

# FORTEBRAZE

Brazing Alloys  
Brazing Fluxes  
Brazing Pastes





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# FORTEBRAZE

## About FORTEBRAZE Brazing Products

ForteBraze is the certified brand of Sentes-BiR for high quality brazing product groups.

Manufacturing process of brazing alloys, fluxes and pastes are awarded with ISO 9001, ISO 14001 and OHSAS 18001 certification.

Thanks to its flexible production process, Sentes-BiR is able to meet various demands its customers from different industries and applications.

With the manufacturing site in Turkey and sales office in Poland, ForteBraze products are effectively delivered to global industrial requirements.

## Symbols










## Cadmium Bearing Silver Brazing Alloys





Universal brazing alloys suitable for brazing of any steel, copper and copper alloys, nickel and nickel alloys. When brazing stainless steel, zinc content of these alloys may cause corrosion.

Overheating during brazing process may cause highly toxic cadmium fumes.

Product Code	EN 1044	AWS A5.8	ISO 17672	Ag	Cu	Zn	Cd	Melting Range °C					
5020	AG309			20	40	25	15	605-765	•	•	•		•
5025	AG307	BAG-33	Ag 326	25	30	27	18	605-720	•	•	•		•
5025*		BAG-27		25	35	26	14	605-745	•	•	•		•
5030	AG306	BAG-2a	Ag 330	30	28	21	21	600-690	•	•	•	•	•
5035	AG305	BAG-2	Ag 335	35	25	22	19	605-700	•	•	•	•	•
5040	AG304		Ag 340	40	19	21	20	595-630	•	•	•	•	•
5045	AG302	BAG-1	Ag 345	45	16	16	23	605-620	•	•	•	•	•
5050	AG301	BAG-1a	Ag 350	50	15	17	18	625-635	•	•	•	•	•

## Silver Brazing Alloys for Special Applications

7072 is the eutectic alloy used when no zinc is required. Can be used in furnace applications, with and without flux. 7060 alloy is suitable for brazing stainless steel.






Product Code	EN 1044	AWS A5.8	ISO 17672	Ag	Cu	Other	Melting Range °C				
7072	AG401	BAG-8	Ag 272	72	28		778	•	•	•	•
7060	AG402	BAG-18	Ag 160	60	30	10 Sn	600-730	•	•	•	•

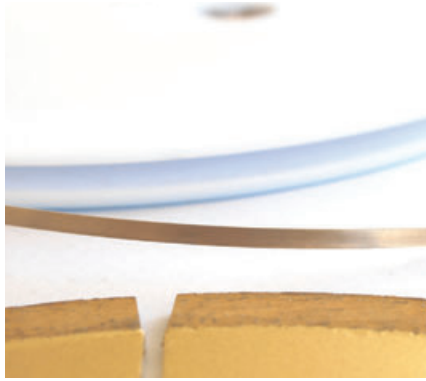
## Cadmium-free Silver Brazing Alloys

All alloys in this group are suitable for brazing of any steel, copper and copper alloys, nickel and nickel alloys. When brazing stainless steel, zinc content of these alloys may cause corrosion.

Tin containing cadmium-free silver brazing alloys are developed to replace the silver alloys with cadmium. Ternary alloys are favorable for dynamic operations.





Product Code	EN 1044	AWS A5.8	ISO 17672	Ag	Cu	Zn	Other	Melting Range °C					
6025	AG108	BAG-37	Ag 125	25	40	33	2 Sn	680-760	•	•	•	•	•
6030	AG107		Ag 130	30	36	32	2 Sn	665-755	•	•	•	•	•
6034	AG106		Ag 134	34	36	27.5	2.5 Sn	630-730	•	•	•	•	•
6038		BAG-34	Ag 138	38	32	28	2 Sn	650-720	•	•	•	•	•
6040	AG105	BAG-28	Ag 140	40	30	28	2 Sn	650-710	•	•	•	•	•
6045	AG104	BAG-36	Ag 145	45	27	25.5	2.5 Sn	640-680	•	•	•	•	•
6055	AG103		Ag 155	55	21	22	2 Sn	630-660	•	•	•	•	•
6056	AG102	BAG-7	Ag 156	56	22	17	5 Sn	620-655	•	•	•	•	•
4005	AG208		Ag 205	5	55	40	0.15 Si	820-870	•	•	•		
4012	AG207		Ag 212	12	48	40	0.15 Si	800-830	•	•	•		
4020	AG206			20	44	36	0.15 Si	690-810	•	•	•		
4025	AG205		Ag 225	25	40	35		700-790	•	•	•		
4030	AG204	BAG-20	Ag 230	30	38	32		680-765	•	•	•		
4044	AG203	BAG-5	Ag 244	44	30	26		675-735	•	•	•	•	





## Brazing Alloys for Tungsten Carbide Tipped Tools and Diamond Tools

### Silver Brazing Alloys

Product Code	EN 1044	AWS A5.8	ISO 17672	Ag	Cu	Zn	Ni	Other	Melting Range °C				
7027	AG503		Ag 427	27	38	20	5.5	9.5 Mn	680-830	•	•	•	•
7040		BAG-4	Ag 440	40	30	28	2		670-780	•	•	•	•
7049	AG502	BAG-22	Ag 449	49	16	23	4.5	7.5 Mn	680-705	•	•	•	•
7049CU				49	27.5	20.5	0.5	2.5 Mn	670-690	•	•	•	•
7050		BAG-24	Ag 450	50	20	28	2		660-705	•	•	•	•
7056	AG403			56	27.25		2.25	14.5 In	600-710	•	•	•	•

### Copper Brazing Alloys



Product Code	EN 1044	AWS A5.8	ISO 17672	Cu	Mn	Other	Melting Range °C		
11212			Cu 595	86	12	2 Ni	970-990	•	•
11310				87	10	3 Co	980-1030	•	•

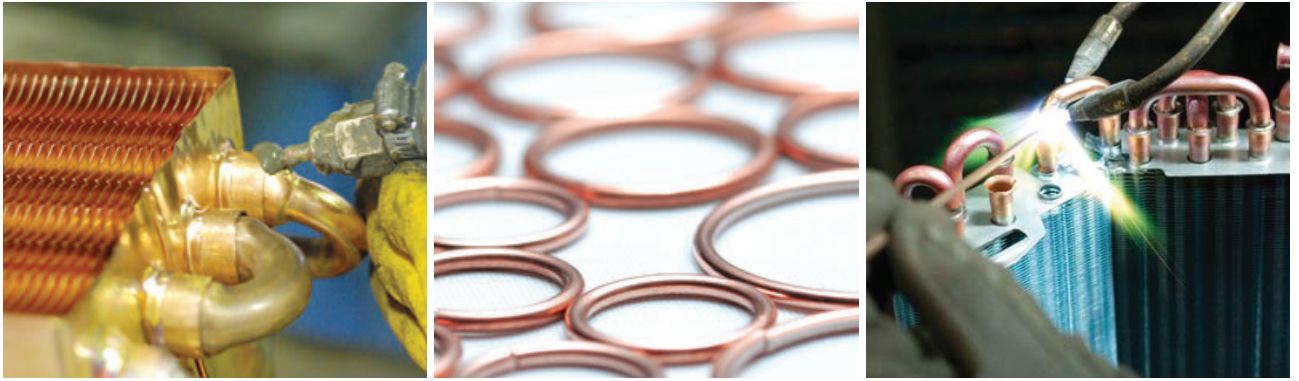
## Fluxes for Silver Brazing Alloys

055, 056 and 060 fluxes are called as General Purpose Fluxes. Used with similar and non-similar metals, provides strong and clear joints. They are in powder and pasta form and used with silver bearing brazing alloys with manual and automated brazing machines. After brazing, joint area should be cleaned with hot water or diluted acid, due to their corrosive residues. Their application temperature is 550-800 °C.

075 flux is brown flux used for brazing of harf metals and stainless steel.






Product Code	EN 1045	Chemical Compounds	Applications		
045	F-SH1	Complex Fluorides and Boron components	Brazing of Steel, Copper and Copper alloys and Silver alloys	•	
055	F-SH1			•	
056	F-SH1				•
060	F-SH1			•	
075	FH 12	Complex Fluorides and Boron components	Brown paste: Stainless Steel and Hard Metal		•



## Copper-Phosphorus Brazing Alloys

Copper-phosphorus and copper-phosphorus-silver alloys used brazing of copper to copper and copper to brass. Phosphorus gives a property of self-fluxing when used for copper joints. No need use of additional flux. These alloys shouldn't use with steels and nickel bearing alloys.

The phosphorus content in P group alloys changes its fluidity. More phosphorus in filler metal increase fluidity. Tin containing alloys enables lower melting temperatures than copper-phosphorus alloys.






Product Code	EN 1044	AWS A5.8	ISO 17672	Cu	P	Sn	Melting Range °C				
2005		BCuP-1	CuP 178	95	5		710-925	•	•	•	
2006	CP203		CuP 179	93.8	6.2		710-890	•	•	•	•
2007	CP202	BCuP-2	CuP 180	93	7		710-820	•	•	•	•
2008	CP201		CuP 182	92.2	7.8		710-770	•	•	•	•
2077	CP302		CuP 386	86.2	6.8	7	650-700	•			•
2076				89.6	6.2	4.2	650-700	•			

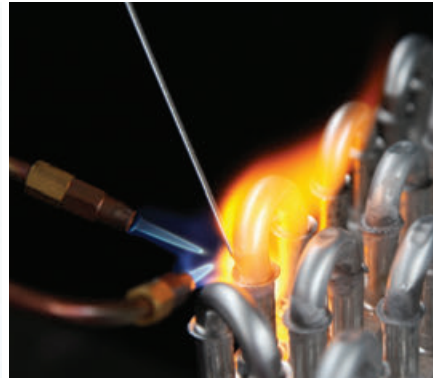


## Copper-Phosphorus-Silver Brazing Alloys

The silver and phosphorus content in 3000 series alloys changes materials melting characteristics. Fluidity increases with higher silver content.



Product Code	EN 1044	AWS A5.8	ISO 17672	Ag	Cu	P	Sn	Melting Range °C					
3002	CP105		CuP 279	2	91.5	6.5		645-825	•	•	•		
3002 LP				2	93.5	4.5		650-850	•	•	•	•	
3022		BCuP-6	CuP 280	2	91	7		645-790	•	•	•		
3005	CP104	BCuP-3	CuP 281	5	89	6		645-815	•	•	•	•	
3055		BCuP-7	CuP 282	5	88	7		645-770	•	•			
3015	CP102	BCuP-5	CuP 284	15	80	5		645-800	•	•		•	•
3018	CP101		CuP 286	18	75	7		645	•	•		•	•
3666				6	81	6.5	6.5	600-640					•







## Aluminum and Zinc-Aluminum Alloys

1000 series alloys are filling metals to braze aluminium and its alloys. 10000 series alloys are used when brazing is needed at low temperatures. The use of these alloys when joining aluminium to copper or to brass yields perfect results.

### FLUX COATED ZnAl RODS

ZnAl alloys are offered in flux coated form. This unique product is very practical to use and no additional flux is needed when used.

Product Code	EN 1044	AWS A5.8	ISO 17672	Al	Si	Zn	Melting Range °C				
1001	AL104	BAISi-4	Al 112	88	12		575-585	•	•	•	
1005	AL101		Al 105	95	5		575-630	•	•	•	
10002				2		98	377-385		•	•	•
10004				4		96	382-405		•	•	•
10015				15		85	382-450		•	•	•
10022				22		78	441-471		•	•	•



## Fluxes for Aluminium Brazing

035 flux is used to braze aluminium and aluminium alloys. Suitable for using especially with manual flame brazing. Can also be used in brazing of aluminium stainless steel brazing. The activity range is 520 – 650 °C.

030 flux is used when it is not possible to clean flux residues after the brazing process. Generally used in furnace brazing applications for joining aluminium to aluminium, with the activity range of 550 – 650 °C.

040 and 041 fluxes are used to join aluminium to copper and aluminium to copper, available in powder and paste forms. Since the brazing is at low temperatures, there is no risk deformation or melting of aluminium base metal with thin wall thickness. These fluxes are used with 10002 and 10004 alloys with the working temperature of 450 – 460 °C.







Product Code	EN 1045	AWS A5.31	Chemical Compounds	Applications		
035	FL20	FB1-A	Hygroscopic fluorides and chlorides	Aluminium and alloys	•	
036						•
030	FL10	FB1-C	Non-hygroscopic fluorides		•	
040			Non-hygroscopic fluorides	Soldering Aluminium to Copper	•	
041						•



## Copper Bearing Brazing Alloys

Universal brazing alloys used with steel and steel alloys.



Product Code	EN 1044	AWS A5.8	ISO 17672	Cu	Zn	Si	Other		Melting Range °C				
8001	CU302	RBCuZn-A		60	38.5	0.3	0.2 Sn		875-895	•	•	•	•
8003	CU305	RBCuZn-D	Cu 773	49	41.3	0.2	9.5 Ni		890-920	•	•	•	•
8003 Ni 6				50	43.8	0.2	6 Ni		890-910	•	•	•	•
8004				60	38	x	x Mn	x Sn	870-895	•	•	•	•
8006	CU306		Cu 471	59	40.1	0.5	0.2 Mn	0.2 Sn	870-900	•	•	•	•
8016	CU301	RBCuZn-C	Cu 470a	59.8	40	0.2			875-895	•	•	•	•

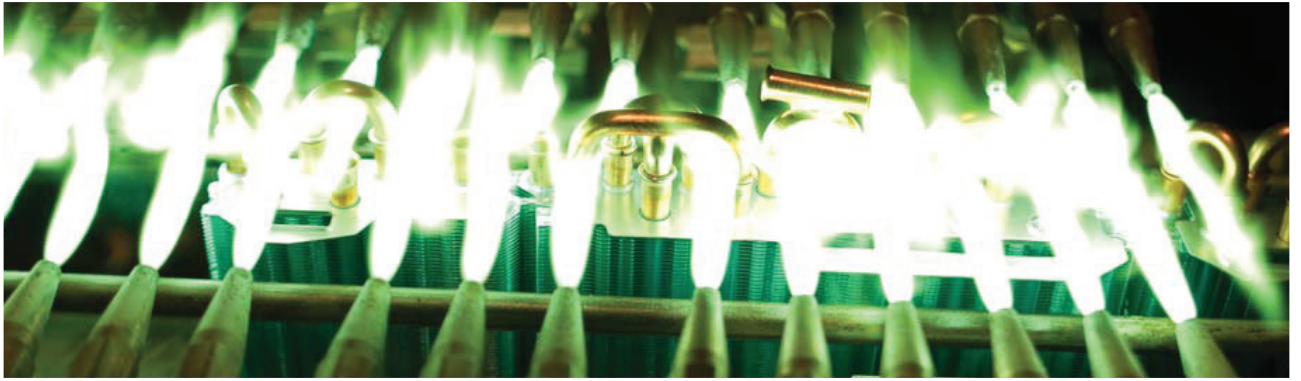
## Fluxes for Copper Bearing Brazing Alloys

110 and 112 fluxes in paste and powder form used with brass brazing alloys, with the activity range of 780-1050 °C. Residues are corrosive.

GREEN FLAME liquid fluxes are suitable, due to they don't have flux residues and protecting from oxidation characteristics. Suitable for flame brazing with high speed brazing applications. Activity range is 750-1100 °C.



Product Code	EN 1045	AWS A5.31	Chemical Compounds	Applications		
110	F-SH2	FB3-F	Complex Boron Components	Brazing of Steel, Copper and Copper alloys		•
112		FB3-F			•	
GREEN FLAME	FH21	FB3-F	Methyl Borates			



## GREENFLAME Liquid Flux

GREENFLAME is a fluxing agent in liquid form. In this application the flue gas flow through liquid mixture and enriches with fluxing agent. GREENFLAME brings higher efficiency and speed to brazing application. Deoxidation of components and wetting action is done by this torch flame. Activity range of GREENFLAME liquid flux is 750-1100 °C. Since there are no residues after brazing, no post cleaning is required.

### Advantages of GREENFLAME

- Reducing brazing process costs
- Higher brazing speed
- No flux residues
- Good finishing appearance
- Providing protective atmosphere for brazing process
- Higher strength
- Adjustable flux richness for different flame sizes
- Can be used with all fuel gases
- No fluoride gases

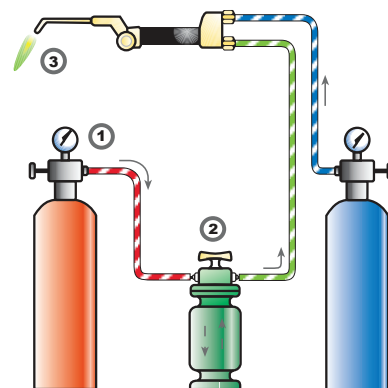
### Industries and Applications

All brazable non-ferrous goods except those with aluminium and magnesium as a consistent. Also used to braze carbides and can be applied to automatic brazing systems.


- Heating, cooling, ventilation
- Automotive, bicycle, motorcycle
- Medical equipments
- Jewelry
- Metall furniture
- Other brazing assemblies

### How It Works?

1. Fuel gas connected to vaporizer tank.
2. Combustion gas vaporizes flux liquid and proper amount of GREENFLAME mixes with fuel.
3. A green flame provides superior wetting action. So, brazing alloy runs smoothly, makes joint with optimum strength and good appearance. Required amount of flux is applied with flame.



GREENFLAME is offered in different concentrations for using with various torch sizes and combustion gas flows.

Product Code	Application
70/30	Standard concentration suitable with applications for the brazing of copper, brass, steel, stainless steel, cast iron, and carbide.
60/40	Medium concentration
50/22-28 Ac	Reduced concentration for brazing copper and copper alloys
45/20-35 Ac	
Non-Tox 	Standard and reduced concentrations for the applications where no toxic material allowed.

#### Package Size

- 5 lt plastic
- 10 lt plastic
- 20 lt plastic
- 200 lt metal drum



## FLUXMATIC Vaporizer

FLUXMATIC Vaporizers are cast aluminium and designed for long running. Any torch can be used with FLUXMATIC Vaporizers. Different models are available for various uses and applications.

#### FLUXMATIC VAPORIZERS

- Fluxmatic A Internal ball check valve and reserve tank.
- Fluxmatic B Additional by-pass valve.
- Fluxmatic E Economic vaporizer
- Fluxmatic ORO E For jewellery industry. Designed to operate with Hydrogen generator.





## Nickel-based Brazing Pastes

### Applications

High strength, corrosion and oxidation resistance properties of nickel based brazing alloys made them ideally suited to join stainless steel parts. These alloys are used in aerospace, tool manufacturing, HVAC industries. Automotive parts like EGR coolers, catalytic converters and brazed plate heat exchangers some example of their applications.

Product Code	EN 1044	AWS A5.8	ISO 17672	Ni	Cr	Si	B	Other	Melting Range °C
9002	NI 102	BNi-2	Ni 620	82.4	7	4.5	3.1	3 Fe	970-1000
9005	NI 105	BNi-5	Ni 650	70.9	19	10.1			1080-1135
9007	NI 107	BNi-7	Ni 710	76	14			10 P	890
9010		BNi-14	Ni 655	66.5	23	6.5		4 P	960-1080

### Binders

Binders have been developed for different application technologies.

Dispensing

*For automatic or manual dosing.*

Screen Printing

*Binder developed for automated screen printing paste application.*

Spraying

*Thin layer of paste applied with spray air gun.*

Roller Coating

*Paste is applied on fins or structured plates by roller coating*

Transfer Tape

*Uniform layer of cast braze alloy and a binder wound in rolls with adhesive applied one side.*



## Copper-based Brazing Pastes

Various paste types has been developed for different applications, furnace atmospheres and brazing characteristics. ForteBraz paste do not leave residues, do not spatter and have high adhesion characteristics.

**GF Series** *Copper paste with gas atomised copper powder. Good fillet forming properties gives better appearance of joint. Used in cracked natural gas or propane, H<sub>2</sub>/N<sub>2</sub> atmosphere furnaces.*

**SF Series** *Economical copper paste with water atomised copper powder. Used in cracked natural gas or propane, H<sub>2</sub>/N<sub>2</sub> atmosphere furnaces.*

**MF Series** *Copper paste for vacuum or pureH<sub>2</sub> atmosphere furnace*

Product Code	EN 1044	AWS A5.8	ISO 17672	Cu	Sn	Ni	Other	Melting Range °C
11000	CU102	B-Cu1	Cu 102	99.95				1085
11000 GFx	CU103	B-Cu1a		99.9				1085
11000 SFx								
11000 MF3								
11000 MF5	CU102	B-Cu3	Cu 102	99.9				1085
11000 MF4	CU104	B-Cu1f	Cu 141	99.9			<0.03 P	1085
11200	CU105		Cu 186	97		2.5	0.03 B	1085-110
11310				87		3	10 Mn	980-1030
11401	CU108		Cu 188	99			1 Ag	1070-1080
12004				96	4		<0.03 P	960-1060
12006	CU201		Cu 922	94	6		<0.03 P	910-1040
12008				92	8		<0.03 P	880-1030
12012	CU202		Cu 925	88	12		<0.03 P	825-990

## Copper-Phosphorus Brazing Pastes

Product Code	EN 1044	AWS A5.8	ISO 17672	Cu	P	Ag	Other	Melting Range °C
2006	CP203		CuP 179	93.8	6.2			710-890
2007	CP202	BCuP-2	CuP 180	93	7			710-820
2008	CP201		CuP 182	92.2	7.8			710-770
2077	CP302		CuP 386	86.2	6.8		Sn 7	650-700
3015	CP102	BCuP-5	CuP 102	80	7	15		645-800
3018	CP101		CuP 101	75	5	15		645
3666				72	6	6	Sn 6	600-640
2155				76	5		Sn 15 Ni 4	590-610



## Silver Brazing Pastes with Flux

### Applications

Silver brazing pastes with flux are used mostly for brazing carbides and steels with induction heating and non-protective atmospheres.

7072 brazing paste is eutectic alloy paste for joining copper, steels and ceramics under protective atmospheres.

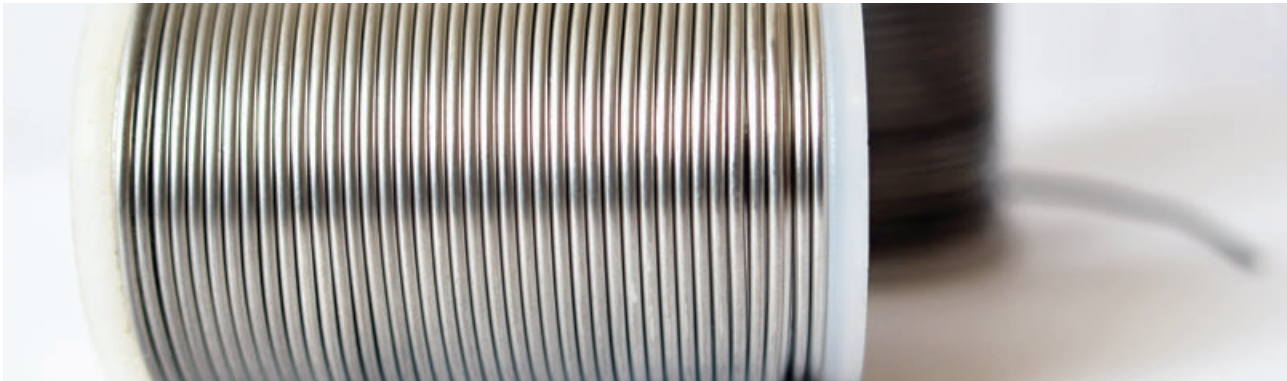
Product Code	EN 1044	AWS A5.8	ISO 17672	Ag	Cu	Zn	Other		Melting Range °C
5040	AG304		Ag 340	40	19	21	Cd 20		595-630
7049	AG502	BAG-22	Ag 449	49	16	23	Ni 4.5	Mn 7.5	680-705
7051	AG351	BAG-3	Ag 351	50	15.5	15.5	Ni 3	Cd 16	635-655
6056	AG102	BAG-7	Ag 156	56	22	17	Sn 5		620-655


## Silver Brazing Pastes without Flux

Product Code	EN 1044	AWS A5.8	ISO 17672	Ag	Cu	Melting Range °C
7072	AG401	BAG-8	Ag 272	72	28	780

## Lead-free Soldering Alloys

Lead-free soldering alloys are suitable for joining metals other than aluminium on lower temperatures. Also available flux cored form.



Product Code	EN 29453	Sn	Cu	Ag	Melting Range °C	
139703	S-Sn97Ag3	97		3	221-230	•
139604	S-Sn96Ag4	96		4	221	•
149703	S-Sn97Cu3	97	3		230-250	•



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