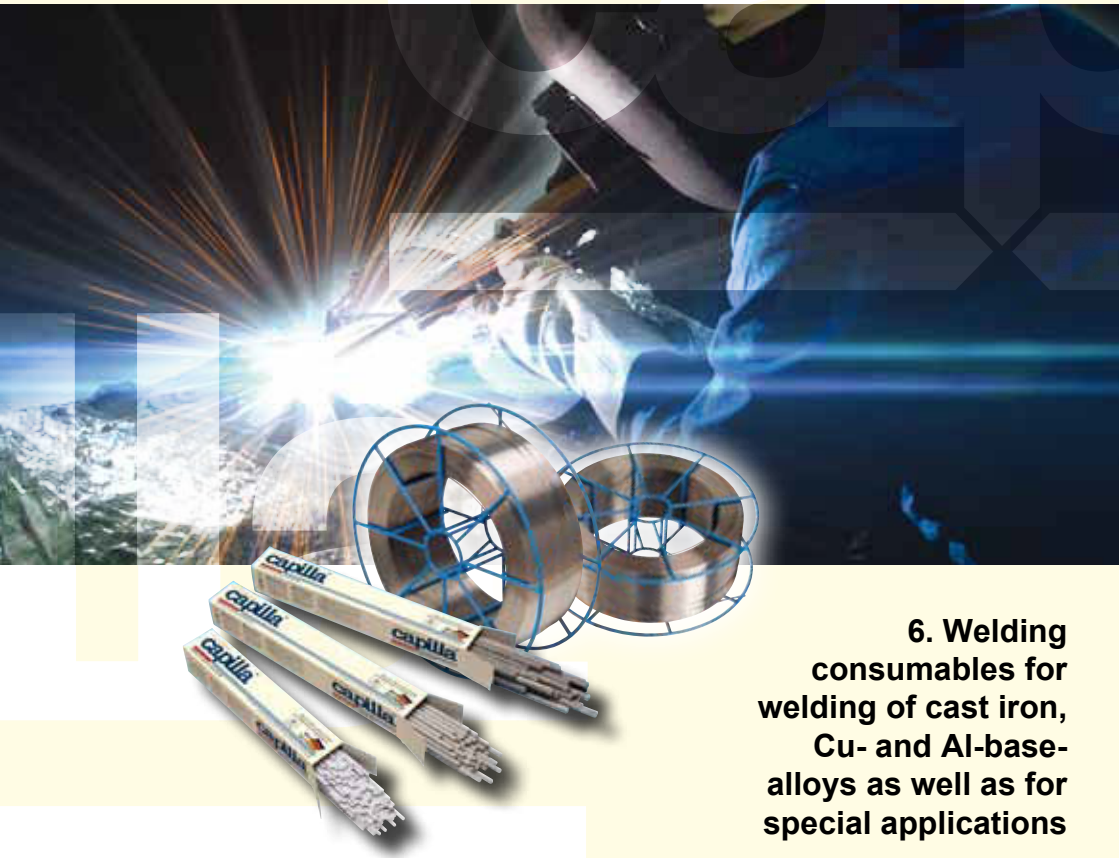
capilla®

Part catalogue



6. Welding consumables for welding of cast iron, Cu- and Al-base-alloys as well as for special applications

6 Welding consumables for welding of cast iron, Cu- and Al-base-alloys as well as for special applications

6.1 Coated stick electrodes for welding of cast iron, Cu- and Al-base-alloys as well as for special applications

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Capitherm	-	-	**178**
41	EN ISO 1071: E FeC-GP 2 1		**179**
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44	EN ISO 1071: E C NiCu-B 1	-	**181**
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47 N	~DIN EN 14640: E Cu6338 (CuMn14Al7)	2.1368	**185**
48	~DIN EN 14640: E Cu5210 (CuSn9)	2.1025	**186**
NiCu 30 Mn	EN ISO 14172 E Ni 4060 (NiCu 30 Mn3)	2.4377	**187**
NiTi 3	EN ISO 14172: E Ni2061 (NiTi4)	2.4156	**188**
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6.2 Wire electrodes for welding of cast iron, Cu- and Al-base-alloys as well as for special applications

6.2.1 Solid wires for gas shielded arc welding of cast iron, Cu- and Al-base-alloys as well as for special applications

capilla®	Standard	Mat.-No.:	Page
45 MIG	EN ISO 1071: S C NiFE 1 M		**192**
NiTi 4 MIG	EN ISO 14172: S Ni2061 (NiTi4)	2.4155	**192**
NiCu 30 Mn MIG	EN ISO 18274: S Ni 4060 (NiCu30Mn3Ti)	2.4377	**192**
47 MIG	EN ISO 24373: S Cu6100 (CuAl8)	2.0921	**192**
47 N MIG	EN ISO 24373: S Cu6338 (CuMn14Al7)	2.1367	**192**
47 Ni MIG	EN ISO 24373: S Cu 6327 (CuAl8Ni5Fe3Mn2)	2.0922	**192**
47 Ni 6 MIG	EN ISO 24373: S Cu 6328 (CuAl9Ni2Fe2Mn2)	2.0923	**193**
48 MIG	EN ISO 24373: S Cu5180 (CuSn6P)	2.1022	**193**
CuSn MIG	EN ISO 24373: S Cu 5180A (CuSn1MnSi)	2.1006	**193**
CuSn 12 MIG	EN ISO 24373: S Cu 5410 (CuSn12P)	2.1056	**193**
CuAl 10 MIG	EN ISO 24373: S Cu 6180 (CuAl10Fe)	2.0937	**193**
CuSi 3 MIG	EN ISO 24373: S Cu6560 (CuSi3Mn1)	2.1461	**193**
CuAg MIG	EN ISO 24373: S Cu 1897 (CuAg1)	2.1211	**193**
AlSi 12 MIG	EN ISO 18273: S Al4047 (AlSi 12)	3.2585	**194**
AlSi 5 MIG	EN ISO 18273: S Al4043 (AlSi5)	3.2245	**194**
Al 99,5 MIG	EN ISO 18273: S Al 1450 (Al99,5Ti)	3.0805	**194**
AlMg 3 MIG	EN ISO 18273: S Al5754 (AlMg 3)	3.3536	**194**
AlMg 5 MIG	EN ISO 18273: S Al5356 (AlMg5Cr)	3.3556	**194**
AlMg 4,5 Mn MIG	EN ISO 18273: S Al5183 (AlMg4,5Mn0,7)	3.3548	**194**

6.2.2 TIG-rods for tungsten inert gas welding of cast iron, Cu- and Al-base-alloys as well as for special applications

capilla®	Standard	Mat.-No.:	Page
45 WIG	EN ISO 1071: S C NiFE 1 M	-	**195**
NiTi 4 WIG	EN ISO 14172:S Ni2061 (NiTi4)	2.4155	**195**
NiCu 30 Mn WIG	EN ISO 18274: S Ni 4060 (NiCu30Mn3Ti)	2.4377	**195**
47 WIG	EN ISO 24373: S Cu6100 (CuAl8)	2.0921	**195**
47 N WIG	EN ISO 24373: S Cu6338 (CuMn14Al7)	2.1367	**195**
47 Ni WIG	EN ISO 24373: S Cu 6327 (CuAl8Ni5Fe3Mn2)	2.0922	**195**
47 Ni 6 WIG	EN ISO 24373: S Cu 6328 (CuAl9Ni2Fe2Mn2)	2.0923	**196**
48 WIG	EN ISO 24373: S Cu5180 (CuSn6P)	2.1022	**196**
CuSn WIG	EN ISO 24373: S Cu 5180A (CuSn1MnSi)	2.1006	**196**
CuSn 12 WIG	EN ISO 24373: S Cu 5410 (CuSn12P)	2.1056	**196**
CuAl 10 WIG	EN ISO 24373: S Cu 6180 (CuAl10Fe)	2.0937	**196**
CuSi 3 WIG	EN ISO 24373: S Cu6560 (CuSi3Mn1)	2.1461	**196**
CuAg WIG	EN ISO 24373: S Cu 1897 (CuAg1)	2.1211	**196**
AlSi 12 WIG	EN ISO 18273: S Al4047 (AlSi 12)	3.2585	**197**
AlSi 5 WIG	EN ISO 18273: S Al4043 (AlSi5)	3,2245	**197**
Al 99,5 WIG	EN ISO 18273: S Al 1450 (Al99,5Ti)	3.0805	**197**
AlMg 3 WIG	EN ISO 18273: S Al5754 (AlMg 3)	3.3536	**197**
AlMg 5 WIG	EN ISO 18273: S Al5356 (AlMg5Cr)	3.3556	**197**
AlMg 4,5 Mn WIG	EN ISO 18273: S Al5183 (AlMg4,5Mn0,7)	3.3548	**197**

6.2.3 Tubular wires for gas shielded arc welding of cast iron, Cu- and Al-base-alloys as well as for special applications

capilla®	Standard	Mat.-No.:	Page
FeC 3 RLD	EN ISO 1071: T C FE-3 N	-	**198**
45 RLD	DIN EN ISO 1071: T C NiFe1 M	-	**198**
47 N RLD	EN 14640: T Cu6338 (Cu Mn14Al7)	2.0921	**198**

Standards:
No standard

capilla® 50 B

Product description:

Special coated stick electrode designed for high speed grooving, chamfering and gouging all metals, e.g. mild steels, high alloyed steel, cast iron, stainless and heat resistant steels, steel cast, light metal, nonferrous heavy metal etc.
AC or DC power sources may be used.

Applications:

Special developed for grooving and gouging of worn hot forming dies e.g. forging dies and moulds. This electrode allows the accurate removal of fatigue and cracked surfaces of tool steels. After grooving, a dye penetration test should be performed to ensure whether the base metal is absolutely crack-free.

Typical weld metal composition:

[wt. - %]

No weld metal

Mechanical properties:

Void

Positions: all

Redrying: Void

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	100 - 150
3,25	450	150 - 200
4,0	450	220 - 300
5,0	450	300 - 400
6,0	450	350 - 450

Polarity
=(-)~

Standards:
No standard

capilla® 50 N

Product description:

Special coated stick electrode designed for high speed grooving, chamfering and gouging all metals, e.g. mild steels, high alloyed steel, cast iron, stainless and heat resistant steels, steel cast, light metal, nonferrous heavy metal etc.
AC or DC power sources may be used.

Applications:

For removal of a scaled or corroded metallic surfaces. Removal of worn hardfacings and corrosion resistant claddings.

Typical weld metal composition:

[wt. - %]

No weld metal

Mechanical properties:

Void

Positions: all

Redrying: Void

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
2,5	350	100 - 150	=(-)~
3,25	350	150 - 200	
4,0	350/450	220 - 300	
5,0	350/450	300 - 400	

Standards:
No standard

capilla® 50 K

Product description:

Coated carbon stick electrode designed for high speed grooving, chamfering and gouging of all metals, e.g. mild steels, high alloyed steel, cast iron, stainless and heat resistant steels, steel cast, light metal, nonferrous heavy metal etc.
It is used for grooving and thermal cutting in all positions when the conventional oxy-acetylene process is not possible for metallurgical reasons.

Applications:

For removal of scaled or corroded metallic surfaces. Removal of worn hardfacings and corrosion resistant claddings.

Typical weld metal composition:

[wt. - %]

No weld metal

Mechanical properties:

Void

Positions: all

Redrying: -

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
4,0	305	220 - 300
6,5	305	400 - 600
8,0	305	500 - 700
9,5	305	600 – 800
13,0	355	700 - 900

Polarity
=(+)~

Standards:
No standard

capilla® Capitherm

Product description:

Special coated stick electrode for preheating of small or medium sized steel workpieces. Using this electrode very long electrical arcs can be realised (up to 30 mm) without melting the surface of the workpiece.

Applications:

The energy of the electrical arc allows an intensive and controlled preheating of the metallic base metal. AC and DC power sources can be used.

Typical weld metal composition:

[wt. - %]

No weld metal

Mechanical properties:

Void

Positions: all

Redrying: Void

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
2,5	350	70 - 120	=(+)~
3,25	350/450	100 - 150	
4,0	450	130 - 180	

Standards:

EN ISO 1071: E FeC-GP2 1
(DIN 8573): E FeC-G
AWS: E St

capilla® 41

Product description:

Special coated stick electrode suitable for repair and maintenance welding of grey cast iron.
Characteristics of weld metal:

Ni-alloyed Fe-base alloy with high content of carbon

If heat treated correctly and if composition of the base material is suitable, the weld metal is mainly perltic with embedded globular carbon.

Pre-heating of base material in the range between 600°C and 650°C.

Applications:

For cold welding of grey cast iron, malleable cast iron and nodular cast iron.

Base metals:
EN 1561: EN-GJL-100 (GG10) to EN-GJL-350 (GG 35).
EN 1562: EN-GJMB-350 (GTS 35) to EN-GJMB-550 (GTS 55).
EN-GJMW-350 (GTW 35) to EN-GJMW-550 (GTW 55).
EN 1563: EN-GJS-400 (GGG40) to EN-GJS-700 (GGG 70).

Typical weld metal composition:

[wt. - %]

	C	Si	Mn	Ni	Ti	Fe
Min.	**2,0**	**1,5**	**0,8**	**1,5**	**0,3**	
Max.	**2,5**	**2,0**	**1,0**	**2,5**	**0,5**	**Bal.**

Mechanical properties:

The mechanical properties of the deposit are mainly influenced by the base material and the heat treatment during and after welding.

Positions: PA

Redrying: 150 – 180°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 - 80
3,25	350	80 - 120
4,0	350	110 - 140
5,0	350	140 - 180

Polarity =(-)~

Standards:

DIN EN ISO 1071: E C NI-CI 1
(DIN 8573): E Ni-BG 22
AWS: E Ni-CI

capilla® 43

Product description:

Basic-graphitic coated stick electrode for fusion and deposition welding of cast iron. The soft characteristic of the electrical arc allows a controlled, spatter free transfer of weld metal to the workpiece. Welding using low amperage ensures machinable weld deposits and HAZ. Carbon is precipitated as graphite in the weld metal.

Applications:

For cold welding of grey cast and annealed cast iron, suitable for repair and maintenance work.

Base metals:
EN 1561: EN-GJL-100 (GG10) to EN-GJL-350 (GG 35).
EN 1562: EN-GJMB-350 (GTS 35) to EN-GJMB-550 (GTS 55).
EN-GJMW-350 (GTW 35) to EN-GJMW-550 (GTW 55).

Typical weld metal composition:

[wt. - %]

	C	Fe	Ni
Min.			
Max.	**0,5**	**2,5**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	160	[HB]

Positions: all except PG

Redrying: 150 – 180°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 - 90
3,25	350	90 - 120
4,0	350	110 - 150
5,0	450	130 - 180

Polarity =(+)~

Standards:

DIN EN ISO 1071: E C NiCu-B 1
(DIN 8573): E Ni Cu-BG 22
AWS: E Ni Cu-B

capilla® 44

Product description:

Special coated stick electrode made of an alloyed core wire with a basic-graphitic flux coating. The weld metal consists of nickel-copper-alloy.
The deposits are ductile, machinable and show nearly the same colour as the base metal.

Applications:

For repair and maintenance of grey cast iron and malleable cast iron. The weld deposits are free of blowholes and undercuts.

Typical weld metal composition:

[wt. - %]

	C	Cu	Ni
Min.		**28**	
Max.	**0,7**	**30**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	160	[HB]

Positions: all except PG

Redrying: 150 – 180°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 - 90
3,25	350	90 - 120
4,0	350	110 - 150

Polarity
=(+)~

Standards:

DIN EN ISO 1071: E C NiFe 1 1
(DIN 8573): E NiFe-1-BG 23
AWS: E NiFe-CI

capilla® 45

Product description:

Special flux coated stick electrode with a nickel-iron alloyed core wire for repair and maintenance of cast iron.
The welding properties of the electrode are excellent. The seams are free of blow holes.
The deposits can be machined excellently.

Carbon is precipitated as graphite in the weld metal.

Applications:

For cold welding of grey cast iron, malleable cast iron and nodular cast iron.

Base metals:
EN 1561: EN-GJL-100 (GG10) to EN-GJL-350 (GG 35);
EN 1562: EN-GJMB-350 (GTS 35) to EN-GJMB-550 (GTS 55); EN-GJMW-350 (GTW 35) to EN-GJMW-550 (GTW 55);
EN 1563: EN-GJS-400 (GGG40) to EN-GJS-700 (GGG 70)

Typical weld metal composition:

[wt. - %]

	C	Ni	Fe
Min.		**51**	
Max.	**1,5**	**55**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	200	[HB]

Positions: all except PG

Redrying: 150 – 180°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
2,5	350	60 - 90	=(+)~
3,25	350	90 - 120	
4,0	350	110 - 150	

also available:
find in table of content

Capilla 45-2
Capilla 45 MIG
Capilla 45 WIG
Capilla G 45 MM (tubular wire)

Standards:

DIN EN ISO 1071: E C NiFe 1 1
(DIN 8573): E NiFe-1-BG 23
AWS: E NiFe-CI

capilla® 45-2

Product description:

Special flux coated stick electrode with a nickel-iron alloyed bi-metal core wire for repair and maintenance of cast iron.
Due to the special core wire even higher amperage can be used.
The welding properties of the electrode are excellent. The seams are free of blow holes.
The deposits can be machined excellently.

Carbon is precipitated as graphite in the weld metal.

Applications:

For cold welding of grey cast iron, malleable cast iron and nodular cast iron.

Base metals:

EN 1561: EN-GJL-100 (GG10) to EN-GJL-350 (GG 35);
EN 1562: EN-GJMB-350 (GTS 35) to EN-GJMB-550 (GTS 55); EN-GJMW-350 (GTW 35) to EN-GJMW-550 (GTW 55);
EN 1563: EN-GJS-400 (GGG40) to EN-GJS-700 (GGG 70)

Typical weld metal composition:

[wt. - %]

	C	Ni	Fe
Min.		**51**	
Max.	**1,5**	**55**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	200	[HB]

Positions: all except PG

Redrying: 150 – 180°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 - 90
3,25	350	90 - 120
4,0	350	110 - 150

Polarity =(+)~

Standards:

DIN EN ISO 1071: E C NiFe 1 1
(DIN 8573): E NiFe-1-BG 23
AWS: E NiFe-CI

capilla® 45-2 minus

Product description:

Special flux coated stick electrode with a nickel-iron alloyed bi-metal core wire for repair and maintenance of cast iron.
Due to the special core wire even higher amperage can be used.
The welding properties of the electrode are excellent. The seams are free of blow holes.
The deposits can be machined excellently.

Carbon is precipitated as graphite in the weld metal.

Applications:

For cold welding of grey cast iron, malleable cast iron and nodular cast iron.

Base metals:
EN 1561: EN-GJL-100 (GG10) to EN-GJL-350 (GG 35);
EN 1562: EN-GJMB-350 (GTS 35) to EN-GJMB-550 (GTS 55); EN-GJMW-350 (GTW 35) to EN-GJMW-550 (GTW 55);
EN 1563: EN-GJS-400 (GGG40) to EN-GJS-700 (GGG 70)

Typical weld metal composition:

[wt. - %]

	C	Ni	Fe
Min.		**51**	
Max.	**1,5**	**55**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	200	[HB]

Positions: all except PG

Redrying: 150 – 180°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 - 90
3,25	350	90 - 120
4,0	350	110 - 150

Polarity =(-)~

also available:
find in table of content

Capilla 45
Capilla 45 MIG
Capilla 45 WIG
Capilla G 45 MM (tubular wire)

Standards:

~EN 14640:	E Cu6338 (CuMn14Al7)
(DIN 1733):	E-Cu Mn14Al7
(DIN 8555):	E 31-UM-200-CN
AWS A 5.7:	(E CuMnNiAl)
Mat.-No.:	2.1368

capilla® 47 N

Product description:

Flux coated aluminium-bronze stick electrode for joint welding of similar alloyed base metals.
The weld metal is corrosion resistant to salt-water and erosion resistant.

Applications:

Welding of high strength and corrosion resistant CuAl-bronze containing Mn and Ni.

Overlay welding of low-alloyed steels, steel cast and grey cast iron.

Dissimilar joints of Cu-alloys with steels.

Typical weld metal composition:

[wt. - %]

	Mn	AL	Ni	Fe	Cu
Min.	**12**	**7**	**1,5**	**2,3**	
Max.	**14**	**8,5**	**3**	**3,5**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	640	[MPa]
Yield strength $R_{p0,2}$:	420	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	20	[%]
Hardness	160	[HB]

Positions: all except PG

Redrying: 300°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	50 - 80
3,25	350	60 - 100
4,0	350	80 - 130
5,0	450	110 - 160

Polarity =(+)~

also available:
find in table of content

Capilla 47 N MIG
Capilla 47 N WIG
Capilla G 47 MM (tubular wire)

Standards:

~EN 14640:	E Cu5210 (CuSn9)
(DIN 1733):	EL-CuSn 7
(DIN 8555):	E30-UM-100-CNR
AWS A 5.7:	E CuSn-C
Mat.-No.:	2.1025

capilla® 48

Product description:

Flux coated tin-bronze stick electrode for joint welding with elevated tin content.

Applications:

For joint and overlay welding of:

CuSn-alloys (bronze), CuZn alloys (brass) and CuSnZnPb alloys (special brass).

Overlay welding of steel and grey cast iron.

Typical weld metal composition:

[wt. - %]

	Sn	Cu
Min.	**7,5**	
Max.	**8**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	280	[MPa]
Yield strength $R_{p0,2}$:	120	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	-	[%]
Hardness	120	[HB]

Positions: all except PG

Redrying: 200°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	50 - 80
3,25	350	60 - 100
4,0	350	80 - 130
5,0	450	110 - 160

Polarity =(+)~

also available:
find in table of content

Capilla 48 MIG
Capilla 48 WIG

Standards:

(DIN 1736): E-NiCu30Mn
AWS: E NiCu-7
Mat.-No.: 2.4377

capilla® NiCu30Mn

Product description:

Stick electrode for cladding and fusion welding of Ni-Cu-alloys (Monel).
Dissimilar joints of steels with copper and copper alloys.

Max.service temperatures : ≤425°C,
good toughness down to -196°C.

Applications:

Chemical and petro-chemical plant construction, desalination plants, ship building .

Base materials:

2.4360, 2.4375.

Typical weld metal composition:

[wt. - %]

	C	Cu	Si	Mn	Fe	Ni
Min.		**28**		**3**		
Max.	**0,2**	**30**	**0,3**	**3,5**	**1**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	280	[MPa]
Yield strength $R_{p0,2}$:	330	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	36	[%]

Positions: all except PG

Redrying: 300°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 - 90
3,25	350	80 - 110
4,0	350	100 - 150
5,0	450	150 - 200

Polarity =(+)~

also available:
find in table of content

Capilla NiCu 30 Mn MIG
Capilla NiCu 30 Mn WIG

Standards:

EN ISO 14172:	E Ni 2061 (NiTi4)
(DIN 1736):	EL-NiTi 3
Mat.-No.:	2.4156
AWS:	E Ni-1

capilla® NiTi 3

Product description:

Special basic flux coated stick electrode suitable for welding of pure nickel and nickel alloys as well as welding of dissimilar joints of this materials with low- and medium-alloyed steels and fusion welding of steels and Cu-alloys.
Cladding on carbon steel. Welding of buffer layers preventing carbon diffusion from high carbon steels to corrosion resistant low carbon steels.

Applications:

Welding of nickel base alloys, low-alloyed nickel (Ni-semifinished products/Ni-cast) e.g.:

2.4066, 2.4068, 2.4061, 2.4060, 2.4050, 2.4062, 2.4106, 2.4110, 2.4122, 2.4116, 2.4128

as well as steel/grey cast iron joints, dissimilar joints copper/iron,corrosion resistant claddings and buffer layers.

Typical weld metal composition:

[wt. - %]

	C	Mn	Si	Al	Ti	Ni
Min.					**2**	
Max.	**0,02**	**0,03**	**0,7**	**0,3**	**2,5**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	500	[MPa]
Yield strength $R_{p0,2}$:	320	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	28	[%]
Impact strength (ISO-V):	160	[J]

Positions: all except PG

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	50 – 90
3,25	350	80 – 110
4,0	350	100 – 150

Polarity =(+)~

also available:
find in table of content

Capilla NiTi 4 MAG
Capilla NiTi 4 WIG

Standards:

DIN EN ISO 1071: E C NiFe-1 6
(DIN 8573): E NiFe-1-BG 23
AWS: E NiFe-CI

Recovery: **150%**

capilla® FeNi 55

Product description:

Special flux coated high recovery stick electrode for repair and maintenance of cast iron.
The welding properties of the electrode are excellent. The seams are free of blow holes.
The deposits can be machined excellently.

Carbon is precipitated as graphite in the weld metal.

Applications:

For cold welding of grey cast iron, malleable cast iron and nodular cast iron.

Base metals:
EN 1561: EN-GJL-100 (GG10) to EN-GJL-350 (GG 35);
EN 1562: EN-GJMB-350 (GTS 35) to EN-GJMB-550 (GTS 55); EN-GJMW-350 (GTW 35) to EN-GJMW-550 (GTW 55);
EN 1563: EN-GJS-400 (GGG40) to EN-GJS-700 (GGG 70)

Typical weld metal composition:

[wt. - %]

	C	Ni	Fe
Min.		**51**	
Max.	**0,02**	**55**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	200	[HB]

Positions: PA; PB; PC

Redrying: 150 – 180°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 – 90
3,25	350	90 – 120
4,0	350	110 – 150

Polarity =(+)~

also available:
find in table of content

Capilla 45 MIG
Capilla 45 WIG
Capilla G 45 MM (tubular wire)

Standards:

~DIN EN ISO 18273: E Al 4043 (AlSi 5)
(DIN 1732): EL-AlSi 5
AWS A 5.3: E-4043
Mat.-No.: 3.2245

capilla® 60/5

Product description:

Special flux coated stick electrode.

In case of welding of heat treatable Al-alloys such as AlCuMg 1, AlMgSi1 and AlZn4,5Mg1 the mechanical properties of the base metals have to be taken into account.

Applications:

Fusion and overlay welding of AlSi-alloys with a maximum amount of 7 % Si.
Dissimilar joints of several different Al-alloys.

Typical weld metal composition:

[wt. - %]

	Si	Al
Min.	**4,5**	
Max.	**5,5**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	120	[MPa]
Yield strength $R_{p0,2}$:	60	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	15	[%]
Impact strength (ISO-V):	-	[J]

Positions: all except PG

Redrying: 120°C/2h (store dry)

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	300	40 – 70
3,25	350	60 – 90
4,0	350	80 – 120

Polarity =(+)~

also available:
find in table of content

Capilla Al Si 5 MIG
Capilla Al Si 5 WIG

Standards:

~DIN EN ISO 18273: E Al 4047 (AlSi 12)
DIN 1732: El-AlSi 12
AWS: E 4047
Mat.-No.: 3.2585

capilla® 60/12

Product description:

Special flux coated stick electrode, particularly for welding of aluminium cast alloys.

Applications:

Joint and overlay welding of AlSi-alloys with a maximum amount of 12 % Si (with and without additions of Cu and/or Mg).

Typical weld metal composition:

[wt. - %]

	Si	Al
Min.	**11**	
Max.	**12**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	180	[MPa]
Yield strength $R_{p0,2}$:	80	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	5	[%]
Impact strength (ISO-V):	-	[J]

Positions: all except PG

Redrying: 120°C/2h (store dry)

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	300	40 – 70
3,25	350	60 – 90
4,0	350	80 – 120

Polarity =(+)~

also available:
find in table of content

Capilla Al Si 12 MIG
Capilla Al Si 12 WIG

6.2 Wire electrodes for gas shielded arc welding of cast iron, Cu- and Al-base-alloys as well as for special applications

6.2.1 Solid wires for gas shielded arc welding of cast iron, Cu- and Al-base-alloys as well as for special applications

Designation	Standard	Weld Metal Analysis [Wt.%]									Properties*					
capilla®		C	Si	Mn	Ni	Fe	Cu	Al	Mg	Others	$R_{o0,2}$ [MPa]	R_m [MPa]	L=5d [%]	KV (ISO-V) [J]	Hardness [HB]	SG
45 MIG	EN ISO 1071: S C NiFE 1 M	0,1	0,2	0,8	54	Bal.	-	-	-	-	-	480	16	-	200	M12
NiTi 4 MIG	EN ISO 14172: S Ni2061 (NiTi4) 2.4155	0,03	0,4	0,5	Bal.	-	-	-	-	Ti = 2,8	250	460	30	120	-	I1
NiCu30Mn MIG	EN ISO 18274: S Ni 4060 (NiCu30Mn3Ti) 2.4377	0,2	0,3	3	Bal.	1	29	-	-	-	330	490	36	-	-	I1
47 MIG	EN ISO 24373: S Cu6100 (CuAl7) 2.0921	-	-	0,3	0,5	-	Bal.	8	-	-	185	430	30	-	-	I1
47 N MIG	EN ISO 24373: S Cu6338 (CuMn13Al8Fe3Ni2) 2.1367	-	<0,1	13	1,5	1,5	Bal.	7			400	650	10	-	290	I1
47 Ni MIG	EN ISO 24373: S Cu 6327 (CuAl8Ni2Fe2Mn2) 2.0922	-	≤0,1	2,2	2,2	2,3	Bal.	8	-	-	290	550	30	-	140	I1

*** Min. values at AT / no heat treatment; shielding gas (SG) acc. EN ISO 14175;**
Dimensions: Ø 1,0; 1,2; 1,6 [mm]; Spools: K 300; other dimensions and packing units on demand;
****The mechanical properties of the deposit are mainly influenced by the base material and the heat treatment during and after welding**

6.2.1 Solid wires for gas shielded arc welding of cast iron, Cu- and Al-base-alloys as well as for special applications (continued)

Designation	Standard	Weld Metal Analysis [Wt.%]									Properties*					
capilla®		**C**	**Si**	**Mn**	**Ni**	**Fe**	**Cu**	**Al**	**Mg**	**Others**	**$R_{o0,2}$ [MPa]**	**R_m [MPa]**	**L=5d [%]**	**KV (ISO-V) [J]**	**Hardness [HB]**	**SG**
47 Ni 6 MIG	EN ISO 24373: S Cu 6328 (CuAl9Ni5Fe3Mn2) 2.0923	-	≤0,1	1,8	5	3	Bal.	9	-	-	-	690	16	-	150	I1
48 MIG	EN ISO 24373: S Cu5180A (CuSn6P) 2.1022	-	-	-	-	-	Bal.	-	-	Sn = 6; P< 0,2	150	260	20	-	80	I1
CuSn MIG	EN ISO 24373: S Cu 1898A (CuSn1MnSi) 2.1006	-	0,25	0,3	-	-	Bal.	-	-	Sn=1	-	230	-	-	70	I1
CuSn 12 MIG	EN ISO 24373: S CU 5410 (CuSn12P) 2.1056	-	-	-	-	-	Bal.	-	-	Sn=12 P=0,3	190	380	25	-	100	I1
CuAl 10 MIG	EN ISO 24373: S Cu 6180 (CuAl10Fe) 2.0937	-	0,1	-	-	1,5	Bal.	10	-	-	-	420	35	-	150	I1
CuSi 3 MIG	EN 14640: S Cu6560 (CuSi3Mn1) 2.1461	-	3	1	-	-	Bal.	-	-	-	120	350	40	-	-	I1
CuAg MIG	EN ISO 24373: S Cu 1897 (CuAg1) 2.1211	-	0,1	0,5	-	-	Bal.	-	-	Ag=0,9	-	200	30	-	60	I1

*** Min. values at AT / no heat treatment; shielding gas (SG) acc. EN ISO 14175;**
Dimensions: Ø 1,0; 1,2; 1,6 [mm]; Spools: K 300; other dimensions and packing units on demand

6.2.1 Solid wires for gas shielded arc welding of cast iron, Cu- and Al-base-alloys as well as for special applications (continued)

Designation	Standard	Weld Metal Analysis [Wt.%]									Properties*					
capilla®		**C**	**Si**	**Mn**	**Ni**	**Fe**	**Cu**	**Al**	**Mg**	**Others**	**$R_{o0,2}$ [MPa]**	**R_m [MPa]**	**L=5d [%]**	**KV (ISO-V) [J]**		**SG**
AlSi 12 MIG	EN ISO 18273: S Al4047 (AlSi 12) 3.2585	-	12	-	-	-	-	Bal.	-	Ti=0,1	>60	>130	>5	-		I1
AlSi 5 MIG	EN ISO 18273 S Al4043 (AlSi5) 3.2245	-	5	-	-	0,3	-	Bal.	-	Ti=0,1	>40	>120	>8	-	-	I1
Al 99,5 MIG	EN ISO 18273: S Al1450 (Al99,5Ti) 3.0805	-	0,1	0,01	-	-	0,01	Bal.	0,01	Ti=0,15	>20	>65	>35	-	-	I1
AlMg 3 MIG	EN ISO 18273: S Al5754 (AlMg 3) 3.3536	-	0,2	-	-	-	-	Bal.	3,2	Mn+Cr=0,5	>80	>190	20	-		I1
AlMg 5 MIG	EN ISO 18273: S Al5356 (AlMg5Cr) 3.3556	-	0,2	0,1	-	-	-	Bal.	5	Ti=0,1 Cr=0,1	>120	>250	>8	-		I1
AlMg 4,5 Mn MIG	EN ISO 18273: S Al5183 (AlMg4,5Mn0,7) 3.3548	-	0,2	0,8	-	-	-	Bal.	4,8	Cr=0,15; Fe≤0,1	>125	>275	>17	-		I1

*** Min. values at AT / no heat treatment; shielding gas (SG) acc. EN ISO 14175;**
Dimensions: Ø 1,0; 1,2; 1,6 [mm]; Spools: K 300; other dimensions and packing units on demand

6.2.2 Welding rods for tungsten inert gas welding of cast iron, Cu- and Al-base-alloys as well as for special applications

Designation	Standard	Weld Metal Analysis [Wt.%]									Properties*					
capilla®		**C**	**Si**	**Mn**	**Ni**	**Fe**	**Cu**	**Al**	**Mg**	**Others**	**$R_{o0,2}$ [MPa]**	**R_m [MPa]**	**L=5d [%]**	**KV (ISO-V) [J]**	**Hardness [HB]**	**SG**
45 WIG	EN ISO 1071: S C NiFE 1 M	0,1	0,2	0,8	54	Bal.	-	-	-	-	-	480	16	-	200	M12
NiTi 4 WIG	EN ISO 14172: S Ni2061 (NiTi4) 2.4155	0,03	0,4	0,5	Bal.	-	-	-	-	Ti = 2,8	250	460	30	120	-	I1
NiCu30Mn WIG	EN ISO 18274: S Ni 4060 (NiCu30Mn3Ti) 2.4377	0,2	0,3	3	Bal.	1	29	-	-	-	330	490	36	-	-	I1
47 WIG	EN ISO 24373: S Cu6100 (CuAl7) 2.0921	-	-	0,3	0,5	-	Bal.	8	-	-	185	430	30	-	-	I1
47 N WIG	EN ISO 24373: S Cu6338 (CuMn13Al8Fe3Ni2) 2.1367	-	<0,1	13	1,5	1,5	Bal.	7			400	650	10	-	290	I1
47 Ni WIG	EN ISO 24373: S Cu 6327 (CuAl8Ni2Fe2Mn2) 2.0922	-	≤0,1	2,2	2,2	2,3	Bal.	8	-	-	290	550	30	-	140	I1

*** Dimensions: Ø 1,0; 1,6; 2,0; 2,4 [mm]; Length: 1000 [mm]; other dimensions on demand; shielding gas (SG) acc EN ISO 14175**

6.2.2 Welding rods for tungsten inert gas welding of cast iron, Cu- and Al-base-alloys as well as for special applications (continued)

Designation	Standard	Weld Metal Analysis [Wt.%]									Properties*					
capilla®		C	Si	Mn	Ni	Fe	Cu	Al	Mg	Others	$R_{o0,2}$ [MPa]	R_m [MPa]	L=5d [%]	KV (ISO-V) [J]	Hardness [HB]	SG
47 Ni 6 WIG	EN ISO 24373: S Cu 6328 (CuAl9Ni5Fe3Mn2) 2.0923	-	≤0,1	1,8	5	3	Bal.	9	-	-	-	690	16	-	150	I1
48 WIG	EN ISO 24373: S Cu5180A (CuSn6P) 2.1022	-	-	-	-	-	Bal.	-	-	Sn = 6; P< 0,2	150	260	20	-	80	I1
CuSn WIG	EN ISO 24373: S Cu 1898A (CuSn1MnSi) 2.1006	-	0,25	0,3	-	-	Bal.	-	-	Sn=1	-	230	-	-	70	I1
CuSn 12 WIG	EN ISO 24373: S CU 5410 (CuSn12P) 2.1056	-	-	-	-	-	Bal.	-	-	Sn=12 P=0,3	190	380	25	-	100	I1
CuAl 10 WIG	EN ISO 24373: S Cu 6180 (CuAl10Fe) 2.0937	-	0,1	-	-	1,5	Bal.	10	-	-	-	420	35	-	150	I1
CuSi 3 WIG	EN 14640: S Cu6560 (CuSi3Mn1) 2.1461	-	3	1	-	-	Bal.	-	-	-	120	350	40	-	-	I1
CuAg WIG	EN ISO 24373: S Cu 1897 (CuAg1) 2.1211	-	0,1	0,5	-	-	Bal.	-	-	Ag=0,9	-	200	30	-	60	I1

*** Dimensions: Ø 1,0; 1,6; 2,0; 2,4 [mm]; Length: 1000 [mm]; other dimensions on demand; shielding gas (SG) acc EN ISO 14175**

6.2.2 Welding rods for tungsten inert gas welding of cast iron, Cu- and Al-base-alloys as well as for special applications (continued)

Designation	Standard	Weld Metal Analysis [Wt.%]									Properties*					
capilla®		C	Si	Mn	Ni	Fe	Cu	Al	Mg	Others	$R_{o0,2}$ [MPa]	R_m [MPa]	L=5d [%]	KV (ISO-V) [J]		SG
AlSi 12 WIG	EN ISO 18273: S Al4047 (AlSi 12) 3.2585	-	12	-	-	-	-	Bal.	-	Ti=0,1	>60	>130	>5	-		I1
AlSi 5 WIG	EN ISO 18273 S Al4043 (AlSi5) 3.2245	-	5	-	-	0,3	-	Bal.	-	Ti=0,1	>40	>120	>8	-	-	I1
Al 99,5 WIG	EN ISO 18273: S Al1450 (Al99,5Ti) 3.0805	-	0,1	0,01	-	-	0,01	Bal.	0,01	Ti=0,15	>20	>65	>35	-	-	I1
AlMg 3 WIG	EN ISO 18273: S Al5754 (AlMg 3) 3.3536	-	0,2	-	-	-	-	Bal.	3,2	Mn+Cr=0,5	>80	>190	20	-		I1
AlMg 5 WIG	EN ISO 18273: S Al5356 (AlMg5Cr) 3.3556	-	0,2	0,1	-	-	-	Bal.	5	Ti=0,1 Cr=0,1	>120	>250	>8	-		I1
AlMg 4,5 Mn WIG	EN ISO 18273: S Al5183 (AlMg4,5Mn0,7) 3.3548	-	0,2	0,8	-	-	-	Bal.	4,8	Cr=0,15; Fe≤0,1	>125	>275	>17	-		I1

*** Dimensions: Ø 1,0; 1,6; 2,0; 2,4 [mm]; Length: 1000 [mm]; other dimensions on demand; shielding gas (SG) acc EN ISO 14175**

6.2.3 Tubular wires for gas shielded arc welding of cast iron, Cu- and Al-base-alloys as well as for special applications

Designation	Standard	Weld Metal Analysis [Wt.%]									Properties*					
capilla®		C	Si	Mn	Ni	Fe	Cu	Al	Mg	Others	$R_{o0,2}$ [MPa]	R_m [MPa]	L=5d [%]	KV (ISO-V) [J]	Hardness	SG
FeC 3 RLD*	EN ISO 1071: T C FeC-3 N	2,3	1,8	0,9	-	Bal.	-	-	-	Ti=0,4	-*	-*	-*	-*	-*	OA
45 RLD	DIN EN ISO 1071: T C NiFe1 M	1,5	-	-	55	Bal.	-	-	-	-	-	-	-	-	200	M21
47 N RLD	EN ISO 24373: T Cu6338 (Cu Mn14Al7)	-	<0,1	13	1,5	1,5	Bal.	7			400	650	10	-	290	I1

*** Min. values at AT / no heat treatment; shielding gas (SG) acc. EN ISO 14175;**

Dimensions: Ø 1,0; 1,2; 1,6 [mm]; Spools: K 300; other dimensions and packing units on demand;

****The mechanical properties of the deposit are mainly influenced by the base material and the heat treatment during and after welding.**

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