

Table 3.1. Characterization of conductivity copper alloys.

UNS/European Number Name Applications Processing Corrosion Resistance Forms Standards																
Component Elements Properties	Physical Properties		Mechanical Properties							Electrical Properties			Thermal Properties			
	Density	Hardness	Tensile Strength, Ultimate	Tensile Strength, Yield	Elongation at Break	Modulus of Elasticity	Poissons Ratio	Machinability	Shear Modulus	Electrical Conductivity (Temperature 20,0 °C)	Electrical Resistivity (Temperature 20,0 °C)	CTE, linear	Specific Heat Capacity (Temperature 20,0 °C)	Thermal conductivity (Temperature 20,0 °C)	Melting Point	
	[g/cc]	[-]	[MPa]	[MPa]	[%]	[GPa]	[-]	[%]	[GPa]	[MS/m]	[%IACS]	[Ωcm]	[μm/m°C]	[J/g°C]	[W/m-K]	[°C]
UNS/European Number: <b>C10100/CW009A</b> Name: <b>Oxygen-Free Electronic Copper, Cu-OFE</b> Applications: Busbars, bus conductors, waveguides, hollow conductors, lead-in wires and anodes for vacuum tubes, vacuum seals, transistor components, glass to metal seals, coaxial cables, klystrons, microwave tubes, and rectifiers. Processing: Excellent hot and cold workability; good forgeability. Fabricated by bending, coining, coppersmithing, drawing and upsetting, hot forging and pressing, knurling, roll threading, shearing, spinning, swaging, and stamping. Corrosion Resistance: Good to excellent. Susceptible to galvanic corrosion when coupled with iron, aluminum, magnesium, lead, tin, and zinc. Good resistance to atmospheric, brackish water, sea water, and non-oxidizing acid corrosion, but avoid heating in oxidizing atmospheres or exposing to oxidizing acids, moist halogens, sulfides, ammonia, or solutions with ammonium ions. Forms: Pipe, plate, rod, shapes, sheet, strip, tube, and wire. Standards: ASTM (flat products) B-48, B-133, B-152, B-187, B-272, B-432, B-451, F-68, (pipe) B-42, B-188, F-68, (rod) B-12, B-49, B-133, B-187, F-68, (shapes) B-113, B-187, F-68, (tubing) B-372, B-68, B-75, B-188, B-280, F-68, (wire) B-1, B-2, B-3, F68; 101A (Australia); C110 (UK); CDA 101 OFE; ISO Cu-OFE, JIS C1011 H3510 (Japan)																
Copper, Cu ≥ 99,99 %	8,89 – 8,94	Vickers 75,0 – 90,0 (1/2 hard) 90,0 – 105 (full hard)	221 – 455 (Varies with heat treatment)	69,0 – 365 (Varies widely with heat treatment)	55,0 (in 101,6 mm)	115	0,310	20 (UNS C36000 free-cutting brass = 100%)	44,0	58,5	100,9	0,00000171	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	383 – 391	1083
UNS/European Number: <b>C10200/CW008A</b> Name: <b>Oxygen-free high conductivity Copper, Cu-OFHC (contains a minimum of 99,95 Cu+Ag, Soft)</b> Applications: Busbars, bus conductors, waveguides, hollow conductors, lead-in wires and anodes for vacuum tubes, vacuum seals, transistor components, glass to metal seals, coaxial cables, klystrons, microwave tubes, and rectifiers. Processing: Excellent hot and cold workability; good forgeability. Fabricated by bending, coining, coppersmithing, drawing and upsetting, hot forging and pressing, knurling, roll threading, shearing, spinning, swaging, and stamping. Corrosion Resistance: Good to excellent. Susceptible to galvanic corrosion when coupled with iron, aluminum, magnesium, lead, tin, and zinc. Good resistance to atmospheric, brackish water, sea water, and non-oxidizing acid corrosion, but avoid heating in oxidizing atmospheres or exposing to oxidizing acids, moist halogens, sulfides, ammonia, or solutions with ammonium ions. Forms: Pipe, plate, rod, shapes, sheet, strip, tube, and wire.																

Standards: ASTM (flat products) B-48, B-133, B-152, B-187, B-272, B-370, B-432, B-451, (pipe) B-42, B-188, (rod) B-12, B-49, B-124, B-133, B-187, (tubing) B-68, B-75, B-88, B-111, B-188, B-280, B-359, B-372, B-395, B-447, (shapes) B-124, B-133, B-187, (wire) B-1, B-2, B-3, B-33, B-47, B-116, B-189, B-246, B-286, B-298, B-355; C-103 (UK); CDA 102 OF; CEN CW009A; Cu/cl NF A53301 (France), ISO Cu-OF R1337; JIS C1020 H3100 - sheet, plate, C1020 H3140 - bar (Japan); QQ-C-576 (flat products), QQ-C-502 (rod, shapes); QQ-C-576 (tube); QQ-C-502, QQ-W-343, MIL-W-3318 (wire)

Copper, Cu ≥ 99,99 %	8,90	Vickers 215 75,0 - 90,0 (1/2 hard), 90,0 - 105 (full hard)	215 - 254 (soft), 261 - 441 (hard)	49,0 - 78,0 (Strain 0,100 %, varies with temper and cold work )	35,0 - 55,0	117	0,310	20 (Based on 100% machinability for BS2874 CZ 121 Free- machining brass - 20% of 100% for UNS C360000)	44,0	59,2 - 57,8	102,1 - 99,7	0,00000169 - 0,00000173	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	383 – 391	1083
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UNS/European Number: **C10200/CW008A**  
Name: **Oxygen-free high conductivity Copper, Cu-OFHC (contains a minimum of 99,95 Cu+Ag, Hard)**  
Applications: Busbars, bus conductors, waveguides, hollow conductors, lead-in wires and anodes for vacuum tubes, vacuum seals, transistor components, glass to metal seals, coaxial cables, klystrons, microwave tubes, and rectifiers.  
Processing: Excellent hot and cold workability; good forgeability. Fabricated by bending, coining, coppersmithing, drawing and upsetting, hot forging and pressing, knurling, roll threading, shearing, spinning, swaging, and stamping.  
Corrosion Resistance: Good to excellent. Susceptible to galvanic corrosion when coupled with iron, aluminum, magnesium, lead, tin, and zinc. Good resistance to atmospheric, brackish water, sea water, and non-oxidizing acid corrosion, but avoid heating in oxidizing atmospheres or exposing to oxidizing acids, moist halogens, sulfides, ammonia, or solutions with ammonium ions.  
Forms: Pipe, plate, rod, shapes, sheet, strip, tube, and wire.  
Standards: ASTM (flat products) B-48, B-133, B-152, B-187, B-272, B-370, B-432, B-451, (pipe) B-42, B-188, (rod) B-12, B-49, B-124, B-133, B-187, (tubing) B-68, B-75, B-88, B-111, B-188, B-280, B-359, B-372, B-395, B-447, (shapes) B-124, B-133, B-187, (wire) B-1, B-2, B-3, B-33, B-47, B-116, B-189, B-246, B-286, B-298, B-355; C-103 (UK); CDA 102 OF; CEN CW009A; Cu/cl NF A53301 (France), ISO Cu-OF R1337; JIS C1020 H3100 - sheet, plate, C1020 H3140 - bar (Japan); QQ-C-576 (flat products), QQ-C-502 (rod, shapes); QQ-C-576 (tube); QQ-C-502, QQ-W-343, MIL-W-3318 (wire)

Copper, Cu ≥ 99,99 %	8,90	-	261 - 441 (Varies with heat treatment)	88,0 - 324 (Strain 0,100 %, varies with temper and cold work)	6,00 - 30,0	117 - 132	0,310	20 (Based on 100% machinability for BS2874 CZ 121 Free- machining brass - 20% of 100% for UNS C360000)	44,0	59,2 - 57,8	102,1 - 99,7	0,00000169 - 0,00000173	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	391	1083
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UNS/European Number: **C10300/CW021A**  
Name: **Oxygen-free extra-low phosphorus Copper, Cu-HCP (Cu percentage includes Cu+Ag+P). OS025 temper**  
Applications: Electrical conductors and terminals, tubular busbars, commutators, copper clad steel and clad products, waveguide tubing, thermostatic control tubing, and applications requiring good conductivity and welding or brazing properties.  
Processing: Excellent hot and cold workability; good forgeability. Annealing temp.: 475-750°C (900-1400°F). Hot working temp.: 750-875°C (1400-1600°F). Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.  
Corrosion Resistance: Good to excellent. Weldability: excellent welding and brazing properties.  
Forms: Test specimens: flat products - 1 mm thick; tube - 25 mm OD, 1,65 mm thick.  
Standards: CDA 103, ASTM (flat products) B-133, B-152, B-187, B-272, B-432, (tubing) B-68, B-75, B-88, B-111, B-188, B-251, B-280, B-306, B-359, B-372, B-395, B-447

Copper,	8,94	Rockwell	235	76,0	45,0	115	0,310	20	44,0	57,5	99,1	0,00000174	17,0	0,385	386	1083
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Cu 99,95 %, Other ≤0,050 %, Phosphorous, P 0,0010 - 0,0050 %		F 45			(in 50 mm)								(Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)			
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UNS/European Number: **C10400/CW017A**  
Name: **Oxygen-free silver-bearing Copper, CuAg0,04(OF). OSO25 Temper**  
Applications: Auto gaskets, radiators, busbars, conductivity wire, contacts, radio parts, winding, switches, terminals, commutator segments, chemical process equipment, printing rolls, clad metals, printed circuit foil.  
Processing: Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Test specimens: flat products: 1mm thick and tubing - 25mm OD x 1,65mm wall thickness. 226 g/ton Ag (UNS C10400)  
Standards: ASTM-B-152, QQ-C-576, C103

Copper, Cu 99,95%, Silver, Ag ≥ 0,0270 %	8,94	Rockwell F 45,0 (Flat product. Thickness 1,00 mm)	235 (Flat product. Thickness 1,00 mm)	76,0 (Flat product. Thickness 1,00 mm)	45,0 (Flat product. Thickness 1,00 mm)	115	0,307	20 (UNS C36000 - free-cutting brass = 100%)	44,0	58,1	100,3	0,00000172	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	388	1083 (Solidus 1083 °C, Liquidus 1083°C)
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UNS/European Number: **C10500/CW017A**  
Name: **Oxygen-free silver-bearing Copper, CuAg0,04(OF). OSO50 Temper**  
Applications: Auto gaskets, radiators, busbars, conductivity wire, contacts, radio parts, winding, switches, terminals, commutator segments, chemical process equipment, printing rolls, clad metals, printed circuit foil.  
Processing: Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Test specimens: flat products - 6mm thick, rod - 25mm OD, shapes - 13mm section, and tubing - 25mm OD x 1,65mm wall thickness. 226 g/ton Ag (UNS C10400), 283 g/ton Ag (UNS C10500), 708 g/ton Ag (UNS C10700).  
Standards: ASTM-B-152, QQ-C-576, C103

Copper, Cu 99,95%, Silver, Ag ≥ 0,0340 %	8,94	Rockwell F 40	220	69,0	45,0 (Tubing), 50,0 (in 50 mm, flat products, shapes), 55,0 (Rod)	115	0,307	20 (UNS C36000 - free-cutting brass = 100%)	44,0	58,1	100,3	0,00000172	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	388	1083 (Solidus 1083 °C, Liquidus 1083°C)
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UNS/European Number: **C10700/CW017A**  
Name: **Oxygen-free silver-bearing Copper, CuAg0,1(OF), OSO50 Temper**

<p><b>Applications:</b> Auto gaskets, radiators, busbars, conductivity wire, contacts, radio parts, winding, switches, terminals, commutator segments, chemical process equipment, printing rolls, clad metals, printed circuit foil.</p> <p><b>Processing:</b> Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.</p> <p><b>Corrosion Resistance:</b> Good to excellent corrosion resistance.</p> <p><b>Forms:</b> Test specimens: flat products - 6mm thick, rod - 25mm OD, shapes - 13mm section, and tubing - 25mm OD x 1,65mm wall thickness. 226 g/ton Ag (UNS C10400), 283 g/ton Ag (UNS C10500), 708 g/ton Ag (UNS C10700).</p> <p><b>Standards:</b> ASTM-B-152, QQ-C-576, C103</p>																
Copper, Cu 99,95%, Silver, Ag ≥ 0,085 %	8,94	Rockwell F 40	220	69,0	45,0 (Tubing), 50,0 (in 50 mm, flat products, shapes), 55,0 % (Rod)	115	0,307	20 (UNS C36000 - free-cutting brass = 100%)	44	58,1	100,3	0,00000172	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	388	1083 (Solidus 1083 °C, Liquidus 1083°C)
<p><b>UNS/European Number:</b> <b>C10800/CW023A</b></p> <p><b>Name:</b> <b>Oxygen-free low phosphorus Copper, Cu-DLP. OSO25 Temper</b></p> <p><b>Applications:</b> Refrigerators, air conditioners, gas and heater lines, oil burner tubes, brewery tubes, condenser and heat exchanger tubes, dairy and distiller tubes, pulp and paper lines, tanks, air, gasoline, hydraulic and oil lines.</p> <p><b>Processing:</b> Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.</p> <p><b>Corrosion Resistance:</b> Good to excellent corrosion resistance.</p> <p><b>Forms:</b> Test specimens: flat products - 1mm thickness and tubing - 25mm OD x 1,65 mm wall thickness.</p> <p><b>Standards:</b> ASTM. Flat products B-113, B-152, B-187, B-432. Pipe: B-42, B-302, Rod: B-12, B-133. Shapes: B-133. Tubing: B-68, B-75, B-88, B-111, B-188, B-251, B-280, B-306, B-357, B-360, B-372, B-395, B-395, B-447, B-453.</p>																
Copper, Cu 99,95%, Phosphorous, P 0,0050 – 0,012 %	8,94	Rockwell F 45	235	76,0	45,0 (in 50 mm)	115	0,307	20 (UNS C36000 - free-cutting brass = 100%)	44,0	53,5	92,2	0,00000187	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	350	1083 (Solidus 1083 °C, Liquidus 1083°C)
<p><b>UNS/European Number:</b> <b>C11000/CW004A</b></p> <p><b>Name:</b> <b>Electrolytic tough pitch anneal resistant Copper, Cu-ETP</b></p> <p><b>Applications:</b> Electrical power transmission where resistance to softening under overloads is desired,</p> <p><b>Processing:</b> Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.</p> <p><b>Corrosion Resistance:</b> Good to excellent corrosion resistance.</p> <p><b>Forms:</b> Available as wire.</p> <p><b>Standards:</b> ASTM. Rod: B-49, B-133. Wire: B-246, B-334, B-189, B-355, B-298, B-1, B-2, B-8, B-172, B-173, B-174, B-226, B-228, B-229, B-286, B-47, B-116.</p>																
Cadmium, Cd 0,010%,	8,89 – 8,94	Rockwell B	455	69,0 - 365	1,50 (in 150 cm)	115	0,300	20 (UNS C36000 –	44,0	58,1	100,3	0,00000172	17,0 (Temperature	-	388	1065 – 1085

Copper, Cu 99,9%, Oxygen, O 0,040%		10,0 - 62,0 (depending on temper)		(dependin g on temper)				free-cutting brass = 100%)					20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)			(Solidus 1065 °C, Liquidus 1085 °C)
<p>UNS/European Number: <b>C11300/CW010A, C11400/CW011A, C11500/CW012A, C11600/CW013A</b></p> <p>Name: <b>Silver-bearing tough pitch Copper. OSO25 Temper.</b></p> <p>Applications: Gaskets, radiators, busbars, windings, switches, chemical process equipment, clad metals, printed circuit foil.</p> <p>Processing: Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.</p> <p>Corrosion Resistance: Good to excellent corrosion resistance.</p> <p>Forms: Test specimens: flat products - 1 mm thickness.</p> <p>Standards: ASTM. Bar: B-152. Bar, bus: B-187. Pipe, bus: B-187. Plate B-152. Rod B-49. Rod, bus, shapes: B-187. Sheet, clad: B-152, B-506. Wire: B-272, B-1, B-2, B-49, B-3, B-48.</p>																
Copper, Cu 99,0 – 99,9 %, Oxygen, O ≤0,040%, Silver, Ag ≤0,027% (C11300), ≤0,0340 % (C11400), ≤0,0540 % (C11500), ≤0,085 % (C11600)	8,89 – 8,94	Rockwell F 45	235	75,0	45,0 (in 50 mm)	115	0,307	20 (UNS C36000 – free-cutting brass = 100%)	44,0	58,1	100,3	0,00000172	17,7 (Temperature 20,0 – 300 °C)	0,385	388	1080 (Liquidus 1080 °C)
<p>UNS/European Number: <b>C12500/CW006A</b></p> <p>Name: <b>Fire-refined tough pitch with silver Copper, Cu-FRTP. OSO25 Temper</b></p> <p>Applications: Busbars, bus conductors, waveguides, hollow conductors, lead-in wires and anodes for vacuum tubes, vacuum seals, transistor components, glass to metal seals, coaxial cables and tubes, klystrons, microwave tubes, and rectifiers.</p> <p>Processing: Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.</p> <p>Corrosion Resistance: Good to excellent corrosion resistance.</p> <p>Forms: Test specimens: flat products - 1mm thickness. 226 g/ton Ag (UNS C12700), 283 g/ton Ag (UNS C12800), 453 g/ton Ag (UNS C12900), 708 g/ton Ag (UNS C13000).</p> <p>Standards: ASTM. Flat products: B-11, B-124, B-133, B-152, B-272. Rod: B-12, B-124, B-133. Shapes: B-124, B-133, B-216. Lake copper wirebar, cake, slab, billet and ingot: B-4.</p>																
Arsenic,As ≤0,012%, Bismuth,Bi ≤0,0030%,	8,89	Rockwell F 45	235	76,0 (Strain 0,500 %)	45,0 (in 50 mm)	-	-	20 (UNS C36000 – free-cutting brass = 100%)	-	56,8	98,0	0,00000176	16,8 (Temperature 20,0 – 100 °C), 17,4 (Temperature	0,385	377	1085 (Liquidus 1085 °C)

Copper, Cu 99,88%, Lead, Pb ≤0,0040 %, Nickel, Ni ≤0,050%, Silicon, Si ≤0,0030 %													20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)			
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UNS/European Number: **C14300/-, C14310/-**  
Name: **Cadmium-Copper, Deoxidized, Cu-Cd. OS025 Temper**  
Applications: Anneal resistant electrical applications requiring thermal softening and embrittlement resistance, lead frames, contacts, terminals, solder-coated and solder-fabricated parts, furnace-brazed assemblies and welded components, cable wrap.  
Processing: Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Available as flat products.

Cadmium, Cd 0,10 % (C14300), 0,20 % (C14310), Copper, Cu 99,9 % (C14300), 99,8 % (C14310)	8,94	-	220	75,0 (Strain 0,200 %)	42,0 (in 50 mm)	115	0,300 Calculated	20 (UNS C36000 – free-cutting brass = 100%)	44,0	55,6 (C14300) 49,3 (C14310)	95,8 (C14300) 85,0 (C14310)	0,00000180 (C14300), 0,00000203 (C14310)	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	377 (C14300), 343 (C14310)	1052 – 1080 (Solidus 1052 °C, Liquidus 1080 °C)
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UNS/European Number: **C14500/CW118C**  
Name: **Phosphorus deoxidized tellurium bearing Copper, Cu-Te-P. OSO50 Temper**  
Applications: Forgings and screw machine products, and parts requiring high conductivity, extensive machining, corrosion resistance, copper color, or a combination of these: electrical connectors, motor and switch parts, plumbing fittings, soldering coppers, welding torch tips, transistors bases and furnace-brazed articles.  
Processing: Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Test specimens: rod - 25mm diameter.  
Standards: ASTM. Flat products and rod: B-124, B-301. Shapes: B-124, B-283.

Copper, Cu 99,5 %, Phosphorus, P 0,0040 - 0,012 %, Tellurium, Te 0,40 - 0,60 %	8,90	Rockwell F 40	220	69,0 (Strain 0,500 %)	50,0 (In 50 mm)	-	-	85 (UNS C36000 - free-cutting brass = 100%)	-	53,8	92,7	0,00000186	17,1 (Temperature 20,0 – 100 °C), 17,4 (Temperature 20,0 – 200 °C), 17,8 (Temperature 20,0 – 300 °C)	0,385	355	1051 – 1075 (Solidus 1051 °C, Liquidus 1075 °C)
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UNS/European Number: <b>C14700/CW114C</b> Name: <b>Sulfur bearing Copper, Cu-S. OSO50 Temper</b> Applications: Screw machine products and parts requiring high conductivity, extensive machining, corrosion resistance, copper color, or a combination of these: electrical connectors, motor and switch components, plumbing fittings, cold headed and machined parts, cold forgings, furnace-brazed articles, screws, soldering coppers, rivets and welding torch tips. Processing: Excellent hot and cold workability; good forgeability. Fabricated by coining, coppersmithing, drawing and upsetting, hot forging and pressing, spinning, swaging, stamping. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Test specimen: rod - 25mm diameter. Standards: ASTM. Flat products and rod: B-301																
Copper, Cu 99,6 %, Other ≤0,10 %, Sulfur, S 0,20 - 0,50 %	8,94	Rockwell F 40	220	69,0	50,0 (in 50 mm)	-	-	85 (UNS C36000 – free-cutting brass = 100%)	-	55,2	95,3	0,00000181	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,385	374	1067 – 1076 (Solidus 1067 °C, Liquidus 1076 °C)
UNS/European Number: <b>C15000/CW120C</b> Name: <b>Zirconium Copper , Cu-Zr (Amzirc Brand Copper)</b> Applications: Stud bases for power transmitters and rectifiers, switches and circuit breakers for high-temperature service, commutators, resistance welding tips and wheels, solderless wrapped connectors. Processing: Excellent hot and cold workability. Fabricated by swaging, bending, heading, or forging. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Test specimen: rod - 5mm diameter; cold worked 76% after aging (1 hour or more at 400-425°C).																
Copper,Cu 99,85 %, Zirconium, Zr 0,13 - 0,20 %	8,89	Rockwell B 72	430, 445 (Temperature 22,0 °C), 463 (Temperature -78,0 °C), 534 (Temperature -197 °C), 587 (Temperature -253 °C), 591 (Temperature -269 °C)	385, 411 (Strain 0,200 %, Temperature 22,0 °C), 423 (Strain 0,200 %, Temperature -78,0 °C), 446 (Strain 0,200 %, Temperature -269 °C), 453 (Strain 0,200 %, Temperature -269 °C)	8,00 (In 50 mm), 16,0 (Temperature 22,0 °C), 20,0 (Temperature -78,0 °C), 26,0 (Temperature -197 °C), 36,0 (Temperature -269 °C), 37,0 (Temperature -253 °C)	129	-	20 (UNS C36000 – free-cutting brass = 100%)	-	53,8	92,7	0,00000186	16,9 (Temperature 20,0 – 100 °C), 17,6 (Temperature 20,0 – 200 °C), 20,2 (Temperature 20,0 – 300 °C)	0,385	367	980 – 1080 (Solidus 980 °C, Liquidus 1080 °C)





Ag 0,0270 - 0,10 %																
UNS/European Number: <b>C15710/-</b> Name: <b>Copper Cu-Al<sub>2</sub>O<sub>3</sub>, 24 mm rod, 0% Cold Worked</b> Applications: Electrical connectors, light-duty current-carrying springs, inorganic insulated wire, thermocouple wire, lead wire, resistance welding electrodes for aluminum, heat sinks. Processing: Excellent cold workability. Fabricated by extrusion, drawing, rolling, impacting, heading, swaging, bending, machining, blanking, roll threading. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Test specimen: rod - 10 mm diameter; 0% cold worked.																
Al <sub>2</sub> O <sub>3</sub> 0,15 - 0,25 %, Copper, Cu 99,69 - 99,85 %, Iron, Fe ≤0,010 %, Lead, Pb ≤0,010 %, Oxygen, O ≤0,040 %	8,82	Rockwell B 60	325	270 (Strain 0,200 %)	20,0 (In 50 mm)	105	-	-	-	52,1	89,8	0,00000192	19,5 (Temperature 20,0 – 300 °C)	0,380	360	≤1080 (Liquidus 1080 °C)
UNS/European Number: <b>C15720/-</b> Name: <b>Copper Cu-Al<sub>2</sub>O<sub>3</sub>, 0,76 mm thick flat product, 91% Cold Worked</b> Applications: Relay and switch springs, lead frames, contact supports, heat sinks, circuit breaker parts, rotor bars, resistance welding electrodes and wheels, connectors, high strength high temperature parts. Processing: Excellent cold workability. Fabricated by extrusion, drawing, rolling, impacting, heading, swaging, bending, machining, blanking. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Test specimen: flat product - 0,76mm thick; 91% cold worked.																
Al <sub>2</sub> O <sub>3</sub> 0,35-0,45 %, Copper, Cu 99,49 - 99,6 %, Iron, Fe ≤ 0,010 %, Lead, Pb ≤ 0,010 %, Oxygen,O ≤ 0,040 %	8,81	-	570	545 (Strain 0,200%)	7,00 (In 50 mm)	113	-	-	-	51,6	88,9	0,00000194	19,6 (Temperature 20,0 – 300 °C)	0,380	353	≤1080 (Liquidus 1080 °C)
UNS/European Number: <b>C15735/-</b> Name: <b>Copper Cu-Al<sub>2</sub>O<sub>3</sub>, 24 mm rod, 0% Cold Worked</b> Applications: Resistance welding electrodes, circuit breakers, feed-through conductors, heat sinks, motor parts, high-strength high-temperature parts. Processing: Excellent cold workability. Fabricated by extrusion, drawing, heading, impacting, machining. Corrosion Resistance: Good to excellent corrosion resistance.																

Forms: Test specimen: rod - 24mm diameter; 0% cold worked.																
Al <sub>2</sub> O <sub>3</sub> 0,65-0,75 %, Copper, Cu 99,19 - 99,35 %, Iron, Fe ≤ 0,010 %, Lead, Pb ≤ 0,010 %, Oxygen, O ≤ 0,040 %	8,80	Rockwell B 77	485 (Extrusion ration and temperatur e dependent )	420 (Strain 0,200 %, , extrusion ratio and temperatur e depende)	16,0 (In 50 mm)	123	-	-	-	49,3	85,0	0,00000203	20,0 (Temperature 20,0 – 300 °C)	0,420	339	≤1080 (Liquidus 1080 °C)
UNS/European Number: <b>C16200/CW131C</b> Name: <b>Cadmium Copper, Cu-Cd. OS025 Temper. Flat products</b> Applications: Trolley wire, heating pads, electric-blanket elements, spring contacts, railbands, high-strength transmission lines, connectors, cable wrap, switch gear components and wave guide cavities. Processing: Excellent cold workability; good hot formability. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Test specimen: flat products - 1mm thickness; OS025 anneal (0,025 mm grain size). Standards: ASTM. Wire: B-9. B-105. SAE: J463.																
Cadmium, Cd 0,70 -1,20%, Copper,Cu 98,78 - 99,3 %, Iron, Fe ≤ 0,020 %	8,89	Rockwell F 54	240	76,0	52,0 (In 50mm)	115	0,307	20 (UNS C36000 – free-cutting brass = 100%)	44,0	52,1	89,8	0,00000192	17,0 (Temperature 20,0 – 100 °C), 17,3 (Temperature 20,0 – 200 °C), 17,7 (Temperature 20,0 – 300 °C)	0,380	360	1030 –1076 (Solidus 1030 °C, Liquidus 1076 °C)
UNS/European Number: <b>C18200/CW105C, C18400/CW105C, C18500/CW105C</b> Name: <b>Chromium Copper Cu-Cr. TB00 Temper flat products</b> Applications: Resistance welding electrodes, seam welding wheels, switch gear, electrode holder jaws, cable connectors, current carrying arms and shafts, circuit breaker parts, molds, spot welding tips, flash welding electrodes, electrical and thermal conductors requiring strength, switch contacts. Processing: Excellent cold workability; good hot workability. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Test specimen: flat products - 1 mm thickness. Standards: ASTM. Wire: F-9. SAE: J463 (C18400 only). Bar, forgings, rod, strip: MIL-C-19311(C18400, C18500)																
C18200: Chromium, Cr 0,60 - 1,20 %, Copper, Cu 98,0	8,89	Rockwell B 16,0	235	130	40,0 (In 50mm)	130	0,300	20 (UNS C36000 – free-cutting brass = 100%)	50,0	46,3	79,9	0,00000216	17,6 (Temperature 20,0 – 100 °C)	0,385	171	1070 – 1075 (Solidus 1070 °C, Liquidus 1075 °C)



Phosphorous, P ≤ 0,040 %, Silver, Ag 0,080 - 0,12 %.																
UNS/European Number: <b>C17500/CW104C</b> Name: <b>Copper-Cobalt-Beryllium Cu-Co-Be</b> Applications: Fuse clips, fasteners, springs, switch and relay parts, electrical conductors, welding equipment. Processing: Excellent cold workability; good hot formability. Corrosion Resistance: Good to excellent corrosion resistance. Standards: SAE: J463. Flat products: ASTM B-534. Rod, bar: ASTM B-441, MIL-C-46087. Strip: MIL-C-81021.																
Beryllium, Be 0,40 - 0,70 %, Cobalt, Co 2,40 - 2,70 %, Copper, Cu 96,9 %, Iron, Fe ≥ 0,10 %, Other ≥ 0,50 %.	Name: TB00 Temper strip, rod, bar, plate, tubing, forged products Forms: TB00 temper strip, rod, bar, plate, tubing, and forged products															
	8,75	Rockwell B 20,0 - 50,0 (Rod, bar, plate, tubing, forged product), 28,0 - 50,0 (Strip)	240 - 380	140 - 205 (Strain 0,200 %)	20,0 - 35,0 (In 50mm)	125 - 130	-	-	-	30,3 - 11,6	52,3 - 20,0	0,00000330 - 0,00000862	17,6 (Temperature 20,0 - 200 °C)	0,420	-	1030 - 1070 (Solidus 1030 °, Liquidus 1070 °C)
	Name: TF00 Temper strip, rod, bar, plate, tubing, forged products Forms: TF00 temper strip, rod, bar, plate, tubing, and forged products															
	8,75	Rockwell B 92,0 - 100	690 - 825	550 - 690 (Strain 0,200%)	10,0 - 20,0 (In 50mm, strip) 10,0 - 25,0 (In 50 mm, rod, bar, plate, tubing, forged products)	125 - 130	-	-	-	34,8 - 26,1	60,0 - 45,0	0,0000028735 - 0,0000038313 33	17,6 (Temperature 20,0 - 200 °C)	0,420	-	1030 - 1070 (Solidus 1030 °, Liquidus 1070 °C)
Name: TH04 Temper strip, rod, bar, plate, tubing Forms: TH04 temper strip, rod, bar, plate, and tubing																
8,75	Rockwell B 95,0 - 102 (Rod, plate, bar,	760 - 895	690 - 825 (Strain 0,200%)	8,00 - 15,0 (In 50 mm, strip), 10,0	125 - 130	-	-	-	34,8 - 29,0	60,0 - 50,0	0,0000028735 - 0,0000034482	17,6 (Temperature 20,0 - 200 °C)	0,420	-	1030 - 1070 (Solidus 1030 °, Liquidus	

		tubing), 98,0 – 102 (Strip)			- 20,0 % (In 50 mm, rod, bar, plate, tubing)											1070 °C)
Name: HTR (Proprietary mill hardening) Temper																
Forms: HTR temper strip																
	8,75	Rockwell B 98,0 - 103	825 – 1035	760 – 965 (Strain 0,200 %)	1,00 – 4,00 (In 50 mm)	125 – 130	-	-	-	34,8 - 26,1	60,0 - 45,0	0,0000028735 – 0,0000038313 33	17,6 (Temperature 20,0 – 200 °C)	0,420	-	1030 – 1070 (Solidus 1030 °, Liquidus 1070 °C)
Name: HTC (Proprietary mill hardening) Temper																
Forms: HTC temper strip																
	8,75	Rockwell B 79,0 - 88,0	515 – 585	345 – 515 (Strain 0,200 %)	8,00 – 15,0 (In 50mm)	125 – 130	-	-	-	≤ 34,8	≤ 60,0	≤ 0,0000028735	17,6 (Temperature 20,0 – 200 °C)	0,420	-	1030 – 1070 (Solidus 1030 °, Liquidus 1070 °C)
UNS/European Number: <b>C17600/-</b>																
Name: <b>Chromium-Copper Cr-Cu</b>																
Applications: Resistance welding electrodes for spot, seam, flash, and projection welding methods; electrical connectors, clips																
Processing: Excellent cold workability; good hot formability																
Corrosion Resistance: Good to excellent corrosion resistance																
Standards: SAE J463 (CA176)																
Beryllium, Be 0,25 – 0,50 %, Co + Ni ≥ 1,40 %, Co+Ni+Fe ≤ 1,90 %, Cobalt, Co 1,40 - 1,70 %, Copper, Cu 97,0 %, Silver, Ag 0,90 - 1,10 %	Name: TB00 Temper rod, bar, wire, tubing, plate, forged products															
	Forms: TB00 temper rod, bar, wire, plate, tubing, and forged products															
	8,75	Rockwell B 25,0 - 45,0 (Forged products), 20,0 - 50,0 (Rod, bar, wire, tubing, plate)	240 – 380	140 – 205 (Strain 0,200 %)	20,0 – 35,0	125 – 130	-	-	44,0	34,8 - 11,6	60,1 - 20,0	0,00000287 – 0,00000862	16,7 (Temperature 20,0 – 200 °C)	0,420	215 – 245	1031 – 1068 (Solidus 1031 °, Liquidus 1068 °C)
Name: TF00 Temper rod, bar, wire, tubing, plate, forged products																
Forms: TF00 temper rod, bar, wire, plate, tubing, and forged products																
	8,75	Rockwell B 92,0 - 100	690 – 825	550 – 690 (Strain	10,0 – 25,0	125 – 130	-	-	44,0	34,8 - 29,0	60,0 - 50,0	0,0000028735 – 0,0000034482	16,7 (Temperature 20,0 – 200 °C)	0,420	215 – 245	1031 – 1068 (Solidus

				0,200 %							(Forged products), 34,8 - 26,1 (Rod, bar, wire, tubing, plate)	(Forged products), 60,0 - 45,0 (Rod, bar, wire, tubing, plate)	(Forged products), 0,0000028735 - 0,0000038313 33 (Rod, bar, wire, tubing, plate)				1031 °, Liquidus 1068 °C)
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UNS/European Number: **C18100/-**  
Name: **Copper Cu-Cr-Zr-Mg. Cold Worked (40% reduction) Strip**  
Applications: Resistance welding electrodes and wheels, switches, circuit breakers, high temperature wire, semiconductor bases, heat sinks, and continuous casting molds.  
Processing: Excellent capacity for both cold and hot forming. Excellent solderability. Good brazing and gas-shielded arc welding. Fair butt resistance welding.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Strip, rod, wire.

Chromium, Cr 0,40 - 1,20 %, Copper, Cu 99,0 %, Magnesium, Mg 0,030 - 0,060 %, Zirconium, Zr 0,050 - 0,30 %	8,88	-	460	≥ 430	6,00 (In 50 mm)	125	-	-	-	46,1	79,5	0,00000217	16,7 (Temperature 20,0 – 100 °C), 18,4 (Temperature 20,0 – 200 °C), 19,3 (Temperature 20,0 – 300 °C)	-	324	≤ 1075 (Liquidus 1075 °C)
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UNS/European Number: **C18700/CW113C**  
Name: **Leaded Copper Cu-Pb**  
Applications: Connectors, motor and switch parts, screw machine parts requiring high conductivity.  
Processing: Good cold workability, poor hot workability.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Available as rod.  
Standards: ASTM. Flat products, rod: B-301. SAE. Rod: J463

Copper, Cu 99,0 %, Lead, Pb 0,80 - 1,50 %, Other ≤ 0,10 %	8,94	-	221 – 379	69,0 – 345 (Depending on temper)	45,0 (In 203,2 mm)	115	0,300 (Calculated)	85 (UNS C36000 - free-cutting brass = 100%)	44,0	55,9	96,3	0,00000179	17,6 (Temperature 20,0 – 300 °C)	0,385	377	950 - 1080 (Solidus 950 °C, Liquidus 1080 °C)
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UNS/European Number: **C19200/-**  
Name: **Copper Cu-Fe-P, O60 Temper strip**  
Applications: Automotive hydraulic brake lines, flexible hose, electrical terminals, fuse clips, gaskets, gift hollow ware, applications requiring resistance to softening and stress corrosion, air conditioning and heat exchanger tubing.

Processing: Excellent hot and cold workability. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Test specimen: strip - 1mm diameter. Standards: ASTM. Tubing: B-111, B-359, B-395, B-469																
Copper, Cu 98,7 - 99,19 %, Iron, Fe 0,80 - 1,20 %, Phosphorous, P 0,010 - 0,040 %	8,87	Rockwell B 38	310	≥ 140 (Strain 0,200 %)	≥ 25,0 % (ln 50 mm)	115	0,307	-	44,0	34,7	59,9	0,00000288	16,2 (Temperature 20,0 - 100 °C)	0,380	251	1078 - 1084 (Solidus 1078 °C, Liquidus 1084 °C)
UNS/European Number: <b>C19210/-</b> Name: <b>Copper Cu-Fe-P. H01 Temper sheet</b> Applications: Air conditioner and heat exchanger tubing, lead frames, electrical connectors and terminals. Processing: Excellent soldering, brazing, and coated metal arc welding. Good butt, resistance, and oxyacetylene welding. Gas-shielded arc, spot, and seam resistance welding are not recommended. Corrosion Resistance: Good to excellent corrosion resistance Forms: Sheet																
Copper, Cu 99,87 %, Iron, Fe 0,050 - 0,15 %, Phosphorous, P 0,025 - 0,040 %	8,94	-	345	330	13,0	125	-	20 (UNS C36000 - free-cutting brass = 100%)	-	46,3	79,9	0,00000216	16,9 (Temperature 20,0 - 300 °C)	-	-	≤ 1082 °C (1082 °C Liquidus)
UNS/European Number: <b>C19400/CW107C</b> Name: <b>High Strength Modified Copper Cu-Fe-P-Zn. O50 Temper flat products</b> Applications: Circuit breaker components, contact springs, electrical clamps, electrical springs, electrical terminals, flexible hose, fuse clips, gaskets, gift hollow ware, plug contacts, rivets, and welded condenser tubes. Processing: Excellent hot and cold workability. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Flat products, tubing. Test specimen: flat products - 0,64mm thickness. Standards: ASME. Welded tubing: SB543. ASTM. Flat products: B-465. Welded tubing: B-453, B-586.																
Copper, Cu 97,5 %, Iron, Fe 2,10-2,60 %, Lead, Pb ≤ 0,030%	8,78	Rockwell B 45	345	160 (Strain 0,200 %)	28,0 (ln 50 mm)	121	0,330	20 (UNS C36000 - free-cutting brass = 100%)	45,5	37,6	64,8	0,00000266	16,3 (Temperature 20,0 - 300 °C)	0,385	260	1080 - 1090 (Solidus 1080 °C, Liquidus 1090 °C)

, Other ≤ 0,15 %, Phosphorous, P 0,015 - 0,15 %, Tin, Sn ≤ 0,030 %, Zinc, Zn 0,050 - 0,20 %																
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UNS/European Number: **C19500/-**  
Name: **Copper Cu-Fe-P-Co-Sn**  
Applications: Electrical springs, sockets, terminals, connectors, clips and other current carrying parts having strength.  
Processing: Excellent hot and cold workability.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Available as flat products.

Aluminum, Al ≤ 0,020 % , Cobalt, Co 0,60 - 1,0 %, Copper, Cu 97,0 %, Iron, Fe 1,30 - 1,70 %, Lead, Pb ≤ 0,020 %, Other ≤ 0,10 %, Phosphorous, P 0,080 - 0,12 %, Tin, Sn 0,40 - 0,70 %, Zinc, Zn ≤ 0,20 %.	8,92	-	≥ 360	≥ 170	≥ 25,0 (ln 50 mm)	119	-	20 (UNS C36000 - free-cutting brass = 100%)	-	29,1	50,1	0,00000344	16,9 (Temperature 20,0 – 300 °C)	-	199	1085 – 1090 (Solidus 1085 °C, Liquidus 1090 °C)
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UNS/European Number: **C19700/-**  
Name: **Copper Cu-Fe-P-Mg**  
Applications: Electrical and electronic connectors, circuit breaker components, fuse clips, cable shielding, and lead frames. Generally suited to applications requiring excellent formability combined with high strength and conductivity.  
Processing: Excellent soldering and brazing. Excellent capacity for both cold and hot forming.



Corrosion Resistance: Good to excellent corrosion resistance																
Forms: Flat products, sheets, rod, wire.																
Cobalt, Co ≤ 0,050 %, Copper, Cu 99,15 %, Iron, Fe 0,30-1,20 %, Lead, Pb ≤ 0,050 %, Magnesium , Mg 0,010 - 0,20 %, Manganese , Mn ≤ 0,050 %, Phosphorous, P 0,10 - 0,40 %, Tin, Sn ≤ 0,20 %, Zinc, Zn ≤ 0,20 %	8,83	Rockwell B 68	380	315 (Strip)	10,0 (In 50mm)	121	-	20 (UNS C36000 - free-cutting brass = 100%)	-	46,3	79,9	0,00000216	15,8 (Temperature 20,0 – 100 °C), 16,8 (Temperature 20,0 – 200 °C), 17,3 (Temperature 20,0 – 300 °C)	-	320	1069 – 1086 (Solidus 1069 °C, Liquidus 1086 °C)
UNS/European Number: <b>C21000/CW500L</b>																
Name: <b>Gilding Copper Cu-Zn. OSO50 Temper</b>																
Applications: Coins, medals, tokens, bullet jackets, firing pin supports, fuse caps, primers, emblems, plaques, base for gold plate.																
Processing: Excellent cold workability, good hot workability for blanking, coining, drawing, piercing and punching, shearing, spinning, squeezing and swaging, stamping.																
Corrosion Resistance: Good to excellent corrosion resistance.																
Forms: Available as flat products and wire. 0,05 mm grain size																
Standards: SAE: J463. Rolled bar, plate, sheet and strip: ASTM B-36, MIL-C-21768. Wire: ASTM B-134, QQ-W-321.																
Copper, Cu 94,0 - 96,0 %, Iron, Fe ≤ 0,050 %, Lead, Pb ≤ 0,050 %, Zinc, Zn 5,0 %	8,86	Rockwell F 46	235	69,0	45,0 (In 50mm)	115	0,307	20 (UNS C36000 - free-cutting brass = 100%)	44,0	41,0 (Temperature 1100 °C, Liquid phase), 32,3 (Temperature 20,0 °C, Annealed)	70,7 (Temperature 1100 °C, Liquid phase), 55,7 (Temperature 20,0 °C, Annealed)	0,00000244 (Temperature 1100 °C, Liquid phase), 0,00000310 (Temperature 20,0 °C, Annealed)	18,0 (Linear, Temperature 20,0 – 300 °C)	0,380	234	1050 – 1065 (Solidus 1050 °C, Liquidus 1065 °C)
UNS/European Number: <b>C63800/-</b>																
Name: <b>Coronze Copper Cu-Al-Si-Co. H08 Temper sheet/strip</b>																
Applications: Springs, switch parts, contacts, relay springs, glass sealing and porcelain enameling.																

Processing: Excellent cold workability and hot formability. Corrosion Resistance: Good to excellent corrosion resistance. Forms: Available as flat products.																
Aluminum, Al 2,50 - 3,10 %, Cobalt, Co 0,25 - 0,55 %, Copper, Cu 95,0 %, Iron, Fe $\leq 0,10$ %, Lead, Pb $\leq 0,050$ %, Manganese , Mn $\leq 0,10$ %, Nickel, Ni $\leq 0,10$ %, Silicon, Si 1,50 - 2,10 %, Zinc, Zn $\leq 0,80$ %	8,28	Rockwell B 100, HR30T 83	895, 900 (as rolled; strip, annealed 1h ), 200 (Treatment Temperatu r 700 °C, strip, annealed 1h), 280 (Treatment Temperatu r 600 °C, strip, annealed 1h), 560 (Treatment Temperatu r 500 °C, strip, annealed 1h), 440 (Treatment Temperatu r 400 °C, strip, annealed 1h), 605 (Treatment Temperatu r 400 °C, strip, annealed 1h), 905 (Treatment Temperatu r 300 °C, strip, annealed 1h), 840 (Treatment Temperatu r 300 °C, strip, annealed 1h), 930 (Treatment Temperatu r 200 °C, strip, annealed 1h), 800	800 (as rolled; strip, annealed 1h), 200 (Treatment Temperatu r 700 °C, strip, annealed 1h), 280 (Treatment Temperatu r 600 °C, strip, annealed 1h), 360 (Treatment Temperatu r 500 °C, strip, annealed 1h), 440 (Treatment Temperatu r 400 °C, strip, annealed 1h), 36,0 (Treatment Temperatu r 400 °C, strip, annealed 1h), 43,0 (Treatment Temperatu r 300 °C, strip, annealed 1h), 49,0 (Treatment Temperatu r 200 °C, strip, annealed 1h)	3,00, 4,00 (as rolled; strip, annealed 1h), 2,00 (Treatment Temperatur 700 °C; strip, annealed 1h), 4,00 (Treatment Temperatur 300 °C, strip, annealed 1h), 31,0 (Treatment Temperatur 500 °C, strip, annealed 1h), 36,0 (Treatment Temperatur 500 °C, strip, annealed 1h), 43,0 (Treatment Temperatur 600 °C, strip, annealed 1h), 49,0 (Treatment Temperatur 700 °C, strip, annealed 1h)	117	0,312	-	45,0	57,5 (Annealed)	99,1 (Annealed)	0,00000174 (Annealed)	17,1 (Temperature 20,0 - 300 °C)	0,375	42,0	1000 - 1030 (Solidus 1000 °C, Liquidus 1030 °C)

			t Temperatu r 200 °C, strip, annealed 1h)	(Strain 0,200 %)												
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UNS/European Number: **C81100/CC040A/A – CC040A/B – CC040A/C**  
Name: **Copper Casting Alloy. Copper content listed above also includes silver**  
Applications: Electrical and thermal conductors; corrosion and oxidation resistant applications.  
Processing: Casting methods recommended for this alloy: Centrifugal, Continuous, Investment, Permanent Mold, Plaster, and Sand. Alloy does not respond to heat treating.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Bars

Copper,Cu ≥ 99,7 %, Other ≤ 0,30 %, P + Si ≤ 0,010 %	8,94	Mechanical properties typical for sand-cast test bars								53,4	92,0	0,000001874	16,9 (Temperature 20,0 – 300 °C)	0,380	346	1065 – 1083 (Solidus 1065 °C, Liquidus 1083 °C)
		Brinell 44	170	62,0 (Strain 0,500 %)	40,0 (in 50mm)	115	-	10 (UNS C36000 - free-cutting brass = 100%)	-							

UNS/European Number: **C81300/CC040A/A – CC040A/B – CC040A/C**  
Name: **Copper Casting Alloy. Sum of Copper and named elements should total a minimum of 99,5%**  
Applications: Higher hardness electrical and thermal conductors.  
Processing: Casting methods recommended for this alloy: Centrifugal, Continuous, Investment, Permanent Mold, Plaster, and Sand.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Bars

Beryllium, Be 0,020 - 0,10 %, Cobalt, Co 0,60 - 1,0 %, Copper,Cu ≥ 98,5 %	8,81	Mechanical properties typical for separately cast heat-treated (TF00 temper) test bars								34,8	60,0	0,000002874	18,0 (Temperature 20,0 – 300 °C)	0,390	260	1066 – 1093 (Solidus 1066 °C, Liquidus 1093 °C)
		Brinell 89 (500 kg, typical)	≥ 365	≥ 250 (Strain 0,200 %)	≥ 11,0 (in 50 mm)	-	-	20 (UNS C36000 - free-cutting brass = 100%)	-							

UNS/European Number: **C81400/-**  
Name: **Copper Casting Alloy Cu-Cr-Be**  
Applications: Higher hardness electrical and thermal conductors.  
Processing: Casting methods recommended for this alloy: Centrifugal, Continuous, Investment, Permanent Mold, Plaster, and Sand.  
Corrosion Resistance: Good to excellent corrosion resistance.  
Forms: Casts.  
Standards: RMWA. Class II

Beryllium, Be 0,020 - 0,10 %, Chromium, Cr 0,80 %,	8,81	Rockwell	205	83,0	11,0	110	0,341	30	41,0	40,0	69,0	0,00000250	19,0 (Temperature 20,0 – 300 °C)	0,389	259	1065 – 1095 (Solidus 1065 °C, Liquidus
		B 62 (as cast), 69 (TF00 temper)	(as cast), 365 (TF00 temper)	(Strain 0,200 %, as cast), 250 (Strain	(in 50 mm, TF00 temper), 35,0 % (in 50 mm,	(UNS C36000 - free-cutting brass = 100%, as cast), 40										

Copper, Cu ≥ 98,5 %, Other 0,60 - 1,0 %				0,200 %, TF00 temper)	as cast)			(UNS C36000 - free-cutting brass = 100%, TF00 temper)									1095 °C)
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UNS/European Number: **C81500/CW106C**  
Name: **Copper Casting Alloy Cu-Cr**  
Applications: Electrical and/or thermal conductors used as structural members where strength and hardness greater than that of UNS C8100-8110 are required  
Processing: Casting methods recommended for this alloy: Centrifugal, Continuous, Investment, Permanent Mold, Plaster, and Sand.  
Corrosion Resistance: Good to excellent corrosion resistance  
Forms: Bars.  
Standards: CA815

Chromium, Cr 0,40 - 1,50 %, Copper, Cu 98,0 - 99,6 %, Lead, Pb ≤ 0,015 %, Other ≤ 0,50 %, Phosphorous, P ≤ 0,040 %	8,82	Mechanical properties typical for sand cast test bars, heat treated								47,6	82,1	0,00000210 (Precipitation hardened), 0,00000383 (Solution heat treated)	Mechanical properties typical for sand cast test bars, heat treated,	47,6	82,1	0,00000210 (Precipitation hardened), 0,00000383 (Solution heat treated)
		Brinell 105	350	275	17,0	115	0,320	20 (UNS C36000 - free-cutting brass = 100%)	44,0							