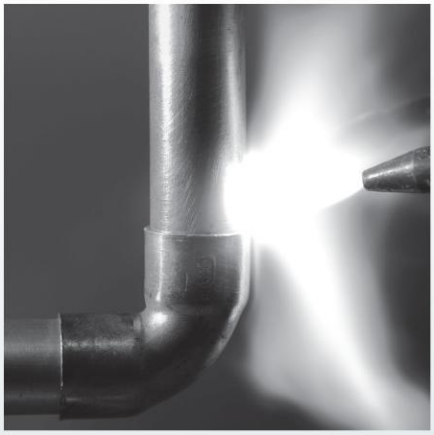
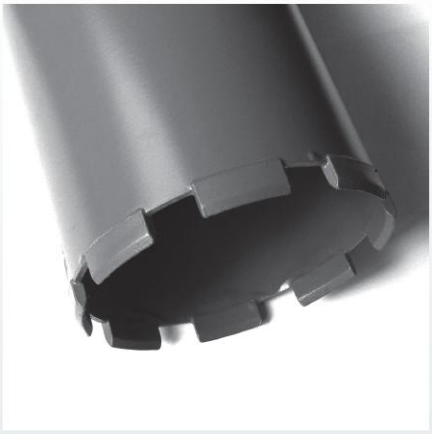
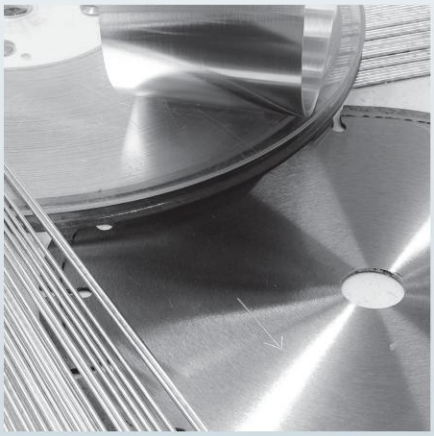
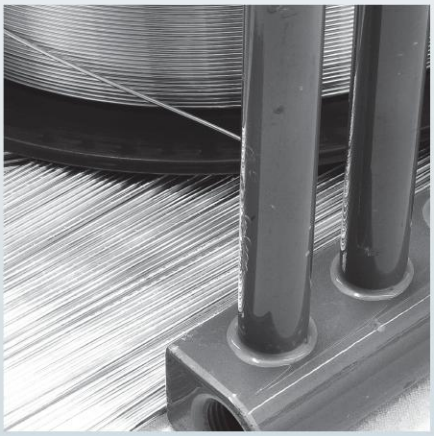
LUT-SPAW

Nowa jakość lutowania









INSTALFIT

INSTALFLUX

LUT-SPAW

For more than 20 years, LUT-SPAW Przedsiębiorstwo Inżynieryjne s.c. has been specialising in material joining processes. Established at the beginning of the 90s by Wroclaw University of Technology research cadre in an answer to the domestic's industry's ever growing demand for knowledge and products used within the sphere of metal bonding processes. In 1993 LUT-SPAW begun manufacturing brazing pastes and metal powders. The growing needs of its customers over the next few years result in the dynamic company growth. Our extensive experience and technical knowledge helped us to become the national industry leader. Our offer within the scope of INSTALFIT and INSTALFLUX brands includes a full range of high quality brazing materials such as: silver alloys, copper/phosphorus alloys, brass alloys, aluminium alloys, brazing rings, brazing pastes, soft solders, metal powders and fluxes. Long term hands-on experience and in-depth knowledge of the bonding process constitute a guarantee of a professional service and continual technical support.

INSTALFIT

INSTALFIT represents a new range of professional brazing alloys. It was developed with those customers who value quality, reliability and seamless everyday performance. INSTALFIT products are manufactured using materials of the highest quality which is reflected in its precise chemical composition, purity of the alloy and exact dimensions.

INSTALFLUX

INSTALFLUX is a complete range of brazing fluxes developed with the relationship between the perfo-rmance of a high quality bond and the choice of the correct flux in mind. In creating the INSTALFLUX brand we paid particular attention to the safety of our products, considering both the environment and human health.

Brazing process at Backer OBR Sp. z o.o.

In attempting to satisfy the requirements of even the most discerning customers we supply flux coated silver alloys in various options. Our team of engineers is always on hand to help in the choice of the correct solution, selecting the right alloy for the particular use and precisely determining the degree to which it is covered.

Brazing ferrous and non-ferrous metals (with the exception of aluminium, magnesium and zinc)

Product	Melting temp. range °C	Working temperature °C	Standard PN-EN ISO 17672 (PN-EN 1044)
INSTALFIT Ag25Sn FC	680-760	750	Ag 125 (AG 108)
INSTALFIT Ag30Sn FC	665-755	740	Ag 130 (AG 107)
INSTALFIT Ag33 FC	700-740	730	-
INSTALFIT Ag34Sn FC	630-730	710	Ag 134 (AG 106)
INSTALFIT Ag40Sn FC	650-710	690	Ag 140 (AG 105)
INSTALFIT Ag44 FC	675-735	730	Ag 244 (AG 203)
INSTALFIT Ag45Sn FC	640-680	670	Ag 145 (AG 104)
INSTALFIT Ag56Sn FC	620-655	650	Ag 156 (AG 102)

Silver alloys are characterised by good brazing properties, exhibiting good shearing, fatigue and impact stress strength. They are resistant to acids and alkalis. Due to good wettability, they may be used for joining most metals and alloys, including: carbon steel, alloy and stainless steels as well as copper and its alloys.

Brazing ferrous and non-ferrous metals
(with the exception of aluminium, magnesium and zinc)

Product	Composition %					Melting temp. range	Working temperature	Density	Tensile strength (for carbon steel)	Standard PN-EN ISO 17672 (PN-EN 1044)	Standard AWS A5.8	Recommended flux	Alloy characteristic
	Ag	Cu	Zn	Sn	Other	°C	°C	g/cm³	MPa				
Ag12	12	48	40	-	-	800-830	830	8,7	410	Ag 212 (AG 207)	-	INSTALFIT TLS-1 INSTALFIT TLS-2 INSTALFIT TLS-F	
INSTALFIT Ag20	20	44	36	-	Si 0,15	690-810	810	8,7	380	(AG 206)	-		The binder with low silver content, sufficient liquidity and good mechanical properties. Mainly used for steel brazing.
INSTALFIT Ag25	25	41	34	-	-	700-790	780	8,8	380	Ag 225 (AG 205)	-		
INSTALFIT Ag25Sn	25	40	33	2	-	680-760	750	8,7	360	Ag 125 (AG 108)	BAg-37		This alloy due to the addition of tin provides a reduced brazing temperature, good liquidity and moderate mechanical properties.
INSTALFIT Ag30	30	38	32	-	-	680-765	750	8,9	380	Ag 230 (AG 204)	BAg-20		Alloy with good wettability, liquidity and sufficient mechanical properties. The addition of tin lowers the temperature and increases the spreading of the solder.
INSTALFIT Ag30Sn	30	36	32	2	-	665-755	740	8,8	360	Ag 130 (AG 107)	-		
INSTALFIT Ag33	33	34	33	-	Si 0,15	700-740	730	8,9	535	-	-		Cost-effective binder for universal use. Due to the very good strength, it is used primarily in the tools industry and medical gases systems.
INSTALFIT Ag34Sn	34	36	27,5	2,5	-	630-730	710	9	360	Ag 134 (AG 106)	-		Alloy with reduced melting point, good wettability, deliquescence and sufficient mechanical properties.
INSTALFIT Ag40Sn	40	30	28	2	-	650-710	690	9,1	350	Ag 140 (AG 105)	BAg-28		Universal alloy with reduced melting point used for connecting a variety of metals. It provides good mechanical properties.
INSTALFIT Ag44	44	30	26	-	-	675-735	730	9,1	400	Ag 244 (AG 203)	-		Due to the very good brazing properties these alloys are widely used in the installation industry, tool, cooling and solar. They can be used interchangeably.
INSTALFIT Ag45	45	30	25	-	-	660-740	730	9,2	400	Ag 245	BAg-5		
INSTALFIT Ag45Sn	45	27	25	3	-	640-680	670	9,2	350	Ag 145 (AG 104)	BAg-36		This alloy is ideal for general use, particularly where is required low melting point eg. stainless steel brazing. It provides a very good fluidity, capillarity and good mechanical properties. It is ideal substitute for alloys with cadmium.
INSTALFIT Ag49NiMn	49	16	23	-	Mn7,5 Ni4,5	680-705	690	8,9	250-300 (shear strength)	Ag 449 (AG 502)	BAg-22		This alloy have e a low melting point, excellent wettability, very good mechanical properties and high corrosion resistance. Mainly used in the tools industry.
INSTALFIT Ag56Sn	56	22	17	5	-	620-655	650	9,5	350	Ag 156 (AG 102)	BAg-7		Substitute for alloys containing cadmium. It characterized by a very low melting point and very good liquidity. For general use and especially to connect stainless steel.
INSTALFIT Ag70	70	20	10	-	-	690-740	730	10	-	Ag 270	BAg-10		Alloy with high silver content, mainly used in the jewelery industry
INSTALFIT Ag72	72	28	-	-	-	780	780	10	-	Ag 272 (AG 401)	BAg-8		Eutectic alloy is recommended for furnace brazing.

Recommended cadmium free alternative			Silver alloys with cadmium		
Product	Melting temp. range	Tensile strength	Product	Melting temp. range	Tensile strength
	°C	MPa		°C	MPa
INSTAL Ag20	690-810	380	L-Ag20Cd	605-765	350
INSTAL Ag25	700-800	380			
INSTAL Ag25Sn	680-760	360			
INSTAL Ag30Sn	665-755	360	L-Ag30Cd	600-690	380
INSTAL Ag33	700-740	535			
INSTAL Ag34Sn	630-730	360			
INSTAL Ag40Sn	650-710	350	L-Ag40Cd	595-630	410
INSTAL Ag44	675-735	400			
INSTAL Ag45Sn	640-680	350			
INSTAL Ag49NiMn	680-705	350			
INSTAL Ag45Sn	640-680	350	L-Ag45Cd	620-635	410
INSTAL Ag49NiMn	680-705	350			
INSTAL Ag56Sn	620-655	410			

The EU Commission Regulation No. 494/2011 came into force on 10 December 2011 prohibiting the use of cadmium alloys. As a result, LUT-SPAW has introduced cadmium alloys equivalents. As an alternative to this type of alloy we will suggest alloys containing tin. This element is added in order to lower the melting point and improve the wettability of alloy on the silver base.

If you have any questions or queries please do not hesitate to contact us on: 71 326 93 95, 71 326 94 52 or e-mail: handlowy@lut-spaw.com.pl or sprzedaz@lut-spaw.com.pl.

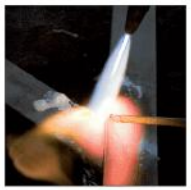
Copper-phosphorus alloys, due to their significant wettability, low melting temperature and the possibility to braze flux free copper-copper bonds are widely used in the brazing of copper and its alloys. The quantity of phosphorus in copper-phosphorus alloys affects the melting temperature range as well as basic parameters viscosity or strength. In order to meet the requirements of our customers, the quantity of phosphorus in our alloys in controlled to within a margin of error of +/- 0.1%.

Brazing copper and its alloys

Produkt	Composition %				Melting temp. range	Working temperature	Density	Compressive strength	Standard PN-EN ISO 17672 (PN-EN 1044)	Standard AWS A5.8	Recommended flux	Alloy characteristic
	Ag	Cu	P	Other	°C	°C	g/cm³	MPa				
INSTAL CuP6	-	93,8	6,2	-	710-890	760	8,1	250	CuP 179 (CP 203)	-		Basic alloy for copper-copper connections.
INSTAL CuPSn	-	89,5	6,2	Sn 4,2	650-700	690	8,0	250	-	-		Characterized by low melting point, good fluidity and capillarity.
INSTAL CuP7	-	93	7	-	710-820	730	8,1	250	CuP 180 (CP 202)	BCuP-2	INSTAL TLS-1	Used for copper-copper connections. Taking into account the operating temperature and liquidity is a middle ground between INSTAL CuP6 and INSTAL CuP8.
INSTAL CuP7Sn7	-	86,2	6,8	Sn 7	650-700	700	8,0	250	CuP 386 (CP 302)	-	INSTAL TLS-F	Characterized by low melting point, a very good liquidity and capillarity.
INSTAL Plus	-	86	6,5	Sn 6,5 Si 0,2	635-675	675	8,0	250	CuP 385	BCuP-9	INSTAL TLP-1	This alloy is ideal for connection copper-copper, copper-brass. It provides excellent fluidity and capillarity, and has the lowest melting temperature of the mixture of all copper-phosphorus alloys.
INSTAL Plus FC	-	86	6,5	Sn 6,5 Si 0,2	635-675	675	8,0	250	CuP 385	BCuP-9	Not required	The covered form of INSTAL Plus ideal for brazing copper with brass because there is no need to use flux.
INSTAL CuP8	-	92,2	7,9	-	710-770	720	8,1	250	CuP 182 (CP 201)	-		This alloy is characterized by a lower operating temperature and greater liquidity than INSTAL CuP6.
INSTAL Ag2P	2	91,8	6,2	-	645-825	740	8,1	250	CuP 279 (CP 105)	-		Popular alloy for connections copper-copper, copper-brass. It provides good filling the gap at low temperatures, and high fluidity at high temperatures.
INSTAL Ag5P	5	88,8	6,2	-	645-815	710	8,2	250	CuP 281 (CP 104)	BCuP-3	INSTAL TLS-1	Alloy recommended for connecting the parts exposed to vibrations. Is the guarantor of connections with good strength.
INSTAL Ag6P	6	87,9	6,1	-	643-787	705	8,2	250	-	-	INSTAL TLS-F	Due to the similar properties to the INSTAL Ag15P it is perfectly suitable as the economical replacement. It provides a low operating temperature, good ductility and toughness.
INSTAL Ag15P	15	80	5	-	645-800	700	8,4	250	CuP 284 (CP 102)	BCuP-5	INSTAL TLP-1	Due to the good ductility and strength, ideal for connecting copper-copper, copper-brass, exposed to vibrations.
INSTAL Ag18P	18	75	7	-	645	650	8,4	250	CuP 286 (CP 101)	-		Eutectic alloy with a low melting temperature ranging. It offers exceptional smoothness and good mechanical properties.

Attention! These alloys should not be used to bond iron and nickel alloys, as the wettability in this combination is impaired and the brazes are brittle with low strength.

Copper-zinc alloys with additional enrichment of elements like: silicon, tin, manganese, nickel or cobalt are used for joining carbon steel, cooperand its alloys in the tool industry for brazing cemented carbide plates.They have good mechanical properties but in a case of high temperature ofmelting point and a relatively low fluidity their use is limited. Inconnection with the liquid flux technology it is possible to eliminate the traditional fluxes in paste or powder forms.



A dispenser is a device designed for automated delivery of flux. It consists of the main tank (where the flammable gas is mixed with the flux vapour) and an reserve tank which is used for safe filling of the main. Liquid flux technology may be used with all flammable gasses sued for brazing. The advantages of using volatile fluxes include the elimination of manual handling and application of flux during brazing, quality and aesthetics of the finished braze and reduced consumption of brazing alloys.

Brazing carbon steels

Product	Composition %					Melting temp. range	Working temperature	Density	Compression strength	Standard PN-EN ISO 17672 (PN- EN 1044)	Standard AWS A5.8	Recommended flux	Application
	Cu	Zn	Ni	Si	Inne	°C	°C	g/cm³	MPa				
INSTALgrid CuZn	63	37	-	-	-	900-905	905	8,4	400	-	-	INSTALgrid TLB-1 INSTALgrid TLB-3 INSTALgrid EXT-50 INSTALgrid EXT-70 INSTALgrid EXT-7AC	Brass alloy of the simplest composition used for brazing steel.
INSTALgrid CuZnSi	60	39,7	-	0,25	-	875-895	900	8,4	400	Cu 470a (CU 301)	-		Basic brass alloy used for steel brazing. The addition of silicon prevents vaporization of zinc, resulting in improved aesthetics and quality of the braze. Recommended with liquid flux INSTALgrid EXT70.
INSTALgrid CuZnSn	59	40,65	-	-	Sn 0,35	875-895	900	8,4	400	Cu 470	-		Brass alloy used for brazing copper, steel, nickel and their alloys, and where the most important is the corrosion resistance. Recommended with liquid flux INSTALgrid EXT70.
INSTALgrid CuZnMn	59	40,25	-	0,25	Mn 0,15 Sn 0,35	870-900	890	8,4	380	(CU 304)	-		
INSTALgrid CuZnNi5	57	37,85	5	0,15	-	870-900	900	8,4	400	-	-		Alloy used to join steel, nickel and alloys thereof. They have very good mechanical properties. The addition of nickel increases the strength of the joint and improve the appearance of a braze, particularly in the case of certain plating. Recommended with liquid flux INSTALgrid EXT70.
INSTALgrid CuZnNi10	48	41,8	10	0,2	-	890-920	910	8,7	600	Cu 773 (CU 305)	-		
INSTALgrid CuZnNi9Ag	47,5	42,3	8,5	0,3	Ag1 Sn 0,2 Mn 0,2	890-920	910	8,7	600	-	-		

The brazing process with the use of volatile flux is based on automatic feeding of liquid flux by the gas flame. It aims to improve the quality of bonds made with the use of brass, copper/phosphorus and silver alloys.

Brazing aluminium and its alloys

Product	Composition %			Melting temp. range	Working temperature	Density	Standard PN-EN 17672 (PN-EN 1044)	Standard AWS 5.8	Recommended flux	Characteristic
	Al	Zn	Si	°C	°C	g/cm³				
INSTAL ZnAl2	2	98	-	377-385	385	6,9	-	-	Not required	Zinc-aluminium alloy with flux in the core, used to join aluminium with aluminium and its alloys.
INSTAL ZnAl4	4	96	-	385-418	410	6,7	-	-	INSTAL TLA-1	Ideal for brazing thin-wall elements with aluminium. Also used for aluminium-copper joints.
INSTAL ZnAl4 FC	4	96	-	385-418	410	6,7	-	-	Not required	Covered zinc-aluminium alloy with a low melting point. Ideal for brazing thin-wall elements with aluminium. Also used for aluminium-copper joints.
INSTAL ZnAl22	22	78	-	426-485	485	-	-	-	Not required	Zinc-aluminium alloy with flux in the core guaranteeing good mechanical properties and good corrosion resistance. This alloy is used for brazing aluminium and aluminium alloys, copper and aluminium, stainless steel and aluminium.
INSTAL AlSi12	88		12	575-585	610	2,65	Al 112 (Al 104)	BAlSi-4	INSTAL TLA-1 INSTAL TLA-2	The primary hard alloy used to join aluminium to aluminium, copper to aluminium and aluminium with stainless steel. Available as core rods with flux cores and composite rods. Very good resistance to corrosion.

Alloys containing aluminium and silicon are most commonly used for brazing aluminium and its alloys. Such bonds guarantee good strength parameters and are highly resistant to corrosion. Fluxes with appropriate activity should be used during brazing due to the emergence of a tight layer of oxides on the surface of aluminium. The choice of flux should be determined by the chemical composition of the brazed metals and the type of alloys used.

Brazing aluminium causes numerous problems particularly in the initial stages of the introduction of this metal into the production process (this is particularly true in situations where aluminium is to replace copper). Based on our extensive experience we offer tried and tested solutions facilitating the production of aluminium-aluminium, aluminium-copper and aluminium-stainless steel bonds. We supply aluminium alloys in the form of rods, covered rods, core rods and composite rods containing flux. In implementing aluminium brazing solution, we are also able to offer training and assist in the selection of appropriate equipment.

Brazing paste consists of metal powder and an appropriate binding system. Additionally, depending on the type of application flux may be added to the paste. Pastes are used in situations where the use of traditional shape in wire or tape form is not feasible due to the complex shape of brazed elements. Pastes are predominantly used in furnace, induction or automated flame brazing processes.

Copper-based brazing pastes

Product	Composition %		Melting temp. range	ISO 17672 (PN EN 1044)	Characteristic
	Cu	Other	°C		
Cu 01	99.90	-	1085	Cu 110 (CU 101)	Copper Paste is dedicated for furnace brazing steel and nickel alloys. The total impurities limit is 0,04% (excluding O and Ag).
Cu 02	99.95	-	1085	Cu 102 (CU 102)	Copper Paste is dedicated for furnace brazing steel and nickel alloys. The total impurities limit is 0,03% (excluding Ag).
Cu 03	99.00	-	1085	Cu 099 (CU 103)	Copper Paste is dedicated for furnace brazing steel and nickel alloys. The total impurities limit is 0,03% (excluding Ag).
Cu 04	99.90	< 0.04 P	1085	(CU 104)	Copper Paste is dedicated for furnace brazing steel and nickel alloys. The total impurities limit is 0,06% (excluding Ag, As and Ni).
Cu 05	Reszta	Ni 2.5 – 3.5 Bi 0.02 – 0.05	1085–1100	Cu 186 (CU 105)	Copper Paste dedicated for furnace brazing or induction brazing hard metal under an inert atmosphere. The total impurities limit is 0,15% (excluding Ag).
CuSn6	94	6Sn	910-1040	Cu 922 (CU 201)	Copper Paste dedicated for furnace brazing steel and nickel alloys.
CuSn12	88	12Sn	825-990	Cu 925 (CU 202)	Copper Paste dedicated for furnace brazing steel, nickel alloys and cooper.

Types of pastes

We offer various pastes adapted to the particular application, furnace atmosphere and brazing process characteristics. LUT-SPAW pastes do not leave residue after the brazing process, do not spatter during heating up and exhibit high adhesion.

GS type – Copper paste based on copper powder obtained by a process of gas atomization. Intended for brazing in furnaces with a protective N_2 / H_2 atmosphere achieved as a result of methane or propane decomposition.

WT type – Copper paste based on copper powder obtained as a result of water atomization. Intended for brazing in furnaces with a protective N_2 / H_2 atmosphere achieved as a result of methane or propane decomposition.

PW type – Copper paste intended for use in vacuum or pure H_2 brazing

Types of binders

We manufacture binders in accordance with the requirements defined by our customers. They are available for the following application methods:

D type – binder intended for pastes applied by hand or automatically

SP type – binder intended for pastes applied by the screen printing method.

Nickel based pastes

Product	Composition %			Melting temp. range	ISO 17672 (PN EN 1044)	Characteristic
	Ni	Cr	Other	°C		
L-Ni-1a	76	14	4.5Si 3.1B 4.5Fe	980-1070	Ni 610 (NI 1A1)	Nickel paste for general use dedicated for furnace brazing stainless steel.
L-Ni2	82.4	7	3Fe 4.5Si 3.1B	970-1000	Ni 620 (NI 102)	Nickel paste for general use dedicated for furnace brazing stainless steel. It has a relatively low melting temperature.
L-Ni5	70.9	19	10.1Si	1080-1135	Ni 650 (NI 105)	Nickel paste dedicated for making joints with severe oxidation, requiring high strength and working at elevated temperatures.
L-Ni6	89	-	11P	875	Ni 700 (NI 106)	Nickel paste suitable for furnace brazing stainless steel.
L-Ni7	76	14	10P	890	Ni 710 (NI 107)	Nickel paste suitable for furnace brazing stainless steel, cooper and nickel alloys.

Types of binders

We manufacture binders in accordance with the requirements defined by our customers. They are available for the following application methods:

D type – binder intended for pastes applied by hand or automatically
SP type – binder intended for pastes applied by the screen printing method.
P type – binder intended for pastes applied by spraying
R type – binder intended for pastes applied to a surface using a roller

Apart from the high-temperature pastes LUT-SPAW also offers other pastes based on the following alloys:

– Brazing pastes based on alloys containing silver
– Brazing pastes based on copper alloys containing phosphorus
– Brazing pastes based on aluminium alloys
– Brazing pastes based on tin alloys

There is a possibility to prepare pastes in accordance with the customer's requirements, by defining the metal powder grain size, percentage metal powder contents as well as the binding system, which will be adapted to the paste application method.

LUT-SPAW manufactures rings using all types of brazing alloys in a wide range of sizes. Our specialists will help in the selection of the correct alloy and ring size. Brazing rings – due to their advantages – are successfully replacing brazing alloys in the form of rods. Their use result into a significant quality improvement and increase production efficiency. They facilitate a faster and more effective brazing process resulting in savings and improved competitiveness.

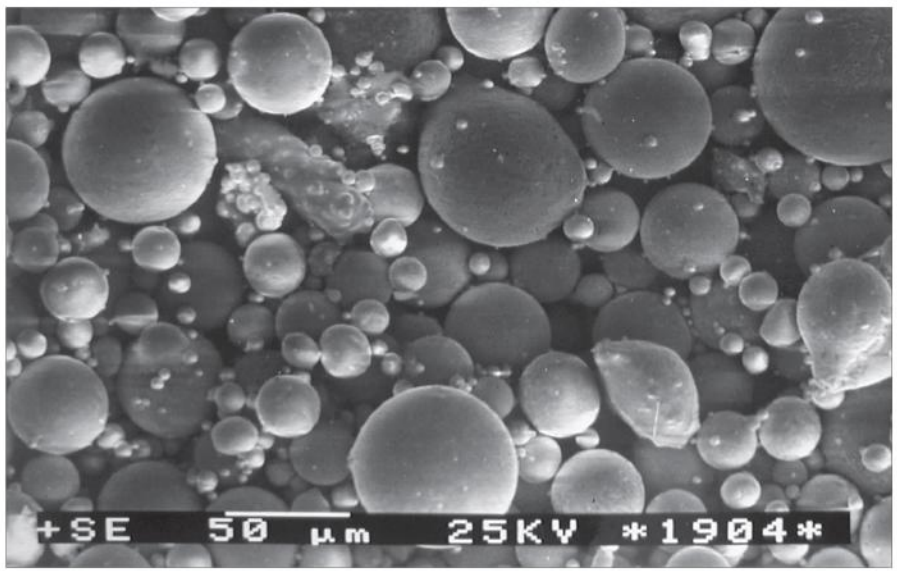
Available forms:

- I.D. rings – full turn of wire
- Gap rings
- Segment rings – ½ diameter and ¾ diameter
- Multi turn rings
- Preforms

Brazing alloys available in ring form:

- Silver and copper-phosphorus
- Copper
- Brass
- Aluminium and zinc

From the beginning of LUT-SPAW company activity we are engaged in manufacturing metal powders made from alloys. The powders are mainly used for brazing furnace, but when mixed with flux, they can also be used in flame brazing. For detailed information about the production, please contact our sales department: handlowy@lut-spaw.com.pl, sprzedaz@lut-spaw.com.pl. In the request specify the type of alloy, quantity and granulating of the powder.



The purpose of the flux is to remove oxides, resulting from the heating process of the joining faces of the metal and the liquid solder. The choice of flux depends on the brazing material, the binder used and the method of soldering. By operation of the flux solders can freely melt the joining faces of the metal.

INSTALFLUX

INSTALFLUX is a complete brand of brazing fluxes with the awareness created depending on how exists between the performance of high-quality connection and selection of a suitable flux. By creating a brand INSTALFLUX we put emphasis on the safety of our products for both health and the environment.

Product	Activity temp. range °C	Standard PN-EN 1045	Standard AWS-FB	Flux characteristics
Fluxes for silver alloys				
INSTALFLUX TLS-1	550-870	FH10	FB3A	Universal white paste flux for use with silver brazing alloy. May be used for bonding stainless steel, brass, bronze and other ferrous and non-ferrous metal alloys. Flux residue is corrosive, water soluble and easy to remove.
INSTALFLUX TLS-2	570-980	FH12	FB3C	Black paste flux with improved activity and a wide range of temperatures. Recommended particularly in the event of rapid spot heating. Used for brazing stainless steel, cemented carbides and other ferrous and non-ferrous metals with silver alloys. Flux residue is corrosive, water soluble and easy to remove.
INSTALFLUX TLS-F	550-800	FH10	FB3A	Universal brown paste flux used with silver and copper-phosphorus alloys. Flux residue is corrosive, water soluble and easy to remove.
Fluxes for copper-phosphorus alloys				
INSTALFLUX TLS-F	550-800	FH10	FB3A	Universal copper brown paste flux used with copper-phosphorus and silver alloys. Flux residue is corrosive, water soluble and easy to remove.
INSTALFLUX TLP-1	550-800	FH10	FB3A	Flux in powder form, recommended for brazing ferrous and non-ferrous metals Usually used if the joint dimensions required long heat-up times. Most commonly used for brazing copper and its alloys using copper/phosphorus alloys and silver alloys with a low content of silver (below 30%). Flux residue is corrosive, water soluble and easy to remove.
Fluxes for brass alloys				
INSTALFLUX TLB-1	700-950	FH20	-	Flux in a paste for brass alloys. Flux residue is corrosive and should be removed using warm water.
INSTALFLUX TLB-3	750-1050	FH21	FB3D	Universal paste or powder flux recommended for brass alloys. Flux residue is corrosive and should be removed using warm water.
Fluxes for aluminium alloys				
INSTALFLUX TLA-1	520-635	FL10	-	Hygroscopic flux for flame brazing. Ideal for brazing aluminium alloy elements with a magnesium content of up to 2.5 %. Flux residue is corrosive, should be removed after brazing. Recommended for AL-Si alloys.
INSTALFLUX TLA-2	515-630	FL10	-	Hygroscopic powder flux for brazing aluminium and its alloys. Recommended for Al-Si alloys. Flux residue is corrosive, should be removed after brazing
INSTALFLUX TLA-4	420-480	-	-	Non-hygroscopic powder flux for brazing aluminium and its alloys. Flux residue is not corrosive.
Fluxes for soldering alloys				
INSTALFLUX TLM-1	180-350	-	-	Universal flux for soldering using tin and tin-lead alloys.
INSTALFLUX TKW-3	180-300	-	-	Liquid flux for soldering stainless steel by tin-lead alloys.
Liquid fluxes				
INSTALFLUX EXT 50	750-950	FH21	FB3D	Liquid flux with 52% - 56% of active ingredient contents (trimethyl borate) and an addition of methanol.
INSTALFLUX EXT 70	750-950	FH21	FB3D	Liquid flux with 70% - 80% of active ingredient contents (trimethyl borate) and an addition of methanol.
INSTALFLUX EXT 7AC	750-950	FH21	FB3D	Liquid flux with 70% - 80% of active ingredient contents (trimethyl borate) and an addition of acetone.

LUT-SPAW supplies soft solders manufactured using metals with the highest purity, which effectively eliminates brazing defects occurring during the process.

Product	Composition %			Melting temp. range	Standard PN EN 29453	Application
	Sn	Ag	Cu	°C		
Sn99Cu1	99	-	1	230 - 240	S-Sn99Cu1	Solder is primarily used in the electrical engineering industry for the manufacture of devices and electronic components.
Sn97Cu3	97	-	3	230 - 250	S-Sn97Cu3	Solder is primarily for brazing copper-copper bonds in potable water or central heating installations.
Sn97Ag3	97	3	-	221 - 224	S-Sn97Ag3	Solder is used in the electronics industry.
SAC 305	96,5	3	0,5	217 - 219	S-Sn97AgCu0,5	Solder is used in the electronics industry.
SAC 0307	99	0,3	0,7	216 - 227	S-Sn99Cu07Ag03	Solder is used in the electronics industry.

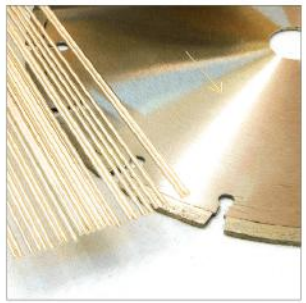
Available wire diameters: 0.25mm – 5.0mm
Available types of wire: monolithic wires, wire with flux
Available forms of alloys: wire, rods, triangular shapes

All of the soft solders on offer are manufactured pursuant to international standards in accordance with the RoHS European Directive. We are able to help our customers in the elimination of solders containing lead. Taking into consideration the specifics of the brazing process we assist in the selection of appropriate lead-free alloy which will comply with all the requirements indicated by the customer whilst at the same time making sure that the production is safe to the health and environment.

Product	Composition %			Melting temp. range	Standard PN EN 29453	Application
	Sn	Ag	Cu	°C		
INSTALFIX Paste	97	-	3	230 - 250	S-Sn97Cu3	Paste intended for brazing copper-copper bonds in potable water or central heating installations.
Sn97Cu3 N paste	97	-	3	230 - 250	S-Sn97Cu3	Non-corrosive paste intended for copper soldering.
Sn97Ag3 paste	97	3	-	221 - 224	S-Sn97Ag3	Paste intended for brazing copper-copper bonds in potable water or central heating installations.

INSTALFIX paste is characterised by high efficiency thanks to carefully selected binders facilitating its application in the form of a thin, uniform layer. Due to its excellent brazing gap filling properties the INSTALFIX paste makes it possible to achieve bonds of a very high quality and which are highly resistant to shearing. INSTALFIX paste in available in 50g, 100g, 200g, 250g and 1 kg containers.

The brazing quality of cemented carbide inserts as well as the diamond sections to a large extent is decisive when it comes to the quality of a given tool. The correct brazing method as well as alloy and flux have to be selected. The alloy is selected on the basis of the material from which the insert is made. In order to look after the joint quality particular attention should be paid to the process of annealing of the brazed joint.



Alloys for the machine and tooling industry
are available as rods, tapes and tapes with copper transfer.

Product	Composition %					Melting temp. range	Standard PN-EN	Alloy characteristic
	Ag	Cu	Zn	Sn	Other	°C	ISO 17672	
INSTALFIT Ag33	33	34	33	-	Si 0,15	700-740	-	A low cost alloy. Due to excellent durability this alloy is primarily used in the tool industry as well as medical gas systems.
INSTALFIT Ag40Sn	40	30	28	2	-	650-710	Ag 140	Universal alloy with a lower melting temperature used for bonding different metals. Ensures good mechanical properties. This alloy is available as rods and tape.
INSTALFIT Ag44	44	30	26	-	-	675-735	Ag 244	Universal alloy with very good mechanical properties, used for bonding ferrous and non-ferrous metals. This alloy is available as rods and tape.
INSTALFIT Ag49NiMn	49	16	23	-	Mn7,5 Ni 4,5	680-705	Ag 449	These alloys are characterised by a low melting temperature, excellent mechanical properties as well as high resistance to corrosion. Available as rods and tape. INSTALFIT Ag49NiMn is also available as "sandwich" tape.
INSTALFIT Ag50Ni	50	20	28	-	Ni2	660-750	Ag 450	
INSTALFIT Ag56Sn	56	22	17	5	-	620-655	Ag 156	Replacement for cadmium alloys. Characterised by very low melting temperature, very good liquidity and mechanical properties. Used where low melting temperatures are required. Available as rods and tape.

Alloys for the refrigeration and air conditioning industry.

Product	Composition %				Melting temp. range	Standard PN-EN	Alloy characteristic
	Ag	Cu	P	Other	°C	ISO 17672	
INSTALFIT CuPSn	-	89,5	6,2	Sn 4,2	650-700	-	Characterised by low melting temperature, good liquidity and capillarity.
INSTALFIT CuP7Sn7	-	86	7	Sn 7	650-700	CuP 386	Characterised by low melting temperature, very good liquidity and capillarity.
INSTALFIT Plus	-	86	6,5	Sn 6,5 Si 0,2	635-675	CuP 385	Ideal alloy for copper-copper and copper-brass bonds. Ensures excellent illiquidity and capillarity and boasts the lowest melting temperature among all copper-phosphorus alloys.
INSTALFIT Plus FC	-	86	6,5	Sn 6,5 Si 0,2	635-675	CuP 385	Covered form of INSTALFIT Plus alloy. Ideal solution for brazing copper with brass as there is no need to use flux.
INSTALFIT Ag2P	2	91,8	6,2	-	645-825	CuP 279	Popular alloy for copper-copper and copper-brass bonds. Ensures a good fill of the gap at low temperatures and high liquidity at high temperatures.
INSTALFIT Ag5P	5	88,8	6,2	-	645-815	CuP 281	Alloy recommended for bonding elements subject to vibrations. Is a guarantee for high strength bonds.
INSTALFIT Ag6P	6	87,9	6,1	-	643-787	-	Due to the similarities in properties with INSTALFIT Ag15P alloy, this is an excellent cheaper alternative. Ensures low working temperature, good plasticity and strength.
INSTALFIT Ag15P	15	80,3	4,7	-	645-800	CuP 284	Due to its good plasticity and strength, ideal for bonding copper-copper, copper-brass joints which will be subject to vibrations.
INSTALFIT Ag25Sn	25	40	-	Zn 33 Sn 2	680-760	Ag 125	Good liquidity and sufficient capillary effect, moderate mechanical properties, good plasticity.
INSTALFIT Ag33	33	34	-	Zn 33 Si 0,15	700-740	-	Efficient universal use alloy. Ensures good liquidity and very good mechanical properties.
INSTALFIT Ag44	44	30	-	Zn 26	675-735	Ag 244	Due to its very good brazing properties this alloy is extensively used in the installation, tool and machinery refrigeration and solar panel industries.
INSTALFIT Ag45Sn	45	27	-	Zn 25,5 Sn 2,5	640-680	Ag 145	Ideal alloy for general use, especially where low temperatures are required, e.g. during brazing of stainless steel. Ensures a very good liquidity, capillarity and mechanical properties. Ideal alternative to alloys with cadmium.

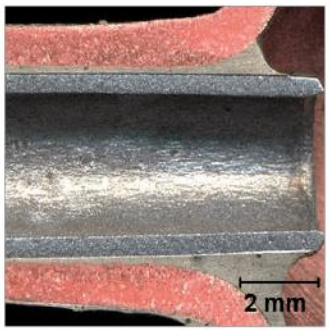
The refrigeration and air conditioning industry, due to the particular working conditions of the brazed joints, requires the use of alloys characterised by good strength parameters as well as high resistance to the effects of acids and alkalis. Thus LUT-SPAW recommends the use three component alloys copper-phosphorus-silver and silver-copper-zinc.

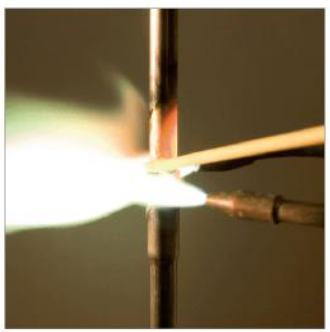
LUT-SPAW guarantees professional technical advice within the scope of brazing to its customers. We offer assistance within the scope of alloy selection to match the brazed materials, choice of brazing technique and introduce the state of the art technologies within the scope of metal bonding. With our help your company will be able to make the brazing process more effective which will result into better quality, improved efficiency, reduction of costs and introduction of technological changes to the production process. Advice is provided by qualified personnel, headed by Wroclaw University of Technology staff, who have been involved with brazing for over thirty years. Due to the complexity of the problems we adopt a very individual approach to each Customer.

Technical queries should be addressed to:

Wiesław Derlukiewicz PhD Eng
Zbigniew Bartnik PhD Eng
Jarosław Król MSc Eng
Lesław Krynicki PhD Eng

doradztwo@lut-spaw.com.pl





LUT-SPAW is also able to supply brazing services. Highly qualified engineering team as well as access to technologically advanced materials means that we are able to accept even the most unusual production orders.

We are able to provide services within the scope of:

Prototype production
Small and large batch production

We guarantee:

The highest quality of service
Convenient commercial terms and short lead times.

To obtain a quote please contact:Jarosław Król MSc Eng
jaroslaw.krol@lut-spaw.com.pl

We are looking forward to doing business with you!









Standard forms of brazing alloys:

Rods of the following diameters: 1.5/2.0/3.0mm and 500mm length
Flux coated rods of the following diameters: 1.5/2.0/3.0mm and 500mm length
Wires or coils, diameters: 1.0/1.5/2.0/2.5/3.0mm
Tapes of the following thicknesses: 0.1/0.2/0.3/0.4/0.5mm and width from 2.0 to 100mm
Transfer tapes of the following thicknesses: 0.2 / 0.3 / 0.4 / 0.5mm and width from 2 to 80mm
Brazing rings
Powder, grain size 56-320µm

LUT-SPAW also offers different brazing alloys, forms and dimensions custom made to the customer's order.

LUT-SPAW

Nowa jakość lutowania

Lut-Spaw s.c.
Przedsiębiorstwo Inżynieryjne
ul. Zakrzowska 21A
51-318 Wroclaw

tel./fax +48 71 326 94 52
tel. +48 71 326 93 95

www.lut-spaw.com.pl
biuro@lut-spaw.com.pl

NIP: 895-00-16-037
REGON: 930136053

Online shop:
www.lut-spaw.com.pl/sklep
office@lut-spaw.com.pl

Sales department:
handlowy@lut-spaw.com.pl
sprzedaz@lut-spaw.com.pl