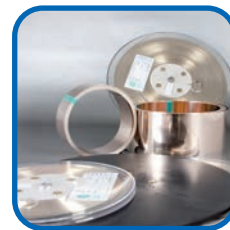


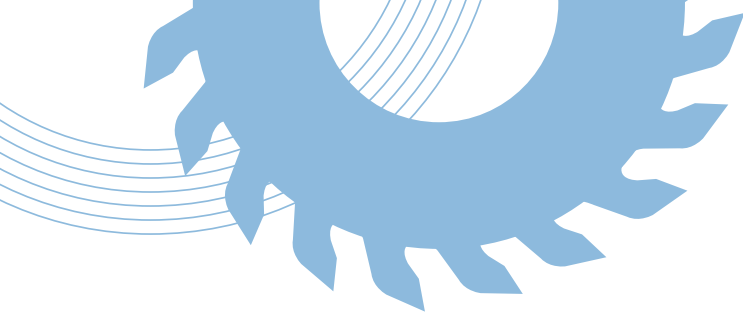
BRAZING

Filler metals and fluxes



STELLA
WELDING ALLOYS

CATALOGUE



STELLA

WELDING ALLOYS

STELLA srl is an Italian manufacturer of brazing alloys specialized in providing complete solutions in Brazing, Soldering and Welding applications. Our headquarters are located in the north of Italy from where we supply Customers in more than 60 countries worldwide. With more than 30 years of experience, we operate in plumbing, heating, air-conditioning and refrigeration, diamond and carbide tipped tools, heat exchangers, electro-mechanical, metal furniture industries and others, being a reliable source for worldwide leader original equipment manufacturers (OEMs). Our Quality System is certified ISO 9001 since 1998.

We offer:

- the most comprehensive and widest range of different products, from general purpose to special applications
- variety of different make-ups, from standard forms to custom engineered forms
- conformity to the main international, technical and environmental standards
- complete source for technical information, consulting and assistance



Our activity is focused on offering flexibility, technical support, prompt and customized service.

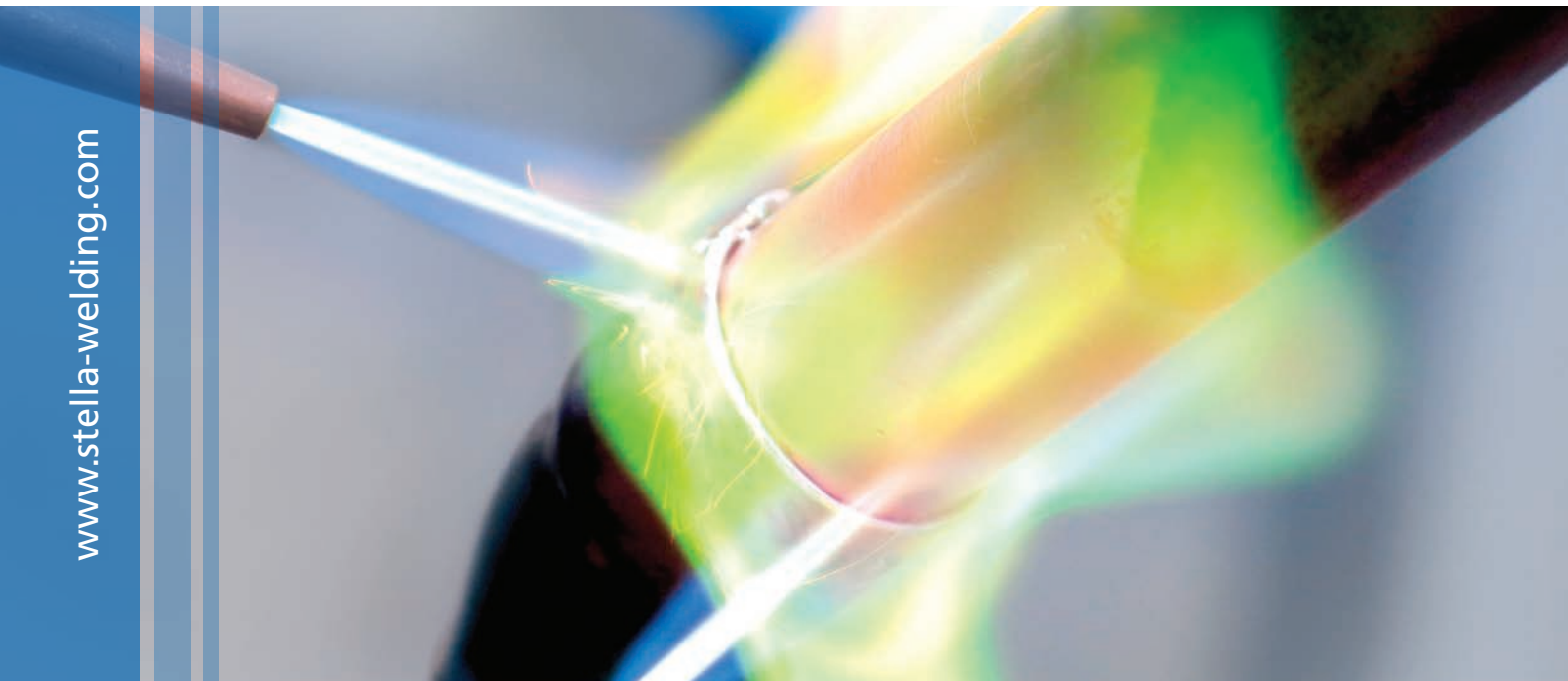


We operate regularly in:
Italian, English, German, French,
and Spanish.



30
YEARS
OF EXPERIENCE

ISO 9001:2015
Certified Company



● Our capabilities	page 2
● Our services	page 3
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● Silver based alloys - Special applications	page 6
● Silver based alloys - Trimetals	page 7
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(*) Available in European Union countries only for military and aerospace applications (EU Regulation 494/2011).



OUR CAPABILITIES

BARE RODS



Available in different diameters and cut to different lengths.

COATED RODS



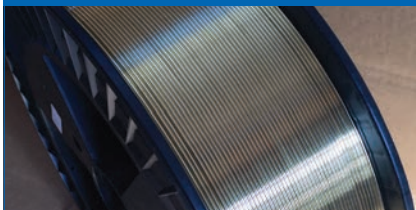
Environmentally friendly flux coated rods. Different ratios of coating available. Different colours available.

WIRE IN COIL



Different physical states available.

WIRE ON SPOOLS



On different types of spools. Precision layer available.

FLUX-CORED RODS AND WIRES



Suitable for aluminium alloys, silver alloys, brass and copper alloys in rods, wires and preforms from wire.

STRIPS



Available in a very wide combination of thickness/width in coils and on different types of spools.

POWDERS AND PASTES



Powders available in different grain sizes. Pastes available with different combination of binder/flux.

RINGS



Wide variety of sizes, with open ends or closed ends, single turn, two turns or multiple turns, loose or mounted on tubes.

FLUXES



Widest range of formulations. Thermo-sealed jars for preserving shelf life.

PREFORMS



Wide selection of preforms from wire and strip in various shapes like slugs, shims, discs and washers.

OUR SERVICES

PERSONAL ASSISTANCE IN YOUR OWN LANGUAGE



Multilingual assistance to support our customers in commercial, technical and logistics fields.

DELIVERY TO YOUR HOUSE



Reliable shipments, trackable in real time.

PACKING AND LABELS



Customized solutions for products packaging and labelling.

SAMPLE TESTING



Sending samples to choose the most suitable product

TECHNICAL EXPERTISE AND TRAINING



Thanks to our long experience in the field, we provide high-level technical support and training programs dedicated to operators and technicians.

LABORATORY TESTING



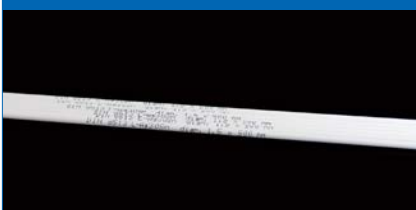
Analysis service to diagnose and resolve operational issues.

RECOVERY OF WASTE MATERIAL



For an efficient waste management of scraps and obsolete stocks.

RODS MARKING



Both on bare and on coated rods.

SUSTAINABILITY



Every decision we make and every action we take is guided by our commitment to supporting sustainable development.

SILVER BASED ALLOYS - CADMIUM FREE

The following are general purpose brazing alloys, suitable to join easily a wide range of ferrous and non-ferrous base materials (iron, steel, stainless steel, copper, brass, etc.).

Continuous service operating temperatures of joints brazed with these alloys range up to approx 200 °C.

When joining stainless steel in wet environments, in order to avoid failure of the joint due to interfacial corrosion, it is recommended to use zinc-free alloys (Ag60Sn/1), or alloys with Nickel additions.

Available in many different presentation forms (rods, flux-coated rods, wires, strips, rings, preforms, pastes and powders), these alloys are very free flowing, ductile and strong.

All these alloys do not contain Cadmium, do not present the Health & Safety concerns associated with Cadmium-Bearing Alloys and are compliant with the RoHS regulation. They are divided in two categories: alloys with Tin and alloys without Tin; Tin being used to lower the melting temperature of the alloy.

When brazing in an oxidizing environment (that is: in air), the use of a proper flux is required: see page 16.



Brazing of a brass component

CODE	COMPOSITION %					MELTING RANGE SOL - LIQ	DENSITY	TENSILE STRENGTH	CORRESPONDING STANDARDS		
	Ag	Cu	Zn	Sn	Si	°C	g/cm ³	kg/mm ²	ISO 17672	EN 1044	AWS A5.8

ALLOYS WITH TIN

Ag60Sn	60	23	14	3	-	620-685	9,6	48	-	AG 101	-
Ag60Sn/1	60	30	-	10	-	600-730	9,8	-	Ag 160	AG 402	BAG-18
Ag56Sn	56	22	17	5	-	620-655	9,4	48	Ag 156	AG 102	BAG-7
Ag55Sn	55	21	22	2	-	630-660	9,4	44	Ag 155	AG 103	-
Ag45Sn	45	27	25,5	2,5	-	640-680	9,2	43	Ag 145	AG 104	BAG-36
Ag40Sn	40	30	28	2	-	650-710	9,1	44	Ag 140	AG 105	BAG-28
Ag38Sn	38	32	28	2	-	650-720	9,1	45	Ag 138	-	BAG-34
Ag34Sn	34	36	27,5	2,5	-	630-730	9	48	Ag 134	AG 106	-
Ag32Sn	32	35	30,5	2,5	-	660-740	8,8	-	-	-	-
Ag30Sn	30	36	32	2	-	665-755	8,8	48	Ag 130	AG 107	-
Ag25Sn	25	40	33	2	-	680-760	8,8	48	Ag 125	AG 108	BAG-37
Ag17Sn	17	47,5	33,5	2	-	690-810	8,7	-	-	-	-










CODE	COMPOSITION %					MELTING RANGE SOL - LIQ	DENSITY	TENSILE STRENGTH	CORRESPONDING STANDARDS		
	Ag	Cu	Zn	Sn	Si	°C	g/cm ³	kg/mm ²	ISO 17672	EN 1044	AWS A5.8

ALLOYS WITHOUT TIN

Ag83	83	15	2	-	-	780-830	10,2	-	-	-	-
Ag81	81	13	6	-	-	725-800	10	36	-	-	-
Ag74	74	18	8	-	-	740-780	9,8	41	-	-	-
Ag67,5	67,5	23,5	9	-	-	700-730	9,7	47	-	-	-
Ag65	65	20	15	-	-	670-720	9,6	41	Ag 265	-	BAG-9
Ag60	60	26	14	-	-	695-730	9,5	45	-	AG 202	-
Ag45	45	30	25	-	-	665-745	9,1	42	Ag 245	-	BAG-5
Ag44	44	30	26	-	-	675-735	9,1	51	Ag 244	AG 203	-
Ag40	40	30	30	-	-	660-720	9,1	46	-	-	-
Ag35	35	32	33	-	-	685-755	9	48	Ag 235	-	BAG-35
Ag33	33	33,5	33,5	-	-	680-750	9	55	-	-	-
Ag30	30	38	32	-	-	680-765	8,9	50	Ag 230	AG 204	BAG-20
Ag25	25	40	35	-	-	700-790	8,8	45	Ag 225	AG 205	-
Ag20	20	44	36	-	0,15	690-810	8,7	43	Ag 220	AG 206	-
Ag18	18	46	36	-	0,15	720-820	8,5	-	-	-	-
Ag12	12	48	40	-	0,15	800-830	8,4	48	Ag 212	AG 207	-
Ag5	5	55	40	-	0,15	820-870	8,4	48	Ag 205	AG 208	-

ALLOYS WITH 0,2 % SILICON ARE AVAILABLE

CHARACTERISTICS MAKE-UP

 Rods	Ø: 0,5 → 4 mm	Length: 500 / 1.000 mm / Other lengths available
 Coated Rods	Ø: 1,5 - 2 - 2,5 - 3 mm / Others diameters available	Length: 500 mm / Different kinds of coating available in various colours
 Wires	Ø: 0,25 → 3 mm	Coils and Spools
 Strips	Thickness: 0,1 → 1 mm	Width: 1,3 → 80 mm
 Powder and Paste	 Rings	 Preforms from Wire and from Strip

SILVER BASED ALLOYS - SPECIAL APPLICATIONS



The following are alloys that, thanks to the addition of specific elements, or to their particular composition, have improved characteristics that make them suitable for specific applications or to operate in difficult conditions.

In particular, the addition of Nickel helps in joining difficult-to-braze materials (such as stainless steel, tool steel, tungsten carbide, nickel and nickel alloys, etc.) and improves corrosion resistance.

Manganese helps in brazing carbides.

Alloys without Copper are ammonia resistant.

Alloys without Zinc are suitable for brazing in oven and may be used to join stainless steels in wet conditions to avoid interfacial corrosion problems.

Alloys with Indium are suitable to join pieces that will undergo Tin coating.



CODE	COMPOSITION %							MELTING RANGE SOL - LIQ °C	DENSITY g/cm ³	TENSILE STRENGTH kg/mm ²	CORRESPONDING STANDARDS		
	Ag	Cu	Zn	Ni	Mn	Sn	In				ISO 17672	EN 1044	AWS A5.8

ALLOYS WITH NICKEL (FOR STAINLESS STEEL AND HARDMETALS)

Ag27MnNi	27	38	20	5,5	9,5	-	-	680-830	8,7	-	Ag 427	AG 503	-
Ag38MnNi	38	26	24	4,5	7,5	-	-	650-690	8,9	-	-	-	-
Ag40Ni	40	30	28	2	-	-	-	670-780	8,9	-	Ag 440	-	BAG-4
Ag49MnNi	49	16	23	4,5	7,5	-	-	680-705	8,9	55	Ag 449	AG 502	BAG-22
Ag49MnNi/1	49	27	21	0,5	2,5	-	-	670-690	8,9	-	-	-	-
Ag50Ni	50	20	28	2	-	-	-	660-705	9,0	45	Ag 450	-	BAG-24
Ag54Ni	54	40	5	1	-	-	-	720-855	9,6	-	Ag 454	-	BAG-13

ALLOYS WITHOUT COPPER (AMMONIA RESISTANT)

Ag72Zn	72	-	28	-	-	-	-	710-730	8,4	44	-	-	-
Ag85Mn	85	-	-	-	15	-	-	960-970	10	-	Ag 485	AG 501	BAG-23








ALLOYS WITHOUT ZINC (SUITABLE FOR BRAZING IN OVEN)

Ag60Sn/1	60	30	-	-	-	10	-	600-730	9,8	-	Ag 160	AG 402	BAG-18
Ag72Cu	72	28	-	-	-	-	-	780	10	35	Ag 272	AG 401	BAG-8
Ag99,9	99,9	-	-	-	-	-	-	960	10,5	-	-	-	-

ALLOYS WITH INDIUM (FOR TIN COATING)

Ag56InNi	56	27	-	2,5	-	-	14,5	600-710	9,6	-	-	AG 403	-
Ag64MnNiIn	64	26	-	2	2	-	6	730-780	9,6	-	-	-	-

CHARACTERISTICS MAKE-UP

 Rods	Ø: 0,5 → 4 mm	Length: 500 / 1.000 mm / Other lengths available
 Coated Rods	Ø: 1,5 - 2 - 2,5 - 3 mm / Others diameters available	Length: 500 mm / Different kinds of coating available in various colours
 Wires	Ø: 0,25 → 3 mm	Coils and Spools
 Strips	Thickness: 0,1 → 1 mm	Width: 1,3 → 80 mm
 Powder and Paste	 Rings	 Preforms from Wire and from Strip

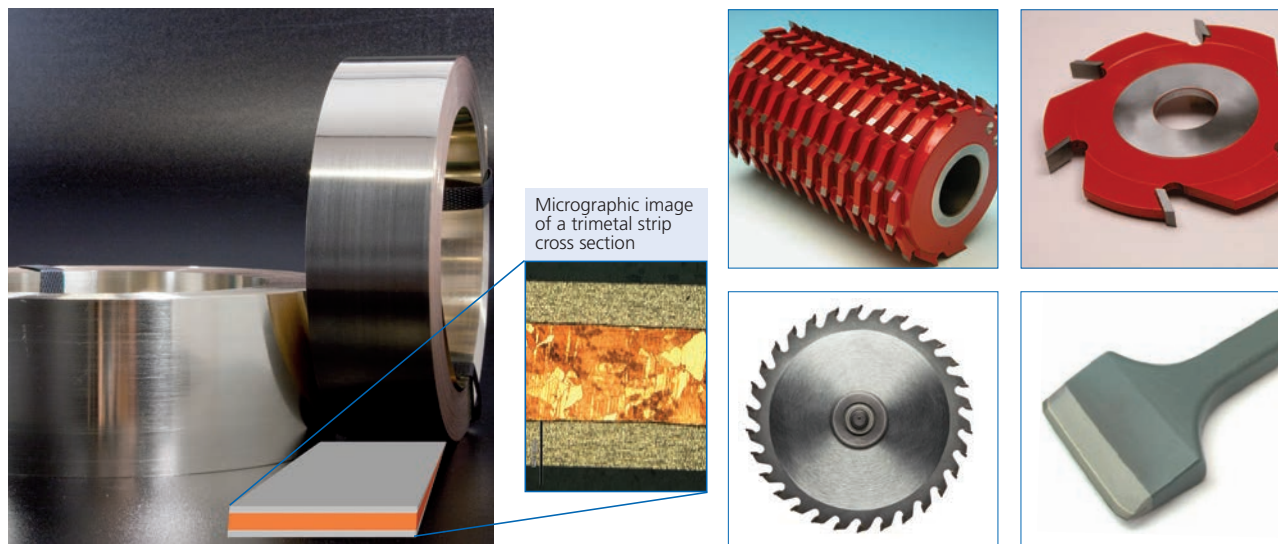
SILVER BASED ALLOYS - TRIMETALS

Trimetals strips consist of two layers of silver brazing alloy clad onto a copper core and are very popular for brazing of carbides onto steel, especially large pieces.

The copper core of the strip absorbs and relieves the stresses caused by the difference in thermal expansion between carbide and base metal, thus helping to prevent cracking.

Higher joint tensile strength performances are obtainable with Ag49MnNi/1 TR TOP, thanks to its modified copper central core.

For very large carbide pieces, or very hard carbide types, Ag49MnNi/1 TR 161, with higher copper percentage, is advised for the maximum reduction of internal stresses.



CODE	COMPOSITION % (external layers)					MELTING RANGE SOL - LIQ	DENSITY	JOINT SHEAR STRENGTH*	NOTES
	Ag	Cu	Zn	Ni	Mn	°C	g/cm ³	N/mm ²	

TRIMETALS (FOR HARDMETALS)

Ag49MnNi/1 TR	49	27,5	20,5	0,5	2,5	670-690	9,0	150-300	Copper Core - Ratio 1:2:1
Ag49MnNi/1 TR TOP	49	27,5	20,5	0,5	2,5	670-690	9,0	200-300	Modified Copper Core - Ratio 1:2:1
Ag49MnNi/1 TR 161	49	27,5	20,5	0,5	2,5	670-690	9,0	-	Copper Core - Ratio 1:6:1
Ag38MnNi TR	38	26	24	4,5	7,5	650-690	8,9	-	Copper Core - Ratio 1:2:1

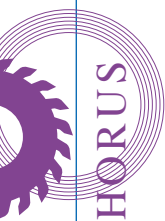
(*) Average value. Actual joint strength is a function of various factors, such as: type of base metals to be joined, joint design, joint clearance, brazing procedure, etc.

[OTHER ALLOYS AVAILABLE UPON REQUEST](#)

CHARACTERISTICS MAKE-UP

Strips	Thickness: 0,1 → 1 mm	Width: 1,3 → 80 mm
Preforms from Strip		





COPPER PHOSPHOROUS ALLOYS

The Copper-Phosphorous alloys are extensively used to join copper and copper alloy base metals (brass, bronzes).

They have self-fluxing properties when used on copper and may or may not contain Silver.

A flux is required when joining brass or bronze. Continuous service operating temperatures of joints brazed with these alloys range up to approx 200 °C. Corrosion resistance is satisfactory, except when the joints are exposed to sulfurous environments, especially at elevated temperatures. Copper-Phosphorous alloys should not be used on ferrous, nickel based alloys, or copper-nickel alloys with more of 10% nickel, in order to avoid premature failure of the joint due to the formation of brittle intermetallic phases. They are available in rods, wires, rings, preforms, pastes and powders.

Ag15CuP is also available in strip form.



Brazing of copper return bends

COPPER PHOSPHOROUS PLUS

The copper phosphorus alloys PLUS version, thanks to a special production process, guarantee a safe and efficient brazing, free from annoying sparkles and splashes.

Even when overheated, the alloy does not bubble, flows smoothly and wets completely the surfaces to be brazed.

The result is a joint free from porosity, safer and cleaner, and with enhanced mechanical and pressure tightness properties.

The alloys of the PLUS range may be conveniently used without flux for brazing of copper, and, with a suitable flux, for brazing of brasses and bronzes.

The PLUS copper phosphorus alloys comply, in their chemical composition, with the characteristics specified in the regulations in force.

They do not contain cadmium or lead and are therefore in conformity with the European standard RoHS (2011/65/EC) and have no usage restrictions in their applications.

They are available in the following variants:

CuP6 PLUS, CuP7 PLUS, CuP8 PLUS, Ag2CuP PLUS, Ag5CuP PLUS, Ag15CuP PLUS





CODE	COMPOSITION %				MELTING RANGE SOL - LIQ	FLOW POINT	DENSITY	TENSILE STRENGTH	CORRESPONDING STANDARDS		
	Ag	Cu	P	Sn	°C	°C	g/cm ³	kg/mm ²	ISO 17672	EN 1044	AWS A5.8

COPPER-PHOSPHORUS

CuP5	-	Bal	5	-	710-925	790	8,1	-	CuP 178	-	-
CuP6	-	Bal	6,3	-	710-890	760	8,1	56	CuP 179	CP 203	-
CuP7	-	Bal	7,3	-	710-820	730	8,1	58	CuP 180	CP 202	BCuP-2
CuP8	-	Bal	7,8	-	710-770	720	8	60	CuP 182	CP 201	-

COPPER-PHOSPHORUS-TIN

CuP7Sn	-	Bal	7	7	650-700	700	8	60	CuP 386	CP 302	~ BCuP-9
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SILVER-COPPER-PHOSPHORUS

Ag0,4CuP	0,4	Bal	6,6	-	650-810	750	8,2	58	-	-	-
Ag2CuP	2	Bal	6,5	-	645-825	740	8,1	55	CuP 279	CP 105	-
Ag2CuP HP	2	Bal	7	-	643-788	740	8,1	-	CuP 280	-	BCuP-6
Ag5CuP	5	Bal	6	-	645-815	710	8,2	55	CuP 281	CP 104	BCuP-3
Ag5CuP HP	5	Bal	6,75	-	643-771	710	8,2	-	CuP 282	-	BCuP-7
Ag6CuP LP	6	Bal	6,2	-	643-800	720	8,3	-	-	-	-
Ag6CuP	6	Bal	7	-	643-813	720	8,3	55	CuP 283	-	BCuP-4
Ag10CuP	10	Bal	6	-	650-750	720	8,3	65	-	-	-
Ag15CuP	15	Bal	4,9	-	645-800	700	8,4	54	CuP 284	CP 102	BCuP-5
Ag15CuP HP	15	Bal	5,1	-	645-800	700	8,4	54	CuP 284	CP 102	BCuP-5
Ag18CuP LP	18	Bal	6,3	-	643-666	670	8,4	50	CuP 285	-	BCuP-8
Ag18CuP	18	Bal	7	-	645	650	8,4	50	CuP 286	CP 101	-

STABILIZED, NOT SPARKLING ALLOYS ARE ALSO AVAILABLE (PLUS VERSION).
ALLOYS WITH DIFFERENT PHOSPHORUS CONTENT ARE AVAILABLE.

CHARACTERISTICS MAKE-UP

 Rods	Ø; □: 1,5 → 4 mm	Length: 500 / 1.000 mm
 Coated Rods	Ø: 1,5 - 2 mm	Length: 500 mm
 Wires	Ø: 0,5 → 3 mm	Coils and Spools
 Strips (Ag15CuP)	Thickness: 0,1 → 1 mm	Width: 1,3 → 120 mm
 Powder and Paste	 Rings	 Preforms from Wire and from Strip

BRASS AND COPPER BASED ALLOYS

This group includes four different categories of high-temp brazing alloys:

- General Purpose Brasses
- Brasses with addition of Nickel
- High temperature Copper Alloys for special applications
- Copper for furnace brazing

All these alloys are economical to use and can be generally supplied in a variety of forms (rods, wires, strips, preforms, powder and pastes). General purpose brasses can be used for brazing and for the Oxy-Fuel Gas Braze-Welding process, with liquid flux spread through the torch flame.

CODE	COMPOSITION %								MELTING RANGE SOL - LIQ °C	DENSITY g/cm ³	TENSILE STRENGTH kg/mm ²	CORRESPONDING STANDARDS		
	Cu	Zn	Ag	Ni	Mn	Sn	Si	Other				ISO 17672	EN 1044	AWS A5.8

GENERAL PURPOSE BRASSES

Cu60Zn	60	Bal	-	-	-	-	0,3	-	875-895	8,4	40	Cu 470a	CU 301	-
Cu59ZnSn	59	Bal	-	-	-	0,4	0,3	-	875-895	8,4	45	Cu 470	CU 302	RBCuZn-A
Cu59ZnMn	60	Bal	-	-	0,15	-	0,3	-	870-900	8,4	45	Cu 670	CU 303	-
Cu59ZnSnMn	59	Bal	-	-	0,7	0,4	0,3	-	870-890	8,4	45	~ Cu 471	~ CU 304	~ RBCuZn-C
Cu59ZnSnMnNi	59	Bal	-	0,8	0,6	1	0,3	-	870-890	8,4	45	Cu 671	CU 306	-
Cu59ZnAg	59	Bal	1	-	0,1	0,1	0,1	-	860-890	8,4	45	-	-	-

BRASSES WITH NICKEL

Cu48ZnNi10	48	Bal	-	10	-	-	0,3	-	890-920	8,7	54	Cu 773	CU 305	RBCuZn-D
Cu48ZnNi9Ag	48	Bal	1	9	-	-	0,2	-	890-920	8,7	54	-	-	-
Cu53ZnNi6	53	Bal	-	6	-	-	0,2	-	900-920	8,5	49	-	-	-








HIGH TEMPERATURE COPPER ALLOYS

Cu97Ni3B	97	-	-	3	-	-	-	B 0,03	1085-1100	8,9	-	Cu 186	CU 105	-
Cu87MnCo3	87	-	-	-	10	-	-	Co 3	980-1030	8,7	-	-	-	-
Cu86MnNi2	86	-	-	2	12	-	-	-	960-990	8,8	-	Cu 595	-	-
Cu85MnNi3	85	-	-	3	12	-	-	-	960-990	8,8	-	Cu 595	-	-
Cu67MnNi9	67	-	-	9	24	-	-	-	950-955	8,2	-	-	-	-
Cu58ZnMnCo2	57,5	Bal	-	-	2	-	-	Co 2	880-930	8,2	-	-	-	-
Cu55ZnMn4Ni6	55	Bal	-	6	4	-	0,3	-	880-920	8,9	-	-	-	-
CuMn38Ni9,5	52,5	-	-	9,5	38	-	-	-	880-925	7,7	-	-	-	-

COPPER (FURNACE BRAZING)

OF-Cu	≥ 99,95	-	-	-	-	-	-	-	1085	8,9	-	Cu 102	CU 102	BCu-3
ETP-Cu	≥ 99,90	-	-	-	-	-	-	-	1085	8,9	-	Cu 110	CU 101	BCu-1b
DHP-Cu	99,90	-	-	-	-	-	-	P<0,075	1085	8,9	-	Cu 141	~ CU 104	BCu-1

CHARACTERISTICS MAKE-UP

 Rods	Ø: 1,5 → 10 mm	Length: 500 / 1.000 mm / Other lengths available
 Coated / Micro Coated Rods	Ø: 1,5 - 2 - 2,5 - 3 - 4 mm	Length: 500 mm / Different kinds of coating available in various colours
 Wires	Ø: 1 → 6 mm	Coils and Spools
 Strips	Thickness: 0,2 → 1 mm	Width: 1,3 → 70 mm
 Powder and Paste	 Rings	 Preforms from Wire and from Strip






COPPER BASED ALLOYS FOR WELDING

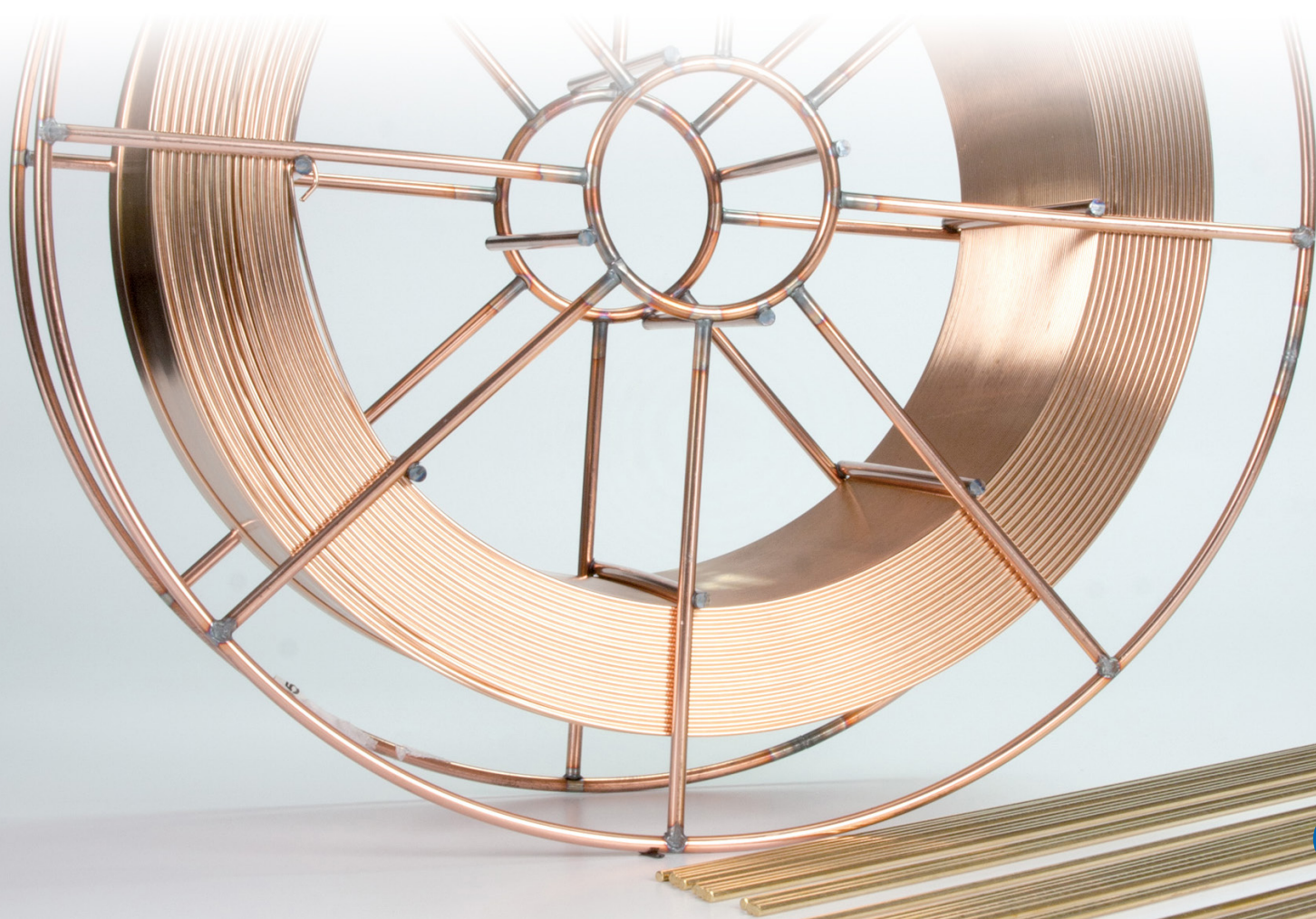
Alloys based on copper suitable for the TIG / MIG techniques.

Supplied as rods and wires, some alloys are also suitable for the brazing technique.

CODE	COMPOSITION %										MELTING RANGE SOL - LIQ	DENSITY	TENSILE STRENGTH	BRINELL HARDNESS	CORRESPONDING STANDARDS	
	Cu	Fe	Ag	Ni	Al	Mn	Sn	Si	Others	°C	g/cm ³	kg/mm ²	HB 2,5	ISO 24373	AWS A5.7	
Cu99,9	99,9								P 0,05	1080	8,9	22	50			
CuSn	Bal					X	0,8	X		1020-1050	8,9	22	60	Cu 1898	ERCu	
CuAg	Bal		1			X				1070-1080	8,9	20	60	Cu 1897		
CuSi2Mn	Bal					1	X	1,8		1030-1050	8,7	28	62	Cu 6511		
CuSi3	Bal					1		3		965-1035	8,5	35	80	Cu 6560	ERCuSi-A	
CuSn6	Bal							6	P 0,25	910-1040	8,7	26	80	Cu 5280A	ERCuSn-A	
CuSn8	Bal							8	P 0,1	875-1025	8,8	26	80	Cu 5210	ERCuSn-C	
CuSn12	Bal							13	P 0,2	825-990	8,6	32	120	Cu 5410		
CuAl8	Bal				8					1030-1040	7,7	43	100	Cu 6100	ERCuAl-A1	
CuAl8Ni2	Bal	2		2	8	2				1030-1050	7,5	53	140	Cu 6325		
CuAl9Fe	Bal	1,2			9,5					1030-1040	7,6	50	140	Cu 6180	ERCuAl-A2	
CuMn13Al8	Bal	2,5		2,5	8	13				945-985	7,4	90	290	Cu 6338	ERCuMnNiAl	
CuNi10Fe	Bal	1,5		10,5		1			Ti 0,4	1100-1145	8,9	30	80	Cu 7061		
CuNi30Fe	Bal	0,5		31		1			Ti 0,4	1180-1240	8,9	42	115	Cu 7158	ERCuNi	

CHARACTERISTICS MAKE-UP

 Rods	Ø: 1 → 6 mm	Length: 1.000 mm
 Wires	Ø: 0,8 → 2,4 mm	On Spools DIN 300 and DIN 100
 Strips	 Rings	 Preforms from Wire and from Strip



ALUMINIUM AND ZINC-ALUMINIUM ALLOYS

Alloys based on Aluminium and/or Zinc for brazing of Aluminium.

Continuous service operating temperatures of joints brazed with Al/Si alloys range up to approx 150 °C.

Zinc-Aluminum alloys are also suitable for copper-aluminium and brass-aluminium joints.

CODE	COMPOSITION %					MELTING RANGE SOL - LIQ	CORRESPONDING STANDARDS		
	Al	Si	Mg	Mn	Zn	°C	ISO 17672	EN 1044	AWS A5.8

ALUMINIUM ALLOYS

Al99,5	99,5	-	-	-	-	647-658	-	SG-Al99,5 (DIN 1732)	1050 (AWS A5.10)
Al99,5 FC	99,5	-	-	-	-	647-658	-	SG-Al99,5 (DIN 1732)	1050 (AWS A5.10)

ALUMINIUM-SILICON ALLOYS

AlSi5	Bal	5	-	-	-	575-630	Al 105	AL 101	4043 (AWS A5.10)
AlSi5 FC	Bal	4	-	-	-	575-630	~ Al 105	~ AL 101	~ 4043 (AWS A5.10)
AlSi12	Bal	12	-	-	-	575-585	Al 112	AL 104	BAISi-4
AlSi12 FC-NC	Bal	12	-	-	-	575-585	Al 112	AL 104	BAISi-4

ZINC-ALUMINIUM ALLOYS

AlZn98	2	-	-	-	98	380-405	-	-	-
AlZn98 FC-NC	2	-	-	-	98	380-405	-	-	-
AlZn98 FG-NC	2	-	-	-	98	380-405	-	-	-
AlZn85	15	-	-	-	85	380-450	-	-	-
AlZn85 FC-NC	15	-	-	-	78	380-450	-	-	-
AlZn78	22	-	-	-	78	380-475	-	-	-
AlZn78 FC-NC	22	-	-	-	78	380-475	-	-	-
AlZn78 FG-NC	22	-	-	-	78	380-475	-	-	-







FC: Flux Cored FG: Flux Grooved NC: Non-Corrosive Flux

SELF FLUXING ROD FOR LOW TEMPERATURE JOINING AND REPAIR OF ALUMINIUM

ST 380 AL	-	-	-	-	-	380	-	-	-
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CHARACTERISTICS MAKE-UP





 Rods	Ø: 1,6 → 5 mm	Length: 500 / 1.000 mm
 Wires	Ø: 0,8 → 3,2 mm	On Spools DIN 300 and DIN 100
 Flux-cored rods & wires	Ø: 2 → 5 mm	
 Flux-grooved rods & wires	Ø: 1,6 → 2 mm	
 Powder and Paste		AlSi12 - AlZn98
 Rings		

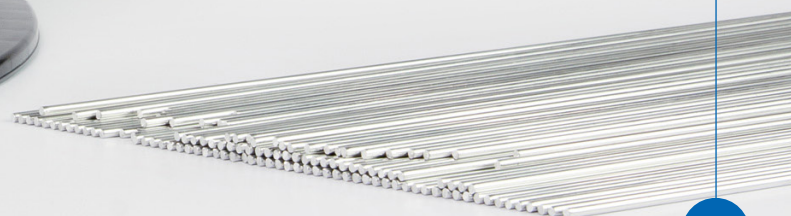
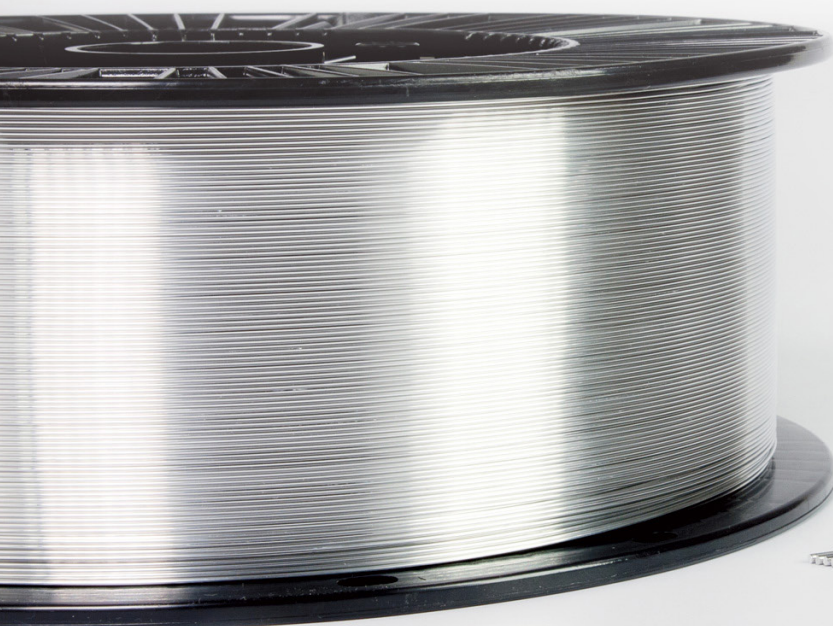
ALUMINIUM AND MAGNESIUM BASED ALLOYS FOR WELDING

Alloys based on aluminium and magnesium, suitable for the TIG/MIG techniques.
Used to join aluminium and magnesium base metals.
Some alloys are also suitable for the brazing technique.

CODE	COMPOSITION %						CORRESPONDING STANDARDS	
	Al	Si	Mg	Mn	Zn	Zr	ISO 18273	AWS A5.10
ALUMINIUM:								
Al99,8	Bal	0,2	0,02	0,02			Al 1080A	1080
Al99,7	Bal	0,2	0,03	0,03			Al 1070	1070
ALUMINIUM-SILICON:								
AlSi5	Bal	5	0,05	0,05			Al 4043	4043
AlSi12	Bal	12	0,05	0,15			Al 4047	4047
ALUMINIUM-MAGNESIUM:								
AlMg4,5Mn	Bal	0,2	4,5	0,5-1			Al 5183	5183
AlMg4,5MnZr	Bal	<0,4	4,5-5,2	0,7-1,1	<0,25	0,1-0,2	Al 5087	5087
AlMg5	Bal	0,2	5	0,05-2			Al 5356	5356
AlMg5Mn	Bal	0,3	5	0,6-1			Al 5556	5556
AlMg3	Bal	0,4	3	0,5			Al 5754	5754
MAGNESIUM:								
MgAl6Zn	6		Bal		1		AZ61A (AWS A5.19)	
MgAl9Zn	9		Bal		2		AZ92A (AWS A5.19)	

CHARACTERISTICS MAKE-UP

 Rods	Ø: 1,2 → 5 mm	Length: 1.000 mm
 Wires	Ø: 0,8 → 3,2 mm	On Spools DIN 300, DIN 200 and DIN 100
 Flux-cored rods & wires	Ø: 2 → 5 mm	Only AlSi12
 Rings		



NICKEL BASED ALLOYS

These brazing alloys are generally used when specifications require good corrosion resistance and/or extreme service temperature (both high and subzero) properties.

Ideal for brazing of stainless steels and nickel based alloys. They find numerous applications in the manufacturing of heat exchangers, diamond tools, and high-tech sectors such as aerospace industry.

Brazing is performed under a protective, reducing atmosphere, or in vacuum.



Vacuum Brazing of Diamond

CODE	COMPOSITION %									MELTING RANGE SOL - LIQ °C	CORRESPONDING STANDARDS	
	Ni	Cr	Fe	Si	B	C	P	Mn	Cu		ISO 17672	AWS A5.8
Ni1	Bal	14	4,5	4,5	3,1	0,7	-	-	-	977-1038	-	BNi-1
Ni1a	Bal	14	4,5	4,5	3,1	-	-	-	-	977-1077	Ni 610	BNi-1a
Ni2	Bal	7	3	4,1	3	-	-	-	-	971-999	Ni 620	BNi-2
Ni3	Bal	-	-	4,5	2,9	-	-	-	-	982-1037	Ni 630	BNi-3
Ni4	Bal	-	-	3,5	1,9	-	-	-	-	982-1066	Ni 631	BNi-4
Ni5	Bal	19	-	10	-	-	-	-	-	1080-1135	Ni 650	BNi-5
Ni5a	Bal	19	-	7,2	1,2	-	-	-	-	1065-1150	Ni 660	BNi-5a
Ni6	Bal	-	-	-	-	-	11	-	-	875-875	Ni 700	BNi-6
Ni7	Bal	14	-	-	-	-	10	-	-	890-890	Ni 710	BNi-7
Ni8	Bal	-	-	7	-	-	-	23	4,5	982-1010	Ni 800	BNi-8
Ni9	Bal	15	-	-	3,6	-	-	-	-	1055	Ni 612	BNi-9
Ni12	Bal	25	-	-	-	-	10	-	-	880-950	Ni 720	BNi-12

AVAILABLE AS POWDER AND PASTE

PARTICLE SIZE COMPARISON TABLE

PARTICLE SIZE			MESH		
MICRONS [μ]	MILLIMITRES [mm]	INCHES	US STANDARD MESH [No.] (*)	TYLER STANDARD MESH	BRITISH STANDARD MESH
33	0,0330	0,0013	425	-	-
38	0,0380	0,0015	400	-	-
45	0,0450	0,0018	325	325	-
53	0,0530	0,0021	270	270	300
63	0,0630	0,0025	230	250	-
75	0,0750	0,0030	200	200	-
90	0,0900	0,0035	170	170	170
106	0,1060	0,0042	140	150	150
125	0,1250	0,0049	120	115	120
150	0,1500	0,0059	100	-	-
180	0,1800	0,0071	80	-	85
212	0,2120	0,0083	70	-	72
250	0,2500	0,0098	60	-	-
300	0,3000	0,0118	50	-	-
350	0,3500	0,0138	45	42	44
420	0,4200	0,0165	40	-	-
500	0,5000	0,0197	35	-	30
600	0,6000	0,0236	30	28	-
710	0,7100	0,0280	25	20	-
850	0,8500	0,0335	20	-	-

(*): a "+" sign before the sieve mesh number indicates that the particles are retained by the sieve.
 a "-" sign before the sieve mesh number indicates that the particles pass through the sieve. For instance if the particle size of a powder is described as -140 +325 mesh, then 90% or more of the powder will pass through a 140 mesh sieve (particles smaller than 106 μ) and will be retained by a 325 mesh sieve (particles larger than 45 μ). If a powder is described as -100 mesh, then 90% or more of the powder will pass through a 100 mesh sieve (particles smaller than 150 μ).

POWDERS & PASTES

A wide range of filler metals in powder and paste is available.

Brazing is performed in air, under protective atmosphere, or in vacuum, by flame, induction or in furnace.

Powders are available in different grain sizes, from coarse to fine.

Pastes can be supplied with and without flux, with various binders and with different metal content percentages, in order to fulfill the most demanding applications.

To select the most appropriate brazing paste, many factors have to be taken into account, such as: type and dimensions of pieces, materials to be joined, heating method, type of atmosphere, etc.

Consequently technical testing is generally required to select the most appropriate paste for the specific customer application.

PASTES SELECTION CHART

	AVAILABLE ALLOYS		AVAILABLE MAKE UP		
● SILVER BASED ALLOYS	Ag-Cu; Ag-Cu-Sn; Ag-Cu-Zn; Ag-Cu-Zn-Sn; Ag-Cu-Zn-Ni; Ag-Cu-Zn-Mn-Ni	Powder	Paste		
			Torch	Induction	Furnace
● ACTIVE BRAZING ALLOYS	Ag-Cu-Ti; Ni1; Ni1a; Ni2	Powder	Paste		
			-	Induction	Furnace
● COPPER-PHOSPHOROUS ALLOYS	Cu-P; Cu-P-Sn; Ag-Cu-P	Powder	Paste		
			Torch	Induction	Furnace
● COPPER	Cu	-	Paste		
			-	-	Furnace
● BRONZE	CuSn6 - CuSn8 - CuSn12	Powder	Paste		
			-	-	Furnace
● COPPER BASED	Cu-Zn; Cu-Zn-Ni; Cu-Mn-Ni	Powder	Paste		
			Torch	Induction	Furnace
● ALUMINIUM	Al-Si; Al-Zn	Powder	Paste		
			Torch	Induction	Furnace
● SOFT SOLDERS	Sn; Ag-Sn; Sn-Cu; Sn-Pb	Powder	Paste, with following flux types: 3.1.1.C (general purpose) 2.1.2.C (for aluminium) 1.1.2 (colophony)		



FLUXES

Our range:

- Fluxes for Silver Based Alloys
- Fluxes for Brass and Copper Based Alloys
- Liquid Fluxes for Braze-Welding
- Fluxes for Aluminium alloys
- Fluxes for Soft Soldering alloys

Available in different presentations, such as:
Powder, Paste and Liquid form.



FLUXES FOR SILVER BASED ALLOYS

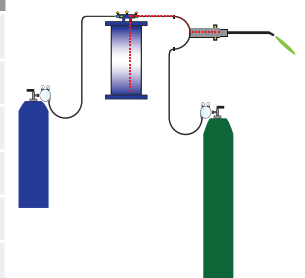
CODE	ACTIVITY RANGE	MAKE-UP		STANDARD	DESCRIPTION
	°C	Powder	Paste	ISO 18496	
FLUX AG1	550-800	✓	✓	FH 10 A/B	General purpose
FLUX AG3	600-850	✓	✓	FH 10 A/B	For high temperatures
FLUX AG4	550-850	✓	✓	FH 10 A/B	General purpose - Very wide range of temperatures
FLUX AG5	700-1000	✓	✓	FH 20 A/B	For very high temperatures
FLUX AG6	550-850	✓	-	FH 11 A/B	For Aluminium Bronze
FLUX AG7	550-800	✓	✓	FH 10 A/B	General purpose. Also for Stainless Steel.
FLUX AG8	550-850	-	✓	FH 12 B	For Stainless Steel and Hard Metal - Brown paste
FLUX AG11	550-800	-	✓	FH 10 B	General purpose. Also for Stainless Steel - For use with automatic dispensing machines
FLUX AG12	550-850	-	✓	FH 12 B	For Stainless Steel and Hard Metal - For use with automatic dispensing machines
ANTIFLUX	-	-	✓	-	Prevents wetting of brazing alloy

FLUXES FOR BRASS AND COPPER BASED ALLOYS

CODE	ACTIVITY RANGE	MAKE-UP		STANDARD	DESCRIPTION
	°C	Powder	Paste	ISO 18496	
FLUX BR1	800-1000	✓	✓	FH 21 A/B	Brazing with Brass
FLUX BR2	750-1000	✓	-	FH 20 A	Boric Acid Free

LIQUID FLUXES FOR BRAZING AND FOR BRAZE-WELDING

CODE	ACTIVITY RANGE	STANDARD	DESCRIPTION
	°C	ISO 18496	
FLUX LI1	550-1100	FH 21 C	For Brazing with Vaporizer systems. Medium Concentration
FLUX LI2	550-1100	FH 21 C	For Brazing with Vaporizer systems. Medium-High Concentration
FLUX LI3	550-1100	FH 21 C	For Brazing with Vaporizer systems. High Concentration
FLUX LI1 ECO	550-1100	FH 21 C	Non-toxic formulation. Medium concentration
FLUX LI2 ECO	550-1100	FH 21 C	Non-toxic formulation. Medium-High concentration
FLUX LI3 ECO	550-1100	FH 21 C	Non-toxic formulation. High concentration



FLUXES FOR ALUMINIUM

CODE	ACTIVITY RANGE	MAKE-UP		STANDARD	DESCRIPTION
	°C	Powder	Paste	ISO 18496	
FLUX AL1/d	550-650	✓	✓	FL 10 A/B	Corrosive flux for flame brazing
FLUX AL1 NC	550-650	✓	✓	FL 20 A/B	Non-corrosive flux for flame, induction and furnace (C.A.B.) brazing
FLUX AL6	440-470	✓	✓	FL 30 A/B	Non-corrosive flux for brazing with Zinc-Aluminium alloys

FLUXES FOR SOFT SOLDERS

CODE	MAKE-UP		STANDARD		DESCRIPTION
	Paste	Liquid	DIN 8511	EN 29454-1	
FLUX SN1	✓	✓	F - SW12	3.1.1.A/C	General purpose
FLUX SN2	-	✓	F - SW11	3.2.2.A	High Activity
FLUX SN6	-	✓	F - SW24	2.1.3.A	For Electromechanics
FLUX SN35	-	✓	-	2.1.2.A	For aluminium and low-alloyed aluminium alloys



OTHER PACKAGES AVAILABLE UPON REQUEST

Powder: Packages of: 0,1 - 0,25 - 0,5 - 1 - 10 - 20 kg

Paste: Packages of: 0,1 - 0,25 - 0,5 - 1 - 1,5 - 10 - 20 kg

Liquid: Packages of: 0,25 - 0,5 - 1 - 5 - 10 - 25 lt • Drums of 60 - 200 lt (LI1 - LI2 - LI3)

SOFT SOLDERS

Alloys based on Tin for Soft-Soldering.
Lead bearing alloys have particular Health and Safety limitations in applications and uses.
Lead-free alloys, compliant to RoHS regulation, are available.
Available as ingots, bars, sticks, wires and flux-cored wires.

Flux cored wires are available with different cores for various applications:

- General purpose soldering
- Soldering of stainless steel
- Soldering of aluminium
- Electromechanics
- Electrical Engineering
- Electronics (no clean)
- Others



CODE	COMPOSITION %				MELTING RANGE SOL - LIQ	CORRESPONDING STANDARDS	
	Sn	Pb	Ag	Other	°C	ISO 9453	EN 29453
TIN							
Sn100	99,9	-	-	-	232	-	-
TIN - COPPER							
SnCu97/3	97	-	-	Cu 3	230-250	No. 402	S-Sn97Cu3
Sn99Cu1	99,3	-	-	Cu 0,7	227	No. 401	S-Sn99Cu1
TIN - SILVER							
Ag2Sn	98	-	2	-	221-225	-	-
Ag3,5Sn	96,5	-	3,5	-	221	No. 703	S-Sn97Ag3
Ag5Sn	95	-	5	-	221-235	No. 704	-
Ag10Sn	90	-	10	-	221-300	-	-
TIN - SILVER - COPPER							
Ag1SnCu4	95,6	-	0,4	Cu 4	225-258	-	-
Ag3SnCu0,5	96,5	-	3	Cu 0,5	217-220	No. 711	-
Sn99Cu1Ag	99	-	0,3	Cu 0,7	217-227	-	-
TIN - SILVER - LEAD							
Ag1,4SnPb	63	35,6	1,4	-	178	-	-
Ag1,5SnPb	5	93,5	1,5	-	296-301	-	-
TIN - ANTIMONY							
SnSb95/5	95	-	-	Sb 5	230-240	No. 201	S-Sn95Sb5
TIN - LEAD							
SnPb80/20	80	20	-	-	183-205	-	-
SnPb63/37	63	37	-	-	183	No. 101	S-Sn63Pb37
SnPb60/40	60	40	-	-	183-190	No. 103	S-Sn60Pb40
SnPb50/50	50	50	-	-	183-215	No. 111	S-Pb50Sn50
SnPb40/60	40	60	-	-	183-235	No. 114	S-Pb60Sn40
SnPb33/67	33	67	-	-	183-242	-	-
SnPb30/70	30	70	-	-	183-255	No. 116	S-Pb70Sn30
SnPb8/92	8	92	-	-	280-305	-	S-Pb92Sn8
TIN - LEAD - COPPER							
Sn60Pb38Cu2	60	38	-	Cu 2	183-190	No. 161	S-Sn60Pb38Cu2
TIN - ZINC							
SnZn80/20	80	-	-	Zn 20	200-288	-	-
LEAD							
Pb100	-	99,9	-	-	327	-	-








OTHER ALLOYS AVAILABLE UPON REQUEST



(*) FLUX CORE TYPE

TYPE	EN 29454-1	APPLICATION
SN1	3.1.1	Acid Core
SN35	2.1.2	For Aluminium
SN6	2.1.3	For Electromechanics
SN61	2.1.2	General Use
SN7	1.1.2	Electrical Engineering
SN71	1.1.3	For Electronics - NO CLEAN
SN72	1.1.1	Colophony

CHARACTERISTICS MAKE-UP

 Ingots, bars and sticks	
 Solid Wires	Ø: 0,5 → 3 mm
 Flux-cored wires	Ø: 0,8 → 3 mm Different kinds of coring available (*see table)
 Strips	
 Powder and Paste	 Rings  Preforms from Wire and from Strip

SILVER BASED ALLOYS - CADMIUM BEARING



The brazing alloys presented in this page are very versatile, high-strength, free-flowing and exhibit the lowest melting points of all silver based alloys.

They can be used to join a wide range of base materials. Continuous service operating temperatures of joints brazed with these alloys range up to approx 200 °C.







Since Cadmium and its oxides are toxic, special safety precautions must be followed during brazing operations (e.g. mechanical ventilation and/or respiratory mask).

The use of these alloys in applications where food, beverages and/or human health in general is involved, is forbidden.

AVAILABLE IN EUROPEAN UNION COUNTRIES ONLY FOR MILITARY AND AEROSPACE APPLICATIONS (EU COMMISSION REGULATION NO. 494/2011): PLEASE CONTACT OUR TECHNICAL AND COMMERCIAL STAFF TO GET AN ADVICE ON SELECTING THE MOST APPROPRIATE CADMIUM-FREE SUBSTITUTES.

CODE	COMPOSITION %						MELTING RANGE SOL - LIQ °C	DENSITY g/cm ³	TENSILE STRENGTH kg/mm ²	CORRESPONDING STANDARDS		
	Ag	Cu	Zn	Cd	Si	Ni				ISO 17672	EN 1044	AWS A5.8
Ag40Cd	40	19	21	20	-	-	595-630	9,3	42	Ag 340	AG 304	-
Ag34Cd	34	22	24	20	-	-	610-670	9,1	40	~ Ag 335	~ AG 305	~ BAg-2
Ag30Cd	30	28	21	21	-	-	600-690	9,1	38	Ag 330	AG 306	~ BAg-2a
Ag25Cd	25	30	27,5	17,5	-	-	605-720	8,8	40	Ag 326	AG 307	BAg-33
Ag20Cd	20	40	25	15	-	-	620-750	8,7	40	-	AG 309	-

CHARACTERISTICS MAKE-UP

 Rods	Ø: 0,5 → 4 mm	Length: 500 / 1.000 mm / Other lengths available
 Coated Rods	Ø: 1,5 - 2 - 2,5 - 3 mm / Others diameters available	Length: 500 mm / Different kinds of coating available in various colours
 Wires	Ø: 0,25 → 3 mm	Coils and Spools
 Strips	Thickness: 0,1 → 1 mm	Width: 1,3 → 80 mm
 Rings	 Preforms from Wire and from Strip	

INFILTRATION BINDERS

Copper based alloys to be used as infiltration binders for the production of mining and exploration tools, drill heads, diamond bits.

These alloys are melted and infiltrated onto a matrix of hard materials in powder form, creating an hard, abrasive, and wear resistant component.

These materials are available as cubes, slugs and grains.



CODE	COMPOSITION %				
	Cu	Zn	Ni	Mn	Sn
IB-CuMn24	Bal.	8	15	24	-
IB-CuMn20	Bal.	-	10	20	-
IB-CuSn19	Bal.	-	1,5	0,3	19
IB-CuNi10	Bal.	-	10,1	5,7	6

OTHER ALLOYS AVAILABLE UPON REQUEST

CONTACT MATERIALS

CODE	COMPOSITION % (Ag is balance)	MELTING POINT	DENSITY	ELECTRICAL CONDUCTIVITY	MECHANICAL PROPERTIES (RECRYSTALLIZED STATE)		
		°C	g/cm ³	MS/m	Rm [MPa]	A [%]	HV _{0,2}
Ag99,9	Ag 99,9 min.	960	10,5	60	155-215	40	30
AgNi0,15	Ni 0,10—0,20	960	10,5	57	185-255	30	40
AgNi10	Ni 10,0	960	10,4	48	200-250	20	50
AgNi20	Ni 20,0	960	10,3	46	270-300	15	60
AgCu8	Cu 7,4—8,4	900-940	10,3	50	225-325	25	60
AgCu010	CuO 10,0	960	10,2	45	225-325	15	60

Wires

Strips

Solid and bimetallic contact rivets

Solid and bimetallic contact discs

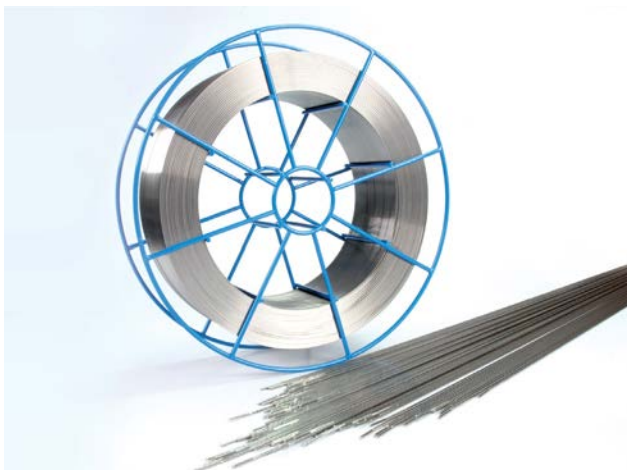


WELDING ALLOYS

We provide our customers with a wide selection of consumables for Gas Welding and TIG/MIG of Aluminium, Copper and Steel, available in different make-ups and packages.



Aluminium and magnesium based alloys for welding



Stainless Steel



Copper based alloys for welding



Low alloyed steel welding wire

Visit our website to discover more about our selection of welding alloys.

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