

Table A-1M Basic Allowable Stresses in Tension for Metals (SI Units) (Cont'd)

Numbers in Parentheses Refer to Notes for Appendix A Tables; Specifications Are ASTM Unless Otherwise Indicated

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	UNS No.	Class/Condition/Temper	Size, mm	P-No. (5)
114	Al-Mg-Si-Cu	Plate & sheet	B209	Alclad 6061	A86061	T651	≥13, ≤100	23
115	99.60Al	Plate & sheet	B209	1060	A91060	O	...	21
116	99.60Al	Plate & sheet	B209	1060	A91060	H112	≥13, ≤25	21
117	99.60Al	Plate & sheet	B209	1060	A91060	H12	...	21
118	99.60Al	Plate & sheet	B209	1060	A91060	H14	...	21
119	99.0Al-Cu	Plate & sheet	B209	1100	A91100	O	...	21
120	99.0Al-Cu	Plate & sheet	B209	1100	A91100	H112	≥13, ≤50	21
121	99.0Al-Cu	Plate & sheet	B209	1100	A91100	H12	...	21
122	99.0Al-Cu	Plate & sheet	B209	1100	A91100	H14	...	21
123	Al-Mn-Cu	Plate & sheet	B209	3003	A93003	O	...	21
124	Al-Mn-Cu	Plate & sheet	B209	3003	A93003	H112	≥13, ≤50	21
125	Al-Mn-Cu	Plate & sheet	B209	3003	A93003	H12	...	21
126	Al-Mn-Cu	Plate & sheet	B209	3003	A93003	H14	...	21
127	Al-Mn-Mg	Plate & sheet	B209	3004	A93004	O	...	22
128	Al-Mn-Mg	Plate & sheet	B209	3004	A93004	H112	...	22
129	Al-Mn-Mg	Plate & sheet	B209	3004	A93004	H32	...	22
130	Al-Mn-Mg	Plate & sheet	B209	3004	A93004	H34	...	22
131	Al-1.5Mg	Plate & sheet	B209	5050	A95050	O	...	21
132	Al-1.5Mg	Plate & sheet	B209	5050	A95050	H112	...	21
133	Al-1.5Mg	Plate & sheet	B209	5050	A95050	H32	...	21
134	Al-1.5Mg	Plate & sheet	B209	5050	A95050	H34	...	21
135	Al-2.5Mg	Plate & sheet	B209	5052	A95052	O	...	22
136	Al-2.5Mg	Plate & sheet	B209	5052	A95052	H112	≥13, ≤75	22
137	Al-2.5Mg	Plate & sheet	B209	5052	A95052	H32	...	22
138	Al-2.5Mg	Plate & sheet	B209	5052	A95052	H34	...	22
139	Al-4.4Mg-Mn	Plate & sheet	B209	5083	A95083	O	≥1.3, ≤38	25
140	Al-4.4Mg-Mn	Plate & sheet	B209	5083	A95083	H32	≥5, ≤38	25
141	Al-4.0Mg-Mn	Plate & sheet	B209	5086	A95086	O	...	25
142	Al-4.0Mg-Mn	Plate & sheet	B209	5086	A95086	H112	≥13, ≤25	25
143	Al-4.0Mg-Mn	Plate & sheet	B209	5086	A95086	H32	...	25
144	Al-4.0Mg-Mn	Plate & sheet	B209	5086	A95086	H34	...	25
145	Al-3.5Mg	Plate & sheet	B209	5154	A95154	O	...	22
146	Al-3.5Mg	Plate & sheet	B209	5154	A95154	H112	≥13, ≤75	22
147	Al-3.5Mg	Plate & sheet	B209	5154	A95154	H32	...	22
148	Al-3.5Mg	Plate & sheet	B209	5154	A95154	H34	...	22
149	Al-3.5Mg	Plate & sheet	B209	5254	A95254	O	...	22

Table A-1M Basic Allowable Stresses in Tension for Metals (SI Units) (Cont'd)

Numbers in Parentheses Refer to Notes for Appendix A Tables; Specifications Are ASTM Unless Otherwise Indicated

Line No.	Notes	Basic Allowable Stress, S, MPa, at Metal Temperature, °C [Notes (1) and (4b)]											
		Min. Temp., °C (6)	Min. Tensile Strength, MPa	Min. Yield Strength, MPa	Max. Use Temp., °C								
						Min. Temp. to 40	65	100	125	150	175	200	225
114	(33) (68)	-269	290	241	204	96.5	96.5	96.5	92.5	79.9	63.1	40.2	35.9
115	...	-269	55	17	204	11.5	11.5	10.9	9.8	8.8	7.5	5.8	5.5
116	(13) (33)	-269	69	34	204	23.0	21.8	19.1	17.0	15.0	11.8	7.5	5.9
117	(33)	-269	76	62	204	25.3	25.3	23.1	21.0	18.1	12.7	8.4	7.8
118	(33)	-269	83	69	204	27.6	27.6	27.6	26.6	18.1	12.7	8.4	7.8
119	...	-269	76	24	204	16.1	16.1	16.0	15.6	11.8	9.3	7.2	6.9
120	(13) (33)	-269	83	34	204	23.0	23.0	22.7	21.6	16.3	11.8	7.5	6.9
121	(33)	-269	97	76	204	32.2	32.2	31.3	25.2	19.0	13.6	8.5	7.8
122	(33)	-269	110	97	204	36.8	36.8	36.1	33.1	19.0	13.6	8.5	7.8
123	...	-269	97	34	204	23.0	22.1	21.4	20.5	18.2	13.6	10.9	10.5
124	(13) (33)	-269	103	41	204	27.6	26.6	25.6	24.4	18.2	13.6	10.9	10.5
125	(33)	-269	117	83	204	39.1	39.1	38.1	35.8	29.0	21.1	16.7	16.1
126	(33)	-269	138	117	204	46.0	46.0	46.0	43.9	29.0	21.1	16.7	16.1
127	...	-269	152	59	204	39.1	39.1	39.1	39.0	38.9	26.9	17.4	16.1
128	(33)	-269	159	62	204	41.4	41.4	41.4	41.4	38.9	26.9	17.4	16.1
129	(33)	-269	193	145	204	64.4	64.4	64.4	60.4	38.9	26.9	17.4	16.1
130	(33)	-269	221	172	204	73.5	73.5	73.5	73.5	38.9	26.9	17.4	16.1
131	...	-269	124	41	204	27.6	27.6	27.5	27.5	27.5	20.1	10.8	9.7
132	(33)	-269	138	55	204	36.8	36.7	36.7	36.6	35.8	20.1	10.8	9.7
133	(33)	-269	152	110	204	50.6	50.6	50.6	50.6	35.8	20.1	10.8	9.7
134	(33)	-269	172	138	204	57.5	57.5	57.5	57.5	35.8	20.1	10.8	9.7
135	...	-269	172	65	204	43.7	43.7	43.7	43.6	41.6	28.8	17.6	16.1
136	(13) (33)	-269	172	65	204	43.7	43.7	43.7	43.6	41.6	28.8	17.6	16.1
137	(33)	-269	214	159	204	71.2	71.2	71.2	71.0	41.6	28.8	17.6	16.1
138	(33)	-269	234	179	204	78.1	78.1	78.1	78.1	41.6	28.8	17.6	16.1
139	(13)	-269	276	124	65	82.7	82.7	...	...	...	...	...	...
140	(13) (33)	-269	303	214	65	101.1	101.1	...	...	...	...	...	...
141	...	-269	241	97	65	64.4	64.4	...	...	...	...	...	...
142	(13) (33)	-269	241	110	65	73.5	73.5	...	...	...	...	...	...
143	(33)	-269	276	193	65	91.9	91.9	...	...	...	...	...	...
144	(33)	-269	303	234	65	101.1	101.1	...	...	...	...	...	...
145	...	-269	207	76	65	50.6	50.4	...	...	...	...	...	...
146	(13) (33)	-269	207	76	65	50.6	50.4	...	...	...	...	...	...
147	(33)	-269	248	179	65	82.7	82.7	...	...	...	...	...	...
148	(33)	-269	269	200	65	89.6	89.6	...	...	...	...	...	...
149	...	-269	207	76	65	50.6	50.4	...	...	...	...	...	...

Table A-1M Basic Allowable Stresses in Tension for Metals (SI Units) (Cont'd)

Numbers in Parentheses Refer to Notes for Appendix A Tables; Specifications Are ASTM Unless Otherwise Indicated

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	UNS No.	Class/Condition/ Temper	Size, mm	P-No. (5)
150	Al-3.5Mg	Plate & sheet	B209	5254	A95254	H112	≥13, ≤75	22
151	Al-3.5Mg	Plate & sheet	B209	5254	A95254	H32	...	22
152	Al-3.5Mg	Plate & sheet	B209	5254	A95254	H34	...	22
153	Al-2.7Mg-Mn	Plate & sheet	B209	5454	A95454	O	...	22
154	Al-2.7Mg-Mn	Plate & sheet	B209	5454	A95454	H112	≥13, ≤75	22
155	Al-2.7Mg-Mn	Plate & sheet	B209	5454	A95454	H32	...	22
156	Al-2.7Mg-Mn	Plate & sheet	B209	5454	A95454	H34	...	22
157	Al-5.1Mg-Mn	Plate & sheet	B209	5456	A95456	O	≥1.3, ≤38	25
158	Al-5.1Mg-Mn	Plate & sheet	B209	5456	A95456	H32	≥5, <13	25
159	Al-2.5Mg	Plate & sheet	B209	5652	A95652	O	...	22
160	Al-2.5Mg	Plate & sheet	B209	5652	A95652	H112	≥13, ≤75	22
161	Al-2.5Mg	Plate & sheet	B209	5652	A95652	H32	...	22
162	Al-2.5Mg	Plate & sheet	B209	5652	A95652	H34	...	22
163	Al-Mg-Si-Cu	Plate & sheet	B209	6061	A96061	T4 wld.	...	23
164	Al-Mg-Si-Cu	Plate & sheet	B209	6061	A96061	T6 wld.	...	23
165	Al-Mg-Si-Cu	Plate & sheet	B209	6061	A96061	T4	...	23
166	Al-Mg-Si-Cu	Plate & sheet	B209	6061	A96061	T6	...	23
167	Al-Mg-Si-Cu	Plate & sheet	B209	6061	A96061	T651	≥6, ≤100	23
168	Al-Mn-Cu	Forgings & fittings	B361	WP Alclad 3003	A83003	O	...	21
169	Al-Mn-Cu	Forgings & fittings	B361	WP Alclad 3003	A83003	H112	...	21
170	99.60Al	Forgings & fittings	B361	WP1060	A91060	O	...	21
171	99.60Al	Forgings & fittings	B361	WP1060	A91060	H112	...	21
172	99.0Al-Cu	Forgings & fittings	B361	WP1100	A91100	O	...	21
173	99.0Al-Cu	Forgings & fittings	B361	WP1100	A91100	H112	...	21
174	Al-Mn-Cu	Forgings & fittings	B247	3003	A93003	H112	...	21
175	Al-Mn-Cu	Forgings & fittings	B247	3003	A93003	H112 wld.	...	21
176	Al-Mn-Cu	Forgings & fittings	B361	WP3003	A93003	O	...	21
177	Al-Mn-Cu	Forgings & fittings	B361	WP3003	A93003	H112	...	21
178	Al-Mn-Cu	Forgings & fittings	B247	5083	A95083	O	...	25
179	Al-Mn-Cu	Forgings & fittings	B247	5083	A95083	H112	...	25
180	Al-Mn-Cu	Forgings & fittings	B247	5083	A95083	H112 wld.	...	25
181	Al-4.4Mg-Mn	Forgings & fittings	B361	WP5083	A95083	O	...	25

Table A-1M Basic Allowable Stresses in Tension for Metals (SI Units) (Cont'd)

Numbers in Parentheses Refer to Notes for Appendix A Tables; Specifications Are ASTM Unless Otherwise Indicated

Line No.	Notes	Basic Allowable Stress, S, MPa, at Metal Temperature, °C [Notes (1) and (4b)]											
		Min. Temp., °C (6)	Min. Tensile Strength, MPa	Min. Yield Strength, MPa	Max. Use Temp., °C	Min. Temp. to 40							
						65	100	125	150	175	200	225	
150	(13) (33)	-269	207	76	65	50.6	50.4	...	...	...	...	...	...
151	(33)	-269	248	179	65	82.7	82.7	...	...	...	...	...	...
152	(33)	-269	269	200	65	89.6	89.6	...	...	...	...	...	...
153	...	-269	214	83	204	55.2	55.2	55.2	48.9	37.5	28.6	21.7	20.7
154	(13) (33)	-269	214	83	204	55.2	55.2	55.2	48.9	37.5	28.6	21.7	20.7
155	(33)	-269	248	179	204	82.7	82.7	82.7	49.5	37.5	28.6	21.7	20.7
156	(33)	-269	269	200	204	89.6	89.6	89.6	49.5	37.5	28.6	21.7	20.7
157	(13)	-269	290	131	65	87.3	87.3	...	...	...	...	...	...
158	(13) (33)	-269	317	228	65	105.7	105.7	...	...	...	...	...	...
159	...	-269	172	65	204	43.7	43.7	43.7	43.6	41.6	28.8	17.6	16.1
160	(13) (33)	-269	172	65	204	43.7	43.7	43.7	43.6	41.6	28.8	17.6	16.1
161	(33)	-269	214	159	204	71.2	71.2	71.2	71.0	41.6	28.8	17.6	16.1
162	(33)	-269	234	179	204	78.1	78.1	78.1	78.1	41.6	28.8	17.6	16.1
163	(22) (63)	-269	165	...	204	55.2	55.2	55.2	54.3	52.0	46.3	35.3	34.8
164	(22) (63)	-269	165	...	204	55.2	55.2	55.2	54.3	52.0	46.3	35.3	34.8
165	(33) (63)	-269	207	110	204	68.9	68.9	68.9	67.8	64.8	57.9	40.2	35.9
166	(33)	-269	290	241	204	96.5	96.5	96.5	92.5	79.9	63.1	40.2	35.9
167	(13) (33)	-269	290	241	204	96.5	96.5	96.5	92.5	79.9	63.1	40.2	35.9
168	(13) (14) (32) (33) (66)	-269	90	31	204	20.7	19.9	19.3	18.4	17.3	13.6	10.9	10.5
169	(13) (14) (32) (33) (66)	-269	90	31	204	20.7	19.9	19.3	18.4	17.3	13.6	10.9	10.5
170	(13) (14) (32) (33)	-269	55	17	204	11.5	11.5	10.9	9.8	8.8	7.5	5.8	5.5
171	(13) (14) (32) (33)	-269	55	17	204	11.5	11.5	10.9	9.8	8.8	7.5	5.8	5.5
172	(13) (14) (32) (33)	-269	76	21	204	13.8	13.8	13.7	13.2	11.8	9.3	7.2	6.9
173	(13) (14) (32) (33)	-269	76	21	204	13.8	13.8	13.7	13.2	11.8	9.3	7.2	6.9
174	(9) (45)	-269	97	34	204	23.0	22.1	21.4	20.5	18.2	13.6	10.9	10.5
175	(9) (45)	-269	97	34	204	23.0	22.1	21.4	20.5	18.2	13.6	10.9	10.5
176	(13) (14) (32) (33)	-269	97	34	204	23.0	22.1	21.4	20.5	18.2	13.6	10.9	10.5
177	(13) (14) (32) (33)	-269	97	34	204	23.0	22.1	21.4	20.5	18.2	13.6	10.9	10.5
178	(9) (32) (33)	-269	268	110	65	73.5	73.5	...	...	...	...	...	...
179	(9) (32) (33)	-269	268	110	65	73.5	73.5	...	...	...	...	...	...
180	(9) (32) (33)	-269	268	110	65	73.5	73.5	...	...	...	...	...	...
181	(13) (32) (33)	-269	269	110	65	73.5	73.5	...	...	...	...	...	...

Table A-1M Basic Allowable Stresses in Tension for Metals (SI Units) (Cont'd)

Numbers in Parentheses Refer to Notes for Appendix A Tables; Specifications Are ASTM Unless Otherwise Indicated

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	UNS No.	Class/Condition/ Temper	Size, mm	P-No. (5)
182	Al-4.4Mg-Mn	Forgings & fittings	B361	WP5083	A95083	H112	...	25
183	Al-3.5Mg	Forgings & fittings	B361	WP5154	A95154	O	...	22
184	Al-3.5Mg	Forgings & fittings	B361	WP5154	A95154	H112	...	22
185	Al-Mg-Si-Cu	Forgings & fittings	B247	6061	A96061	T6 wld.	...	23
186	Al-Mg-Si-Cu	Forgings & fittings	B361	WP6061	A96061	T4 wld.	...	23
187	Al-Mg-Si-Cu	Forgings & fittings	B361	WP6061	A96061	T6 wld.	...	23
188	Al-Mg-Si-Cu	Forgings & fittings	B361	WP6061	A96061	T4	...	23
189	Al-Mg-Si-Cu	Forgings & fittings	B247	6061	A96061	T6	...	23
190	Al-Mg-Si-Cu	Forgings & fittings	B361	WP6061	A96061	T6	...	23
191	Al-Mg-Si	Forgings & fittings	B361	WP6063	A96063	T4 wld.	...	23
192	Al-Mg-Si	Forgings & fittings	B361	WP6063	A96063	T6 wld.	...	23
193	Al-Mg-Si	Forgings & fittings	B361	WP6063	A96063	T4	...	23
194	Al-Mg-Si	Forgings & fittings	B361	WP6063	A96063	T6	...	23
195	Al-Si-Mg	Castings	B26	356.0	A03560	T71	...	26
196	Al-Si-Mg	Castings	B26	356.0	A03560	T6	...	26
197	Al-Si	Castings	B26	443.0	A04430	F	...	...

Table A-1M Basic Allowable Stresses in Tension for Metals (SI Units) (Cont'd)

Numbers in Parentheses Refer to Notes for Appendix A Tables; Specifications Are ASTM Unless Otherwise Indicated

Line No.	Notes	Basic Allowable Stress, S, MPa, at Metal Temperature, °C [Notes (1) and (4b)]												
		Min. Temp., °C (6)	Min. Tensile Strength, MPa	Min. Yield Strength, MPa	Max. Use Temp., °C	Min. Temp. to 40								
							65	100	125	150	175	200	225	
182	(13) (32) (33)	-269	269	110	65	73.5	73.5	...	...	...	...	...	...	
183	(32) (33)	-269	207	76	65	50.6	50.6	...	...	...	...	...	...	
184	(32) (33)	-269	207	76	65	50.6	50.6	...	...	...	...	...	...	
185	(9) (22)	-269	165	...	204	55.2	55.2	55.2	54.3	52.0	46.3	35.3	34.8	
186	(22) (32) (63)	-269	165	...	204	55.2	55.2	55.2	54.3	52.0	46.3	35.3	34.8	
187	(22) (32) (63)	-269	165	...	204	55.2	55.2	55.2	54.3	52.0	46.3	35.3	34.8	
188	(13) (32) (33) (63)	-269	179	110	204	59.8	59.8	59.8	58.9	56.3	50.2	38.3	35.9	
189	(9) (33)	-269	262	241	204	87.3	87.3	87.3	83.6	72.3	57.2	40.2	35.9	
190	(13) (32) (33) (63)	-269	262	241	204	87.3	87.3	87.3	83.6	72.3	57.2	40.2	35.9	
191	(32)	-269	117	...	204	39.1	39.1	37.6	36.0	32.0	24.7	15.3	13.8	
192	(32)	-269	117	...	204	39.1	39.1	37.6	36.0	32.0	24.7	15.3	13.8	
193	(13) (32) (33)	-269	124	62	204	41.4	41.3	41.3	41.0	41.0	33.9	22.6	9.8	
194	(13) (32) (33)	-269	207	172	204	68.9	68.9	67.7	59.0	45.9	27.5	15.3	13.8	
195	(9) (43)	-269	172	124	204	57.5	57.5	57.5	55.0	49.8	38.6	18.9	16.5	
196	(9) (43)	-269	207	138	121	68.9	68.9	68.9	57.9	...	...	...	...	
197	(9) (43)	-269	117	48	204	32.0	32.0	32.0	32.0	32.0	32.0	32.0	24.1	

Table A-1A Basic Casting Quality Factors, E_c

These quality factors are determined in accordance with [para. 302.3.3\(b\)](#). See also [para. 302.3.3\(c\)](#) and [Table 302.3.3C](#) for increased quality factors applicable in special cases. Specifications are ASTM.

Spec. No.	Description	E_c [Note (2)]	Appendix A Notes
Iron			
A47	Malleable iron castings	1.00	(9)
A48	Gray iron castings	1.00	(9)
A126	Gray iron castings	1.00	(9)
A197	Cupola malleable iron castings	1.00	(9)
A278	Gray iron castings	1.00	(9)
A395	Ductile and ferritic ductile iron castings	0.80	(9), (40)
A536	Ductile iron castings	0.80	(9), (40)
A571	Austenitic ductile iron castings	0.80	(9), (40)
Carbon Steel			
A216	Carbon steel castings	0.80	(9), (40)
A352	Ferritic steel castings	0.80	(9), (40)
Low and Intermediate Alloy Steel			
A217	Martensitic stainless and alloy castings	0.80	(9), (40)
A352	Ferritic steel castings	0.80	(9), (40)
A426	Centrifugally cast pipe	1.00	(10)
Stainless Steel			
A351	Austenitic steel castings	0.80	(9), (40)
A451	Centrifugally cast pipe	0.90	(10), (40)
A487	Steel castings	0.80	(9), (40)
Copper and Copper Alloy			
B61	Steam bronze castings	0.80	(9), (40)
B62	Composition bronze castings	0.80	(9), (40)
B148	Al-bronze and Si-Al-bronze castings	0.80	(9), (40)
B584	Copper alloy castings	0.80	(9), (40)
Nickel and Nickel Alloy			
A494	Nickel and nickel alloy castings	0.80	(9), (40)
Aluminum Alloy			
B26, Temper F	Aluminum alloy castings	1.00	(9), (10)
B26, Temper T6, T71	Aluminum alloy castings	0.80	(9), (40)
Titanium and Titanium Alloy			
B367	Titanium and titanium alloy castings	0.80	(9), (40)

Table A-1B Basic Quality Factors for Longitudinal Weld Joints in Pipes and Tubes, E_j

(20)

These quality factors are determined in accordance with [para. 302.3.4\(a\)](#). See also [para. 302.3.4\(b\)](#) and [Table 302.3.4](#) for increased quality factors applicable in special cases. Specifications, except API, are ASTM.

Spec. No.	Class (or Type)	Description	E_j [Note (2)]	Appendix A Notes
Carbon Steel				
API 5L	...	Seamless pipe	1.00	...
		Electric fusion welded pipe, 100% radiographed	1.00	...
		Electric resistance welded pipe	0.85	...
		Electric fusion welded pipe, double butt seam	0.95	...
		Continuous welded (furnace butt welded) pipe	0.60	...
A53	Type S	Seamless pipe	1.00	...
	Type E	Electric resistance welded pipe	0.85	...
	Type F	Furnace butt welded pipe	0.60	...
A106	...	Seamless pipe	1.00	...
A134	...	Electric fusion welded pipe, single butt, straight or spiral (helical) seam	0.80	...
A135	...	Electric resistance welded pipe	0.85	...
A139	...	Electric fusion welded pipe, straight or spiral (helical) seam	0.80	...
A179	...	Seamless tube	1.00	...
A333	...	Seamless pipe	1.00	...
		Electric resistance welded pipe	0.85	...
A334	...	Seamless tube	1.00	...
A369	...	Seamless pipe	1.00	...
A381	...	Electric fusion welded pipe, 100% radiographed	1.00	...
		Electric fusion welded pipe, spot radiographed	0.90	(19)
		Electric fusion welded pipe, as manufactured	0.85	...
A524	...	Seamless pipe	1.00	...
A587	...	Electric resistance welded pipe	0.85	...
A671	12, 22, 32, 42, 52	Electric fusion welded pipe, 100% radiographed	1.00	...
	13, 23, 33, 43, 53	Electric fusion welded pipe, double butt seam	0.85	...
A672	12, 22, 32, 42, 52	Electric fusion welded pipe, 100% radiographed	1.00	...
	13, 23, 33, 43, 53	Electric fusion welded pipe, double butt seam	0.85	...
A691	12, 22, 32, 42, 52	Electric fusion welded pipe, 100% radiographed	1.00	...
	13, 23, 33, 43, 53	Electric fusion welded pipe, double butt seam	0.85	...
Low and Intermediate Alloy Steel				
A333	...	Seamless pipe	1.00	...
		Electric resistance welded pipe	0.85	(78)
A334	...	Seamless tube	1.00	...
A335	...	Seamless pipe	1.00	...
A369	...	Seamless pipe	1.00	...
A671	12, 22, 32, 42, 52	Electric fusion welded pipe, 100% radiographed	1.00	...
	13, 23, 33, 43, 53	Electric fusion welded pipe, double butt seam	0.85	(78)
A672	12, 22, 32, 42, 52	Electric fusion welded pipe, 100% radiographed	1.00	...
	13, 23, 33, 43, 53	Electric fusion welded pipe, double butt seam	0.85	(78)
A691	12, 22, 32, 42, 52	Electric fusion welded pipe, 100% radiographed	1.00	...
	13, 23, 33, 43, 53	Electric fusion welded pipe, double butt seam	0.85	(78)

Table A-1B Basic Quality Factors for Longitudinal Weld Joints in Pipes and Tubes, E_j (Cont'd)

These quality factors are determined in accordance with [para. 302.3.4\(a\)](#). See also [para. 302.3.4\(b\)](#) and [Table 302.3.4](#) for increased quality factors applicable in special cases. Specifications, except API, are ASTM.

Spec. No.	Class (or Type)	Description	E_j [Note (2)]	Appendix A Notes
Stainless Steel				
A249	...	Electric fusion welded tube, single butt seam	0.80	...
A268	...	Seamless tube	1.00	...
		Electric fusion welded tube, double butt seam	0.85	...
		Electric fusion welded tube, single butt seam	0.80	...
A269	...	Seamless tube	1.00	...
		Electric fusion welded tube, double butt seam	0.85	...
		Electric fusion welded tube, single butt seam	0.80	...
A270	...	Seamless tube	1.00	...
		Electric fusion welded tube, double butt seam	0.85	...
		Electric fusion welded tube, single butt seam	0.80	...
A312	...	Seamless pipe	1.00	...
		Electric fusion welded pipe, double butt seam	0.85	...
		Electric fusion welded pipe, single butt seam	0.80	...
		Electric fusion welded pipe, 100% radiographed	1.00	(46)
A358	1, 3, 4	Electric fusion welded pipe, 100% radiographed	1.00	...
	5	Electric fusion welded pipe, spot radiographed	0.90	...
	2	Electric fusion welded pipe, double butt seam	0.85	...
A376	...	Seamless pipe	1.00	...
A409	...	Electric fusion welded pipe, double butt seam	0.85	...
		Electric fusion welded pipe, single butt seam	0.80	...
A789	...	Seamless tube	1.00	...
		Electric fusion welded tube, 100% radiographed	1.00	...
		Electric fusion welded tube, double butt	0.85	...
		Electric fusion welded tube, single butt	0.80	...
A790	...	Seamless pipe	1.00	...
		Electric fusion welded pipe, 100% radiographed	1.00	...
		Electric fusion welded pipe, double butt	0.85	...
		Electric fusion welded pipe, single butt	0.80	...
A813	DW	Electric fusion welded pipe, double butt	0.85	...
	SW	Electric fusion welded pipe, single butt	0.80	...
A814	DW	Electric fusion welded pipe, double butt	0.85	...
	SW	Electric fusion welded pipe, single butt	0.80	...
A928	1, 3, 4	Electric fusion welded pipe, 100% radiographed	1.00	...
	5	Electric fusion welded pipe, spot radiographed	0.90	...
	2	Electric fusion welded pipe, double butt seam	0.85	...
Copper and Copper Alloy				
B42	...	Seamless pipe	1.00	...
B43	...	Seamless pipe	1.00	...
B68	...	Seamless tube	1.00	...
B75	...	Seamless tube	1.00	...
B88	...	Seamless water tube	1.00	...

Table A-1B Basic Quality Factors for Longitudinal Weld Joints in Pipes and Tubes, E_j (Cont'd)

These quality factors are determined in accordance with [para. 302.3.4\(a\)](#). See also [para. 302.3.4\(b\)](#) and [Table 302.3.4](#) for increased quality factors applicable in special cases. Specifications, except API, are ASTM.

Spec. No.	Class (or Type)	Description	E_j [Note (2)]	Appendix A Notes
Copper and Copper Alloy (Cont'd)				
B280	...	Seamless tube	1.00	...
B466	...	Seamless pipe and tube	1.00	...
B467	...	Electric resistance welded pipe	0.85	...
		Electric fusion welded pipe, double butt seam	0.85	...
		Electric fusion welded pipe, single butt seam	0.80	...
Nickel and Nickel Alloy				
B161	...	Seamless pipe and tube	1.00	...
B163	...	Seamless tube	1.00	...
B165	...	Seamless pipe and tube	1.00	...
B167	...	Seamless pipe and tube	1.00	...
B407	...	Seamless pipe and tube	1.00	...
B444	...	Seamless pipe and tube	1.00	...
B464	...	Welded pipe	0.80	...
B474	1, 3, 4	Welded pipe, 100% radiographed	1.00	...
	2	Electric fusion welded pipe, double butt seam	0.85	...
B514	...	Welded pipe	0.80	...
B515	...	Welded tube	0.80	...
B619	...	Electric resistance welded pipe	0.85	...
		Electric fusion welded pipe, double butt seam	0.85	...
		Electric fusion welded pipe, single butt seam	0.80	...
B622	...	Seamless pipe and tube	1.00	...
B626	All	Electric resistance welded tube	0.85	...
		Electric fusion welded tube, double butt seam	0.85	...
		Electric fusion welded tube, single butt seam	0.80	...
B668	All	Seamless pipe and tube	1.00	...
B675	All	Welded pipe	0.80	...
B690	...	Seamless pipe and tube	1.00	...
B704	...	Welded tube	0.80	...
B705	...	Welded pipe	0.80	...
B725	...	Electric fusion welded pipe, double butt seam	0.85	...
		Electric fusion welded pipe, single butt seam	0.80	...
B729	...	Seamless pipe and tube	1.00	...
B804	1, 3, 5	Welded pipe, 100% radiographed	1.00	...
	2, 4	Welded pipe, double fusion welded	0.85	...
	6	Welded pipe, single fusion welded	0.80	...
Titanium and Titanium Alloy				
B338	...	Seamless tube	1.00	...
		Electric fusion welded tube, 100% radiographed	1.00	...

Table A-1B Basic Quality Factors for Longitudinal Weld Joints in Pipes and Tubes, E_j (Cont'd)

These quality factors are determined in accordance with [para. 302.3.4\(a\)](#). See also [para. 302.3.4\(b\)](#) and [Table 302.3.4](#) for increased quality factors applicable in special cases. Specifications, except API, are ASTM.

Spec. No.	Class (or Type)	Description	E_j [Note (2)]	Appendix A Notes
Titanium and Titanium Alloy (Cont'd)				
		Electric fusion welded tube, double butt seam	0.85	...
		Electric fusion welded tube, single butt seam	0.80	...
B861	...	Seamless pipe	1.00	...
B862	...	Electric fusion welded pipe, 100% radiographed	1.00	...
		Electric fusion welded pipe, double butt seam	0.85	...
		Electric fusion welded pipe, single butt seam	0.80	...
Zirconium and Zirconium Alloy				
B523	...	Seamless tube	1.00	...
		Electric fusion welded tube	0.80	...
B658	...	Seamless pipe	1.00	...
		Electric fusion welded pipe	0.80	...
Aluminum Alloy				
B210	...	Seamless tube	1.00	...
B241	...	Seamless pipe and tube	1.00	...