



FLEXIBLE _ INNOVATIVE _ COMPETENT

Phone: +49 (0) 6351 / 401 – 0
Facsimile: +49 (0) 6351 / 401 – 149
Mail: info@fontargen.de
www.fontargen.com

Your contacts:

General Manager:	Udo Kringel	- 120	kringel.u@fontargen.de
Secretary:	Petra Joas	- 121	joas.p@fontargen.de
Technical Manager:	Olaf Hendriks	- 184	hendriks.o@fontargen.de
Product Manager:			
Copper alloys	Michael Ebbinghaus	- 136	ebbinghaus.m@fontargen.de
Brazing pastes	Detlef Müller	- 150	mueller.d@fontargen.de
	Frederic Gley	- 137	gley.f@fontargen.de
Brazing alloys	Oliver Jülly	- 115	juelly.o@fontargen.de
Technical department:	Dr. Axel Demmler	- 151	demmler.a@fontargen.de
	Jochen Fey	- 139	fey.j@fontargen.de
	Beate Schwinger	- 163	schwinger.b@fontargen.de
Sales Manager:	Steffen Merten	- 124	merten.s@fontargen.de
Sales:	Cornelia Nennstiel	- 125	nennstiel.c@fontargen.de
	Andrea Pfannebecker	- 131	pfannebecker.a@fontargen.de
	Monika Roddey	- 128	roddey.m@fontargen.de
	Marianne Stilgenbauer	- 145	stilgenbauer.m@fontargen.de
	Rosemarie Steinbrecher	- 129	steinbrecher.r@fontargen.de
Export Manager:	Matthias Resch	- 156	resch.m@fontargen.de
Export:	Susanne Krause	- 181	krause.s@fontargen.de
	Martin Finkler	- 123	finkler.m@fontargen.de
	Christoph Adamek	- 162	adamek.c@fontargen.de

Handbook on consumables for welding, brazing and spraying



Summary in groups of FONTARGEN products	Page
Group 1 Brazing and soldering alloys	3 – 130
Group 2 Fluxes	131 – 138
Group 3 Solid and cored wires for MIG / MAG welding	139 – 175
Group 4 Filler rods for TIG and gas welding	176 – 204
Group 5 Stick electrodes	205 – 224
Group 6 Metal powder	225 – 236
Group 7 Special products	237 – 248
Technical advice for the dFUMjcbYf	
Application overview	250 – 262
General information	263 – 264
Process technology information	265

Group 1

Brazing and soldering alloys

- a) Brazing alloys: Rods, Wire, Foil
- b) Brazing alloys: Pastes
- c) Soldering alloys: Rods, Wire
- d) Soldering alloys: Pastes
- e) High-temperature brazing alloys: Rods, Wire, Foil
- f) High-temperature brazing alloys: Pastes, Powder

a) Brazing alloys: Rods, Wire, Foil

Type	DIN EN 1044 / DIN 8513	Page
A 101	CU 305 / L-Cu Ni 10 Zn 42	10
A 102	CU 305 / L-Cu Ni 10 Zn 42 + Ag (modified)	11
A 210	CU 301 / L-Cu Zn 40	12
A 210 K	CU 306 / L-Cu Zn 39 Sn	13
A 210 MK	CU 306 / L-Cu Zn 39 Sn	14
A 211	CU 306 / L-Cu Zn 39 Sn	15
A 211 RF	CU 306 / L-Cu Zn 39 Sn	16
A 204	CP 201 / L-Cu P 8	17
A 2003	CP 202 / L-Cu P 7	18
A 2004	CP 203 / L-Cu P 6	19
A 2005	CP 302 / L-Cu Sn P 7	20
A 2006	not standardized	21
A 3002	CP 105 / L-Ag 2 P	22
A 3005	CP 104 / L-Ag 5 P	23
A 3005 S	CP 104 / L-Ag 5 P (modified)	24
A 3015	CP 102 / L-Ag 15 P	25
A 3018	CP 101 / L-Ag 18 P	26
A 303	AG 206 / L-Ag 20	27
A 331	AG 205 / L-Ag 25	28
A 330	AG 204 / L-Ag 30	29
A 311	AG 203 / L-Ag 44	30
A 304	AG 309 / L-Ag 20 Cd	31
A 305	AG 306 / L-Ag 30 Cd	32
A 307	AG 305 / L-Ag 34 Cd	33
A 306	AG 304 / L-Ag 40 Cd	34
A 332	AG 107 / L-Ag 30 Sn	35
A 319	AG 106 / L-Ag 34 Sn	36
A 340	AG 105 / L-Ag 40 Sn	37
A 320	AG 104 / L-Ag 45 Sn	38
A 314	AG 103 / L-Ag 55 Sn	39
A 317	AG 402 / L-Ag 60 Sn	40
A 312 F	AG 502 / L-Ag 49 (modified)	41
A 324	AG 502 / L-Ag 49	42
A 308	AG 401 / L-Ag 72	43
A 308 V	AG 401 / L-Ag 72	44
A 384	- / L-Ag 72 Zn	45
A 341	PD 106	46
A 343	PD 103	47
A 345	PD 204	48
A 407/10 L	AL 103 / L-Al Si 10	49
A 407 L	AL 104 / L-Al Si 12	50

b) Brazing alloys: Pastes

Type	DIN EN 1044 / DIN 8513	Page
AP 210 II Mn Si	B-Cu 55 Zn (Si) (Mn) – 875/890	51
AP 211 FM	B-Cu 59 Zn Ag (Sn) (Ni) (Mn) (Si) – 850/870	52
AP 218 FM	B-Cu 51 Zn (Si) – 870/915	53
AP 2003	CP 202 / L-Cu P 7	54
AP 2004	CP 203 / L-Cu P 6	55
AP 2005	CP 302 / L-Cu Sn P 7	56
AP 3018	CP 101 / L-Ag 18 P	57
AP 3018 FM	CP 101 / L-Ag 18 P	58
AP 306 FM	AG 304 / L-Ag 40 Cd	59
AP 366 FM	B-Cu 33 Zn Ag – 700/740	60
AP 320 FM	AG 104 / L-Ag 45 Sn	61
AP 314 FM	AG 102 / L-Ag 55 Sn	62
AP 314 IL	AG 102 / L-Ag 55 Sn	63
AP 317	AG 402 / L-Ag 60 Sn	64
AP 317 FM	AG 402 / L-Ag 60 Sn	65
AP 309 FM	AG 351 / L-Ag 50 Cd Ni	66
AP 350 FM	not standardized	67
AP 308 V	AG 401 / L-Ag 72	68
AP 46 QL/3	AL 104 / L-Al Si 12	69
AP 47 QL/2	AL 104 / L-Al Si 12	70

c) Soldering alloys: Rods, Wire

Type	DIN EN 29453	Page
A 604	S-Sn Zn 40	71
A 604 KA	S-Sn 90 Zn 7 Cu 3	72
A/AF 605	S-Sn 50 Pb 32 Cd 18	73
A 611	S-Sn 96 Ag 4	74
A/AF 612	S-Sn 60 Pb 40	75
AF 618	S-Sn 60 Pb 38 Cu 2	76
A 630	S-Pb 50 Sn 50	77
A 633	S-Zn Al 3	78
A 644	S-Sn 97 Cu 3	79
A 665	S-Zn 78 Al 22	80

d) Soldering alloys: Pastes

Type	DIN EN 29453	Page
AP 604/12	S-Sn 99,9	81
AP 638/26	S-Sn 99 Cu 1	82
AP 638/26 N	S-Sn 97 Cu 3	83
AP 644/12	S-Sn 97 Cu 3	84
AP 644/21	S-Sn 97 Cu 3	85
AP 653/12	S-Sn 96 Ag 4	86

e) High-temperature brazing alloys: Rods, Wire, Foil

Type	DIN EN 1044 / DIN 8513	Page
A 200 L	CU 104 / L-SF Cu	87
A 200 L 58	CU 101 / L-Cu	88
A 200/2L	CU 105 / L-Cu Ni 2	89
A 202 L	Cu Si 3	90
A 203/6 L	CU 201 / L-Cu Sn 6	91
A 203/12 L	CU 202 / L-Cu Sn 12	92
A 205	- / L-Cu Mn 12 Ni 2	93
A 842	AU 205 / L-Au 82 Ni	94

f) High-temperature brazing alloys: Pastes, Powder

Type	DIN EN 1044 / DIN 8513	Page
AP 20 AL DB	CU 101 / L-Cu	95
AP 21 AL	CU 101 / L-Cu	96
AP 21 AL C	CU 103 / L-Cu	97
AP 21 CL	CU 104 / L-SF Cu	98
AP 21 CLP	CU 104 / L-SF Cu	99
AP 21 CL - 5	CU 104 / L-SF Cu	100
AP 21 DL	CU 105	101
AP 21 ESB2*	- / L-Cu Mn 10 Ni 3	102
AP 21 GL/GS	- / L-Cu Sn 4	103
AP 21 HL/HS	CU 201 / L-Cu Sn 6	104
AP 21 KL	CU 202 / L-Cu Sn 12	105
AP 22 GS	- / L-Cu Sn 4	106
AP 22 LL	- / L-Cu Sn 20	107
HTL 1_1AP	NI 101 / L-Ni 1	108
HTL 1A_1A AP	NI 1A1 / L-Ni 1a	109
HTL 2_2AP	NI 102 / L-Ni 2	110
HTL 2 AP(L)	NI 102 / L-Ni 2	111
HTL 2 AP B	NI 102 / L-Ni 2	112
HTL 3_3AP	NI 103 / L-Ni 3	113
HTL 5_5AP	NI 105 / L-Ni 5	114
HTL 5M_5MAP	not standardized	115

Continuation

HTL 6_6AP	NI 106 / L-Ni 6	116
HTL 6 AP B	NI 106 / L-Ni 6	117
HTL 7 AP Nr.4	NI 107 / L-Ni 7	118
HTL 8_8AP	NI 108 / L-Ni 8	119
HTL 9_9AP	NI 109	120
HTL 9 AP(L)	NI 109	121
HTL 10_10AP	NI 110	122
HTL 14_14AP	AU 105	123
HTL 15_15AP	PD 101	124
HTL 17_17AP	not standardized	125
HTL 170AP	not standardized	126
HTL 270_270AP	not standardized	127
HTL 310 AP	not standardized	128

FONTARGEN A 101

High strength brazing alloy



DIN EN 1044:	CU 305
DIN 8513:	L-Cu Ni 10 Zn 42
EN ISO 3677:	B-Cu 48 Zn Ni (Si) – 890/920
AWS A 5.8:	RB Cu Zn – A
Material-no.:	2.0711

Composition, typical analysis (% w/w):

Cu	Ni	Si	Mn	Sn	Zn
48	9,5	0,25	< 0,2	< 0,2	Remainder

Mechanical and physical properties:

Working temperature:	910°C
Melting range:	890 – 920°C
Specific gravity:	8,7 g/cm ³
Tensile strength:	690 N/mm ²
Elongation:	15 – 20 %

Characteristics / Applications:

Nickel-bearing filler metal of high strength and good fluidity. Suitable for brazing of steel, cast iron, malleable cast iron, nickel and nickel alloys. Suitable for brazing and hardening in one production step. It is very often used in the steel furniture industry.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 100 – Series
Rapidflux - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 102

High strength German silver brazing alloy



DIN EN 1044:	CU 305 (modified)
DIN 8513:	L-Cu Ni 10 Zn 42 + Ag
EN ISO 3677:	B-Cu 48 Zn Ni Ag (Si) - 870/900

Composition, typical analysis (% w/w):

Cu	Ni	Ag	Si	Mn	Sn	Zn
48	9,5	1	0,25	< 0,2	< 0,2	Remainder

Mechanical and physical properties:

Working temperature:	890°C
Melting range:	870 - 900°C
Specific gravity:	8,2 g/cm ³
Tensile strength:	785 N/mm ²
Elongation:	17 - 21 %

Characteristics / Applications:

Nickel-bearing filler metal of high strength and good fluidity. Suitable for gap brazing of steel, cast iron, malleable cast iron, nickel and nickel alloys. This alloy is very well suited for butt joints.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 100 - Series
Rapidflux - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 210

Brass hard solder



DIN EN 1044:	CU 301
DIN 8513:	L-Cu Zn 40
EN ISO 3677:	B-Cu 60 Zn (Si) – 875/895
AWS A 5.8:	RB Cu Zn – A
Material-no.:	2.0367

Composition, typical analysis (% w/w):

Cu	Si	Sn	Zn
60	0,3	< 0,2	Remainder

Mechanical and physical properties:

Working temperature:	900 °C
Melting range:	875 – 895 °C
Specific gravity:	8,4 g/cm ³
Tensile strength:	350 N/mm ²
Elongation:	35 %
Electrical conductivity:	15 S m/mm ²
Hardness:	110 BHN

Characteristics / Applications:

Brazing alloy with good flowing properties, hardly sensitive to overheating. Suitable for gap brazing and coating of steel, cast iron, malleable cast iron, nickel and nickel alloys, as well as copper and copper alloys with a solidus of > 900 °C.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 100 – Series

Rapidflux - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 210 K

Brazing rod with flux impressed in notches



DIN EN 1044:	CU 306
DIN 8513:	L-Cu Zn 39 Sn
EN ISO 3677:	B-Cu 59 Zn Sn (Ni) (Mn) (Si) – 870/890
Material-no.:	2.0533

Composition, typical analysis (% w/w):

Cu	Sn	Si	Mn	Ni	Zn
59	1	0,3	0,6	0,85	Remainder

Mechanical and physical properties:

Working temperature:	900°C
Melting range:	875 – 895°C
Specific gravity:	8,4 g/cm ³
Tensile strength:	380 – 420 N/mm ²
Elongation:	30 %
Hardness:	120 BHN

Characteristics / Applications:

Particularly thin brazing alloy, insensitive to overheating for gap brazing and coating of steel, cast iron, malleable cast iron, nickel and nickel alloys, as well as copper and copper alloys with a solidus of > 900 °C. Also suitable for gap brazing of galvanised steel tubes.

Heat sources:

Acetylene torch, furnace, induction and resistance heating

Flux:

F 100 – Series
Rapidflux - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 210 MK

Brazing rod with flux impressed in notches

FONTARGEN

DIN EN 1044:	CU 306
DIN 8513:	L-Cu Zn 39 Sn
EN ISO 3677:	B-Cu 59 Zn Sn (Ni) (Mn) (Si) – 870/890
Material-no.:	2.0533

Composition, typical analysis (% w/w):

Cu	Sn	Si	Mn	Ni	Zn
59	1	0,3	0,6	0,85	Remainder

Mechanical and physical properties:

Working temperature:	900°C
Melting range:	875 – 895°C
Specific gravity:	8,4 g/cm ³
Tensile strength:	380 – 420 N/mm ²
Elongation:	30 %
Hardness:	120 BHN

Characteristics / Applications:

Particularly thin brazing alloy, insensitive to overheating for gap brazing and coating of steel, cast iron, malleable cast iron, nickel and nickel alloys, as well as copper and copper alloys with a solidus of > 900 °C. Also suitable for gap brazing of galvanised steel tubes.

Heat sources:

Acetylene torch: For copper materials and galvanised steel → Oxygen-excess flame
Other base metals → Neutral flame

Flux:

F 100 – Series
Rapidflux - Series

Approval:

Germanischer Lloyd (G.L.)
Galvanised steel pipes of drinking water installations in accordance with DIN 1988-2

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 211

Thin fluid special brass hard solder



DIN EN 1044:	CU 306
DIN 8513:	L-Cu Zn 39 Sn
EN ISO 3677:	B-Cu 59 Zn Ag (Sn) (Ni) (Mn) (Si) – 870/890
Material-no.:	2.0533

Composition, typical analysis (% w/w):

Cu	Sn	Ag	Si	Mn	Ni	Zn
59	0,3	1	0,3	0,6	0,85	Remainder

Mechanical and physical properties:

Working temperature:	890°C
Melting range:	870 – 890°C
Specific gravity:	8,4 g/cm ³
Tensile strength:	440 N/mm ²
Elongation:	30 %
Hardness:	100 – 125 BHN

Characteristics / Applications:

Brazing alloy with good flowing and wetting properties. Applications on galvanised steel do not lead to a destruction of the zinc-coating. For gap brazing of copper and copper alloys with a solidus of > 900 °C, steel, cast iron, malleable cast iron, galvanised steel, nickel and nickel alloys.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 100 – Series
Rapidflux - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 211 RF

Brass hard solder with flux impressed in grooves **FONTARGEN**

DIN EN 1044:	CU 306
DIN 8513:	L-Cu Zn 39 Sn
EN ISO 3677:	B-Cu 59 Zn Sn (Ni) (Mn) (Si) – 870/890
Material-no.:	2.0533

Composition, typical analysis (% w/w):

Cu	Sn	Si	Mn	Ni	Zn
59	0,3	0,3	0,6	0,85	Remainder

Mechanical and physical properties:

Working temperature:	890°C
Melting range:	870 – 890°C
Specific gravity:	8,4 g/cm ³
Tensile strength:	440 N/mm ²
Elongation:	30 %
Hardness:	100 – 125 BHN

Characteristics / Applications:

Brazing solder with dosed quantity of flux. The solder-flux combination allows simple operation procedures, outstanding flowing properties and perfect bonding to the base metal. For gap brazing and coating of copper and copper alloys with a solidus of > 900°C, steel, cast iron, malleable cast iron, galvanised steel, nickel and nickel alloys.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 100 – Series
Rapidflux - Series

Approval:

Germanischer Lloyd (G.L.)

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SK/0

FONTARGEN A 204

Copper-phosphorus alloy



DIN EN 1044:	CP 201
DIN 8513:	L-Cu P 8
EN ISO 3677:	B-Cu 92 P - 710/770
AWS A 5.8:	B Cu P - 2
Material-no.:	2.1465

Composition, typical analysis (% w/w):

Cu	P
92,2	7,8

Mechanical and physical properties:

Working temperature:	720°C
Melting range:	710 - 770°C
Specific gravity:	8,0 g/cm ³
Tensile strength:	250 N/mm ²
Elongation:	5 %
Electrical conductivity:	3,5 S m/mm ²

Characteristics / Applications:

Filler metal with very good flowing properties and high capillarity. Suitable for gap brazing of copper and copper alloys. Joint-brazing at working temperatures between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, induction and resistance heating, WIG-torch.

Flux:

Only copper alloys require the use of flux

F 300 - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 2003

Copper-phosphorus alloy

FONTARGEN

DIN EN 1044:	CP 202
DIN 8513:	L-Cu P 7
EN ISO 3677:	B-Cu 93 P - 710/820
AWS A 5.8:	B Cu P - 2
Material-no.:	2.1463

Composition, typical analysis (% w/w):

Cu	P
93	7

Mechanical and physical properties:

Working temperature:	730°C
Melting range:	710 - 820°C
Specific gravity:	8,1 g/cm ³
Tensile strength:	250 N/mm ²
Elongation:	5 %

Characteristics / Applications:

Filler metal with good flowing properties and capillarity. Suitable for gap brazing of copper and copper alloys. Joint-brazing at working temperatures between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, induction and resistance heating, TIG-torch.

Flux:

Only copper alloys require the use of flux
F 300 - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 2004

Copper-phosphorus alloy



DIN EN 1044:	CP 203
DIN 8513:	L-Cu P 6
EN ISO 3677:	B-Cu 94 P - 710/890
Material-no.:	2.1462

Composition, typical analysis (% w/w):

Cu	P
93,8	6,2

Mechanical and physical properties:

Working temperature:	760°C
Melting range:	710 – 890°C
Specific gravity:	8,1 g/cm ³
Tensile strength:	250 N/mm ²
Elongation:	5 %

Characteristics / Applications:

Filler metal with good flowing properties and capillarity. Suitable for gap brazing of copper and copper alloys. Joint-brazing at working temperatures between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, induction and resistance heating, WIG-torch.

Flux:

Only copper alloys require the use of flux

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 2005

Copper-phosphorus-tin alloy



DIN EN 1044:	CP 302
DIN 8513:	L-Cu Sn P 7
EN ISO 3677:	B-Cu 86 Sn P – 650/700

Composition, typical analysis (% w/w):

Cu	Sn	P
86,2	7	6,8

Mechanical and physical properties:

Working temperature:	690°C
Melting range:	650 – 700°C
Specific gravity:	8,8 g/cm ³
Tensile strength:	250 N/mm ²

Characteristics / Applications:

Filler metal with good flowing properties and capillarity. Suitable for gap brazing of copper and copper alloys. Colour very similar to brass. Soldering seam can be easily electroplated. Joint-brazing at working temperatures between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating, WIG-torch.

Flux:

Only copper alloys require the use of flux
F 300 -Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preform	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 2006

Copper-phosphorus-tin alloy

FONTARGEN

EN ISO 3677:

B-Cu 89 P Sn – 640/680

Composition, typical analysis (% w/w):

Cu	Sn	P	Si
88,8	6,5	6,5	0,2

Mechanical and physical properties:

Working temperature:	670°C
Melting range:	637 – 674°C
Specific gravity:	8,8 g/cm ³

Characteristics / Applications:

Filler metal with good flowing properties and capillarity. Suitable for gap brazing of copper and copper alloys. The seam colour is silver-gray. Joint-brazing at working temperatures between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating, WIG-torch.

Flux:

Only copper alloys require the use of flux

F 300 –Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 3002

Silver containing copper-phosphorus alloy

DIN EN 1044:	CP 105
DIN 8513:	L-Ag 2 P
EN ISO 3677:	B-Cu 92 P Ag – 645/825
AWS A 5.8:	B Cu P – 2
Material-no.:	2.1467

Composition, typical analysis (% w/w):

Ag	Cu	P
2	91,7	6,3

Mechanical and physical properties:

Working temperature:	740°C
Melting range:	645 – 825°C
Specific gravity:	8,1 g/cm ³
Tensile strength:	250 N/mm ²
Elongation:	5 %
Electrical conductivity:	4 S m/mm ²

Characteristics / Applications:

Copper-phosphorus alloy with low silver content. This alloy has good gap filling properties and is well suited to bridge wide gaps. Suitable for gap brazing of copper and copper alloys. Approved by DVGW-worksheet GW 2 for copper pipes. Joint-brazing at working temperatures between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, induction and resistance heating, TIG-torch.

Flux:

Only copper alloys require the use of flux

F 300 – Series

Approval:

DVGW-Worksheet GW 2

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 3005

Silver containing copper-phosphorus alloy

DIN EN 1044:	CP 104
DIN 8513:	L-Ag 5 P
EN ISO 3677:	B-Cu 89 P Ag – 645/815
AWS A 5.8:	B Cu P – 3
Material-no.:	2.1466

Composition, typical analysis (% w/w):

Ag	Cu	P
5	89	6

Mechanical and physical properties:

Working temperature:	710°C
Melting range:	645 – 815°C
Specific gravity:	8,2 g/cm ³
Tensile strength:	250 N/mm ²
Elongation:	8 %
Electrical conductivity:	5 S m/mm ²

Characteristics / Applications:

Copper-phosphorus alloy with low silver content, good flowing properties and high ductility. Suitable for gap brazing of copper and copper alloys. Joint-brazing at working temperatures between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, induction and resistance heating, WIG-torch.

Flux:

Only copper alloys require the use of flux

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 3005 S

Silver containing copper-phosphorus alloy

FONTARGEN

DIN EN 1044:	CP 104 (modified)
DIN 8513:	L-Ag 5 P Si (modified)
EN ISO 3677:	B-Cu 89 P Ag Si – 645/810

Composition, typical analysis (% w/w):

Ag	Cu	P	Si
5	88,75	6	0,25

Mechanical and physical properties:

Working temperature:	705°C
Melting range:	645 – 810°C
Specific gravity:	8,2 g/cm ³
Tensile strength:	250 N/mm ²
Elongation:	8 %
Electrical conductivity:	5 S m/mm ²

Characteristics / Applications:

Thin fluid, silver containing copper-phosphorus alloy with high capillarity and very good gap bridging properties. It is also suitable for bridging wide gaps. The chemical purity of the alloy leads to a very calm soldering bath and a smooth soldering seam surface. Suitable for gap brazing of copper and copper alloys. Joint-brazing at working temperatures between -60°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, induction and resistance heating, WIG-torch.

Flux:

Only copper alloys require the use of flux

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 3015

Copper-phosphorus alloy with high silver content **FONTARGEN**

DIN EN 1044:	CP 102
DIN 8513:	L-Ag 15 P
EN ISO 3677:	B-Cu 80 Ag P – 645/800
AWS A 5.8:	B Cu P – 5
Material-no.:	2.1210

Composition, typical analysis (% w/w):

Ag	Cu	P
15	80	5

Mechanical and physical properties:

Working temperature:	700°C
Melting range:	645 – 800°C
Specific gravity:	8,4 g/cm ³
Tensile strength:	250 N/mm ²
Elongation:	10 %
Electrical conductivity:	7 S m/mm ²

Characteristics / Applications:

Thin fluid copper-phosphorus alloy with high silver content and high ductility, even at low temperatures. Suitable for gap brazing of copper and copper alloys. Recommended for joints with strong thermal load and vibrations. Joint-brazing at working temperatures between -70°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, induction and resistance heating, TIG-torch.

Flux:

Only copper alloys require the use of flux

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 3018

Copper-phosphorus alloy with high silver content **FONTARGEN**

DIN EN 1044:	CP 101
DIN 8513:	L-Ag 18 P
EN ISO 3677:	B-Cu 75 Ag P – 645

Composition, typical analysis (% w/w):

Ag	Cu	P
18	75	7

Mechanical and physical properties:

Working temperature:	650°C
Melting range:	645°C (Eutectic)
Specific gravity:	8,7 g/cm ³
Tensile strength:	250 N/mm ²
Elongation:	> 10 %

Characteristics / Applications:

Thin fluid copper-phosphorus alloy with high silver content and high ductility, even at low temperatures. Suitable for gap brazing of copper and copper alloys. Recommended for joints with strong thermal load and vibrations. Joint-brazing at working temperatures between -70°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heatsources:

Acetylene torch, air-gas torch, furnace, induction and resistance heating, WIG-torch.

Flux:

Only copper alloys require the use of flux
F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 303

Silver brazing alloy, cadmium free



DIN EN 1044:	AG 206
DIN 8513:	L-Ag 20
EN ISO 3677:	B-Cu 44 Zn Ag (Si) – 690/810
Material-no.:	2.1213

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Si
20	44	36	0,15

Mechanical and physical properties:

Working temperature:	810°C
Melting range:	690 – 810°C
Specific gravity:	8,7 g/cm ³
Tensile strength:	380 – 450 N/mm ²
Elongation:	25 %
Electrical conductivity:	10,6 S m/mm ²
Hardness:	125 BHN

Characteristics / Applications:

Silver-bearing, cadmium-free alloy insensitive to overheating for gap and joint brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Perfect colour match with brass. The silicon contained in the solder can reduce the mechanical property values of welded carbon steels. For brazing joints at working temperatures of max. 300°C.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SK/0

FONTARGEN A 331

Silver brazing alloy, cadmium free

FONTARGEN

DIN EN 1044:	AG 205
DIN 8513:	L-Ag 25
EN ISO 3677:	B-Cu 40 Zn Ag - 700/790
Material-no.:	2.1216

Composition, typical analysis (% w/w):

Ag	Cu	Zn
25	40	35

Mechanical and physical properties:

Working temperature:	780°C
Melting range:	700 – 790°C
Specific gravity:	8,8 g/cm ³
Tensile strength:	380 – 430 N/mm ²
Elongation:	25 %

Characteristics / Applications:

Silver alloy, cadmium free, insensitive to overheating. Gap brazing with alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys. Good colour match with brass. Joint-brazing at working temperatures of max. 300°C.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 330

Silver brazing alloy, cadmium free



DIN EN 1044:	AG 204
DIN 8513:	L-Ag 30
EN ISO 3677:	B-Cu 38 Zn Ag – 680/765
AWS A 5.8:	B Ag – 20
Material-no.:	2.5167

Composition, typical analysis (% w/w):

Ag	Cu	Zn
30	38	32

Mechanical and physical properties:

Working temperature:	750°C
Melting range:	680 – 765°C
Specific gravity:	8,9 g/cm ³
Tensile strength:	380 – 430 N/mm ²
Elongation:	25 %

Characteristics / Applications:

Silver alloy, cadmium free, insensitive to overheating. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys. Good colour match with brass. Joint-brazing at working temperatures of max. 300°C.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 311

Silver brazing alloy, cadmium free



DIN EN 1044:	AG 203
DIN 8513:	L-Ag 44
EN ISO 3677:	B-Ag 44 Cu Zn - 675/735
AWS A 5.8:	B Ag - 5
Material-no.:	2.5147

Composition, typical analysis (% w/w):

Ag	Cu	Zn
44	30	26

Mechanical and physical properties:

Working temperature:	730°C
Melting range:	675 - 735°C
Specific gravity:	9,1 g/cm ³
Tensile strength:	400 - 480 N/mm ²
Elongation:	25 %
Electrical conductivity:	11,2 S m/mm ²
Hardness:	100 BHN

Characteristics / Applications:

Cadmium free brazing alloy with good fluidity and capillary flow characteristics. For gap and joint brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Approval: Marine code VG 81245, section 3. Also suitable for copper pipe installation according to DVGW work certificate GW 2. For brazing joints with a working temperature of max. 300°C.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 - Series

Approval:

Marine code VG 81245, section 3
DVGW work certificate GW 2

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 304

Silver brazing alloy, cadmium bearing



DIN EN 1044:	AG 309
DIN 8513:	L-Ag 20 Cd
EN ISO 3677:	B-Cu 40 Zn Ag Cd – 605/765
Material-no.:	2.1215

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Cd	Si
20	40	25	15	0,15

Mechanical and physical properties:

Working temperature:	750°C
Melting range:	605 – 765°C
Specific gravity:	8,8 g/cm ³
Tensile strength:	350 – 430 N/mm ²
Elongation:	25 %
Electrical conductivity:	12 S m/mm ²

Characteristics / Applications:

Silver alloy with low working temperature and very good flowing and gap-bridging properties. For gap brazing with alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Joint-brazing at working temperatures of max. 150°C. The silicon contained in the solder can reduce the mechanical property values of welded carbon steels.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 305

Silver brazing alloy, cadmium bearing



DIN EN 1044:	AG 306
DIN 8513:	L-Ag 30 Cd
EN ISO 3677:	B-Ag 30 Cu Cd Zn - 600/690
AWS A 5.8:	B Ag - 2a
Material-no.:	2.5145

Composition, typical analysis (% w/w):

Ag	Zn	Cu	Cd	Si
30	21	28	21	0,15

Mechanical and physical properties:

Working temperature:	680°C
Melting range:	600 - 690°C
Specific gravity:	9,2 g/cm ³
Tensile strength:	380 - 470 N/mm ²
Elongation:	30 %
Electrical conductivity:	13 S m/mm ²

Characteristics / Applications:

Silver alloy of low working temperatures and very good capillary flowing properties. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Joint-brazing at working temperatures of max. 200°C. The silicon contained in the solder can reduce the mechanical property values of the welded carbon steels.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 307

Silver brazing alloy, cadmium bearing



DIN EN 1044:	AG 305
DIN 8513:	L-Ag 34 Cd
EN ISO 3677:	B-Ag 35Cu Zn Cd – 610/700
AWS A 5.8:	B Ag – 2
Material-no.:	2.5140

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Cd
35	26	21	18

Mechanical and physical properties:

Working temperature:	640°C
Melting range:	610 – 700°C
Specific gravity:	9,1 g/cm ³
Tensile strength:	400 – 480 N/mm ²
Elongation:	25 %
Electrical conductivity:	13,5 S m/mm ²

Characteristics / Applications:

Silver alloy of low working temperature and very good capillary flowing properties. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Joint-brazing at working temperatures of max. 150°C.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 306

Silver brazing alloy, cadmium bearing

FONTARGEN

DIN EN 1044:	AG 304
DIN 8513:	L-Ag 40 Cd
EN ISO 3677:	B-Ag 40 Zn Cd Cu – 595/630
Material-no.:	2.5141

Composition, typical analysis (% w/w):

Ag	Zn	Cd	Cu
40	21	20	19

Mechanical and physical properties:

Working temperature:	610°C
Melting range:	595 – 630°C
Specific gravity:	9,3 g/cm ³
Tensile strength:	410 – 510 N/mm ²
Elongation:	25 %
Electrical conductivity:	14 S m/mm ²

Characteristics / Applications:

Silver alloy of lowest possible working temperature and very good capillary flowing properties. Gap brazing with alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Joint-brazing at working temperatures of max. 200°C. Brazing joints with A 306 have shown good service results in seawater.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 332

Silver brazing alloy, cadmium free



DIN EN 1044:	AG 107
DIN 8513:	L-Ag 30 Sn
EN ISO 3677:	B-Cu 36 Zn Ag Sn – 665/755
Material-no.:	2.5166

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Sn	Si
30	36	32	2	0,15

Mechanical and physical properties:

Working temperature:	740°C
Melting range:	665 – 755°C
Specific gravity:	8,8 g/cm ³
Tensile strength:	360 – 480 N/mm ²
Hardness:	140 BHN

Characteristics / Applications:

Silver alloy, cadmium free, insensitive to overheating. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys. Joint-brazing at working temperatures of max. 300°C.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 319

Silver brazing alloy, cadmium free



DIN EN 1044:	AG 106
DIN 8513:	L-Ag 34 Sn
EN ISO 3677:	B-Cu 36 Ag Zn Sn – 630/730
Material-no.:	2.5157

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Sn	Si
34	36	27,5	2,5	0,15

Mechanical and physical properties:

Working temperature:	710°C
Melting range:	630 – 730°C
Specific gravity:	9 g/cm ³
Tensile strength:	360 – 480 N/mm ²
Elongation:	12 %
Electrical conductivity:	14 S m/mm ²

Characteristics / Applications:

Cadmium free brazing alloy for gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys. Suitable for copper pipe installation according to DVGW work certificate GW 2. The silicon contained in the solder can reduce the mechanical property values of welded carbon steels. Joint-brazing at working temperatures of max. 200°C.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating

Flux:

F 300 – Series

Approval:

DVGW work certificate GW 2

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 340

Silver brazing alloy, cadmium free



DIN EN 1044:	AG 105
DIN 8513:	L-Ag 40 Sn
EN ISO 3677:	B-Ag 40 Cu Zn Sn – 650/710
Material-no.:	2.5165

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Sn	Si
40	30	28	2	0,15

Mechanical and physical properties:

Working temperature:	690°C
Melting range:	650 – 710°C
Specific gravity:	9,1 g/cm ³
Tensile strength:	350 – 430 N/mm ²
Elongation:	20 %
Electrical conductivity:	14 S m/mm ²
Hardness:	130 BHN

Characteristics / Applications:

Silver alloy, cadmium free, insensitive to overheating. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Seawater resistant, according to marine standard VG 82145, part 3. Silicon can reduce the mechanical properties of carbon steel. Joint-brazing at working temperatures of max. 200°C.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating

Flux:

F 300 – Series

Approval:

Marine Standard VG 81245, Part 3

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 320

Silver brazing alloy, cadmium free



DIN EN 1044:	AG 104
DIN 8513:	L-Ag 45 Sn
EN ISO 3677:	B-Ag 45 Cu Zn Sn – 640/680
AWS A 5.8:	B Ag – 36
Material-no.:	2.5158

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Sn	Si
45	27	25,5	2,5	0,15

Mechanical and physical properties:

Working temperature:	670°C
Melting range:	640 – 680°C
Specific gravity:	9,2 g/cm ³
Tensile strength:	350 – 430 N/mm ²
Elongation:	12 %
Electrical conductivity:	13 S m/mm ²

Characteristics / Applications:

Cadmium free brazing alloy for gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys. Approval: Marine code VG 81245, section 3. Also suitable for copper pipe installation according to DVGW work certificate GW 2. The silicon contained in the solder can reduce the mechanical property values of welded carbon steels. Joint-brazing at working temperatures of max 200°C.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating

Flux:

F 300 – Series

Approval:

DVGW work certificate GW 2

Marine code VG 81245, section 3

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
☒	☒	☒	☒	☒	☒	☒

07/08/SR/0

FONTARGEN A 314

Silver brazing alloy, cadmium free

DIN EN 1044:	AG 103
DIN 8513:	L-Ag 55 Sn
EN ISO 3677:	B-Ag 55 Zn Cu Sn – 630/660
Material-no.:	2.5159

Composition, typical analysis (% w/w):

Ag	Zn	Cu	Sn	Si
55	22	21	2	0,15

Mechanical and physical properties:

Working temperature:	650°C
Melting range:	630 – 660°C
Specific gravity:	9,4 g/cm ³
Tensile strength:	330 – 430 N/mm ²
Elongation:	25 %
Electrical conductivity:	7 S m/mm ²
Hardness:	110 BHN

Characteristics / Applications:

Silver-bearing, cadmium-free low melting brazing alloy, insensitive to overheating for gap and joint brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Brazing stainless steel provides the best possible colour match. Suitable for brazed joints which will be used in seawater according to marine code VG 81245, section 3. The absence of cadmium makes it especially suitable for joints destined to come in contact with food. The silicon contained in the solder can reduce the mechanical property values of welded carbon steels. For brazing joints with a working temperature of max. 200°C.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating

Flux:

F 300 – Series

Approval:

Marine code VG 81245, section 3

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 317

Silver brazing alloy, cadmium free

FONTARGEN

DIN EN 1044:	AG 402
EN ISO 3677:	B-Ag 60 Cu Sn – 600/720
AWS A 5.8:	B Ag – 18
AMS:	4773 F

Composition, typical analysis (% w/w):

Ag	Cu	Sn
60	30	10

Mechanical and physical properties:

Working temperature:	720°C
Melting range:	602 – 718°C
Specific gravity:	9,8 g/cm ³
Tensile strength:	390 – 460 N/mm ²
Elongation:	35 %
Electrical conductivity:	8,7 S m/mm ²

Characteristics / Applications:

Zinc- and cadmium free silver brazing alloy, low vacuum-resistant. For gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys. Excellent in reducing atmospheres since no contamination of the furnace can occur through the evaporation of the contents of the alloy. Particularly well suited for brazing on supply circuits in aircraft construction.

Heat sources:

Acetylene torch, air-gas torch, induction and resistance heating, inert-gas furnace, vacuum furnace

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 312 F

3-layer-silverfoil cadmiumfree



EN ISO 3677:

B-Ag 49 Zn Cu Mn Ni – 680/705

Composition, typical analysis (% w/w):

Ag	Zn	Ni	Mn	Cu
49	20,5	0,5	2,5	27,5

Composition refers to the different solder coats

Mechanical and physical properties:

Working temperature:	690°C
Melting range:	680 – 705°C
Specific gravity:	9,0 g/cm ³
Shear strength:	150 – 300 N/mm ² (depends on Co-content of metal)
Elongation:	35 %

Characteristics / Applications:

Copper foil coated with silver solder on both sides for joints of hard metals and carrier steel. The foil is build-up with a ratio 1:2:1. The copper, which does not melt during brazing, relieves the stress that occurs during brazing due to the difference in coefficients of expansion of the hard metal layer and the carrier steel. Compared to A 324, A 312 F has a lower manganese- and nickel content.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 – Series, particularly recommendable: F 300 HFS

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 324

Silver brazing alloy, cadmium free

DIN EN 1044:	AG 502
DIN 8513:	L-Ag 49
EN ISO 3677:	B-Ag 49 Zn Cu Mn Ni – 680/705
AWS A 5.8:	B Ag – 22
Material-no.:	2.5156

Composition, typical analysis (% w/w):

Ag	Zn	Cu	Mn	Ni
49	23	16	7,5	4,5

Mechanical and physical properties:

Working temperature:	690°C
Melting range:	680 – 705°C
Specific gravity:	8,9 g/cm ³
Shear strength:	250 – 300 N/mm ² (depends on Co-content of hard metals)
Electrical conductivity:	4 S m/mm ²

Characteristics / Applications:

Nickel- and manganese-bearing silver hard solder with very good wetting properties on steel and hard metals, therefore ensuring very tough joints. Gap brazing of hard metals in combination with steel, tungsten, tantalum and molybdenum materials.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 – Series, especially F 300 HFS

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 308

Silver-Copper-Eutectic



DIN EN 1044:	AG 401
DIN 8513:	L-Ag 72
EN ISO 3677:	B-Ag 72 Cu – 780
AWS A 5.8:	B Ag – 8
Material-no.:	2.5151

Composition, typical analysis (% w/w):

Ag	Cu
72	28

Mechanical and physical properties:

Working temperature:	780°C
Melting range:	779°C (Eutectic)
Specific gravity:	10 g/cm ³
Tensile strength:	340 – 390 N/mm ²
Elongation:	17 %
Electrical conductivity:	46,1 S m/mm ²

Characteristics / Applications:

Zinc- and cadmium free alloy with good flowing properties for gap brazing in vacuum and for vacuum-sealed joints of alloyed and unalloyed steel, nickel and nickel alloys. Also suitable for joints of copper and copper alloys.

Heat sources:

Inert gas furnace, acetylene torch, induction and resistance heating, WIG-torch

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 308 V

Silver-Copper-Eutectic

DIN EN 1044:	AG 401
DIN 8513:	L-Ag 72
EN ISO 3677:	B-Ag 72 Cu – 780
AWS A 5.8:	B Ag – 8
Material-no.:	2.5151

Composition, typical analysis (% w/w):

Ag	Cu
72	28

Mechanical and physical properties:

Working temperature:	780°C
Melting range:	779°C (Eutectic)
Specific gravity:	10 g/cm ³
Tensile strength:	340 – 390 N/mm ²
Elongation:	17 %
Electrical conductivity:	46,1 S m/mm ²

Characteristics / Applications:

Zinc- and cadmium free alloy with good flowing properties for gap brazing in vacuum and for vacuum-sealed joints of alloyed and unalloyed steel, nickel and nickel alloys. Very good vacuum durability even at high temperatures. Also suitable for joints of copper and copper alloys. The brazing alloy is coalesced in vacuum with a minimum purity of 99,9%.

Heat sources:

Vacuum furnace, inert gas furnace, acetylene torch, induction and resistance heating, WIG-torch

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN A 384

Copperfree silver brazing solder



DIN 8513: L-Ag 72 Zn
EN ISO 3677: B-Ag 72 Zn - 710/730

Composition, typical analysis (% w/w):

Ag	Zn
72	28

Mechanical and physical properties:

Working temperature: 730°C
Melting range: 710 - 730°C
Specific gravity: 9,8 g/cm³

Characteristics / Applications:

Corrosion-resistant, copper free silver brazing alloy for joints of alloyed and unalloyed steel. The solder seam is suited for ammonia in liquid or vapour form. This brazing alloy is mostly used in the heating and cooling industry.

Heat sources:

Acetylene torch, induction and resistance heating

Flux:

F 300 - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 341

Palladium containing silver brazing alloy



DIN EN 1044:

PD 106

EN ISO 3677:

B-Ag 68 Cu Pd – 805/810

Composition, typical analysis (% w/w):

Ag	Cu	Pd
68,5	26,5	4

Mechanical and physical properties:

Working temperature: 815°C

Melting range: 805 – 810°C

Specific gravity: 10,1 g/cm³

Characteristics / Applications:

Palladium containing brazing alloy made of metals with a minimum purity of 99,99%, coalesced in vacuum. The brazing alloy is oxide free and thus also suitable for joints in vacuum and inert gas. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, copper and copper alloys, cobalt alloys, beryllium, gold, molybdenum, wolfram, titan alloys, zircon and metallised ceramic.

Heat sources:

Acetylene torch, induction and resistance heating, inert gas furnace, vacuum furnace

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SK/0

FONTARGEN A 343

Palladium containing silver brazing alloy



DIN EN 1044:

PD 103

EN ISO 3677:

B-Ag 65 Cu Pd – 850/900

Composition, typical analysis (% w/w):

Ag	Cu	Pd
65	20	15

Mechanical and physical properties:

Working temperature:

910°C

Melting range:

850 – 900°C

Specific gravity:

10,4 g/cm³

Characteristics / Applications:

Palladium containing brazing alloy made of metals with a minimum purity of 99,99%, coalesced in vacuum. The brazing alloy is oxide free and thus also suitable for joints in vacuum and inert gas. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, copper and copper alloys, cobalt alloys, beryllium, gold, molybdenum, wolfram, titan alloys, zircon and metallised ceramic.

Heat sources:

Acetylene torch, induction and resistance heating, inert gas furnace, vacuum furnace

Flux:

F 300 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SK/0

FONTARGEN A 345

Palladium containing silver brazing alloy



DIN EN 1044: PD 204
EN ISO 3677: B-Ag 95 Pd - 970/1010

Composition, typical analysis (% w/w):

Ag	Pd
95	5

Mechanical and physical properties:

Working temperature: 1015°C
Melting range: 970 - 1010°C
Specific gravity: 10,6 g/cm³

Characteristics / Applications:

Palladium containing brazing alloy made of metals with a minimum purity of 99,99%, coalesced in vacuum. The brazing alloy is oxide free and thus also suitable for joints in vacuum and inert gas. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, copper and copper alloys, cobalt alloys, beryllium, gold, molybdenum, wolfram, titan alloys, zircon and metallised ceramic.

Heat sources:

Inert gas furnace, vacuum furnace

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 407/10 L

Aluminium hard solder



DIN EN 1044:	AL 103
DIN 8513:	L-Al Si 10
EN ISO 3677:	B-Al 90 Si - 575/590

Composition, typical analysis (% w/w):

Al	Si
90	10

Mechanical and physical properties:

Working temperature:	600°C
Melting range:	575 – 595°C
Specific gravity:	2,7 g/cm ³
Tensile strength:	170 – 210 N/mm ²
Electric conductivity:	17 – 26 S m/mm ²

Characteristics / Applications:

Brazing alloy for structure- and colour matching joints of aluminium and rolled / cast aluminium alloys. The Mg-content must be $\leq 3\%$. The solidus temperature should be $> 630^{\circ}\text{C}$. The brazing alloy is able to be modelled and is suitable for bridging wide gaps. Not suitable for joints that are to be eloxadized. This brazing alloy is also suited for joints of aluminium with Cr-Ni-steel.

Heat sources:

Inert gas- and vacuum furnace, induction and resistance heating, acetylene torch

Flux:

F 400 – Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN A 407 L

Aluminium hard solder



DIN EN 1044:	AL 104
DIN 8513:	L-Al Si 12
EN ISO 3677:	B-Al 88 Si - 575/585
AWS A 5.8:	B Al Si - 4
Material-no.:	3.2285

Composition, typical analysis (% w/w):

Al	Si
88	12

Mechanical and physical properties:

Working temperature:	590°C
Melting range:	575 - 585°C
Specific gravity:	2,7 g/cm ³
Tensile strength:	100 N/mm ²

Characteristics / Applications:

Capillary active brazing alloy for structure matching and tonal joints of aluminium and rolled / cast aluminium alloys. The Mg-content must be $\leq 3\%$. The solidus temperature should be $> 630^{\circ}\text{C}$. Not suitable for joints that are to be eloxadized. This brazing alloy is also suited for joints of aluminium with Cr-Ni-steel.

Heat sources:

Inert gas- and vacuum furnace, induction and resistance heating, acetylene torch

Flux:

F 400 - Series

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/SR/0

FONTARGEN AP 210 IL Mn Si

Flux containing brass brazing paste



EN ISO 3677:

B-Cu 55 Zn (Si) (Mn) – 875/890

Composition, typical analysis (% w/w):

Cu	Si	Mn	Zn
55	0,2	0,2	Remainder

Mechanical and physical properties:

Working temperature: 900°C

Melting range: 875 – 890°C

Characteristics / Applications:

Dispensable and flux containing brass brazing paste. Flux residues can be removed mechanically or by pickling. The Si-content improves the wetting and flowing properties. AP 210 IL Mn Si is a low cost product for brazing of steel under a normal atmosphere. AP 210 IL Mn Si can also be used for the brazing of hard metals. Typical applications are the tooling (drills) and electro-industry and the car manufacturing.

Heat sources:

Flame and induction

Flux:

FH 21 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 211 FM

Flux containing fluid brass brazing paste

EN ISO 3677: B-Cu 59 Zn Ag (Sn) (Ni) (Mn) (Si) – 850/870
DIN 8513: L-Cu Zn 39 Sn

Composition, typical analysis (% w/w):

Cu	Sn	Ag	Si	Mn	Ni	Zn
59	0,3	1	0,3	0,6	0,85	Remainder

Mechanical and physical properties:

Working temperature: 890°C
Melting range: 850 – 870°C
Specific weight: 8,4 g/cm³ (Metal content)

Characteristics / Applications:

Dispensable flux containing brazing paste with very good flowing and wetting properties. Suitable for the brazing of hard metal with steel. Gap and joint brazing of copper and copper alloys with a solidus of > 900°C, nickel and nickel alloys, steel, cast iron, malleable iron, zinc coated steel (no destruction of the zinc layer).

Heat sources:

Flame, induction and resistance heating

Flux:

FH 21 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 218 FM

Flux containing brass brazing paste

FONTARGEN

EN ISO 3677:

B-Cu 51 Zn (Si) – 870/915

Composition, analysis (% w/w):

Cu	Sn	Zn
51,8	0,2	Remainder

Mechanical and physical properties:

Working temperature: 925°C

Melting range: 870 – 915°C

Characteristics / Applications:

Dispensable flux containing brazing paste with good flowing and wetting properties. Gap and joint brazing of copper and copper alloys with solidus > 900°C, steel and hard metal.

Heat source:

Flame, induction and resistance heating

Flux:

FH 21 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 2003

Copper-phosphorus brazing paste alloy



DIN EN 1044:	CP 202
DIN 8513:	L-Cu P 7
EN ISO 3677:	B-Cu 93 P - 710/820

Composition, typical analysis (% w/w):

Cu	P
93	7

Mechanical and physical properties:

Working temperature:	730°C
Melting range:	710 - 820°C
Specific gravity:	8,1 g/cm ³ (Metal content)

Characteristics / Applications:

Filler metal with good flowing properties and capillarity. The AP 2003 is suitable for gap brazing of copper and copper alloys. For joints with a working temperature between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, air-gas torch, furnace, induction and resistance heating.

Flux:

None - For copper applications there is no need of flux

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/GI/0

FONTARGEN AP 2004

Flux free copper-phosphorus brazing paste

FONTARGEN

DIN EN 1044:	CP 203
DIN 8513:	L-Cu P6
EN ISO 3677:	B-Ag 45 Cu Zn Sn - 710/890

Composition, typical analysis (% w/w):

P	Cu
6,2	Remainder

Mechanical and physical properties:

Working temperature:	760°C
Melting range:	710 – 890°C
Specific gravity:	8,1 g/cm ³ (Metal content)

Mechanical and physical properties:

Capillary brazing on copper, brass, bronze and red brass. For joints with operating temperatures between -20°C up to +150°C. Do not use on assemblies that come in contact with sulphide substances and on Fe and/or Ni based alloys. The paste can be dispensed with FONTARGEN applicators.

Heat sources:

Oxy-acetylene torch, air torch, furnace, induction, resistance.

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 2005

Copper-phosphorus-tin brazing paste



DIN EN 1044:	CP 302
DIN 8513:	L-Cu Sn P 7
EN ISO 3677:	B-Cu 86 Sn P – 650/700

Composition, typical analysis (% w/w):

Cu	Sn	P
86,2	7	6,8

Mechanical and physical properties:

Working temperature:	690°C
Melting range:	650 – 700°C
Specific gravity:	8,8 g/cm ³ (Metal content)

Characteristics / Applications:

Filler metal with good flowing properties and capillarity. Suitable for gap brazing of copper and copper alloys. High colour similarity with brass. Easy electroplating of the soldering seam. For brazing joints with working temperatures between -20°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, air-gas torch, furnace, induction and resistance heating.

Flux:

None - For copper applications there is no need of flux

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in Jars; 3 Mo. in cartridges

Availability: On request

Tins	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/GI/0

FONTARGEN AP 3018

Copper-phosphorus paste with high silver content **FONTARGEN**

DIN EN 1044:	CP 101
DIN 8513:	L-Ag 18 P
EN ISO 3677:	B-Cu 75 Ag P – 645

Composition, typical analysis (% w/w):

Ag	Cu	P
18	75	7

Mechanical and physical properties:

Working temperature:	650°C
Melting range:	645°C (Eutectic)
Specific gravity:	8,7 g/cm ³ (Metal content)

Characteristics / Applications:

AP 3018 is a thin fluid copper-phosphorus alloy with high silver content and high ductility, even at low temperatures. It is suitable for gap brazing of copper and copper alloys. It is recommended for joints with strong thermal load and vibrations and for brazing joints with working temperatures between -70°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys.

Heat sources:

Acetylene torch, air-gas torch, furnace, induction and resistance heating.

Flux:

None - For copper applications there is no need of flux.

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/GI/0

FONTARGEN AP 3018 FM

Copper-phosphorus paste with high silver content and flux

FONTARGEN

DIN EN 1044:	CP 101
DIN 8513:	L-Ag 18 P
EN ISO 3677:	B-Cu 75 Ag P – 645

Composition, typical analysis (% w/w):

Ag	Cu	P
18	75	7

Mechanical and physical properties:

Working temperature:	650°C
Melting range:	645°C (Eutectic)
Specific gravity:	8,7 g/cm ³ (Metal content)

Characteristics / Applications:

AP 3018 is a thin fluid copper-phosphorus alloy with high silver content and high ductility, even at low temperatures. It is suitable for gap brazing of copper and copper alloys and brass. It is recommended for joints with strong thermal load and vibrations and for brazing joints with working temperatures between -70°C and +150°C. Do not use in sulphurous environment and on Fe- and Ni-alloys. Residues are corrosive and have to be removed.

Heat sources:

Acetylene torch, air-gas torch, furnace, induction and resistance heating.

Flux-Type:

FH-10

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

11/08/GI/0

FONTARGEN AP 306 FM

Cadmium bearing, flux containing silver brazing paste **FONTARGEN**

DIN EN 1044:	AG 304
DIN 8513:	L-Ag 40 Cd
EN ISO 3677:	B-Ag 40 Zn Cd Cu – 595/630

Composition, typical analysis (% w/w):

Ag	Zn	Cd	Cu
40	21	20	19

Mechanical and physical properties:

Working temperature:	610°C
Melting range:	595 – 630°C
Specific gravity:	9,3 g/cm ³ (Metal content)
Electrical conductivity:	14 Sm/mm ²

Characteristics / Applications:

AP 306 is a silver brazing paste with low working temperatures and excellent wetting and capillary properties. Suitable for capillary brazing of steels, copper and copper alloys, nickel and nickel alloys, malleable cast iron and hard metal. For braze joints operating at temperatures up to 200°C. Brazing joints with AP 306 have shown good service results in seawater.

Heat sources:

Oxy-acetylene torch, induction, resistance

Flux:

Type FH10 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 Weeks in cartridges <175 cc.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 366 FM

Cadmiumfree, flux containing silver brazing paste 

DIN EN 1044:	No standard
DIN 8513:	No standard
EN ISO 3677:	B-Cu 33 Zn Ag – 700/740

Composition, typical analysis (% w/w):

Ag	Zn	Cd	Cu
40	21	20	19

Mechanical and physical properties:

Working temperature:	750°C
Melting range:	700 – 740°C

Characteristics / Applications:

AP 366 FM is a cadmium free silver brazing paste with good wetting properties, a narrow melting range and a high solidus temperature. It is especially suitable for the capillary brazing of steel, nickel and nickel alloys, copper and copper alloys. This filler metal fits in most common materials used in machine and car constructions and in the electro-industry. The paste can be dispensed with FONTARGEN applicators.

Heat sources:

Oxy-acetylene torch, induction, resistance

Flux:

Type FH10 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 Weeks in cartridges <175 cc.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 320 FM

Cadmiumfree, flux containing silver paste

FONTARGEN

DIN EN 1044:	AG 104
DIN 8513:	L-Ag 45 Sn
EN ISO 3677:	B-Ag 45 Cu Zn Sn – 640/680
AWS A 5.8:	B Ag – 36

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Sn
45	27	25,5	2,5

Mechanical and physical properties:

Working temperature:	670°C
Melting range:	640 – 680°C
Specific gravity:	9,2 g/cm ³ (Metal content)
Electrical conductivity:	13 Sm/mm ²

Characteristics / Applications:

AP 320 FM is a cadmium free silver brazing paste with good wetting properties for capillary brazing of steels, copper and copper alloys, nickel and nickel alloys and malleable cast iron. It is suitable for copper pipe installations according to DVGW-work certificate GW 2 and for parts that come in contact with seawater. For braze joints operating at temperatures up to 200°C.

Heat sources:

Oxy-acetylene torch, induction, resistance

Flux:

Type FH10 acc. to DIN EN 1045

Approval:

DVGW-work certificate GW 2
Marine code VG 81245, section 3

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 Weeks in cartridges <175 cc

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 314 FM

Silver brazing alloy, cadmium free

DIN EN 1044:	AG 102
DIN 8513:	L-Ag 55 Sn
EN ISO 3677:	B-Ag 56 Cu Zn Sn – 620/655

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Sn
56	22	17	5

Mechanical and physical properties:

Working temperature:	660°C
Melting range:	620 – 655°C
Specific gravity:	9,4 g/cm ³
Electrical conductivity:	7 S m/mm ²

Characteristics / Applications:

Cadmium-free low melting silver brazing alloy for gap and joint brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Brazing stainless steel produces the best possible colour match. The paste is suitable for brazed joints to be used in seawater according to marine code VG 81245, section 3. The absence of cadmium makes it especially suitable for joints destined to come in contact with food. For brazing joints with a working temperature of max. 200°C.

Heat sources:

Oxy-acetylene torch, induction, resistance

Flux:

Type FH10 acc. to DIN EN 1045

Approval:

Marine code VG 81245, section 3

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 weeks in cartridges <175 cc.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 314 IL

Silver brazing alloy, cadmium free

DIN EN 1044:	AG 102
DIN 8513:	L-Ag 55 Sn
EN ISO 3677:	B-Ag 56 Cu Zn Sn – 620/655

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Sn
56	22	17	5

Mechanical and physical properties:

Working temperature:	660°C
Melting range:	620 – 655°C
Specific gravity:	9,4 g/cm ³
Electrical conductivity:	7 S m/mm ²

Characteristics / Applications:

Cadmium-free low melting silver brazing alloy for gap and joint brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Brazing stainless steel produces the best possible colour match. The paste is suitable for brazed joints which will be used in seawater according to marine code VG 81245, section 3. The absence of cadmium makes it especially suitable for joints which come in contact with food. For brazing joints with working temperature of max. 200°C.

Heat sources:

Oxy-acetylene torch, induction, resistance

Flux:

Type FH10 acc. to DIN EN 1045

Approval:

Marine code VG 81245, section 3

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 weeks in cartridges <175 cc.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 317

Silver brazing alloy, cadmium free

DIN EN 1044:	AG 402
EN ISO 3677:	B-Ag 60 Cu Sn – 600/730
AWS A 5.8:	B Ag – 18
AMS:	4773 F

Composition, typical analysis (% w/w):

Ag	Cu	Sn
60	30	10

Mechanical and physical properties:

Working temperature:	740°C
Melting range:	600 – 730°C
Specific gravity:	9,8 g/cm ³ (Metal content)
Electrical conductivity:	8,7 S/mm ²

Characteristics / Applications:

Zinc- and cadmium-free silver brazing alloy, low vacuum-resistant. For gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys. Excellent in reducing atmospheres since no contamination of the furnace can occur through the evaporation of the contents of the alloy. The paste is particularly suitable for soldering at supply circuits in aircraft construction.

Heat sources:

Oxy-acetylene torch, induction, furnace, vacuum.

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 Weeks in cartridges <175 cc.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 317 FM

Flux containing silver brazing alloy, cadmium free

FONTARGEN

DIN EN 1044:	AG 402
EN ISO 3677:	B-Ag 60 Cu Sn - 600/730
AWS A 5.8:	B Ag - 18
AMS:	4773 F

Composition, typical analysis (% w/w):

Ag	Cu	Sn
60	30	10

Mechanical and physical properties:

Working temperature:	740°C
Melting range:	600 - 730°C
Specific gravity:	9,8 g/cm ³ (Metal content)
Electrical conductivity:	8,7 S /mm ²

Characteristics / Applications:

Zinc- and cadmium-free silver brazing alloy, low vacuum-resistant. For gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys. Excellent in reducing atmospheres since no contamination of the furnace can occur through the evaporation of the contents of the alloy. It is particularly suitable for soldering on supply circuits in aircraft construction. The paste can be dispensed with FONTARGEN applicators.

Heat sources:

Oxy-acetylene torch, induction, furnace, vacuum.

Flux:

Type FH10 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 309 FM

Cadmium bearing, flux containing silver paste

FONTARGEN

DIN EN 1044:	AG 351
DIN 8513:	L-Ag 50 Cd Ni
EN ISO 3677:	B-Ag 50 Cd Zn Cu Ni – 635/655

Composition, typical analysis (% w/w):

Ag	Cd	Zn	Cu	Ni
50	16	15,5	15,5	3

Mechanical and physical properties:

Working temperature:	655°C
Melting range:	635 – 655°C
Specific gravity:	9,3 g/cm ³ (Metal content)
Electrical conductivity:	9,8 S/mm ²

Characteristics / Applications:

Nickel and cadmium bearing silver brazing paste for capillary brazing of steels, copper and copper alloys, nickel and nickel alloys and hard metal. The alloy shows very good wetting properties on steel and hard metal and consequently a high mechanical strength of the assembly. The alloy is suitable for the brazing of tungsten, molybdenum, tantalum and in sea water areas.

Heat sources:

Oxy-acetylene torch, induction, resistance

Flux:

Type FH10 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 weeks in cartridges <175 cc.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 350 FM

Cadmium free, flux containing silver paste

DIN EN 1044:	No standard
DIN 8513:	No standard
EN ISO 3677:	B-Ag 50 Zn Cu Ni – 660/705
AWS A 5.8:	B Ag – 24
AMS:	4788

Composition, typical analysis (% w/w):

Ag	Cu	Zn	Ni
50	20	28	2

Mechanical and physical properties:

Working temperature:	670°C
Melting range:	660 – 705°C
Specific gravity:	9,17 g/cm ³ (Metal content)

Characteristics / Applications:

Low melting cadmium free silver brazing paste with good wetting and excellent mechanical properties. Suitable for the brazing of hard metals with steel, tungsten, tantalum and molybdenum materials. The alloy is used in the tooling industry and on stainless steel food handling equipment with close joint clearance. For braze joints operating at temperatures up to 200°C, respectively up to 150°C continuous operating temperature.

Heat sources:

Oxy-acetylene torch, induction, resistance

Flux:

Type FH10 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 Weeks in cartridges <175 cc

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 308 V

Silver-Copper-Eutectic paste for vacuum brazing

FONTARGEN

DIN EN 1044:	AG 401
DIN 8513:	L-Ag 72
EN ISO 3677:	B-Ag 72 Cu - 780
AWS A 5.8:	B Ag - 8

Composition, typical analysis (% w/w):

Ag	Cu
72	28

Mechanical and physical properties:

Working temperature:	780°C
Melting range:	779°C (Eutectic)
Specific gravity:	10g/cm ³ (Metal content)
Electrical conductivity:	46,1 S m/mm ²

Characteristics / Applications:

Zinc- and cadmium free alloy with good flowing properties for gap brazing in vacuum and for vacuum-sealed joints of alloyed and unalloyed steel, nickel and nickel alloys. Very good vacuum durability even at high temperatures. Also suitable for joints of copper and copper alloys. The brazing alloy is coalesced in vacuum with a minimum purity of 99,9%.

Heat sources:

Vacuum furnace

Flux:

None

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 cc; 6 weeks in cartridges <175 cc.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/0

FONTARGEN AP 46 QL/3

Aluminium brazing paste

DIN EN 1044:	AL 104
DIN 8513:	L-Al Si 12
EN ISO 3677:	B-Al 88 Si - 575/585
AWS A 5.8:	B Al Si - 4

Composition, typical analysis (% w/w):

Al	Si
88	12

Mechanical and physical properties:

Working temperature:	590°C
Melting range:	575 - 585°C
Specific gravity:	2,7 g/cm ³ (Metal content)

Characteristics / Applications:

Capillary active brazing alloy for structure matching and ternal joints of aluminium and rolled / cast aluminium alloys. The Mg-content must be ≤ 3%. The solidus temperature should be > 630°C. Not suitable for joints that are to be eloxadized. This brazing alloy is also suited for joints of aluminium with Cr-Ni-steel. The flux residues have to be removed after brazing.

Heat sources:

Inert gas furnace (N₂, cracked ammonia), acetylene torch (indirect heating)

Flux:

F-LH 1 acc. to DIN 8511
FL 10 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/GI/0

FONTARGEN AP 47 QL/2

Aluminium brazing paste

FONTARGEN

DIN EN 1044:	AL 104
DIN 8513:	L-Al Si 12
EN ISO 3677:	B-Al 88 Si - 575/585
AWS A 5.8:	B Al Si - 4

Composition, typical analysis (% w/w):

Al	Si
88	12

Mechanical and physical properties:

Working temperature:	590°C
Melting range:	575 - 585°C
Specific gravity:	2,7 g/cm ³ (Metal content)

Characteristics / Applications:

Capillary active brazing alloy for structure matching and tonal joints of aluminium and rolled / cast aluminium alloys. The Mg-content must be $\leq 0,7\%$. The solidus temperature should be $> 630^{\circ}\text{C}$. Not suitable for joints that are to be eloxadized. This brazing alloy is also suited for joints of aluminium with Cr-Ni-steel. The flux residues can be left on the assembly. The brazed joints must be protected against wetness.

Heat sources:

Inert gas furnace (N₂, cracked ammonia), acetylene torch (indirect heating)

Flux:

F-LH 2 acc. to DIN 8511
FL 20 acc. to DIN EN 1045

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/GI/0

FONTARGEN A 604

Friction solder



DIN EN ISO 3677:

S – Sn 60 Zn 40

Composition, typical analysis (% w/w):

Sn	Zn
60,0	Remainder

Mechanical and physical properties:

Melting range: 200 - 340 °C

Hardness (BHN): 19 HB

Electrical conductivity: 22,2 Sm/mm²

Copper: 100 N/mm²

Brass: 90 N/mm²

Steel: 90 N/mm²

Specific gravity: 7,1 g/cm³

Characteristics / Applications:

Lead-free friction solder, on aluminium without flux. Build-up possible. Step-by-step solder (first solder). Sealing of blowholes and cracks on cast iron and cast aluminium, repairs on zinc injection moulded parts, filling-up of dents in aluminium plates. Car body workshops, aluminium foundries, repair shops, etc.

Heat sources:

Acetylene torch (fuel gas excess), air-gas torch, soldering lamp, soldering iron.

Flux:

F 600 Al

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN A 604 KA

Friction solder, build-up soldering (lead-free)



DIN EN ISO 3677:

S – Sn 90 Zn 7 Cu3

Composition, typical analysis (% w/w):

Zn	Cu	Sn
7,0	3,0	Remainder

Mechanical and physical properties:

Melting range: 200 - 250°C

Hardness (BHN): 16 HB

Electrical conductivity: 22,6 Sm/mm²

Specific gravity: 7,3 g/cm³

Characteristics / Applications:

Step-by-step solder (first solder). Sealing of blowholes and cracks on cast iron and cast aluminium, repairs on zinc injection moulded parts, filling-up of dents in aluminium plates. Autobody workshops, aluminium foundries, repair shops, etc.

In application to steel autobodies like the correction of detriments and cracks, AP 644/12 must be applied beforehand (also see FONTARGEN work assembly autobody solder).

Friction solder, on aluminium without flux. Build-up possible. A 604 KA is an enhancement of A 604.

Heat sources:

Acetylene torch (fuel gas excess), air-gas torch, soldering lamp, soldering iron

Flux:

F 600 Al

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN A/AF 605

Eutectic soft solder with low melting point

FONTARGEN

EN ISO 9453:

Alloy-no. 151/ S – Sn 50 Pb 32 Cd18

A 605

DIN EN 29454.1 (Flux):

Full wire

F 600: 3.1.1.A (corrosive fluid, for low alloyed and alloyed steel and heavy metals)

F 600 CW: 3.1.1.C (paste-like, soldering flux, activated, limited corrosive)

F 600 CC: 1.1.2. (paste-like, colophony based)

F 600 AL: 2.1.2 (soldering oil, limited corrosive, for aluminium and copper/copper alloys)

AF 605

DIN EN 29454.1 (Flux):

Soft solder with active flux core

1.1.2 (non corrosive flux, colophony based)

Composition, typical analysis (% w/w):

Cd	Sn	Sb	Pb
18,0	50,0	0,10	Remainder

Mechanical and physical properties:

Melting range:	145°C
Tensile strength (solder):	43 N/mm ²
On Ms 58:	99 N/mm ²
Shear strength on Cu:	30 N/mm ²
On Ms:	20 N/mm ²
On St:	15 N/mm ²
Hardness (BHN):	12 HB
Electrical conductivity:	7,6g/cm ³
Specific gravity (metal):	8,5g/cm ³

Characteristics / Applications:

Solders on steel, copper and copper alloys. Particularly well suited for delicate jobs that require the lowest working temperatures possible. Engineering of electrical and general apparatus. Also for phased solders, tin goods, fuses and condensers. Capillary active solder with very good flowing properties and eutectic melting point. Suitable for step-by-step solders.

Heat sources:

Acetylene torch (fuel gas excess), air-gas torch, soldering lamp, soldering iron, dip bath.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN A 611

Silver-bearing, lead-free solder



EN ISO 9453:	Alloy-no. 703/S – Sn 97 Ag3
DIN EN 29454.1 (Flux):	3.1.1.A (corrosive fluid, for low alloyed and alloyed steel and heavy metals)
	3.1.1.C (paste-like, soldering flux, activated, limited corrosive)
	2.1.2. (soldering oil, limited corrosive, for aluminium and copper/copper alloys)

Composition, typical analysis (% w/w):

Ag	Sn
3,5	Remainder

Mechanical and physical properties:

Melting range:	221 - 230°C
Tensile strength (solder):	44 N/mm ²
On Ms 58:	53 N/mm ²
Shear strength on Cu:	30 N/mm ²
On Ms:	20 N/mm ²
On St:	25 N/mm ²
Hardness (BHN):	15 HB
Electrical conductivity:	7,5 Sm/mm ²
Specific gravity:	7,3 g/cm ³

Characteristics / Applications:

Solders on steel, stainless steel, copper and copper alloys. Foodstuffs industry, electrical industry and general apparatus engineering, refrigerating industry, copper pipe installations, hot and cold water installations, heating installations up to 100°C, oil piping in accordance with DVGW specification sheet.

Lead- and cadmium-free eutectic solder with very good flowing properties. The solder remains brilliant even after a long period of using the soldered objects. Cold-resistant up to -200°C.

Heat sources:

Acetylene torch (fuel gas excess), air-gas torch, soldering lamp, soldering iron, dip bath.

Flux:

F 600 Al

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN A/AF 612

Antimony-free soft solder alloy



EN ISO 9453:

Alloy-no. 104 /S – Sn 60 Pb 40

A 612

DIN EN 29454.1 (Flux):

Solid wire

F 600: 3.1.1.A (corrosive fluid, for unalloyed and low alloyed steel and heavy metals)

F 600 CW: 3.1.1.C (paste-like, soldering flux, activated, limited corrosive)

F 600 CC: 1.1.2. (paste-like, colophony based)

AF 612

DIN EN 29454.1 (Flux) :

Soft solder with active flux core

1.1.2 (non corrosive flux, colophony based)

Composition, typical analysis (% w/w):

Sn	Sb	Pb
60,0	0,12	Remainder

Mechanical and physical properties:

Melting range: 183-190°C

Tensile strength (solder): 29 N/mm²

On Ms 58: 78 N/mm²

Hardness (BHN): 13 HB

Electrical conductivity: 7 Sm/mm²

Specific gravity (metal): 8,5 g/cm³

Characteristics / Applications:

General soldering work on iron and copper based metals without flux. Electrical industry and construction of electrical and general apparatuses. Tin plating. Lead-bearing soft solder with very narrow melting interval. Very fluid with good wetting properties on copper and ferrous metals. AF 612 enables good bonds with cuprous base metals without additional flux.

Heat sources:

Acetylene torch (fuel gas excess), air-gas torch, soldering lamp, soldering iron.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN AF 618

Antimony-free soft solder with activated flux core 

EN ISO 9453:

Alloy-no. 161/ S – Sn 60 Pb 38 Cu 2

DIN EN 29454.1 (Flux):

1.1.2 (non corrosive flux, colophony based)

Composition, typical analysis (% w/w):

Sn	Cu	Sb	Pb
60	1,75	0,10	Remainder

Mechanical and physical properties:

Melting range: 183-190°C

Tensile strength (solder): 38 N/mm²

Hardness (BHN): 18 HB

Electrical conductivity: 6,6 Sm/mm²

Specific gravity (metal): 8,5 g/cm³

Characteristics / Applications:

General soldering work on copper base metals. Electrical industry and construction and general apparatuses. Soft solder with very narrow melting interval. Good wetting properties on copper. The copper content of 2% ensures that the solder does not alloy with the copper of the soldering rod.

Heat sources:

Soldering iron

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN A 630

Soft solder



EN ISO 9453:

Alloy-no.111 / S- Pb 50 Sn 50

DIN EN 29454.1 (Flux):

F 600: 3.1.1.A (corrosive fluid, for low alloyed and alloyed steel and heavy metals)

F 600 CW: 3.1.1.C (paste-like, soldering flux, activated, limited corrosive)

F 600 CC: 1.1.2. (paste-like, colophony based)

Soft solder with active flux core

1.1.2 C. (paste-like, colophony based)

Composition, typical analysis (% w/w):

Sn	Sb	Pb
50,0	0,12	Remainder

Mechanical and physical properties:

Melting range: 183-215°C

Tensile strength (solder): 39 N/mm²

On Ms 58: 81 N/mm²

Hardness (BHN): 12 HB

Electrical conductivity: 6,7Sm/mm²

Specific gravity (metal): 8,9 g/cm³

Characteristics / Applications:

Tubular installations, electrical industry, thin sheet metal packages and tinning work. Soft solder with long melting interval and good gap-bridging properties. Good wetting properties on copper and copper alloys.

Heat sources:

Acetylene torch (fuel gas excess), air-gas torch, soldering lamp, soldering iron and dip bath.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN A 633

Zinc-bearing aluminium soft solder



DIN EN ISO 3677:

S-Zn97 Al3

Flux:

F 600 Zn

Highly active special flux for the soldering of aluminium. For a quality ensured soldering process, only a small amount is needed.

Flux working temperature: 400-500°C.

Composition, typical analysis (% w/w):

Zn	Al
97,0	3,0

Mechanical and physical properties:

Melting range: 430-450°C

Specific gravity (metal): 7,1g/cm³

Characteristics / Applications:

Soft solder for joints on aluminium and aluminium alloys. Suitable for aluminium/copper-joints in the heating and cooling industry. Aluminium solder with low melting point.

Removal of brazing flux residues:

Brazing flux residues can be removed by brushing in hot water.

Heat sources:

Induction, flame

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN A 644

Copper-bearing, lead-free soft solder alloy



EN ISO 9453:

DIN EN 29545.1 (Flux)

Alloy-no. 402 / S-Sn97 Cu3

F 600:

3.1.1.A (corrosive fluid, for low alloyed and alloyed steel and heavy metals)

F 600 CW:

3.1.1.C (paste-like, soldering flux, activated, limited corrosive)

Composition, typical analysis (% w/w):

Cu	Sn
3,0	Remainder

Mechanical and physical properties:

Melting range: 230-250°C

Tensile strength (solder): 44 N/mm²

On Ms 58: 53 N/mm²

Shear strength on Cu: 30 N/mm²

On Ms: 20 N/mm²

On St: 25 N/mm²

Hardness (BHN): 15 HB

Electrical conductivity: 8,5 g/cm³

Specific gravity (metal): 7,3g/cm³

Characteristics / Applications:

Fittings solder for copper pipe installations and plumbing works. Work on metal goods. Suited for use in the foodstuffs industry. In terms of DVGW sheet GW 2 this solder is suited for copper pipe installations. Lead- and cadmium-free soft solder. The copper content ensures that the tin does not alloy with the copper of the soldering rod.

Heat sources:

Acetylene torch (fuel gas excess), air-gas torch, soldering lamp, soldering iron, induction, resistance heating, dip bath.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN A 665

Zinc-bearing aluminium soft solder



DIN EN ISO 3677:

S-Zn22 Al 420/480

Flux:

F 600 Zn

Highly active special flux for the soldering of aluminium. For a quality ensured soldering process, only a small amount is needed.

Flux working temperature: 400-500°C

Composition, typical analysis (% w/w):

Zn	Al
75,0	25,0

Mechanical and physical properties:

Melting range: 420-480°C

Specific gravity: 5,4 g/cm³

Characteristics / Applications:

Soft solder for joints on aluminium and aluminium alloys. Suitable for aluminium/copper-joints in the heating and cooling industry. Aluminium solder with low melting point.

Removal of brazing flux residues:

Brazing flux residues can be removed by brushing in hot water.

Heat sources:

Induction, flame

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

09/08/DE/0

FONTARGEN AP 604/12

Tinning soldering paste, pure tin

DIN EN 29453 (*): S-Sn99,9 (* leaning on)

Composition, typical analysis (% w/w):

Sn
99,9

Mechanical and physical properties:

Working temperature: 235°C
Melting point: 232°C
Specific gravity: 7,3 g/cm³ (Metal content)

Characteristics / Applications:

AP604/12 contains pure tin powder (lead free) mixed with a highly activating and corrosive flux. The coated surfaces remain brilliant and have a good corrosion resistance. Used for tin coating and soldering of copper, brass, steel, stainless steel.

Flux residues can be removed with hot water.

Heat sources:

Oxyacetylene torch (excess of fuel gas), air-gas torch, soldering iron, soldering lamp

Flux:

3.1.1 acc. DIN EN 29454.1

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

07/08/GI/O

FONTARGEN AP 638/26

Flux containing tin-copper solder paste

FONTARGEN

DIN EN 29453:

S-Sn99 Cu1 / Alloy-no. 23

Composition, typical analysis (% w/w):

Cu	Sn
0,85	Remainder

Mechanical and physical properties:

Melting range: 230 – 240°C

Specific weight: 7,3 g/cm³ (metal content)

Metal content: approx. 87%

Characteristics / Applications:

AP 638/26 is a solder with a high metal content, packed in a non corrosive flux rosin (colophony) binder system. This solder paste is used for soldering of Cu/Cu assemblies, in the cold and hot water industry segment and preferably on solar absorbers.

Heat sources:

Induction, solder iron, oven

Flux:

1.1.2 acc. DIN EN 29454.1 (colophony)

Storage:

Keep sealed, under stable temperatures in dry rooms. Temperature 20°C. Stir well before use.

Shelf life:

Approx. 4 Mo.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

09/08/GI/0

FONTARGEN AP 638/26 N

Flux containing tin-copper solder paste

FONTARGEN

DIN EN 29453:

S-Sn99 Cu1 / Alloy-no. 23

Composition, typical analysis (% w/w):

Cu	Sn
0,85	Remainder

Mechanical and physical properties:

Melting range:	230 – 240°C
Specific weight:	7,3 g/cm ³ (metal content)
Metal content:	approx. 90%

Characteristics / Applications:

AP 638/26 N is a solder with a high metal content, packed in a non corrosive flux rosin (colophony) binder system. This solder paste is used for soldering of Cu/Cu assemblies in the cold and hot water industry segment and preferably on solar absorbers.

Heat sources:

Induction, solder iron, oven

Flux:

1.1.2 acc. DIN EN 29454.1 (colophony)

Storage:

Keep sealed, under stable temperatures in dry rooms. Temperature 20°C. Stir well before use.

Shelf life:

Approx. 4 Mo.

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

09/08/GI/0

FONTARGEN AP 644/12

Lead free highly activating tin copper solder paste **FONTARGEN**

DIN EN 29453:

S-Sn97 Cu3 / Alloy-no. 24

Composition, typical analysis (% w/w):

Cu	Sn
3,0	Rest

Mechanical and physical properties:

Working temperature:	300°C
Melting range:	230 – 250°C
Electrical conductivity:	8,5 Sm/mm ²
Specific weight:	7,3 g/cm ³ (metal content)

Characteristics / Applications:

The lead and cadmium free solder paste AP 644/12 contains a highly activating and corrosive flux. The flux residues are corrosive and must be removed. Used for tin coating and soldering of metal products. The paste is suitable for products used in the food industry. The paste must be well stirred before using.

Flux residues can be removed with hot water.

Heat sources:

Oxyacetylene torch (excess of fuel gas), Gas-air torch, soldering iron, soldering lamp

Flux:

3.1.1 acc. DIN EN 29454.1

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

09/08/GI/0

FONTARGEN AP 644/21

Lead free tin copper solder paste/DVGW conform **FONTARGEN**

DIN EN 29453:

S-Sn97 Cu3 / Alloy-no. 24

Composition, typical analysis (% w/w):

Cu	Sn
3,0	Remainder

Mechanical and physical properties:

Working temperature:	300°C
Melting range:	230 – 250°C
Electrical conductivity:	8,5 Sm/mm ²
Specific weight:	7,3 g/cm ³ (metal content)

Characteristics / Applications:

For soldering with copper tube installations for hot and cold water supplies, including drinking water. The paste is suitable for applications in the food industry, sanitary (plumbing works – hot water up to 110°C) and miscellaneous metal products. This soldering paste is conform to DVGW-GW2 and GW7. If used in copper tube installations, additional solid wire of solder A 644 S-Sn97 Cu 3 needs to be added to guarantee maximum penetration.

Removal of flux residues: Wash with warm water.

Heat sources:

Oxyacetylene torch (excess of fuel gas), air-gas torch, soldering iron, soldering lamp

Flux:

3.1.1 acc. DIN EN 29454.1

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20°C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

09/08/GI/0

FONTARGEN AP 653/12

Lead free highly activating solder paste

FONTARGEN

DIN EN 29453:

S-Sn96 Ag4 / Alloy-no. 28

Composition, typical analysis (% w/w):

Ag	Sn
3,5	Remainder

Mechanical and physical properties:

Working temperature: 221 °C

Electrical conductivity: 8,1 Sm/mm²Specific weight: 7,3 g/cm³ (metal content)**Characteristics / Applications:**

AP 653/12 contains a highly activating and corrosive flux. The alloy remains brilliant. The flux residues are corrosive and must be removed. Tin coating and soldering of copper, brass, steel, stainless steel, food industry, air conditioning. The paste must be well stirred before using.

Flux residues can be removed with hot water.

Heat sources:

Oxyacetylene torch (excess of fuel gas), air-gas torch, soldering iron, soldering lamp

Flux:

3.1.1 acc. DIN EN 29454.1

Storage:

Keep sealed, under stable temperatures in dry rooms. Optimum temperature range is between 5 and 20 °C. Stir well before use.

Shelf life:

6 Mo. in pots; 3 Mo. in cartridges >175 ccm; 6 Weeks in cartridges <175 ccm

Availability: On request

Pots	Cartridges
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

09/08/GI/0

FONTARGEN A 200 L

Copper brazing alloy



DIN EN 1044:	CU 104
DIN 8513:	L-SF Cu
EN ISO 3677:	B-Cu 100 (P) - 1085
AWS A 5.8:	B Cu 1 f/BV Cu 1 x
Material-no.:	2.0091

Composition, typical analysis (% w/w):

Cu	P
> 99,9 (oxygen-free)	< 0,025

Mechanical and physical properties:

Working temperature:	1100°C
Melting range:	1083°C (Eutectic)
Specific gravity:	8,9 g/cm ³
Tensile strength on S235:	340 N/mm
Electrical conductivity:	56 - 58 S m/mm ²

Characteristics / Applications:

Alloy suitable for gap brazing subjected to tough conditions. High-temperature brazing of alloyed and unalloyed steel.

Heat sources:

Inert-gas and vacuum furnace, induction

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

06/08/Re/0

FONTARGEN A 200 L 58

Copper brazing alloy



DIN EN 1044:	CU 101
DIN 8513:	L-Cu
EN ISO 3677:	B-Cu 100 - 1085
DIN EN 17933-52:	Cu - ETP
Material-no.:	2.0065 / 2.0060

Composition, typical analysis (% w/w):

Cu	P
> 99,9 (oxygenic)	< 0,025

Mechanical and physical properties:

Working temperature:	1100°C
Melting range:	1083°C (Eutectic)
Specific gravity:	8,9 g/cm ³
Tensile strength on S235:	340 N/mm
Electrical conductivity:	56 - 58 S m/mm ²

Characteristics / Applications:

Alloy suitable for gap brazing subjected to tough conditions. High-temperature brazing of alloyed and unalloyed steel.

Heat sources:

Inert-gas furnace, induction

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

05/08/Re/0

FONTARGEN A 200/2 L

Copper-based high-temperature brazing alloy

FONTARGEN

DIN EN 1044:

CU 105

EN ISO 3677:

B-Cu 97 Ni (B) – 1085/1100

Composition, typical analysis (% w/w):

Cu	Ni
98	2

Mechanical and physical properties:

Working temperature:

1110°C

Melting range:

1085 – 1100°C

Specific gravity:

8,9 g/cm³

Characteristics / Applications:

High-temperature brazing alloy for brazing of alloyed and unalloyed steel as well as hard metals, wolfram, molybdenum and tantalum. The addition of nickel leads to a higher tensile strength compared to pure copper and better wetting properties on hard metal / steel joints. This alloy is mainly used on drill bits and bore-crowns.

Heat sources:

Inert-gas and vacuum furnace, induction

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

05/08/Re/0

FONTARGEN A 202 L

Copper-based high-temperature brazing alloy

FONTARGEN

EN ISO 3677: B-Cu 94 Si – 965/1032

Material-no.: 2.1461

Composition, typical analysis (% w/w):

Cu	Si	Mn	Fe	Zn
95,5	2,8	1	0,3	0,2

Mechanical and physical properties:

Working temperature: 1100°C

Melting range: 965 - 1032°C

Specific gravity: 8,5 g/cm³

Heat conductivity: 35 W/m K

Characteristics / Applications:

High-temperature brazing alloy for copper and steel. Particularly well suited for brazing of metallic sintered material with a residual porosity < 15%.

Heat sources:

Inert-gas furnace, induction

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

05/08/Re/0

FONTARGEN A 203/6 L

Copper-based high-temperature brazing alloy

FONTARGEN

DIN EN 1044:	CU 201
DIN 8513:	L-Cu Sn 6
Material-no.:	2.1021
EN ISO 3677:	B-Cu 94 Sn (P) – 910/1040

Composition, typical analysis (% w/w):

Cu	Sn	P
93,55	6,25	0,2

Mechanical and physical properties:

Working temperature:	1040°C
Melting range:	910 – 1040°C
Specific gravity:	8,9 g/cm ³
Tensile strength:	334 – 363 N/mm ²
Elongation:	> 30 %
Electrical conductivity:	9 S m/mm ²
Heat conductivity:	35 W/m K
Hardness:	> 80 HB
Thermal elongation:	18.10 ⁻⁶ °C

Characteristics / Applications:

High-temperature brazing alloy for copper, iron and nickel.

Heat sources:

Inert-gas furnace, induction

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

05/08/Re/0

FONTARGEN A 203/12 L

Copper-based high-temperature brazing alloy

FONTARGEN

DIN EN 1044:	CU 202
DIN 8513:	L-Cu Sn 12
EN ISO 3677:	B-Cu 88 Sn (P) – 825/990
Material-no.:	2.1055

Composition, typical analysis (% w/w):

Cu	Sn	P
87,8	12	0,2

Mechanical and physical properties:

Working temperature:	1000°C
Melting range:	825 – 990°C
Specific gravity:	8,9 g/cm ³
Tensile strength:	392 – 441 N/mm ²
Elongation:	25 – 28 %
Electrical conductivity:	6 S m/mm ²
Heat conductivity:	61 W/m K
Hardness:	95 – 105 HB

Characteristics / Applications:

High-temperature brazing alloy for brazing of copper, iron and nickel.

Heat sources:

Inert-gas furnace, induction

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

05/08/Re/0

FONTARGEN A 205

Copper-based high-temperature brazing alloy



EN ISO 3677:

B-Cu 86 Mn Ni – 970/990

Material-no.:

2.1362

Composition, typical analysis (% w/w):

Cu	Mn	Ni
86	12	2

Mechanical and physical properties:

Working temperature: 990°C

Melting range: 970 – 990°C

Specific gravity: 8,4 g/cm³

Tensile strength: 390 N/mm²

Characteristics / Applications:

Manganese bearing copper based alloy for capillary brazing of alloyed and unalloyed steel. Well suited for hard metal / steel joints.

Heat sources:

Inert-gas furnace, induction, resistance-heating

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

05/08/Re/0

FONTARGEN A 842

High temperature gold base brazing alloy

FONTARGEN

EN ISO 3677:	B-Au 82 Ni – 950
AWS A 5.8:	B Au – 4
AMS:	4787 A
Pratt & Whitney:	698

Composition, typical analysis (% w/w):

Au	Ni
82	18

Mechanical and physical properties:

Working temperature:	1000 °C
Melting range:	950 °C (Eutectic)
Specific gravity:	9,8 g/cm ³
Shear strength:	441 N/mm
Gap width:	0,04 – 0,08 mm
Oxidation resistance:	815 °C

Characteristics / Applications:

The main application area of this alloy is the beam engine construction. It is used for joints of alloyed steel and nickel alloys where high strength, as well as high temperature corrosion resistance is demanded. Suitable for the following materials: Fe/Cr, Mo/W, Ni, Ni/Cu, Ni/Fe, Fe/Co, steel, kovar and vacon.

Heat sources:

Inert gas furnace:	Oxygen (dew point: -51 °C) Argon (dew point: -63 °C)
Vacuum furnace:	Vacuum 0,15 Pa (1x 10 ⁻³ Torr)

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

07/08/SR/0

FONTARGEN AP 20 AL DB

Copper high-temperature brazing paste



DIN EN 1044:	CU 101
DIN 8513:	L-Cu
EN ISO 3677:	B-Cu100 – 1085

Composition, typical analysis (% w/w):

Cu
99,9

Mechanical and physical properties:

Working temperature:	1100 - 1150°C
Melting range:	1083°C
Gap width:	≤ 0,15 mm
Viscosity range:	190.000 – 220.000 mPas
Metal content:	≈ 90,0 %

Characteristics / Applications:

Flux-free copper brazing paste with high metal content. The brazing paste has a high viscosity and dries slowly on air. Suited for workpieces made of unalloyed, high-alloyed as well as low-carbon steel.

Application

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Inert-gas continuous furnace Cracked ammonia atmosphere
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 AL

Copper high-temperature brazing alloy



DIN EN 1044:	CU 101
DIN 8513:	L-Cu
EN ISO 3677:	B-Cu100 – 1085

Composition, typical analysis (% w/w):

Cu
99,9

Mechanical and physical properties:

Working temperature:	1100 - 1150°C
Melting range:	1083°C
Gap width:	≤ 0,15 mm
Viscosity range:	120.000 - 145.000 mPas
Metal content:	≈ 89,0 % w/w
Tensile strength:	316 N/mm ² (Assembly gap 0,05mm)
(Steel St 37-2 / Tensile test according to DIN50145)	272 N/mm ² (Assembly gap 0,15mm)

Characteristics / Applications:

Flux-free copper brazing paste with high metal content. The paste has a medium viscosity and dries very slowly on air. Suited for unalloyed, low-alloyed and high-alloyed steel as well as nickel and nickel alloys. Easy to dispense and good adherence on the workpiece. Suitable for thin and thick workpieces.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Inert-gas continuous furnace Cracked ammonia atmosphere
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 AL C

Copper high-temperature brazing alloy



DIN EN 1044:	CU 101
DIN 8513:	L-Cu
EN ISO 3677:	B-Cu100-1085

Composition, typical analysis (% w/w):

Cu
99,9

Mechanical and physical properties:

Working temperature:	1100 - 1150°C
Melting range:	1083°C
Gap width:	≤ 0,15 mm
Viscosity range:	145.000 - 165.000 mPas
Metal content:	≈ 89,0 % w/w

Characteristics / Applications:

Flux-free copper brazing paste with high metal content. The paste has a medium viscosity and dries slowly on air. Suitable for workpieces made of unalloyed, low-alloyed and high-alloyed steel. Easy to dispense and good adherence on the workpiece.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace Cracked ammonia atmosphere	Inert-gas continuous furnace H ₂ /N ₂
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

09/08/He/2

FONTARGEN AP 21 CL

Copper high-temperature brazing alloy



DIN EN 1044:	CU 104
DIN 8513:	L-SF Cu
EN ISO 3677:	B-Cu100(P) - 1085

Composition, typical analysis (% w/w):

Cu
99,9

Mechanical and physical properties:

Working temperature:	1100 – 1150°C
Melting range:	1083°C
Gap width:	≤ 0,1 mm
Viscosity range:	150.000 – 165.000 mPas
Metal content:	≈ 87 % w/w
Tensile strength:	371 N/mm ² (Assembly gap)
(Steel St 37-2 / Tensile test according to DIN50145)	356 N/mm ² (Assembly gap)

Characteristics / Applications:

Flux-free copper brazing paste with high metal content. The paste has a high viscosity and dries slowly on air. Suitable for workpieces made of unalloyed, low-alloyed and high-alloyed steel.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂ Cracked ammonia atmosphere	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 CLP

Copper high-temperature brazing paste



DIN EN 1044:	CU 104
DIN 8513:	L-SF Cu
EN ISO 3677:	B-Cu100(P) - 1085

Composition, typical analysis (% w/w):

Cu
99,9

Mechanical and physical properties:

Working temperature:	1100 – 1150°C
Melting range:	1083°C
Gap width:	≤ 0,15 mm
Viscosity range:	140.000 – 165.000 mPas
Metal content:	≈ 87 % w/w
Tensile strength:	371 N/mm ² (Assembly gap 0,05mm)
(Steel St 37-2 / Tensile test according to DIN50145)	356 N/mm ² (Assembly gap 0,15mm)

Characteristics / Applications:

Flux-free copper brazing paste with high metal content. The paste has a high viscosity and dries slowly on air. Suitable for workpieces made of unalloyed, alloyed and high-alloyed steel.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Inert-gas continuous furnace Cracked ammonia atmosphere
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 CL-5

Copper high-temperature brazing alloy



DIN EN 1044:	CU 104
DIN 8513:	L-SF Cu
EN ISO 3677:	B-Cu100(P) – 1085

Composition, typical analysis (% w/w):

Cu
99,9

Mechanical and physical properties:

Working temperature:	1100 – 1150°C
Melting range:	1083°C
Gap width:	≤ 0,1mm
Viscosity range:	150.000 – 165.000mPas
Metal content:	≈ 85 % w/w

Characteristics / Applications:

Flux-free brazing paste with high metal content. The paste has a high viscosity and dries slowly on air. Suitable for workpieces made of unalloyed and alloyed steel.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Inert-gas continuous furnace Cracked ammonia atmosphere
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 DL / DS

Copper- nickel- high-temperature brazing paste

FONTARGEN

DIN EN 1044:

CU 105

EN ISO 3677:

B-Cu 97 Ni (B) – 1085/1100

Composition, typical analysis (% w/w):

Cu	Ni	B
97,0	2,5	0,02 – 0,05

Mechanical and physical properties:

Working temperature:

1120°C

Melting range:

1085 – 1100°C

Gap width:

0,05 – 0,2 mm

Viscosity range:

105.000 – 120.000 mPas

Metal content:

≈ 88 % w/w

Tensile strength:

301 N/mm² (Assembly gap 0,05mm)

(Steel St 37-2 / Tensile test according to DIN50145) 408 N/mm² (Assembly gap 0,15mm)

Characteristics / Applications:

Flux-free copper- nickel- brazing paste with high metal content. The paste has a high viscosity and dries slowly on air. The alloy is particularly well suited for bridging wide gaps (max. 0,2mm). Suitable for workpieces made of alloyed and unalloyed steel, wolfram, molybdenum, tantalum and hard metals (e.g. drill bits exposed to high mechanical stress). The contained nickel facilitates the wetting on hard metals.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂ Cracked ammonia atmosphere	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Producttypes:

AP 21 DL	AP 21 DS
Slow drying paste	Quick drying paste

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 ESB2*

Copper- manganese- nickel brazing paste



EN ISO 3677:

B-Cu87MnNi980-1030

Composition, typical analysis (% w/w):

Cu	Ni	Mn
87,0	3,0	10,0

Mechanical and physical properties:

Working temperature:	1120°
Melting range:	980 – 1030°C
Gap width:	0,05 – 0,2 mm
Viscosity range:	105.000- 115.000 mPas
Metal content:	≈ 88 % w/w
Tensile strength:	456 N/mm ² (Assembly gap 0,05mm)
(Steel St 37-2 / Tensile test according to DIN50145)	323 N/mm ² (Assembly gap 0,15mm)

Characteristics / Applications:

Flux-free copper- manganese- nickel- brazing paste with high metal content. This paste has a medium viscosity and dries slowly on air. Suitable for workpieces made of steel, hard metal, wolfram, molybdenum and tantalum. The paste has good wetting, flowing and gap bridging properties

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 GL / GS

Copper- tin- high-temperature brazing paste



Composition, typical analysis (% w/w):

Cu	Sn
96,0	4,0

Mechanical and physical properties:

Working temperature:	1060 - 1100°C
Melting range:	960 - 1060°C
Gap width:	0,05 - 0,2 mm
Viscosity range:	90.000 - 110.000 mPas (GL) 45.000 - 55.000 mPas (GS)
Metal content:	≈ 87 % w/w

Characteristics / Applications:

Flux-free copper- tin- brazing paste with high metal content. The paste is easy to dispense and available in two different drying rates. Suitable for brazing of low-alloyed, medium-alloyed and high-alloyed steel. Good wetting and flowing properties.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Vacuum furnace (Watch vapour pressure curve!)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Producttypes:

AP 21 GL	AP 21 GS
Slow drying paste	Quick drying paste

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 HL / HS

Copper- tin- high-temperature brazing paste



DIN EN 1044:	CU 201
DIN 8513:	L-Cu Sn6
EN ISO 3677:	B-Cu 94Sn(P)-910/1040

Composition, typical analysis (% w/w):

Cu	Sn
94,0	6,0

Mechanical and physical properties:

Working temperature:	1040°C
Melting range:	910 – 1040°C
Gap width:	0,1 – 0,2 mm
Viscosity range:	90.000 – 120.000 mPas
Metal content:	≈ 88 % w/w
Tensile strength:	417 N/mm ² (Assembly gap 0,05mm)
(Steel St 37-2 / Tensile test according to DIN50145)	326 N/mm ² (Assembly gap 0,15mm)

Characteristics / Applications:

Flux-free copper- tin- brazing paste with high metal content. The paste is easy to dispense and available in two different drying rates. The brazing temperature range is a little lower compared to AP 21 GL (L-Cu Sn4). Suitable for brazing of unalloyed and alloyed steel.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Producttypes:

AP 21 HL	AP 21 HS
Slow drying paste	Quick drying paste

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 21 KL

Copper- tin- brazing paste



DIN EN 1044:	CU 202
DIN 8513:	L-CuSn 12
EN ISO 3677:	B-Cu88Sn(P) – 825/990

Composition, typical analysis (% w/w):

Cu	Sn	P
88,0	12,0	0,01 – 0,4

Mechanical and physical properties:

Working temperature:	990°C
Melting range:	825 - 990°C
Gap width:	≤ 0,15 mm
Viscosity range:	100.000 – 110.000 mPas
Metal content:	88,0 %
Tensile strength:	276 N/mm ² (Assembly gap 0,05mm)
(Steel St 37-2 / Tensile test according to DIN50145)	238 N/mm ² (Assembly gap 0,15mm)

Characteristics / Applications:

Flux-free copper- tin- brazing paste with high metal content. The paste has a high viscosity and dries slowly on air. Due to the low melting range the paste is particularly well suited for brazing of unalloyed and alloyed steel, copper and copper-plated workpieces as well as copper- nickel- alloys. Interesting for workpieces that have to be processed at low temperatures.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN AP 22 GS

Copper- tin- brazing paste



EN ISO 3677:

B-Cu96- 960/900

Composition, typical analysis (% w/w):

Cu	Sn
96,0	4,0

Mechanical and physical properties:

Working temperature:	1060- 1100°C
Melting range:	960- 1060°C
Gap width:	0,05 - 0,2 mm
Viscosity range:	45.000- 55.000 mPas
Metal content:	84,0 %

Characteristics / Applications:

Flux-free copper- tin- brazing paste with high metal content. The paste has a low viscosity, is easy to dispense and dries quickly on air. Good wetting and flowing properties.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input type="checkbox"/>

8/08/He/0

FONTARGEN AP 22 LL

Copper- tin- brazing paste



Composition, typical analysis (% w/w):

Cu	Sn
80,0	20,0

Mechanical and physical properties:

Working temperature:	930 – 980°C
Melting range:	800 – 890°C
Gap width:	0,05 - 0,2 mm
Viscosity range:	100.000 – 110.000 mPas
Metal content:	≈ 82,0 % w/w
Tensile strength:	205 N/mm ² (Assembly gap 0,05mm)
(Steel St 37-2 / Tensile test according to DIN50145)	127 N/mm ² (Assembly gap 0,15mm)

Characteristics / Applications:

Flux-free copper- tin- brazing paste with medium metal content. The paste has a medium viscosity and dries slowly on air. Due to the low melting range this paste is suited for brazing of unalloyed and alloyed steel, copper and copper-plated workpieces as well as copper- nickel- alloys. This paste is only suited for parts, which are exposed to low mechanical stress only.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas	Inert-gas continuous furnace H ₂ /N ₂	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Availability:

Paste	Powder
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 1

Nickel-based high-temperature brazing paste

FONTARGEN

DIN EN 1044:	NI 101
DIN 8513:	L-Ni1
EN ISO 3677:	B-Ni74CrFeSiB(C)-980/1060
AWS:	B Ni-1
AMS:	4775 G
Boing:	BTS 1025-4

Composition, typical analysis (% w/w):

Cr	Si	B	Fe	C	P	Ni
14,0	4,5	3,2	4,5	0,75	<0,02	Remainder

Mechanical and physical properties:

Working temperature:	1066 - 1204°C
Melting range:	980 - 1060°C
Gap width:	0,05 - 0,15 mm
Viscosity range:	55.000 - 65.000 mPas
Metal content:	≈ 90 % w/w
Oxidationresistant up to:	1200°C
Shear strength:	383 N/mm ² (1.4006)
(at room temperature)	334 N/mm ² (1.4301)

Characteristics / Applications:

This brazing alloy achieves good stability, is heat- and oxidationresistant and offers good diffusibility. Suitable for joints which are exposed to high thermal and dynamic stress, e.g. turbine blades as well as assemblies in the hot area of steel engines. Steel, nickel, cobalt and special materials. Suitable for workpieces with thicker cross sections.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 1 AP	Powder HTL 1
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 1A

Nickel-based high-temperature brazing paste

FONTARGEN

DIN EN 1044:	NI 1A1
DIN 8513:	L-Ni1a
EN ISO 3677:	B-Ni74CrFeSiB-980/1070
AWS:	B Ni-1A
AMS:	4776 F
Boing:	BTS 1025-5

Composition, typical analysis (% w/w):

Cr	Si	B	Fe	C	P	Ni
14,0	4,5	3,2	4,5	<0,06	<0,02	Remainder

Mechanical and physical properties:

Working temperature:	1077 - 1204°C
Melting range:	980 - 1070°C
Gap width:	0,05 - 0,1 mm
Viscosity range:	55.000 - 65.000 mPas
Metal content:	≈ 90 % w/w
Oxidationresistant up to:	1200°C
Shear strength [N/mm ²]:	383 (1.4006)
(at room temperature)	334 (1.4301)

Characteristics / Applications:

HTL1A is an alloy composition identical to HTL 1, however, with a max. C-content of 0,06%. This brazing alloy is utilised for parts which are used in the high-temperature range as well as in the cooling technology. This brazing alloy shows good gap bridging properties. Suitable for slowly heated assemblies made of steel, nickel, cobalt and special metals. This brazing alloy achieves good stability, is heat- and oxidationresistant and offers good diffusibility. Better flowing properties compared to HTL 1.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 1A AP	Powder HTL 1A
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 2

Nickel-based high-temperature brazing paste



DIN EN 1044:	NI 102
DIN 8513:	L-Ni2
EN ISO 3677:	B-Ni82CrSiBFE-970/1000
AWS:	B Ni-2
AMS:	4777
Rolls Royce:	9500/97

Composition, typical analysis (% w/w):

Cr	Si	B	Fe	C	P	Ni
7,0	4,5	3,1	3,0	< 0,06	< 0,02	Remainder

Mechanical and physical properties:

Working temperature:	1010 - 1170°C, recomm. brazing temp. 1080°C
Melting range:	970 - 1000°C
Gap width:	0,02 - 0,20 mm
Viscosity range:	55.000 - 65.000 mPas
Metal content:	≈ 90 % w/w
Oxidation resistant up to:	982°C
Shear strength:	383 N/mm ² (1.4006)
(at room temperature)	255 N/mm ² (1.4301)

Characteristics / Applications:

This brazing alloy has good flowing properties and offers good diffusibility and is easy to dispense. Suitable for joints which are exposed to high thermal and dynamic stress. The brazing alloy allows optimal processing on e.g. turbine blades as well as on assemblies for the hot area in steel engines. Iron-, nickel-, cobalt and special materials.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 2 AP	Powder HTL 2
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 2 AP (L)

Nickel-based high-temperature brazing paste

FONTARGEN

DIN EN 1044:	NI 102
DIN 8513:	L-Ni2
EN ISO 3677:	B-Ni82CrSiBFE-970/1000
AWS:	B Ni-2
AMS:	4777
Rolls Royce:	9500/97

Composition, typical analysis (% w/w):

Cr	Si	B	Fe	C	P	Ni
7,0	4,5	3,1	3,0	< 0,06	< 0,02	Remainder

Mechanical and physical properties:

Working temperature:	1010 - 1170°C, recomm. brazing temp. 1080°C
Melting range:	970 - 1000°C
Gap width:	0,02 - 0,15 mm
Viscosity range:	100.000 - 115.000 mPas
Metal content:	≈ 90 % w/w
Oxidation resistant up to:	982°C
Shear strength:	383 N/mm ² (1.4006)
(at room temperature)	255 N/mm ² (1.4301)

Characteristics / Applications:

This brazing alloy has good flowing properties and offers good diffusibility. It is easy to dispense and dries slowly on air. Suitable for joints which are exposed to high thermal and dynamic stress. The brazing alloy allows optimal processing on e.g. turbine blades, as well as on assemblies for the hot area in steel engines. Iron-, nickel-, cobalt and special materials.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 2 AP (L)	Powder
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/He/0

FONTARGEN HTL 2 AP B

Nickel-based high-temperature brazing paste

FONTARGEN

DIN EN 1044:	NI 102
DIN 8513:	L-Ni2
EN ISO 3677:	B-Ni82CrSiBFE-970/1000
AWS:	B Ni-2
AMS:	4777
Rolls Royce:	9500/97

Composition, typical analysis (% w/w):

Cr	Si	B	Fe	C	P	Ni
7,0	4,5	3,1	3,0	< 0,06	< 0,02	Remainder

Mechanical and physical properties:

Working temperature:	1010 - 1177°C, recomm. brazing temp. 1040°C
Melting range:	970 - 1000°C
Gap width:	0,02 - 0,20 mm
Viscosity range:	90.000 - 115.000 mPas
Metal content:	≈ 90 % w/w
Oxidation resistant up to:	982°C
Shear strength:	383 N/mm ² (1.4006)
(at room temperature)	255 N/mm ² (1.4301)

Characteristics / Applications:

This brazing alloy has good flowing properties and offers good diffusibility and is easy to dispense. Suitable for joints which are exposed to high thermal and dynamic stress. The brazing alloy allows optimal processing on e.g. turbine blades as well as on assemblies for the hot area in steel engines. Iron-, nickel-, cobalt and special materials.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Induction with inert-gas
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 2 AP B	Powder
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/He/0

FONTARGEN HTL 3

Nickel-based high-temperature brazing paste



DIN EN 1044:	NI 103
DIN 8513:	L-Ni3
EN ISO 3677:	B-Ni92SiB-980/1040
AWS:	B Ni-3
AMS:	4778 D

Composition, typical analysis (% w/w):

Si	B	Fe	C	P	Ni
4,5	3,1	< 0,5	< 0,06	< 0,02	Remainder

Mechanical and physical properties:

Working temperature:	1010 - 1177°C, recomb. brazing temp. 1040°C
Melting range:	980 - 1040°C
Gap width:	0,01 - 0,20 mm
Viscosity range:	95.000 - 110.000 mPas
Metal content:	≈ 90 % w/w
Oxidation resistant up to:	982°C
Shear strength:	393 N/mm ² (1.4006)
(at room temperature)	234 N/mm ² (1.4301)

Characteristics / Applications:

HTL 3 is a heat-resistant brazing alloy whose optimal brazing temperature is than HTL 1 and HTL 2. It is very well suited for joints exposed to high stress. It is easy to dispense. The brazing alloy offers good wetting properties even with small brazing gaps. Suitable for brazing of iron-, nickel-, cobalt- and special materials.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 3 AP	Powder HTL 3
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 5

Nickel-based high-temperature brazing paste

FONTARGEN

DIN EN 1044:	NI 105
DIN 8513:	L-Ni5
EN ISO 3677:	B-Ni71CrSi-1080/1135
AWS:	B Ni-5
AMS:	4782 B

Composition, typical analysis (% w/w):

Cr	B	Si	C	P	Ni
19,0	< 0,03	10,1	< 0,06	< 0,02	Remainder

Mechanical and physical properties:

Working temperature:	1149 - 1204°C, <i>recomm. brazing temp.</i> 1190°C
Melting range:	1080 - 1135°C
Gap width:	0,02 - 0,10 mm
Viscosity range:	55.000 - 65.000 mPas
Metal content:	≈ 90 % w/w
Shear strength:	676 N/mm ² (1.4006)
(at room temperature)	

Characteristics / Applications:

HTL 5 is a well suited brazing alloy for joints exposed to high stress. It has a good oxidation resistance. The absence of boron allows its use in the nuclear power area. Suited for joints made of iron-, nickel-, cobalt and special materials.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 5 AP	Powder HTL 5
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/Ht5/0

FONTARGEN HTL 5 M

Nickel-based high-temperature brazing paste



Composition, typical analysis (% w/w):

Cr	Si	P	Ni
18,0	8,0	2,0	Remainder

Mechanical and physical properties:

Working temperature:	1050 - 1070°C, recomb. brazing temp. 1060°C
Melting range:	971- 1051°C
Gap width:	0,02 - 0,10 mm
Viscosity range:	55.000 - 65.000 mPas
Metal content:	≈ 89 % w/w

Characteristics / Applications:

HTL 5 is a brazing alloy suited for corrosionresistant joints.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 5 M AP	Powder HTL 5 M
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 6

Nickel-based high-temperature brazing paste

FONTARGEN

DIN EN 1044:	NI 106
DIN 8513:	L-Ni6
EN ISO 3677:	B-Ni89P-875
AWS:	B Ni-6

Composition, typical analysis (% w/w):

P	C	Ni
11,0	< 0,06	Remainder

Mechanical and physical properties:

Working temperature:	927 - 1093°C, recomm. brazing temp. 980°C
Melting range:	875°C
Gap width:	up to 0,05 mm
Viscosity range:	60.000 - 80.000 mPas
Metal content:	≈ 90 % w/w
Oxidationresistant up to:	760°C

Characteristics / Applications:

The brazing alloy HTL 6 has outstanding wetting properties. No erosion occurs while brazing on Fe- or Ni-based materials. The brazing alloy is applicable on currentless NiP-coated assemblies. Iron-, nickel-, cobalt- and special materials. Suited for workpieces which come in contact with food. Good flowing properties at low diffusibility.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Exogas / cracked NH ₃	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 6 AP	Powder HTL 6
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 6 AP B

Nickel-based high-temperature brazing paste

FONTARGEN

DIN EN 1044:	NI 106
DIN 8513:	L-Ni6
EN ISO 3677:	B-Ni89P-875
AWS:	B Ni-6

Composition, typical analysis (% w/w):

P	C	Ni
11,0	< 0,06	Remainder

Mechanical and physical properties:

Working temperature:	927 - 1093°C, recomm. brazing temp. 980°C
Melting range:	875°C
Gap width:	up to 0,05 mm
Viscosity range:	90.000 - 115.000 mPas
Metal content:	≈ 90 % w/w
Oxidationresistant up to:	760°C

Characteristics / Applications:

The brazing alloy HTL 6 offers outstanding wetting properties. No erosion occurs while brazing on Fe- or Ni-based materials. The brazing alloy is applicable on currentless NiP-coated assemblies. Iron-, nickel-, cobalt- and special materials. Suited for workpieces which come in contact with food. Good flowing properties at low diffusibility.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Induction
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 6 AP B	Powder
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/He/0

FONTARGEN HTL 7 AP Nr. 4

Nickel-based high-temperature brazing alloy



DIN EN 1044:	NI 107
DIN 8513:	L-Ni7
EN ISO 3677:	B-Ni76CrP-890
AWS:	B Ni-7

Composition, typical analysis (% w/w):

Cr	P	C	Fe	Si	B	Ni
14,0	10,1	< 0,06	< 0,20	< 0,10	< 0,01	Remainder

Mechanical and physical properties:

Working temperature:	927 - 1093°C, recomm. brazing temp. 980°C
Melting range:	890°C
Gap width:	up to 0,05 mm
Viscosity range:	90.000 - 110.000 mPas
Metal content:	≈ 89 % w/w
Oxidationresistant up to:	855°C

Characteristics / Applications:

The brazing alloy HTL 7 is used for thin-walled tubes, honeycomb-structures as well as assemblies for the nuclear technology. It is easy to dispense and dries slowly on air. It is very well suited for high-tensile, vacuum-sealed, high-temperature- and corrosionresistant joints. Suited for parts which come in contact with food. The ductility of the brazing joint can be enhanced by an extension of the exposure time. Iron-, nickel-, cobalt and special materials are applicable. Good flowing properties at low diffusibility.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace cracked NH ₃	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 7 AP Nr. 4	Powder
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/He/0

FONTARGEN HTL 8

Nickel-based high-temperature brazing paste

FONTARGEN

DIN EN 1044:	NI 108
DIN 8513:	L-Ni8
EN ISO 3677:	B-Ni66MnSiCu-980/ 1010
AWS:	B Ni-8

Composition, typical analysis (% w/w):

Mn	Cu	Si	C	P	Ni
23,0	4,5	7,0	< 0,06	< 0,02	Remainder

Mechanical and physical properties:

Working temperature:	1010- 1093°C, recomm. brazing temp. 1065°C
Melting range:	890- 1010°C
Gap width:	up to 0,05 mm
Oxidationresistant up to:	816°C

Characteristics / Applications:

The flux-free brazing alloy HTL 8 is used for brazing of heat exchangers, honeycomb-structures as well as temperable or stainless steel. The operation of this brazing alloy requires a very good furnace atmosphere. Iron-, nickel-, cobalt- and special materials are to be brazed with this alloy. Good flowing properties at low diffusibility.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Availability:

Paste HTL 8 AP	Powder HTL 8
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 9

Copper-based high-temperature brazing paste

FONTARGEN

AMS: 4764 E

Composition, typical analysis (% w/w):

Cu	Ni	Mn
52,5	9,5	Remainder

Mechanical and physical properties:

Working temperature: 1010 - 1093°C, recomb. brazing temp. 1065°C

Melting range: 879 - 927°C

Gap width: up to 0,02 - 0,08 mm

Oxidation resistant: 538°C

Characteristics / Applications:

The flux-free brazing alloy HTL 9 is used for joints on Cu-, Fe- and Ni-based alloys as well as on stainless Cr-Ni-steel. This brazing alloy is used especially in the aviation, nuclear technology and the chemical industry. It is easy to dispense and dries slowly on air.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Availability:

Paste HTL 9 AP	Powder HTL 9
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 9 AP (L)

Copper-based high-temperature brazing alloy



AMS: 4764 E

Composition, typical analysis (% w/w):

Cu	Ni	Mn
52,5	9,5	Remainder

Mechanical and physical properties:

Working temperature: 1010- 1093°C, recomm. brazing temp. 1065°C
 Melting range: 879- 927°C
 Gap width: up to 0,02- 0,08 mm
 Oxidationresistant up to: 538°C

Characteristics / Applications:

The flux-free brazing alloy HTL 9 is used for joints on Cu-, Fe- and Ni-based alloys as well as on stainless Cr-Ni-steel. This brazing alloy is used especially in the aviation, nuclear technology and the chemical industry. It is easy to dispense and dries slowly on air.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Availability:

Paste HTL 9 AP (L)	Powder
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/He/0

FONTARGEN HTL 10

Copper-based high-temperature brazing paste



EN ISO 3677:

B-Cu68MnNi-910/932

Composition, typical analysis (% w/w):

Cu	Ni	Mn
67,5	9,0	Remainder

Mechanical and physical properties:

Working temperature:	954 - 1093°C
Melting range:	910 - 932°C
Gap width:	up to 0,02 - 0,08 mm
Metal content:	≈ 90 % w/w
Oxidationresistant up to:	538°C

Characteristics / Applications:

The flux-free brazing alloy HTL 10 is used for joints on Cu-, Fe- and Ni-based alloys as well as on stainless Cr-Ni-steels. This brazing alloy is mostly used in aviation, nuclear technology and chemical industry.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 10 AP	Powder HTL 10
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 14

Gold-based high-temperature brazing paste

DIN EN 1044:	AU 105
EN ISO 3677:	B-Au82Ni-950
AWS:	B Au-4

Composition, typical analysis (% w/w):

Au	Ni
82	Remainder

Mechanical and physical properties:

Working temperature:	950°C
Melting range:	949 - 1004°C
Gap width:	up to 0,04 - 0,10 mm
Metal content:	≈ 90 % w/w
Oxidationresistant up to:	815°C

Characteristics / Applications:

The flux-free brazing alloy HTL 14 has a wide range of applications in the steel engine construction. This standard Au-Ni brazing alloy is universally used for brazing of alloyed steel and Ni-alloys where high stability and good high-temperature corrosion resistance is demanded.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 14 AP	Powder HTL 14
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL15

Silver-based high-temperature brazing paste



DIN EN 1044:

PD 101

EN ISO 3677:

B-Ag54PdCu-900/950

Composition, typical analysis (% w/w):

Ag	Pd	Cu
54,0	25,0	21,0

Mechanical and physical properties:

Working temperature: 982 - 1010°C

Melting range: 900 - 950°C

Gap width: up to 0,04 - 0,10 mm

Characteristics / Applications:

The flux-free brazing alloy HTL 15 is suited for joints on Cu-, Fe- and Ni-based alloys as well as on stainless Cr-Ni-steels. It is a ductile brazing alloy for the high-temperature range with a good resistance against chemical corrosion.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 15 AP	Powder HTL 15
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 17

Copper-based high-temperature brazing paste



EN ISO 3677:

B-Cu87MnNi- 980/1030

Composition, typical analysis (% w/w):

Cu	Ni	Mn
Remainder	3,0	10,0

Mechanical and physical properties:

Working temperature:	982 - 1010°C
Melting range:	980 - 1030°C
Gap width:	up to 0,05 - 0,25 mm
Viscosity range:	100.000 - 120.000 mPas
Metallanteil:	≈ 91 Gew.-%

Characteristics / Applications:

The flux-free brazing alloy HTL 17 is an easy to dispense brazing paste with high metal content. This brazing alloy is particularly well suited for joints made of hard to wet base materials e.g. hard metals and for joining of workpieces with big brazing gaps. The binder dries slowly on air and combusts, depending on the brazing atmosphere, residue-free. Good wetting and flowing properties. Also suited for resistance-heating processes with inert-gas.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace cracked NH ₃	Inert-gas continuous furnace H ₂ /N ₂	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 17 AP	Powder HTL 17
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/He/0

FONTARGEN HTL 170 AP

Nickel-based high temperature brazing paste



Composition, typical analysis (% w/w):

Ni	Cr	Si	P	Fe	B
Remainder	14,0	2,0	5,6	2,0	1,4

Mechanical and physical properties:

Working temperature:	980 - 1050°C
Melting range:	866 - 881°C
Gap width:	0,02 - 0,2 mm
Viscosity range:	90.000 - 110.000 mPas
Metal content:	≈ 90 % w/w

Characteristics / Applications:

The flux-free brazing alloy HTL 170 AP is an easy to dispense brazing paste of medium viscosity with a high metal content and good gap bridging properties. The alloy is particularly well suited for brazing of high-alloyed steel. The paste dries slowly on air.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace cracked NH ₃	Inert-gas continuous furnace H ₂ /N ₂	Vacuum furnace
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Availability:

Paste HTL 170 AP	Powder
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/He/0

FONTARGEN HTL 270

Nickel-based high-temperature brazing paste



Composition, typical analysis (% w/w):

Ni	Cu	Cr	P
Remainder	10,0	11,8	8,0

Mechanical and physical properties:

Working temperature:	980 - 1050°C
Melting range:	870 - 890°C
Gap width:	up to 0,2 mm
Viscosity range:	90.000- 110.000 mPas
Metal content:	81 % w/w

Characteristics / Applications:

The flux-free brazing alloy HTL 270 AP is an easy to dispense brazing paste with medium viscosity and high metal content. It dries slowly on air and has good gap bridging properties. This brazing alloy is particularly well suited for stainless steel processing.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Availability:

Paste HTL 270 AP	Powder HTL 270
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

06/08/He/0

FONTARGEN HTL 310 AP

Copper- nickel-based high-temperature paste

FONTARGEN

Composition, typical analysis (% w/w):

Ni	Cu	Mn	Si	B	Remainder
42,2	40,5	14,1	1,8	1,2	< 0,2

Mechanical and physical properties:

Working temperature:	1100°C
Melting range:	> 910°C
Gap width:	up to 0,1 mm
Viscosity range:	80.000 - 90.000 mPas
Metal content:	≈ 90 % w/w

Characteristics / Applications:

The flux-free brazing alloy HTL 310 AP is an easy to dispense brazing paste with medium viscosity and high metal content. It dries slowly on air. It is used for brazing of steel sinter materials.

Application:

Manually or automatically with pneumatical or mechanical dispensing units. More information in the dosing technology brochure from Fontargen.

Heat sources:

Inert-gas continuous furnace Argon	Inert-gas continuous furnace Hydrogen	Vacuum furnace
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Availability:

Paste HTL 310 AP	Powder
<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/He/0

Group 2

Fluxes

- a) Brass and German silver fluxes
- b) Silver fluxes
- c) Aluminium fluxes
- d) Soldering fluxes
- e) Remarks

a) Brass and German silver fluxes

Type	<i>DIN EN 8511 / DIN 1045</i>	Page
F 100 – Series		133
Rapidflux – Series		

b) Silver fluxes

Type	<i>DIN EN 8511 / DIN 1045</i>	Page
F 300 – Series		134

c) Aluminium fluxes

Type	<i>DIN EN 8511 / DIN 1045</i>	Page
F 400 – Series		135

d) Soldering fluxes

Type	<i>DIN EN 8511 / DIN 29454</i>	Page
F 600 – Series		136

e) Remarks

Removal of flux residues		137
Precautions		138

Brass and German silver fluxes in accordance with DIN EN 1045 (DIN 8511)

FONTARGEN

The following fluxes are available as standard brazing fluxes for brass and German silver:

F 100 (FH 21 / F-SH2) white paste, non-corrosive
Brazing of steel, cast iron, malleable cast iron, nickel and nickel alloys.

F 110 (not standardised) red powder
Welding of cast iron with FONTARGEN A 110.

F 120 (FH 21 / F-SH2) white powder, non-corrosive
Brazing of steel, cast iron, malleable cast iron, nickel and nickel alloys. Mixed with distilled water, the powder becomes an easy to spread flux paste.

Rapidflux (FH 21 / F-SH2) clear liquid, non-corrosive
Brazing of steel, cast iron, malleable cast iron, nickel and nickel alloys. The liquid is used in conjunction with the appropriate RAPIDFLUX equipment and is fed through the burner directly to the brazing joint.

Rapidflux NT (FH 21 / F-SH2) clear, nontoxic liquid, non-corrosive
Brazing of steel, cast iron, malleable cast iron, nickel and nickel alloys. The liquid is used in conjunction with the appropriate RAPIDFLUX equipment and is fed through the burner directly to the brazing joint.

07/08/SR/0

Silver solder fluxes in accordance with DIN EN 1045 (DIN 8511)

The fluxes featured in the FONTARGEN program are adjusted to match the working temperature of the silver brazing alloy or to suit the base material being brazed.

F 300 (FH 10 / F-SH1) white powder, non-corrosive
Brazing of copper and copper alloys, nickel and nickel alloys, alloyed and unalloyed steel. Mixed with distilled water, the powder becomes an easy to spread flux paste.

F 300 S (FH 10 / F-SH1) white, easy to spread paste, corrosive
Brazing of copper and copper alloys, nickel and nickel alloys, alloyed and unalloyed steel.

F 300 DN (FH 10 / F-SH1) white, easy to dose flux paste, corrosive
Brazing of copper and copper alloys, nickel and nickel alloys, alloyed and unalloyed steel. Well suited for mechanical brazing e.g. flame brazing.

F 300 HFS (FH 12 / F-SH1) dark, easy to spread paste, corrosive
Brazing of copper and copper alloys, nickel and nickel alloys, alloyed and unalloyed steel as well as hard metals. Particularly well suited for higher temperatures of max. 850°C.

F 300 AB (FH 11 / F-SH1) white, easy to spread paste, corrosive
Brazing of copper and copper alloys, aluminium-bronze or aluminium alloyed brass.

F 300 F (FH 10 / F-SH1) white, easy to spread paste, corrosive
Brazing of copper and copper alloys. Particularly well suited for brazing on thin brass parts to prevent red stains.

F 3400 S (not standardised) clear sprayable liquid, slightly corrosive
Brazing of copper and copper alloys. The flux supports the fluidity of the solder in conjunction with RAPIDFLUX and copper-phosphor-silver alloys.

07/08/SR/0

Aluminium fluxes in accordance with DIN EN 1045 (DIN 8511)

FONTARGEN

The FONTARGEN fluxes for light metals have been developed to suit the characteristic properties of aluminium.

F 400 NH (FL 20 / F-LH2) white powder, non-corrosive

Brazing of aluminium and aluminium alloys with a Mg-content of max. 0,5 %. The powder is non-hygroscopic and mixed with distilled water the powder becomes an easy to spread flux paste. The brazing joints must be protected from wetness.

F 400 M (FL 10 / F-LH1) white powder, corrosive

Brazing of aluminium and aluminium alloys with a Mg-content of max. 3,0 %. The powder is highly hygroscopic. Flux residues are corrosive and must be removed immediately after work is completed.

F 400 MD (FL 10 / F-LH1) white, easy to dose paste, corrosive

Brazing of aluminium and aluminium alloys with a Mg-content of max. 3,0 %. The paste is highly hygroscopic and should be kept in tight closed containers. Flux residues must be removed immediately after work is completed.

07/OB/SR/0

Soft soldering fluxes in accordance with DIN EN 29454 (DIN 8511)

The following soft soldering fluxes are featured in the FONTARGEN program:

F 600 (3.1.1.A / F-SW12) easy to spread liquid, corrosive
Brazing of copper and copper alloys, alloyed and unalloyed steel.

F 600 S15 (3.2.2.A / F-SW11) liquid, corrosive
Brazing of copper and copper alloys, alloyed and unalloyed steel. Suitable for galvanised plate.

F 600 LW (3.2.2.A / F-SW12) liquid, corrosive
Brazing of copper and copper alloys, alloyed and unalloyed steel.

F 600 E (3.1.1.A / F-SW12) soldering fluid, corrosive
Brazing of copper and copper alloys.

F 600 A (3.1.1.A / F-SW12) liquid, corrosive
Brazing of copper and copper alloys for plumbing and radiator construction. Low halogen content.

F 600 CW (3.1.1.C / F-SW21) paste, non-corrosive
High quality flux for soldering of pipe installation e.g. copper pipes. DVGW-approved.

F 600 C (3.1.1.C / F-SW21) solder cream, slightly corrosive
Brazing of copper.

F 600 CC (1.1.2.C / F-SW26) paste, non-corrosive
Colophony-based flux, suitable for brazing in the electrical engineering and electronics.

F 600 AL (2.1.2.A / F-LW3) oil, non-corrosive
Brazing of aluminium, copper and copper alloys.

F 600 N16 (1.1.3.A / F-SW32) liquid, non-corrosive
Halogen-free flux on the base of colophony for brazing of copper.

F 600 ZN (not standardised) paste, non-corrosive
Brazing of aluminium, aluminium alloys and aluminium-copper alloys with zinc-aluminium solders at a temperature of approx. 380 – 500°C.

07/08/SR/0

Brazing flux residues can be removed:

- mechanically
- by brushing in hot water
- by quenching the brazed parts while they are still hot, or
- by pickling (bath temperature approx. 40°C)

When quenching, take care that the base material and the brazed joint do not take damage through change of structure, brittleness and stresses etc.

To remove flux residues after brazing with pickling, we recommend the following FONTARGEN products for the dip-pickling-procedure:

- FONTEX for steel parts
- FONTEX P or FONTEX NE for non-ferrous metals

Particularities:

- The residues of F 400 NH are non-soluble. If necessary, remove mechanically.
- The flux residues of F 600 C and F 600 CC can be removed by dry brushing or by washing with alcohol, petrol, Tri etc.

07/08/SR/0

Safety precautions while working with fluxes

It is normal that brazing fluxes (with a few exceptions) contain aggressive substances. Nevertheless, their use is absolutely harmless if the elementary safety precautions, familiar to every welder or brazer are provided and observed. The most important precautions are:

- Fluxes in liquid or paste form should be applied with a brush, fluxes in powder form by dipping the hot tip of the rod or by sprinkling from the container. Avoid all contact with the skin; this is particularly important in case of sensitive skin or open wounds. Wash hands carefully after work is completed and before meals.
- Do not inhale the fumes produced during work. The primary requirement in this respect is an adequately ventilated work-place.

The following rule – of – thumb can serve as a guide:

Max. amount of brazing flux used per hour =

$$\frac{\text{Volume of workshop m}^3}{5} \approx \text{g/hour}$$

Assuming the workshop is of normal height (approx. 3-5 m, depending on flood space).

The following indications provide a guide-line:

A well ventilated workshop suffices for occasional brazing work. A larger, well ventilated workshop, approx. 4 m in height, will be adequate for small series by manual brazing. For large series production, carried out manually or with brazing machines, fume extractor devices should be provided at the work-place.

07/OB/SR/0

Group 3

MIG/MAG

Solid and cored wires

- a) Welding of low alloyed steels and cast iron
- b) Welding of stainless and heat-resisting steels
- c) Welding of copper and copper alloys
- d) Welding of aluminium and aluminium alloys
- e) Welding of wear-resisting coatings
- f) Cored wires for MAG welding
- g) Cored wires, self-protecting (open arc)

a) Welding of low-alloyed steels / cast iron

Type	DIN EN 440 / DIN 8559	Page
A 100 M	G 42 2 C G3 Si 1 / SG 2 CY 42 32	144
A 100 AM	G 46 2 C G4 Si 1 / SG 3 CY 46 43	145
A 116 M	SG Ni Fe 2	146

b) Welding of stainless and heat-resisting steels

Type	DIN EN 12072 / DIN 8556	Page
A 1107 M	G 18 8 Mn M 12 / SG-X 15 Cr Ni Mn 18 8	147
A 1120 M	G 19 9 L M 12 / SG-X 2 Cr Ni 19 9	148
A 1121 M	G 19 12 3 L M 12 / SG-X 2 Cr Ni Mo 19 12	149
A 1122 M	G 25 20 M 12 / SG-X 12 Cr Ni 25 20	150

c) Welding of copper and copper alloys

Type	DIN EN 14640 / DIN 1733	Page
A 200 M	S Cu 1897 (CuAg1) / SG-Cu Ag	151
A 200 SM	S Cu 1898 (CuSn1) / SG-Cu Sn	152
A 202 M	S Cu 6560 (CuSi3 Mn1) / SG-Cu Si 3	153
A 202 MS	S Cu 6560 (CuSi3 Mn1) / SG - Cu Si 3	154
A 207 M	S Cu 6511 (CuSi2Mn1) / SG-Cu Si 2 Mn	155
A 203/6 M	S Cu 5180 (CuSn6P) / SG-Cu Sn 6	156
A 203/12 M	S Cu 5410 (CuSn12P) / SG-Cu Sn 12	157
A 2115/5 Ni M	SG-Cu Al 5 Ni 2	158
A 2115/8 M	S Cu 6100 (CuAl8) / SG-Cu Al 8	159
A 216 M	S Cu 6327 (CuAl8Ni2) / SG-Cu Al 8 Ni 2	160
A 512/30 M	S Cu 7158 (CuNi30) / SG-Cu Ni 30 Fe	161

d) Welding of aluminium and aluminium alloys

Type	DIN EN 18273 / DIN 1732	Page
A 400 Ti M	S Al 1450 (Al99,5Ti) / SG-Al 99,5 Ti	162
A 402 M	S Al 5754 (AlMg3) / SG-Al Mg 3	163
A 404 M	S Al 5356 (AlMg5Cr(A)) / SG-Al Mg 5	164
A 404/4,5 M	S Al 5183 (AlMg4,5Mn(A)) / SG-Al Mg 4,5 Mn	165
A 404/4,5 ZR M	S Al 5087(AlMg4,5MnZr) / SG-Al Mg 4,5 Mn Zr	166
A 405 M	S Al 4043 (AlSi5) / SG-Al Si 5	167
A 407 M	S Al 4047 (AlSi12) / SG-Al Si 12	168

e) Welding of wear-resisting coatings

Type	DIN EN 14700 / DIN 8555	Page
A 7101 M	S Fe 1 / MSG 2-GZ-350	169
A 7111 M	S Fe2 / MSG 6-GZ-60-G	170
A 751 M	S Fe 20 / G 21 - UM - 65 GR	171

f) Cored wires for MAG welding

Type	DIN EN ISO 17632, Teil A	Page
FONTRAFILL 10	T 42 4 B C 3 H5 / T 42 4 B M3 H5	172
FONTRAFILL 11	T 46 4 M M Hr	173
FONTRAFILL 18	T 46 2 P C 1 H5 / T 46 4 P M 1 H5	174
FONTRAFILL 712/600	MF 6-GF-60-GP	175

g) Cored wires, self-protecting (open arc)

Type	DIN	Page
FONTRAFILL 7055	T Fe 3	176
FONTRAFILL 7068	Z T Fe 14	177

FONTARGEN A 100 M

Wire electrode for MAG welding of low-alloyed steel

FONTARGEN

DIN EN 440: G 42 2 C G3 Si 1 (G 46 4 M G3 Si 1)
AWS A 5.18: ER 70 S - 6
Material-no.: 1.5125

Wire analysis standard values (%):

C	Mn	Si	P	S
0,06-0,12	1,3-1,6	0,7-1,0	0,025	0,025

Wire deposit analysis under CO₂ (%):

C	Mn	Si	P	S
0,05-0,10	0,7-1,0	0,5-0,8	0,025	0,025

Characteristics / Applications:

Low-alloyed wire electrode for MAG operations, joint welding and build-up welding of construction steels and tubular steels.

Base materials:

Unalloyed structural steels S235JRG2-S355J2; Boiler plates P235GH, P265GH, P295GH; Fine grained construction steels up to S420N.

Mechanical properties of pure welding deposit

(Min. values at RT):

Tensile strength: 500 – 640 N/mm²
Yield strength: 420 N/mm²
Elongation (l=5d): 20 %
Impact energy (+20%) ISO-V: 47 J

Welding process:

MAG

Shielding gas (DIN EN 439):

C1 (CO₂), M21 (82%Ar+18% CO₂)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,6/0,8/1,0/1,2/1,6

Spool type:

B300

Approvals:

DB (43.046.03/QS), TÜV

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/EB/0

FONTARGEN A 100 AM

Wire electrode made of low-alloy steel for MAG welding **FONTARGEN**

DIN EN 440:	G 46 2 C G4 Si 1 (G 50 3 M G4 Si 1)
AWS A 5.18:	ER 70 S - 6
Material-no.:	1.5130

Wire analysis standard values (%):

C	Mn	Si	P	S
0,06-0,12	1,6-1,9	0,7-1,0	0,025	0,025

Wire deposit analysis under CO₂ (%):

C	Mn	Si	P	S
0,05-0,10	1,0-1,5	0,5-0,8	0,025	0,025

Characteristics / Applications:

Low-alloyed wire electrode for MAG operations, for joint welding and build-up welding of construction steels and tubular steels.

Base materials:

Unalloyed structural steels S235JRG2-S355J2; Boiler plates P235GH, P265GH, P295GH, P355GH; Fine grained construction steels up to S460N.

Mechanical properties of pure welding deposit

(Min. values at RT):

Tensile strength:	500 – 640 N/mm ²
Yield strength:	460 N/mm ²
Elongation (l=5d):	20 %
Impact energy (+20%) ISO-V:	47 J

Welding process:

MAG

Shielding gas (DIN EN 439):

C1 (CO₂), M21 (82%Ar+18% CO₂)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6

Spool type:

B300

Approvals:

DB (42.046.04), TÜV

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/EB/0

FONTARGEN A 116 M

Wire electrode made of a Fe-Ni alloy for MAGM welding **FONTARGEN**

DIN 8573:

SG - Ni Fe - 2

AWS A 5.15:

Ni Fe - C1

Composition, typical analysis (% w/w):

C	Mn	Ni	Si	Cu	Ti	Fe
0,2	1,0-4,0	45-60	0,2	1,5	0,3	Remainder

Characteristics / Applications:

Cold welding of cast iron, black and white malleable iron. Nodular cast iron and austenitic cast iron. Welding of alloyed grey cast iron tools in the automotive industry. Edge welds. Preheating only for critical parts (external cross-over sections at the plate thickness) 100 - 200°C.

To avoid excessive stress and the related risk of cracks, it is advisable to keep input of heat to a level as low as possible, to weld in short step-backs and with cooling periods, and to gently remove welding layer by hammer. Good workability by machine. Number of layers: max. 4 layers.

Mechanical properties of pure welding deposit

(Min. values at RT):

Tensile strength:

approx. 500 N/mm²

Elongation (l=5d):

approx. 25 %

Hardness HB 30:

165 - 175 HB

Welding process:

MAGM, pulsing

Shielding gas (DIN EN 439):

M13 (Ar+1-3% O₂)

M12 (Ar+2-5% CO₂)

M21 (Ar+15-25% CO₂)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 1,0/1,2

Spool type:

B300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/Elb/0

FONTARGEN A 1107 M

Austenitic Cr-Ni-Mn wire electrode for MAGM-welding

FONTARGEN

EN 12072: G 18 8 Mn M 12
AWS A 5.9: ER 307 (mod.)
Material-no.: 1.4370

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni	Fe
0,08	0,8	7,0	19,0	8,5	Remainder

Characteristics / Applications:

For applications that require very good toughness and fracture resistance properties.

Welding of: tempering steels, armour plates, austenitic rustproof steels, austenitic manganese and heat-resistant steels, and austenitic-ferritic steels. For mixture joints of unalloyed steels and stainless steels by process temperatures up to 300°C. Buffer layers at hard-surfacing, high fracture resistance. Also for weld surfacing against strong rolling and shock wear. The austenitic welding deposit is scale-resistant up to 850°C, rustproof, for operating temperatures of -110 to +300°C.

Hardened through compression and impacting. For material no. 1.3401.

Base materials:

TÜV certificated materials.

X10CrNiMoNb18-12 (1.4583) and included ferritic steels up to fine grained steels P460NL2.

Mechanical properties of pure welding deposit

(Min. values at RT):

Tensile strength: 600 N/mm²
Elongation limit (0.2%): 320 N/mm²
Elongation limit (1.0%): 350 N/mm²
Elongation (l=5d): 40 %
Imoact energy (ISO-V): 100 J
Hardness (Vickers): 200 HV

Welding process:

MAGM

Shielding gas (DIN EN 439):

M 12 (argon + 1-3% O₂),
M 21 (argon + 5-25% CO₂)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6

Spooltype:

B300

Approval:

TÜV

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/EB/0

FONTARGEN A 1120 M

Austenitic Cr-Ni wire electrode for MIG/MAG welding

FONTARGEN

EN 12072: G 199 L M 12
AWS A 5.9: ER 308 L Si
Material-no.: 1.4316

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni
< 0,03	0,9	2,0	20,0	10,0

Characteristics / Applications:

Joint welding and build-up welding of rustproof, austenitic Cr-Ni steels. For operating temperatures of -196°C up to +350°C. Scale-resistant (up to 800°C) on air and oxygenating combustion gases. Joint welding of ferritic Cr steels (up to a max. of 18% Cr). If influence of sulphide gases, only for root and intermediate layers.

Base materials:

TÜV certificated materials; X5CrNi18-10 (1.4301), X2CrNiM18-10 (1.4311), X6CrNiNb18-10 (1.4550).

Mechanical properties of pure welding deposit

(Min. values at RT):

Tensile strength: 570 N/mm²
Elongation limit (0.2%): 320 N/mm²
Elongation limit (1.0%): 350 N/mm²
Elongation (l=5d): 35 %
Impact energy (ISO-V): 75 J
Hardness (Vickers): 160 HV

Welding process: MAGM

Shielding gas (DIN EN 439): M 13 (argon + 1-3% O₂),
M 12 (argon + 2,5% CO₂)

Current mode: DC (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2

Spool type: B300

Approval: TÜV

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/EB/0

FONTARGEN A 1121 M

Cr-Ni-Mo wire electrode for MAGM welding



EN 12072: G 19 12 3 L M 12
 AWS A 5.9: ER 316 L Si
 Material-no.: 1.4430

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni	Mo
0,02	0,8	1,7	18,8	12,5	2,8

Characteristics / Applications:

Wire electrode made of austenitic Cr-Ni-Mo steel with exceptionally low carbon content for MAGM welding of corrosion-resistant and low-temperature-resistant austenitic steels. Austenitic welding deposit with 4 - 8% ferrite content. Suitable for operating temperatures of -120 up to +400°C (TÜV identification sheet). High resistance to granular corrosion due to the low carbon content. Highly polished welding deposit.

Mechanical properties of pure welding deposit

(Min. values at RT):

Tensile strength: 550 N/mm²
 Elongation limit (0.2%): 320 N/mm²
 Elongation limit (1.0%): 340 N/mm²
 Elongation (l=5d): 35 %
 Impact energy (ISO-V): 70 J
 Hardness (Vickers): 160 HV

Welding process: MAGM

Shielding gas (DIN EN 439): M 13 (argon + 1-3% O₂),
 M 12 (argon + 2,5% CO₂)

Current mode: DC (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6

Spool type: B300

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/Eb/0

FONTARGEN A 1122 M

Heat-resistant wire electrode for MAGM-welding

FONTARGEN

EN 12072: GZ 25 20 M 1 2
AWS A 5.9: ER 310 Si
Material-no.: 14842

Composition, typical analysis (% w/w):

C	Cr	Ni	Mn	Si
0,13	25,0	20,5	3,2	1,0

Characteristics / Applications:

Wire electrode made of full austenitic Cr-Ni steel for the MAG welding of corrosion- and heat-resistant steels of type 25 Cr/20 Ni. Well suited for the welding of carbon steel on 18/8 steel. Also very well suited for build-up welding. Scale-resistant up to 1.150°C (in oxygenating, sulphide environments up to about 650°C).

Base Materials:

GX 40 Cr Ni Si 25 - 12 (1.4837), GX 15 Cr Ni 25 - 20 (1.4840), X 15 Cr Ni Si 25 - 20 (1.4841)

Mechanical properties of pure welding deposit

(Min. values at RT):

Tensile strength: 550 N/mm²
Elongation limit (0.2%): 320 N/mm²
Elongation limit (1.0%): 340 N/mm²
Elongation (l=5d): 25 %
Impact energy (ISO-V): 80 J
Hardness (Vickers): 160 HV

Welding process: MAGM

Shielding gas (DIN EN 439): M 13 (argon + 1-3% O₂),
M 12 (argon + 2,5% CO₂)

Current mode: DC (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6

Spool type: B300

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARGEN A 200 M

Copper wire electrode for MIG-welding

FONTARGEN

EN 14640: S Cu 1897 (CuAg1)
AWS A 5.7: ER Cu
Material-no.: 2.1211

Composition, typical analysis (% w/w):

Ag	Mn	Cu
1,0	0,1	Remainder

Characteristics / Applications:

Joint and build-up welding on copper, for example material numbers: 2.0060 (E-Cu 57), 2.0070 (SE-Cu), 2.0090 (SF-Cu), 2.0110 (SD-Cu), 2.0150 (SB-Cu), 2.0170 (SA-Cu), 2.1202 (Cu Ag), plates, profiles, containers.

Very easily processed copper alloy. Semi-fluid. Suited for difficult welding positions. The welding pool is clean and clear. The welding deposit is tough and non-porous. Colour and structure of the welding deposit like copper. For work pieces that must be polished, use in limited fashion, as silver can cause blackening. Preheat large work pieces to 350-600°C; use Ar-He inert-gas mixture if necessary.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range: 1070 – 1080 °C
Tensile strength: 200 N/mm²
Elongation limit (0.2%): 80 N/mm²
Elongation (l=5d): 30 %
Thermal elongation: 17,7 p 10⁻⁶/K
Hardness (Brinell): 60 HB
Electrical conductivity: 44 – 46 Sm/mm²
Heat conductivity: 220 – 315 W/m K
Specific gravity: 8,9 g/cm³

Welding process:

MIG

Shielding gas (DIN EN 439):

1 1 (Argon), | 3(Ar-He mixture)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type:

B300, S300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Elb/0

FONTARGEN A 200 SM

Copper wire electrode for MIG-welding

FONTARGEN

EN 14640: S Cu 1898 (CuSn1)
AWS A 5.7: ER Cu
Material-no.: 2.1211

Composition, typical analysis (% w/w):

Sn	Si	Mn	Cu
0,8	0,3	0,3	Remainder

Characteristics / Applications:

Joint and build-up welding on oxygen-free copper and copper alloys of material numbers: 2.0040, 2.0060, 2.0070, 2.0080, 2.0090, 2.0100, 2.0120, 2.0150, 2.0170, 2.1202, 2.1322, 2.1325, 2.1491. Suitable for out-of position welding. Clean base materials in the welding spheres and preheat if over 3 mm (per mm of plate thickness approx. 100°C, but not more than 600°C). Suitable for welding of galvanised steel (MIG-brazing).

Mechanical properties of pure welding deposit (Min. values at RT):

Melting range: 1020 – 1050 °C
Tensile strength: 200 – 240 N/mm²
Elongation (l=5d): 30 %
Thermal elongation: 18,1 p 10⁻⁶/K
Impact energy (ISO-V): 75 J
Hardness (Brinell): 50 – 60 HB
Electrical conductivity: 15 – 20 Sm/mm²
Heat conductivity: 120 – 145 W/m K
Specific gravity: 8,9 g/cm³

Welding process: MIG

Shielding gas (DIN EN 439): 1 1 (Argon), 3 (Ar-He mixture)

Current mode: DC (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6

Spool type: B300, S300

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARGEN A 202 M

Copper-silicon wire electrode for MIG-brazing



EN 14640: S Cu 6560 (CuSi3Mn1)
 AWS A 5.7: ER Cu Si - A
 Material-no.: 2.1461

Composition, typical analysis (% w/w):

Si	Sn	Zn	Mn	Fe	Cu
2,9	0,1	0,1	1,2	0,2	Remainder

Characteristics / Applications:

MIG-brazing of zinc or aluminium plated and uncoated steel plates. Applications: Autobody, air condition and container building. The corrosion resistance of zinc plated surfaces remains unaffected. Little deformation of thin steel sheets.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range: 965 – 1032 °C
 Tensile strength: 350 N/mm²
 Yield strength: 120 N/mm²
 Elongation (l=5d): 40 %
 Thermal elongation: 18,1 p 10⁻⁶/K
 Hardness (Brinell): 80 HB
 Impact energy (ISO-V): 60 J
 Electrical conductivity: 3 – 4 Sm/mm²
 Heat conductivity: 35 W/m K
 Specific gravity: 8,5 g/cm³

Welding process: MIG/MAGM

Shielding gas (DIN EN 439): I 1 (Argon), M12 (Ar + 2,5%CO₂),
 M12 (Ar + 1-3% O₂)

Current mode: DC (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6

Spool type: B300, S300, S560, Drum

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARGEN A 202 MS

Copper-silicon wire electrode for Laser-brazing



EN 14640: S Cu 6560 (CuSi3Mn1)
 Material-no.: 2.1461

Composition, typical analysis (% w/w):

Si	Sn	Zn	Mn	Fe	Cu
2,9	0,1	0,1	1,2	0,2	Remainder

Characteristics / Applications:

Laser-brazing of zinc-galvanised plates. Applications: Autobody and thin sheet brazing.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range: 950 – 1032 °C
 Tensile strength: 350 N/mm²
 Yield strength: 120 N/mm²
 Elongation (l=5d): 40 %
 Thermal elongation: 18,1 p 10⁻⁶/K
 Hardness (Brinell): 80 HB
 Impact energy (ISO-V): 60 J
 Electrical conductivity: 3 – 4 Sm/mm²
 Heat conductivity: 35 W/m K
 Specific gravity: 8,5 g/cm³

Welding process: Laser-brazing

Shielding gas (DIN EN 439): I 1 (Argon), M12 (Ar +2,5%CO₂),
 M12 (Ar + 1-3% O₂)

Current mode: DC (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6

Spool type: B300
 S300
 S560
 Drum

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/EB/0

FONTARGEN A 207 M

Cu-Si-Mn wire electrode for MIG and MAG welding

FONTARGEN

EN 14640: S Cu 6511 (CuSi2Mn1)
Material-no.: 2.1522

Composition, typical analysis (% w/w):

Si	Sn	Mn	Cu
1,8	0,2	1,0	Remainder

Characteristics / Applications:

Very easy to weld. High temperature- and corrosion resistance as well as good behaviour under compression stress. Good wetting of the base material with lower working temperature compared to copper. Flat seams due to Si content and little pore formation.

Welding of galvanised autobody steel sheets (MIG brazing), un-alloyed and low-alloyed steels, cast iron as well as copper and copper alloys. With MIG burner: Weld sharp, not dragging.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range: 1030 – 1050 °C
Tensile strength: 285 N/mm²
Yield strength: 140 N/mm²
Elongation (l=5d): up to 40 %
Impact energy: 75 J
Hardness (Brinell): 62 HB
Thermal conductivity: 40 W/m • K
Specific gravity: 8,7 g/cm³
Linear expansion: 18,1 • 10⁻⁶/K

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type:

B300
S300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Elb/0

FONTARGEN A 203/6 M

Copper-tin wire electrode for MIG-welding



EN 14640: S Cu 5180 (CuSn6P)
 AWS A 5.7: ER Cu Sn - A
 Material-no.: 2.1022

Composition, typical analysis (% w/w):

Sn	P	Cu
6,0	0,2	Remainder

Characteristics / Applications:

Welding of copper materials, e.g. CuSn-alloys, CuSnZnPb-cast alloys. Particularly well suited for the joint welding of brass on brass or brass on Cu-alloys, Fe-materials and cast iron. Suitable for welding of galvanised steel (MIG-brazing). Further applications include: Building-up of bearing bushes, sliding rails, repairs of phosphor bronze parts. For tin-bronze parts of >10 mm thickness we recommend preheating. Suitable for material numbers: 2.1010, 2.1016, 2.1020, 2.1030, 2.1050, 2.1052, 2.1056, 2.1080, 2.1086, 2.1090, 2.1096. Build-up welding on Fe materials should be performed by pulsed arc welding.

Corrosion- and overheating-resistant tin-bronze alloy. A203/6 M is very easily machined and produces a clear weld pool. The welding deposit is tough and non-porous. Keep arc short. To eliminate contraction strains (in materials with high tin content)peen the seam.

Mechanical properties of pure welding deposit (Min. values at RT):

Melting range: 910 – 1040 °C
 Tensile strength: 260 N/mm²
 Elongation (l=5d): 20 %
 Thermal elongation: 18,1 p 10⁻⁶/K
 Hardness (Brinell): 80 HB
 Electrical conductivity: 6 – 7 Sm/mm²
 Heat conductivity: 75 W/m K
 Specific gravity: 8,7 g/cm³

Welding process: MIG

Shielding gas (DIN EN 439): I 1 (Argon)

Current mode: DC (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6/2,0/2,4

Spool type: B300, S300

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARGEN A 203/12 M

Copper-tin wire electrode for MIG-welding



EN 14640: S Cu 5410 (CuSn12P)
 AWS A 5.7: R Cu Sn - D
 Material-no.: 2.1056

Composition, typical analysis (% w/w):

Sn	P	Cu
12,0	0,2	Remainder

Characteristics / Applications:

Welding of copper materials, e.g. copper and Sn-bronze. Particularly well suited for joint welding of brass on brass or brass on Cu alloys and Fe materials. Building-up of bearing bushes, sliding rails and repairs of phosphor bronze parts. Welding deposit nearly of same colour as welding of red brass Rg 5. Suitable for material numbers: 2.1010, 2.1020, 2.1050, 2.1056, 2.1086, 2.1016, 2.1030, 2.1052, 2.1080. Build-up welding on Fe materials should be performed with pulsed arc welding.

Corrosion- and overheating-resistant tin-bronze alloy. A203/12 M is very easily machined and produces a clear weld pool that is smooth, clear and non-porous.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range: 825 – 990 °C
 Tensile strength: 320 N/mm²
 Elongation (l=5d): 5 %
 Thermal elongation: 18,5 p 10⁻⁶/K
 Hardness (Brinell): 120 HB
 Impact energy: 8 J
 Electrical conductivity: 3 – 5 Sm/mm²
 Heat conductivity: 40 – 50 W/m K
 Specific gravity: 8,6 g/cm³

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,0/2,4

Spool type:

B300
 S300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/EB/0

FONTARGEN A 2115/5 Ni M

Copper-aluminium wire electrode for MIG-brazing

DIN 1733:

SG – Cu Al 5 Ni 2

Composition, typical analysis (% w/w):

Al	Ni	Mn	Cu
5,0	2,0	0,2	Remainder

Characteristics / Applications:

Welded joints and deposit welding on aluminium bronze with 5-6% Al, high-strength brass, copper and copper-alloys, ferritic and austenitic steel, steel, aluminium-coated steel, gray cast. Suitable for welding of galvanized steel (MIG-welding). Preheating is only necessary for big assemblies. Pulsed arc welding is recommended for the 1st layer of deposit welding on ferrous materials.

Mechanical properties of pure welding deposit (Min. values at RT):

Melting range:	1060 – 1085 °C
Tensile strength:	360 – 450 N/mm ²
Elongation (l=5d):	45 %
Hardness (Brinell):	160 HB
Thermal conductivity:	61,0 W/m • K
Electrical conductivity:	8,0 – 8,8 Sm/mm ²
Specific gravity:	8,2 g/cm ³
Linear expansion:	17,5 • 10 ⁻⁶ /K

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon), M12 (Ar + 2%CO₂),
M12 (Ar + 1% O₂)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type:

B300
S300
Drum

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Еb/0

FONTARGEN A 2115/8 M

Copper-aluminium wire electrode for MIG-brazing

FONTARGEN

EN 14640:	S Cu 6100 (CuAl8)
AWS A 5.7:	ER Cu Al - A1
Material number:	2.0921

Composition, typical analysis (% w/w):

Al	Ni	Mn	Fe	Cu
8,0	0,5	0,2	0,2	Remainder

Characteristics / Applications:

MIG-brazing of aluminium plated and uncoated steel plates. Applications: Autobody, magnetic solenoids, air condition and container building. The corrosion resistance galvanized steel plates remain unaffected. Little deformation of thin steel sheets.

Joint welding on aluminium-bronze and high-strength brass and steel. In the machine, chemical, as well as shipbuilding industries. Joint welding: Corrosion-resistant conduits made of aluminium-bronze or high-strength brass of large nominal diameters. Joint of copper conduits with steel. Joining of material numbers 2.0916, 2.0920, 2.0928. Particularly well suited for the welding of galvanised steels (MIG brazing). Low zinc consumption.

Properties: Corrosion- and saltwater-resistant alloy with very good glide properties (metal-metal). A 2115/8 M is very easy to machine and ensures a perfect weld and a clean weld surface. Excellent wetting properties allow high welding speeds.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range:	1030 – 1040 °C
Tensile strength:	380 – 450 N/mm ²
Elongation (l=5d):	45 %
Thermal elongation:	17 p 10 ⁻⁶ /K
Hardness (Brinell):	60 – 80 HB
Electrical conductivity:	8 Sm/mm ²
Heat conductivity:	35 W/m K
Specific gravity:	7,7 g/cm ³

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2

Spool type:

B300, S300, Drum

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

EN DIN 14640: S Cu 6327 (CuAl8Ni2)
Material-no.: 2.0922

Composition, typical analysis (% w/w):

Al	Ni	Mn	Fe	Cu
8,0	2,0	1,8	1,8	Remainder

Characteristics / Applications:

Joint and build-up welding on multi-alloyed aluminium-bronze, for example material numbers: 2.0916, 2.0920, 2.0928, 2.0932, 2.0936, 2.0940, 2.0960, 2.0962, 2.0966, 2.0970, 2.0975, 2.0978 and 2.0980. Build-up welding on steel and copper alloys. Fusion welding between steel and aluminium-bronze (also multi-alloys). Suitable for welding (MIG brazing) of aluminium surfaced and galvanised steels. For use in shipbuilding, machine, apparatus and pump construction; for example ship propellers, pump casings, valve control casings and food containers. Preheating necessary only with large workpieces. For the first run of build-up welds on ferrous base material we recommend pulsed-arc welding.

The welding deposit is saltwater- and corrosion resistant as well as wear resistant. Well suited if subjected to wear by salt water, cavitation and erosion at the same time.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range: 1030 – 1050 °C
Tensile strength: 530 – 590 N/mm²
Yield strength (0,2): 290 N/mm²
Elongation (l=5d): 30 %
Impact energy (ISO-V): 70 J
Hardness (Brinell): 130 – 150 HB
Electrical conductivity: 5 Sm/mm²

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)

Current mode:

DC (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type:

B300
S300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Elb/0

FONTARGEN A 512/30 M

Copper-nickel welding rod for MIG welding



EN 14640: S Cu 7158 (CuNi30)
Material-no.: 2.0837

Composition, typical analysis (% w/w):

Ni	Fe	Mn	Si	Ti	Cu
30	0,5	1,0	0,1	0,3	Remainder

Characteristics / Applications:

Corrosion- and saltwater-proof alloy. A512/30 M is very easily machined. The weld pool is clean. The welding deposit is tough and non-porous.

Joint and build-up welding on copper-nickel alloys up to a Ni content of 30%. Material numbers 2.0806, 2.0812, 2.0818, 2.0822, 2.0830, 2.0836, 2.0842, 2.0862, 2.0872, 2.0878, 2.0882, 2.0890. In the shipbuilding and chemical industries, e.g. containers, condenser tubes, radiators, heat exchangers, etc. For welds with unalloyed materials buffer the edges of the weld seam of the unalloyed base material with a suitable filler metal, e.g. SG-NiCu 30 Mn Ti = A511 M. For build-up welds on ferrous materials it is possible to direct the arc to the edges of the preceding pass. Pulsed-arc welding recommended. Also suitable for build-ups on cast iron.

Mechanical properties of pure welding deposit (Min. values at RT):

Melting range:	1180 – 1240°C
Tensile strength:	380 – 480 N/mm ²
Yield strength (0,2):	200 N/mm ²
Elongation (l=5d):	30 %
Thermal elongation:	16 p 10 ⁻⁶ /K
Impact energy:	100 J
Electrical conductivity:	3 Sm/mm ²
Heat conductivity:	35 W/m • K

Welding process:	MIG
Shielding gas (DIN EN 439):	I 1 (Argon); Ar-H ₂ -mixture
Current mode:	Direct current (+pole)
Availability:	Diameter (mm): 1,0/1,2
Spool type:	B300
Welding position:	according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/EB/0

FONTARGEN A 400 Ti M

Aluminium wire electrode for MIG welding



EN ISO 18273: S Al 1450 (Al 99,5 Ti)
 Material-no.: 3.0805

Composition, typical analysis (% w/w):

Fe	Si	Cu	Zn	Ti	Al
0,4	0,2	0,05	0,07	0,1	Remainder

Characteristics / Applications:

Aluminium alloy with good fluidity. Can be welded in all positions. The Ti-content ensures a grain refinement of the welding deposit. Joint welding of base materials: Al 98; Al 99; Al 99,5; Al 99,8 und Al 99,7. For plates thicker than 15mm preheat to a min. of 150 °C.

Mechanical properties of pure welding deposit (Min. values at RT):

Melting range: 647 – 658 °C
 Tensile strength: 65 N/mm²
 Yield strength (0,2%): 30 N/mm²
 Elongation (l=5d): 35 %
 Electrical conductivity: 34 – 36 Sm/mm²
 Heat conductivity: 210 – 230 W/m • K
 Specific gravity: 2,71 g/cm³
 Linear expansion: 23,5 • 10⁻⁶/K

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)
 I 3 (Argon/Helium mixture)

Current mode:

Direct current (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type:

B300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARGEN A 402 M

Aluminium-magnesium wire electrode for MIG-welding

FONTARGEN

EN ISO 18273: S Al 5754 (Al Mg 3)

AWS A 5.10: ER 5754

Material-no.: 3.3536

Composition, typical analysis (% w/w):

Mg	Mn	Fe	Si	Cr	Ti	Al
3,0	0,3	0,2	0,2	0,1	0,1	Remainder

Characteristics / Applications:

Corrosion- and saltwater-proof alloy. Suitable for anodising.

Welding of rolled and cast aluminium-magnesium alloys like Al Mg 3, Al Mg Mn, Al Mg 1, Al Mg 2, Al Mg Si 0,5, Al Mg Si 0,8, G - Al Mg 3, G - Al Mg 3 (Cu), G - Al Mg 3 Si. Tank construction, aluminium constructions, constructions of vehicles, shipbuilding, window and door frames construction. Plates thicker than 15mm must be preheated to approx. 150 °C - 200 °C.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range:	610 - 642 °C
Tensile strength:	200 N/mm ²
Yield strength (0,2%):	80 N/mm ²
Elongation (l=5d):	20 %
Electrical conductivity:	21 Sm/mm ²
Heat conductivity:	130 - 170 W/m • K
Specific gravity:	2,66 g/cm ³
Linear expansion:	23,7 • 10 ⁻⁶ /K

Welding process: MIG

Shielding gas (DIN EN 439): I 1 (Argon)
I 3 (Argon/Helium mixture)

Current mode: Direct current (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type: B300

Welding positions: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/ЕБ/0

FONTARGEN A 404 M

Aluminium-magnesium wire electrode for MIG-welding

FONTARGEN

EN ISO 18273: S Al 5356 (Al Mg 5 Cr (A))

AWS A 5.10: ER 5356

Material-no.: 3.3556

Composition, typical analysis (% w/w):

Mg	Mn	Fe	Si	Cr	Ti	Al
5,0	0,1	0,2	0,2	0,1	0,1	Remainder

Characteristics / Applications:

Corrosion- and saltwater-proof alloy. Suitable for anodising. Welding of rolled and cast aluminium-magnesium alloys according to DIN 1725 Bl.1 und Bl. 2, like Al Mg 3, Al Mg 5, Al Mg Mn, Al Zn Mg 1, G-Al Mg 3/+Si/+Cu, G-Al Mg 5/+Si, G-Al Mg 10, Al Mg Si 1. Tank construction, construction of vehicles, aluminium constructions, shipbuilding, windows, etc. For plates thicker than 15mm preheat to min. 150 °C.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range:	575 – 633 °C
Tensile strength:	250 N/mm ²
Yield strength (0,2%):	110 N/mm ²
Elongation (l=5d):	25 %
Electrical conductivity:	15 – 19 Sm/mm ²
Heat conductivity:	110 – 150 W/m • K
Specific gravity:	2,64 g/cm ³
Linear expansion:	23,7 • 10 ⁻⁶ /K

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)
I 3 (Argon/Helium mixture)

Current mode:

Direct current (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type:

B300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Elb/0

FONTARGEN A 404/4,5 M

Aluminium-magnesium wire electrode for MIG-welding

FONTARGEN

EN ISO 18273: S Al 5183 (Al Mg 4,5 Mn 0,7 (A))
AWS A 5.10: ER 5183
Material-no.: 3.3548

Composition, typical analysis (% w/w):

Mg	Mn	Fe	Si	Cr	Ti	Al
4,5	0,7	0,2	0,2	0,1	0,1	Remainder

Characteristics / Applications:

Filler metal for joints which demand highest toughness. The welding deposit has a good resistance to atmospheric influences and seawater. Joint welding on rolled and cast aluminium-magnesium alloys, e.g. Al Mg 4,5 Mn, Al Mg 5, Al Zn 4,5 Mg 1, G-Al Mg 3/+Si/+Cu, G-Al Mg 5/+Si, G-Al Mg 10, Al Mg Si 1. If plates are thicker than 15mm preheat to a min. of 150 °C.

Filler metal for joints on which highest demands of toughness are made. The welding deposit has a good resistance to atmospheric influences and saltwater.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range: 574 – 638 °C
Tensile strength: 280 N/mm²
Yield strength: 140 N/mm²
Elongation (l=5d): 20 %
Electrical conductivity: 16 – 19 Sm/mm²
Heat conductivity: 110 – 120 W/m • K
Specific gravity: 2,66 g/cm³
Linear expansion: 23,7 • 10⁻⁶/K

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)
I 3 (Argon/Helium mixture)

Current mode:

Direct current (+pole)

Approval:

DB (61.046.02/QS)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type:

B300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARGEN A 404/4,5 ZR M

Aluminium-magnesium wire electrode for MIG-welding

FONTARGEN

EN ISO 18273: S Al 5087 (Al Mg 4,5 Mn Zr)

AWS A 5.10: ER 5087

Material-no.: 3.3546

Composition, typical analysis (% w/w):

Mg	Mn	Fe	Si	Cr	Ti	Zr	Al
4,7	0,9	0,2	0,1	0,1	0,1	0,15	Remainder

Characteristics / Applications:

Zirconic welding deposit for joints which demand highest toughness. Zirconium increases the heat crack-resistance. The welding filler can be used advantageously for complicated welding constructions involving unfavourable restraint conditions. The welding deposit has a good resistance to atmospheric influences and seawater.

Joint welding on rolled and cast aluminium-magnesium alloys, e.g. Al Mg 3, G-Al Mg 3, Al Mg 4,5 Mn, Al Mg 5, G-Al Mg 5, Al-Cu Mg 1, Al Mg Si 1, Al Zn 4,5 Mg 1. If plates are thicker than 10mm preheat to 150°C – 200°C.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range:	574 – 638°C
Tensile strength:	300 N/mm ²
Yield strength (0,2%):	140 N/mm ²
Elongation (l=5d):	20 %
Electrical conductivity:	17 – 19 Sm/mm ²
Heat conductivity:	110 – 120 W/m • K
Specific gravity:	2,66 g/cm ³
Linear expansion:	23,7 • 10 ⁻⁶ /K

Welding process: MIG

Shielding gas (DIN EN 439): I1 (Argon)
I3 (Argon/Helium mixture)

Current mode: Direct current (+pole)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type: B300

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/EB/0

FONTARGEN A 405 M

Aluminium-silicon wire electrode for MIG-welding



EN ISO 18273:	S Al 4043 (Al Si 5)
AWS A 5.10:	ER 4043
Material-no.:	3.2245

Composition, typical analysis (% w/w):

Fe	Si	Cu	Ti	Al
0,5	5,2	0,1	0,1	Remainder

Characteristics / Applications:

Welding of Al Si 5, Al Mg Si 0,5, Al Mg Si 0,8, Al Mg Si 1. Al and Al alloys with an alloy content of less than 2%. Al cast alloy with Si content of max. 7%. Plates thicker than 15mm preheat to approx. 150°C. When welding heat-treatable alloys, do not put the weld seam in areas subjected to high mechanical stress. Al-Si alloy with good fluidity. Discolouring when anodised.

Mechanical and physical properties:

Melting range:	573 – 625°C
Tensile strength:	160 N/mm ²
Yield strength (0,2%):	40 N/mm ²
Elongation (l=5d):	15 %
Electrical conductivity:	24 – 32 Sm/mm ²
Heat conductivity:	170 W/m • K
Specific gravity:	2,68 g/cm ³
Linear expansion:	22,1 • 10 ⁻⁶ /K

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)
I 3 (Argon/Helium mixture)

Current mode:

Direct current (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2/1,6/2,4

Spool type:

B300

Approval:

DB (61.046.01/QS)

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARGEN A 407 M

Aluminium-silicon wire electrode for MIG-welding

FONTARGEN

EN ISO 18273:	S Al 4047 (Al Si 12 (A))
DIN 1732:	SG – Al Si 12
AWS A 5.10:	ER 4047
Material-no.:	3.2585

Composition, typical analysis (% w/w):

Si	Fe	Mn	Cu	Zn	Ti	Al
12,0	0,5	0,1	0,1	0,1	0,1	Remainder

Characteristics / Applications:

Al-Si alloy with good fluidity. Structure and colour matching. Not suited for joints that are subsequently anodised. Al-Si cast alloys with more than 7% weight content of silicon. In special cases also Al and Al alloys with less than 2% alloying elements. Tank constructions, air-conditioning equipment, household appliances, sheets, pipes, profiles. Preheat thick plates and large workpieces to approx. 150°C – 180°C.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range:	573 – 585°C
Tensile strength:	180 N/mm ²
Yield strength (0,2%):	80 N/mm ²
Elongation (l=5d):	5 %
Electrical conductivity:	17 – 27 Sm/mm ²
Heat conductivity:	150 – 170 W/m • K
Specific gravity:	2,65 g/cm ³
Linear expansion:	20 • 10 ⁻⁶ /K

Welding process:

MIG

Shielding gas (DIN EN 439):

I 1 (Argon)
I 3 (Argon/Helium mixture)

Current mode:

Direct current (+pole)

Availability:

Diameter (mm): 0,8/1,0/1,2

Spool type:

B300

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Еb/0

FONTARGEN A 7101 M

Wire electrode of low-alloyed Mn-Cr steel for surfacing

FONTARGEN

EN 14700: S Fe 1
Material-no.: 1.8405

Composition, typical analysis (% w/w):

C	Mn	Cr	Ti	Fe
0,7	2,0	1,0	0,2	Remainder

Characteristics / Applications:

Build-up welding of machine parts made of construction or cast steel that are subject to abrasion. For slide bars, running wheels, bearing surfaces, wheel rims, rails, reels, guiding devices, transport rollers, clutches, dies and moulds. If necessary add a buffer layer with cored wire electrode FONTARFILL 10. The untreated welding deposit is machine workable. In hardened condition (820°C-850°C/oil) only be machined by grinding. Preheat base metals susceptible to cracking to about 250°C.

Hardness of pure welding deposit (shielding gas: CO₂)+20°C:

Hardness (Vickers): 340 – 395 HV
Hardness (Brinell): 325 – 375 HB
Hardness (Rockwell): 35 – 40 HRC

Current mode: DC

Welding process: MAGM

Shielding gas (DIN EN 439): C1 (CO₂), M12 (Ar + 3 % CO₂),
M13 (Ar + 3 % O₂), M21 (Ar + 18 % CO₂)

Availability: Diameter (mm): 1,2

Spool type: S300

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

08/08/Eb/0

FONTARGEN A 7111 M

Wire electrode of Cr-Si steel for surfacing



EN 14700: S Fe 2
Material-no.: 1.4718

Composition, typical analysis (% w/w):

C	Mn	Cr	Si
0,5	0,5	9,0	2,5

Characteristics / Applications:

Welding of tough, abrasion proof depositions on machine parts made of construction steel, cast steel or manganese hard steel. For transport rolls, running wheels, creeper bands, edge grinders, excavator parts, conveyor worm screws, rolling crushers, paving breakers, rolling mill guiding devices cams, clamps, baffle plates, mixer arms, anvils.

Untreated welding deposit can only be machined by grinding. Soft-annealing: 780-820°C/5h. Hardening: 1.020-1.070°C/oil or compressed air. Preheat base metals that are susceptible to cracking to 200-300°C. For base materials with high susceptibility to cracking, weld intermediate (buffer) layer with E 107 or A 107 M.

Hardness of pure welding deposit (shielding gas: CO₂)+20°C:

Hardness (Vickers): 670 – 775 HV
Hardness (Rockwell) 56 – 62 HRC

Current mode: DC

Welding process: MAGM

Shielding gas (DIN EN 439): C1 (CO₂), M12 (Ar + 3 % CO₂),
M13 (Ar + 3 % O₂), M21 (Ar + 18 % CO₂)

Availability: Diameter (mm): 0,8/1,0/1,2/1,6

Spool type: B300

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARGEN A 751 M

Flexible wire for hardfacing by autogenous procedure

FONTARGEN

EN 14700:

S Fe 20

Welding deposit:

Tungsten-carbide in Ni-C-B-Si-matrix

Composition, typical analysis (% w/w):

Si	Fe	Mn	Cu	Zn	Ti	Al
12,0	0,5	0,1	0,1	0,1	0,1	Remainder

Characteristics / Applications:

For extreme strong abrasion wear in the ceramic and lime stone industry, as well as mixer blades, mixer arms, edges as well as application on press-spirales, slip off-segments, sludge rotors and similar parts.

Base materials:

Steels and cast iron

Instructions:

The deposit zone has to be grinded or rayed metallic clean. The deposit zone should have temperatures of 600 - 700°C. Melt-off drop by drop with a little excess gas flame of acetylen-oxygen and pickup. The dap technique is preferred. Do not meltdown the base metals. It is comparable with brazing.

Mechanical properties of pure welding deposit

(Min. values at RT):

Melting range: approx.

950 – 1050°C

Hardness of tungsten carbide:

HV₅₀ 2500-3000

Hardness of matrix hard material:

HV₁₀ 900-1000

Hardness of nickel matrix:

320-370 HV

Percentage of tungsten carbides

In the welding deposit:

65 %

Size of tungsten carbides:

primarily (45%):

0,3-0,7 cm

secondarily (20%):

38-75 μ

Heat sources:

Acetylene torch

Availability:

Diameter (mm): 0,8/1,0/1,2

Spool type:

Special spool: D400

Weight per spool: 15,- kg

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

FONTARFILL 10

Basic cored-wire electrode for MAG welding

DIN EN ISO 17632, Teil A: T 42 4 B C 3 H5/T 42 4 B M 3 H5
DIN 8559: SA B 1 C4 42 54 / SG B 1 M 21 Y 42 54
AWS A 5.20: E 70 T-5

Composition, guiding analysis (% w/w):

C	Mn	Si	P	S
0,05	1,4	0,40	< 0,015	< 0,015

Characteristics / Applications:

Fully basic cored-wire with high mechanical properties for joint and deposit welding. Crack-free and non-porous. Welding deposit with low hydrogen content of < 3 ml/100 g. Also as buffer layer for extremely hard deposit alloys. Welding of high-carbon steels.

Base materials:

S185 – S355J, P235GH – P265GH, P295GH – P355GH
S275N – P355NL2, P275NH – P355NH
St 35, St 35.4, St 35.8 – St 45.8, St 52.4
L210 – L360MB
X42 – X52 (API-5LX)
GS-38 – GS-52
Ship building steels: Grade A – E, AH32 – EH36

Mechanical properties of welding deposit (min. values at room temperature):

Tensile strength: 520 N/mm²
Limit of elasticity: 420 N/mm²
Elongation: 24 %
Impact energy: RT: 140 J
-20°C: 100 J
-40°C: 70 J

Welding process: MAGM

Shielding gas (DIN EN 439): C1 (CO₂)
M 21 (Ar + 18 % CO₂), M 33 (Ar + 9-12 % O₂)

Current mode: DC (+pole)

Spool type (DIN 8559): B300

Availability: Diameter (mm): 1,0/1,2/1,6

Recovery: > 85 %

Approval: TÜV

Welding positions: DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

01/09/Eb/1

FONTARFILL 11

Metal powder flux cored electrode for MAG-welding

FONTARGEN

DIN EN ISO 17632, Teil A: T 46 4 M M 1 H5
DIN 8559: SA B 1 C4 42 54 / SG B 1 M 21 Y 42 54
AWS A 5.20: E 71 T - 1

Composition, guiding analysis (-.%):

C	Mn	Si	P	S
0,05	1,3	0,5	< 0,015	< 0,015

Characteristics / Properties:

High-efficiency metal powder cored welding wire. A low formation of oxides makes a multiple welding possible without cleaning; slagless. Well suitable for robot-welding or rather for fully mechanised welding processes, e.g. for the car industry. The electrode has to be welded by slightly forehand welding. Try to use a water cooled torch. Stable welding properties at low to high amperage grant good results on material thicknesses of more than 2mm. Applicable in short-arc welding, therefore suitable for bridging of gaps and out-of-position welding. Deposit with a low content of hydrogen < 3ml/100g.

Base materials:

Structural steels:

S185, S 235, J 2G3, S 27572G3, E 295, P 235-GH-P265GH, P 295GH, P 355GH,
S 275N - S 420NL, P 275NH, P 355NH, P 460NH, P 275NL1, P 355NL1, P 460NL1
St 35, St 35.4, St 35.8 - St 45, St 52.4

L210, L 240, L 290, L 360 MB, L 414MB

GS-38 - GS-52

Ship building steels: grade A - E, AH32 - EH36

Mechanical properties of welding deposit

(min. values at room temperature):

Tensile strength: 550-650 N/mm²
Yield strength: 470 N/mm²
Elongation: 27 %
Impact energy: -20°C: 100 J
-40°C: 60 J

Welding process:

MAGM

Shielding gases (DIN EN 439):

M 21 (18 % CO₂, remainder Ar)

Current mode:

DC (+pole)

Spool type:

B300

Availability:

Diameter (mm): 1,0/1,2

Approval:

TÜV, DB (42.046.02/QS)

Welding positions:

DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

01/09/Eb/1

FONTARFILL 18

Rutile flux-cored electrode for MAG-welding

FONTARGEN

DIN EN ISO 17632, Teil A:

T 46 2 P C 1 H5/T 46 4 P M 1 H5

AWS A 5.20:

E 71 T - 1

Composition, guiding analysis (% w/w):

C	Mn	Si	P	S
0,05	1,3	0,5	< 0,015	< 0,015

Characteristics / Properties:

Good modelling capacity, outstanding properties in particular for the welding of vertical-up welds. This enables position welding with higher welding currents, and thus an increase in melting output. Especially for semi- or fully automated circumferential pipe welding. For orbital MAG-welding the 06h00 to 12h00 position with wire (diameter 1,2-1,4 mm) is to be preferred. Little spatter loss. Easy detachable. Fine, non-porous beads. Notch-free bead transition.

Base materials:

Unalloyed steels:

S185, S-235JR, S 275JR, P235GH, P265HG, P 295GH, P355GH, S 255N-S §55N; P 275NH-P 355NH

Boiler steels:

St 35, St 35.4, St 35.8 – St 45.8, St 5-2.4

Construction steels:

X 42-X 52 (API- 5LX);

Ship building steels:

Grade A-E; AH 32-EH36

Mechanical properties of welding deposit

(min. values at room temperature):

Tensile strength: 550-650 N/mm²Yield strength: 460 N/mm²

Elongation: 24 %

Impact energy: -20°C: 60 J

-40°C: 60 J

Welding process:

MAGM, MAGC

Shielding gases (DIN EN 439):

C 1 (CO₂), M 21 (18 % CO₂, remainder Ar)

Current mode:

DC (+pole)

Spool type:

B300

Availability:

Diameter (mm): 1,0/1,2

Approval:

TÜV, DB (43.046.01/QS)

Welding positions:

DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

01/09/Eb/1

DIN EN 14700:

T Fe 2

Composition, guiding analysis (% w/w):

C	Mn	Si	Cr	Mo
0,45	1,5	0,6	6,0	0,6

Characteristics / Properties:

Deposit welds on parts subject to extreme mineral abrasion along with average impacting, e.g. strippers, digging teeth, feed screws, sliding rails, gravel pump casings, gravel pump rotors, gravel pump cutters, forging tools, mortar pump rotors, grinding units, mixer blades, pressure worms, compression moulds, chutes, grate bars, sand slinger cutters, feeder reels, ventilators, etc. If there are old welds, it is even better to remove the old deposit layer than welding one or more intermediate layers with FONTARFILL 10.

Mechanical properties of welding deposit**(min. values at room temperature):**

Hardness during the as-welded

Condition shielding gas M 21:

57 – 62 HRC

Shielding gas (DIN EN 439):mixed gas M 21 (82 % Ar, 18 % CO₂) and
C 1 (CO₂)**Current mode:**

DC (+pole)

Spool type:

B300

Availability:

Diameter (mm): 1,2/1,6

Welding positions:

DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

08/08/Elb/0

FONTARFILL 7055

Self-shielding flux cored wire for hard surfacing



Din EN 14700 :

T Fe 3

Composition, guiding analysis (% w/w):

C	Mn	Mo	Si	Cr	W
0,45	1,5	1,5	0,5	5,8	1,4

Characteristics / Properties:

Medium-alloyed flux cored electrode with good welding properties.

The weld metal is tough, free of cracks and pores, malleable, tempering, hardening and magnetic. Martensite microstructure.

Machining only by grinding. Can be cut with a plasma torch.

Wear-resistant, though build-up welding on workpieces subject to abrasion wear, combined with shock and impact stress, e.g. excavator-bucket knives, grab teeth, hammer for hammer mills, beating arms for impact crushers, breaker jaws, beaters, edge runners, boring tools, gravel pumps, conveying augers and coal planes.

Mechanical properties of welding deposit

(min. values at room temperature):

Hardness of the weld metal: 55 HRC

Current mode:

DC (+pole)

Diameter (mm)	Welding Current (A)	Welding Voltage (V)	Stickout (mm)
1,6	180 - 200	26 - 30	35 - 40
2,4	250 - 300	26 - 30	35 - 40
2,8	300 - 350	26 - 30	35 - 40

Spool type:

B300

Availability:

Diameter (mm): 1,6

Welding positions:

DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

08/08/EB/0

FONTARFILL 7068

Self-shielding corded wire for hard surfacing

FONTARGEN

DIN 8555:

Z T Fe 14

Composition, guiding analysis (.%):

C	Cr	B	W	V	Mn
3,8	22,0	1,1	0,8	0,8	1,8

Characteristics / Properties:

Deposit welds on parts subject to extreme mineral abrasion along with average impacting, e.g. strippers, digging teeth, feed screws, sliding rails, gravel pump casings, gravel pump rotors, gravel pump cutters, forging tools, mortar pump rotors, grinding units, mixer blades, pressure worms, compression moulds, chutes, grate bars, sand slinger cutters, feeder reels, ventilators, etc. If there are old welds, it is even better to remove the old deposit layer than welding one or more intermediate layers with FONTARFILL 10.

Mechanical properties of welding deposit**(min. values at room temperature):****Hardness:** approx. 64 HRC**Current mode:** DC (+pole)**Spool type:** B300**Availability:** Diameter (mm): 1,6**Welding positions:** DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

08/08/Eb/0

Group 4

Filler rods for TIG welding and gas welding

- a) Welding of low and medium alloyed steels
- b) Welding of stainless and heat-resisting steels
- c) Welding of copper and copper alloys
- d) Welding of aluminium and aluminium alloys, titanium

a) Welding of low and medium alloyed steels

Type	DIN EN1668 / DIN 8559	Page
A 100 W	W425 W3 Si 1 / WSG 2 DIN EN12070 / DIN 8575	181
A 103 NW	W Mo Si / SG Mo	182

b) Welding of stainless and heat-resisting steels

Type	DIN EN12072 / DIN 8556	Page
A 1107 W	G 18 8 Mn 11 / SG-X 15 Cr Ni Mn 18 8	183
A 1120 W	G 19 9 L11 / SG-X 2 Cr Ni 19 9	184
A 1121 W	G 19 12 3 L11 / SG-X 2 Cr Ni Mo 19 12 DIN EN ISO18274 / DIN1736	185
A 521 W	S Ni 6082(NiCr20Mn3Nb) / SG-NiCr20Nb	186

c) Welding of copper and copper alloys

Type	DIN EN 14640 / DIN 1733	Page
A 200 W	S Cu 1897 (CuAg1) / G / SG-Cu Ag	187
A 200 SW	S Cu 1898 (CuSn1) / G / SG-Cu Sn	188
A 202 W	S Cu 6560 (CuSi3Mn1) / SG-Cu Si 3	189
A 207 W	SG-Cu Si 2 Mn	190
A 203/6 W	S Cu 5180 (CuSn6P) / G / SG-Cu Sn 6	191
A 203/12 W	S Cu 5410 (CuSn12) / G / SG-Cu Sn 12	192
A 215/8 W	S Cu 6100 (CuAl8) / SG-Cu Al 8	193
A 216 W	S Cu 6327 (CuAl8Ni2) / SG-Cu Al Ni 2	194
A 512/30 W	S Cu 7158 (CuNi30) / SG-Cu Ni 30 Fe	195

d) Welding of aluminium and aluminium alloys, titanium

Type	DIN EN 18273 / DIN 1732	Page
A 400 Ti W	S Al 1450 (Al 99,5 Ti) / SG-Al 99,5 Ti	196
A 402 W	S Al 5754 (AlMg3) AG-Al Mg 3	197
A 404 W	S Al 5356 (AlMg5Cr(A)) / AG-Al Mg 5	198
A 404 /4,5 W	S Al 5183 (AlMg 4,5 Mn(A)) / SG-Al Mg 4,5 Mn	199
A 404 /4,5 ZR W	S Al 5087 (AlMg4,5MnZr) / SG-Al Mg 4,5 Mn Zr	200
A 405 W	S Al 4043 (AlSi5) / SG-Al Si 5	201
A 407 W	S Al 4047 (AlSi12) / SG-Al Si 12	202
A 411	DIN 1729: SG - Mg Al 6 Zn ISO 24034 / DIN 1737	203
A 850	S Ti 0120 (Ti 99,6) / SG-Ti 2	204

e) Welding of wear-resisting surface coatings

Type	DIN EN 14700 / DIN 8555	Page
A 711 W	S Fe 1 / G / WSG 6-60	205
A 721	T Fe 20 / G 21 - 70 Füllstab	206
A 727	S Ni 3 / G / WSG 22 - 60 - CTZ	207

FONTARGEN A 100 W

Manganiferous filler rod for TIG welding



DIN EN 1668: W 42 5 W3 Si1
 AWS A 5.18: ER 70 S-6
 Material-no.: 1.5125

Composition, typical analysis (% w/w):

C	Si	Mn
0,08	0,85	1,5

Characteristics / Applications:

Joint welding of unalloyed and low-alloyed steel.

Base materials:

Boiler plates: P235GH, P265GH, P295GH, P355GH;
 Fine-grained construction steels: up to S420N.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Tensile strength: 560 N/mm²
 Elongation limit: 450 N/mm²
 Elongation: 25 %
 Impact energy: 130 J

Welding process:

TIG

Shielding gas (DIN EN 439):

I 1 (argon)

Current mode:

Direct current (-pole)

Availability:

Diameter (mm): 1,6/2,0/2,4/3,0
 Length (mm): 1000

Approvals:

TÜV

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/ELy/O

FONTARGEN A 103 NW

Molybdenum low-alloyed filler rod

DIN EN 1668: W 2 Mo
AWS A 5.28: ER 80 S - G
Material-no.: 1.5424

Composition, typical analysis (% w/w):

C	Si	Mn	Mo
0,10	0,6	1,15	0,5

Characteristics / Applications:

Joint welding of unalloyed and low-alloyed steels used in steam boilers, apparatuses and conduits of pipe constructions.

Base materials:

Boiler plates: P235GH, P265GH, P295GH, 16 Mo 3, 17 MnMoV 64, 15 NiCuMoNb 5, 20 MnMoNi 55
Fine-grained constructions steels: up to S460N
Tubular steels: St 35, St 45, St 38.5, St 45.8.

Mechanical properties of pure welding deposit

(Min. values of room temperature):

Tensile strength: 570 N/mm²
Elongation limit: 480 N/mm²
Elongation: 23 %
Impact energy: 110 J

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,0/1,6/2,0/2,4/3,0
Length (mm): 1000

Approvals: TÜV

Welding positions: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 1107 W

Cr-Ni-Mn welding rod for TIG welding

FONTARGEN

DIN EN 18274: W 18 8 Mn 11
AWS A 5.9: ER 307 (mod.)
Material-no.: 1.4370

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni	Fe
0,08	0,8	7,0	19,0	8,5	Remainder

Characteristics / Applications:

For very tough and crack-resistant welds. Welding of heat treatable steels, armoured plates, austenitic non-corrosive manganese steels and heat-resistant steels as well as austenitic on ferritic steels at a max. working temperature of 300°C. The fully austenitic welding deposit is scale-resistant up to 850°C.

Base materials:

TÜV-approved base materials X10CrNiMoNb18-12 (1.4583) and if included with ferritic steels up to boiler plate P295GH.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Tensile strength: 600 N/mm²
0,2 %-limit: 320 N/mm²
1,0 %-limit: 350 N/mm²
Elongation: 40 %
Impact energy: 100 J
Hardness (BHN): 200 HV

Welding process: TIG

Shielding gas (DIN EN 439): I1 (argon), helium or
Ar/He- mixture

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,2/1,6/2,0/2,4/3,0
Length (mm): 1000

Approvals: TÜV

Welding positions: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 1120 W

Cr-Ni-Mn welding rod

FONTARGEN

DIN EN 12072: W 19 9 L
AWS/A 5.9: ER 308 L
Material-no.: 1.4316

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni
< 0,025	< 0,65	2,0	20,0	10

Characteristics / Applications:

Joint welding and build-up welding of rustproof, austenitic Cr-Ni steels. For operating temperatures of -196°C to +350°C. Scale-resistant (up to 800°C) to air and oxygenating combustion gases. Joint welding of ferritic Cr steels (up to a max. of 18% Cr). If under influence of sulphide gases, only root and intermediate beads. Good resistance to nitric acids.

Base materials:

TÜV-approved base materials X5CrNi18-10 (1.4301), X2CrNiN18-10 (1.4311), X6CrNiNb18-10 (1.4550)

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Tensile strength: 550 N/mm²
0,2 %-limit: 320 N/mm²
1,0 %-limit: 350 N/mm²
Elongation: 35 %
Impact energy: 75 J
Hardness: 160 HV

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,0/1,6/2,0/2,4/3,0/4,0
Length (mm): 1000

Approvals: TÜV

Welding positions: According to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 1121 W

Cr-Ni-Mo welding rod

FONTARGEN

DIN EN 12072: W 19 12 3 L
AWS A 5.9: ER 316 L
Material-no.: 1.4430

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni	Mo
< 0,03	< 0,65	1,7	18,8	12,5	2,8

Characteristics / Applications:

Welding rod made of austenitic Cr-Ni-Mo steel with exceptionally low carbon content for TIG welding of corrosion-resistant and low-temperature austenitic steels.

Austenitic welding deposit with 4 - 8% ferrite content. Suited for operating temperatures of -120°C up to +400°C (TÜV identification sheet). High resistance to granular corrosion due to the low carbon content. Highly polished welding deposit.

Base materials:

TÜV-approved base materials X10CrNiMoNb18-12 (1.4583)

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Tensile strength: 550 N/mm²
0,2 %-limit: 320 N/mm²
1,0 %-limit: 350 N/mm²
Elongation: 35 %
Impact energy: 70 J
Hardness: 160 HV

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,2/1,6/2,0/2,4/3,2
Length (mm): 1000

Approvals: TÜV

Welding positions: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/EB/0

FONTARGEN A 521 W

Nickel-Chrome welding rod

FONTARGEN

EN ISO 18274:	S Ni 6082 (NiCr20Mn3Nb)
AWS A 5.18:	ER Ni Cr - 3
Material-no.:	2.4806

Composition, typical analysis (% w/w):

C	Mn	Fe	Si	Cr	Nb	Ni
<0,03	2,8	<2,0	<0,3	19,5	2,5	>67,0

Characteristics / Applications:

Joint welding on pressure tanks, construction of boilers, fittings, machines and apparatuses. Joint welding of a range of different alloyed materials (including low- and medium-alloyed). Joint welding on low-temperature nickel steels.

High- and low-temperature, corrosion-resistant alloy with good resistance to thermal shocks. Suitable for working temperatures of -269°C to +1000°C. TÜV-approved range: from -269°C to +550°C.

Particularly well suited to thermally loaded black and white joints of over 300°C, to avoid the diffusion of carbon.

Base materials:

TÜV-approved base materials X10NiCrAlTi32-20 (1.4879), NiCr15Fe (2.4816), X8Ni9 (1.5662), 10CrMo9-10,

Mixed assemblies between X10CrNiMoNb18-12 (1.4583), X1NiCrMoCu25-20-5 (1.4539) and ferritic boiler plates.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Tensile strength:	620 N/mm ²
0,2 %-limit:	380 N/mm ²
1,0 %-limit:	420 N/mm ²
Elongation:	35 %
Impact energy:	90 J
Hardness:	160 HV

Welding process:

TIG

Shielding gas (DIN EN 439):

I 1 (argon); I 3 (Ar/He mixture)

Welding current:

Direct current (-pole)

Availability:

Diameter (mm): 1,6/2,0/2,4/3,2
Length (mm): 1000

Approvals:

TÜV

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 200 W

Copper welding rod



EN 14640:	S Cu 1897 (CuAg1)
DIN 1733:	G/SG - Cu Ag
AWS A 5.7:	ER Cu
Material-no.:	2.1211

Composition, typical analysis (% w/w):

Ag	P	Mn	Cu
1,0	0,02	0,1	Remainder

Characteristics / Applications:

Joint and build-up welding on copper, for example material numbers: 2.0040 (OF-Cu), 2.0060 (E-Cu 57), 2.0070 (SE-Cu), 2.0090 (SF-Cu), 2.0110 (SD-Cu), 2.0150 (SB-Cu), 2.0170 (SA-Cu), 2.1202 (Cu Ag), plates, profiles, containers. Suited for copper pipe installations in accordance with DVGW work sheet GW 2.

Preheat large work pieces to 350°C – 600°C; use Ar-He inert-gas mixture if necessary.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range:	1070 – 1080°C
Tensile strength:	200 N/mm ²
Yield strength (0,2%):	80 N/mm ²
Elongation (l=5d):	30 %
Hardness (BHN):	60 HB
Impact energy:	75 J
Heat conductivity:	220 – 315 W/m • K
Electrical conductivity (20°):	44 – 46 Sm/mm ²
Thermal elongation:	17,7 • 10 ⁻⁶ /K
Specific gravity:	8,9 kg/dm ³

Welding process:

TIG, gas welding

Shielding gas (DIN EN 439):

I 1 (argon)
I 3 (argon/helium mixture)

Flux:

F 100 (Paste) at preheating to > 300°C

Current mode:

DC (-pole)

Availability:

Diameter (mm): 1,6/2,0/2,4/3,2
Length (mm): 1000

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 200 SW

Copper-fin welding rod



EN 14640:	S Cu 1898 (CuSn1)
DIN 1733:	G/SG - Cu Sn
AWS A 5.7:	ER Cu
Material-no.:	2.1006

Composition, typical analysis (% w/w):

Sn	Si	Mn	P	Cu
0,8	0,3	0,3	0,01	Remainder

Characteristics / Applications:

Joint and build-up welding on copper and copper alloys of material numbers: 2.0040, 2.0060, 2.0070, 2.0080, 2.0090, 2.0100, 2.0120, 2.0150, 2.0170, 2.1202, 2.1322, 2.1325, 2.1491. Suitable for copper pipe installations according to DVGW work sheet GW 2. The base materials in the welding spheres should be cleaned and preheated if over 3mm (per mm of plate thickness approx. 100°C, but not over 600°C). For preheating temperatures of over 300°C, flux should be used.

Mechanical properties of pure welding deposit (Min. values at room temperature):

Melting range:	1020 – 1050°C
Tensile strength:	200 N/mm ²
Elongation (l=5d):	30 %
Hardness (BHN):	60 HB
Impact energy:	75 J
Heat conductivity:	120 – 145 W/m • K
Electrical conductivity (20°):	15 – 20 Sm/mm ²
Thermal elongation:	18 • 10 ⁻⁶ /K

Welding process:

TIG, gas welding

Shielding gas (DIN EN 439):

I 1 (argon)
I 3 (argon/helium mixture)

Flux:

F 100 (Paste) at preheating >300°C

Current mode:

Direct current (-pole)

Availability:

Diameter (mm): 1,6/2,0/2,4/3,2
Length (mm): 1000

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/EB/0

FONTARGEN A 202 W

Copper-silicon welding rod

EN 14640: S Cu 6560 (CuSi3Mn1)
 AWS A 5.7: ER Cu Si - A
 Material-no.: 2.1461

Composition, typical analysis (% w/w):

Si	Sn	Zn	Mn	Fe	Cu
2,85	0,1	0,1	1,0	0,1	Remainder

Characteristics / Applications:

High temperature- and corrosion resistance as well as good behaviour to compression stress. Thanks to high silicon content liquid welding deposit that results in flat seams. Joint and build-up welding on copper alloys of material numbers 2.0853, 2.0855, 2.0857, 2.1243, 2.1245, 2.1247, 2.1265, 2.1266, 2.1267, 2.1270, 2.1285, 2.1322, 2.1323, 2.1363, 2.1366, 2.1522, 2.1525, 2.1545, 2.1546, brass as well as build-up welding on unalloyed or low-alloyed steels and cast iron. To avoid hot cracks keep welding pool small, and feed fast. Preheat thick workpieces to 350 - 600°C.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range: 910 - 1025°C
 Tensile strength: 350 N/mm²
 Yield strength: 120 N/mm²
 Elongation (l=5d): 40 %
 Thermal elongation: 18 p 10⁻⁶/K
 Hardness (Brinell): 85 - 100 HB
 Electrical conductivity: 3 - 4 Sm/mm²
 Heat conductivity: 35 W/m K
 Specific gravity: 8,5 g/cm³

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,6/2,0/2,4/3,2
 Length (mm): 1000

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 207 W

Copper-silicon-manganese welding rod

FONTARGEN

EN 14640: S Cu 6511 (CuSi2Mn1)
Material-no.: 2.1522

Composition, typical analysis (% w/w):

Si	Sn	Mn	Cu
1,8	0,2	1,0	Remainder

Characteristics / Applications:

Easy to weld. High temperature- and corrosion resistance as well as good behaviour under compression stress. Good wetting of the base material with low working temperature compared to copper. Flat seams due to silicon content. Little pore formation. Welding deposit has good modelling properties.

Welding of galvanised autobody steel sheets, other steels as well as copper, copper alloys and cast iron.

Mechanical properties of pure welding deposit (Min. values at room temperature):

Melting range: 1030 – 1050 °C
Tensile strength: 285 N/mm²
Yield strength: 140 N/mm²
Elongation (l=5d): 45 %
Hardness (Brinell): 62 HB
Electrical conductivity: 4,7-5,3 Sm/mm²
Heat conductivity: 40 W/m • K
Specific gravity: 8,7 g/cm³
Coefficient of expansion: 18,1 • 10⁻⁶/K

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,6/2,0
Length (mm): 1000

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 203/6 W

Copper-tin welding rod

FONTARGEN

EN 14640: S Cu 5180 (CuSn6P)
AWS A 5.7: ER Cu Sn - A
Material-no.: 2.1022

Composition, typical analysis (% w/w):

Sn	P	Cu
6,0	0,2	Remainder

Characteristics / Applications:

Welding of copper materials, for example copper and Sn bronze. Particularly well suited for joint welding of brass on brass or brass on other Cu alloys, (Rg), Fe materials and cast iron. Other applications include: Building-up of bearing bushes, sliding rails and repairs of tin bronze parts. For tin bronze parts of more than 8mm thickness we recommend preheating. Suitable for material numbers: 2.1010, 2.1016, 2.1020, 2.1030, 2.1050, 2.1052, 2.1056, 2.1080, 2.1086, 2.1090, 2.1096.

Corrosion- and overheating-resistant tin-bronze alloy. A203/6 W is very easily machined and produces a clear weld pool. The welding deposit is tough and non-porous.

Mechanical properties of pure welding deposit (Min. values at room temperature):

Melting range: 910 – 1040°C
Tensile strength: 330 N/mm²
Elongation (l=5d): 30 %
Hardness (Brinell): 80 HB
Electrical conductivity: 7 – 9 Sm/mm²
Thermal conductivity: 75 W/m K
Linear expansion: 18,5 • 10⁻⁶/K

Welding process: TIG, gas welding

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,6/2,0/2,4/3,2/4,0
Length (mm): 1000

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/EB/0

FONTARGEN A 203/12 W

Copper-tin welding rod

EN 14640:	S Cu 5410 (CuSn12P)
DIN 1733:	G/SG - Cu Sn 12
AWS A 5.13:	ER Cu Sn - D
Material-no.:	2.1056

Composition, typical analysis (% w/w):

Sn	P	Cu
12,0	0,2	Remainder

Characteristics / Applications:

Welding of copper materials, e.g. copper and Sn-bronze. Particularly well suited for joint welding of brass or brass on Cu alloys and Fe materials. Building-up of bearing bushes, sliding rails and repairs of phosphor bronze parts. Welding deposit very similar coloured as welding of red brass Rg 5. Suitable for material numbers: 2.1020, 2.1050, 2.1056, 2.1086, 2.1016, 2.1030, 2.1052, 2.1080.

Mechanical properties of pure welding deposit (Min. values at room temperature):

Melting range:	825 - 990°C
Tensile strength:	320 N/mm ²
Elongation (l=5d):	5 %
Hardness (BHN):	120 HB
Heat conductivity:	40 - 50 W/m • K
Electrical conductivity (20°):	3 - 5 Sm/mm ²
Linear expansion:	18,5 • 10 ⁻⁶ /K
Specific gravity:	8,6 kg/dm ³

Welding process: TIG, gas welding

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,6/2,0/2,4/3,2
Length (mm): 1000

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 215/8 W

Copper-aluminium welding rod

EN DIN 14640:	S Cu 6100 (CuAl8)
AWS A 5.7:	ER Cu Al - A1
Material-no.:	2.0921

Composition, typical analysis (% w/w):

Al	Ni	Mn	Fe	Cu
8,0	0,5	0,2	0,2	Remainder

Characteristics / Applications:

Corrosion- and seawater-resistant alloy with very good glide properties (metal-metal). A215/8 W is very easy to handle and ensures a perfect weld in the root pass and a clean top surface. The seam is smooth and non-porous.

Joint and build-up welding on aluminium-bronze, high-strength brass, steel and cast iron. For use in the machine-, chemical- as well as shipbuilding industries. Joint welding: Corrosion-resistant aluminium-bronze or high-strength brass pipework. Joining of copper conduits with steel. Joining of material numbers 2.0916, 2.0920, 2.0928. Preheat thick workpieces to 200°C. Build-up welding: Building-up of ship propellers, kid rails, running surfaces, bearings, valves, slide gates, fittings, etc.

Mechanical properties of pure welding deposit (Min. values at room temperature):

Melting range:	1030 – 1040°C
Tensile strength:	380 N/mm ²
Yield strength (0,2):	200 N/mm ²
Elongation (l=5d):	45%
Hardness (Brinell):	11 HB
Electrical conductivity:	8Sm/mm ²
Thermal conductivity:	65/m • K
Specific gravity:	7,7 g/cm ³
Linear expansion:	17 • 10 ⁻⁶ / K

Welding process:	TIG
Shielding gas (DIN EN 439):	I 1 (argon)
Current mode:	Direct current (-pole) ; Recommendation: Flux F200
Availability:	Diameter (mm): 2,0 Length (mm): 1000
Welding position:	according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

EN DIN 14640: S Cu 6327 (CuAl8Ni2)
Material-no.: 2.0922

Composition, typical analysis (% w/w):

Al	Ni	Mn	Fe	Cu
8,0	2,0	1,5	1,5	Remainder

Characteristics / Applications:

Joint and build-up welding on multi-alloyed aluminium-bronze, for example material numbers: 2.0916, 2.0920, 2.0928, 2.0932, 2.0936, 2.0940, 2.0960, 2.0962, 2.0966, 2.0970, 2.0975, 2.0978 and 2.0980. Build-up welding on steel and copper alloys. Fusion welding between steel and aluminium-bronze (also multi-alloys). Suitable for welding (MIG brazing) of aluminium surfaced and galvanised steels. For use in shipbuilding, machine, apparatus and pump construction; for example ship propellers, pump casings, valve control casings and food containers. Preheating necessary only with large workpieces. For the first run of build-up welds on ferrous base material we recommend pulsed-arc welding.

The welding deposit is saltwater- and corrosion resistant as well as wear resistant. Well suited if at the same time subjected to wear by salt water, cavitation and erosion.

**Mechanical properties of pure welding deposit
(Min. values at room temperature):**

Melting range: 1030 – 1050°C
Tensile strength: 530 N/mm²
Yield strength (0,2): 290 N/mm²
Elongation (l=5d): 30 %
Impact energy (ISO-V): 70 J
Hardness (Brinell): 140 HB
Electrical conductivity: 5 Sm/mm²
Thermal conductivity: 58 W/m • K
Linear expansion: 17 • 10⁻⁶ / K

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)
Recommendation : using of flux F200

Availability: Diameter (mm): 2,0
Length (mm): 1000

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 512/30 W

Copper-nickel welding rod



EN 14640: S Cu 7158 (CuNi30)
 Material-no.: 2.0837

Composition, typical analysis (% w/w):

Ni	Fe	Mn	Si	Ti	Cu
30	0,5	1,0	0,1	0,3	Remainder

Characteristics / Applications:

Corrosion- and saltwater-proof alloy. A 512/30 W is very easily machined. The weld pool is clean. The welding deposit is tough and non-porous.

Joint and build-up welding on copper-nickel alloys up to a Ni content of 30%. Material numbers 2.0806, 2.0812, 2.0818, 2.0822, 2.0830, 2.0836, 2.0842, 2.0862, 2.0872, 2.0878, 2.0882, 2.0890, 2.1972. In the shipbuilding and chemical industries, e.g. containers, condenser tubes, radiators, heat exchangers, etc. For welds with unalloyed materials buffer the edges of the weld seam of the unalloyed base metal with a suitable filler material, e.g. WSG-NiCu 30 Ti = FONTARGEN A 511 W.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range: 1180 – 1240°C
 Tensile strength: 380 N/mm²
 Yield strength (0,2): 200 N/mm²
 Elongation (l=5d): 30 %
 Thermal elongation: 16 p 10⁻⁶/K
 Impact energy: 100 J
 Electrical conductivity: 3 Sm/mm²
 Heat conductivity: 35 W/m • K

Welding process:

TIG

Shielding gas (DIN EN 439):

I 1 (argon); I 3 (Ar-H₂-mixture)

Current mode:

Direct current (+pole)

Availability:

Diameter (mm): 1,6/2,0/2,4/3,2
 Length (mm): 1000

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Elb/0

FONTARGEN A 400 Ti W

Aluminium welding rod

EN ISO 18273: S Al 1450 (Al 99,5 Ti)
DIN 1732: SG – Al 99,5 Ti
Material-no.: 3.0805

Composition, typical analysis (% w/w):

Fe	Si	Cu	Zn	Ti	Al
0,4	0,2	0,05	0,05	0,1	Remainder

Characteristics / Applications:

Aluminium alloy with good fluidity. Weldable in all positions. The Ti-content ensures a grain refinement of the welding deposit. Joint welding of base materials: Al 98; Al 99; Al 99,5; E Al; Al 99,8 und Al 99,7. For plates thicker than 15mm preheat to a min. of 150°C.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range: 647 – 658°C
Tensile strength: 65 N/mm²
Yield strength (0,2%): 20 N/mm²
Elongation (l=5d): 35 %
Electrical conductivity: 34 Sm/mm²
Specific gravity: 2,71 g/cm³

Welding process: WIG

Shielding gas (DIN EN 439): I 1 (argon)
I 3 (argon/helium mixture)

Current mode: Alternating current

Availability: Diameter (mm): on request
Length (mm): 1000

Welding positions: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 402 W

Aluminium welding rod

FONTARGEN

EN ISO 18273:	S Al 5754 (Al Mg 3)
DIN 1732:	SG – Al Mg 3
AWS A 5.10:	ER 5754
Material-no.:	3.3536

Composition, typical analysis (% w/w):

Mg	Mn	Fe	Si	Cr	Ti	Al
3,0	0,3	0,2	0,2	0,1	0,1	Remainder

Characteristics / Applications:

Corrosion- and saltwater-proof alloy. Easily anodised. Welding of rolled and cast aluminium-magnesium alloys e.g. Al Mg 3, Al Mg Mn, Al Mg 1, Al Mg 2, Al Mg Si 0,5, Al Mg Si 0,8, G-Al Mg 3, G-Al Mg 3 (Cu), G-Al Mg 3 Si. Manufacturing of containers, aluminium constructions, constructions of vehicles, ship building, window and door frames. Plates thicker than 15mm must be preheated to approx. 150°C – 200°C.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range:	615 – 642°C
Tensile strength:	190 N/mm ²
Yield strength (0,2%):	80 N/mm ²
Elongation (l=5d):	20 %
Electrical conductivity:	20 – 23 Sm/mm ²
Specific gravity:	2,66 g/cm ³

Welding process: WIG

Shielding gas (DIN EN 439): I 1 (argon)
L 3 (argon/helium mixture)

Current mode: Alternating current

Availability: Diameter (mm): 1,6/2,0/2,4/3,2
Length (mm): 1000

Welding positions: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN A 404 W

Aluminium-magnesium welding rod



EN ISO 18273:	S Al 5356 (Al Mg 5 Cr (A))
DIN 1732:	SG - Al Mg 5
AWS A 5.10:	ER 5356
Material-no.:	3.3556

Composition, typical analysis (% w/w):

Mg	Mn	Fe	Si	Cr	Ti	Al
5,0	0,1	0,2	0,2	0,1	0,1	Remainder

Characteristics / Applications:

Corrosion- and saltwater-proof alloy. Easily anodised. Welding of rolled and cast aluminium-magnesium alloys according to DIN 1725 Bl. 1 and Bl. 2, like Al Mg 3, Al Mg 5, Al Mg Mn, Al Zn Mg 1, G-Al Mg 3/+Si/+Cu, G-Al Mg 5/+Si, G-Al Mg 10, Al Mg Si 1. Tank constructions, construction of vehicles, aluminium constructions, shipbuilding, windows, etc. For plates thicker than 15mm preheat to min. 150°C.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range:	575 - 633°C
Tensile strength:	235 N/mm ²
Yield strength (0,2%):	110 N/mm ²
Elongation (l=5d):	8 %
Electrical conductivity:	15 - 19 Sm/mm ²
Specific gravity:	2,64 g/cm ³

Welding process:

TIG

Shielding gas (DIN EN 439):

1 1 (argon)
1 3 (argon/helium mixture)

Current mode:

Alternating current

Availability:

Diameter (mm): 1,6/2,0/2,4/3,2
Length (mm): 1000

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

EN ISO 18273:	S Al 5183 (Al Mg 4,5 Mn 0,7 (A))
DIN 1732:	SG – Al Mg 4,5
AWS A 5.10:	ER 5183
Material-no.:	3.3548

Composition, typical analysis (% w/w):

Mg	Mn	Fe	Si	Cr	Ti	Al
4,5	0,7	0,2	0,2	0,1	0,1	Remainder

Characteristics / Applications:

Filler metal for joints that have high demands of toughness. The welding deposit has a good resistance to atmospheric influences and sea water. Joint welding on rolled and cast aluminium-magnesium alloys, e.g. Al Mg 4,5 Mn, Al Mg 5, Al Zn 4,5 Mg 1, G-Al Mg 3/+Si/+Cu, G-Al Mg 5/+Si, G-Al Mg 10, Al Mg Si 1. For plates thicker than 15mm preheat to min. 150°C.

**Mechanical properties of pure welding deposit
 (Min. values at room temperature):**

Melting range:	574 – 638°C
Tensile strength:	275 N/mm ²
Yield strength (0,2%):	125 N/mm ²
Elongation (l=5d):	17 %
Electrical conductivity:	16 – 19 Sm/mm ²
Specific gravity:	2,66 g/cm ³

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)
 I 3 (argon/helium mixture)

Current mode: Alternating current

Availability: Diameter (mm): 1,6/2,0/2,4/3,2
 Length (mm): 1000

Approval: DB (61.046.02/QS)

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Elb/0

FONTARGEN A 404/4,5 ZR W

Aluminium-magnesium welding rod

FONTARGEN

EN ISO 18273:	S Al 5087 (Al Mg 4,5 Mn ZR)
DIN 1732:	SG – Al Mg ZR
AWS A 5.10:	ER 5087
Material-no.:	3.3546

Composition, typical analysis (% w/w):

Mg	Mn	Fe	Si	Cr	Ti	Zr	Al
4,7	0,9	0,2	0,1	0,1	0,1	0,15	Remainder

Characteristics / Applications:

Zirconic welding deposit for joints of very high toughness. The welding deposit has a good resistance to atmospheric influences and sea water. Joint welding on rolled and cast aluminium-magnesium alloys, e.g. Al Mg 4,5 Mn, Al Mg 5, Al Zn 4,5 Mg 1, G-Al Mg 3/+Si/+Cu, G-Al Mg 5/ +Si, G-Al Mg 10, Al Mg Si 1. For plates thicker than 15mm preheat to 150°C.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range:	574 – 638°C
Tensile strength:	275 N/mm ²
Yield strength (0,2%):	125 N/mm ²
Elongation (l=5d):	27 %
Electrical conductivity:	17 – 19 Sm/mm ²
Specific gravity:	2,66 g/cm ³

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)
I 3 (argon/helium mixture)

Current mode: Alternating current

Availability: Diameter (mm): on request
Length (mm): 1000

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

EN ISO 18273:	S Al 4043 (Al Si 5)
DIN 1732:	SG – Al Si 5
AWS A 5.10:	ER 4043
Material-no.:	3.2245

Composition, typical analysis (% w/w):

Fe	Si	Cu	Ti	Al
0,5	5,2	0,1	0,1	Remainder

Characteristics / Applications:

Al-Si alloy with good fluidity. Welding on pure aluminium without surface-melting the base material is possible. Discolouring when anodised.

Welding of Al Si 5, Al Mg Si 0,5, Al Mg Si 0,8, Al Mg Si 1. Al and Al alloys with an alloy content of max. 7%. Plates thicker than 15mm preheat to 150°C.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range:	573 – 625°C
Tensile strength:	120 N/mm ²
Yield strength (0,2%):	40 N/mm ²
Elongation (l=5d):	8 %
Electrical conductivity:	24 – 32 Sm/mm ²
Heat conductivity:	170 W/m • K
Specific gravity:	2,68 g/cm ³
Linear expansion:	22,1 • 10 ⁻⁶ /K

Welding process: TIG, gas welding

Shielding gas (DIN EN 439): I 1 (argon)
I 3 (argon/helium mixture)

Current mode: Alternating current

Flux: For gas welding use flux F 400 M (powder, corrosive, low melting point).

Availability: Diameter (mm): 1,6/2,0/2,4/3,2
Length (mm): 1000

Approval: DB (61.046.01/QS)

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/EB/0

EN ISO 18273:	S Al 4047 (Al Si 12 (A))
DIN 1732:	SG – Al Si 12
AWS A 5.10:	ER 4047
Material-no.:	3.2585

Composition, typical analysis (% w/w):

Si	Fe	Mn	Cu	Zn	Ti	Al
12,0	0,5	0,1	0,1	0,1	0,1	Remainder

Characteristics / Applications:

Al-Si alloy with good fluidity. Not suitable for joints that are subsequently anodised, since the seam turns grey. Al-Si cast alloys with more than 7% weight content of silicon. In special cases also Al and Al alloys with less than 2% alloying elements. Tank construction, air-conditioning equipment, household articles, plates, pipes, profiles. Preheat thick plates and large workpieces to approx. 150°C – 200°C.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range:	573 – 585°C
Tensile strength:	130 N/mm ²
Yield strength (0,2%):	60 N/mm ²
Elongation (l=5d):	5 %
Electrical conductivity:	17 – 27 Sm/mm ²
Specific gravity:	2,65 g/cm ³

Welding process: TIG, gas welding

Shielding gas (DIN EN 439): I 1 (argon)
I 3 (argon/helium mixture)

Current mode: Alternating current

Availability: Diameter (mm): 1,6/2,0/2,4/3,2
Length (mm): 1000

Welding position: according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

AWS A 5.10:	ER AZ 61 A
AMS:	4350 F
B.S.:	1354
Material-no.:	3.5612

Composition, typical analysis (% w/w):

Al	Si	Mn	Zn	Mg
6,5	0,2	0,4	1,0	Remainder

Characteristics / Applications:

A 411 is easy to handle. The bonding is achieved without melting the base material. The welding deposit is free from cracks and pores, colour match to Mg alloys. Corrosion-resistant.

Joint and building up of magnesium and magnesium alloys. Plates, profiles, castings.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range:	594 – 610°C
Tensile strength:	180 N/mm ²
Yield strength (0,2%):	100 N/mm ²
Elongation (l=5d):	5 %
Hardness:	50 – 55 HB

Sources of heat:

Oxyacetylene torch and TIG procedure

Shielding gas (DIN EN 439):

I 1 (argon)

Current mode:

Alternating current

Fluxes:

F 400 (powder, corrosive)
F 400 M (powder, corrosive, low melting point)

Availability:

Diameter (mm): 3,0
Length (mm): 914

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/EB/0

FONTARGEN A 850

Titanium welding rod

FONTARGEN

AWS A 5.16-90:

ER Ti 2 / ER Ti 3

Material-no.:

3.7036

Composition, typical analysis (% w/w):

C	N	Fe	O	H	Ti	Ti
0,08	0,05	0,1	0,15	0,013	0,1	Remainder

Characteristics / Applications:

Welding of pure titanium, e.g. 3.7035, titanium degree 2 and 3. At comparatively low temperatures titanium and titanium alloys are already reacting to atmospheric gases. It is necessary to obtain absolute cleanliness while welding. By using suitable welding equipment it has to be guaranteed that the whole welding spot, the seam up-side, as well as the root side and the edge zones are protected from air; even during cooling down to less than 300°C. For argon welding choose conditions to ensure a metallic clean welding seam. Annealing colours like blue or yellow are also tolerable in some cases. Hardening and brittleness at the welding seam are a result of absorption of impurities. Thorough cleaning of the welding seam, edge zones as well as welding filler before welding is essential. Cut off brittle wire. The hardness of the welding seam has to be checked after welding. The hardening should not exceed 50 Brinell compared to the base material. Stress-relief annealing heat treatment after welding is not required, if higher residual welding stresses are to be expected due to material thickness or construction. Unalloyed titanium quality with medium hardness and good elongation.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Tensile strength: 390 N/mm²

Elongation limit (0.2%): 250 N/mm²

Breaking elongation: 20 %

Hardness (weld seam): 120 HB

Welding process:

TIG and plasma welding with pure argon
99,998 - 99,999 % dew-point under -50°C

Welding current:

Direct current (-pole)

wire diameter: 1.5 mm 35 – 60 ampere*

wire diameter: 1.5 mm 70 – 80 ampere*

*depends on thickness of plate

Gas consumption:

For TIG arc: 12 – 14 l/min.

Backing strip: 1 – 2 l/min.

Availability:

Diameter (mm): 1,0/1,6/2,0/2,4/3,0

Length (mm): 1000

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

06/08/Elb/0

FONTARGEN A 711 W

Welding rod for hardfacing

FONTARGEN

EN 14700: S Fe 2
Material-no.: 1.4718

Composition, typical analysis (% w/w):

C	Mn	Cr	Si	Fe
0,45	0,40	9,5	3,25	Remainder

Characteristics / Applications:

Welding of tough, abrasion-proof depositions that will be subject to impacts. Suited to repairs and the manufacturing of cutting, deep-drawing and stamping tools made of low- to high-alloyed steel in tool manufacture (automobile industry). Also suited to depositions on injection moulding tools. Wear-proof, tough build-up alloy with crack-free and non-porous welding deposit. Can only be processed by grinding.

Heat treatment:

Soft annealing: 780 – 820°C
Hardening: 1020 – 1070°C
Tempering: 720 – 820°C/2h/water or air

Mechanical properties of pure welding deposit (Min. values at room temperature):

Hardness in welding condition: 54 - 60 HRC
Hardened: 61 HRC

Welding process: TIG

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 1,6/2,0/2,4/3,0
Length (mm): 1000

Welding positions: according DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

EN 14700:	T Fe 20
A 721 F	= fine grain/70-120 mesh (0,2-0,12 mm)
A 721 M	= medium grain/30-40 mesh (0,58-0,42mm)
A 721 G	= coarse grain/10-30 mesh (1,68-0,58 mm)

Composition, typical analysis (% w/w):

WC	Fe
60	Remainder

Characteristics / Applications:

For the armour-plating of unalloyed and low-alloyed steel or cast steel to a max. of 0,5 % C. Depositions on parts that are subjected to strong frictional wear. Wearing parts in coal, coke and slag processing plants, percussion drill bits, break bits, roller bits, mill crushers as well as parts subjected to a high amount of wear that must retain non-slippery edges. Building industry, petroleum industry, cooking plants, coal mines and mining industry. Welding: Hold burner flat. Heat workpiece to light red colour and melt off tip of rod. Work from right to left.

Tough, wear proof build-up alloy in which the very hard tungsten-carbide grains are embedded in a tough base material. Regular distribution of the tungsten-carbide grain during welding will produce deposits with smooth surfaces. Depending on the type of alloy and size of the workpiece we recommend preheating from 350-500°C. Joining with the base metal almost without mixing.

Mechanical properties of pure welding deposit
(Min. values at room temperature):

Hardness of the tungsten carbide: 1700 – 2200 HV_{0,1}

Hardness of the matrix: 110 – 150 HB

Heat sources: Acetylene torch, neutral to acetylene excess

Flux: F 120 (Powder)

Availability: Diameter (mm): 3,5 / more on request
Length (mm): 350/700

FONTARGEN A 727

Welding rod for hard surfacing



EN 14700: S Ni 3
AWS: R Ni Cr-C

Composition, typical analysis (% w/w):

C	Si	Cr	Fe	B	Ni
0,5	4,0	13,5	4,0	3,5	Remainder

Characteristics / Applications:

Suitable for build-up welding on alloyed and unalloyed steel and parts made of cast iron which are exposed to intensive wear and corrosion, e.g. valves and valve seats in combustion engines, steam pipes, conveyor bands for cement, cams, pump shafts, stirrers and mixer blades, glass moulds, slide valves, fan blades and workpieces which, depending upon size and shape, have to be preheated to 400-500°C. Warm-hard and hot oxide resistant, nickel-based alloys. Highly resistant to metal-metal wear. The weld metal deposit can be hot moulded at temperatures of 1.050-1.100°C.

Mechanical properties of pure welding deposit

(Min. values at room temperature):

Melting range: 950 – 1.090°C
Hardness: 56 – 62 HRC
Specific gravity: 7 – 8 g/cm³

Heat sources: Oxyacetylene torch, TIG

Flux: F 120 (Powder), only in connection with larger build-up deposits with an oxyacetylene torch.

Shielding gas (DIN EN 439): I 1 (argon)

Current mode: Direct current (-pole)

Availability: Diameter (mm): 5,0
Length (mm): 1.000

Welding positions: according to DIN EN 287

PA	PB	PC	PD	PE	PF 45°	PG
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

Group 5

Stick electrodes

- a) Welding of unalloyed steels
- b) Welding of stainless and heat-resisting steels
- c) Welding of cast iron
- d) Welding of wear-resisting coatings
- e) Gouging and cutting

a) Welding of unalloyed steels

Type	DIN EN499 /DIN1913	Page
FE 1001	E 38 2 RB 12 / E 43 33 RR (B) 7	211
FE 1004	E 42 0 RR 12 / E 51 22 RR 6	212
FE 1010	E 42 0 RC 11 / E 51 22 R (C) 3	213
FE 1013	E 42 3 B 12 H 10 / E 51 43 B (R) 10	214
FE 1018	E 46 0 RC 11 / E 51 22 R (C) 3	215

b) Welding of stainless and heat-resisting steels

Type	DIN EN 1600 / DIN 8556	Page
E 106	E 29 9 R 12 / E 29 9 R 23	216
E 1107	E 18 8 Mn 6 R 26 / E 18 8 Mn R 12	217
E 1124	E 19 9 LR 12 / E 19 9 LR 23	218
E 1125	E 10 12 3 LR 12 / E 19 12 3 LR 23	219
E 126	E 2520 R 12 / E 2520 R 26	220
E 138 Mo	E 23 12 2 LR 12 / E 23 13 2 LR 23	221
	EN ISO14172 / DIN1736	
E 521	E Ni 6082 / EL-Ni Cr 19 Nb	222

c) Welding of cast iron

Type	DIN 8573	Page
E 114	E Ni BG 12	223
E 116 BM	E-Ni Fe 1-BG 22	224

d) Welding of wear-resisting coatings

Type	DIN EN 14700 / DIN 8555	Page
E 711	E Fe 2 / E 6-UM-60	225
E 726/60	E Co 3 / E 20-UM-55-CRSTZ	226

e) Gouging and cutting

Type	Page
E 901	227
E 903	228

DIN EN 499:	E 38 2 RB 12
ISO 2560:	E 43.4 RR 22
AWS A 5.15:	E 6013

Composition, typical analysis (% w/w):

C	Mn	Si	Fe
0,08	0,55	0,20	Remainder

Characteristics / Applications:

Rutile-basic electrode. Particularly well suited for root welds and welds in difficult positions, e.g. in pipelines, boilers and containers. The welding deposit has high mechanical properties (good low temperature toughness).

Base materials:

S235JRG2 – S355J2; St 35, St 45, St 35.8, St 45.8; shipbuilding steels, approval level 3; pressure-vessel steels P235GH, P265GH, P295GH

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	460 N/mm ²
Limit of elasticity:	380 N/mm ²
Elongation:	22 %
Impact energy:	50 J

Current mode:

Direct current (-pole), alternating current

Welding current:

Ø mm	Ampere
2,5 x 350	60 – 100
3,2 x 350	90 – 135

Approval:

TÜV; DB (10.046.04/QS) G.L.

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Elb/0

DIN EN 499:	E 42 0 RR 12
ISO 2560:	E 42 0 RR 12
AWS/A 5.15:	E 6013

Composition, typical analysis (% w/w):

C	Mn	Si	Fe
0,08	0,55	0,35	Remainder

Characteristics / Applications:

All-purpose rutile stick electrode. Weldable in all positions, except downwards. Applicable for welding with small transformers open-circuit voltage (42 V).

Base materials:

S235JRG2 – S355J2; St 35, St 45, St 35.8, St 45.8; boiler plates P235GH, P265GH, P295GH; fine-grained construction steels up to P355N and M-Qualities

Mechanical and physical analysis in accordance to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	510 N/mm ²
Elongation limit:	420 N/mm ²
Elongation:	22 %
Impact energy:	60 J

Current mode:

Direct current (-pole), alternating current

Welding current:

Ø mm	Ampere
2,0 x 250	
2,5 x 350	60 – 100
3,2 x 350	85 – 140
4,0 x 350	130 – 200

Approval:

TÜV; DB (10.046.07/QS); G.L.

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

DIN EN 499:	E 42 0 C 11
ISO 2560:	E 51.3 R 12
AWS A 5.15:	E 6013

Composition, typical analysis (% w/w):

C	Mn	Si	Fe
0,09	0,50	0,35	Remainder

Characteristics / Applications:

All-purpose rutile cellulose-coated stick electrode. Vertical-down welding applicable. Excellent welding properties. Well suited for welding on production-coated sheets (approx. 40 my). Good weldability on small transformers (42 V).

Base materials:

S235JRG2 – S355J2; GS-38; GS-45, St 35, St 45, St 35.8; boiler plates P235GH, P265GH, P295GH; Shipbuilding steels approval level 3; fine-grained construction steels up to P355N; Concrete steels (ribbed reinforcing steel).

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	510 N/mm ²
Limit of elasticity:	420 N/mm ²
Elongation:	22 %
Impact energy:	50 J

Current mode:

Direct current (-pole), alternating current

Welding current:

∅ mm	Ampere
2,5 x 350	60 – 90
3,2 x 350	90 – 140
4,0 x 350	150 – 190
5,0 x 350	190 – 240

Approval:

TÜV; DB (10.046.01/QS); G.L.

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

06/08/Eb/0

DIN EN 499:	E 42 3 B 12
ISO 2560:	E 51.4 B 23 (H)
AWS A 5.15:	E 7016

Composition, typical analysis (% w/w):

C	Mn	Si	Fe
0,06	1,05	0,65	Remainder

Characteristics / Applications:

Basic coated electrode. Applicable for industry and handcraft for installation-workshops and repair welding. Weldable on direct and alternating current in all positions, besides downwards. Good root and out-of-position welding. Good weldability on small transformers (42 V). Redrying: 2h at 250 – 300°C.

Base material:

S235JRG2 – S355J2, boiler plates P235GH, P265GH, P295GH, P355GH; Fine-grained construction steels up to S355N; tubular steels St 35, St 35.8, L210 – L360NB, GS-52, L290MB – L360MB

Mechanical and physical analysis according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	510 N/mm ²
Elongation limit:	420 N/mm ²
Elongation:	22 %
Impact energy:	55 J

Current mode:

Direct current (+pole or -pole), alternating current

Welding current:

Ø mm	Ampere
2,5 x 350	60 – 90
3,2 x 350 (450)	95 – 150
4,0 x 450	140 – 190
5,0 x 450	190 – 250

Approval:

TÜV; DB (10.046.02/QS)

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Elb/0

DIN EN 499:	E 42 0 C 11
ISO 2560:	E 51.3 R 12
AWS A 5.15:	E 6013

Composition, typical analysis (% w/w):

C	Mn	Si	Fe
0,09	0,50	0,35	Remainder

Characteristics / Applications:

All-purpose rutile cellulose coated stick electrode. Applicable for vertical-down welding. Excellent igniting and gap-bridging properties. Well suited for welding on production-coated sheets (approx. 40 my). Good weldability on small transformers (42 V).

Base materials:

S235JRG2 – S355J2; GS-38; GS-45, St 35, St 45, St 35.8; boiler plates P235GH, P265GH, P295GH; shipbuilding steels approval level 2; Fine-grained construction steels up to P355N; Concrete steels (ribbed reinforcing steel).

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	510 N/mm ²
Elongation limit:	420 N/mm ²
Elongation:	22 %
Impact energy:	50 J

Current mode:

Direct current (-pole), alternating current

Welding current:

∅ mm	Ampere
2,5 x 350	60 – 90
3,2 x 350	90 – 140
4,0 x 350	150 – 190

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

06/08/Eb/0

FONTARGEN E 106

Stick electrode for welding of steels

DIN EN 1600: E 29 9 R 1 2
 AWS SFA 5.4: E 312 - 16 (mod.)
 Material-no.: 1.4337

Composition, typical analysis (% w/w):

C	Mn	Si	Cr	Ni	Fe
0,10	0,8	1,1	29,2	9,5	Remainder

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength: 750 N/mm²
 0,2 %-limit: 590 N/mm²
 Hardness: 210 BH
 Elongation: 25 %
 Impact energy: 50 J

Characteristics / Applications:

Welded joints and welded surfacing on high carbon steels, alloyed and high alloyed steels, tool steels, spring steels, manganese alloyed steels, case hardening steels, rapid steels, rail steels and cast steels. It is particularly suitable for joint welding of the above named types of steels to each other. The weld metal is crack-resistant, non-corrosive, ductile, shockproof and work-hardening. Easy arc striking, good wetting properties, flat bead shape, practically splatter-free, no undercut. Good weld ability on small transformers.

Current mode: Direct current (+pole), alternating current

Welding current:

Ø mm	Ampere
2,0 x 350	
2,5 x 250	45 - 60
2,5 x 250	55 - 75
3,2 x 350	75 - 115
4,0 x 350	100 - 145
5,0 x 350	120 - 195

Approval: DB (30.046.01/QS)

Welding position: DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

06/08/Eb/0

FONTARGEN E 1107

Austenitic Cr-Ni-Mn stick electrode



DIN EN 1600: E 18 8 Mn 6 R 26
 AWS A 5.4: E 307 - 16 (mod.)
 Material-no.: 1.4370

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni	Fe
0,10	0,6	7,0	18,5	9,0	Remainder

Characteristics / Applications:

Joint welding of high-, low-, and unalloyed steels. Welding of manganese hard steel. Joint welding of construction and high heating steels with a high carbon content. Wear resistant armouring, e.g.: rails, points, frogs and buffer layers. Austenitic electrode with high strength and elongation. Scale-resistant up to 850°C, stainless, cold tough. The welding deposit is tough, crack- and abrasion resistant.

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength: 600 N/mm²
 0,2 %-limit: 350 N/mm²
 Hardness (BHN): 200 HB
 Elongation: 40 %
 Impact energy: 100 J

Current mode: Direct current (+pole), alternating current

Welding current:

Ø mm	Ampere
2,5 x 300	45 - 82
3,2 x 350	70 - 120
4,0 x 350	110 - 150

Welding positions: in accordance to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN E 1124

Austenitic Cr-Ni stick electrode

DIN EN 1600:	E 199 LR 3 2
Material-no.:	1.4316
AWS SFA 5.4:	E 308 L - 17

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni
< 0,035	< 0,9	0,9	19,5	10,0

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	550 N/mm ²
0,2 %-limit:	320 N/mm ²
1,0 %-limit:	350 N/mm ²
Elongation:	35 %
Impact energy:	65 (20°C), > 40 (- 80°C), > 30 (- 196°C) J

Characteristics / Applications:

Austenitic rutile electrode of ELC quality for joint and build-up welding on unstabilised, corrosion-proof and cold tough 18/8 Cr-Ni steels. Joint welding of ferritic Cr steels (max. of 18% Cr), only for root and intermediate beads if exposed to sulphide corrosion. Suitable for steels of material numbers: 1.4301, 1.4306, 1.4308, 1.4311, 1.4312, 1.4371, 1.4541, 1.4543, 1.4550, 1.4552, 1.4948, 1.6900, 1.6901, 1.6902, 1.6903, 1.6905, 1.6906, 1.6907. This stick electrode is also very well suitable for power line-fed transformers and rectifiers. Works only with dry electrodes.

Austenitic welding deposit with ferrite content of 5-9%. Rustproof. Immersion corrosion-resistant at wet corrosion up to 350 °C. In air and oxygenating combustion gases scale-resistant up to 800 °C. Good resistance to nitric acids.

Current mode: Direct current (+pole), alternating current

Welding current:

Ø mm	Ampere
2,0 x 300	45 - 60
2,5 x 300	50 - 80
3,2 x 350	60 - 110
4,0 x 350	90 - 150

Approval: TÜV

Welding positions: DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/ЕБ/0

FONTARGEN E 1125

Cr-Ni-Mo stick electrode



DIN EN 1600: E 19 12 3 LR 23
 AWS A 5.4: E 316 L-17
 Material-no.: 1.4430

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni	Mo	Fe
< 0,035	< 0,9	0,9	18,5	12,5	2,8	Remainder

Characteristics / Applications:

Rutile-coated stick electrode of ELC quality for the joint and build-up welding of corrosion-proof, austenitic steels of the type 18 Cr/8 Ni, 18 Cr/ 8 Ni/Mo and 18 Cr/8 Ni/Mo + Nb. However, not suited if there is risk of sulphide corrosion. Intergranular corrosion-proof at operating temperatures of up to 400 °C.

Base materials:

TÜV qualification proof base materials X10 CrNiMoNb 18-12 (1.4583); X2 CrNiMoNb 17-13-3 (1.4429).

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength: 550 N/mm²
 0,2 %-limit: 320 N/mm²
 1,0 %-limit: 350 N/mm²
 Elongation: 35 %
 Impact energy: 60 J

Current mode:

Direct current (+pole), alternating current

Welding current:

Ø mm	Ampere
2,0 x 300	45 – 60
2,5 x 300	50 – 80
3,2 x 350	60 – 110

Approval:

TÜV

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN E 126

Austenitic, heat-resistant electrode

DIN EN 1600: E 25 20 R 12
AWS A 5.4: E 310 - 16
Material number: 1.4842

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni
0,14	0,7	2,0	26,5	21,0

Mechanical and physical properties according to DIN EN 1597-1 (Min. properties at room temperature):

Tensile strength: 340 N/mm²
Elongation limit 0,2 %: 380 N/mm
Elongation limit 1,0 %: 410 N/mm
Elongation (l = 5): 30 %
Impact energy (ISO-V): 70 J

Characteristics / Applications:

Fully austenitic, heat-resistant welding deposit. Heat-resistant up to operating temperatures of 1150°C in oxygenating, sulphur-free atmospheres.

Welding of austenitic, rustproof, high-temperature Cr-Ni-steels of the type 25 Cr/20 Ni. Electrode E 126 is also suitable for the welding of high-carbon steels as are often used in the construction industry.

Base materials: TÜV certificates materials, X 15 CrNiSi 25-20

Current mode: Direct current (+pole), Alternating current

Welding current:

∅ mm	Ampere
2,5 x 300	55 - 70
3,2 x 350	65 - 105

Welding positions: DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

08/08/Elb/0

FONTARGEN E 138 Mo

Austenitic stick electrode

DIN EN 1600:	E 23 12 2 LR 3 2
DIN 8556:	E 23 13 2 LR 23
AWS SFA 5.4:	E 309 Mo L - 17 (mod.)
Material-no.:	1.4459

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Ni	Mo
0,02	0,7	0,8	23,0	13,5	2,6

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	780 N/mm ²
0,2 %-limit:	630 N/mm ²
Elongation:	27 %
Impact energy:	55 J

Characteristics / Applications:

Special electrode for joint welding of hard to weld steels and in particular for repair welding. Welding of buffer layers on plated sheets. Suitable for joint welding of austenitic steels with ferritic steels up to an operating temperature of 300°C (black-white joints). High mechanical values. Austenitic welding deposit with ferrite content of 15-20%. Scale-resistant up to 1050°C. Improved stability at high temperatures and increased resistance to corrosion due to Mo addition.

Current mode: Direct current (+pole), alternating current

Welding current:

Ø mm	Ampere
2,5 x 250	60 - 90
3,2 x 350	80 - 120
4,0 x 350	110 - 160

Approval: TÜV

Welding positions: DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/ELy/0

FONTARGEN E 521

Basic-coated stick electrode

DIN ISO 14172:	E Ni 6082
AWS SFA 5.11:	E Ni Cr Fe - 3 (mod.)
Material-no.:	2.4648

Composition, typical analysis (% w/w):

C	Si	Mn	Cr	Fe	Nb	Ni
0,03	0,4	4,0	19,0	3,0	2,0	Remainder

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	620 N/mm ² :
Elongation limit (0,2%):	390 N/mm ² :
Hardness:	ca.180 BHN
Elongation:	35 %
Impact energy:	80 J

Characteristics / Applications:

Joint welding of iron, nickel and copper alloys in the manufacture of pressure vessels, boilers, fittings, machines and apparatus. Welded joints in nickel steels of low temperature toughness and Ni Cr Mo alloys. Especially suitable for welding "black-white" joints subjected to thermal stress above 300°C, in order to prevent carbon diffusion. The weld metal is creep-resistant at elevated temperatures, tough at low temperatures, corrosion-resistant and offers good resistance to thermal shocks. Do not use in sulphuric atmospheres. Suitable for applications with working temperatures from -269 to +1000°C. TÜV approval up to + 550 °C. Suitable for the following base materials: 1.4876, 1.4958, 2.4870, 2.4816, 2.4851, 2.4951, 2.4630, 2.4952, 2.4631, 2.4969, 2.4632, 1.5662. Incoloy 800, Incoloy 800 H, Inconel 600, Inconel 601, Nimonic 75, Nimonic 80 A, Nimonic 90.

Current mode: Direct current (+pole)

Welding current:

∅ mm	Ampere
3,2 x 300	70 - 100

Approval: TÜV

Welding positions: DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/EB/0

FONTARGEN E 114

Basic coating electrode



AWS SFA 5.15:

E Ni - Cal (mod.)

Composition, typical analysis (% w/w):

C	Mn	Si	Fe	Ni
1,2	0,2	0,5	0,5	Remainder

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Tensile strength:	340 N/mm
Limit of elasticity:	260 N/mm
Hardness of pure welding deposit:	180 BH
Hardness of weld junction:	290 BH
Elongation:	5 %

Characteristics / Applications:

Hot and cold welding on grey cast iron, malleable iron and cast steel. The electrode is suited both for joint and build-up welding, in particular on used cast iron. Large number of possible uses, e.g.: repairs on machine-tool blades, machine casings, machine parts and bearing chairs. Good wetting properties. Welding deposit suited for mechanical working.

Current mode:

Direct current (-pole), alternating current

Welding current:

∅ mm	Ampere
2,0 x 300	40 - 60
2,5 x 300	60 - 80
3,2 x 300	80 - 100

Welding positions:

DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Elb/0

FONTARGEN E 116 BM

Ni-Fe stick electrode

AWS SFA 5.15:

E Ni Fe - Cl (mod.)

Composition, typical analysis (% w/w):

C	Mn	Si	Ni	Fe
1,2	0,30	0,5	55,0	Remainder

Mechanical and physical properties according to DIN EN 1597-1**(Min. properties at room temperature):**Tensile strength: 500 N/mm²Limit of elasticity: 340 N/mm²

Hardness: ca. 220 BH

Elongation: 18 %

Characteristics / Applications:

Hot and cold welding on grey cast iron and spheroid iron parts subjected to high stress: Machine casings, machine-tool stands, machine parts. Joint welding between steels, cast steel and cast metals as well as deposits of harder sealing surfaces. Approved for welding on pipelines of ductile cast iron in the public water- and gas-supply sectors. Foliated graphite cast iron in accordance with DIN 1691: GG-10 to GG-40. Ductile cast iron in accordance with DIN 1693: GGG-38 to GGG-80. Malleable cast iron in accordance with DIN 1692: GTS-35-10 to GTS-70-02 and GTW 35-04 to GTW 70-02. Austenitic cast iron GGL Ni 130-170 N/mm² / GGG Ni to 410 N/mm².

Crack-proof. Welding deposit can be filed down. Outstanding flow properties. Silent arc. Good melting performance and current-carrying capacity thanks to bimetallic core wire.

Cut out cracks. With V-, X- or U-welds (approach angle 90 °C) weld beads of 20-30mm. Work by hammer. Preheat difficult preforms to 300-350 °C. Cool down slowly.

Current mode:

Direct current (-pole), alternating current

Welding current:

Ø mm	Ampere
2,5 x 300	65 – 80
3,2 x 350	90 – 110

Approval:SLV Duisburg,
directive DVS instruction leaflet 1502, part 1**Welding positions:**

DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Elb/0

FONTARGEN E 711

Hard-facing electrode

FONTARGEN

DIN EN 14700:

E Fe 2

Composition, typical analysis (% w/w):

C	Mn	Si	Cr	Fe
0,5	0,4	2,3	9,0	Remainder

Characteristics / Applications:

Lime-basic-coated electrode with very good welding properties for tough and abrasion-proof build-up welds. Build-up of worn parts to wear by abrasion and at the same time shocks. Excavator teeth, feed screws, baffle plates, beaters, crusher jaws, crusher heads, percussion chisels, cutting, deep-drawing and stamping tools, sliding and guide rails. With very welding-sensitive base materials a tough ductile layer of E 1107 is required. Weld dry electrodes only; redrying: 2h/300 – 350°C.

Mechanical and physical properties according to DIN EN 1597-1**(Min. properties at room temperature):**

Hardness

Welding condition: 56 – 58 HRC

After heat treatment: 59 – 61 HRC

After soft annealing: 20 – 30 HRC

1 layer on Mn high-carbon steel: 22 HRC

2 layers on Mn high-carbon steel: 40 HRC

Current mode:

Direct current (+pole), alternating current

Welding current:

Ø mm	Ampere
2,5 x 350	
3,2 x 450	100 – 140
4,0 x 450	140 – 180

Welding position:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN E 726/60

Cobalt-based rutile-basic coated stick electrode

FONTARGEN

DIN EN 14700:

E Co 3

AWS A 5.13:

E Co Cr - C

Composition, typical analysis (% w/w):

C	Cr	W	Si	Fe	Ni	Mn	Mo	Co
2,3	32,0	12,0	0,8	2,0	1,7	0,4	0,1	Remainder

Characteristics / Applications:

Welding deposit with very good resistance to abrasion and very high resistance to cavitation pitting and erosion under low striking and impacting. Excellent gliding properties. High resistance to corrosion and heat (up to 800°C, for a short while up to 1100°C).

Build-up welding on parts with high corrosion-, oxidation-, heat- and wear resistance. Bolts, valves, augers, heat extruders, hot shearing-blades, moulds and cutting edges. Chemical, petroleum and sugar industries and steel mills.

Mechanical and physical properties according to DIN EN 1597-1

(Min. properties at room temperature):

Hardness: 56 HRC

Elevated temperature hardness: 450 (500°C)

400 (600°C)

340 (700°C)

Melting range: 1260 – 1300°C

Specific gravity: 8,5 g/cm³

Current mode:

Direct current (+pole), alternating current

Welding current:

Ø mm	Ampere
3,2 x 350	90 – 120

Welding positions:

according to DIN EN 287

PA	PB	PC	PD	PE	PF	PG
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

06/08/Eb/0

FONTARGEN E 901

Cutting electrode with special coating

FONTARGEN

Electrode for cutting or piercing of all industrial metals including cast iron, aluminium and non-ferrous metals without injection of oxygen or compressed air.

Characteristics / Applications:

Special electrode with a coating type ensuring a stable arc during cutting or piercing operations. Clean cuts and narrow joints are obtained.

Cutting and piercing of steel, Cr-Ni-steel, cast iron, copper alloys and aluminium. The electrode can also be used to cut steel of plates with stainless steel cladding. The position of the workpiece should allow melted metal to peel off easily. We recommend a sawing up and down movement and to push away the fluid metal with help of the electrode. The welding current depends on diameters of the electrode and material thickness.

Current mode: Direct current (-pole), alternating current

Welding current:

Ø mm	Ampere
2,5 x 350	100 - 150
3,2 x 450	130 - 180
4,0 x 350	170 - 230
4,0 x 450	170 - 230
5,0 x 450	

06/08/EB/0

Carbon electrode for gouging and cutting all industrial metals by the arc-compressed-air process.

Characteristics / Applications:

Carbon electrode for economical gouging and cutting. Back-gouging of weld roots to allow welding on the reverse side of weld joints, gouging out cracks, cutting materials which cannot be cut by fuel-gas cutting processes. Parting off or gouging of all metals which can be melted by an electric arc. Exceptionally suitable for use on unalloyed, low- and high alloyed steels, aluminium and aluminium alloys. The high heat conductivity of copper and copper alloys must be taken into consideration when dealing with these materials. Therefore, preheating of the material is recommended. For gouging, use gouging torch K 12 or K 16.

Current mode:

Direct current

Polarity:

Plus pole: steel

Minus pole: copper, copper alloys, nickel and nickel alloys

Compressed air pressure:

6 – 7 atm, Consumption 600 – 1500 l/min

Welding current:

Ø mm	Ampere
4,0 x 305	180
6,0 x 305	220
8,0 x 305	360
10,0 x 305	500

06/08/EB/0

Group 6

Spraying powder

- a) Metal powder for diffusion deposit spraying
- b) FM-powder for the cold spray process

a) Metal powder for diffusion deposit spraying

Type	DIN 32 529	Page
MP 1	A 2.3	233
MP 3	K 2	234
MP 33	K 3	235
MP 4	similar to A 2.1	236
MP 5	similar to A 1.3	237
MP 5 F	E 46 0 RC 11 / E 51 22 R (C) 3	238

b) FM-Powder for the cold spray process

Type	DIN 32 529	Page
FM 1	D 2.1	239
FM 2	D 4.1	240
FM 3	D 3.1	241
FM 4	A 2.1	242

FONTARGEN MP 1

Metal powder for diffusion deposit spraying

FONTARGEN

DIN EN 1274: ~ 2.16

DIN 32529: A 2.3

Composition, typical analysis (% w/w):

C	Si	Cr	Fe	B	Ni
0,75	4,3	14,8	3,7	3,1	Remainder

Mechanical and physical properties:

Working temperature: approx. 1000°C

Melting range: 980 – 1020°C

Hardness: 810 HV (64 HRC)

Grain size: 20 – 106 µm

Characteristics / Applications:

Deposits on alloyed and unalloyed steels subjected to very severe abrasive wear, oxidation and corrosion. Conveyor worm-screws and -belts, mixer blades, scoops. Surfacing on alloyed and unalloyed steels as well as cast iron subject to high severe wear and corrosive attacks. Valves and valve seats, conveyor belts, conveyor worm-screws, cams, pump shafts, etc.

Heat sources:

Powder deposit torch (oxy-acetylene; only use cylinder gas). Flame setting: neutral to slight gas excess.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/EB/0

FONTARGEN MP 3

Metal powder for diffusion deposit spraying

FONTARGEN

DIN 32529:

K 2

Composition, typical analysis (% w/w):

C	Cr	B	Si	Tungsten carbide	Ni
0,75	14,8	3,1	4,3	50,0	Remainder

Mechanical and physical properties:

Working temperature:	approx. 1000°C
Hardness:	60 – 65 HRC (Matrix) approx. 1300 HV (W ₂ C)
Grain size:	20 – 106 µm

The tungsten carbide particles do not melt.

Characteristics / Applications:

Alloy with high tungsten carbide content, good flowing properties, resistance to hot hardness and oxidation. High wear-resistance.

Deposits on alloyed and unalloyed steels subjected to very severe abrasive wear, oxidation and corrosion. Conveyor worm-screws and -belts, mixer blades, scoops.

Heat sources:

Powder deposit torch (oxy-acetylene; only use cylinder gas). Flame setting: neutral to slight gas excess.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/Eb/0

FONTARGEN MP 33

Metal powder for diffusion deposit spraying



DIN 32529:

K 3

Composition, typical analysis (% w/w):

C	Cr	B	Si	Fe	WC	Co	Ni
0,75	15	3,1	4,3	3,5	44,0	6,0	Remainder

Mechanical and physical properties:

Working temperature:	approx. 1000°C
Hardness:	60 – 65 HRD (Matrix) approx. 1500 HV (W ₂ C)
Grain size:	20 – 106 µm

The tungsten carbide is not melted.

Characteristics / Applications:

Alloy with very good flowing properties. Resistant to elevated temperatures and heat oxidation. High content of tungsten carbide. Highly abrasion-proof.

Deposits on alloyed and unalloyed steels subject to very high levels of frictional wear, oxidation and corrosion. Feed screws, conveyor belts, mixer blades, etc.

Heat sources:

Powder deposit torch (oxy-acetylene; only use cylinder gas). Flame setting: neutral to slight gas excess.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/Eb/0

FONTARGEN MP 4

Metal powder for diffusion deposit spraying



DIN EN 1274: 2.10
DIN 32529: Similar to A 2.1

Composition, typical analysis (% w/w):

C	Cr	Si	B	Fe	Ni
0,25	7,5	3,5	1,6	2,5	Remainder

Mechanical and physical properties:

Working temperature: approx. 1050°C
Melting range: 1010 – 1035°C
Hardness: 425 HV
Specific gravity: 4,7 g/cm³
Grain size: 20 – 71 µm

Characteristics / Applications:

Nickel-based alloy with very good flowing properties, hot hardness and resistance to oxidation and corrosion. The surfacing layers are shock-proof and resistant to abrasion. Surfacing of alloyed and unalloyed steels as well as cast iron. Edges and corners of glass moulds, sealing surfaces on pumps, press tools, sliding valve seats.

Heat sources:

Powder deposit torch (oxy-acetylene; only use cylinder gas). Flame setting: neutral to slight gas excess.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/Eb/0

FONTARGEN MP 5

Metal powder for diffusion deposit spraying

FONTARGEN

DIN EN 1274:

2.2

DIN 32529:

Similar to A 1.3

Composition, typical analysis (% w/w):

C	Si	B	Fe	Ni
0,03	2,4	1,4	0,4	Remainder

Mechanical and physical properties:

Working temperature: approx. 1100°C

Melting range: 1090 – 1120°C

Hardness: 230 HV

Specific gravity: 5,1 g/cm³

Grain size: 20 – 106 µm

Characteristics / Applications:

Nickel alloy with very good flow properties. Resistant to high temperatures and corrosion. Deposits on alloyed and unalloyed steels stainless steel and cast iron. Repairs to glass moulds, moulds for the rubber-industry, filling up shrinkage cavities on cast iron, build-up of edges on slide rails. MP 5 can be used for welded joints on steel and cast iron.

Heat sources:

Powder deposit torch (oxy-acetylene; only use cylinder gas). Flame setting: neutral to slight gas excess.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/EB/0

FONTARGEN MP 5 F

Metal powder for diffusion deposit spraying

FONTARGEN

DIN EN 1274: 2.2
DIN 32529: Similar to A 1.3

Composition, typical analysis (% w/w):

C	Si	B	Fe	Ni
0,03	2,4	1,4	0,4	Remainder

Mechanical and physical properties:

Working temperature: approx. 1100°C
Melting range: 1090 – 1120°C
Hardness: 230 HV
Specific gravity: 4,9 g/cm³
Grain size: 15 – 53 µm

Characteristics / Applications:

Nickel alloy with good flowing properties, heat and corrosion resistance.

Deposits on alloyed and unalloyed steels, stainless steel and cast iron. Repairs of glass moulds, moulds for the rubber industry, filling up shrinkage cavities on cast iron, build-up of edges on slide rails. MP 5 F is also suitable for welded joints on steel and cast iron.

Heat sources:

Powder deposit torch (oxy-acetylene; only use cylinder gas). Flame setting: neutral to slight gas excess.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/Eb/0

FONTARGEN FM 1

Metal powder for flame spraying



DIN 32529:

D 2.1

Composition, typical analysis (% w/w):

Ni	Al
95,0	5,0

Mechanical and physical properties:

Hardness: 100 - 120 HB

Density: 8,4 g/cm³

Powder consumption: 0,30 kg/m²

Coat thickness: 0,1 mm

Characteristics / Applications:

Bonding base for subsequent surfacing layers with the cold spraying process.

Processing procedures:

Flame setting: neutral

Spraying distance: 150 - 180 mm

Machining / Processing: grinding with silicon carbide or special-fused alumina grinders.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/Eb/0

FONTARGEN FM 2

Metal powder for flame spraying



DIN 32529:

D 4.1

Composition, typical analysis (% w/w):

Al	Fe	Cu
9,5	1,0	Remainder

Mechanical and physical properties:

Hardness: 115 – 130 HB

Density: 7,7 g/cm³

Warning: As a general rule, spray a first layer (bonding base) of FM 1.

Characteristics / Applications:

Adhesive strength: good

Structure: compact

Shrinking factor: 150 – 180 mm

Friction metal on metal: low

Surfacing of friction bearings, bearing shells, piston sliding seats, slide guides, bearing bushes and other similar parts.

Processing procedures:

Flame setting: slight excess of oxygen

Spraying distance: 150 – 180 mm

Machining / Processing: lathe – turning with carbide – tipped tools

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/Eb/0

FONTARGEN FM 3

Metal powder for flame spraying



DIN 32529:

D 3.1

Composition, typical analysis (% w/w):

Cr	Ni	Mo	Fe
20,0	15,0	4,0	Remainder

Mechanical and physical properties:

Hardness: 150 - 180 HB

Density: 7,9 g/cm³

Warning: As a general rule, spray a first layer (bonding base) of FM 1.

Characteristics / Applications:

Tensile strength of primer: good

Structural constitution: dense

Shrinking factor: low

Metal-on-metal friction: good

Coating of ball-bearing seats, shaft seats, friction bearing seats, gear drills and other machine components which, after coating, must be machined.

Processing procedures:

Flame setting: neutral

Spraying distance: 150 – 180 mm

Machining / Processing: turning with hard metal (ISO K 10) or grinding.

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/Eb/0

FONTARGEN FM 4

Metal powder for flame spraying



DIN 32529:

A 2.1

Composition, typical analysis (% w/w):

C	Si	B	Fe	Cr	Ni
0,35	3,7	1,8	2,6	8,5	Remainder

Mechanical and physical properties:

Hardness: 395 - 435 HB
Melting range: 1000 - 1030°C
Density: 4,6 g/cm³

Warning: As a general rule, spray a first layer (bonding base) of FM 1.

Characteristics / Applications:

Tensile strength of primer: good
Structural constitution: dense
Shrinking factor: low
Metal-on-metal friction: good

Coating of pistons, sealing, sealing fits on stuffing boxes, protective shaft sleeves and similar parts subject to strong abrasion, pressure and high temperatures.

Processing procedures:

Flame setting: neutral
Spraying distance: 150 - 180 mm
Machining / Processing: grinding

Availability:

Bare rods	Coated rods	Wire	Foil	Preforms	Powder	Paste
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11/08/Eb/0

Group 7

Special products

- a) FONTARFIX – Fireproof positioning compound
- b) FONTEX
- c) FONTEX NE
- d) FONTEX P
- e) FONTINOX FR – Surface cleaner
- f) FONTINOX N – W
- g) Neutralisation paste
- h) Passivierungsmittel
- i) Cleaning and decreasing spray
- j) Silicon-free separating agent

FONTARGEN special products

<i>Type</i>	<i>Page</i>
FONTARFIX	247
FONTEX	248
FONTEX NE	249
FONTEX P	250
FONTINOX FR	251
FONTINOX N	252
Neutralisation paste	253
Passivierungsmittel	254
Cleaning and decreasing spray	255
Silicon-free separating agent	256

FONTARFIX is an easy to shape fireproof mixture that contains no asbestos.

Application:

FONTARFIX is very well suited for the fixing of small brazing parts or, in combination with a small quantity of water, to spread onto surfaces as protection against direct flames.

Direction for use:

FONTARFIX is delivered as a ready-mix. To fix the brazing parts manually press them into FONTARFIX. The brazing area itself should not come into contact with FONTARFIX in order to avoid a disturbance of the flow of the hard solder.

The mixture can be used several times if you do not overheat it. To protect the surfaces or parts from the effects of direct flames, dilute the mixture with a bit of water and apply by brush or spatula. FONTARFIX can be removed easily by washing after completion of the soldering operation.

Availability: On request

11/08/Еб/0

Liquid on the basis of phosphor acid to remove flux residues of brazing filler metals with the dip-pickling-process. The brazed parts will be pickled without pre-weld treatment.

Pickling:

The application occurs with a dip-bath-process. FONTEX is normally diluted with water 1:6. The pickling temperature should be 60°C at the maximum. A pickling duration of 3-10 min. is necessary depending on the thickness and the penetration of the flux-layers. The pickled workpieces have to be washed in fresh and cold water. In case that the parts should be treated on the surface, they have to be washed with hot water.

It is possible to use a solvent agent (approx. 1%) in the water for a last washing to avoid rust. With this process the parts are passivated. The parts have to drip well and should dry quickly and thoroughly.

Maintenance of industrial health and safety standards:

FONTEX contains acid, contact with skin and eyes should therefore be avoided. Before use please read recommended safety practices as well as the safety data sheet.

Availability: On request

11/08/EB/0

Pickling powder for dip-pickling of non-ferrous metals.

Liquid on the basis of organic acid to remove flux residues of brazing alloys with the dip-pickling-process. The brazed parts will be pickled without pre-weld treatment.

Pickling:

The Dip-soldering-pot-process.

FONTEX NE is normally diluted with water 200-400g/5 l. The pickling temperature should be 60°C at the maximum. A pickling duration of 3-10 min. is necessary in accordance with the thickness and the penetration of the flux-layers.

Rinsing and Re-rinsing:

The pickled workpieces must be washed in fresh and cold water.

Occupational safety:

FONTEX NE contains acid, contact with skin and eyes should therefore be avoided. We recommend wearing rubber gloves as well as protective goggles.

Availability: On request

11/08/Eb/0

FONTARGEN FONTEX P

Pickling-salt for non-ferrous metals

FONTARGEN

FONTEX P is used to remove flux residues of brazing filler metals with the dip-pickling process on non-ferrous metals.

Pickling:

FONTEX P is normally diluted with water 50-100g/l. The pickling temperature should be 60°C at the maximum.

The pickled workpieces must be washed in fresh and cold water.

The following materials can be used as pickling-equipment:

Tubs made of ceramic, glass or plastic and radiators made of chrome-nickel-molybdenum steel.

Maintenance of industrial health and safety standards:

FONTEX P-pickling-salt is irritating, contact with skin and eyes should therefore be avoided. Before use, please read recommended safety practices as well as the safety data sheet. We recommend wearing rubber gloves as well as protective goggles.

Availability: On request

11/08/Eb/0

FONTARGEN FONTINOX FR

Surface cleaner



Designed to brighten and clean up aluminium, stainless steels as well as non-ferrous metallic surfaces.

Application:

Manual spreading, spraying and dipping followed by intensive flushing in water.

Effect:

FONTINOX FR dissolves high levels of dirt, in particular of organic kind. Light oils and fats are removed effortlessly by the surfactants. Iron oxides (rust film) dissolve into the solution during the indicated reaction time.

A bright, metallically clean metal surface remains after flushing.

FONTINOX FR is highly acidic. After the reaction time it must be rinsed out abundantly with water. The contaminated rinsing water must be reprocessed or disposed in accordance with local regulations.

Neutralisation of the acid and inorganic salt can be undertaken with a milk of lime.

The DIN safety data sheets should be read attentively prior to the processing of the product.

Reaction times:

Extensive research carried out over a large number of years has proven that for aluminium and non-ferrous heavy metals 10-20 minutes provide optimum results.

For chromium-nickel steels 30-60 minutes (also harmless if left overnight).

You could also add 1.5% of gallic acid to the water soluble to provide protection against corrosion.

Warning:

Do not work with the product at temperatures under 5°C, at high levels of heat or in direct sunlight.

Availability: On request

11/08/Eb/0

FONTARGEN FONTINOX N

Pickling paste for stainless steel



FONTINOX N contains hydrochloric acid and chlorides. 1 kg FONTINOX N is sufficient to treat 80-150m of weld seam with a discoloured zone of 5 cm width, FONTINOX N passivates the surface of Cr Ni steel, due to the oxygen elimination caused by nitric acid content.

Instructions for use:

Read the safety recommendations before using FONTINOX N.

Shake or stir FONTINOX N to a homogeneous consistency and apply generously with a flat brush (especially well suitable: FONTARGEN-FONTINOX-flat brush with plastic holder) on the seam to be pickled. The treated seams must be thoroughly washed with water. Additionally, a brush (with natural, synthetic or stainless steel bristles) can be used to remove the paste residues. Flushing by high-pressure cleaning unit is particularly effective.

Neutralize acid residues with soda- and sodium carbonate leach bringing the pH-values to 6,5 - 9,0. FONTINOX N can be poured into the sewage system after cutting-off insoluble components. Observe local sewage regulations.

FONTINOX N must be protected from direct sunlight.

Pickling temperatures +5 to +50 °C

Recommended reaction times (at 20°C):

Stainless and acid resistant steels:	15-60 minutes
Copper-nickel alloys:	5-20 minutes
Nickel and nickel alloys:	5-20 minutes

Warning:

FONTINOX N contains nitric and hydrofluoric acids. There is a serious risk of poisoning due to inhaling, swallowing or in case of skin contact. Causes serious burns.

Safety advice:

Keep container tightly shut and store in a cool, well-ventilated room. Do not store near food. Avoid contact with skin, eyes or clothing. If a spatter happens to come into contact with your skin or eyes, rinse abundantly in water. During processing wear safety glasses, protective clothing and impermeable gloves. Make sure ventilation is sufficient or wear an efficient breathing mask. Wash hands immediately after application. Neutralise floors and objects contaminated by pickling paste with lime and abundantly flush with water. In case of feeling ill consult a medical doctor and show him this warning. Also see the information leaflet "Hydrogen Fluoride" issued by BG Chemical.

Availability: On request

11/08/Eb/0

The neutralisation paste is recommended for neutralisation of very acidic pickling paste of high-grade steel (FONTINOX N) after the pickling.

Application:

Neutralisation paste is used and well spread after completing the pickling of the seams and surfaces.

To reach a sufficient neutralisation, the same quantity of neutralisation paste must be used as for the pickling of the applied high-grade steel pickling paste.

The process of neutralisation is completed as soon as there is no visible reaction on the treated places (formation of blowholes). Residues of paste must be washed off with water.

Brushes of natural or plastic material as well as high-grade steel or wash appliances at high pressure support the cleaning process.

If the reaction of neutralisation paste together with acid pickling paste of high-grade steels (FONTINOX N) is correct, it leads to a neutral connection.

The washed off water with the reaction products and the neutralisation paste can be disposed into the canalisation after separation of the insoluble components. Local regulations of sewage must be considered. After the neutralisation process the neutralised solution has a pH-value of about 7.4.

Availability: On request

11/08/ЕБ/0

The deadening agent serves to treat pickled surfaces and weld seams made of stainless steel that require to be deadened quickly after pickling.

The deadening agent contains hydrochloric acid and chlorides. Prior to application please attentively read through the safety advice.

Application:

The pickled and rinsed workpieces can either be painted, dipped or sprayed with the passivator.

Then rinse with fully demineralised (Deionat) water. Flushing is best performed by a high-pressure spraying device.

Warning:

The passivator contains nitric acid and causes very serious burns.

Safety advice:

- Handle container with care.
- Keep container tightly shut and store in a cool, well ventilated room. Do not inhale vapors.
- Avoid contact with skin, eyes or clothing.
- Immediately take off contaminated clothing.
- In case of feeling ill, consult a doctor and show him this technical data sheet.

Availability: On request

11/08/Eb/0

Application:

Quickly and thoroughly cleaning and degreasing of all metals from oil, fat and dirt.

Dissolves glue and sealing.

Highly suited for the degreasing and cleaning of metal surfaces prior to sticking, brazing or welding.

The cleaner and degreaser evaporates quickly. Sprayable in all positions.

No formation of residues occur during brazing and welding on sprayed parts. No formation of fumes.

Please note:

The container is under pressure. Do not heat to over 50°C (e.g. by direct sunlight).

After usage do not open by force or burn. Do not spray into flames or on red-hot objects.

Availability: On request

11/08/Eb/0

FONTARGEN Silicon-free separating agent

Separating agent containing no solvents or silicon



It contains organic anti-bonding mediums which function very well as separating mediums due to their rejecting properties.

Properties:

The applied coating is oily, indifferent, non-toxic and resistant to normal working temperatures.

- Physiological safety of the material.
- The propellant contains no solvents. Thus it has no detrimental effect to health and the environment and is fire-proof.
- Not required to identify in terms of VogA or VbF.

Application:

- Apply a thin and even coating on surfaces and components from a distance of 30 - 50cm. Avoid "re-oiling". Avoids the adhering of welding beads.
- To spray onto shielding-gas nozzles and current nozzles on MIG/MAG burners, in particular with the aluminium and CO₂ welding of steel. This prevents the incrustation of nozzles. Effortless removal of welding spatter.
- Sprayed components can afterwards be lacquered or metal-coated without any problems.

Please note:

The container is under high pressure. Do not heat to over 50°C (e.g. by direct sunlight). After usage do not open by force or burn. Do not spray into flames or on red-hot objects.

Availability: On request

11/08/Eb/0

Group 8

Technical advice for the practitioner

- a) Application overview
- b) General information
- c) Processing advice

Welding of low- and high-alloyed steel and cast steel

Material number	Material name	Weld-ability	Fontargen filler metal						
			similar or alike		higher alloyed				
			E	A	E	E	A	A	
1.2780	X 16 Cr Ni Si 20 - 12	good	E 138	A 138 C	A 132	-	-	-	-
1.2782	X 16 Cr Ni Si 25 - 20	good	E 126/E 126 Kb	A 122	-	-	-	-	-
1.3941	X 4 Cr Ni 18 - 13	good	-	-	E 133	-	-	-	A 128
1.3953	X 4 Cr Ni Mo 18 - 15	good	-	-	E 133	-	-	-	A 128
1.4000	X 6 Cr 13	good	-	-	E 521	-	-	-	A 521
1.4001	X 7 Cr 14	good	-	-	E 521	-	-	-	A 521
1.4002	X 6 Cr Al 13	good	-	A 127/4	E 126/E 521	-	-	-	A 122/A 521
1.4006	GX 12 Cr 13	good	-	-	E 521	-	-	-	A 521
1.4008	GX 8 Cr Ni 13	good	-	A 127/4	E 521	-	-	-	A 521
1.4016	X 6 Cr 17	limited	E 127/17	-	E 521	-	-	-	A 521
1.4021	X 20 Cr 13	limited	E 127	-	E 521	-	-	-	A 521
1.4024	X 15 Cr 13	limited	E 127	-	E 521	-	-	-	A 521
1.4027	GX 20 Cr 14	limited	E 127	-	E 521	-	-	-	A 521
1.4057	X 19 Cr Ni 17 - 2	limited	E 127/17	-	-	-	-	-	-
1.4085 ¹⁾	GX 70 Cr 29	bad	E 127/30	-	-	-	-	-	-
1.4086 ¹⁾	GX 120 Cr 29	bad	E 127/30	-	-	-	-	-	-
1.4113	X 6 Cr Mo 17 - 1	limited	-	-	E 124 Kb	-	-	-	A 1120 Nb
1.4133	X 1 Cr Mo 28 2	limited	-	-	E 136	-	-	-	A 136
1.4301	X 4 Cr Ni 18 - 10	good	E 1124	A 1120	E 125	-	-	-	A 1121/A 107
1.4306	X 2 Cr Ni 19 - 10	good	E 1124	A 1120	E 125	-	-	-	A 1121/A 107
1.4308	GX 5 Cr Ni 19 - 10	good	E 124 Kb/E 124 Nb	A 1120 Nb	E 125 Kb	-	-	-	A 1121 Nb
1.4311	X 2 Cr Ni N 18 - 10	good	E 124 Kb	A 1120	E 124 NbKb	-	-	-	A 1121 Nb
1.4312	GX 10 Cr Ni 18 - 8	good	E 124 Kb	A 1120 Nb	E 125 Kb	-	-	-	A 1121 Nb
1.4313	X 5 Cr Ni 13 - 4	good	E 127/4	A 127/4	-	-	-	-	-
1.4339	GX 32 Cr Ni 28 - 10	good	E 106/ 1106	A 106	-	-	-	-	-

Welding of low- and high-alloyed steel and cast steel

Material number	Material name	Weld-ability	Fontargen filler metal						
			similar or alike		higher alloyed				
			E	A	E	E	A	A	
1.4347	GX 8 Cr Ni 26 - 7	good	E 131	A 131	E 106			A 1106	
1.4371	X 2 Cr Mn Ni 17 - 7 - 5	good	E 1107	A 1107	-			-	
1.4401	X 4 Cr Ni Mo 17 - 12 - 2	good	E 1125	A 1121	E 133			A 128/A 1107	
1.4404	X 2 Cr Ni Mo 17 - 12 - 2	good	E 1125	A 1121	E 133			A 128/A 1107	
1.4406	X 2 Cr Ni Mo N 17 - 11 - 2	good	E 1125	A 1121	E 133			A 128	
1.4407	GX 5 Cr Ni Mo 13 - 4	good	E 127/4	A 127/4	-			-	
1.4408	GX 6 Cr Ni Mo 19 - 11	good	E 125 Kb	A 1121 Nb	-			-	
1.4410	X 2 Cr Ni Mo N 25 - 7 - 4	good	E 125 Kb	A 1121 Nb	-			-	
1.4429	X 2 Cr Ni Mo N 17 - 13 - 3	good	E 125 Kb	A 1121	E 133			A 128	
1.4435	X 3 Cr Ni Mo 18 - 14 - 3	good	E 125 Kb	A 1121	E 133			A 128	
1.4436	X 3 Cr Ni Mo 17 - 13 - 3	good	E 125 Kb	A 1121	E 133			A 128	
1.4437	GX 6 Cr Ni Mo 18 - 12	good	E 125 Kb	A 1121 Nb	E 133			A 128	
1.4438	X 2 Cr Ni Mo 17 - 13	good	E 133	A 128	-			-	
1.4439	X 2 Cr Ni Mo N 17 - 13 - 5	good	E 133 N/E 133	A 128 N/A 128	-			-	
1.4448	GX 6 Cr Ni Mo 17 - 13	good	E 133	A 128	-			-	
1.4449	X 5 Cr Ni Mo 17 - 13	good	E 133	A 128	-			-	
1.4460	X 4 Cr Ni Mo N 27 - 5 - 2	good	E 148/E 148 Kb	A 148	-			-	
1.4462	X 2 Cr Ni Mo N 22 - 5 - 3	good	E 148/E 148 Kb	A 148	-			-	
1.4465	GX 2 Cr Ni Mo N 25 - 25	good	-	-	E 136			A 136	
1.4500	GX 7 Ni Cr Mo Cu Nb 25 - 20	good	E 137	A 137	E 136			A 136	
1.4505	X 4 Ni Cr Mo Cu Nb 20 - 18 - 2	good	E 137	A 137	E 136			A 136	
1.4506	X 5 Ni Cr Mo Cu Ti 20 - 18	good	E 137	A 137	E 136			A 136	
1.4510	X 3 Cr Ti 17	limited	E 127/17 ^{a)}	A 127/17	E 124 Kb ³⁾			A 1120 Nb	
1.4511	X 3 Cr Nb 17	limited	E 127/17 ^{a)}	A 127/17	E 124 Kb ³⁾			A 1120 Nb	
1.4539	X 1 Ni Cr Mo Cu (X) 25 - 20 - 5	good	E 137	A 137	E 136			A 136	

Welding of low- and high-alloyed steel and cast steel

Material number	Material name	Weld-ability	Fontargen filler metal					
			similar or alike		higher alloyed			
			E	A	E	A	E	A
1.4541	X 6 Cr Ni Ti 18 - 10	good	E 1124 Nb	E 1120 Nb	E 1125 Nb	A 121 Nb/A 1107		
1.4543	X 3 Cr Ni Cu Ti 12 - 9	good	E 1124 Nb	E 1120 Nb	E 1125 Nb	A 1121 Nb		
1.4550	X 6 Cr Ni Nb 18 - 10	good	E 1124 Nb	E 1120 Nb	E 1125 Nb	A 121 Nb/A 1107		
1.4552	GX 5 Cr Ni Nb 18 - 10	good	E 1124 Nb	E 1120 Nb	E 1125 Nb	A 121 Nb		
1.4571	X 6 Cr Ni Mo Ti 17 - 12 - 2	good	E 1124 Nb	E 1121 Nb	E 1107	A 107		
1.4573	X 10 Cr Ni Mo Ti 18 - 12	good	E 1125 Nb	A 1121	-	-		
1.4577	X 3 Cr Ni Mo Ti 25 - 25	good	-	-	E 136	A 136		
1.4578	X 3 Cr Ni Cu Mo 17 - 11 - 3 - 2	good	-	-	E 136	A 136		
1.4580	X 6 Cr Ni Mo Nb 17 - 12 - 2	good	E 1125 Nb	E 1121 Nb	-	-		
1.4581	GX 5 Cr Ni Mo Nb 19 - 11	good	E 1125 Nb	E 1121 Nb	-	-		
1.4583	X 10 Cr Ni Mo Nb 18 - 12	good	E 1125 Nb	E 1121 Nb	-	-		
1.4585	GX 7 Cr Ni Mo Cu Nb 18 - 18	good	E 137 W	A 137	E 136	A 136		
1.4586	X 5 Ni Cr Mo Cu Nb 22 - 18	good	E 137 W	A 137	E 136	A 136		
1.4741 ²⁾	X 2 Cr Al Ti 18 - 2	limited	E 127/17	A 127/17	E 127/30	-		
1.4742 ²⁾	X 10 Cr Al 18	limited	E 127/17	A 127/17	E 127/30	-		
1.4762 ¹⁾	X 10 Cr Al 24	limited	E 127/30	-	E 131/E 126 Kb	A 131/A 1122		
1.4821	X 20 Cr Ni Si 25 - 4	limited	E 131	A 131	E 138	A 1138 C		
1.4822	GX 40 Cr Ni 24 - 5	limited	E 131	A 131	E 138	A 1138 C		
1.4823	GX 40 Cr Ni Si 27 - 4	limited	E 131	A 131	E 138	A 1138 C		
1.4825	GX 25 Cr Ni Si 18 - 9	good	E 124 NbKb	-	E 138/E 1107	A 138 C/A 1107		
1.4826	GX 40 Cr Ni Si 22 - 9	good	E 138	A 1138 C	-	-		
1.4828	X 15 Cr Ni Si 20 - 12	good	E 138	A 1138 C	E 126 Kb	A 1122		
1.4832	GX 25 Cr Ni Si 20 - 14	good	E 138	A 1138 C	E 126 Kb	A 1122		
1.4837	GX 40 Cr Ni Si 25 - 12	good	E 126 Kb/E 126	A 1122	-	-		
1.4841	X 15 Cr Ni Si 25 - 20	good	E 126 Kb/E 126	A 1122	-	-		

Welding of low- and high-alloyed steel and cast steel						
Material number	Material name	Weld-ability	similar or alike		Fontargen filler metal	
			E	A	E	higher alloyed
1.4845	X 12 Cr Ni 25 - 21	good	E 126 Kb/E 126	A 1122	-	-
1.4846	X 40 Cr Ni 25 - 21	limited	E 126 Kb	A 1122	-	-
1.4848	GX 40 Cr Ni Si 25 - 20	good	E 126	A 1122	-	-
1.4849	GX 40 Ni Cr Si Nb 38 - 18	good	E 126	A 1122	-	-
1.4876	X 10 Ni Cr Al Ti 32 - 21	good	E 521	A 521	-	-
1.4878	X 12 Cr Ni Ti 18 - 9	good	-	-	E 138/E 107	A 138 C/A 107

¹⁾ Weld at 700 - 800 °C only in special cases, inquiries in the plant required

²⁾ preheat, 200 - 300 °C

Welding of cold-tough steel and cast steel

Material number	Material name	Weld-ability	Fontargen filler metal					
			similar or alike		higher alloyed			
			E	A	E	E	E	A
1.5637	10 Ni 14/12 Ni 14	good	-	-	E 521 ²⁾	E 521 ²⁾	A 521 ²⁾	A 521 ²⁾
1.5638	GS-10 Ni 14/G 9 Ni 14	good	-	-	E 521 ²⁾	E 521 ²⁾	A 521 ²⁾	A 521 ²⁾
1.5639	16 Ni 14	good	-	-	E 521 ²⁾	E 521 ²⁾	A 521 ²⁾	A 521 ²⁾
1.5662	G-X 8 Ni 9	good	-	-	E 521	E 521	A 521	A 521
1.5680	12 Ni 19/X 12 Ni 5	good	E 1107	A 1107	E 521	E 521	A 521	A 521
1.5681	GS-10 Ni 19/GX 10 Ni 5	good	E 1107	A 107 ⁵⁾ /A 1107	E 521	E 521	A 521	A 521
1.6901	GX 8 Cr Ni 18 - 10	good	E 124 Kb/E 1124	A 1120	E 521/E 126	E 521/E 126	A 521/A 1122	A 521/A 1122
1.6902	GX 6 Cr Ni 18 - 10	good	E 124 Kb	A 1120	E 521/E 126	E 521/E 126	A 521/A 1122	A 521/A 1122
1.6903	X 10 Cr Ni Ti 18 - 10	good	E 124 Kb	A 1120	E 521/E 126	E 521/E 126	A 521/A 1122	A 521/A 1122
1.6905	GX 5 Cr Ni Nb 18 - 10	good	E 124 Kb	A 1120	E 521/E 126	E 521/E 126	A 521/A 1122	A 521/A 1122
1.6906	X 5 Cr Ni 18 - 10	good	E 124 Kb	A 1120	E 521/E 126	E 521/E 126	A 521/A 1122	A 521/A 1122
1.6907	X 3 Cr Ni N 18 - 10	good	E 124 Kb	A 1120	E 521/E 126	E 521/E 126	A 521/A 1122	A 521/A 1122

²⁾ preheat, 100-300 °C

⁵⁾ only till -100°C

Welding of nickel and nickel alloys

Material number		Material name	FONTARGEN filler metal		
			Arc welding	WIG-(TIG)-Welding	MIG-Welding
2.4050	Ni 99,8		E 501	A 501 W	A 501 M
2.4060	Ni 99,6		E 501	A 501 W	A 501 M
2.4062	Ni 99,4 Fe		E 501	A 501 W	A 501 M
2.4066	Ni 99,2		E 501	A 501 W	A 501 M
2.4068	LC-Ni 99		E 501	A 501 W	A 501 M
2.4106	Ni Mn 1		E 501	A 501 W	A 501 M
2.4108	Ni Mn 1 C		E 501	A 501 W	A 501 M
2.4110	Ni Mn 2		E 501	A 501 W	A 501 M
2.4116	Ni Mn 5		E 501 ¹⁾	A 501 W ¹⁾	A 501 M
2.4122	Ni Mn 3 Al		E 501 ¹⁾	A 501 W ¹⁾	A 501 W ¹⁾
2.4361	LC-Ni Cu 30 Fe		E 511	A 511 W	A 511 M
2.4472	Ni Fe 45		E 521 ²⁾		
2.4480	Ni Fe 48 Cr		E 521 ²⁾		
2.4486	Ni Fe 47 Cr		E 521 ²⁾		
2.4500	Ni Fe 16 Cu Cr		E 521 ²⁾		
2.4520	Ni Fe 16 Cu Mo		E 521 ²⁾		
2.4540	Ni Fe 15 Mo		E 521 ²⁾		
2.4600	Ni Mo 29 Cr		-	A 552 W ³⁾	A 552 M ³⁾
2.4856	Ni Cr 22 Mo 9 Nb		E 524	A 524 W	A 524
2.4858	Ni Cr 21 Mo		E 524	A 524 W	A 524
2.4867	Ni Cr 60 15		E 521	A 521 W	A 521
2.4869	Ni Cr 80 20		E 521	A 521 W	A 521
2.4870	Ni Cr 10		E 521	A 521 W	A 521
2.4879	Ni Cr 28 W		E 521 ¹⁾	A 521 W ¹⁾	A 521 ¹⁾

Welding of nickel and nickel alloys

Material number	Material name	FONTARGEN filler metal		
		Arc welding	WIG-(TIG)-Welding	MIG-Welding
2,4951	Ni Cr 20 Ti	E 521	A 521 W	A 521
2,4952	Ni Cr 20 Ti Al	E 521	A 521 W	A 521
2,4969	Ni Cr 20 Co 18 Ti	E 521 ¹⁾	A 521 W ¹⁾	A 521 ¹⁾

Welding of copper and copper alloys

		FONTARGEN filler metal				
Material number	Material name	Arc welding		MIG-Welding		Gas welding
		WIG-(TIG)-Welding				
2.0040	OF-Cu	(E 206)	A 200 W, A 200 SW	A 200 SM, A200 M	A 200 SW/A 200 W	
2.0050	KE-Cu	(E 206)	A 200 W	A 200 M	A 200 W	
2.0060	E-Cu 57	(E 206)	A 200 W, A 200 SW	A 200 SM, A200 M	-	
2.0065	E-Cu 58	(E 206)	A 200 W, A 200 SW	A 200 SM, A200 M	-	
2.0070	SE-Cu	(E 206)	A 200 W, A 200 SW	A 200 SM, A200 M	A 200 W/A 200 SW	
2.0076	SW-Cu	(E 206)	A 200 W, A 200 SW	A 200 SM, A200 M	A 200 W/A 200 SW	
2.0080	F-Cu	(E 206)	A 200 SW	A 200 M	-	
2.0090	SF-Cu	(E 206)	A 200 W, A 200 SW	A 200 SM, A200 M	A 200 W/A 200 SW	
2.0100	D-Cu	(E 206)	A 200 SW	A 200 M	A 200 SW	
2.0110	SD-Cu	(E 106)	A 200 W, A 200 SW	A 200 SM, A200 M	A 200 W/A 200 SW	
2.0120	C-Cu	(E 206)	A 200 SW	A 200 M	A 200 SW	
2.0150	SB-Cu	(E 206)	A 200 W, A 200 SW	A 200 M	A 200 W/A 200 SW	
2.0170	SA-Cu	(E 206)	A 200 W, A 200 SW	A 200 M	A 200 W/A 200 SW	
2.0220	Cu Zn 5	(E 214 W)	A 202 W (A203/6 W)	A 200 M (A 203/6 M)	A 210 (A 203/6 W)	
2.0230	Cu Zn 10	(E 214 W)	A 202 W (A203/6 M)	A 200 M (A 203/6 M)	A 210 (A 203/6 W)	
2.0240	Cu Zn 15	(E 214 W)	A 202 W (A203/6 W)	A 200 M (A 203/6 M)	A 210 (A 203/6 W)	
2.0250	Cu Zn 20	(E 214 W)	A 202 W, A 203/6 W	A 202 M, A 215/8 M	A 210 (A 203/6 W)	
2.0261	Cu Zn 28	(E 214 W)	A 202 W, A 203/6 W	A 202 M, A 215/8 M	A 210	
2.0265	Cu Zn 30	(E 214 W)	A 202 W, A 203/6 W	A 202 M, A 215/8 M	A 210	
2.0280	Cu Zn 33	(E 214 W)	A 202 W, A 203/6 W	A 202 M, A 215/8 M	A 210	
2.0321	Cu Zn 37	(E 214 W)	A 202 W, A 203/6 W	A 202 M, A 215/8 M	A 210	
2.0335	Cu Zn 36	(E 214 W)	A 202 W, A 203/6 W	A 202 M, A 215/8 M	A 210	
2.0360	Cu Zn 40	(E 214 W)	A 202 W, A 203/6 W	A 202 M, A 215/8 M	A 210	
2.0460	Cu Zn 20 Al 2	(E 215)	A 215/8 W	A 215/8 M	-	
2.0470	Cu Zn 28 Sn 1	(E 214)	A 202 W, A 203/6 W	A 202 M, A 203/6 M	A 211	

Welding of copper and copper alloys

FONIARGEN filler metal					
Material number	Material name	Arc welding		MIG-Welding	
		WIG-(TIG)-Welding		Gas welding	
2.0490	Cu Zn 31 Si 1	(E 214)	A 202 W, A 203/6 W	A 202 M, A 203/6 M	-
2.0492	G-Cu Zn 15 Si 4	-	A 202 W	A 202 M	-
2.0510	Cu Zn 37 Al 1	(E 215)	A 215/8 W	A 215/8 M	A 210
2.0515	Cu Zn 30 Al	(E 215)	A 215/8 W	A 215/8 M	A 210
2.0530	Cu Zn 39 Sn	(E 214)	A 203/6 W	A 203/6 M	A 210
2.0540	Cu Zn 35 Ni 2	(E 215)	A 215/8 W	A 215/8 M	A 210
2.0550	Cu Zn 40 Al 2	(E 215)	A 215/8 W, A 202 W	A 215/8 M	A 210
2.0571	Cu Zn 40 Ni 1	(E 214)	A 203/6 W, A 202 W	A 203/6 M	A 210
2.0572	Cu Zn 40 Mn 2	(E 215)	A 203/6 W, A 202 W	A 203/6 M	A 210
2.0730	Cu Ni 12 Zn 24	-	A 512/30 W	A 512/30 M	-
2.0740	Cu Ni 18 Zn 20	-	A 512/30 W	A 512/30 M	-
2.0750	Cu Ni 25 Zn 15	-	A 512/30 W	A 512/30 M	-
2.0806	Cu Ni 5	-	A 512/30 W	A 512/30 M	-
2.0812	Cu Ni 10	-	A 512/30 W	A 512/30 M	-
2.0815	G-Cu Ni 10	-	A 512/30 W	A 512/30 M	-
2.0818	Cu Ni 15	-	A 512/30 W	A 512/30 M	-
2.0822	Cu Ni 20	-	A 512/30 W	A 512/30 M	-
2.0830	Cu Ni 25	-	A 512/30 W	A 512/30 M	-
2.0835	G-Cu Ni 30	-	A 512/30 W	A 512/30 M	-
2.0836	Cu Ni 30	-	A 512/30 W	A 512/30 M	-
2.0839	G-Cu Ni 30 Cr 3	-	-	-	-
2.0842	Cu Ni 44 Mn 1	-	A 512/30 W	A 512/30 M	-
2.0853	Cu Ni 1,5 Si 1	-	A 202 W	A 202 M	-
2.0855	Cu Ni 2 Si	-	A 200 W, A 202 W	A 200 M, A 202 M	A 200 W
2.0857	Cu Ni 3 Si	-	A 202 W	A 202 M	-

Welding of copper and copper alloys

		FONIARGEN filler metal			
Material number	Material name	Arc welding	WIG-(TIG)-Welding	MIG-Welding	Gas welding
2.0862	Cu Ni 5 Fe	-	A 512/30 W	A 512/30 M	-
2.0872	Cu Ni 10 Fe 1 Mn	-	A 512/30 W	A 512/30 M	-
2.0878	Cu Ni 20 Fe	-	A 512/30 W	A 512/30 M	-
2.0882	Cu Ni 30 Mn 1 Fe	-	A 512/30 W	A 512/30 M	-
2.0890	Cu Ni 30 Mn	-	A 512/30 W	A 512/30 M	-
2.0916	Cu Al 5	(E 215)	A 215/8 W	A 215/8 M	-
2.0920	Cu Al 8	(E 215)	A 215/8 W, A 216 W	A 215/8 M, A 216 M	-
2.0928	G-Cu Al 9	(E 215)	A 215/8 W, A 216 W	A 215/8 M, A 216 M	-
2.0932	Cu Al 8 Fe 3	(E 217)	A 216 W	A 216 M	-
2.0936	Cu Al 10 Fe 3 Mn 2	(E 217)	A 216 W	A 216 M	-
2.0940	G-Cu Al 10 Fe	(E 217)	A 216 W	A 216 M	-
2.0957	G-Cu Al 8 Mn 8	(E 217, E746)	A 216 W, A 746 W	A 216 M, A 746 M	-
2.0958	Cu Al 8 Mn	(E 217, E745)	A 216 W, A 745 W, A 746 W	A 216 M, A 745 M, A 746 M	-
2.0960	Cu Al 9 Mn 2	(E 217, E745)	A 216 W, A 745 W, A 746 W	A 216 M, A 745 M, A 746 M	-
2.0962	G-Cu Al 8 Mn	(E 217, E745)	A 216 W, A 745 W, A 746 W	A 216 M, A 745 M, A 746 M	-
2.0966	Cu Al 10 Ni 5 Fe 4	(E 217, E745)	A 216 W, A 745 W, A 746 W	A 216 M, A 745 M, A 746 M	-
2.0967	Cu Al 9 Ni 7	(E 217)	A 216 W, (SG-Cu Al 8 Ni 6)	A 216 M, (SG-Cu Al 8 Ni 6)	-
2.0968	G-Cu Al 9 Ni 7	(E 217)	A 216 W, A 745 W	A 216 M, A 745 M	-
2.0970	G-Cu Al 9 Ni	(E 217)	A 216 W	A 216 M	-
2.0975	G-Cu Al 10 Ni	(E 217)	A 216 W	A 216 M	-
2.0978	Cu Al 11 Ni 6 Fe 5	(E 217)	A 216 W, A 745 W, A 746 W	A 216 M, A 745 M, A 246 M	-
2.0980	G-Cu Al 11 Ni	(E 217)	A 216 W, A 745 W	A 216 M, A 745 M	-
2.1010	Cu Sn 2	E 218	A 203/6 W	A 203/6 M	A 203/6 W
2.1016	Cu Sn 4	E 218	A 203/6 W	A 203/6 M	A 203/6 W
2.1020	Cu Sn 6	E 218	A 203/6 W	A 203/6 M	A 203/6 W

Welding of copper and copper alloys

Material number		Material name	FONTARGEN filler metal			
			Arc welding	WIG-(TIG)-Welding	MIG-Welding	Gas welding
2.1030	Cu Sn 8	E 218	A 203/6 W	A 203/6 M	A 203/6 W	
2.1050	G-Cu Sn 10	E 218	A 203/12 W	A 203/12 M	A 203/12 W	
2.1052	G-Cu Sn 12	(E 218)	A 203/12 W	A 203/12 M	A 203/12 W	
2.1056	G-Cu Sn 14	(E 218)	A 203/12 W	A 203/12 M	A 203/12 W	
2.1060	G-Cu Sn 12 Ni	(E 218)	A 203/12 W	A 203/12 M	A 203/12 W	
2.1080	Cu Sn 6 Zn	E 218	A 203/6 W	A 203/6 M	A 203/6 W	
2.1086	G-Cu Sn 10 Zn	E 218	A 203/12 W	A 203/12 M	-	
2.1090	G-Cu Sn 7 Zn Pb	E 218	A 203/6 W	A 203/6 W	-	
2.1093	G-Cu Sn 6 Zn Ni	E 218	A 203/6 W	A 203/6 M	-	
2.1096	G-Cu Sn 5 Zn Pb	E 218	A 203/6 W/A 202 W	A 203/6 M	-	
2.1191	Cu Ag 0,1 P	-	A 200 W, A 200 SW	A 200 M, A 200 SM	A 200 W	
2.1202	Cu Ag 0,1 P	-	A 200 W	A 200 M	A 200 W	
2.1203	Cu Ag 0,1	-	A 200 W, A 200 SW	A 200 M, A 200 SM	A 200 W	
2.1322	Cu Mg 0,4	-	(A 202 W)	(A 202 M)	-	
2.1323	Cu Mg 0,7	-	(A 202 W)	(A 202 M)	-	
2.1363	Cu Mn 2	-	A 200 SW, A 202 W, A 207 W	A 200 SM, A 202 M, A 207 M	-	
2.1491	Cu As P	(E 206)	A 200 SW	A 200 SM	-	
2.1522	Cu Si 2 Mn	-	A 202 W, A 207 W	A 202 M, A 207 M	-	
2.1525	Cu Si 3 Mn	-	A 202 W	A 202 M	-	
2.1545	E-Cu Te	-	(A 202 W) ¹⁾	(A 202 M) ¹⁾	-	
2.1546	Cu Te P	-	(A 202 W) ¹⁾	(A 202 M) ¹⁾	-	
2.1972	Cu Ni 10 Fe 1,6 Mn	-	A 512/30	A 512/30 M	-	

Welding of aluminium and aluminium alloys

Material number		Material name	FONTARGEN filler metal			
			Arc welding	WIG-(TIG)-Welding	MIG-Welding	Gas welding
3.0185	Al 98		E 401	A 400 Ti W	A 400 Ti M	AF 400
3.0205	Al 99		E 401	A 400 Ti W	A 400 Ti M	AF 400
3.0255	Al 99,5		E 401	A 400 Ti W	A 400 Ti M	AF 400
3.0275	Al 99,7		E 401	A 400 Ti W	A 400 Ti M	-
3.0285	Al 99,8		E 401	A 400 Ti W	A 400 Ti M	-
3.0515	Al Mn		E 412	A 404/4,5 W	A 404/4,5 M	-
3.1255	Al Cu Si Mn		-	A 405 W ¹⁾	A 405 M ¹⁾	-
3.1263	G-Al Cu 5 Si 3		-	A 405 W ¹⁾	A 405 M ¹⁾	A 405 ¹⁾
3.1325	Al Cu Mg 1		-	A 405 W ¹⁾	A 405 M ¹⁾	A 405 ¹⁾
3.1355	Al Cu Mg 2		-	A 405 W ¹⁾	A 405 M ¹⁾	A 405 ¹⁾
3.2131	G-Al Si 5 Cu 1		-	A 405 W ¹⁾	A 405 M ¹⁾	A 405 ¹⁾
3.2151	G-Al Si 6 Cu 4		-	A 405 W ¹⁾	A 405 M ¹⁾	A 405 ¹⁾
3.2153	G-Al Si 7 Cu 3		-	A 405 W ¹⁾	A 405 M ¹⁾	A 405 ¹⁾
3.2305	E-Al Mg Si		-	A 4054/4,5W ¹⁾	A 404/4,5 M ¹⁾	-
3.2315	Al Mg Si 1		-	A 4054/4,5W	A 404/4,5 M	-
3.2316	Al Mg Si 0,8		-	A 4054/4,5W	A 404/4,5 M	-
3.2318	Al Mg Si 1		-	A 4054/4,5W	A 404/4,5 M	-
3.2341	G-Al Si 5 Mg		E 409	A 405	A 405 M	AF 408
3.2345	Al Si 5		E 409	A 405	A 405 M	AF 408
3.2381	G-Al Si 10 Mg		E 409	A 407	-	A 407
3.2581	G-Al Si 12		E 409	A 407	-	A 407
3.2584	Al Si 12		E 409	A 407	-	A 407
3.3206	Al Mg Si 0,5		-	A 402/A 405	A 402 M/A 405 M	-
3.3207	E-Al Mg Si 0,5		-	A 402/A 405	A 402 M/A 405 M	-
3.3241	G-Al Mg 3 Si		E 402	A 402/A 405	A 402 M	-

Welding of aluminium and aluminium alloys

Material number		Material name	FONTARGEN filler metal			
			Arc welding	WIG-(TIG)-Welding	MIG-Welding	Gas welding
3.3261	G-Al Mg 5 Si		-	A 404 W	A 402 M	-
3.3308	Al 99,9 Mg 0,5		-	A 400 ²⁾	-	-
3.3315	Al Mg 1		-	A 402	-	-
3.3318	Al 99,9 Mg 1		-	A 400/A 402	-	-
3.3325	Al Mg 2	E 412	-	A 402	A 402 M	-
3.3326	Al 99,9 Mg 2		-	A 400/A 402	-	-
3.3334	Al Mg		-	A 404 W	A 404 M	-
3.3354	Al Mg 5		-	A 404/4,5 W/A 404 W	A 404/4,5 M/A 404 M	-
3.3524	Al Mg 2,5		-	A 402 W	A 402 M	-
3.3527	Al Mg Mn	E 412	-	A 404/4,5 W	A 404/4,5 M	-
3.3528	Al Mg Mn	E 412	-	A 404/4,5 W	A 404/4,5 M	-
3.3535	Al Mg 3	E 412	-	A 404 W/A 402 W	A 404/4,5 M/A 402 M	-
3.3541	G-Al Mg 3	E 412	-	A 402	A 402 M	-
3.3547	Al Mg 4,5 Mn		-	A 404/4,5 W	A 404/4,5 M	-
3.3555	Al Mg 5		-	A 404/4,5 W	A 404/4,5 M	-
3.3561	G-Al Mg 5		-	A 404 W	A 404 M	-
3.4335	Al Zn Mg 1		-	A 404/4,5 W	A 404/4,5 M	-
3.4338	Al 99,9 Zn Mg		-	A 400	-	-
3.4345	Al Zn Mg CU 0,5		-	A 404/4,5 W ¹⁾	A 404/4,5 M ¹⁾	-
3.4365	Al Zn Mg CU 1,5		-	A 404/4,5 W ¹⁾	A 404/4,5 M ¹⁾	-

Physical property values of some elements

Element	Symbol	Melting point (°C)	Boiling point (°C) at 0,1 MPa	Density
Aluminium	Al	660	2060	2,7
Antimony	Sb	630,5	1440	6,62
Beryllium	Be	1280	2770	1,82
Lead	Pb	327,4	1740	11,34
Boron	B	2300	2550	3,3
Chromium	Cr	1890	2500	7,19
Iron	Fe	1539	2740	7,87
Gold	Au	1063	2970	19,32
Indium	In	156	2075	7,306
Iridium	Ir	2454	5300	22,50
Cadmium	Cd	321	765	8,65
Cobalt	Co	1495	2900	8,90
Carbon	C	3500	-	3,51
Copper	Cu	1083	2600	8,96
Lithium	Li	186	1370	0,53
Magnesium	Mg	650	1110	1,74
Manganese	Mn	1245	2150	7,43
Molybdenum	Mo	2625	4800	10,20
Nickel	Ni	1455	2730	8,90
Niobium	Nb	2415±15	3300	8,57
Palladium	Pd	1554	4000	12,00
Phosphorus	P	44	282	1,82
Platinum	Pt	1773,50	4410	21,45
Mercury	Hg	-38,87	357	13,55
Sulfur	S	112,8	444,6	2,05
Silver	Ag	960,5	2210	10,49
Silicium	Si	1430	2300	2,33
Strontium	Sr	770	1380	2,60
Tantalum	Ta	3000	5300	16,60
Titanium	Ti	1730	-	4,54
Vanadium	V	1735	3400	6,00
Bismuth	Bi	271,3	1420	9,80
Wolfram	W	3410	5930	19,30
Zink	Zn	419,50	906	7,136
Tin	Sn	231,90	2270	7,298
Zirconium	Zr	1750	2900	6,50

Physical property values of some alloys

Name	Tensile strength (N/mm ²)	Melting point (°C)	Density
Steel	340 – 1800	1450 – 1520	7,7 – 7,85
Cast iron	150 – 400	1150 – 1250	7,1 – 7,3
Austenitic Cr-Ni-Steel	600 – 800	1440 – 1460	7,8 – 7,9
Mg-Alloys	180 – 300	590 – 650	1,8 – 1,83
Al-Alloys	100 – 400	570 – 655	2,6 – 2,85
Zn-Alloys	140 – 300	380 – 420	5,7 – 7,2
Brass	250 – 600	900 – 950	8,25
Bronze	200 – 300	880 – 1040	8,56 – 8,9

During the brazing process the necessary fluxes and metals can endanger the brazing technician due to their characteristics and composition as well as improper handling. Therefore eye-, skin- and mucous membrane contact should be avoided at all costs.

Inevitably, brazing leads to flux and metal vaporization and in regard to brazing powders fine metal dust, which can also have negative effects on your health.

As a protection for the fabricator the basic rules of work hygiene and UVV-VGW 15 „Welding, cutting and similar processes“ must be strictly adhered to. Further information on each product is provided via technical data sheets and safety data sheets according to EU directive 91/155/EWG. Those are being updated regularly and apply to effective technical rules.

Especially worth mentioning is the danger of cadmium bearing brazing alloys. The hazardous material cadmium oxide is a result of the brazing process and has been classified in group III A 2 in the technical rules of hazardous materials TRGS 900 (MAK-Value). Therewith the old MAK-Value is void. During the processing of cadmium bearing brazing alloys special protection and surveillance is necessary.

For every range of application FONTARGEN offers a suitable cadmium free brazing alloy. FONTARGEN is pleased to help you finding the most suitable brazing alloy.

All information concerning our products, equipment and processes is based on extensive research work and application technology experience. We provide these results orally and in writing in all conscience; this not however exempting the consumer from the obligation to check our products and processes on his own responsibility, especially if the application and process has not been expressly approved by us in writing. The test certificates enclosed do not exempt the user from carrying out correct incoming goods inspections in accordance with Sections 377/378 HGB (German commercial code). Numbers 10 and 11 of our General Terms of Sale and Delivery have validity for any damaging events.



Member of the Böhler Welding Group

FONTARGEN GmbH

Siemensstraße 4

67304 EISENBERG

Telefon: +49(0)6351/401-0

Telefax: +49(0)6351/401-149

Email: info@fontargen.de

Internet: www.fontargen.de