

# High Precision Copper Alloy Guide

Alloys available in sheet, strip, plate, welded tube and foil forms.

UNS/CDA Number	-	C11000	C15100	C18665	C19010	C19002	19015	C19210	C19400	C19700	C22000	C26000	C26800	C27200	C42200	C42500	C64725	C64750	C65500	C70250	C70260	C70310
ASTM Spec Number	-	B152	B747	-	B422	B422	B422	B465	B465	B465	B36	B36	B36	B36	B591	B591	B422	B422	B96-01	B422	B422	-
PMX Alloy Number	XP 5	110	151	MSP 1	XP 150	19010 M	19015M	XP 10	194	197	220	260	268	272	422	425	MAX 251C	PMC 26	655	7025	7026	70310

Chemistry (nominal)*																						
Copper (Cu) (including Ag)	Bal	Bal	Bal	Bal	Bal	Bal	Bal	Bal	Bal	Bal	90	70	66	63	87.5	88.5	96	Bal	Bal	Bal	97.6	Bal
Oxygen (O)	.005 max	.05 max																				
Zinc (Zn)								0.12			10	30	34	36	11.5	9.5	1 max	0.9 max				2 max
Tin (Sn)						0.1											.5 max	0.65				1 max
Nickel (Ni)					1.3	1.5	1										2	2		3.2	2	2.5
Iron (Fe)								0.1	2.35	0.8												0.1 max
Phosphorus (P)				0.005	0.032	0.01	0.02	0.032	0.032	0.25												0.05 max
Silicon (Si)					0.25	0.25	0.15										0.5	0.45	3	0.65	0.4	0.6
Zirconium (Zr)			0.1			0.005												.1 max				0.005
Magnesium (Mg)				0.7			0.02			0.05								.1 max		0.15		0.01 max
Aluminum (Al)																						
Manganese (Mn)																			0.9			

\* Nominal chemistry shown for reference, not as specification

Physical Properties																						
Density lb/cu. in. @ 68° F	0.323	0.323	0.323	0.323	0.322	0.322	0.322	0.323	0.322	0.319	0.318	0.308	0.306	0.305	0.318	0.317	0.317	0.322	0.308	0.318	0.319	0.320
Modulus of Elasticity x 1000 Ksi (10 <sup>6</sup> psi)	17	17	17	17	19	19	18	17	17	17	17	16	15	16	16	16	19	19	15	19	19	19
Electrical Conductivity % I.A.C.S. @ 68° F (Annealed)	99	101	95	63	52	57	80	90	60	80	44	28	27	26	31	28	37	40	7	40	40	38
Thermal Conductivity Btu/sq.ft./ft./hr./°F @ 68° F	221	226	208	264	149	150	201	201	150	185	109	70	67	69	75	69	92	95	21	95	9	91
Coef. of Thermal Expansion x 10 <sup>6</sup> in./in./°F (68° to 572° F)	9.8	9.8	9.8	9.6	9.3	9.3	9.3	9.8	9.7	9.6	10.2	11.1	11.3	11.4	10.2	10.2	9.5	9.5	-	9.4	10	9.4

Tensile Strength x Ksi (Kgf/mm <sup>2</sup> =Ksi x .7031)																						
Annealed (SOXX) (TM00)	26-33	26-33	37-42	57	-	-	-	39-54	40-63	-	36-43	45-61	46-61	44-54	41-49	40-50	-	-	-	90-110	85-95	75-90
1/4 Hard (H01) (TM00S)	34-42	34-42	40-45	52-65	-	-	-	40-55	-	-	40-50	49-59	49-59	-	47-57	49-59	-	-	68	-	90-105	-
1/2 Hard (H02) (TM02)	37-46	37-46	43-51	61-74	-	-	53-63	47-60	53-63	53-63	47-57	57-67	55-65	51-64	54-65	57-69	70-93	-	78	95-120	95-105	88-103
3/4 Hard (H03) (TM03)	41-50	41-50	47-56	-	67-77	-	-	52-62	-	-	52-62	64-74	62-72	59-71	60-72	62-74	-	77-90	-	100-125	-	-
Hard (H04) (TM04)	43-52	43-52	53-62	69-82	71-81	72-87	60-70	56-66	60-70	60-70	57-66	71-81	68-78	70-81	67-79	70-82	87-101	87-97	89	-	-	93-108
Extra Hard (H06) (TM06)	47-56	47-56	59-65	78-91	75-86	84-94	65-75	60-70	67-73	67-73	64-72	83-92	79-89	80-93	75-85	76-88	92-107	87 min	105	-	-	98-113
Spring (H08) (TM08)	50-58	50-58	64-71	85 min	84 min	90-101	67 min	64 min	70-75	70-76	69-77	91-100	86-95	>91	82-92	84-94	101-113	-	110	-	-	106-125
Extra Spring (H10)	52 min	52 min	-	-	-	-	-	66 min	73-80	-	72-80	95-104	90-99	-	88 min	92 min	110 min	-	-	-	-	-


Yield Strength x Ksi (0.2% offset)(kgf/mm <sup>2</sup> =Ksi x .7031) Nominal																						
Annealed (SOXX) (TM00)	11	11	8	-	-	-	-	30	38	-	12	21	23	<26	19	17	-	-	-	65 min	65 min	67 min
1/4 Hard (H01) (TM00S)	31	31	35	51	-	-	-	28	-	-	33	33	34	-	38	37	-	-	62	-	75 min	-
1/2 Hard (H02) (TM02)	37	37	38	62	-	-	55	52	45	56	47	46	44	>24	55	58	69-91	-	72	85 min	90-100	85 min
3/4 Hard (H03) (TM03)	43	43	50	-	50 min	-	-	56	-	-	53	62	53	>43	64	64	-	68 min	-	95 min	-	-
Hard (H04) (TM04)	45	45	56	72	60 min	65 min	62	60	60	61	57	72	57	>62	71	72	78-100	78 min	82	-	-	90 min
Extra Hard (H06) (TM06)	50	50	60	80	64 min	75 min	66	64	67	68	63	83	67	>72	75	79	84-106	83 min	99	-	-	95 min
Spring (H08) (TM08)	52	52	66	78 min	74 min	82 min	-	62 min	70	-	68	86	71	>87	82	90	95-113	-	103	-	-	105 min
Extra Spring (H10)	54 min	54 min	-	-	-	-	-	64 min	73 min	-	70	90	73	-	82 min	87 min	107 min	-	-	-	-	-

Elongation (% in 2 inches) Nominal or Indicated																						
Annealed (SOXX) (TM00)	35	35	38	25	-	-	-	32	23	20	44	55	53	>38	45	48	-	-	-	12	10 min	10 min
1/4 Hard (H01) (TM00S)	23	23	22	15	-	-	-	20	-	-	27	46	42	-	29	38	-	-	-	-	6 min	-
1/2 Hard (H02) (TM02)	20	20	15	10	-	-	-	5	17	17	13	30	31	>19	16	20	8	-	-	9	5 min	8 min
3/4 Hard (H03) (TM03)	14	14	8	-	12 min	-	-	4	-	-	8	16	20	>8	7	15	-	12 min	-	4	-	-
Hard (H04) (TM04)	9	9	4	7	10 min	10 min	-	3	7	7	4	10	12	>3	4	9	5	8 min	-	-	-	6 min
Extra Hard (H06) (TM06)	4	4	2	5	8 min	8 min	-	2	4	6	2	4	4	-	2	6	3	6 min	-	-	-	5 min
Spring (H08) (TM08)	3	3	1 min	-	6 min	9 min	-	1	2	5	1	1	3	-	2	4	2	-	-	-	-	-
Extra Spring (H10)	3 max	3 max	-	-	-	6 min	-	1 max	2 max	1 min	2 max	3 max	2 max	-	2 max	2 max	1 max	-	-	-	-	-


Dash = Not Applicable

Other alloys are available. Please provide PMX with your requirements.  
The above data is for comparative purposes only and is not intended for use as definitive specifications.

### Copper Alloy Temperature Range



Up to 75° C



105 - 125° C



125 - 150° C



150° C Plus



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