GMAW AND GTAW COPPER ALLOYS

- ❑ Copper-Aluminium (Aluminium Bronze)
- ❑ Copper-Nickel
- ❑ Copper low alloyed
- ❑ Copper-Silicon (Silicon Bronze)
- ❑ Copper-Tin

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Cu Sn W/R

AWS A5.7 / A5.8: ERCu
EN ISO 24373 – S Cu 1898 (CuSn1)

Description: Oxygen-free copper alloy with alloyed elements such as silicon, tin and manganese suitable for GMAW and GTAW copper alloys welding. The alloyed elements improve the weldability without reducing the electrical conductivity. Phosphorus and silicon have a deoxidizer action.

Application: suitable for joining OF-copper and copper materials subject to high strain. Easily workable. In case of high thickness, it is recommended to preheat to 300 °C.

Chemical composition according to EN ISO 24373 [%]:

	Cu	Al	Fe	Mn	Ni[1]	P	Pb	Si	Sn	Zn	As	C	Ti	S	other total
min.	98.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
max.	-	0.01	-	0.50	-	0.15	0.02	0.50	1.00	0.03	-	-	-	-	0.50

Remark: *maximum value unless shown as a range or a minimum.* [1] *including Co*

Mechanical and Physical properties: *(as-welded)*

min R_m [N/mm²]	220
A [%]	30
Electric Conductivity [m/Ω·mm²]	15-20
Brinell Hardness [HB 2,5/62,5]	60
T melting [°C]	1020 - 1050

Gas: EN ISO 439 – I1 (Ar), I3 (He,Ar)
Winding: precision layer wound wire

Available sizes:

Wire: diam. 0.80-1.00-1.20-1.60 mm
Spools:
D100 -
D200 -
D300 15,0 kg plastic spool
BS300 15,0 kg basket spool
Drums:
200 kg
Rods: diam 1.60-2.00-2.40-3.20-4.00 mm x 1000 mm
10 kg cardboard box
Both wire and rods available in FIDAT boxes or neutral boxes

Cu Si 3 W/R

AWS A5.7 / A5.8: ERCuSi-A
EN ISO 24373 – S Cu 6560 (CuSi3Mn1)

Description: Copper Si alloy, with a controlled Si content (2.80%-3.20) in order to avoid welding defects. For GMAW/GTAW welding on low-alloyed CuMn, CuSiMn and CuZn materials. High temperature and corrosion resistance. Thanks to its melting range and weldability this alloy reduce the finishing operation after welding.

Application: Suitable to weld oxygen-free copper and Cu materials. Used also for galvanized steel GMAW brazing and laser brazing. In case of high thickness, it is recommended to preheat to 300 °C.

Chemical composition according to EN ISO 24373 [%]:

	Cu	Al	Fe	Mn	Ni[1]	P	Pb	Si	Sn	Zn	As	C	Ti	S	other total
min.	rem.	-	-	0.50	-	-	-	2.80	-	-	-	-	-	-	-
max.	-	0.02	0.50	1.50	-	0.05	0.02	4.00	0.20	0.40	-	-	-	-	0.50

Remark: *maximum value unless shown as a range or a minimum.* [1] *including Co*

Mechanical and Physical properties: *(as-welded)*

min R_m [N/mm²]	350
A [%]	40
Electric Conductivity [m/Ω·mm²]	3.5 – 4.0
Brinell Hardness [HB 2,5/62,5]	80
T melting [°C]	910 - 1025

Gas: EN ISO 439 – I1 (Ar), I3 (He,Ar)
Winding: precision layer wound wire

Available sizes:
Wire: diam. 0.80-1.00-1.20-1.60 mm
Spools:
D100 1,0 kg plastic spool
D200 2,0 – 5,0 kg plastic spool
D300 15,0 kg plastic spool
BS300 15,0 kg basket spool
Drums:
200 kg
Rods: diam 1.60-2.00-2.40-3.20-4.00 mm x 1000 mm
10 kg cardboard box
Both wire and rods available in FIDAT boxes or neutral boxes

Cu Sn 6 W/R

AWS A5.7 / A5.8: ERCuSn-A
EN ISO 24373 – S Cu 5180A (CuSn6P)

Description: High tin alloyed bronze to weld bronze of similar composition; very often used to join copper with steel. Used for cast iron hardfacing.

Application: Suitable to weld CuSn alloys, CuSnZnPb cast alloys and cast iron. For GMAW brazing on steel it is recommended to use a pulsed arc. Excellent for artistic foundries.

Chemical composition according to EN ISO 24373 [%]:

	Cu	Al	Fe	Mn	Ni[1]	P	Pb	Si	Sn	Zn	As	C	Ti	S	other total
min.	rem.	-	-	-	-	0.01	-	-	4.00	-	-	-	-	-	-
max.	-	0.01	0.10	-	-	0.40	0.02	-	7.00	0.10	-	-	-	-	0.20

Remark: *maximum value unless shown as a range or a minimum.* [1] *including Co*

Mechanical and Physical properties: *(as-welded)*

min R_m [N/mm²]	260
A [%]	20
Electric Conductivity [m/Ω·mm²]	6.0 – 7.0
Brinell Hardness [HB 2,5/62,5]	80
T melting [°C]	910 - 1040

Gas: EN ISO 439 – I1 (Ar), I3 (He,Ar)
Winding: precision layer wound wire

Available sizes:
Wire: diam. 0.80-1.00-1.20-1.60 mm
Spools:
D100 -
D200 -
D300 15,0 kg plastic spool
BS300 15,0 kg basket spool
Drums:
200 kg
Rods: diam 1.60-2.00-2.40-3.20-4.00 mm x 1000 mm
10 kg cardboard box
Both wire and rods available in FIDAT boxes or neutral boxes

Cu Al 8 W/R

AWS A5.7 / A5.8: ERCuAl-A1
EN ISO 24373 – S Cu 6100 (CuAl7)

Description: Wire and rods for GMAW and GTAW copper alloys welding, especially for aluminium bronze alloys. Suitable also for welding of steel and cast iron, porosity free. Pre-heating is recommended when working with large pieces.
Suitable for metal-spraying in wear-resistance surface treatment and for welding galvanized steel sheet.

Application: Suitable in shipbuilding industry for pumps, propellers and valves when a high sea water corrosion resistance is required as well as in automotive industry in galvanized sheet welding and in construction industry where high mechanical properties are required.

Chemical composition according to EN ISO 24373 [%]:

	Cu	Al	Fe	Mn	Ni[1]	P	Pb	Si	Sn	Zn	As	C	Ti	S	other total
min.	rem.	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-
max.	-	8.50	*	0.50	*	-	0.02	0.20	*	0.20	-	-	-	-	0.40°

Remark: *maximum value unless shown as a range or a minimum. [1] including Co. * and ° the total of all other elements, including those for which the maximum value or an asterisk (*) is shown, shall not exceed the value specified in «others total»*

Mechanical and Physical properties: *(as-welded)*

min R_m [N/mm²]	430
A [%]	40
Electric Conductivity [m/Ω·mm²]	7.0 – 9.0
Brinell Hardness [HB 2,5/62,5]	100
T melting [°C]	1030 - 1040

Gas: EN ISO 439 – I1 (Ar), I3 (He,Ar)
Winding: precision layer wound wire

Available sizes:
Wire: diam. 0.80-1.00-1.20-1.60 mm
Spools:
D100 -
D200 -
D300 15,0 kg plastic spool
BS300 15,0 kg basket spool
Drums:
200 kg
Rods: diam 1.60-2.00-2.40-3.20-4.00 mm x 1000 mm
10 kg cardboard box
Both wire and rods available in FIDAT boxes or neutral boxes

Cu Al 8 Ni 2 W/R

EN 14640: CuAl8Ni2
EN ISO 24373 – S Cu 6327 (CuAl8Ni2Fe2Mn2)

Description: Wire and rods for GMAW and GTAW copper alloys welding, especially for copper aluminium and copper aluminium nickel alloys. Suitable also for welding of steel and cast iron, porosity free. Pre-heating is recommended when working with large pieces. Suitable for metal-spraying in wear-resistance surface treatment and for welding galvanized steel sheet.

Application: Suitable in shipbuilding industry for pumps, propellers and valves when a high sea water corrosion resistance is required as well as in automotive industry in galvanized sheet welding and in construction industry where high mechanical properties are required.

Chemical composition according to EN ISO 24373 [%]:

	Cu	Al	Fe	Mn	Ni[1]	P	Pb	Si	Sn	Zn	As	C	Ti	S	other total
min.	rem.	7.00	0.50	0.50	0.50	-	-	-	-	-	-	-	-	-	-
max.	-	9.50	2.50	2.50	3.00	-	0.02	0.20	-	0.20	-	-	-	-	0.40

Remark: *maximum value unless shown as a range or a minimum.* [1] *including Co.*

Mechanical and Physical properties: *(as-welded)*

min R_m [N/mm²]	530
A [%]	30
Electric Conductivity [m/Ω·mm²]	5.0
Brinell Hardness [HB 2,5/62,5]	140
T melting [°C]	1030 - 1050

Gas: EN ISO 439 – I1 (Ar), I3 (He,Ar)
Winding: precision layer wound wire

Available sizes:
Wire: diam. 0.80-1.00-1.20-1.60 mm
Spools:
D100 -
D200 -
D300 15,0 kg plastic spool
BS300 15,0 kg basket spool
Drums:
200 kg
Rods: diam 1.60-2.00-2.40-3.20-4.00 mm x 1000 mm
10 kg cardboard box
Both wire and rods available in FIDAT boxes or neutral boxes

Cu Al 9 Fe W/R

AWS A5.7 / A5.8: ERCuAl-A2
EN ISO 24373 – S Cu 6180 (CuAl10Fe1)

Description: Wire and rods for GMAW and GTAW welding copper-aluminium, copper-silicon, copper-manganese and some copper-nickel alloys. Filler material used to weld cast irons, tool steel and galvanized sheets. Used in welding high-strenght brass to guarantee a deposit of material with similar properties of the base material. Pre-heating is recommended when working with large pieces.

Application: Suitable in shipbuilding industry for pumps, propellers and valves when a high sea water corrosion resistence is required as well as in automotive industry in galvanized sheet welding and in construction industry where high mechanical properties are required.

Chemical composition according to EN ISO 24373 [%]:

	Cu	Al	Fe	Mn	Ni[1]	P	Pb	Si	Sn	Zn	As	C	Ti	S	other total
min.	rem.	8.50	-	-	-	-	-	-	-	-	-	-	-	-	-
max.	-	11.00	1.50	-	-	-	0.02	0.10	-	0.02	-	-	-	-	0.50

Remark: *maximum value unless shown as a range or a minimum.* [1] *including Co.*

Mechanical and Physical properties: *(as-welded)*

min R_m [N/mm²]	500
A [%]	35
Electric Conductivity [m/Ω·mm²]	6.50 - 7.50
Brinell Hardness [HB 2,5/62,5]	140
T melting [°C]	1030 - 1040

Gas: EN ISO 439 – I1 (Ar), I3 (He,Ar)
Winding: precision layer wound wire

Available sizes:
Wire: diam. 0.80-1.00-1.20-1.60 mm
Spools:
D100 -
D200 -
D300 15,0 kg plastic spool
BS300 15,0 kg basket spool
Drums:
200 kg
Rods: diam 1.60-2.00-2.40-3.20-4.00 mm x 1000 mm
10 kg cardboard box
Both wire and rods available in FIDAT boxes or neutral boxes

Cu Ni 30 Fe W/R

AWS A5.7 / A5.8: ERCuNi
EN ISO 24373 – S Cu 7158 (CuNi30Mn1FeTi)

Description: Wire and rods for GMAW and GTAW welding copper-nichel alloys containing 10-30% Ni.

Application: Particularly suitable for high stressed corrosion resistant weld surfacing on cast iron and on unalloyed and low-alloyed steel as well as seawater resistant CuZn alloys. Suitable for welding on CuNi materials. Particularly recommended for the plant engineering. Due to the resistance to sea water the alloy is suitable for offshore applications, ship building, chemical and food industry and oil refineries

Chemical composition according to EN ISO 24373 [%]:

	Cu	Al	Fe	Mn	Ni[1]	P	Pb	Si	Sn	Zn	As	C	Ti	S	other total
min.	rem.	-	0.40	0.50	29.00	-	-	-	-	-	-	-	0.20	-	-
max.	-	-	0.70	1.50	32.00	0.02	0.02	0.25	-	-	-	0.04	0.50	0.01	0.50

Remark: *maximum value unless shown as a range or a minimum.* [1] *including Co.*

Mechanical and Physical properties: *(as-welded)*

min R_m [N/mm²]	410
A [%]	35
Electric Conductivity [m/Ω·mm²]	3.00
Brinell Hardness [HB 2,5/62,5]	110
T melting [°C]	1180- 1240

Gas: EN ISO 439 – I1 (Ar), I3 (He,Ar)
Winding: precision layer wound wire

Available sizes:
Wire: diam. 0.80-1.00-1.20-1.60 mm
Spools:
D100 -
D200 -
D300 15,0 kg plastic spool
BS300 15,0 kg basket spool
Drums:
200 kg
Rods: diam. 2.00-2.40-3.20-4.00 mm x 1000 mm
10 kg cardboard box
Both wire and rods available in FIDAT boxes or neutral boxes