Designation: B918/B918M - 20a

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*

- 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 AMS2772.
- 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 1, 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; it only covers the requirements of artificial aging, annealing and associated pyrometry of those processes for products solution heat treated in accordance with Practices B807/B807M and B947. (Refer to Practice B807/B807M for extrusion press solution heat treatment of aluminum alloys and to Practice B947 for hot rolling mill solution heat treatment of aluminum alloys and associated pyrometry.)
- 1.4 *Units*—The values stated in either Metric or US Customary 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 nonconformance 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 appro-

priate safety, health, and environmental 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 practice to the extent referenced herein:
 - 2.2 ASTM Standards:²
 - B557 Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products
 - B557M Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products (Metric)
 - B807/B807M Practice for Extrusion Press Solution Heat Treatment for Aluminum Alloys
 - B881 Terminology Relating to Aluminum- and Magnesium-
 - B917/B917M Practice for Heat Treatment of Aluminum-Alloy Castings From All Processes
 - B947 Practice for Hot Rolling Mill Solution Heat Treatment for Aluminum Alloy Plate
 - G69 Test Method for Measurement of Corrosion Potentials of Aluminum Alloys
 - 2.3 ANSI Standard:³
 - H35.1/H35.1M Alloy and Temper Designation Systems for Aluminum
 - 2.4 SAE Standard:⁴ AMS2750 Pyrometry

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 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.

³ Available from Aluminum Association, 1400 Crystal Dr., Suite 430, Arlington, VA 22202, http://www.aluminum.org.

⁴ Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096, http://www.sae.org.

TABLE 1 Recommended Heat Treatment for Wrought Aluminum Alloys $^{\!A,W}$

Drodust		Solution Heat Treatment			Precipitation at Treatment ^B	
Product ——	Metal Temperature, ±10 °F [±6 °C] ^{C,D,V}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature, ±10 °F [±6 °C] ^V	Time at Temperature, h	Temper
		2011 Alloy ^A				
Cold-finished wire, rod, and bar	945–995 [507–535]	110 [43] max	T3 T4	320 [160]	14	Т8
and par			T451	• • •		
Orawn tube and pipe	975 [524]	110 [43] max	T3 T4511	320 [160]	14 	T8
		2014 Alloy ^A				
Flat sheet, bare or Alclad	925–945 [496–507] 935 [502] ^U	110 [43] max	T3 T42	320 [160] ^{<i>U</i>}	18–20 ^{<i>U</i>}	T62 ^{<i>U</i>}
Coiled sheet, bare or Alclad	925–945 [496–507] 935 [502] ^U	110 [43] max	T4 T42	320 [160] 320 [160] ^U	18 18–20 ^{<i>U</i>}	Т6 Т62 ^{<i>U</i>}
Plate, bare or Alclad	925–945 [496–507] 935 [502] ^U	110 [43] max	T451 T42	320 [160] 350 [177] ^U	18 8–9 ^{<i>U</i>}	T651 T62 ^{<i>U</i>}
	925–945 [496–507]	110 [43] max	T4		9	 T6
and bar			T451	350 [177]	9	T651
	935 [502] ^U		T42	350 [177] ^U	8–9 ^U	T62 ^υ
Extruded wire, rod, bar,	925-945 [496-507]	110 [43] max	T4	350 [177]	9	Т6
profiles, tube, and pipe	-		T4510	350 [177]	9	T6510
	935 [502] ^U		T4511 T42	350 [177] 350 [177] ^U	9 8–9 ^{<i>u</i>}	T6511 T62 ^{<i>U</i>}
Drawn tube and pipe	925–945 [496–507] 935 [502] ^U	110 [43] max Tab. Standar	T4 T42	350 [177] 350 [177] ^U	9 8–9 ^{<i>u</i> - – – – – – –}	Τ6 Τ62 ^{<i>U</i>}
Die forgings	925–945 [496–507]	140–180 [60–82]	T4	350 [177]	9	T6
	925–945 [496–507] 935 [502] ^U	140–180 [60–82]	T4 T452	350 [177] 350 [177] ^U	9 10 ^{<i>u</i>}	Τ6 Τ652 ^υ
		2017 Alloy ^A	•			
Cold-finished wire, rod, and bar	925–950 [496–510]	CUM 110 [43] max Pre	T4 T451 T42	•••		
	040 070 [504 504]	2018 Alloy ^A		0.10 [171]	10	
Die forgings	940–970 [504–521]	Boiling Water ^T 2024 Alloy ^A	T4	340 [171]	10	T61
Flat sheet, bare	910–930 [488–499]	sist/842 cf.110 [43] max 4.35-1	262 T344a	375 [191]	h918 -12 918m	
or Alclad	920 [493] ^U		T361	375 [191 ⁰	801011	T861 ^U
			T42 T42	375 [191] ^U 375 [191] ^U	9–10 ^{<i>U</i>} 16–18 ^{<i>U</i>}	T62 ^U T72 ^U
	910–930 [488–499]	110 [43] max	T4	375 [191]	9–10	 T6
or Alclad	920 [493] ^U		T42	375 [191] ^{<i>U</i>}	9^U	T62 ^U
			T42	375 [191] ^U	16–18 ^U	T72 ^{<i>U</i>}
Plate, bare or Alclad	910-930 [488-499]	110 [43] max	T351	375 [191]	12	T851
	920 [493] ^U		T361	375 [191] ^{<i>U</i>}	8 ^U	T861 ^{<i>U</i>}
			T42	375 [191] ^U	9–10 ^{<i>U</i>}	T62 ^{<i>U</i>}
Cold-finished wire, rod, and bar	910–930 [488–499]	110 [43] max	T351 T36	375 [191] 	12 	T851
	920 [493] ^U		T4 T42	375 [191] 375 [191] ^U	12 12–13 ^{<i>U</i>}	Τ6 Τ62 ^{<i>υ</i>}
 Extruded wire, rod, bar,	910–930 [488–499]	110 [43] max	T3		12	T81
profiles, tube, and pipe	[007 007]	TTO [TO] MAX	T3510	375 [191]	12	T8510
,, P.Po			T3511	375 [191]	12	T8511
	920 [493] ^U		T42	375 [191] ⁰	12–13 ^{<i>U</i>}	T62 ^U
Drawn tube and pipe	910–930 [488–499] 920 [493] ^U	110 [43] max	T3 T42	375 [191] 375 [191] ^U	12 9–10 ^{<i>U</i>}	Т8 Т62 ^{<i>U</i>}
		2025 Alloy ^A				
Die forgings	950–970 [510–521]	140–160 [60–71] 2117 Alloy ^A	T4	350 [177]	9	Т6
Cold-finished, wire	925–950 [496–510]	2117 Alloy^ 110 [43] max	T4			
or rod				***		

Droduct		Solution Heat Treatment			Precipitation Heat Treatment ^B			
Product —	Metal Temperature, ±10 °F [±6 °C] ^{C,D,V}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature, ±10 °F [±6 °C] ^V	Time at Temperature, h	Temper		
Plate	910–930 [488–499]	2124 Alloy ^A 110 [43] max	T3	375 [191]	12	T8		
riale	910-930 [400-499]	110 [43] Illax	T31	370 [188]	12	T8151		
			T4	375 [191]	9	T6		
	920 [493] U		T3	375 [191] ^U	12 ^U	T82 ^U		
		2218 Allov ^A	T42	375 [191] ^U	10 ^U	T62 ^U		
Die forgings	940–960 [504–516]	Boiling Water ^T	T4	340 [171]	10	T61		
	.,		T4	460 [238]	6,,	T7 , ,		
	950 [510] ^U		T4 T4	340 [171] ^U 460 [238] ^U	10 ⁰ 6 ⁰	T62 ^U T72 ^U		
		2219 Alloy ^A	14	400 [230]	0	172		
Flat sheet, bare	985–1005 [529–541]	110 [43] max	T31	350 [177]	18	T81		
or Alclad	005 [505]//		T37	325 [163]	24 17–19 ^{<i>U</i>}	T87 T62 ^υ		
	995 [535] ^U		T42 	375 [191] ^U	17-19-	162		
Plate	985-1005 [529-541]	110 [43] max	T37	325 [163]	17–19	T87		
	005 (505)//		T351	350 [177]	18	T851		
	995 [535] ^U		T42	375 [191] ^U	35–37 ^U	T62 ^U		
Cold-finished wire, rod,	985-1005 [529-541]	110 [43] max	T4	375 [191]	18	T6		
and bar			T351	375 [191]	18	T851		
Extruded wire, rod, bar,	985–1005 [529–541]	110 [43] max	 T31	375 [191]	18	T81		
profiles, tube, and pipe	903-1003 [329-341]	110 [40] Max	T3510	375 [191]	18	T8510		
, , ,			T3511	375 [191]	18	T8511		
	995 [535] ^U		T42	375 [191] ^{<i>u</i>}	35–37 ^U	T62 ^{<i>U</i>}		
		ah Standar	T3	375 [191] ^{<i>U</i>}	17–19 ^{<i>U</i>}	$T82^{\mathcal{U}}$		
Die forgings and rolled	985–1005 [529–541]	110 [43] max	T4	375 [191]	26	T6		
rings	995 [335] ^U	// 4	T42	375 [191] ^U	25–27 ^U	T62 ^U		
			T352	350 [177] ^U	17–19 ^{<i>U</i>}	T82 ^{<i>U</i>}		
	985–1005 [529–541]	110 [43] max	T4	375 [191]	26	T6		
Tiana lorgings	995 [335] ^U	ument Pro	T42	375 [191] ^Ū	25–27 ^U	T62 ^U		
	Duc		T352	350 [177] ^U	17–19 ^U	T852 ^U		
Die, hand, and rolled	975–995 [524–535]	2618 Alloy ^A Boiling Water ^T	T4	390 [199]	20	T61		
ring forgings	985 [529] ^U	ACTM D019/D019M 2	T42	390 [199] ^U	19–21 ^{<i>U</i>}	T62 ^υ		
D: ()	040,070,[504,504]	4032 Alloy	<u>Ja</u>	0.40 [474]	10	Т0		
Die forgings and siteh a	940–970 [504–521] 955 [513] ^U	/842 140–180 [60–82] 4 3 6 –	b262 <u>T44</u> 4a T42	340 [171] 340 [171]	b918_10018m	T62 ^U		
	555 [516]					102		
		6005 Alloy			0 11			
	^L	6005 Alloy	T1	350 [177]	8	T5		
	^L					T5		
profiles, tube, and pipe	^L	·	T1	350 [177]	8			
profiles, tube, and pipe Extruded rod, bar,	^L	6005A Alloy				T5 T5 T61		
extruded rod, bar, profiles, tube, and pipe	L	6005A Alloy 6013 Alloy ^A	T1 T1 T4	350 [177] 350 [177] 350 [177]	8 8 8	T5 T61		
Extruded rod, bar, profiles, tube, and pipe	^L 1045–1065 [563–574]	6005A Alloy	T1	350 [177] 350 [177] 350 [177] 375 [191]	8 8 8	T5		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare	L	6005A Alloy 6013 Alloy ^A	T1 T1 T4	350 [177] 350 [177] 350 [177]	8 8 8	T5 T61		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare	1045–1065 [563–574] 1000 [538] ^U	6005A Alloy 6013 Alloy ^A 110 [43] max	T1 T1 T4	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] ^U	8 8 8 4 8 4–5	T5 T61 T6		
Extruded rod, bar, profiles, tube, and pipe	1045–1065 [563–574]	6005A Alloy 6013 Alloy ^A	T1 T1 T4	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174]	8 8 8	T5 T61		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566]	6005A Alloy 6013 Alloy ^A 110 [43] max	T1 T1 T4	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] ^U 345 [174]	8 8 8 4 8 4–5	T5 T61 T6 T62 ^U T651		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare Cold-finished wire, rod,	1045–1065 [563–574] 1000 [538] ^U	6005A Alloy 6013 Alloy ^A 110 [43] max 110 [43] max	T1 T1 T4	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] ^U	8 8 8 8 4 4 8 4–5 ^{<i>U</i>} 8–16	T5 T61 T6		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare Cold-finished wire, rod, and bar	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566] 1040–1060 [560–571]	6005A Alloy 6013 Alloy 110 [43] max 110 [43] max 6020 Alloy	T1 T1 T4 T4 T42	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] 345 [174] 375 [191]	8 8 8 4 8 4–5 ^U 8–16	T5 T61 T6 T62 ^U T651 		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566]	6005A Alloy 6013 Alloy ^A 110 [43] max 110 [43] max	T1 T1 T4	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] 345 [174]	8 8 8 8 4 4–5 ⁰ 8–16	T5 T61 T6 T62 ^U T651		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare Cold-finished wire, rod, and bar	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566] 1040–1060 [560–571]	6005A Alloy 6013 Alloy 110 [43] max 110 [43] max 6020 Alloy	T1 T1 T4 T4 T42	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] 345 [174] 375 [191]	8 8 8 4 8 4–5 ^U 8–16	T5 T61 T6 T62 ^U T651 		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare Cold-finished wire, rod, and bar Rod, bar & extrusion Wire, rod, & bar	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566] 1040–1060 [560–571] 1010–1050 [543–566]	6005A Alloy 6013 Alloy ^A 110 [43] max 110 [43] max 110 [43] max 6020 Alloy ^A 110 [43] max 110 [43] max 6041 Alloy	T1 T1 T4 T4 T42 W' W'	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] 345 [174] 375 [191] 375 [191] 355 [179]	8 8 8 4 4–5 ¹¹ 8–16 4 4 4 8–10	T5 T61 T6 T62 ^U T651 T8 T6511 T8		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare Cold-finished wire, rod, and bar Rod, bar & extrusion Wire, rod, & bar Extruded rod, bar, and	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566] 1040–1060 [560–571]	6005A Alloy 6013 Alloy ^A 110 [43] max 110 [43] max 110 [43] max 6020 Alloy ^A 110 [43] max 110 [43] max	T1 T1 T4 T4 T42 W'	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] 345 [174] 375 [191] 375 [191]	8 8 8 4 4 8-16 8-16 8-10	T5 T61 T6 T62 ^U T651 T651 T8 T6511		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare Cold-finished wire, rod, and bar Rod, bar & extrusion Wire, rod, & bar	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566] 1040–1060 [560–571] 1010–1050 [543–566]	6005A Alloy 6013 Alloy ^A 110 [43] max 110 [43] max 110 [43] max 6020 Alloy ^A 110 [43] max 110 [43] max 6041 Alloy	T1 T1 T4 T4 T42 W' W'	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] 345 [174] 375 [191] 375 [191] 355 [179]	8 8 8 4 4–5 ¹¹ 8–16 4 4 4 8–10	T5 T61 T6 T62 ^U T651 T8 T6511 T8		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare Cold-finished wire, rod, and bar Rod, bar & extrusion Wire, rod, & bar Extruded rod, bar, and profiles	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566] 1040–1060 [560–571] 1010–1050 [543–566] 1010–1050 [543–566]	6005A Alloy 6013 Alloy ^A 110 [43] max 110 [43] max 110 [43] max 6020 Alloy ^A 110 [43] max 110 [43] max 110 [43] max 6041 Alloy 110 [43] max	T1 T1 T4 T4 T42 W' W' T4 T4511	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] 345 [174] 375 [191] 355 [179] 350 [176] 350 [176]	8 8 8 8 4-5 ^U 8-16 	T5 T61 T6 T62 ^U T651 T651 T8 T6511 T8 T6 T6511		
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Sheet, bare Plate, bare Cold-finished wire, rod, and bar Rod, bar & extrusion Wire, rod, & bar Extruded rod, bar, and	1045–1065 [563–574] 1000 [538] ^U 1020–1050 [549–566] 1040–1060 [560–571] 1010–1050 [543–566]	6005A Alloy 6013 Alloy 110 [43] max 110 [43] max 110 [43] max 6020 Alloy 110 [43] max 110 [43] max 110 [43] max 110 [43] max	T1 T1 T4 T4 T42 W' W' T4	350 [177] 350 [177] 350 [177] 375 [191] or 345 [174] 375 [191] 345 [174] 375 [191] 355 [179] 355 [179]	8 8 8 4 8 4–5 ^u 8–16 4 4 4 8–10 8–10	T5 T61 T6 T62 ^U T651 T651 T8 T6511 T8		

		Solution		F	Precipitation	
Product —		Heat Treatment		He	at Treatment ^B	
	Metal Temperature, ±10 °F [±6 °C] ^{C,D,V}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature, ±10 °F [±6 °C] ^V	Time at Temperature, h	Temper
		6053 Alloy ^A				
Cold-finished wire and rod	960–980 [516–527]	110 [43] max	T4	355 [179]	8	T61
Die forgings	960–980 [516–527]	110 [43] max	T4	340 [171]	10	T6
	970 [521] ^U	6061 Alloy ^A	T42	340 [171] ^U	10 ^U	T62 ^U
Sheet, bare or Alclad	960–1075 [516–579] ^F	110 [43] max	T4	320 [160]	18	T6
officet, bare of Aloiau	985 [529] ^U	110 [40] Max	T42	350 [177]	8–10 ^{<i>U</i>}	Τ62 ^{<i>U</i>}
	· ·		T42 ^P	320 [160] ^{P,U}	17–19 ^{<i>P,U</i>}	T62 ^{P,U}
Plate	960–1075 [516–579]	110 [43] max	T451	320 [160]	18	T651
	985 [529] ^U 		T42	350 [177] ^U	18 ^U	Τ62 ^{<i>U</i>}
Tread Sheet and Plate ^G	960–1075 [516–579]	110 [43] max	T4	320 [160]	18	T6
Cold-finished wire, rod,	960–1075 [516–579]	110 [43] max ^H	T4	350 [177]	8	Т6
and bar				or 320 [160]	18	
			Т3	340 [171] or 320 [160]	8 18	T89
			T4	350 [177]	8	T94
			T451	350 [177]	8	T651
	985 [529] ^U		T42	350 [177] ^U	8–10 ^{<i>U</i>}	T62 ^U
Extruded rod, bar,	L		T1	350 [177]	 8	T51
profiles, tube, and pipe	960–1075 [516–579] ^L	110 [43] max ^H	T4	350 [177]	8	T6
, , , , , , , , , , , , , , , , , , , ,			T4510	350 [177]	8	T6510
			T4511	350 [177]	8	T6511
	985 [529] ^U	en Standar	T42	350 [177] ^U	8–10 ^{<i>U</i>}	Τ62 ^{<i>U</i>}
Structural profiles	960–1075 [516–579] ^L	110 [43] max ^H	14 T4	350 [177]	8	T6
Drawn tube and pipe	960-1075 [516-579] ^L	110 [43] max	T4	320 [160]	18	T6
	985 [529] ^U		T42	or 340 [171] 340 [171] ^U	8 8 ^U	Т62 ^{<i>U</i>}
		110 [40] may	Y 165 YY T4			
Die and hand forgings	960–1075 [516–579]	110 [43] max	14	350 [177] or 340 [171]	8 10	T6
Rolled rings	960–1075 [516–579]	110 [43] max	<u>a</u> T4	350 [177]	8	 Т6
ps://standards.iteh.ai/	985 [529] ^U	t/842cf46d-13e5,4c3b-l	262T452	350 [177] ^U	6018-1018m	T652 ^U
Extruded rod, bar, tube,	<u>L</u>	6063 Alloy	T1	400 [204]	1–2	T5
pipe, and profiles		• • •		or 360 [182]	3	15
p.po, and p.omoo			T1	400 [204] ^U	1–2 ^U	$T52^{U}$
				or 360 [182] ^U	3^U	
	960–1010 [516–543] ^L	110 [43] max ^H	T4	350 [177]	8	T6
	985 [529] ^U		T42	or 360 [182] 350 [177] ^U	6 8–10 ^{<i>U</i>}	T62 U
Drawn tube and pine	060 1010 [516 542]	110 [42] may	T4	250 [177]		те
	960–1010 [516–543] ^{<i>L</i>}	110 [43] max	T4 T3	350 [177] 350 [177]	8 8	T6 T83
Drawn tube and pipe	960–1010 [516–543] ^{<i>L</i>}	110 [43] max	T4 T3 T3	350 [177]	8 8 8 8	T6 T83 T831
Drawn tube and pipe		110 [43] max	Т3	350 [177] 350 [177] 350 [177]	8	T83 T831 T832
Drawn tube and pipe	960–1010 [516–543] ^L 985 [529] ^U		T3 T3	350 [177] 350 [177]	8 8	T83 T831
	985 [529] ^U	6064 Alloy	T3 T3 T3 T42	350 [177] 350 [177] 350 [177] 350 [177] ^U	8 8 8 8–10 ^{<i>U</i>}	T83 T831 T832 T62 ⁰
Extruded rod, bar,			T3 T3 T3	350 [177] 350 [177] 350 [177]	8 8 8	T83 T831 T832
Extruded rod, bar, profiles, tube, and pipe	985 [529] ^U	6064 Alloy 6066 Alloy	T3 T3 T3 T42 T4 T4	350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177]	8 8 8–10 ^U 8 8	T83 T831 T832 T62 ^U T6 T6 T6511
Extruded rod, bar, profiles, tube, and pipe	985 [529] ^U	6064 Alloy	T3 T3 T3 T42 T4 T4511	350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177]	8 8 8-10 ^U 8 8	T83 T831 T832 T62 ^U T6 T6511
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar,	985 [529] ^U	6064 Alloy 6066 Alloy	T3 T3 T3 T42 T4 T4511 T4 T4510	350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177]	8 8 8 8-10 ^U 8 8 8	T83 T831 T832 T62 ^U T6 T6511 T6 T6510
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar,	985 [529] ^U	6064 Alloy 6066 Alloy	T3 T3 T3 T42 T4 T4511	350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177]	8 8 8-10 ^U 8 8	T83 T831 T832 T62 ^U T6 T6511
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe	985 [529] ^U ^L 960–1010 [516–543] ^L	6064 Alloy 6066 Alloy	T3 T3 T3 T42 T4 T4511 T4 T4510 T4511	350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177] 350 [177]	8 8 8 8–10 ^U 8 8 8	T83 T831 T832 T62 ^U T6 T6511 T6 T6510 T6511
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Die forgings	985 [529] ^U ^L 960–1010 [516–543] ^L 985 [529] ^U 960–1010 [516–543]	6064 Alloy 6066 Alloy 110 [43] max 110 [43] max 6070 Alloy	T3 T3 T3 T42 T4 T4511 T4 T4510 T4511 T42	350 [177] 350 [177]	8 8 8 8-10 ^U 8 8 8 8 8-10 ^U	T83 T831 T832 T62 ^U T6 T6511 T6 T6510 T6511 T62 ^U T6
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Die forgings Extruded rod, bar,	985 [529] ^U ^L 960–1010 [516–543] ^L 985 [529] ^U	6064 Alloy 6066 Alloy 110 [43] max	T3 T3 T3 T42 T4 T4511 T4 T4510 T4511 T42 T4 T4	350 [177] 350 [177]	8 8 8-10 ^U 8 8 8 8-10 ^U 	T83 T831 T832 T62 ^U T6 T6511 T6 T6510 T6511 T62 ^U T6 T6
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe Die forgings Extruded rod, bar,	985 [529] ^U ^L 960–1010 [516–543] ^L 985 [529] ^U 960–1010 [516–543]	6064 Alloy 6066 Alloy 110 [43] max 110 [43] max 6070 Alloy 110 [43] max	T3 T3 T3 T42 T4 T4511 T4 T4510 T4511 T42	350 [177] 350 [177]	8 8 8 8-10 ^U 8 8 8 8 8-10 ^U	T83 T831 T832 T62 ^U T6 T6511 T6 T6510 T6511 T62 ^U T6
Extruded rod, bar, profiles, tube, and pipe Extruded rod, bar, profiles, tube, and pipe	985 [529] ^U ^L 960–1010 [516–543] ^L 985 [529] ^U 960–1010 [516–543]	6064 Alloy 6066 Alloy 110 [43] max 110 [43] max 6070 Alloy	T3 T3 T3 T42 T4 T4511 T4 T4510 T4511 T42 T4 T4	350 [177] 350 [177]	8 8 8-10 ^U 8 8 8 8-10 ^U 	T83 T831 T832 T62 ^U T6 T6511 T6 T6510 T6511 T62 ^U T6 T6

		IABLE 1 Continued					
Product —	Solution Heat Treatment			Precipitation Heat Treatment ^B			
Floudet —	Metal Temperature, ±10 °F [±6 °C] ^{C,D,V}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature, ±10 °F [±6 °C] ^V	Time at Temperature, h	Temper	
		6101 Alloy					
Extruded rod, bar,	970 [521] ^L	110 [43] max ^H	T4	390 [199]	10	T6	
profiles, tube, and pipe			T4	440 [227]	5	T61	
			T4	410 [210]	9	T63	
			T4	535 [279]	7	T64	
		6105 Alloy	T4	430 [221]	3	T65	
Extruded rod, bar,	^L		T1	350 [177]	8	T5	
profiles, tube, and pipe	• • •		T4	350 [177]	8	T6	
, , , , , , , , , , , , , , , , , , , ,		6110 Alloy					
Cold-finished wire, rod, and bar	980–1050 [527–566]	110 [43] max	T4	380 [193]	8	Т9	
		6151 Alloy					
Die forgings	950–980 [510–527]	110 [43] max	T4	340 [171]	10	Т6	
Rolled rings	960 [516]	 110 [43] max	 T4	340 [171]	10	T6	
Holled Hillys	965 [518] ^U	110 [43] IIIax	T452	340 [171] ^U	10	T652 ^{<i>U</i>}	
	303 [310]	6162 Alloy	1402	040 [171]	10	1002	
Extruded rod. bar.	^L		T1	350 [177]	8	T5	
profiles, tube, and pipe	-	·	T1510	350 [177]	8	T5510	
			T1511	350 [177]	8	T5511	
	980 [527] ^L		T4	350 [177]	8	T6	
			T4510	350 [177]	8	T6510	
			T45111	350 [177]	8	T6511	
		6201 Alloy					
Wire	950 [510]	110 [43] max	T3	320 [160]	4	T81	
		6262 Alloy					
Cold-finished wire,	960–1050 [516–566] 🍨 🤊	110 [43] max	T4	340 [171]	8	T6	
rod, and bar			T4	340 [171]	8	T9	
	1005 [544]//		T451	340 [171]	8 8 ^U	T651	
	1005 [541] ^U		T42	340 [171] ^U	80	T62 ^U	
Extruded rod, bar,	960–1050 [516–566] ^L	110 [43] max	T4	350 [177]	12	T6	
profiles, tube, and pipe	300 1030 [310 300]	110 [40] Max	T4510	350 [177]	12	T6510	
promoo, tabo, and pipo			T4511	350 [177]	12	T6511	
	1005 [541] ⁰	cument rievi	T42	350 [177] ^U	11–13 ^U	T62 ^U	
Drawn tube and pipe	960-1050 [516-566]	110 [43] max	T4	340 [171]	8	T6	
		A CITIA DO 10 / DO 10 M 20	T4	340 [171]	8	Т9	
	1005 [541] ^{<i>U</i>}		T42	340 [171] ^{<i>Ū</i>}	8^U	$T62^{\mathcal{U}}$	
ne://standards iteh a	i/catalog/standards/s	ict/249 cf464_6351.Alloy-21-1-07	62 <u>-444</u> a	cf2409h0/astm_1	h918_h918m	_20a	
Extruded rod, bar,	i catalog strictaras/s	DV 0 1201100 1303 1030 021	T1	350 [177]	8	T5	
profiles, tube, and pipe				350 [177]	8	T51	
	^L		T11	250 [121]	10	T54	
				or 350 [177]	8		
	960–1010 [516–543] ^L	110 [43] max ^H	T4	350 [177]	8	T6	
Extruded rod, bar,	^L	6463 Alloy	T1	400 [204]	1	T5	
profiles, tube, and pipe	• • •		11	or 360 [182]	3	15	
profiles, tube, and pipe	970 [521] [∠]	110 [43] max ^H	T4	350 [177]	8	Т6	
	370 [321]	110 [40] max	17	or 360 [182]	6	10	
		7005 Alloy		0. 000 [.02]			
Extruded rod, bar,	^L		T1	room temperature	72 plus	T53	
and profiles				225 [107]	8 plus		
				300 [149]	16		
		7049 Alloy ^A					
Extruded rod, bar,	860-900 [460-482]	110 [43] max	W511 ¹	room temperature	48 plus	T76511	
and profiles				250 [121]	24 plus		
			14/542/	375 [163]	13	T705 · ·	
			W511 ⁷	room temperature	48 plus	T73511	
				250 [121]	24 plus		
				330 [166]	17 		
Die and hand forgings*	860–900 [460–482]	140–160 [60–71]		room temperature	48 plus	T73	
2.5 and hand longings	000 000 [400 402]	1.0 .00 [00 71]	••	250 [121]	8–24	.,,	
				340 [171]	6–16		
			W51 [/]	room temperature	8–24 plus	T7351	
			-	250 [121]	8–24 plus		
				335 [168]	6–16		
	875 [468] ^U		W52 ¹	room temperature U	24 plus ^U	T7352 U	
	875 [468] ^U		W52′	room temperature ^U 250 [121] ^U	24 plus ⁰ 8–24 plus ⁰ 6–16 ⁰	17352	

Product		Solution Heat Treatment		Precipitation Heat Treatment ⁸			
	Metal Temperature, ±10 °F [±6 °C] ^{C,D,V}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature, ±10 °F [±6 °C] ^V	Time at Temperature, h	Tempe	
		7049 Alloy (Continued) ^A					
ie and hand forgings	875 [468] ^U		W′	room temperature ^U	48 min ^U	T732 ^U	
Continued)				250 [121] ^U	24 min plus ^U		
		7050 Aller A		325 [163] ^U	13–14 ^U		
Plate	880–900 [471–482]	7050 Alloy ^A 110 [43] max	W51 [/]	250 [121]	4. 04 pluo	T7351	
riale	880–900 [471–462]	110 [43] Max	VVSI	250 [121] 350 [177]	4–24 plus 8–16	17351	
			W51 [/]	250 [121]	3–6 plus	T7451	
			VVSI	325 [163]	24–30	17451	
			W51 [/]	250 [121]	3–6 plus	T7651	
			****	325 [163	12–15	17001	
	890 [477] $^{\it U}$		W51 [/]	250 [121] ^U	6–8 plus ^U	T742 [∪]	
				350 [177] ^U	6–8 ^U		
			W51 [/]	250 [121] ^U	6–8 plus ^U	T762 ^U	
				350 [177] ^{<i>U</i>}	6.5–7 ^U		
					4.04.1		
Cold-finished wire, rod	880–900 [471–482]	110 [43] max	W [']	250 [121]	4–24 plus	T7	
				350 [177]	6–12		
extruded rod, bar,	880–900 [471–482]	110 [43] max	W510 [/]	250 [121]	24 plus	T73510	
nd profiles	1	• • •		350 [177]	12–15		
•			W510 ¹	250 [121]	24 plus	T74510	
				340 [171]	8–12		
			W510 ⁷	250 [121]	3-8 plus	T76510	
				325 [163]	15–18		
			W511 ⁷	250 [121]	24 plus	T7351	
				350 [177]	12–15		
			W511 ¹	250 [121]	24 plus	T7451	
			US.	340 [171]	18–12		
			W511 ⁷	250 [121]	3–8 plus	T7651	
	610.44.000		4	325 [163]	15–18		
	890 [477] ^U		W'	250 [121] ^U	6–8 plus ^U	T732 ^L	
			/	350 [177] ^U	11.5–12.5 ^U	 / .	
			W [']	250 [121] ^U	6–8 plus ^U	T742 ⁰	
			/1 e _w /V	350 [177] ^U	6–8 ^U	T762 ⁰	
			VV.	250 [121] ^U 350 [177] ^U	6–8 plus ^U 3.5–4.5 ^U	1762	
ie forgings &	880-900 [471-482]	140–160 [60–71]	W′	250 [121]	3-6 plus	T74	
and forgings			<u>1</u>	350 [177]	6–12		
			262W51 ⁴ 4a	Cf8 4 (250 [121]	3–6 plus	T7451	
			/	350 [177]	6–10		
			W52 ¹	250 11211	3–6 plus	T7452	
			*****	250 [121]	•		
				350 [177]	6–10	Т0	
			W'	350 [177] room temperature	6–10 72 plus	T6	
	900 [477]		W′	350 [177] room temperature 250 [121]	6–10 72 plus 48		
	890 [477] ^U			350 [177] room temperature 250 [121] 250 [121] ^U	6–10 72 plus 48 6–8 plus ^{<i>U</i>}		
	890 [477] ^U		w' w'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U	6–10 72 plus 48 6–8 plus ^U 6–8	T742 ^L	
	890 [477] ^U		W′	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U	6–10 72 plus 48 6–8 plus ^U 6–8 ^U 6–8 plus ^U	T742 ^L	
	890 [477] ^U	7075 Alloy ^A	w' w'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U	6–10 72 plus 48 6–8 plus ^U 6–8	T742 ^L	
heet, bare or Alclad	890 [477] ^U 860–930 [460–499] ^J	7075 Alloy^A 110 [43] max	W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U	6–10 72 plus 48 6–8 plus ^U 6–8 ^U 6–8 plus ^U	T742 ^t T762 ^t T6	
heet, bare or Alclad			W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U	6–10 72 plus 48 6–8 plus ^U 6–8 ^U 6–8 plus ^U 3.5–4.5 ^U	T742 ^t T762 ^t T6	
heet, bare or Alclad			W' W' W'	350 [177] room temperature 250 [121] 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 255 [107] 325 [163]	6–10 72 plus 48 6–8 plus ^U 6–8 plus ^U 6–8 plus ^U 3.5–4.5 ^U	T742 ^L T762 ^L T6	
iheet, bare or Alclad			W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 255 [107] 225 [107] 325 [163] or 225 [107]	6–10 72 plus 48 6–8 plus 6–8 plus 3.5–4.5 24 6–8 plus 24–30 6–8 plus	T742 ^L	
sheet, bare or Alclad			W' W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K	6–10 72 plus 48 6–8 plus 6–8 lus 3.5–4.5 lus 24 6–8 plus 24–30 6–8 plus 14–18	T742 ^L T762 ^L T6 T73 ^M	
iheet, bare or Alclad			W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 255 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121]	6–10 72 plus 48 6–8 plus 6–8 lus 3.5–4.5 24 6–8 plus 24–30 6–8 plus 14–18 3–5 plus	T742 ^t T762 ^t T6 T73 ^M	
sheet, bare or Alclad	860–930 [460–499] ^J		W' W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163]	6–10 72 plus 48 6–8 plus ^U 6–8 ^U 6–8 plus ^U 3.5–4.5 ^U 24 6–8 plus 24–30 6–8 plus 14–18 3–5 plus 15–18	T742 ^L T762 ^L T6 T73 ^M T76 ^M	
heet, bare or Alclad			W' W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 255 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121]	6–10 72 plus 48 6–8 plus 6–8 lus 3.5–4.5 24 6–8 plus 24–30 6–8 plus 14–18 3–5 plus	T742 ^L T762 ^L T6	
sheet, bare or Alclad	860–930 [460–499] ^J		W' W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163]	6–10 72 plus 48 6–8 plus ^U 6–8 ^U 6–8 plus ^U 3.5–4.5 ^U 24 6–8 plus 24–30 6–8 plus 14–18 3–5 plus 15–18	T742 ^t T762 ^t T6 T73 ^M T76 ^M	
	860–930 [460–499] ^J 870 [466] ^U	110 [43] max	W' W' W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121]	6-10 72 plus 48 6-8 plus 6-8' 6-8 plus 3.5-4.5' 24 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25'	T742 ^t T762 ^t T6 T73 ^M T76 ^M T62 ^U	
	860–930 [460–499] ^J		W' W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121] 250 [121]	6-10 72 plus 48 6-8 plus 6-8' 6-8 plus 3.5-4.5' 24 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25'	T742 ^t T762 ^t T6 T73 ^M T76 ^M T62 ^t	
	860–930 [460–499] ^J 870 [466] ^U	110 [43] max	W' W' W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] 250 [121] 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121] 250 [121] 250 [121] 325 [163]	6-10 72 plus 48 6-8 plus 6-8 lus 3.5-4.5 l 24 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25 l 24 4 plus	T742 ^L T762 ^L T6 T73 ^M T76 ^M T62 ^L	
Sheet, bare or Alclad	860–930 [460–499] ^J 870 [466] ^U	110 [43] max	W' W' W' W' W'	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121] 250 [121]	6-10 72 plus 48 6-8 plus 6-8' 6-8 plus 3.5-4.5' 24 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25'	T742 ^t T762 ^t T6 T73 th T76 th T62 th T62 th T651	
	860–930 [460–499] ^J 870 [466] ^U	110 [43] max	W' W' W' W' W' W' W' W' W' The state of the	350 [177] room temperature 250 [121] 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] 250 [121] 255 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121] 325 [163] 250 [121] 315 [163] 250 [121] 315 [163]	6-10 72 plus 48 6-8 plus 6-8 lus 3.5-4.5 l 24 6-8 plus 24-30 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25 l 24 4 plus 8	T742 ^t T762 ^t T6 T73 th T76 th T62 th T62 th T651	
	860–930 [460–499] ^J 870 [466] ^U	110 [43] max	W' W' W' W' W' W' W' W' W' The state of the	350 [177] room temperature 250 [121] 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121] 325 [163] 250 [121] 315 [163] 250 [121] 07 205 [96] 315 [157] 225 [107]	6-10 72 plus 48 6-8 plus ^U 6-8 Plus ^U 3.5-4.5 ^U 24 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25 ^U 24 4 plus 8 6-8 plus	T742 ^t T762 ^t T6 T73 th T76 th T62 th T62 th T651	
	860–930 [460–499] ^J 870 [466] ^U	110 [43] max	W' W' W' W' W' W' W' W' W' The state of the	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121] 0r 205 [96] 315 [157] 225 [107] 325 [163] or 225 [107]	6-10 72 plus 48 6-8 plus 6-8" 6-8 plus 3.5-4.5" 24 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25" 24 4 plus 8 6-8 plus 24-30	T742 ^t T762 ^t T6 T73 th T76 th T62 th T62 th T651	
	860–930 [460–499] ^J 870 [466] ^U	110 [43] max	W' W' W' W' W' W' W' W' W' The state of the	350 [177] room temperature 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] ^U 350 [177] ^U 250 [121] 225 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121] 0r 205 [96] 315 [157] 225 [107] 325 [163]	6-10 72 plus 48 6-8 plus 6-8' 6-8 plus 3.5-4.5' 24 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25' 24 4 plus 8 6-8 plus 8 6-8 plus 6-8 plus	T742 ^t T762 ^t T6 T73 ^t T76 ^t T62 ^t T651 T7351	
	860–930 [460–499] ^J 870 [466] ^U	110 [43] max	W' W' W' W' W' W51'	350 [177] room temperature 250 [121] 250 [121] 250 [121] ^U 350 [177] ^U 250 [121] 250 [121] 255 [107] 325 [163] or 225 [107] 335 [168] ^K 250 [121] 325 [163] 250 [121] 07 205 [96] 315 [157] 225 [107] 325 [163] or 225 [107]	6-10 72 plus 48 6-8 plus 6-8' 6-8 plus 3.5-4.5' 24 6-8 plus 24-30 6-8 plus 14-18 3-5 plus 15-18 23-25' 24 4 plus 8 6-8 plus 24-30 6-8 plus 15-18 23-25'	T742 ^t T762 ^t T6 T73 ^M T76 ^M	

Product –		Solution Heat Treatment			Precipitation Heat Treatment ^B			
	Metal Temperature, ±10 °F [±6 °C] ^{C,D,V}	Quench Temperature, °F [°C] ^E	Temper	Metal Temperature, ±10 °F [±6 °C] ^V	Time at Temperature, h	Temper		
		7075 Alloy ^A (Continued						
Plate, bare or Alclad* (Continued)	870 [466] ^{R,U}		W [']	250 [121] ^U or 205 [96] ^U 315 [157] ^U	23–25 ^{<i>U</i>} 4 plus ^{<i>U</i>} 8 ^{<i>U</i>}	T62 ^{<i>U</i>}		
Cold-finished wire, rod, and bar	860–930 [460–499] ^{J,N}	110 [43] max	W' W'	250 [121] 225 [107] 350 [177]	24 6–8 plus 8–10	T6 T73 ^M		
			W51 ⁷ W51 ⁷	250 [121] 225 [107] 350 [177]	24 6–8 plus 8–10	T651 T7351 ^M		
	870 [466] ^U			225 [107] ^U	23–25 ^U	Т62 ^{<i>U</i>}		
Extruded rod, bar, profiles, tube, and pipe	860–930 [460–499] ^{J,N}	110 [43] max	W [']	250 [121] or 210 [99] 250 [121] 300 [149]	24 5 plus 4 plus 4	Т6		
			W [']	225 [107] 350 [177] or 225 [107]	6–8 plus 6–8 6–8 plus	T73 ^M		
			W'	335 [168] ^K 250 [121] 325 [163] or 250 [121]	14–18 3–5 plus 15–18 3–5 plus	T76 ^M		
			W510 ⁷	320 [160] 250 [121] or 210 [99] 250 [121]	18–21 24 5 plus 4 plus	T6510		
			VV510'	300 [149] 225 [107] 350 [177]	4 6–8 plus 6–8	T73510 ^M		
			W510 ¹	or 225 [107] 335 [168] ^K 250 [121] 325 [163]	6–8 plus 14–18 plus 3–5 plus 15–18	T76510 ^M		
			W511 ⁷	or 250 [121] 320 [160] 250 [121] or 210 [99]	3–5 plus 18–21 24 5 plus	T6511		
				250 [121] 01840 300 [149] 225 [107] 350 [177] or 225[107]	4 plus 4 0 8 1 6-8 plus 6-8 6-8 plus	n-20a T73511 ^M		
			W511 ¹	335 [168] ^K 250 [121] 325 [163] or 225 [107]	14–18 3–5 plus 15–18 3–5 plus	T76511 ^M		
	870 [466] ^{<i>U</i>}		W'	320 [160] 250 [121] ^U	18–21 23–25 ⁰	Т62 ^{<i>U</i>}		
Drawn tube and pipe	870 [466]	110 [43] max	W' W'	250 [121] 225 [107] 350 [177] or 225 [107]	24 6–8 plus 6–8 6–8 plus	T6 T73 ^M		
	870 [466] ^{<i>U</i>}		W'	335 [168] ^K 250 [121] ^U	14–18 23–25 ^{<i>U</i>}	T62 ^U		
Die forgings	860–900 [460–482]	140–160 [60–71]	W' W'	250 [121] 225 [107] 350 [177]	24 6–8 plus 8–10	T6 T73 ^M		
			W51 ¹	350 [177] 225 [107] 350 [177] 225 [107]	6–8 plus 6–8 6–8 plus	T7351 ^M		
			W ¹	350 [177] 225 [107]	6–8 6–8 plus	T74		
	870 [466] ^U		W'	350 [177] 250 [121] ^U	6–8 23–25 ^{<i>u</i> }	T62 ^{<i>U</i>}		
Hand forgings* *Continued on next page.	860–900 [460–482]	140–160 [60–71]	W' W'	250 [121] 225 [107] 350 [177]	24 6–8 plus 8–10	T6 T73 ^M		