

SILVER PRODUCTS GUIDE



UNIVERSAL SILVER ALLOYS

CADMIUM FREE

Silver alloy	Composition %				Melting range °C	Operating temp. °C	Density g/cm ³	Tensile strength N/mm ²	International norms	
	Ag	Cu	Zn	Other					EN 17672	DIN 8513
Ag 56Sn	56	22	17	5,0 Sn	620-650	650	9,5	410	Ag 156	-
Ag 55Sn	55	21	22	2,0 Sn	620-660	650	9,4	390	Ag 155	L-Ag 55Sn*
Ag 50Ni	50	20	28	2,0 Ni	660-750	740	9	450	Ag 450	-
Ag 45Sn	45	27	25	3,0 Sn	640-680	670	9,2	350	Ag 145	L-Ag 45Sn
Ag 44	44	30	26	-	675-735	730	9,1	545	Ag 244	L-Ag 44
Ag 40Sn	40	30	28	2,0 Sn	640-700	690	9,1	430	Ag 140	L-Ag 40Sn
Ag 34Sn	34	36	27	3,0 Sn	630-730	710	9	420	Ag 134	L-Ag 34Sn
Ag 30Sn	30	36	32	2,0 Sn	680-765	750	8,9	460	Ag 130	L-Ag 30Sn
Ag 30	30	38	32	-	650-750	740	8,8	505	Ag 230	L-Ag 30
Ag 25	25	41	34	-	700-800	750	8,7	420	Ag 225	L-Ag 25
Ag 12	12	48	40	0,2 Si	800-830	830	8,5	410	Ag 212	L-Ag 12

Universal cadmium free silver alloys are used for brazing any steels, copper and copper based alloys as well as for nickel and nickel based alloys. Generally they are used at operating temperature of -200 °C to +200 °C.

These alloys combine the lowest brazing temperatures with short melting ranges. They are very free flowing and produce neat joints with small fillets. They have excellent mechanical properties and are suitable for sea water applications being resistant to dezincification.

Cadmium free alloys are often used as substitutes for cadmium containing alloys. Their narrow melting ranges make them ideal for applications where liquation may be a problem.

Standard delivery forms:

Wire	∅ 1,0 – 1,5 – 2,0 mm
Rods	∅ 1,0 – 1,5 – 2,0 mm; length 500 mm
Foil	thickness 0,1 / 0,2 / 0,3 / 0,4 mm; width 70 mm
Preforms	rings, plates

Other delivery forms upon request.

Universal cadmium free silver alloys can also be delivered as flux coated rods, with flux type FH10 (EN 1045).

UNIVERSAL SILVER ALLOYS

PHOSPHORUS AND COPPER PHOSPHORUS ALLOYS

Phosphorus alloy	Composition %			Melting range °C	Operating temp. °C	Density g/cm ³	Tensile strength N/mm ²	International norms	
	Ag	Cu	P					EN 17672	DIN 8513
Ag 18CuP	18	75	7	645-670	660	8,6	250	CuP 286	-
Ag 15CuP	15	80	5	645-800	710	8,4	250	CuP 284	L-Ag 15P
Ag 5CuP	5	88,8	6,2	645-810	710	8,2	250	CuP 281	L-Ag 5P
Ag 2CuP	2	91,8	6,2	645-800	710	8,1	250	CuP 279	L-Ag 2P
CuP 7	-	93	7	710-820	720	8,1	250	CuP 180	L-CuP 7
CuP 6	-	94	6	710-880	730	8,1	250	CuP 179	L-CuP 6

Phosphorus containing brazing alloys are recommended when joining copper to copper without flux, and with using flux also for joining copper and copper-based materials, such as brass and bronze. They are used at operating temperature of $-70\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$.

These alloys are not suitable for joining materials containing nickel or iron. They should not be applied to materials in which the sulphur is present.

They are widely used in plumbing applications and in refrigeration and air conditioning industries, as well as in the electric industry.



Standard delivery forms:

Wire	∅ 1,0 – 1,5 – 2,0 mm
Rods	∅ 1,0 – 1,5 – 2,0 mm; length 500 mm
Foil	thickness 0,1 / 0,2 / 0,3 / 0,4 mm; width 70 mm
Preforms	rings, plates

Other delivery forms upon request.

SPECIAL SILVER ALLOYS FOR TUNGSTEN CARBIDE

Alloy	Composition %				Melting range °C	Operating temp. °C	Density g/cm ³	Tensile strength N/mm ²	International norms	
	Ag	Cu	Zn	Other					EN 17672	DIN 8513
Ag 49MnNi	49	16	23	7,5 Mn 4,5 Ni	625-705	690	8,9	250-300	Ag 449	L-Ag 49
Ag 49MnNi L	49	27,5	20,5	2,5 Mn 0,5 Ni	670-690	690	9	250-300	-	-
Ag 49MnNi L/Cu	49	27,5	20,5	2,5 Mn 0,5 Ni	670-690	690	9	150-300	-	-
Ag 40Ni	40	30	28	2,0 Ni	670-780	780	8,9	350	Ag 440	-
Ag 27MnNi	27	38	20	9,5 Mn 5,5 Ni	680-850	840	8,7	150-300	Ag 427	L-Ag 27

Special silver brazing alloys are suitable for brazing materials which are difficult to wet, such as stainless steel, tungsten, chromium, molybdenum and tantalum. They are usually used in the tool industry.

The group Ag49MnNi, Ag40Ni and Ag27Mn are cadmium free alloys containing nickel and manganese. The nickel improves wetting on carbides and produces a less free flowing alloy. The manganese content improves the wetting on carbides containing titanium and tantalum. The use is limited only by relatively high temperature of melting.

L-Ag49MnNi/Cu is the compound alloy (triple metal sheets—trifoil) with an interconnected layer of copper which absorbs crashes and vibrations and has low melting point.



Standard delivery forms:

Wire	Ø 1,0 – 1,5 – 2,0 mm
Rods	Ø 1,0 – 1,5 – 2,0 mm; length 500 mm
Foil	thickness 0,1 / 0,2 / 0,3 / 0,4 mm; width 70 mm
Preforms	rings, plates

BRAZING FLUXES

Flux	Activity range °C	Norm EN 1045	Form		Description
			Paste	Powder	
H	550-970	FH 10	X	X	Universal flux for steel, copper and copper alloys, nickel and nickel alloys
H special	520-1.030	FH 12	X	X	For stainless steel, carbide, tungsten, molybdenum
H 80	550-850	FH 10	X	X	For surface brazing, carbides and diamond segments

Choice of flux depends on the joining materials and operating temperature of the alloy. Flux must melt and become active at a temperature lower than that of the melting point of the alloy. Flux should remain active during the whole brazing process, removing the oxides from the two joining metals or preventing the oxidation.



Flux residue removal:

Flux residues soluble in water can be removed by immersion in water followed by brushing in a stream of water. For faster removal 5-10% sulphuric acid solution can be used followed by brushing in a stream of water.

For removing flux residues insoluble in water immersion in a warm 10% sodium hydroxide solution followed by brushing in a stream of water is recommended.

Packaging:
1 kg pot

Other packaging upon request.

OTHER SILVER PRODUCTS

Silver products 99,99 % Ag purity:

Silver granules
for industry



Silver anodes
600 x 200 x 10 mm,
300 x 200 x 5 mm or
other custom dimensions

Silver wire
diameter ranging from
1,0 to 3,0 mm





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