

Designation: B918/B918M - 09 B918/B918M - 17

Standard Practice for Heat Treatment of Wrought Aluminum Alloys¹

This standard is issued under the fixed designation B918/B918M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*Scope

- 1.1 This practice is intended for use in the heat treatment of wrought aluminum alloys for general purpose applications.
- 1.1.1 The heat treatment of wrought aluminum alloys used in specific aerospace applications is covered in AMS 2772.²
- 1.1.2 Heat treatment of aluminum alloy castings for general purpose applications is covered in Practice B917/B917M.
- 1.2 Times and temperatures appearing in the heat-treatment tables are typical for various forms, sizes, and manufacturing methods and may not provide the optimum heat treatment for a specific item.
- 1.3 Some alloys in the 6xxx series may achieve the T4 temper by quenching from within the solution temperature range during or immediately following a hot working process, such as upon emerging from an extrusion die. Such alternatives to furnace heating and immersion quenching are indicated in Table 2, Table 2, by Footnote L, for heat treatment of wrought aluminum alloys. However, this practice does not cover the requirements for a controlled extrusion press or hot rolling mill solution heat treatment. (Refer to Practice B807 for extrusion press solution heat treatment of aluminum alloys and to Practice B947 for hot rolling mill solution heat treatment of aluminum alloys.)³
- 1.4 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.
- 1.5 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.
- 1.6 This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 The following documents, of the issue in effect on the date of material purchase, form a part of this specification to the extent referenced herein:

2.2 ASTM Standards:³

B557 Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products

B881 Terminology Relating to Aluminum- and Magnesium-Alloy Products

B917/B917M Practice for Heat Treatment of Aluminum-Alloy Castings from All Processes

G69 Test Method for Measurement of Corrosion Potentials of Aluminum Alloys

G110 Practice for Evaluating Intergranular Corrosion Resistance of Heat Treatable Aluminum Alloys by Immersion in Sodium Chloride + Hydrogen Peroxide Solution

2.3 American National Standard:

H35.1/H35.1(M) Alloy and Temper Designation Systems for Aluminum⁴

¹ This practice is under the jurisdiction of ASTM Committee B07 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.03 on Aluminum Alloy Wrought Products.

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² Available from SAE International, 400 Commonwealth Dr., Warrendale, PA 15096-0001, http://www.sae.org.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.



TABLE 2 Recommended Heat Treatment for Wrought Aluminum Alloys^A

	S	olution Heat Treatment		Precipi	tation Heat Treatmen	t ^B	
Product	Product	Metal Temperature, ±10°F [±6°C] ^{C,D}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature ±10°F [±6°C]	Time at Temperature h	e, Temper
	-	2011 Alloy ^A					
Cold-finished wire, rod,	945-995 [507-535]	110 [43] max	T3 ^E T4	320 [160]	14	T8 -	
and bar			T451 ^G				
Cold-finished wire, rod,	945-995 [507-535]	110 [43] max	<u>T3</u> F	320 [160]	14	<u>T8</u> ^F	
and bar			<u>T4</u>	<u></u>	<u></u>	<u></u>	
			<u>T451</u> <i>G</i>	:::	:::	····	_
Drawn tube	975 [524]	110 [43] max	T3^F				
			T4511 ^G				
Drawn tube	975 [524]	110 [43] max	<u>T3^F</u> T4511 ^G	320 [160]	<u>14</u>	<u>T8</u> ^F	
		2014 Alloy ^A	14511			<u></u>	_
Flat sheet, bare or	935 [502]	110 [43] max	T3^F				_
Alclad			T42	320 [160]	18	T62	
Flat sheet, bare	925–945 [496–507]	110 [43] max	T3 ^F	220 [160]	10.00	<u></u>	
or Alclad	935 [502]		<u>T42</u>	320 [160]	<u>18–20</u>	<u>T62</u>	_
Coiled sheet, bare	925–945 [496–507]	110 [43] max	<u>T4</u>	320 [160]	<u>18</u>	<u>T6</u>	-
Coiled sheet, bare or	935 [502]	110 [43] max	T4	320 [160]	18	T6	
Alclad	005 (500)		T42	320 [160]	18	T62	
or Alclad	935 [502]		<u>T42</u>	320 [160]	<u>18–20</u>	<u>T62</u>	_
Plate, bare or Alclad	935 [502]	110 [43] max	T451^G T42	320 [160]	18	T651 ^G	
Plate, bare or Alclad	925–945 [496–507]	110 [43] max	T451 ^G	320 [160]	18	—— T651 ^{<i>G</i>}	
Tate, bare of Aloida	935 [502]	110 [40] Max	T42	350 [177]	8 <u>-9</u>	T62	
		<u> </u>	-3-F (TS			=	-
Cold-finished wire, rod,	925–945 [496–507]	110 [43] max	T4 T451 ^H	350 [177]	<u>9</u> 9	<u>T6</u>	
and bar	935 [502]		T42	350 [177] 350 [177]	<u>9</u> 8–9	T651 ^H T62	
		<u>.//Stanuar</u>	ND FECTI	244/			-
Cold-finished wire, rod,	935 [502]	110 [43] max	T4	320 [160]	18	T6	-
and bar			T451H T42	or 350 [177] 320 [160]	8 18	T651^H T62	
				or 350 [177]	8	102	
				320 [160]	18		
		ASTM R018/R018	2M_17	or 350 [177]	8		
Extruded wire, rod, bar,	925–945 [496–507]	110 [43] max	<u>T4</u>	350 [177]	<u>9</u>	<u>T6</u>	
profiles, and tube			4a4e- T4510 ^H 141a	350 [177]	stm-b91 ₈ 8-b91	T6510 ^H	
promoo, and tabo			T4511 ^H	350 [177]	$\frac{9}{9}$	T6511 ^H	
	935 [502]		T42	350 [177]	<u>8–9</u>	T62	
		440 (40)					
Extruded wire, rod, bar, profiles, and tube	935 [502]	110 [43] max	T4 T4510^H	320 [160] o r 350 [177]	18 8	T6 T6510[⊬]	
pro nico, ana tabe			T4511^H	320 [177] 320 [160]	8 18	T6511^H	
			T42	or 350 [177]	8	T62	
				320 [160]	18		
				or 350 [177] 320 [160]	8 18		
				320 [160] o r 350 [177]	18 8		
Drawn tube	925-945 [496-507]	110 [43] max	<u>T4</u>	350 [177]	<u>9</u>	<u>T6</u>	
Drawn tube	935 [502]		<u>T42</u>	350 [177]	<u>8–9</u>	<u>T62</u>	935 [502]110
Diawii tube							JOJ [JOZ] 110
							-
Die forgings	935 [502]	140 180 [60 82]	T4	340 [171]	10	T6	
Die forgings	925–945 [496–507]	<u>140–180 [60–82]</u>	<u>T4</u>	350 [177]	<u>9</u>	<u>T6</u>	_
Hand forgings and rolled	925–945 [496–507]	140–180 [60–82]	T4	350 [177]	<u>9</u>	T6	-
Hand forgings and rolled	935 [502]	140-180 [60-82]	T452 /	340 [171]	10	T652'	
rings	005 (500)		T4	340 [171]	10	T6	_
rings	935 [502]	2017 Alloy ^A	T452 ¹	350 [177]	10	T652 ¹	-
Cold-finished wire, rod,	925-950 [496-510]	110 [43] max	T4				_
and bar	5_5 555 [155 516]	. To [To] max	T451^H	···	···	····	
			T42	• • •		• • • •	
Cold-finished wire, rod,	925–950 [496–510]	110 [43] max	<u>T4</u>	····	<u></u>	<u></u>	



	Solution Heat Treatment			Precipit			
Product P	Product	Metal Temperature, ±10°F [±6°C] ^{C,D}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperatur ±10°F [±6°C]	Time at e Temperature, h	Temper
and bar			T451H	<u></u>	<u></u>	···	
		2018 Alloy ^A	<u>T42</u>	···	<u></u>		
Die forgings	940-970 [504-521]	212 [100]	T4	340 [171]	10	T61	
Die forgings	940–970 [504–521]	212 [100]	<u>T4</u>	340 [171]	10	T61	
		2024 Alloy ^A					
Flat sheet, bare or Alclad	920 [493]	110 [43] max	T3^E T361 [√]	375 [191] 375 [191]	12 8	T81^F T861^J	
Alciau			T42	375 [191]	9	T62	
			T42	375 [191]	16	T72	
Flat sheet, bare	910-930 [488-499]	110 [43] max	<u>T3^F</u>	375 [191]	<u>12</u>	<u>T81^F</u>	
or Alclad	920 [493]		T361 ^J	375 [191]	<u>8</u>	T861 ^J	
			T42	375 [191]	<u>9–10</u>	T62	
			<u>T42</u>	375 [191]	<u>16–18</u>	<u>T72</u>	
Coiled sheet, bare	910–930 [488–499]	110 [43] max	T4	375 [191]	9–10	T6	
Coiled sheet, bare or	920 [493]	110 [43] max	T4				
Alclad	1001		T42	375 [191]	9	T62	
or Alclad	920 [493]		<u>T42</u> T42	<u>375 [191]</u> 375 [191]	<u>9</u> 16–18	<u>T62</u> T72	
				<u>575 [191]</u>	<u></u>		
Plate, bare or Alclad	920 [493]	110 [43] max	T351 ^G	375 [191]	12	T851 ^G	
			T361 ^J T42	375 [191]	8	T861 ^J T62	
Plate, bare or Alclad	910–930 [488–499]	110 [43] max	T351 ^G	375 [191] 375 [191]	9 12	T851 ^G	
Flate, bare of Alciau	<u>-</u>	110 [43] IIIax			_		
	920 [493]		T361 ^J T42	375 [191] 375 [191]	<u>8</u> 9–10	T861 ³ T62	
Cold-finished wire, rod,	920 [493]	110 [43] max	T351 ^H	375 [191]		T851 ^H	
and bar	('nttr	os://standard	T36 ^{-/}	a1 1.		16	
			T4 T42	375 [191]	12	+6 T62	
Cold-finished wire, rod,	910-930 [488-499]	110 [43] max	<u>T351^H</u>	375 [191] 375 [191]	16 <u>12</u>	T851 ^H	
and bar			T36 ^J		<u></u>		
			<u>T4</u>	375 [191]	12	<u>T6</u>	
	920 [493]		-17 T42	375 [191]	12-13	T62	
Extruded wire, rod, bar,	910–930 [488–499]	ards/sist/ca110 [43] max (689_4a4	le-h T3 59-f41	375 [191]	stm-b9 <u>12</u> -b9	1 8 n T81 ^F	
profiles, and tube	[C][, <u>010 000 [100 (100]</u>	ards/sist/Cathornos	T3510 ^H	375 [191]	12	T8510 ^H	
			T3511 ^H	375 [191]	12	T8511 ^H	
	920 [493]		<u>T42</u>	<u>375 [191]</u>	<u>12–13</u>	T62	
Extruded wire, rod, bar,	920 [493]			375 [191]		T81^F	
profiles, and tube	2-3[.00]	[.o]a.	T3510^H	375 [191]	12	T8510 ^H T8511 ^H	
			T3511^H T42	375 [191]	12	18511''	
Drawn tube	910-930 [488-499]	110 [43] max	<u>T3^F</u>	375 [191]	12	<u>T8</u> ^F	
	920 [493]		<u>T42</u>	<u>375 [191]</u>	<u>9–10</u>	<u>T62</u>	
Drawn tube	920 [493]						
Diami tabo	020 [100]	rro [10] max	T42	···	···		
Die Forgings	910-930 [488-499]	110 [43] max	<u>T3^F</u>	375	<u>11</u>	T81 F	
		2025 Alloy ^A		[191]		<u> </u>	
Die forgings	960 [516]	140 160 [60-71]	T4	340 [171]	10	T6	
Die forgings	950–970 [510–521]	140–160 [60–71]	<u>T4</u>	350 [177]	9	<u>T6</u>	
0.1171.111		2117 Alloy ^A					
Cold-finished, wire or rod	925–950 [496-510]	110 [43] max	T4	•••	***	• • •	
Cold-finished, wire	925–950 [496–510]	110 [43] max	<u>T4</u>				
or rod	555 [.55 616]	o [.o]ax	<u>···</u>	····	····	···	
		2124 Alloy ^A					
Plate Plate	920 [493]	110 [43] max	T351 ^G	350 [177]	12	T851 ^G	
Plate	910–930 [488–499]	110 [43] max	<u>T3^F</u> T31 ^G	375 [191] 370 [188]	12 12	<u>T8^F</u> T8151 ^G	
			T4	370 [186]	12 12 9 12		
	920 [493]		<u>T4</u> T3 ^F	375 [191]	12	<u>⊤82</u> <i>F</i>	
	<u></u>						



		TABLE 2 Continue	ea				
	S	Solution Heat Treatment		Precipi	tation Heat Treatme	nt ^B	
<u>Product</u>	Product	Metal Temperature, ±10°F [±6°C] ^{C,D}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperatur ±10°F [±6°C]	Time at e Temperature, h	Temp
			<u>T42</u>	375 [191]	10	T62	
D: (:	050 [540]	2218 Alloy ^A	T.4	040 [474]			
Die forgings	950 [510]	212 [100]	T4 T4	340 [171]	10	T61	
Die forgings	940–960 [504–516]	<u>212 [100]</u>	<u>T4</u> <u>T4</u>	340 [171] 460 [238]	10	<u>T61</u> T7	
	950 [510]		14 T/	340 [236]	10 6 10	T62	
	330 [310]		T4 T4	460 [238]	6	T72	
		2219 Alloy ^A	<u></u>	100 [200]	<u>~</u>		
Flat sheet, bare or	995 [535]	110 [43] max	T31^F T37^K	350 [177]	18	T81 ^F T87 ^K	
Alclad			T37^K T42	325 [163]	24	T87 K	
				375 [191]	36	T62	
Flat sheet, bare	985–1005 [529–541]	110 [43] max	<u>T31^F</u>	<u>350 [177]</u>	<u>18</u>	<u>T81^F</u>	
or Alclad			<u>T37^K</u>	325 [163]	<u>24</u>	T87 ^K	
	995 [535]		T42	375 [191]	17–19	T62	
Plate Plate	985–1005 [529–541]	110 [43] max	T37 ^K	325 [163]	<u>17–19</u> 18	<u>T87^K</u> T87^K	
Flate	995 [535]	110 [43] max	13/ T351 ^G	350 [177] 350 [177]	18	187° T851 ^G	
			T42	375 [177]	16	T62	
			T351 ^G	350 [177]	18	T851 ^{<i>G</i>}	
					10		
	<u>995 [535]</u> 		<u>T42</u>	375 [191] 	<u>35–37</u>	<u>T62</u>	
Cold-finished wire, rod,	985-1005 [529-541]	110 [43] max	T4 T4	375 [191]	18	T6	
Cold-finished wire, rod,	995 [535]	110 [43] max	T4	375 [191]	18	T6	
and bar			T351 ^H	375 [191]	18	T851 [⊬]	
and bar			T351 ^H	375 [191]	<u>18</u>	T851 ^H	
Francisco de la constantina della constantina de	005 [505]	440 [40]	T04F	075 [404]			
Extruded wire, rod, bar,	995 [535]	110 [43] max	T31^E T3510^H	375 [191]	18 18	T81^F T8510^H	
profiles, and tube			T3511 ^H T42	375 [191] 375 [191]	18	T8511 ^H	
			T42	375 [191]	36	T62	
Extruded wire, rod, bar,	985–1005 [529–541]	110 [43] max	<u>T31</u> ^F	375 [191]	<u>18</u>	<u>T81^F</u>	
profiles, and tube			T3510 ^H	375 [191]	18	T8510 ^H	
promes, and tube			T3511 ^H	375 [191]	18	T8511 ^H	
	995 [535]		T42	375 [191]	35–37	T62	
	<u> </u>		$M_{-}17\overline{73}$	375 [191]	17–19	T82	
D:16: 1 // . 1 1 1 1 1			4 4 1 70 040	10.0==7/0/1	1.020.10	10 757	
Die forgings and rolled	985–1005 [529–541] and	S/SIST/C2 110 [43] max (89)	4a4e-b <u>T4</u> 9-f4fa T42	375 [191]	stm-b9 <u>26</u> -b9	18m <u>T6</u> 7 T62	
rings	995 [335]		T352 ¹	375 [191] 350 [177]	<u>25–27</u> 17–19	T82 [/]	
			<u></u>		<u>17-13</u>		
Die forgings and rolled	995 [535]	110 [43] max	T4	375 [191]	26	T6	
rings Hand forgings	985–1005 [529–541]	110 [42] may	T4	375 [191]	26	Т6	
Hand forgings	995 [335]	110 [43] max	<u>14</u> <u>T42</u>	375 [191] 375 [191]	<u>26</u> 25–27	T62	
Hand forgings	995 [535]	110 [43] max	142	375 [191]	26	162	
riana lorgings	000 [000]	110 [40] max	T352 [/]	350 [177]	18	T852 /	
			T352'	350 [177]	17–19	T852'	
		2618 Alloy ^A					
Die, hand, and rolled	985 [529]	212 [100]	T4	390 [199]	20	T61	
ring forgings	/	0.40.7.4003	- .	000 [100]		T 0.	
Die, hand, and rolled	975–995 [524–535]	<u>212 [100]</u>	<u>T4</u> T42	390 [199]	<u>20</u>	T61	
ring forgings	985 [529]	4032 Alloy	142	390 [199]	19–21	T62	
Die forgings	940-970 [504-521]	140 180 [60 82]	T4	340 [171]	10	T6	
Die forgings	940–970 [504–521]	140–180 [60–82]		340 [171]	10	<u>T6</u>	
<u> Dio lorgingo</u>	955 [513]	110 100 [00 02]	<u>T4</u> T42	340 [171]	9–11	T62	
	555 [5.5]	6005 Alloy		0.10 [1.1.1]			
Extruded rod, bar,	<u>L</u>	<u></u>	<u>T1</u>	350 [177]	8	<u>T5</u>	
profiles, and tube							
Francisco III	1	6005A Alloy	T ,	050 (4===			
Extruded rod, bar,	<u>L</u>		T1	350 [177]	8	T5	
profiles, and tube	L		Т1	350 [177]	o	TE	
Extruded rod, bar,	<u>L</u>	<u>· · ·</u> 6005A Alloy	<u>T1</u>	350 [177]	<u>8</u>	<u>T5</u>	
Extruded rod, bar,	<u>L</u>		T1	350 [177]	8	T5	
profiles, and tube				[1	,		
profiles, and tube			<u>T4</u>	350 [177]	8	<u>T61</u>	
		6013 Alloy ^A					
		•					



		Solution Heat Treatment		Precipitation Heat Treatment ^B			
Product	Product	Metal Temperature, ±10°F [±6°C] ^{C,D}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature ±10°F [±6°C]		Tempe
Sheet, bare		110 [43] max	T4	375 [191]	4	T6	
Sheet, bare	1045–1065 [563–574]	110 [43] max	T4	or 345 [174] 375 [191]	8 4	<u>T6</u>	
<u> </u>		<u> </u>	<u></u>	or 345 [174]	$\frac{4}{8}$	<u></u>	
	1000 [538]		<u>T42</u>	375 [191]	<u>4–5</u>	<u>T62</u>	
Plate, bare	1020–1050 [549-566]	110 [43] max		345 [174]	8-16	T651 ^G	
Plate, bare	1020-1050 [549-566]	110 [43] max	<u></u>	345 [174]	<u>8–16</u>	T651 ^G	
Cold-finished wire, rod,	1040–1060 [560–571]	110 [43] max	···	375 [191]	4	T651 ^H	
and bar			<u> </u>	375 [191]	$\frac{4}{4}$	T8 ^F	
Cold-finished wire, rod,	1050 [566]	6020 Alloy ^A		375 [191]	4	T651 ^H	
and bar	1000 [000]	110 [45] Max		375 [191]	4	T651^H T8^F	
Rod, bar & extrusion	1010-1050 [543-566]	110 [43] max	$\frac{W}{\mathit{U}}$	355 [176]	<u>8–10</u>	T6511 ^H	
Wire, rod, & bar	1010-1050 [543-566]	110 [43] max	<u>W</u> ^U	355 [176]	<u>8–10</u>	T8 ^F	
Cold-finished wire and	970 [521]	6053 Alloy ^A	T4	355 [179]	8	T61	
rod							
Cold-finished wire and rod	960–980 [516–527]	110 [43] max	<u>T4</u>	<u>355 [179]</u>	<u>8</u>	<u>T61</u>	
		·					
Die forgings	970 [521]	110 [43] max	T4	340 [171]	10	T6	
Die forgings	960–980 [516–527] 970 [521]	110 [43] max	<u>T4</u> T42	340 [171] 340 [171]	<u>10</u> 10	<u>T6</u> T62	
		6061 Alloy ^A	arde				
Sheet, bare or Alclad	960-1075 [516-579] ^M	110 [43] max	T4	320 [160] 320 [160]	18 18	T6 T62	
Sheet, bare or Alclad	960-1075 [516-579] ^M	110 [43] max	T4	320 [160]	18	<u>T6</u>	
	985 [529])s://s tan dar	T42	350 [177]	<u>8–10</u>	T62	
			<u>T42</u> ^z	320 [160] ^Z	<u>17–19^z</u>	T62 ^Z	
			review				
Plate	960-1075 [516-579]	6061 Alloy ^A (Continued 110 [43] max	7) T451 ^G	320 [160]	18	T651 ^G	
Hate	300 1073 [310 373]	410 [40] max	T42	320 [160]	18	T62	
Plate	960-1075 [516-579]	AST 110 [43] max B918	$\sqrt{1.17} \frac{\text{T451}^{G}}{\text{T45}}$	320 [160]	18	T651 ^G	
_ Jattera <i>d la</i> transla url	<u>985 [529]</u>		T42	350 [177]	<u>18</u> 1019-101	T62	
Tread Sheet and	960-1075 [516-579]	110 [43] max	T4	320 [160]	18	T6	
Tread Sheet and	960-1075 [516-579]	110 [43] max	T4	320 [160]	18	T6	
Plate ^{N,O}			_		_		
Cold-finished wire, rod,	960–1075 [516–579]	110 [43] max ^P	T4	350 [177]	<u>8</u>	T6	
and bar			_	or 320 [160]			
			<u>T3</u> ^F	340 [171] or 320 [160]	<u>8</u>	T89 ^{Q,R}	
			T4	350 [177]	18 8 18 8 8	T94 ^S	
	005 (500)		T451H	350 [177]	<u>8</u>	T651 ^H	
	<u>985 [529]</u> 		T42	350 [177]	<u>8–10</u> 	<u>T62</u>	
Extruded rod, bar,	L 	····	T1 T4	350 [177]	<u>8</u> 	<u>T51</u>	
Cold-finished wire, rod, and bar	960–1075 [516-579]	110 [43] max ^P	T4 T3[_]	340 [171] or 320 [160]		Т6 Т89 ^{Q,R}	
and bar			13" T4 T451<i>"</i>	340 [171]	18 8	T94 ^S	
			T451 # T42	or 320 [160]	18	T651 [⊬] T62	
				340 [171] or 320 [160]	8 18	. 02	
				340 [171]	10 8		
				or 320 [160]	18		
				340 [171] or 320 [160]	8 18		
profiles, and tube	960-1075 [516-579] ^L	110 [43] max ^P	<u>T4</u>	350 [177]	<u>8</u>	<u>T6</u>	
			T4510 ^H T4511 ^H	350 [177] 350 [177]	<u>8</u> 8	T6510 ^H T6511 ^H	
	985 [529]		<u>T42</u>	350 [177]	<u>8–10</u>	T62	
Structural profiles	960–1075 [516–579] ^L	110 [43] max ^P	T4	350 [177]		T6	
orraciarai pronies	900-1073 [310-378]	110 [40] flldx	14	350 [177]	<u>8</u>	10	



		alution Lloot Tractment	C u	Des. 1.1	tation Host Toral	n n t B	_
Product	Product	olution Heat Treatment Metal Temperature, ±10°F [±6°C] ^{C,D}	Quench Temperature, °F [°C] ^E	Temper	tation Heat Treatmo Metal Temperatu ±10°F [±6°C]	Time at	e, Temper
							-
Extruded rod, bar, profiles, and tube	960_10 75 [516-579]^L	 110 [43] max^P	T1 T4 T4510^H T4511^H T42	350 [177] 350 [177] 350 [177] 350 [177] 350 [177]	& & & & &	T51 T6 T6510 ^H T6511 ^H T62	
Pipe	960–1075 [516–579] ^L	110 [43] max ^P	<u>T4</u>	350 [177]	8	<u>T6</u>	
Drawn tube	960–1075 [516–579]	110 [43] max	<u>T4</u>	320 [160] or 340 [171]	<u>18</u>	<u>T6</u>	-
	985 [529]		<u>T42</u>	340 [171]	18 8 8 8	<u>T62</u>	_
Die and hand forgings	960–1075 [516–579]	110 [43] max	<u>T4</u>	350 [177] or 340 [171]	<u>8</u> <u>10</u>	<u>T6</u>	-
Rolled rings	960–1075 [516–579] 985 [529]	110 [43] max 6063 Alloy	<u>T4</u> T452 [™]	350 [177] 350 [177]	<u>8</u> 8–10	<u>T6</u> T652 [™]	-
Extruded rod, bar, tube, and profiles	<u></u>		<u>T1</u> <u>T1</u>	400 [204] or 360 [182] 400 [204]	1-2 3 1-2	<u>T5</u> <u>T52</u>	_
Structural profiles	9 60-1075 [516-579]^L 960-1010 [516-543] ^L	110 [43] max ^P 110 [43] max ^P	T4 <u>T4</u>	or 360 [182] 350 [177] <u>350 [177]</u> or 360 [182]	3 1-2 3 8 8 8	T6 <u>T6</u>	
	985 [529]	·Fz-hC-4-g-a-zd	<u>T42</u>	350 [177]	<u>8–10</u>	<u>T62</u>	<u> </u>
Pipe Drawn tube Drawn tube	960-1075 [516-579] ^L 960-1010 [516-543] 960-1075 [516-579]	110 [43] max ^P 110 [43] max 110 [43] max	T4 T4 T4 T42	350 [177] 350 [177] 340 [171] or 320 [160] 340 [171]	8 8 8 18 8	T6 <u>T6</u> T6 T62	
			rev <u>T3</u>	o r 320 [160] 350 [177]	18 8 8	T83	
			T3 ^F T3 ^F	350 [177] 350 [177]	<u>8</u> 8	T831 ^R T832 ^R	
https://standard Die and hand forgings	985 [529] s.iteh.ai/catalog/standard		<u>M-17</u> <u>T31^F</u> <u>T42</u> 4a4e-b169-f4fa	350 [177] nd206 7 f1 4/a	<u>8–10</u> stm-b918-b9	<u>T62</u> 018m-17	960–1075 [516-579]
	960–1075 [516-579]	110 [43] max	<u>∓4</u> ∓452 [™]	 350 [177] 350 [177]	 8 8	T6 T652 ^T	
		6063 Alloy					_
Extruded rod, bar, tube, and profiles	970 [521] ⁴	 110 [43] max^P	T1 T1 T4 T42	400 [204] or 360 [182] 400 [204] or 360 [182] 360 [182] or 350 [177] 360 [182]	1 to 2 3 1 to 2 3 6 8 6	T5 T52 T6 T62	
Orawn tube	970 [521]	110 [43] max	T4 T 3 ^E T 3 ^E T 31 ^E T 42	or 350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 	8 8 8 8 	T6 T83 ^B T831 ^B T832 ^B T62	
Pipe	9 70 [521]^L	110 [43] max ^P	T4	350 [177] 360 [182] or 350 [177]	8 8	T6	
Pipe Pipe	960–1010 [516–543] ^L	110 [43] max ^P	<u>T4</u>	360 [177] or 350 [177]	6 8	<u>T6</u>	_
		6066 Alloy					_
Extruded rod, bar, profiles, and tube	960-1010 [516-543]	110 [43] max	T4 T4510^H T4511^H T42	350 [177] 350 [177] 350 [177] 350 [177]	8 8 8	T6 T6510^H T6511^H T62	
Extruded rod, bar,	960–1010 [516–543]	110 [43] max	<u>T4</u>	350 [177]	8	<u>T6</u>	



		TABLE 2 Continue	ea -				
		Solution Heat Treatment		Precipi	tation Heat Treatme	ent ^B	
Product	Product	Metal Temperature, ±10°F [±6°C] ^{C,D}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperatu ±10°F [±6°C]	Time at re Temperature, h	Tempe
profiles, and tube	_		T4510 ^H	350 [177]	<u>8</u> <u>8</u>	T6510 ^H	
			T4511 ^H	350 [177]		T6511 ^H	
	985 [529]		<u>T42</u>	<u>350 [177]</u>	<u>8–10</u>	<u>T62</u>	
Die forgings	960-1010 [516-543]	110 [43] max	T4	350 [177]	8		
Die forgings	960–1010 [516–543]	110 [43] max	T4	350 [177]	8	T6	
		6070 Alloy			_		
Extruded rod, bar,	1015 [546]	110 [43] max	T4	320 [160]	18	T6	
profiles, and tube	4045 [540]	440 [40]	T42	320 [160]	18	T62	
Extruded rod, bar, profiles, and tube	1015 [546] ^L	110 [43] max	<u>T4</u> T42	320 [160] 320 [160]	18 18	<u>T6</u> T62	
promes, and tabe		6101 Alloy	172	020 [100]	10	102	
		6082 Alloy					
Extruded rod, bar,	980 [527] ^L	<u>· · · ·</u>	_ <u>T4</u>	350 [177]	<u>8</u> 8	<u>T6</u>	
profiles, and tube		6101 Alley	T4511 ^H	350 [177]	<u>8</u>	T6511 ^H	
Extruded rod, bare tube,	970 [521]^L	6101 Alloy 110 [43] max ^P	T4	390 [199]	10		
pipe and	37 0 [32 1]	110 [40] max	T4	440 [227]	5	T61	
structural profiles			T4	410 [210]	9	T63	
			T4	535 [279]	7	T64	
Estanded and hos	070 [501]/	110 [42] mayP	T4	430 [221]	3	T65	
Extruded rod, bar,	970 [521] ^L	110 [43] max ^P	<u>T4</u>	390 [199]	<u>10</u>	<u>T6</u>	
profiles, and tube			T4	440 [227]	5	T61	
<u> </u>			<u>T4</u> <u>T4</u> <u>T4</u> T4	410 [210]	5 9 7 3	T63	
			<u>T4</u>	535 [279]	<u>7</u>	T64	
			<u>T4</u>	430 [221]	<u>3</u>	T65	
		6105 Alloy					
Extruded rod, bar,	716 44-0	a //atamdau	da H	350 [177]	8	T5	
profiles, and tube			us.ijen	.al)			
Extruded rod, bar, profiles, and tube	<u> </u>	<u></u>	<u>T1</u> T4	350 [177] 350 [177]	<u>8</u> 8	<u>T5</u> T6	
profiles, and tube		6110 Alloy	raviaw	330 [177]	<u> </u>	10	
Cold-finished wire, rod,	980-1050 [527-566]	110 [43] max	T4	380 [193]	8	T9 ^S	
and bar			6				
Cold-finished wire, rod, and bar	980–1050 [527–566]	110 [43] max	<u>T4</u> ^S	380 [193]	<u>8</u>	<u>T9</u> ^S	
and bai		6151 Alloy	<u>M-17</u>				
Die forgings	950 980 [510 527]	08/8181/02 110 [43] max 689_4	la4e-b № 9-f4fa	340 [171]	stm-b9 10 -b9	18m ∓6 7	
Die forgings	950–980 [510–527]	110 [43] max	<u>T4</u>	340 [171]	<u>10</u>	<u>T6</u>	
Dollad rings	000 [516]	110 [40] may	T4	240 [171]	10		
Rolled rings	960 [516]	110 [43] max	14 T452 !	340 [171] 340 [171]	10 10	16 1652	
Rolled rings	960 [516]	110 [43] max	T4	340 [171]	10	T6	
			T452'	340 [171]	10	T652'	
Francisco de la constantina della constantina de	1	6162 Alloy	T4	050 [477]			
Extruded rod, bar, profiles, and tube	<u>L</u>	<u></u>	<u>T1</u> T1510	350 [177] 350 [177]	8	<u>T5</u> T5510	
promes, and tube			T1510	350 [177]	8	T5510	
	980 [527] ^{<i>L</i>}	<u></u>		350 [177]	8	T6	
			T4510	350 [177]	8 8 8 8 8 8	T6510	
		0004 All	T45111	350 [177]	8	T6511	
Wire	950 [510]	6201 Alloy 110 [43] max	T3	320 [160]	4	T81 ^R	
VVIIC	930 [310]	6262 Alloy	10	320 [100]	-	101	
Cold-finished wire, rod,	960 1050 [516 566]	110 [43] max	T4	340 [171]	8	T6	
and bar			T4	340 [171]	8	⊺9 ⊆ Т651 [⊬]	
Cold finished wire	060 1060 [616 666]	110 [42] may	T451^H	340 [171]	8		
Cold-finished wire,	960–1050 [516–566]	110 [43] max	<u>T4</u>	340 [171]	<u>8</u>	<u>T6</u>	
rod, and bar			T4	340 [171]	8	T9 ^S	
			T451 ^H	340 [171]	<u>8</u> 8 8	T651 ^H	
	1005 [541]		T42	340 [171]	<u>8</u>	T62	
Extruded red has	060_1050_[516_5667]	410 [42] may		250 [177]	10		
Extruded rod, bar, profiles, and tube	960-1050 [516-566] ^L	110 [43] max		350 [177] 350 [177]	12 12	16 T6510^H	
promos, and tube			T4510^H T4511^H	350 [177]	12	T6511^H	
			T42	350 [177]	12	T62	
Extruded rod, bar,	960-1050 [516-566] ^L	110 [43] max	<u>T4</u>	350 [177]	<u>12</u>	<u>T6</u>	



Pendust Product Product Properature Temper attrice Temper attrice Prof.		O. I. I. I. T. I.			Procinitation Heat Treatment ^B			
Product Prod		S	olution Heat Treatment		Precipita	ation Heat Treatme	nt ^B	
1005 [641] 100	Product	Product		Temperature,	Temper	Metal Temperatur ±10°F [±6°C]	Time at Temperature h	Tempe
1005 [541] 742 350 [177] 11-13 752	profiles, and tube			T4510 ^H	350 [177]	<u>12</u>	T6510 ^H	
Drawn tubo 960-1660 [616-666] 110 [43] max 14 340 [171] 8 764 744							T6511 ^H	
Transport Tran		1005 [541]		<u>T42</u>	<u>350 [177]</u>	<u>11–13</u>	<u>T62</u>	
Table	Drawn tube	960-1050 [516-566]	110 [43] max	T4	340 [171]	8		
### Provided Production of the	2141111400	200 (000 [0.0 000]	[.e]ax		340 [171]		T9 S	
1005 [541] 142 340 [171] 8 700							T62	
Total Tota	Drawn tube	960-1050 [516-566]	110 [43] max	<u>T4</u>	340 [171]	<u>8</u>	<u>T6</u>	
Total				T4 ^S	340 [171]	8	T9 ^S	
S351 Alloy		1005 [541]		T42		8	T62	
### 14 ##			6351 Alloy		•			
### 14 ##		<u>L</u>	<u></u>	<u>T1</u>		<u>8</u>	<u>T5</u>	
\$660-1010-1616-543 * \$410-143 -max** \$740-145 -max** \$750-145 -max** \$760-145 -max** \$760-		<u>L</u>						
## 10-150-150-150-150-150-150-150-150-150-1	profiles, and tube	960-1010 [516-543] ^L						
## 10 10 10 10 10 10 10 10			110 [43] max-	+4				
Section Sect								
Second tube							10	
Settruded rod, ber; 10 10 15 15 10 15 15 15	profiles, and tube						T51	
Extruded rod, ber;						_		
Extruded rod, bar, profiles, and tube	6463 Alloy	1		T44	050 [404]	10	TC 4	
### 10 [43] max** T4		<u></u>	···	111		<u>10</u> 8	154	
### 140 [43] max ## 24	Extruded rod bar	<u>L</u>		T1		<u> </u>	T5	
Section Sect		970 [521][∠]	110 [43] max ^P					
960-1010 110 [43] max T4 350 [177] 8 T6	p							
S16-543 4 7001-Alloy 6463 Alloy 11 400 [204] 1 15 5 5 5 5 5 5 5		•	Tab Ctan		or 360 [182]	6		
Textuded rod, bar, and tube Textuded rod, bar, and and profiles Textuded rod, bar, and and profile			110 [43] max ^P	$U_1U_1U_1U_1U_1U_1U_1U_1U_1U_1U_1U_1U_1U$	350 [177]	<u>8</u>	<u>T6</u>	
Extruded rod, bar, profiles, and tube Extruded rod, bar, profiles, and tube Extruded rod, bar, profiles, and tube Extruded rod, bar, and profiles Extruded rod, bar, a		[516-543]-	7001 Alloy					
Extruded rod, bar, growing profiles and tube Profiles Profil		- thiins		rds iteh	9i) -			
profiles, and tube Extruded rod, ber, erolled rod,	Extruded rod, bar,	E		T1	400 [204]	1	T5	
## W514***** 250-[121] 24 7651***** W514************************************			<u> </u>			3	_	
Section Sect	Extruded rod, bar,	870 [466]	110 [43] max	Prawwo		24		
970 [521] ^L 110 [43] max ^P 74 350 [177] 8 T6 110 [43] max ^P 8	profiles, and tube			W51077.0			T6510^H	
10 [43] max 74 330 [177] 8 T6				₩ <u>u</u>			16511** T62	
Topic Topi		070 [521]	110 [42] may P					
Tool Alloy		970 [321]	AS Ho [45] Hax By)18M-17 14	330 [177]	<u>o</u>	10	
Extruded red, bar, and profiles Total profiles Tota	https://standard	ls iteh ai/catalog/standard	s/sist/ca7d926b-f68	9-4a4e-h169-f4f	or 360 [182]	tm-b9168-b9	18m-17	_
Extruded rod, bar,			7005 Alloy					
Extruded rod, bar,		<u>-</u> -		11			T53	
Extruded rod, bar,	profiles							
And profiles 225 [107] 8 plus 300 [149] 16 16	Extruded rod bar	L		T1			T53	
Total Alloy	Extraded rod, bar,	<u>· · · · </u>	<u></u>	111	room temperature	72 plus	100	
Extruded rod, bar, and profiles Restricted rod, bar, and profi	and profiles					8 plus		
Extruded rod, bar, and profiles 110 [43] max W511 H.U Foom temperature 48 plus 17651 17351 24 plus 325 [163] 12 to 14 Foom temperature 48 plus 17651 12 to 14 Foom temperature 48 plus 17651 12 to 14 Foom temperature 48 plus 17651 12 to 14 Foom temperature 12 to 24 plus 300 [149] 12 to 24 plus 17651				4	300 [149]	<u>16</u>		
## Profiles W511H,U 250 [121] 24 plus 77351	Estruded red her and	075 [400]			room tomporature	40 mlug	T70511H	
Substitute Sub		8/3 [400]	110 (43) max	₩511 ^{H,U}			170511	
Extruded rod, bar, 860-900 [460-482] 110 [43] max W511 H.U room temperature 250 [121] 24 plus 300 [149] 12 to 21	promes				325 [163]			
Extruded rod, bar, 860-900 [460-482] 110 [43] max W511 ^{H,U} room temperature 48 plus 77651 and profiles M511 ^{H,U} 12 to 21 12 to 21 13 13 13 13 13 14 10 16 10 16 10 to								
Extruded rod, bar, 860-900 [460-482] 110 [43] max W511 H.U room temperature 48 plus T7651 and profiles 250 [121] 24 plus 13 13 13 13 140 160 [60 71] 17 17 17 17 17 17 18 plus								
Moderate						12 to 21		
W511 ^{H,U} Toom temperature 48 plus T7351 24 plus 330 [166] 17 24 plus T7351 250 [121] 24 plus 330 [166] 17 250 [121] 24 plus T7351 T7351 T	Extruded rod, bar,	860-900 [460-482]	110 [43] max	<u>W511^{H,U}</u>	room temperature	48 plus	T76511 ^H	
W511 ^{H,U} 375 [163] 13 13 13 13 140 160 10 17 17 17 17 17 17 1	and profiles				0E0 [101]	24 plus		
W511 ^{H,U} room temperature 48 plus T7351 24 plus 330 [166] 17	and promes							
250 [121] 24 plus 330 [166] 17 250 [121] 24 plus 17 250 [121] 24 plus 17 250 [121] 24 plus 17 17 17 17 17 17 17 1				W511 ^{<i>H</i>,<i>U</i>}			T73511 ^H	
330 [166] 17 17 17 17 18 19 19 19 19 19 19								
W52 ^{LU} 250 [121] 24 plus T735; 330 [166] 10 to 16 room temperature 48 plus 250 [121] 24 plus 330 [166] 10 to 16					330 [166]	17		
W52 ^{LU} 250 [121] 24 plus T735; 330 [166] 10 to 16 room temperature 48 plus 250 [121] 24 plus 330 [166] 10 to 16								
250 [166] 10 to 16 330 [166] 49 plus 250 [121] 24 plus 330 [166] 10 to 16	Die and hand forgings	875 [468]	140 160 [60 71]	/νιεοι.υ			T73	
room temperature 48 plus 250 [121] 24 plus 330 [166] 10 to 16				VV32 -			1/352′	
250 [121] 24 plus 330 [166] 10 to 16								
330 [166] 10 to 16								
	Die and hand forgings	860-900 [460-482]	<u>140–160 [60–7</u> 1]	$\underline{W^{\scriptscriptstyle U}}$			<u>T73</u>	



		TABLE 2 Continue	ed				
		Precipitation Heat Treatment ^B					
Product	Product	Metal Temperature, ±10°F [±6°C] ^{C,D}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature ±10°F [±6°C]	Time at Temperature,	Tempe
	_		<u>W51^{<i>i,U</i>}</u>	250 [121] 340 [171] room temperature 250 [121] 335 [168]	8–24 6–16 8–24 plus 8–24 plus	<u>T7351</u> ′	
	<u>875 [468]</u>		<u>W52^{I,U}</u>	room temperature 250 [151]	6–16 24 plus 8–24 plus	<u>T7352</u> ′	
			<u>W</u> ^U	330 [166] room temperature	6-16 48 min 24 min 13-14	<u>T732</u>	
		7050 Alloy					-
Plate	890 [477]	110 [43] max	₩51 ^{Ġ,U} ₩51 ^{Ġ,U}	250 [121] 330 [166] 250 [121] 330 [166]	3 to 6 plus 24 to 30 3 to 6 plus 12 to 15	T7451^G T7651^G	
Plate	880-900 [471-482]	110 [43] max	<u>W51^{<i>G,U</i>}</u>	250 [121]	4-24 plus	<u>T7351^G</u>	
			<u>W51^{G,U}</u>	350 [177] 250 [121] 325 [163]	8–16 3–6 plus 24–30	<u>T7451^G</u>	
	890 [477]		W51 ^{G,U}	250 [121] 325 [163 250 [121]	<u>3–6 plus</u> <u>12–15</u> 6–8 plus	T7651 ^G	
			W51 ^{G,U}	350 [177] 250 [121] 350 [177]	6-8 plus 6.5-7	T762	
	(- <u> </u> ttr	s://standar	ds.iteh		<u>0.0_7</u>	<u> </u>	
Cold-finished wire, rod	890 [477]	110 [43] max	$W_{\overline{\Omega}}$	250 [121]	4 plus	T7	
Cold-finished wire, rod	880–900 [471–482]	110 [43] max	w ^o	355 [179] 250 [121] 350 [177]	8 to 12 4–24 plus 6–12	<u>T7</u>	
Extruded rod, bar, and profiles	890 [477]	110 [43] max	W510^{H,U} W510^{H,U}	250 [121] 350 [177]	24 plus 12 to 15	T73510 ^H	
			M-1 W510 H.U W511 H.U W511 H.U W511 H.U W511 H.U	250 [121] ad 2 340 [171] /as	24 plus (m-b 8 to 12 9]	T76510 ^H T73511 ^H T74511 ^H	
			₩511 ^{H,U}	250 [121] 315 [154] 250 [121]	3 to 6 plus 15 to 18 24 plus	T76511 ^H	
				350 [177] 250 [121]	12 to 15 24 plus		
				340 [171] 250 [121]	8 to 12 3 to 6 plus		
				315 [154]	15 to 18		
Extruded rod, bar,	880-900 [471-482]	110 [43] max	<u>W510^{H,U}</u>	250 [121]	<u>24 plus</u>	T73510 ^H	
and profiles			<u>W510^{H,U}</u>	350 [177] 250 [121] 340 [171]	<u>12–15</u> 24 plus 8–12	<u>T74510^H</u>	
			<u>W510^{H,U}</u>	250 [121] 325 [163]	3–8 plus 15–18	T76510 ^H	
			W511 ^{H,U}	250 [121] 350 [177]	24 plus 12–15	T73511 ^H	
			<u>W511^{H,U}</u> W511 ^{H,U}	250 [121] 340 [171] 250 [121]	24 plus 18–12 3–8 plus	T74511 ^H	
	890 [477]		<u>w</u> ⁰	325 [163] 250 [121]	15–18 6–8 plus	<u>T732</u>	
			$\underline{W^{\scriptscriptstyle U}}$	350 [177] 250 [121] 350 [177]	11.5–12.5 6–8 plus 6–8	<u>T742</u>	
			$\underline{W^{\upsilon}}$	250 [121] 350 [177]	6–8 plus 3.5–4.5	<u>T762</u>	
Die forgings	890 [477]	140 160 [60 71]	₩ <u>″</u>	250 [121] 350 [177]	1 to 6 plus 4 to 12	T74	
Die forgings &	880-900 [471-482]	140-160 [60-71]	$\underline{W^{\upsilon}}$	250 [121]	3-6 plus	<u>T74</u>	



-	Solution Heat Treatment			Precipitation Heat Treatment ^B			
Product	Product	Metal Temperature, ±10°F [±6°C] ^{C,D}	Quench Temperature, °F [°C] ^F	Temper	Metal Temperatur ±10°F [±6°C]	Time at Temperature, h	Temper
hand forgings	_		<u>W51^{<i>I,U</i>}</u>	350 [177] 250 [121] 350 [177]	6-12 3-6 plus	T7451	
Hand forgings	890 [477]	140 160 [60 71]	₩52 ^{1,U}	350 [177] 250 [121] 350 [177]	6–10 1 to 6 plus 4 to 8	T7452	
			W52 ^{I,U}	250 [121] 350 [177]	3–6 plus 6–10	<u>T7452</u>	
	900 [477]		<u>w</u> ^υ	room temperature 250 [121] 250 [121]	<u>72 plus</u> <u>48</u> 6–8 plus	<u>T6</u>	
	890 [477]		<u>₩</u> ′	350 [177] 250 [121]	6-8 6-8 plus	<u>T742</u> T762	
		7075 Alloy ^A		350 [177]	3.5–4.5		
Sheet, bare or Alclad	860-930 [460-499]^V	110 [43] max	<u> </u>	250 [121] or 205 [96] 315 [157] 225 [107] 325 [163] or 225 [107] 335 [168] ^W 250 [121] 325 [163] 250 [121] or 205 [96] 315 [157]	24 4 plus 8 6 to 8 plus 24 to 30 6 to 8 plus 14 to 18 3 to 5 plus 15 to 18 24 4 plus 8	T6 173 ^½ 176 ^½ 162	-
Sheet, bare or Alclad	860-930 [460-499] ^V	110 [43] max	<u>W</u> ^U	250 [121]	<u>24</u>	<u>T6</u>	
			ds.i _w eh	225 [107] 325 [163] or 225 [107] 335 [168] ^W 250 [121]	6-8 plus 24-30 6-8 plus 14-18 3-5 plus	<u>T73</u> ^x	
	870 [466] ^{V,Y}		reve	325 [163] 250 [121]	15–18 23–25	<u>T62</u>	
Plate, bare or Alclad	860-930 [460-499] ^{V.Y}	110 [43] max	W51 ^{G,U} W51 ^{G,U}	250 [121]	24	 T651^G T7351^{G,X}	
			<u>M-1 W51eu</u> Ha4e-b 109-f4fa	or 205 [96] 315 [157] 325 [107] 325 [163] or 225 [107] 335 [168] 250 [121] 325 [163] 250 [121] or 205 [96] 315 [157]	4 plus 8 6 to 8 plus) 24 to 30 6 to 8 plus 14 to 18 3 to 5 plus 15 to 18 24 4 plus 8	17651 G.X 17651 G.X 1801-17	
Plate, bare or Alclad	860-930 [460-499] ^{V, Y}	110 [43] max	<u>W51^{G,U}</u>	250 [121]	<u>24</u>	<u>T651^G</u>	
			<u>W51^{G,U}</u> W51 ^{G,U}	or 205 [96] 315 [157] 225 [107] 325 [163] or 225 [107] 335 [168] ^W 250 [121]	4 plus 8 6–8 plus 24–30 6–8 plus 14–18 24	T7351 ^{G,X}	
				or 250 [121] 325 [163]	3–5 plus 15–18		
	870 [466] ^{V, Y, AA}		<u>w</u> "	250 [121] or 205 [96] 315 [157]	23–25 4 plus 8	<u>T62</u>	
		7075 Alloy ^A (Continue	d)				
Cold-finished wire, rod, and bar	860–930 [460–499] ^{V, Y}	110 [43] max	$\frac{\overline{M}_{\Omega}}{M}$	250 [121] 225 [107] 350 [177]	<u>24</u> 6–8 plus <u>8–10</u>	<u>T6</u> <u>T73</u> ×	
			W51 ^{G,U} W51 ^{G,U}	250 [121] 225 [107]	<u>24</u> 6–8 plus	T651 ^H T7351 ^{H,X}	