2	G10, T2
17	55	30	NP	700	NP	CS-2	S6, W10, W12
18	55	30	NP	700	NP	CS-2	S6, W10, W12
19	55	30	NP	700	NP	CS-2	S6, W10, W12
20	55	30	NP	700	NP	CS-2	S6, W10, W12
21	55	30	NP	700	NP	CS-2	S6, W10, W12
22	55	30	NP	700	NP	CS-2	S6, W10, W12
23	55	33	NP	700	900	CS-2	G10, G35, T1
24	58	36	650	NP	NP	...	G10, G15, G18
25	58	36	NP	650 (SPT)	900	CS-2	G10, G35, T1
26	58	36	NP	700	650	CS-2	G10, G34, G35, G36, T1
27	58	40	NP	NP	700	CS-3	T1
28	60	30	1000	700	1000	CS-2	G10, G18, G35, S1, T2
29	60	30	1000	700	1000	CS-2	G1, G10, G17, G18, S1, T2
30	60	30	1000	700	1000	CS-2	G10, G18, S1, T2
31	60	30	NP	700	1000	CS-2	G10, T2
32	60	30	NP	700	NP	...	G17
33	60	30	1000	700	NP	CS-2	G1, G10, G17, G18, S1, T2

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	14.3	...	14.3	...	14.3	...	...	...	...	...	...	...	...	...
2	14.3	14.3	14.3	...	14.3	14.3	14.3	13.8	13.3	...	...	...	...	...
3	14.3	...	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	11.0	9.4	7.3	5.0
4	14.3	14.3	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	11.2	9.6	8.1	5.9
5	14.3	...	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	...	...	...	...
6	14.3	14.3	14.3	...	14.3	14.3	14.3	14.3	14.3	12.5	11.2	9.6	8.1	5.9
7	15.7	15.7	15.7	...	15.7	15.7	14.9	14.1	13.6	13.1	12.7	10.8	8.7	5.9
8	15.7	...	15.7	...	15.7	15.7	14.9	14.1	13.6	...	...	...	...	...
9	15.7	...	15.7	...	15.7	...	...	...	...	...	...	...	...	...
10	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	...	...	...	...	...
11	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
12	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
13	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
14	13.4	13.4	13.4	...	13.4	13.4	13.4	13.0	12.6	...	...	...	...	...
15	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
16	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
17	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
18	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
19	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
20	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
21	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
22	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
23	15.7	15.7	15.7	...	15.7	15.7	15.7	15.7	15.7	15.6	13.0	10.8	8.7	5.9
24	15.2	...	15.2	...	15.2	15.2	15.2	15.2	15.2	...	...	...	...	...
25	16.6	16.6	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	13.0	10.8	8.7	5.9
26	16.6	...	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	...	...	...	...
27	16.6	16.6	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	...	...	...	...
28	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
29	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
30	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
31	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
32	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	...	...	...	...
33	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
16	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
29	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
30	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
31	*4.0*	*2.5*	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Castings	SA-352	LCB	J03003	...	...	1	1
2	Carbon steel	Plate	SA-515	65	K02800	...	...	1	1
3	Carbon steel	Plate	SA-516	65	K02403	...	...	1	1
4	Carbon steel	Wld. pipe	SA-671	CB65	K02800	...	...	1	1
5	Carbon steel	Wld. pipe	SA-671	CC65	K02403	...	...	1	1
6	Carbon steel	Wld. pipe	SA-672	B65	K02800	...	...	1	1
7	Carbon steel	Wld. pipe	SA-672	C65	K02403	...	...	1	1
8	Carbon steel	Sheet	SA-414	E	K02704	...	...	1	1
9	Carbon steel	Plate	SA-662	B	K02203	...	...	1	1
10	Carbon steel	Plate	SA-537	...	K12437	1	$2\frac{1}{2} < t \leq 4$	1	2
11	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	$2\frac{1}{2} < t \leq 4$	1	2
12	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$2\frac{1}{4} < t \leq 4$	1	1
13	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$\leq 2\frac{1}{4}$	1	1
14	...	...	...	...	...	...	...	...	...
15	Carbon steel	Plate	SA-455	...	K03300	...	$0.58 < t \leq \frac{3}{4}$	1	2
16	Carbon steel	Bar	SA-675	70	...	...	...	1	2
17	Carbon steel	Forgings	SA-105	...	K03504	...	...	1	2
18	Carbon steel	Forgings	SA-181	...	K03502	70	...	1	2
19	Carbon steel	Castings	SA-216	WCB	J03002	...	...	1	2
20	Carbon steel	Forgings	SA-266	2	K03506	...	...	1	2
21	Carbon steel	Forgings	SA-266	4	K03017	...	...	1	2
22	Carbon steel	Forgings	SA-350	LF2	K03011	...	...	1	2
23	Carbon steel	Forgings	SA-508	1	K13502	...	...	1	2
24	Carbon steel	Forgings	SA-508	1A	K13502	...	...	1	2
25	Carbon steel	Forgings	SA-541	1	K03506	...	...	1	2
26	Carbon steel	Forgings	SA-541	1A	K03506	...	...	1	2
27	Carbon steel	Cast pipe	SA-660	WCB	J03003	...	...	1	2
28	Carbon steel	Forgings	SA-765	II	K03047	...	...	1	2
29	Carbon steel	Plate	SA-515	70	K03101	...	...	1	2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	65	35	NP	700	650	CS-2	G1, G17
2	65	35	1000	700	1000	CS-2	G10, S1, T2
3	65	35	850	700	1000	CS-2	G10, S1, T2
4	65	35	NP	700	NP	CS-2	S6, W10, W12
5	65	35	NP	700	NP	CS-2	S6, W10, W12
6	65	35	NP	700	NP	CS-2	S6, W10, W12
7	65	35	NP	700	NP	CS-2	S6, W10, W12
8	65	38	NP	NP	900	CS-2	G10, G35, T1
9	65	40	NP	NP	700	CS-3	T1
10	65	45	NP	700	650	CS-4	T1
11	65	45	NP	700	NP	CS-4	G26, T1, W10, W12
12	66.5	37.5	850	NP	1000	CS-2	G10, S1, T1
13	66.5	...	850	NP	1000	CS-2	G10, G43, S1, T1
14	...	...	...	...	...	...	...
15	70	35	NP	400 (Cl. 3 only)	650	CS-2	...
16	70	35	850	650 (Cl. 3 only)	1000	CS-2	G10, G15, G18, G22, G35, S1, T2
17	70	36	1000	700	1000	CS-2	G10, G18, G35, S1, T2
18	70	36	1000	700	1000	CS-2	G10, G18, G35, S1, T2
19	70	36	1000	700	1000	CS-2	G1, G10, G17, G18, S1, T2
20	70	36	1000	700	1000	CS-2	G10, G18, S1, T2
21	70	36	NP	NP	1000	CS-2	G10, T2
22	70	36	NP	700	1000	CS-2	G10, T2
23	70	36	NP	700	1000	CS-2	G10, T2
24	70	36	NP	700	1000	CS-2	G10, T2
25	70	36	NP	700	1000	CS-2	G10, T2
26	70	36	NP	700	1000	CS-2	G10, T2
27	70	36	1000	700	NP	CS-2	G1, G10, G17, G18, S1, T2
28	70	36	NP	NP	650	CS-2	...
29	70	38	1000	700	1000	CS-2	G10, S1, T2
30	70	38	850	700	1000	CS-2	G10, S1, T2

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
2	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	13.9	11.4	8.7	5.9
3	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	13.9	11.4	8.7	5.9
4	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
5	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
6	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
7	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
8	18.6	18.6	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	13.9	11.4	8.7	5.9
9	18.6	18.6	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
10	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
11	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
12	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.5	16.9	13.9	11.4	8.7	5.9
13	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	16.9	13.9	11.4	8.7	5.9
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	...	...	...	...	...
16	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.7	14.8	12.0	9.3	6.7
17	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
18	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
19	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
20	20.0	...	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
21	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
22	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
23	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
24	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
25	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
26	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
27	20.0	...	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
28	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	...	...	...	...	...
29	20.0	20.0	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	14.8	12.0	9.3	6.7
30	20.0	20.0	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	14.8	12.0	9.3	6.7
31	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...
32	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...
33	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
3	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
13	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
17	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
18	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
19	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
20	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
21	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
22	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
23	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
24	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
25	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
26	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
27	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
30	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Smls. pipe	SA-106	C	K03501	...	...	1	2
2	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
3	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
4	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
5	Carbon steel	Smls. tube	SA-210	C	K03501	...	...	1	2
6	Carbon steel	Castings	SA-216	WCC	J02503	...	...	1	2
7	Carbon steel	Smls. & wld. fittings	SA-234	WPC	K03501	...	...	1	2
8	Carbon steel	Castings	SA-352	LCC	J02505	...	...	1	2
9	Carbon steel	Castings	SA-487	16	...	A	...	1	2
10	Carbon steel	Plate	SA-537	...	K12437	3	$4 < t \le 6$	1	3
11	Carbon steel	Smls. tube	SA-556	C2	K03006	...	...	1	2
12	Carbon steel	Tube	SA-557	C2	K03505	...	...	1	2
13	Carbon steel	Cast pipe	SA-660	WCC	J02505	...	...	1	2
14	Carbon steel	Bar	SA-695	B/40	K03504	...	...	1	2
15	Carbon steel	Bar	SA-696	C	K03200	...	...	1	2
16	Carbon steel	Sheet	SA-414	F	K03102	...	...	1	2
17	Carbon steel	Plate	SA-662	C	K02007	...	...	1	2
18	Carbon steel	Plate	SA-537	...	K12437	2	$4 < t \le 6$	1	3
19	Carbon steel	Plate	SA-738	C	...	...	$4 < t \le 6$	1	3
20	Carbon steel	Plate	SA-537	...	K12437	1	$\le 2\frac{1}{2}$	1	2
21	Carbon steel	Wld. pipe	SA-671	CD70	K12437	...	$\le 2\frac{1}{2}$	1	2
22	Carbon steel	Wld. pipe	SA-672	D70	K12437	...	$\le 2\frac{1}{2}$	1	2
23	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	$\le 2\frac{1}{2}$	1	2
24	Carbon steel	Plate	SA-455	...	K03300	...	$\frac{3}{8} < t \le 0.58$	1	2
25	Carbon steel	Forgings	SA-266	3	K05001	...	...	1	2
26	Carbon steel	Plate	SA-455	...	K03300	...	$\le \frac{3}{8}$	1	2
27	Carbon steel	Plate	SA-299	...	K02803	...	> 1	1	2
28	Carbon steel	Wld. pipe	SA-671	CK75	K02803	...	> 1	1	2
29	Carbon steel	Wld. pipe	SA-672	N75	K02803	...	> 1	1	2
30	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...	> 1	1	2
31	Carbon steel	Plate	SA-299	...	K02803	...	≤ 1	1	2
32	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...	≤ 1	1	2
33	Carbon steel	Forgings	SA-372	B	K04001	...	...	1	2
34	Carbon steel	Sheet	SA-414	G	K03103	...	...	1	2
35	Carbon steel	Plate	SA-738	A	K12447	...	...	1	2
36	Carbon steel	Plate	SA-537	...	K12437	3	$2\frac{1}{2} < t \le 4$	1	3

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	70	40	1000	700	1000	CS-3	G10, S1, T1
2	70	40	1000	NP	NP	...	G10, S1, T1, W13
3	70	40	1000	NP	NP	...	G4, G10, S1, T4
4	70	40	1000	NP	NP	...	G3, G10, S1, T2
5	70	40	1000	NP	1000	CS-3	G10, S1, T1
6	70	40	1000	700	1000	CS-3	G1, G10, G17, G18, S1, T1
7	70	40	800	700	800	CS-3	G10, G18, T1
8	70	40	NP	700	NP	...	G17, T1
9	70	40	NP	700	NP	...	...
10	70	40	NP	NP	700	CS-3	G21, G23, W11
11	70	40	NP	NP	800	CS-3	G10, T1
12	70	40	NP	NP	1000	CS-3	G24, G35, T2, W6
13	70	40	1000	700	NP	...	G1, G10, G17, G18, S1, T1
14	70	40	NP	700	800	CS-3	G10, T1
15	70	40	NP	700	NP	...	T1
16	70	42	NP	NP	900	CS-3	G10, G35, T1
17	70	43	NP	NP	700	CS-3	T1
18	70	46	NP	700	700	CS-4	G21, G23, T1, W11
19	70	46	NP	650	650	CS-4	G21, G23, W11
20	70	50	NP	700	650	CS-4	G23, T1
21	70	50	NP	700	NP	...	S6, T1, W10, W12
22	70	50	NP	700	NP	...	S6, T1, W10, W12
23	70	50	NP	700	NP	CS-4	S6, T1, W10, W12
24	73	37	NP	400 (Cl. 3 only)	650	CS-2	...
25	75	37.5	1000	700	1000	CS-2	G10, G18, S1, T2, W2, W8, W11
26	75	38	NP	400 (Cl. 3 only)	650	CS-2	...
27	75	40	1000	700	1000	CS-3	G10, S1, T2
28	75	40	NP	700	NP	...	S6, W10, W12
29	75	40	NP	700	NP	...	S6, W10, W12
30	75	40	NP	700	NP	...	S6, W10, W12
31	75	42	1000	700	1000	CS-3	G10, S1, T1
32	75	42	NP	700	NP	...	T1, W10, W12
33	75	45	NP	NP	650	CS-3	W2, W11
34	75	45	NP	NP	900	CS-3	G10, G35, T1
35	75	45	NP	NP	700	CS-4	T1
36	75	50	NP	NP	700	CS-3	G23, T1, W11

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
2	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
3	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	9.3	*5.7*
4	17.0	...	17.0	...	17.0	17.0	17.0	17.0	16.8	15.5	*12.6*	*10.2*	*7.9*	*5.7*
5	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
6	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
7	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	...	...
8	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	...	...	...	...
9	20.0	...	19.9	...	18.8	18.1	17.9	17.9	17.9	17.9	...	...	...	...
10	20.0	20.0	20.0	...	19.7	19.5	18.9	18.0	17.6	17.2	...	...	...	...
11	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	...	...
12	17.0	17.0	17.0	...	17.0	17.0	17.0	17.0	16.8	15.5	*12.6*	*10.2*	*7.9*	*5.7*
13	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
14	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	*14.8*	*12.0*	...	...
15	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	*18.3*	...	...	...	...
16	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	*18.3*	*14.8*	*12.0*	*9.3*	*6.7*
17	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	*18.3*	...	...	...	...
18	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
19	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	...	...	...	...	...
20	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
21	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
22	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
23	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	*18.3*	...	...	...	...
24	20.9	20.9	20.9	...	20.9	20.9	20.1	18.9	18.3	...	...	...	...	...
25	21.4	21.4	21.4	...	21.4	21.4	20.4	19.2	18.5	17.9	*15.7*	*12.6*	*9.3*	*6.7*
26	21.4	21.4	21.4	...	21.4	21.4	20.6	19.4	18.8	...	...	...	...	...
27	21.4	21.4	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	*15.7*	*12.6*	*9.3*	*6.7*
28	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
29	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
30	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
31	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	20.8	*19.6*	*15.7*	*12.6*	*9.3*	*6.7*
32	21.4	...	21.4	...	21.4	21.4	21.4	21.4	20.8	*19.6*	...	...	...	...
33	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	...	...	...	...	...
34	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	21.4	*19.6*	*15.7*	*12.6*	*9.3*	*6.7*
35	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	*19.6*	...	...	...	...
36	21.4	...	21.4	...	21.1	20.9	20.9	20.9	20.9	*18.3*	...	...	...	...
37	21.4	...	21.4	...	21.1	20.9	20.9	20.9	20.9	*19.6*	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
2	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
3	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
4	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
5	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
13	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	1Cr–½Mo	Plate	SA-387	12	K11757	1	...	4	1
2	1Cr–½Mo	Wld. pipe	SA-691	1CR	K11757	...	...	4	1
3	1Cr–½Mo	Cast pipe	SA-426	CP12	J11562	...	...	4	1
4	1Cr–½Mo	Forgings	SA-182	F12	K11562	1	...	4	1
5	1Cr–½Mo	Smls. tube	SA-213	T12	K11562	...	...	4	1
6	1Cr–½Mo	Smls. & wld. fittings	SA-234	WP12	K12062	1	...	4	1
7	1Cr–½Mo	Smls. pipe	SA-335	P12	K11562	...	...	4	1
8	1Cr–½Mo	Forged pipe	SA-369	FP12	K11562	...	...	4	1
9	1Cr–½Mo	Plate	SA-387	12	K11757	2	...	4	1
10	1Cr–½Mo	Wld. pipe	SA-691	1CR	K11757	...	...	4	1
11	1Cr–½Mo	Forgings	SA-182	F12	K11564	2	...	4	1
12	1Cr–½Mo	Forgings	SA-336	F12	K11564	...	...	4	1
13	1Cr–V	Smls. tube	SA-213	T17	K12047	...	...	10B	1
14	1¼Cr–½Mo	Castings	SA-217	WC6	J12072	...	...	4	1
15	1¼Cr–½Mo	Cast pipe	SA-426	CP11	J12072	...	...	4	1
16	1¼Cr–½Mo	Bar	SA-739	B11	K11797	...	...	4	1
17	1¼Cr–½Mo–Si	Smls. tube	SA-199	T11	K11597	...	...	4	1
18	1¼Cr–½Mo–Si	Forgings	SA-182	F11	K11597	1	...	4	1
19	1¼Cr–½Mo–Si	Smls. tube	SA-213	T11	K11597	...	...	4	1
20	1¼Cr–½Mo–Si	Smls. & wld. fittings	SA-234	WP11	...	1	...	4	1
21	1¼Cr–½Mo–Si	Smls. pipe	SA-335	P11	K11597	...	...	4	1
22	1¼Cr–½Mo–Si	Forgings	SA-336	F11	K11597	1	...	4	1
23	1¼Cr–½Mo–Si	Forged pipe	SA-369	FP11	K11597	...	...	4	1
24	1¼Cr–½Mo–Si	Plate	SA-387	11	K11789	1	...	4	1
25	1¼Cr–½Mo–Si	Wld. pipe	SA-691	1¼CR	K11789	...	...	4	1
26	1¼Cr–½Mo–Si	Wld. pipe	SA-691	1¼CR	K11789	...	...	4	1
27	1¼Cr–½Mo–Si	Forgings	SA-182	F11	K11572	2	...	4	1
28	1¼Cr–½Mo–Si	Forgings	SA-336	F11	K11572	2	...	4	1
29	1¼Cr–½Mo–Si	Forgings	SA-336	F11	K11572	3	...	4	1
30	1¼Cr–½Mo–Si	Plate	SA-387	11	K11789	2	...	4	1
31	1¼Cr–½Mo–Si	Wld. pipe	SA-691	1¼CR	K11789	...	...	4	1
32	1¾Cr–½Mo–Cu	Forgings	SA-592	E	K11695	...	$2\frac{1}{2} < t \leq 4$	11B	2
33	1¾Cr–½Mo–Cu	Forgings	SA-592	E	K11695	...	$\leq 2\frac{1}{2}$	11B	2
34	1¾Cr–½Mo–Ti	Plate	SA-517	E	K21604	...	$2\frac{1}{2} < t \leq 6$	11B	2
35	1¾Cr–½Mo–Ti	Plate	SA-517	E	K21604	...	$\leq 2\frac{1}{2}$	11B	2
36	2¼Cr–1Mo	Tube	SA-199	T22	K21590	...	...	5A	1
37	2¼Cr–1Mo	Forgings	SA-182	F22	K21590	1	...	5A	1
38	2¼Cr–1Mo	Smls. tube	SA-213	T22	K21590			5A	1

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	55	33	1200	700	1200	CS-2	S4, T5
2	55	33	NP	700	NP	...	G26, W10, W12
3	60	30	NP	700	NP	...	G17
4	60	32	1200	NP	1200	CS-2	T5
5	60	32	1200	700	1200	CS-2	S4, T5
6	60	32	1200	700	1200	CS-2	G18, S4, T5
7	60	32	1200	700	1200	CS-2	S4, T5
8	60	32	1200	700	1200	CS-2	S4, T5
9	65	40	1200	700	1200	CS-3	S4, T5
10	65	40	NP	700	NP	...	G26, W10, W12
11	70	40	1200	700	1200	CS-3	G18, S4, T4
12	70	40	1200	700	1200	CS-3	G18, S4, T4
13	60	30	NP	NP	650	CS-2	...
14	70	40	1100	700	1100	CS-3	G1, G17, G18, T4
15	70	40	NP	700	NP	...	G17
16	70	45	NP	700	1200	CS-3	T4
17	60	25	NP	NP	1200	CS-1	T5
18	60	30	1200	NP	1200	CS-2	G18, S4, T5
19	60	30	1200	700	1200	CS-2	S4, T5
20	60	30	1200	700	1200	CS-2	G18, S4, T5
21	60	30	1200	700	1200	CS-2	S4, T5
22	60	30	1200	NP	NP	...	G18, S4, T5
23	60	30	1200	700	1200	CS-2	S4, T5
24	60	35	1200	700	1200	CS-2	S4, T4
25	60	35	NP	300 (Cl. 3 only)	NP	CS-2	G27, W10, W12
26	60	35	NP	700	NP	CS-2	G26, W10, W12
27	70	40	1200	700	1200	CS-3	G18, S4, T4
28	70	40	1200	NP	1200	CS-2	G18, S4, T4
29	75	45	NP	NP	1200	CS-2	T3
30	75	45	1200	700	1200	CS-3	S4, T3
31	75	45	NP	700	NP	CS-3	G26, W10, W12
32	105	90	NP	650 (SPT)	650	CS-3	S7
33	115	100	NP	NP	650	HT-1	...
34	105	90	NP	700 (SPT)	650	CS-3	...
35	115	100	NP	650 (SPT)	650	HT-1	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	15.7	...	15.4	...	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	14.7
2	15.7	...	15.4	...	15.1	15.1	15.1	15.1	15.1	15.1	...	...	...	...
3	17.1	...	16.8	...	16.5	16.2	15.7	15.2	15.0	14.8	...	...	...	...
4	17.1	17.1	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
5	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
6	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
7	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
8	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
9	18.6	18.6	18.2	...	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.4
10	18.6	...	18.2	...	17.9	17.9	17.9	17.9	17.9	17.9	...	...	...	...
11	20.0	...	19.6	...	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.1	18.6	*18.0*
12	20.0	20.0	19.6	...	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.1	18.6	*18.0*
13	17.1	17.1	17.1	...	17.1	16.8	16.2	15.7	15.4	...	...	...	...	...
14	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	*13.7*
15	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...
16	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.4	*13.7*
17	16.7	...	15.4	...	14.6	14.0	13.5	13.1	12.8	12.6	12.3	12.0	11.7	11.3
18	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
19	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
20	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
21	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
22	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
23	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
24	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	17.1	17.1	16.8	16.4	*13.7*
25	17.1	...	17.1	...	17.1	...	...	...	...	...	...	...	...	...
26	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...
27	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	*13.7*
28	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	*13.7*
29	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	*20.2*	*13.7*
30	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	*20.2*	*13.7*
31	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	...	...	...	...
32	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	...	...	...	...	...
33	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.9	...	...	...	...	...
34	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	...	...	...	...
35	32.9	...	32.9	32.9	32.9	32.9	32.9	32.9	32.9	...	...	...	...	...
36	16.7	15.9	15.6	...	15.1	15.0	15.0	15.0	15.0	15.0	14.9	14.8	14.5	*13.6*
37	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	*13.6*

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
5	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
6	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
7	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
8	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
9	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
12	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	9.3	6.3	4.2	2.8	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
17	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
18	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
19	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
20	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
21	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
22	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
23	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
24	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
28	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
29	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
30	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	16Cr–12Ni–2Mo	Forgings	SA-182	F316H	S31609	...	> 5	8	1
2	16Cr–12Ni–2Mo	Forgings	SA-182	F316H	S31609	...	> 5	8	1
3	16Cr–12Ni–2Mo	Forgings	SA-336	F316H	S31609	...	...	8	1
4	16Cr–12Ni–2Mo	Forgings	SA-336	F316H	S31609	...	...	8	1
5	16Cr–12Ni–2Mo	Forged pipe	SA-430	FP316H	S31609	...	...	8	1
6	16Cr–12Ni–2Mo	Forged pipe	SA-430	FP316H	S31609	...	...	8	1
7	16Cr–12Ni–2Mo	Forgings	SA-182	F316	S31600	...	≤ 5	8	1
8	16Cr–12Ni–2Mo	Forgings	SA-182	F316	S31600	...	≤ 5	8	1
9	16Cr–12Ni–2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
10	16Cr–12Ni–2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
11	16Cr–12Ni–2Mo	Plate	SA-240	316	S31600	...	...	8	1
12	16Cr–12Ni–2Mo	Plate	SA-240	316	S31600	...	...	8	1
13	16Cr–12Ni–2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
14	16Cr–12Ni–2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
15	16Cr–12Ni–2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
16	16Cr–12Ni–2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
17	16Cr–12Ni–2Mo	Smls. & wld. pipe	SA-312	TP316	S31600	...	...	8	1
18	16Cr–12Ni–2Mo	Smls. & wld. pipe	SA-312	TP316	S31600	...	...	8	1
19	16Cr–12Ni–2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
20	16Cr–12Ni–2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
21	16Cr–12Ni–2Mo	Wld. pipe	SA-358	316	S31600	1	...	8	1
22	16Cr–12Ni–2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	8	1
23	16Cr–12Ni–2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	8	1
24	16Cr–12Ni–2Mo	Smls. & wld. fittings	SA-403	316	S31600	...	...	8	1
25	16Cr–12Ni–2Mo	Wld. pipe	SA-409	TP316	S31600	...	...	8	1
26	16Cr–12Ni–2Mo	Bar	SA-479	316	S31600	...	...	8	1
27	16Cr–12Ni–2Mo	Bar	SA-479	316	S31600	...	...	8	1
28	16Cr–12Ni–2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
29	16Cr–12Ni–2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
30	16Cr–12Ni–2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
31	16Cr–12Ni–2Mo	Wld. pipe	SA-813	TP316	S31600	...	...	8	1
32	16Cr–12Ni–2Mo	Wld. pipe	SA-814	TP316	S31600	...	...	8	1
33	16Cr–12Ni–2Mo	Forgings	SA-182	F316H	S31609	...	≤ 5	8	1

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applic. and Max. Temp. Limits (NP = Not Permitted) (SPT = Supports Only) I	III	VIII-1	External Pressure Chart No.	Notes
1	70	30	1500	800	1500	HA-2	G5, G12, G18, T8
2	70	30	1500	NP	1500	HA-2	G18, T9
3	70	30	NP	800	1500	HA-2	G5, T8
4	70	30	NP	NP	1500	HA-2	T9
5	70	30	1500	800	1500	HA-2	G5, G18, H1, T8
6	70	30	1500	NP	1500	HA-2	G18, H1, T9
7	75	30	1500	800	1500	HA-2	G5, G12, G18, T8
8	75	30	1500	NP	1500	HA-2	G12, G18, T9
9	75	30	1500	800	1500	HA-2	G5, G12, G18, T8
10	75	30	1500	NP	1500	HA-2	G12, G18, T9
11	75	30	1500	800	1500	HA-2	G5, G12, G18, T8
12	75	30	1500	NP	1500	HA-2	G12, G18, T9
13	75	30	1500	NP	NP	...	G12, G18, T9, W13
14	75	30	1500	800	NP	HA-2	G5, G12, G18, T8, W12, W13
15	75	30	1500	NP	1500	HA-2	G3, G5, G12, G18, G24, T7
16	75	30	1500	NP	1500	HA-2	G3, G12, G18, G24, T9
17	75	30	1500	800	1500	HA-2	G5, G12, G18, T8, W12, W13
18	75	30	1500	NP	1500	HA-2	G12, G18, T9, W13
19	75	30	1500	NP	1500	HA-2	G3, G5, G12, G18, G24, T7
20	75	30	1500	NP	1500	HA-2	G3, G12, G18, G24, T9
21	75	30	NP	800	NP	HA-2	G5, W12
22	75	30	1500	800	1500	HA-2	G5, G12, G18, H1, T8, W12
23	75	30	1500	NP	1500	HA-2	G12, G18, H1, T9
24	75	30	NP	800	1500	HA-2	G5, G12, T8, W12, W14
25	75	30	NP	800	NP	HA-2	G5, W12
26	75	30	1500	800	1500	HA-2	G5, G12, G18, G22, H1, T8
27	75	30	1500	NP	1500	HA-2	G12, G18, G22, H1, T9
28	75	30	NP	800	NP	...	G5, W12
29	75	30	NP	NP	1500	HA-2	G5, G12, G24, T7
30	75	30	NP	NP	1500	HA-2	G12, G24, T9
31	75	30	NP	800	NP	HA-2	G5, W12
32	75	30	NP	800	NP	HA-2	G5, W12
33	75	30	1500	800	1500	HA-2	G5, G18, T8

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	–20 to 100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
2	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
3	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
4	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
5	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
6	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
7	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
8	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
9	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
10	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
11	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
12	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
13	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
14	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
15	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
16	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
17	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
18	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
19	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
20	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
21	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
22	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
23	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
24	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
25	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
26	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
27	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
28	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
29	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
30	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
31	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
32	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
33	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
34	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5

Lanjutan C.2

TABLE 1A (CONT'D)
SECTION I; SECTION III, CLASS 2 AND 3;* AND SECTION VIII, DIVISION 1
MAXIMUM ALLOWABLE STRESS VALUES *S* FOR FERROUS MATERIALS
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
2	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
3	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
4	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
5	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
6	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
7	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
8	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
9	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
10	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
11	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
12	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
13	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
14	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
15	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
16	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
17	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
18	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
19	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
20	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
23	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
24	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
27	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
30	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...