

JX金属株式会社 銅合金特性一覧表 JX Advanced Metals Corporation Copper Alloys Property List

JX金属 高機能銅合金 JX Advanced Metals Corporation's High-Performance Copper Alloys

		チタン銅 Copper Titanium Alloy				コルソン合金 Corson Alloy									高導電合金 High Conductivity Alloy		ハイパーリン青銅 Hyper Phosphor Bronze			
製品名 Copper Alloy Name		C1990(HP)	NKT322	NKT322(HB)	C1995(HP)	C7025	NKC286	NKC286S	NKC388	NKC164	NKC8738	NKC8738S	NKC164E	NKC4419	NKC4419(HC)	NKE012	C5210(HP)	C5240(HP)		
UNS No.		C19900	C19910	C19910	C19950	C70250	C64728	C64728	C70252	C64745	C70390	C70390	-	C64800	C64800	C14415	C52100	C52400		
化学組成 (wt%) Chemical Composition		Cu-3.0Ti	Cu-3.2Ti-0.2Fe		Cu-4.0Ti	Cu-3.0Ni-0.65Si-0.15Mg	Cu-2.8Ni-0.6Si-0.5Sn-0.4Zn		Cu-3.8Ni-0.8Si-0.1Mg-0.13Mn	Cu-1.6Ni-0.4Si-0.5Sn-0.4Zn	Cu-3.55Ni-0.25Co-0.87Si		Cu-1.6Ni-0.35Si	Cu-1.9Co-0.44Si		Cu-0.12Sn	Cu-8.0Sn-0.1P	Cu-10Sn-0.1P		
物理的特性 Physical Properties	比重 Specific Gravity	8.70	8.70	8.70	8.62	8.82	8.87	8.87	8.82	8.87	8.83	8.83	8.89	8.85	8.85	8.92	8.80	8.78		
	縦弾性係数 (GPa) Modulus of Elasticity	127	120	120	127	131 SH : 120	127	110	SH : 123 XSH : 123(TD : 135) USH : 120(TD : 140)	127	123	100	120	127	127	128	110	100		
	導電率 (%IACS) Electrical Conductivity	12 GSH : 8	12	11	8	45 SH : 48 TM04S : 50	41	41	SH : 38 XSH : 34 USH : 32	43	41	40	55	65	71	85	12	10		
	体積抵抗率 (nΩ・m)(@20°C) Specific Resistivity	144 GSH : 216	144	157	216	38 SH : 36 TM04S : 34	42	42	SH : 45 XSH : 51 USH : 54	40	42	44	30	27	24	19	144	157		
	熱伝導率 (W/(m・K)) Thermal Conductivity	54 GSH : 39	56	51	39	180 SH : 192 TM04S : 200	165	165	SH : 160 XSH : 143 USH : 136	170	165	163	240	260	288	335	63	50		
	熱膨張係数 (× 10 <sup>-6</sup> /K)(@20~300°C) Thermal Expansion Coefficient	18.6	18.0	18.0	18.6	17.6	17.4	17.4	17.6	17.6	17.6	17.6	17.7	17.8	17.8	17.7	18.2	18.4		
	機械的特性 Mechanical Properties	引張強さ (MPa) Tensile Strength	1/4H	-	-	-	TR02	607-726 (650)	-	-	-	-	-	-	-	-	520-650 (600)	-	-	-
1/2H			-	-	-	SH	800-950 (860)	710-840 (780)	730-870 (800)	-	560-680 (640)	-	-	-	-	-	-	-	-	
H			-	900-1000 (950)	-	-	TM02	650-740 (725)	760-890 (830)	800-940 (880)	-	620-740 (680)	-	-	590-680 (630)	590-720 (670)	540-670 (610)	375-475 (430)	590-705 (636)	650-750 (708)
EH			885-1080	920-1020 (970)	-	-	TM03	680-760 (744)	810-940 (880)	-	680-800 (730)	-	-	620-760 (690)	-	-	410-600 (500)	685-785 (729)	750-850 (805)	
SH			910-1110	970-1100 (1020)	-	-	TM04	750-840 (814)	-	-	890-990 (940)	-	-	-	-	-	-	735-835 (790)	850-950 (866)	
ESH			1000-1180	1010-1200 (1070)	980-1200 (1050)	-	TM04S	730-850 (820)	-	-	-	920-1130 (1010)	890-1070 (980)	-	-	-	-	770-885 (853)	950-1050 (998)	
XSH			-	-	1030-1250 (1100)	-	-	-	-	-	970-1090 (1030)	-	-	-	-	-	-	835-1000 (918)	1000-1200 (1039)	
USH			-	-	-	-	-	-	-	-	970-1090 (1030)	-	-	-	-	-	-	-	-	
GSH			1300-1600 (1400)	-	-	1400-1700 (1540)	-	-	-	-	970-1090 (1030) TD : 1070-1190 (1130)	-	-	-	-	-	-	-	-	
0.2%耐力 (MPa) Yield Strength			1/4H	-	-	-	-	TR02	(575)	-	-	-	-	-	-	-	370-500 (480)	-	-	-
		1/2H	-	-	-	-	SH	(820)	690-830 (760)	695-835 (765)	-	520-670 (610)	-	-	-	-	-	-	-	
		H	-	800-900 (850)	-	-	TM02	585min (644)	740-880 (810)	775-915 (845)	-	580-730 (660)	-	-	540-680 (610)	570-700 (650)	520-650 (590)	(420)	(565)	580-690 (617)
		EH	780-930 (860)	850-950 (900)	-	-	TM03	655min (710)	790-930 (860)	-	640-790 (720)	-	-	600-740 (670)	-	-	(490)	(688)	650-790 (755)	
		SH	810-960 (890)	900-1000 (950)	-	-	TM04	740min (800)	-	-	860-960 (910)	-	-	-	-	-	-	(760)	780-920 (813)	
		ESH	950-1100 (1030)	950-1050 (1000)	950-1050 (1000)	-	TM04S	720min (800)	-	-	-	880-1060 (960)	860-1010 (920)	-	-	-	-	(823)	900-1030 (935)	
		XSH	-	-	1000-1100 (1050)	-	-	-	-	-	940-1060 (1000)	-	-	-	-	-	-	(879)	950-1190 (997)	
		USH	-	-	-	-	-	-	-	-	940-1060 (1000) TD : 1040-1160 (1100)	-	-	-	-	-	-	-	-	
GSH		(1390)	-	-	(1530)	-	-	-	-	-	-	-	-	-	-	-	-	-		
伸び (%) Elongation		1/4H	-	-	-	-	TR02	6.0min (10.0)	-	-	-	-	-	-	-	10.0min (17.0)	-	-	-	
		1/2H	-	-	-	-	SH	1.0min (3.0)	3.0min (6.0)	3.0min (7.0)	-	5.0min (8.0)	-	-	-	-	-	-	-	
		H	-	12.0min (18.0)	-	-	TM02	10.0min (13.0)	2.0min (4.0)	1.0min (2.0)	-	3.0min (6.0)	-	-	5.0min (12.0)	2.0min (8.0)	2.0min (6.0)	1.0min (3.0)	20.0min (33.4)	11.0min (29.6)
		EH	10.0min (17.0)	10.0min (15.0)	-	-	TM03	5.0min (9.0)	1.0min (2.0)	-	-	1.0min (4.0)	-	-	2.0min (5.0)	-	-	(2.0)	11.0min (22.1)	9.0min (18.5)
		SH	8.0min (14.0)	6.0min (10.0)	-	-	TM04	1.0min (3.0)	-	-	-	1.0min (3.0)	-	-	-	-	-	-	9.0min (17.8)	5.0min (11.6)
		ESH	(3.0)	3.0min (5.0)	2.0min (7.0)	-	TM04S	1.0min (4.0)	-	-	-	-	0.1min (3.0)	0.5min (3.0)	-	-	-	-	5.0min (12.0)	1.0min (2.8)
		XSH	-	-	1.0min (5.0)	-	-	-	-	-	1.0min (2.0)	-	-	-	-	-	-	-	1.0min (2.8)	(1.1)
		USH	-	-	-	-	-	-	-	-	1.0min (2.0)	-	-	-	-	-	-	-	-	
硬さ (Hv) Vickers Hardness		1/4H	-	-	-	-	TR02	180-220 (204)	-	-	-	-	-	-	-	160-210 (180)	-	-	-	
		1/2H	-	-	-	-	SH	235-275 (255)	200-270 (230)	215-285 (250)	-	160-230 (190)	-	-	-	-	-	-	-	
		H	-	250-350 (300)	-	-	TM02	190-240 (215)	210-280 (245)	250-320 (285)	-	170-240 (200)	-	-	160-220 (200)	180-220 (200)	160-220 (185)	95-160 (130)	185-235	200-240
		EH	280min (300)	280-360 (310)	-	-	TM03	200-250 (235)	230-300 (260)	-	-	200-270 (220)	-	-	170-230 (210)	-	-	105-175 (145)	210-260	230-270
		SH	300min (320)	290-370 (320)	-	-	TM04	225-275 (248)	-	-	250-310 (280)	-	-	-	-	-	-	-	230-270	250-290
		ESH	320min (340)	300-400 (340)	(340)	-	TM04S	215-265 (246)	-	-	-	-	260-370 (300)	260-370 (295)	-	-	-	-	245-285	270-310
		XSH	-	-	(350)	-	-	-	-	-	285-350 (325)	-	-	-	-	-	-	-	270-350	290min
	USH	-	-	-	-	-	-	-	-	285-350 (325)	-	-	-	-	-	-	-	-		
GSH	350-450 (400)	-	-	400-500 (460)	-	-	-	-	-	-	-	-	-	-	-	-	-			
残留応力率 (%) Thermal Stress Relaxation Resistance		95	97	-	-	89	83	83	92	82	-	-	77	76	-	68	-	-		
Remaining stress: @150°C, 1000h, Yield stress × 80%, Thickness range: t ≥ 0.08mm ※参考値 Reference data																				

いずれの合金もポアソン比は0.33。( )内の数字は代表値。  
Every alloy's Poisson's ratio is 0.33. Number inside ( ) shows typical value.  
※TD : Transverse Direction (圧延直角方向)

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一般銅合金(参考) Conventional Copper Alloys (Reference data)

		一般りん青銅 Phosphor Bronze		洋白 Nickel Silver		
製品名 Copper Alloy Name		C5191	C5210	C7521	C7701	
UNSN No.		C51900	C52100	C75200	C77000	
化学組成 (wt%) Chemical Composition		Cu-6.0Sn-0.1P	Cu-8.0Sn-0.1P	Cu-18Zn-18Ni	Cu-26Zn-18Ni	
物理的特性 Physical Properties	比重 Specific Gravity	8.83	8.80	8.73	8.70	
	縦弾性係数 (GPa) Modulus of Elasticity	110	110	125	125	
	導電率 (%IACS) Electrical Conductivity	14	13	6	5	
	体積抵抗率 (nΩ・m)(@20°C) Specific Resistivity	133	-	-	-	
	熱伝導率 (W/(m・K)) Thermal Conductivity	67	-	-	-	
	熱膨張係数 (×10 <sup>-6</sup> /K)(@20~300°C) Thermal Expansion Coefficient	18.0	-	-	-	
機械的特性 Mechanical Properties	引張強さ (MPa) Tensile Strength	1/4H	390-510	-	-	-
		1/2H	490-610	470-610	440-570	540-655
		H	590-685	590-705	540-635	630-735
		EH	635min	685-785	-	705-805
		SH	-	735-835	-	765-865
		ESH	-	-	-	-
		XSH	-	-	-	-
		USH	-	-	-	-
		GSH	-	-	-	-
	0.2%耐力 (MPa) Yield Strength	1/4H	-	-	-	-
		1/2H	-	-	-	-
		H	-	(528)	-	-
		EH	-	(667)	-	-
		SH	-	(710)	-	-
		ESH	-	-	-	-
		XSH	-	-	-	-
		USH	-	-	-	-
		GSH	-	-	-	-
	伸び (%) Elongation	1/4H	35.0min	-	-	-
		1/2H	20.0min	27.0min	5.0min	11.0min
		H	8.0min	20.0min	3.0min	4.0min
		EH	5.0min	11.0min	-	-
		SH	-	9.0min	-	-
		ESH	-	-	-	-
		XSH	-	-	-	-
		USH	-	-	-	-
		GSH	-	-	-	-
	硬さ (Hv) Vickers Hardness	1/4H	100-160	-	-	-
		1/2H	150-205	140-205	120-180	150-210
		H	180-230	185-235	150-200	180-240
		EH	200min	210-260	-	210-260
		SH	-	230-270	-	230-270
		ESH	-	-	-	-
XSH		-	-	-	-	
USH		-	-	-	-	
GSH		-	-	-	-	
残留応力率 (%) Thermal Stress Relaxation Resistance						
Remaining stress: @150°C, 1000h, Yield stress×80%, Thickness range: t≥0.08mm ※参考値 Reference data						

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