Lawton Jointing Solutions Data Sheet

Lawton Jointing Solutions	Brazing rods, solder wire and fluxes
Applications	Capillary brazing and soft soldering of copper and copper alloy pipework: plumbing, heating, air conditioning, medical gas and engineering
Market Segment	Plumbing, HVAC/R, Medical, Engineering
Product Families	Copper-phosphorus brazing rods (0 - 15 % Ag); silver brazing rods (30 - 56 % Ag, bare and flux-coated); leaded and lead-free solder wire; soldering and brazing fluxes
Brazing Rod Standard	BS EN ISO 17672:2024
Solder Wire Standard	BS EN ISO 9453
Designation Standard	BS EN ISO 3677
Cadmium	All brazing alloys cadmium-free (Cd <= 0.010 %, EN ISO 17672:2024)
Form of Supply	Rods 500 mm standard (square-section and 600/800 mm variants available); solder wire on 500 g reels; flux in 113 g / 250 g / 453 g containers
Pack Sizes	1 kg and 5-rod packs (rods); 500 g reels (wire)
Test Certificates	EN 10204 3.1 available for brazing rods and solder wire
Safety	Safety data sheets available for all products on request
Guarantee	2 Years (See website for full T&Cs)

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CuP Rod Range

Attribute	S2 / CuP179	S2(0.2)	AG2P	AG5P	AG6P	AG15P
Product Name	0% Silver Brazing Alloy	0.2% Silver Brazing Alloy	2% Silver Brazing Alloy	5% Silver Brazing Alloy	6% Silver Brazing Alloy	15% Silver Brazing Alloy
EN ISO 17672:2024 Designation	CuP 179	Proprietary	CuP 279	CuP 281	CuP 283	CuP 284
EN ISO 3677 Designation	B-Cu94P-710/890	-	B-Cu92PAg-645/825	B-Cu89PAg-645/815	B-Cu87PAg-643/720	B-Cu80AgP-645/800
Type	Copper-phosphorus brazing alloy	Copper-phosphorus brazing alloy	Copper-phosphorus-silver brazing alloy	Copper-phosphorus-silver brazing alloy	Copper-phosphorus-silver brazing alloy	Copper-phosphorus-silver brazing alloy
Applications	HVAC/R and plumbing copper-to-copper joints	HVAC/R and plumbing copper-to-copper joints	HVAC/R copper-to-copper joints, improved ductility	HVAC/R, medical and plumbing joints, good gap filling	HVAC/R joints, lower liquidus for reduced heat input	HVAC/R and medical joints, highest ductility of the CuP range
Solidus (°C)	710	710	645	645	645	645
Liquidus (°C)	890	890	825	815	720	800
Working Temperature (°C)	760	760	740	710	690	700
Density (g/cm3)	8.1	8.1	8.1	8.2	8.1	8.3
Tensile Strength (N/mm2, typical)	490	490	490	600	600	600
Hardness (HV, typical)	195	195	195	190	200	180
Elongation (%, typical)	5	5	5	7	3	10
Electrical Conductivity (% IACS at 20 °C)	8.5	8.5	9	10	8	11
Flux on Copper-to-Copper	Not required (self-fluxing)					
Flux on Brass / Bronze	Required					
Available Sizes	2.0 mm square; 2.5 mm x 800 mm; 3.0 mm x 600 mm	2.0 mm square x 500 mm	2.0 mm, 2.5 mm, 3.0 mm x 500 mm	1.5 mm, 2.0 mm, 2.5 mm, 3.0 mm x 500 mm	2.5 mm x 500 mm	1.5 mm, 2.5 mm x 500 mm; 2.5 mm x 600 mm
Pack Sizes	1 kg	1 kg	1 kg; pack of 5 rods	1 kg; pack of 5 rods; 50-pack	1 kg	1 kg; pack of 5 rods

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CuP Rod Composition

Lawton Name	Cu (%)	P min (%)	P max (%)	Ag min (%)	Ag max (%)
S2 / CuP179	Remainder	5.9	6.5	-	-
S2(0.2)	Remainder	6.0 (typ.)	6.8 (typ.)	0.1 (typ.)	0.34 (typ.)
AG2P	Remainder	5.9	6.7	1.5	2.5
AG5P	Remainder	5.8	6.2	4.8	5.2
AG6P	Remainder	7	7.5	5.8	6.2
AG15P	Remainder	4.8	5.2	14.5	15.5
Impurity limits, all CuP alloys (EN ISO 17672:2024)	Al 0.01; Bi 0.030; Cd 0.010; Pb 0.025; Zn 0.05; Zn+Cd 0.05; total 0.25				

Ag Rod Range

Attribute	AG30	AG38	AG40	AG45P	AG55P	AG56 (FC)
Product Name	30% Silver Brazing Alloy	38% Silver Brazing Alloy	40% Silver Brazing Alloy	45% Silver Brazing Alloy	55% Silver Brazing Alloy	56% Silver Brazing Alloy (Flux Coated)
EN ISO 17672:2024 Designation	Ag 130	Ag 138	Ag 140	Ag 145	Ag 155	Ag 156
EN ISO 3677 Designation	B-Cu36Z-nAgSn-665/755	B-Ag38CuZn-Sn-650/720	B-Ag40CuZn-Sn-650/710	B-Ag45CuZn-Sn-640/680	B-Ag55Zn-CuSn-630/660	B-Ag56CuZn-Sn-620/655
Type	Silver brazing alloy (Ag-Cu-Zn-Sn)	Silver brazing alloy (Ag-Cu-Zn-Sn)	Silver brazing alloy (Ag-Cu-Zn-Sn)	Silver brazing alloy (Ag-Cu-Zn-Sn)	Silver brazing alloy (Ag-Cu-Zn-Sn)	Silver brazing alloy (Ag-Cu-Zn-Sn)
Applications	Brazing copper, brass, steel and dissimilar metals	Brazing copper, brass, steel and dissimilar metals	Brazing copper, brass, steel and dissimilar metals	Brazing copper, brass, steel and dissimilar metals; medical	Brazing copper, brass, steel and dissimilar metals; medical	Brazing copper, brass, steel and dissimilar metals; tight fit-ups
Solidus (°C)	665	650	650	640	630	620
Liquidus (°C)	755	720	710	680	660	655
Working Temperature (°C)	760	720	725	695	670	655
Density (g/cm3)	8.8	8.9	9.0	9.1	9.3	9.4
Flux	Required (or FC variant)	Required	Required (or FC variant)	Required	Required	Integral flux coating
Available Sizes	1.5 mm x 500 mm (bare and FC)	1.5 mm x 500 mm	1.5 mm x 500 mm (bare and FC); 3.0 mm x 500 mm (FC)	1.5 mm, 2.5 mm x 500 mm	1.5 mm x 500 mm	2.0 mm x 500 mm (FC only)
Pack Sizes	1 kg; pack of 5 rods	1 kg	1 kg; pack of 5 rods	1 kg	1 kg	Pack of 5 rods
Cadmium-Free	Yes	Yes	Yes	Yes	Yes	Yes

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Ag Rod Composition

Lawton Name	Ag min (%)	Ag max (%)	Cu min (%)	Cu max (%)	Zn min (%)	Zn max (%)	Sn min (%)	Sn max (%)
AG30	29	31	35	37	30	34	1.5	2.5
AG38	37	39	31	33	26	30	1.5	2.5
AG40	39	41	29	31	26	30	1.5	2.5
AG45P	44	46	26	28	23.5	27.5	2	3
AG55P	54	56	20	22	20	24	1.5	2.5
AG56 (FC)	55	57	21	23	15	19	4.5	5.5
Impurity limits, all Ag alloys (EN ISO 17672:2024)			Al 0.0010; Bi 0.030; Cd 0.010; P 0.008; Pb 0.025; Si 0.05; total 0.15					

Solder Wire

Attribute	Leaded Solder Wire	Lead-Free Solder Wire
Product Name	Leaded Solder Wire	Lead-Free Solder Wire
Alloy No. (EN ISO 9453)	136	402
Alloy Designation	Pb74Sn25Sb1	Sn97Cu3
Standard	BS EN ISO 9453:2020	BS EN ISO 9453:2020
Applications	Non-potable water systems, heating and general engineering. NOT for potable water.	Potable water supplies, heating and gas installations
Market Segment	Plumbing, Industrial	Plumbing, Industrial
Jointing Method	Soft soldering with capillary fittings	Soft soldering with capillary fittings
Melting Range (°C)	185 - 270	227 - 310
Form of Supply	Solid wire, 3.0 mm, 500 g reel	Solid wire, 3.0 mm, 500 g reel
Flux	Separate soldering flux required	Separate soldering flux required

Solder Wire Composition

Element	Alloy 136 Pb74Sn25Sb1 (%)	Alloy 402 Sn97Cu3 (%)
Tin (Sn)	24.5 - 25.5	Remainder
Lead (Pb)	Remainder	Max. 0.07
Antimony (Sb)	0.5 - 3.0	Max. 0.10
Copper (Cu)	Max. 0.08	2.5 - 3.5
Bismuth (Bi)	Max. 0.25	Max. 0.10
Cadmium (Cd)	Max. 0.005	Max. 0.002
Silver (Ag)	Max. 0.10	Max. 0.10
Gold (Au)	Max. 0.05	Max. 0.05
Indium (In)	Max. 0.10	Max. 0.10
Aluminium (Al)	Max. 0.001	Max. 0.001
Arsenic (As)	Max. 0.03	Max. 0.03
Iron (Fe)	Max. 0.02	Max. 0.02
Nickel (Ni)	Max. 0.01	Max. 0.01
Zinc (Zn)	Max. 0.001	Max. 0.001

Solder Wire Properties

Property	Leaded Solder Wire	Lead-Free Solder Wire
Solidus (°C)	185	227
Liquidus (°C)	270	310
Density (g/cm3)	10.54	7.33
Appearance	Solid wire, silver grey	Solid wire, silver grey
Potable Water	Not permitted	Permitted

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Fluxes

Attribute	Brazing Powder Flux	Soldering Flux Paste
Type	High-temperature brazing powder flux	Soft soldering paste flux
Used With	Silver (Ag) brazing alloys on brass, bronze, steel and dissimilar joints	Leaded and lead-free solder wire on copper capillary joints
Classification	FH10 to EN ISO 18496 (AWS A5.31 FB3-F). Designation: Flux ISO 18496 - FH10 A	ISO 9454-1 class 212 (organic, water-soluble, halide-activated soft soldering flux)
Active Constituents (MSDS)	Dipotassium tetraborate 50 - 55 %; potassium tetrafluoroborate 25 - 60 %	Ethoxylated fatty alcohol 20 %; fatty acid 5 %; amine chloride 50 %; water 25 %
Physical Data (MSDS)	White powder, odourless; specific gravity 1.3 g/cm3; water-soluble residues; shelf life min. 6 months sealed at +5 to +30 °C	Yellowish paste; pH 6 - 7; density 1.05 - 1.10 g/cm3; melting point 55 - 60 °C; stable emulsion to 65 °C; water soluble
Performance Standard	EN ISO 18496	ISO 9454-2:2020, Table 2, class 212
Applications	Silver brazing of copper, brass, steel	Soft soldering of copper pipe joints
Market Segment	HVAC/R, Engineering	Plumbing
Pack Sizes	250 g	113 g (with brush); 453 g
Working Range (°C)	550 °C - 800 °C (melting point 450 °C)	Active to 300°C; covers soldering with alloy 136 (185 - 270 °C) and alloy 402 (227 - 310 °C)
Residue Behaviour	Residues are corrosive and water-soluble: remove by washing or pickling	Non-acid, non-corrosive type (no zinc chloride). Halide-activated; residues are water-soluble: flush the joint after soldering

Selection Guide [a]

Joint / Application	Recommended Product	Flux	Notes
Copper-to-copper, HVAC/R and plumbing	CuP rods: S2/CuP179 (economy) to AG15P (highest ductility)	Not required (self-fluxing on copper)	Silver content improves ductility and lowers liquidus; select by joint stress and heat sensitivity
Copper-to-brass or bronze	CuP rods with brazing flux, or Ag rods	Required	CuP self-fluxing action works on copper only
Steel or dissimilar metals	Ag rods AG30 - AG56FC	Required (integral on FC variants)	Never use CuP alloys on ferrous or nickel-based parts: brittle phosphide joints
Medical gas pipework (EN 13348)	AG5P, AG15P, AG45P, AG55P	Per joint combination	
Vibration / thermal cycling service	Higher-silver CuP (AG15P) or Ag rods	As above	Higher silver improves fatigue resistance
Potable water soft soldering	Lead-Free Solder Wire (Sn97Cu3) + flux paste	Soldering flux paste	Leaded solder is not permitted on potable water
Non-potable heating circuits	Leaded or Lead-Free Solder Wire + flux paste	Soldering flux paste	

[a] Medical specification, project guidelines and site rules shall take precedence over the general recommendations given in the table

Colour coding relates to application:

- Blue - Lawton Plumbing
- Green - Lawton ACR
- Orange - General application including medical.

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