



Material Specification

➤ for strips of SPECIAL ALLOYS and COPPER



Special alloys - mechanical properties

Alloy	Temper	Tensile strength R _m [MPa]*	Yield strength R _{p0,2} [MPa]*	Elongation A ₅₀ [%]	Vickers hardness	
Cu Ni9 Sn2	R380/H110	380-470	≥ 200	≥ 8	110-150	
	R450/H140	450-530	≥ 370	≥ 4	140-170	
	R500/H160	500-580	≥ 450	---	160-190	
	R560/H180	560-650	≥ 520	---	180-210	
	R610/H190	≥ 610	≥ 580	---	≥ 190	
Cu Ni18 Zn20	R380/H85	380-450	≤ 250	≥ 27	85-115	
	R450/H115	450-520	≥ 250	≥ 9	115-160	
	R500/H160	500-590	≥ 410	≥ 3	160-190	
	R580/H180	580-670	≥ 510	---	180-210	
	R640/H200	640-730	≥ 600	---	200-230	
KHP® 10 (CuFe 0,1)	R300/H80	300-370	≤ 300	≥ 10	80-110	
	R350/H100	350-420	≥ 300	≥ 4	100-130	
	R410/H120	420-480	≥ 350	≥ 2	120-150	
	R440/H125	≥ 440	≥ 400	≥ 1	≥ 125	
KHP® 15 (CuSn 0,15)	R200/H50	200-250	≤ 200	≥ 25	50	
	R250/H60	250-320	≥ 200	≥ 9	60-90	
	R300/H85	300-370	≥ 250	≥ 4	85-110	
	R360/H105	360-430	≥ 300	≥ 3	105-130	
	R420/H120	420-490	≥ 350	≥ 2	120-140	
KHP® 102 (CuNiSi)	R360/H100	360-430	≥ 250	≥ 12	100-130	
	R410/H130	410-480	≥ 360	≥ 10	130-150	
	R460/H140	460-530	≥ 430	≥ 8	140-160	
	R520/H150	520-570	≥ 490	≥ 5	150-170	
	R580/H175	580-650	≥ 540	≥ 6	175-205	
KHP® 105 (CuNi1Sn 0,5)	R400/H120	400-480	≥ 380	≥ 7	120-150	
	R450/H130	450-510	≥ 430	≥ 5	130-155	
	R190/H145	490-550	≥ 470	≥ 5	145-170	
	R530/H155	≥ 530	≥ 510	≥ 4	≥ 155	
KHP® 109 (CuNi1Sn 0,9)	R335/H120	335-470	≥ 315	≥ 15	120-155	
	R440/H135	440-520	≥ 420	≥ 9	135-170	
	R500/H155	500-570	≥ 480	≥ 5	155-180	
	R540/H160	540-610	≥ 520	≥ 4	160-195	
	R580/H175	580-650	≥ 560	---	175-210	
	R630/H190	≥ 630	≥ 610	---	≥ 190	
KHP® 194 (Cu Fe2P)	R300/H80	300-340	≤ 240	≥ 20	80-100	
	R340/H100	340-390	≥ 240	≥ 8	100-120	
	R370/H120	370-430	≥ 330	≥ 4	120-140	
	R420/H130	420-480	≥ 380	---	130-150	
	R470/H140	≥ 470	≥ 440	---	≥ 140	

Copper - mechanical properties

Alloy	Temper	Tensile strength R _m [MPa]*	Yield strength R _{p0,2} [MPa]*	Elongation A ₅₀ [%]	Vickers hardness	
Cu-ETP (E-Cu)	R200/H40	200-250	≤ 100	≥ 33	40-65	
	R220/H40	220-260	≥ 140	≥ 33	40-65	
	R240/H65	240-300	≥ 180	≥ 8	65-95	
	R290/H90	290-360	≥ 250	≥ 4	90-110	
	R360/H110	≥ 360	≥ 320	≥ 2	≥ 110	
Cu-PHC (SE-Cu)	R200/H40	200-250	≤ 100	≥ 33	40-65	
	R220/H40	220-260	≥ 140	≥ 33	40-65	
	R240/H65	240-300	≥ 180	≥ 8	65-95	
	R290/H90	290-360	≥ 250	≥ 4	90-110	
	R360/H110	≥ 360	≥ 320	≥ 2	≥ 110	

 * 1 MPa = 1 N/mm²

Special alloys - physical properties

Density [g/cm ³]	Coefficient of thermal expansion [10 ⁻⁶ /K]	Electrical conductivity [MS/m] ^{***}	Electrical conductivity [% IACS]	Thermal conductivity [W/m K]	Modulus of elasticity [GPa] ^{****}	Weldability	Solderability	Season cracking
8,9	16,5	6,4	11	50	140	fair	good	no
8,7	17,7	3,3	5,5	33	140	good	very good	no
8,9	17	46	80	350	120	fair	fair	no
8,9	18	45	78	300	110	good	good	no
8,9	16,8	35 R580 min. 29	60 R580 min. 50	260	127	good	good	no
8,9	17	29	50	197	130	fair	fair	no
8,9	17	23	40	161	130	good	good	no
8,8	17,6	35	60	260	123	fair	fair	no

Copper - physical properties

Density [g/cm ³]	Coefficient of thermal expansion [10 ⁻⁶ /K]	Electrical conductivity [MS/m] ^{***}	Electrical conductivity [% IACS]	Thermal conductivity [W/m K]	Modulus of elasticity [GPa] ^{****}	Weldability	Solderability	Season cracking
8,9	17,7	58	100	385	130	fair	fair	no
8,9	17,7	58	100	385	130	very good	very good	no

** MS/m = m/Ωmm²

*** 1 GPa = 1 kN/mm²

Special alloys - chemical composition

Chemical composition [%]	EN	USA UNS Alloy-No.	Earlier standards	Applications
Ni 8,5-10,5****/ Sn 1,8-2,8/ Cu rest	CW351H	C72500	DIN 17670-1	contact springs, connectors, soldering tags
Cu 60-63/ Ni 17-19/ Zn rest	CW409J	C76400	DIN 17670-1 BS Alloy NS 106	contact springs, spectacle parts, zipper parts, metal ware, cutlery
Fe 0,05-0,15/ Cu rest	---	C19210	---	leadframes, bas bans
Sn 0,1-0,15/ Cu rest	CW117C	C14415	---	leadframes, contacts, switches
Ni 0,8-1,8/ Si 0,15-0,35/ P 0,01-0,05/ Cu rest	---	C19010	---	connectors, contacts
Ni 0,8-1,2/ Sn 0,4-0,7/ P 0,1/ Cu rest	---	C19020	---	contacts, switches, relais, pressed screen
Ni 0,8-1,2/ Sn 0,74-1,1/ P 0,03-0,07/ Cu rest	---	C19025	---	connectors, switches, relais
Fe 2,1-2,6/ Zn 0,05-0,2/ P max. 0,15/ Cu rest	CW107C	C19400	DIN 17670-1	leadframes, contacts, switches

Copper - chemical composition

Chemical composition [%]	EN	USA UNS Alloy-No.	Earlier standards	Applications
Cu 99,9/ O=0,005-0,04	CW004/A	C11000	DIN 40500-3 BS Alloy C101	components for the electrical industry, connectors, tabs
Cu 99,9/P=0,003 free of oxygen, with phosphor oxide	CW021A	C10300	DIN 40500-3 BS Alloy C103	electrical devices, switching elements, connectors, tabs

**** Ni contains 0,5% Co



Forms of supply

You may choose between the following types and forms:

Dimensions

Strips

Thickness: 0,1 - 3 mm

Width: Thickness \leq 0,3 mm: 3 - 310 mm
Thickness $>$ 0,3 mm: 3 - 330 mm

Coils

Thickness: 0,1 - 0,8 mm

up to 12 kg / mm width

Thickness: over 0,8 mm

up to 6 kg /mm width

Traverse wound strips

on cores

on drums

(depending on strip cross section
and type, up to 1,800 kg drum weight)

POLYCOIL

up to 3 t

Order quantities

base strip min. 500 kg, tinned strip min. 800 kg,
other quantities upon request

Surface

with oil film

oil-free

passivated

Surface plating

hot dip tinning

galvanic tinning

selective plating

gold, silver, nickel plating

Profiled

according to your drawings

Our products are tested, evaluated and subjected to stringent tests in every stage of our production process. KEMPER strips meet the highest technical requirements of the automotive, communications and electrical engineering industries worldwide. We ensure these requirements by our quality management system which is certified per ISO/TS 16949:2002 and DIN EN ISO 9001:2000. At KEMPER quality is an obligation for all our employees, resulting in products which you can lastingly rely on.



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