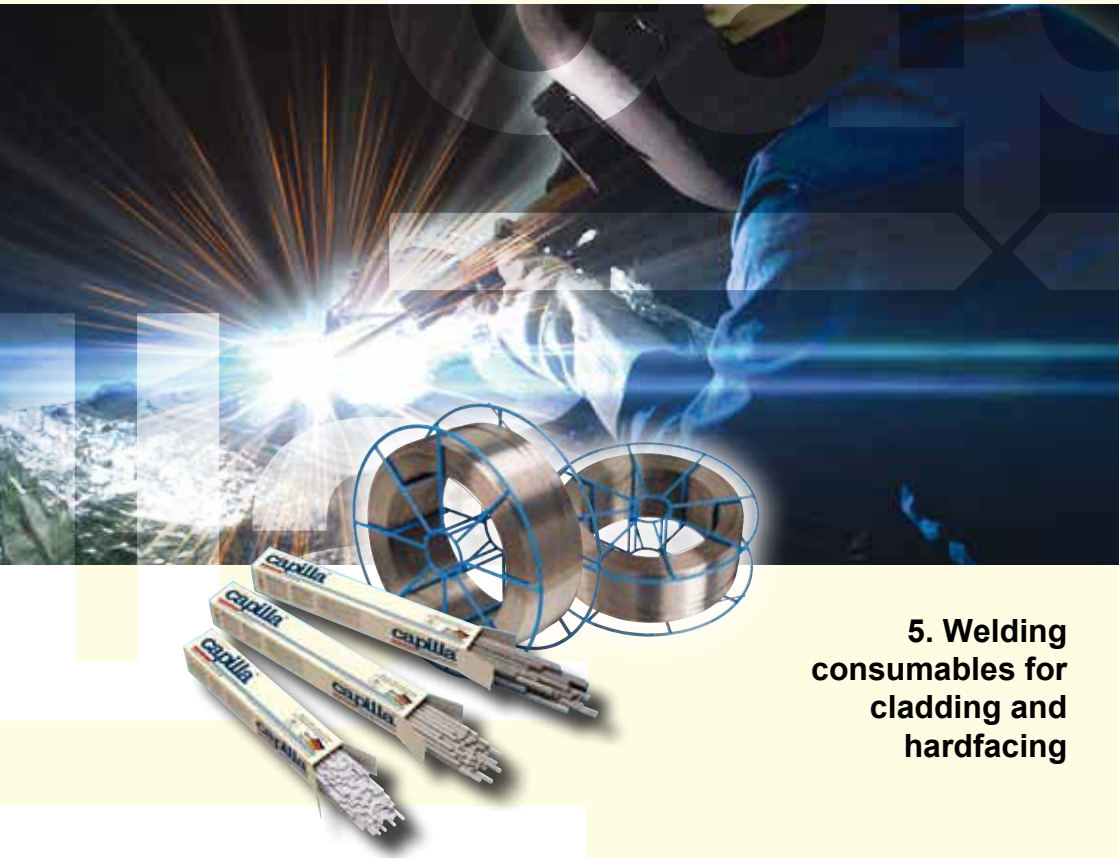
capilla®

Part catalogue



5. Welding consumables for cladding and hardfacing

5 Welding consumables for cladding and hardfacing

5.1 Coated stick electrodes for cladding and hardfacing

capilla®	EN 14700	(DIN 8555):	Page
308 HL	E Fe 11	E 8-UM-200 CKPR	**142**
318 HL	E Fe 11	E 8-UM-200 CKPR	**143**
309 HL	E Fe 11	E 8-UM-200 CKPR	**144**
51 W	E Fe 10	E 8-UM-250 CKPR	**145**
5201	E Fe 11	E 8-UM-250 CKPR	**146**
52	E Fe 11	E 8-UM-300 CKPR	**147**
56	E Fe 9	E 7-UM-200-K	**148**
56 Fe	E Fe 9	E 7-UM-200-K	**149**
CR MA 47	E Fe 9	E7-UM-250-K	**150**
250 B	E Fe 1	E 1-UM-250 P	**151**
300 B	E Fe 1	E 1-UM-300 P	**152**
400 B	E Fe 1	E 1-UM-400 P	**153**
500 B	E Fe 1	E 1-UM-50 P	**154**
54 W	E Fe 8	E 6-UM-60 PS	**155**
54-160	E Fe 8	E 6-UM-60 PS	**156**
60 HRC	E Fe 15	E 10-UM-60-GRZ	**157**
540	E Fe 15	E 10-UM-65-GRZ	**158**
540 SF	E Fe 15	E 10-UM-65-GRZ	**159**
540 Nb	E Fe 15	E 10-UM-65-GRZ	**160**
540 N	E Fe 16	E 10-UM-65-TZ	**161**
540 V	E Fe 16	E 10-UM-65-TZ	**162**
635 S	E Fe 15	E 10-UM-65-Z	**163**
68 HRC	E Fe 15	E 10-UM-70-GCZ	**164**
550 E	T Fe 20	E 21-GF-UM-65 G	**165**
550 G	T Fe 20	G 21-GF-UM-65 G	**166**
900 G	not classified	G 21-UM-65 G	**167**

5.2 Wire electrodes for cladding and hardfacing

5.2.1 Solid wires for gas shielded arc welding of claddings and hardfacings

capilla®	EN 14700	(DIN 8555):	Page
5201 MAG	S Fe 10	MSG 8-GZ-200 KPZ	**168**
250 MAG	S Fe 1	MSG 1-GZ-250	**168**
300 MAG	S Fe 1	MSG 1-GZ-300	**168**
600 MAG	S Fe 8	MSG 6-GZ-60	**168**
54 MAG	S Fe 8	MSG 6-GZ-60 P	**168**
655 MAG	S Fe 8	MSG 6-GZ-60 GZ	**168**

5.2.2 Welding rods for tungsten inert gas welding of claddings and hardfacings

capilla®	EN 14700	(DIN 8555):	Page
5201 WIG	S Fe 10	MSG 8-GZ-200 KPZ	**169**
250 WIG	S Fe 1	MSG 1-GZ-250	**169**
300 WIG	S Fe 1	MSG 1-GZ-300	**169**
600 WIG	S Fe 8	MSG 6-GZ-60	**169**
54 WIG	S Fe 8	MSG 6-GZ-60 P	**169**
655 WIG	S Fe 8	MSG 6-GZ-60 GZ	**169**

5.2.3 Tubular wires for gas shielded arc welding of claddings and hardfacings

capilla®	EN 14700	DIN 8555	Page
G 350 MM	T Fe 1	MF 1-GF-350 P	**170**
G 500 MM	T Fe 1	MF 1-GF-50 GP	**170**
G 600 MM	T Fe 8	MF 6-GF-60 GZ	**170**
G 600 Si MM	T Fe 8	MF 6-GF-60 GZ	**170**
G 655 MM	T Fe 8	MF 6-GF-60 GZ	**170**
561 RLD	T Fe 9	MF 7-GF-200/450 KPN	**170**
562 RLD	T Fe 9	MF 7-GF-200/450 KPN	**170**
56 RLD	T Fe 9	MF 7-GF-200/50 CKP	**170**
52 RLD	T Fe 11	MF 8-GF-150/400 KPZ	**170**
5201 RLD	T Fe 10	MF 8-GF-150/400 KPZ	**170**
354 RLD	T Fe 14	MF 10-GF-50 G	**170**
G 154 MM	T Fe 1	MF 1-GF-40 P	**170**
G 254 MM	T Fe 1	MF 1-GF-45 G	**170**
5600 RLD	T Fe 9	MF 7-GF-40 GKP	**170**
G54 MM	T Fe 8	MF 6-GF-55 GP	**171**
G 54 N MM	T Fe 8	MF 10-GF- 60 G	**171**
55 RLD	T Fe 15	MF 10-GF-60 G	**171**
60 RLD	T Fe 15	MF 10-GF-60 G	**171**
540 RLD	T Fe 14	MF 10-GF-60 CGT	**171**
540 Nb RLD	T Fe 15	MF10-GF-65 G	**171**
540 N RLD	T Fe 16	MF 10-GF-65 GT	**171**
540 V RLD	T Fe 13	MF 10-GF-65 GRZ	**171**
540 B RLD	T Fe 13	MF 10-GF-70 GRZ	**171**
68 HRC RLD	T Fe 15	MF 10-GF-70 GRZ	**171**
HR MAG	special alloy	MF 21-GF-55 G	**171**
911 G	special alloy	MF 21-GF-65 G	**171**

Standards:

EN 14700:	E Fe 11-200-cnz
EN ISO 3581-A:	E 19 9 LR 52
EN 1600:	E 19 9 LR 52
AWS A 5.4:	E 308 L-25
Mat.-No.:	1.4316
Recovery:	**150%**

capilla® 308 HL

Product description:

High recovery rutile-basic coated stick electrode for welding of non-stabilized austenitic stainless Cr-Ni steels with extra low carbon content, suitable for service temperatures of up to 350°C, good low temperature properties down to -78°C.

Also suitable for cladding non-alloyed steels
In this case welding a buffer layer using Capilla 309 HL is recommended.

Applications:

1.4300, 1.4301, 1.4303, 1.4306, 1.4308, 1.4311, 1.4312, 1.4371, 1.4541, 1.4543, 1.4550, 1.4552.

Typical weld metal composition:

[wt. - %]

	C	Cr	Ni	Fe
Min.		**18**	**9**	
Max.	**0,03**	**20**	**11**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	550	[MPa]
Yield strength $R_{p0,2}$:	320	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	35	[%]
Impact strength (ISO-V):	70	[J]

Positions: all except PG

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
2,0	350	40 – 60	=(+)~
2,5	350	50 – 90	
3,25	350	80 – 110	
4,0	350	100 – 150	
5,0	450	150 – 200	

also available:
find in table of content

Capilla 308 H
Capilla 308 KB
Capilla 308 L
Capilla 308 LR

Capilla 308 MAG
Capilla 308 WIG
Capilla G 308 L RM (tubular wire)

Standards:

EN 14700:	E Fe 11-200-cnz
EN ISO 3581-A:	E 19 12 3 Nb R 52
EN 1600:	E 19 12 3 Nb R 52
AWS A 5.4:	E 318-26
Mat.-No.:	1.4576
Recovery:	**150%**

capilla® 318 HL

Product description:

High recovery rutile-basic coated stick electrode for welding of austenitic stainless Cr-Ni-Mo-steels especially for Nb-and Ti - stabilised ELC-types of steel.
Also suitable for cladding non-alloyed steels
In this case welding a buffer layer using Capilla 309 HL is recommended.

Service temperatures up to. 400°C.

Applications:

Suitable for materials as:
1.4571, 1.4573, 1.4580, 1.4581, 1.4583, 1.4401, 1.4404, 1.4408, 1.4420, 1.4435, 1.4436.

Typical weld metal composition:

[wt. - %]

	C	Cr	Ni	Mo	Nb	Fe
Min.		**18**	**11**	**2,5**	**10 x %C**	
Max.	**0,03**	**20**	**13**	**3**		**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	600	[MPa]
Yield strength $R_{p0,2}$:	440	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	30	[%]
Impact strength (ISO-V):	70	[J]

Positions: all except PG

Redrying:: 300°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
2,0	350	40 – 60	=(+)~
2,5	350	50 – 90	
3,25	350	80 – 110	
4,0	350	100 – 150	
5,0	450	150 – 200	

also available:
find in table of content

Capilla 318 KB
Capilla 318 LR

Capilla 318 MAG
Capilla 318 WIG

Standards:

EN 14700:	E Fe 11-200-cnz
EN ISO 3581-A:	E 23 12 LR 52
EN 1600:	E 23 12 LR 52
AWS A 5.4:	E 309 L-26
Mat.-No.:	~1.4332
Recovery:	**160%**

capilla® 309 HL

Product description:

Rutile-basic coated high recovery stick electrode for overlay and fusion weldings of similar or lower alloyed heat-resistant CrNi- steels.
Service temperature of max. 300°C. The weld metal is scaling resistant up to 1050°C.
Suitable for overlay weldings onto non-alloyed steels if an 18/8 Cr-Ni alloy composition has to be achieved in the first layer.

Applications:

Claddings, buffer layers and joints, suitable for steels such as:

1.4541, 1.4550, 1.4710, 1.4712, 1.4727, 1.4729, 1.4740, 1.4742, 1.4780, 1.4825, 1.4826, 1.4828, 1.4878.

Typical weld metal composition:

[wt. - %]

	C	Cr	Ni	Fe
Min.		**21**	**11**	
Max.	**0,03**	**23**	**13**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	550	[MPa]
Yield strength $R_{p0,2}$:	400	[MPa]
Yield strength $R_{p1,0}$:	430	[MPa]
Elongation (L=5d):	30	[%]
Impact strength (ISO-V):	55	[J]

Positions: all except PG

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,0	350	40 – 60
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 309 L KB
Capilla 309 LR
Capilla 309 L MAG
Capilla 309 L WIG
Capilla G 309 L RM (tubular wire)

Standards:

EN14700:	E Fe 10-200/400-cnz
EN ISO 3581-A:	E 18 8 Mn R 52
EN 1600:	E 18 8 Mn R 52
AWS A 5.4:	~ E 307-26
Mat.-No.:	1.4370
Recovery:	**160%**

capilla® 51 W

Product description:

Rutile-basic coated high recovery stick electrode suitable for fusion welding of dissimilar joints and cladding of mild steel.
The Cr-Ni-Mn-alloyed weld metal has a fully of austenitic structure and can be strainhardened.

Service temperatures in corrosive media: up to 300 °C.

Scaling resistant: up to 900 °C.

Applications:

Fusion welding of dissimilar ferritic-austenitic joints; welding of "hard-to-weld"-steels having a high C-content, e.g. rail steels,
fusion welding of strain hardening Mn-steels, e.g. X 120 Mn 12 (1.3401).

Buffer layers of hardfacings.

Typical weld metal composition:

[wt. - %]

	C	Cr	Ni	Mn	Fe
Min.		**17**	**7**	**5**	
Max.	**0,1**	**19**	**9**	**7**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	600	[MPa]
Yield strength $R_{p0,2}$:	350	[MPa]
Yield strength $R_{p1,0}$:	400	[MPa]
Elongation (L=5d):	40	[%]
Impact strength (ISO-V):	70	[J]

Positions: all except PG

Redrying: 320°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	350/450	150 – 200

Polarity =(+)~

also available:
find in table of content

Capilla 51 Kb
Capilla 51 Ti
Capilla 51 MAG

Capilla 51 WIG
Capilla G 51 MM
Capicoat 51

Standards:

EN 14700:	E Fe 11-200-cz
(DIN 8555):	E 8-UM-250 CKPR
EN ISO 3581-A:	E 23 12 2 R 52
AWS:	~ E 309 Mo-26
Mat.-No.:	~ 1.4459
Recovery:	**170%**

capilla® 5201

Product description:

High recovery electrode for for welding of crack-free, wear and heat resistant joints and overlays exposed to heavy shock and impact. Fusion welding of dissimilar steels, tool steels, hot working steels, cast steel or manganese steel.

Applications:

Suitable for fusion and overlay welding on hot forming tools, e.g.:

Dies, trimming tools and valve seats.
Verstatile electrode for repair welding of worn machine parts and for new manufacturing of tools.
Suitable for welding of bufering layers of Co-based hardfacings.

Typical weld metal composition:

[wt. - %]

	C	Cr	Ni	Mo	Fe
Min.		**22**	**10**	**2,5**	
Max.	**0,04**	**24**	**12**	**3,5**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	600	[MPa]
Yield strength $R_{p0,2}$:	400	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	25	[%]
Impact strength (ISO-V):	70	[J]
Hardness:	240	[HB]
	340	[HB] workhardened

Positions: PA, PB

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
2,0	350	50 – 90	=(+)~
2,5	350	80 – 120	
3,25	350	100 – 160	
4,0	450	160 – 220	
5,0	450	190 – 260	

also available:
find in table of content

Capilla 5201 MAG
Capilla G 5201 MM

Standards:

EN 14700:	E Fe 11-250-cz
EN ISO 3581-A:	E 29 9 R 52
EN 1600:	E 29 9 R 52
AWS A 5.4:	E 312-26
Mat.-No.:	1.4337
Recovery:	**170%**

capilla® 52

Product description:

Rutile-basic coated high recovery electrode for fusion welding of dissimilar steels. Suitable for welding buffering layers and corrosion resistant and scaling resistant overlay clads.
The electrode produces a very soft arc and self-detaching slag, easy to weld without any splatters. The weld metal has a ferritic-austenitic microstructure (high strength duplex stainless steel).

Applications:

Corrosion resistant like similar alloyed steels and steel casts, e.g.

1.4762 (X 10 CrAl 24),
1.4085 (G-X 70 Cr 29).

Suitable for “difficult to weld” steels, e.g. constructional steel with high tensile strength, fusion welding of high alloyed manganese steels and joints of this steels with high-alloyed steel, suitable for repair and maintenance.

Typical weld metal composition:

[wt. - %]

	C	Cr	Ni	Fe
Min.		**27,5**	**8**	
Max.	**0,1**	**30**	**10**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Tensile strength R_m:	750	[MPa]
Yield strength $R_{p0,2}$:	500	[MPa]
Yield strength $R_{p1,0}$:	-	[MPa]
Elongation (L=5d):	20	[%]
Impact strength (ISO-V):	40	[J]

Positions: all except PG

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
2,0	250	40 – 60	=(+)~
2,5	300	60 – 90	
3,25	350	80 – 110	
4,0	350	100 – 150	
5,0	350	150 – 200	

also available:
find in table of content

Capilla 52 K
Capilla 52 MAG

Capilla 52 WIG
Capilla G 52 MM (tubular wire)

Standards:		**capilla® 56**
EN 14700:	E Fe 9-200/450-knp	
(DIN 8555):	E 7-UM-250-K	
AWS:	E Fe Mn-A	
Mat.-No.:	1.3402	
Recovery:	**140%**	

Product description:

Basic-coated high recovery stick electrode. The strain hardening weld metal is highly Mn-alloyed. Suitable for welding of very tough and wear resistant overlays exposed to heavy impact Welding should be performed applying low heat input.

Applications:

For overlay welding of worn manganese steel surfaces and parts which are largely exposed to wear caused by impact and shock.

Excavator teeth, beating arm, dredger bolts, crusher jaws and cones, sand blasting and shot peening devices;

Railway systems:
crossing frogs and four-way pieces.

Typical weld metal composition:

[wt. - %]

	C	Mn	Ni	Fe
Min.		**12**		
Max.	**0,8**	**14**	**3**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	240	[HB]
	440	[HB] workhardened

Positions: PA, PB, (PC)

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
3,25	450	100 – 160	=(+)~
4,0	450	160 – 220	
5,0	450	190 – 260	

also available:
find in table of content

Capilla 561 RLD (tubular wire)

Standards:

EN 14700: E Fe 9-200/450-knp
(DIN 8555): E 7-UM-250/450-K
AWS: E Fe Mn-A
Mat.-No.: ~1.3402

Recovery: **140%**

capilla® 56 Fe

Product description:

Basic-coated high recovery stick electrode. The strain hardening weld metal is highly Mn-alloyed. Suitable for welding of very tough and wear resistant overlays exposed to heavy impact Welding should be performed applying low heat input.

Applications:

For overlay welding of worn manganese steel surfaces and parts which are largely exposed to wear caused by impact and shock:
Excavator teeth, beating arm, dredger bolts, crusher jaws and cones, sand blasting and shot peening devices;

Railway systems:
crossing frogs and four-way pieces.

Typical weld metal composition:

[wt. - %]

	C	Mn	Fe
Min.		**12**	
Max.	**0,8**	**14**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	200 – 220	[HB]
	430 – 450	[HB] workhardened

Positions: PA, PB, (PC)

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
3,25	450	100 – 160	=(+)~
4,0	450	160 – 220	
5,0	450	190 – 260	

also available:
find in table of content

Capilla 561 RLD (tubular wire)

Standards:

EN 14700: E Fe 9-250/450-cknp
(DIN 8555): E7-UM-250-K

Recovery: **140%**

capilla® CR MA 47

Product description:

Basic-coated high recovery stick electrode. The strain hardening weld metal is highly Mn-alloyed. Suitable for welding of very tough and wear resistant overlays exposed to heavy impact. Welding should be performed applying low heat input.
The weld metal is corrosion resistant.

Applications:

For overlay welding of worn manganese steel surfaces and parts which are largely exposed to wear caused by impact and shock:
Excavator teeth, beating arm, dredger bolts, crusher jaws and cones, sand blasting and shot peening devices;

Railway systems:
crossing frogs and four-way pieces.

Typical weld metal composition:

[wt. - %]

	C	Cr	Mn	Fe
Min.	**0,5**	**13**	**16**	
Max.	**0,6**	**15**	**18**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	250	[HB]
	450	[HB] workhardened

Positions: PA, PB, (PC)

Redrying: 300°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
2,5	350	80 – 120	=(+)~
3,25	350	100 – 160	
4,0	450	160 – 220	
5,0	450	190 – 260	

also available:
find in table of content

Capilla 56 RLD (tubular wire)

Standards:		**capilla® 250 B**
EN 14700:	E Fe 1-250-p	
(DIN 8555):	E 1-UM-250 P	
Recovery:	**120%**	

Product description:

Basic-coated low alloyed stick electrode for welding of wear resistant overlays.

Applications:

For crack-free, shock-proof overlays of guides, rollers, couplings, running wheels, rails, brake drums, wheel rims, bearing surfaces and rope winches.

Typical weld metal composition:

[wt. - %]

	C	Cr	Mn	Fe
Min.	**0,1**	**2**	**1**	
Max.	**0,12**	**2,5**	**1,5**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	230	[HB]

Positions: all except PG

Redrying: 300 – 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
3,25	350	95 – 150
4,0	450	140 – 190
5,0	450	190 – 250

Polarity =(+)~

also available:
find in table of content

Capilla 250 MAG
Capilla 250 WIG

Standards:		**capilla® 300 B**
EN 14700:	E Fe 1-300-p	
DIN 8555:	E 1-UM-300 P	
Recovery:	**120%**	

Product description:

Basic coated stick electrode for welding of wear resisting overlays. Weld metal of low alloyed Cr-Mn-steel.

Applications:

For crack-free, shock-proof overlays of guides, rollers, couplings, running wheels, rails, brake drums, sliding ways, wheel rims, bearing surfaces and rope winches.

Typical weld metal composition:

[wt. - %]

	C	Cr	Mn	Fe
Min.	**0,1**	**2,5**	**1**	
Max.	**0,15**	**3**	**1,5**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	300	[HB]

Positions: all except PG

Redrying: 300 – 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 – 90
3,25	350	95 – 150
4,0	450	140 – 190
5,0	450	190 – 250

Polarity =(+)~

also available: Capilla 300 MAG
find in table of content

Standards:

EN 14700: E Fe 1-400-p
(DIN 8555): E 1-UM-400 P

Recovery: **120%**

capilla® 400 B

Product description:

Basic coated stick electrode suitable for hardfacing of machine components which are exposed to wear. The electrode has good welding properties when AC-power sources are used.

Good applicability for positional work.
The slag can be removed easily.

Applications:

Hardfacings on surfaces which are exposed to heavy impact and abrasion e.g.
running wheels, earthmoving machines, conveyor screws, chain and bucket conveyors, rails, etc.

The overlays are crack-free. Machining by chipping using hard metal tools is possible.

Typical weld metal composition:

[wt. - %]

	C	Cr	Mn	Fe
Min.		**2,5**		
Max.	**0,15**	**3,5**	**1**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	375	[HB]

Positions: all except PG

Redrying: 300 – 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
3,25	350	100 – 140	=(+)~
4,0	450	140 – 180	
5,0	450	180 – 220	

Standards:

EN 14700: E Fe 7-50-gpt
(DIN 8555): E 6-UM-50

Recovery: **120%**

capilla® 500 B

Product description:

Basic coated stick electrode suitable for hardfacing of machine components which are exposed to wear. The electrode has good welding properties when AC-power sources are used.

Good applicability for positional work.

Hardening parameters: 840°C/Oil

Applications:

Hardfacings on surfaces which are exposed to heavy impact and abrasion e.g.
running wheels, earthmoving machines, conveyor screws, chain and bucket conveyors, rails, etc.

The overlays are crack-free. Machining by chipping using hard metal tools is possible.

Typical weld metal composition:

[wt. - %]

	C	Cr	Si	Fe
Min.		**2,5**	**1,0**	
Max.	**0,30**	**3,5**	**1,3**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	50	[HB]

Positions: all except PG

Redrying: 300 – 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
3,25	450	100 – 140	=(+)~
4,0	450	140 – 180	
5,0	450	180 – 220	

also available: Capilla 500 MAG
find in table of content

Standards:

EN 14700: E Fe 7-55-gpt
(DIN 8555): E 6-UM-60
Mat.-No.: ~ 1.4718

Recovery: **120%**

capilla® 54 W

Product description:

Basic coated Cr-Mo-V-alloyed stick electrode for tough and wear-resistant deposits on parts that are subject to abrasive wear and heavy impacts. Deposits without cracks and pinholes. Deposit thickness as required.

Applications:

Hardfacing of dredger teeth, crusher jaws, screw conveyors, coal cutters, beaters, edge runners, hammers etc.

Typical weld metal composition:

[wt. - %]

	C	Cr	Mn	Mo	V	Fe
Min.	**0,5**	**7**	**0,5**	**0,5**	**1**	
Max.	**0,8**	**10**	**0,7**	**1**	**1,2**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	54 – 60	[HRC]

Positions: all except PG

Redrying: 300°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
2,5	350	80 – 120	=(+)~
3,25	350	100 – 160	
4,0	450	160 – 220	
5,0	450	190 – 260	
6,0	450	220 – 290	

also available:
find in table of content

Capilla 54 Ti
Capilla 54 MAG

Capilla 54 WIG
Capilla G 54 MM (tubular wire)

Standards:

EN 14700: E Fe 7-55-gpt
(DIN 8555): E 6-UM-60 PS
Mat.-No.: ~ 1.4718

Recovery: **160%**

capilla® 54-160

Product description:

Basic coated Cr-Mo-V-alloyed stick electrode for tough and wear-resistant deposits on parts that are subject to abrasive wear and heavy impacts. Deposits without cracks and pinholes. Deposit thickness as required.

Applications:

For dredger teeth, crusher jaws, screw conveyors, coal cutters, beaters, edge runners, hammers etc.

Typical weld metal composition:

[wt. - %]

	C	Cr	Mn	Mo	Fe
Min.	**0,5**	**7**	**0,5**	**0,5**	
Max.	**0,8**	**10**	**0,7**	**1**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	54 – 60	[HRC]

Positions: all except PD, PE, PG

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
2,5	350	80 – 120	=(+)~
3,25	350	100 – 160	
4,0	450	160 – 220	
5,0	450	190 – 260	
6,0	450	220 – 290	

Standards:

EN 14700: E Fe 14-60-cg
(DIN 8555): E 10-UM-60-GRZ
AWS: E Fe Cr A1

Recovery: **160%**

capilla® 60 HRC

Product description:

Rutile-coated high recovery stick electrode for welding of highly wear resistant overlays at machine parts which are exposed to high emery wear caused by abrasive substances.

Applications:

Hardfacing of moulds, agitator blades, dredger teeth, guidance, slides, components of hoisting devices etc. which are exposed to heavy abrasive wear in combination with moderate pressure or impact.

Base materials:
mild steels, low alloyed steels, steel casts and high-manganese steel.

Typical weld metal composition:

[wt. - %]

	C	Cr	Fe
Min.	**3,5**	**28**	
Max.	**4,2**	**32**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	57 – 61	[HRC]

Positions: PA, PB

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	80 – 120
3,25	350	100 – 160
4,0	450	160 – 220
5,0	450	190 – 260

Polarity =(+)~

also available: Capilla 60 RLD
find in table of content

Standards:

EN 14700: E Fe 15-60-cg
(DIN 8555): E 10-UM-65-GRZ

Recovery: **150%**

capilla® 540

Product description:

Rutile-coated high recovery stick electrode for welding of highly wear resistant overlays at machine parts which are exposed to wear caused by abrasive substances.
Base material:
mild steels, low alloyed steels, steel casts and high-manganese steel.

Applications:

Hardfacing of moulds, agitator blades, dredger teeth, guidance, slides, components of hoisting devices etc. which are exposed to heavy abrasive wear in combination with moderate pressure or impact.

Typical weld metal composition:

[wt. - %]

	C	Cr	Fe
Min.	**4,7**	**32**	
Max.	**5,2**	**35**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	60 – 63	[HRC]

Positions: PA, PB

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
3,25	350	100 – 160	=(+)~
4,0	450	160 – 220	
5,0	450	190 – 260	

also available:
find in table of content

Capilla 540 RLD
Capidur 60 FeCr

Standards:

EN 14700: E Fe 15-60-cg
(DIN 8555): E 10-UM-65-GRZ

Recovery: **170%**

capilla® 540 SF

Product description:

High recovery coated stick electrode for high wear resistant overlays at building and machine parts. Good resistance to abrasion and moderate shock. Due to the special properties of the coating of the electrode overlays at corners and edges can be made easily (no slag).

Applications:

Components of sinter plants, dredger teeth and cutters, skirting boards, roller heads, extruder skrews, mixer blades, ore milling devices, coal ploughs.

Typical weld metal composition:

[wt. - %]

	C	Cr	Fe
Min.	**4**	**33**	
Max.	**5**	**36**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	40 – 50	[HRC] first layer
	60 – 63	[HRC] multiple layers

Positions: PA, PB

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
2,5	350	60 - 90
3,25	350	110 - 140
4,0	450	140 - 180
5,0	450	200 - 240

Polarity =(+)~

also available:
find in table of content

Capilla 540 RLD (tubular wire)

Standards:

EN 14700: E Fe 15-60-cg
(DIN 8555): E 10-UM-65-GRZ

Recovery: **190%**

capilla® 540 Nb

Product description:

Basic coated stick electrode suitable for hardfacing of components which are exposed to heavy abrasive wear in combination with medium impact. The maximum service temperature is limited to 450°C.
Usually 2 to 3 layers have to be welded.

Excellent weldability at AC.

Austenitic matrix with embedded Cr-primary and Nb-primary carbides.

Applications:

Overlays on parts like baffle plates, suction pump excavating machines, crusher hammer, guidance elements, turbine wheels of descaling devices and crusher rolls.

Typical weld metal composition:

[wt. - %]

	C	Cr	Nb	Fe
Min.	**5,5**	**22**	**5**	
Max.	**6**	**26**	**7**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	57 – 60	[HRC] first layer
	59 – 62	[HRC] second layer
	61 – 65	[HRC] third layer

Positions: PA, PB

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
3,25	350	100 – 160	=(+)~
4,0	450	160 – 220	
5,0	450	190 – 250	

also available:
find in table of content

Capilla 540 Nb RLD (tubular wire)

Standards:

EN 14700: E Fe 16-65-cgt
(DIN 8555): E 10-UM-65-TZ

Recovery: **190%**

capilla® 540 N

Product description:

Basis coated high-performance stick electrode for welding of parts exposed to extreme abrasion with moderate impact.
Due to the high Mo content the wear resistance is maintained up to high service temperatures (600°C).

Applications:

For welding of overlays of :

crusher components, grate bars of ore processing plants, grates, screw conveyors, grinding rolls, deflector rails, trepans, briquetting dies, coal ploughs, earth scrapers, repair welding of hardfacings of blast furnace exhaust hoods.

Typical weld metal composition:

[wt. - %]

	C	Cr	Mo	V	W	Nb	Fe
Min.	**4**	**22**	**5**	**0,8**	**1,8**	**5**	
Max.	**6**	**25**	**7**	**1,2**	**2,2**	**7**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	63 – 65	[HRC]
	40 – 45	[HRC] at 600°C

Positions: PA

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	Polarity
3,25	350	100 – 160	=(+)~
4,0	450	160 – 220	
5,0	450	190 – 250	

also available:
find in table of content

Capilla 540 N RLD (tubular wire)

Standards:		**capilla® 540 V**
EN 14700:	E Fe 16-65-cgt	
(DIN 8555):	E 10-UM-65-TZ	
Recovery:	**190%**	

Product description:

Basis coated high-recovery electrode producing a special C-Cr-V-Fe-alloy used for services at elevated temperatures. Good resistance against abrasion in combination with low impact.

Applications:

For welding of overlays of :

crusher components, grate bars of ore processing plants, grates, screw conveyors, grinding rolls, deflector rails, trepans, briquetting dies, coal ploughs, earth scrapers, repair welding of hardfacings of blast furnace exhaust hoods.

Typical weld metal composition:

[wt. - %]

	C	Cr	V	Fe
Min.	**4**	**20**	**8**	
Max.	**5**	**22**	**10**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	63 – 67	[HRC]

Positions: PA

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
3,25	350	100 – 160	=(+)~
4,0	450	160 – 220	
5,0	450	190 – 250	

also available:
find in table of content

Capilla 540 V RLD (tubular wire)

Standards:
EN 14700: E Fe 15-60-cg
(DIN 8555): E 10-UM-65-Z

Recovery: **200%**

capilla® 635 S

Product description:

Basis coated high-recovery stick electrode for highly wear resistant hardfacings which are exposed to grinding abrasion and low impact. Despite the weld metal is highly alloyed with C and Cr.

3-layer overlays can be realised.

Applications:

Suitable for highly abrasion resistant overlays on components used in the ore and coal processing industry as well as for the earth moving devices like sheer rails, screw conveyors and sliding surfaces.

Typical weld metal composition:

[wt. - %]

	C	Cr	Others	Fe
Min.	**5,5**	**34**		
Max.	**6,2**	**37**	**3**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	61 – 64	[HRC]

Positions: PA

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
3,25	350	100 – 160	=(+)~
4,0	450	160 – 220	
5,0	450	190 – 250	

Standards:

EN 14700: E Fe 15-70-cgt
(DIN 8555): E 10-UM-70 CZ

Recovery: **180%**

capilla® 68 HRC

Product description:

Basic graphite coated high recovery stick electrode for welding of extremely abrasion resistant overlays which are exposed to moderate impact.

Applications:

For hardfacing on components made of non-alloyed and alloyed steel, which are exposed to extreme abrasive wear caused by ore, pyrites, sand, coal, cement or slag.

Especially suitable for armouring of components of crushing plants for live coals, coke and slag.

Typical weld metal composition:

[wt. - %]

	C	Cr	Others	Fe
Min.	**4**	**27**		
Max.	**5**	**30**	**5**	**Bal.**

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	65 – 68	[HRC]

Positions: PA

Redrying: 320°C/2h

Dimension:

Ø [mm]	Length [mm]	Welding current [A]	**Polarity**
2,5	350	80 - 120	=(+)~
3,25	350	100 - 160	
4,0	450	160 - 220	
5	450	190 - 260	

also available: Capilla 68 HRC RLD (tubular wire)
find in table of content

Standards:

EN 14700: E Fe 15-70-cgt
(DIN 8555): E 10-UM-70 CZ

capilla® 550 E

Product description:

Carbide filled tubular stick electrode having a thin graphitic coating. The deposited material is extremely resistant to abrasive wear.

Applications:

Hardfacing of coal ploughs and similar mining equipment, protection of screw compactors and screw conveyors, crusher and dredger teeth, oil drilling equipment.

Typical weld metal composition:

[wt. - %]

Tungsten carbides of various grain sizes embedded in an iron matrix

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	68 – 70	[HRC] mixed hardness
Hardness of carbides:	2000 – 2400	[HV]

Positions: PA

Redrying: -

Dimension:

Ø [mm]	Length [mm]	Welding current [A]
4,0	350	80 - 110
5,0	350	100 - 130
6,0	350	120 - 150

Polarity =(+)~

also available:
find in table of content

Capilla 550 G

Standards:

EN 14700: T Fe 20-65-gz
(DIN 8555): E 21-GF-UM-65 G

capilla® 550 G

Product description:

Carbide filled tube rod for oxyacetylene welding of tungsten-carbide reinforced hardfacings. The deposited material is extremely resistant to abrasive wear.

Applications:

Hardfacing of coal ploughs and similar mining equipment, protection of screw compactors and screw conveyors, crusher and dredger teeth, oil drilling equipment.

Typical weld metal composition:

[wt. - %]

Tungsten carbides of various grain sizes embedded in an iron matrix

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	68 – 70	[HRC] mixed hardness
Hardness of carbides:	2000 – 2400	[HV]

Positions: PA

Redrying: -

Dimension:

Ø [mm]	Length [mm]
4,0	350/700
5,0	350/700
6,0	350/700

also available: Capilla 550 E
find in table of content

Standards:

EN 14700: not classified
(DIN 8555): G 21-UM-65 G

capilla® 900 G

Product description:

Flexible welding rod for oxy-acetylene welding of highly wear resistant coatings on earthmoving devices. The deposited material mainly consists of tungsten carbides of various sizes embedded in a nickel-base matrix.
A reducing flame should be used.

Applications:

Overlays on coal ploughs and coal cutting machine, armouring of oil drilling devices, worm extruder, cutting edges and crusher teeth.

Typical weld metal composition:

[wt. - %]

Tungsten carbides of various grain sizes embedded in a nickel matrix

Mechanical properties:

(without heat treatment; minimum values at ambient temperature)

Hardness:	68 – 70	[HRC] mixed hardness
Hardness of carbides:	2000 – 2400	[HV]

Positions: PA

Redrying: -

Dimension:

Ø [mm]	Length [mm]
6,0	450

additional dimensions upon request

5.2 Wire electrodes for cladding and hardfacing

5.2.1 Solid wires for gas shielded arc welding of claddings and hardfacings

Designation	Standard	Weld Metal Analysis [Wt.%]											
capilla®	**EN 14700 (DIN 8555):**	**C**	**Mn**	**Si**	**Cr**	**Ni**	**Mo**	**Nb**	**Co**	**Others**	**Fe**	**SG**	**Hardness*)**
5201 MAG	G Fe 10 (MSG 8-GZ-200 KPZ)	0,05	6	0,5	19	7,5	-	-	-	-	Bal.	I1/M12	180HB/400HB**
250 MAG	S Fe 1 (MSG 1-GZ-250)	0,1	1	0,4	1	-	-	-	-	-	Bal.	C1/M21	250 HB
300 MAG	S Fe 1 (MSG 1-GZ-300)	0,15	1,5	0,4	1	-	-	-	-	-	Bal.	C1/M21	300 HB
600 MAG	S Fe 8 (MSG 6-GZ-60)	0,45	1	2,5	9	-	-	-	-	-	Bal.	C1/M21	60 HRC
54 MAG	S Fe 8 (MSG 6-GZ-60 P)	0,5	0,5	2	9,5	-	-	-	-	-	Bal.	C1/M21	58 HRC
655 MAG	S Fe 8 (MSG6-GZ-60 GZ)	0,5	1,2	1,2	5	-	1,2	-	-	W=1,5; V=0,5	Bal.	C1/M21	60 HRC

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

****) strain hardening**

Dimensions: Ø 1,6; 2,0; 2,4 [mm]; Spools: B 300; other dimensions and packing units on demand.

5.2.2 Welding rods for tungsten inert gas welding of claddings and hardfacings

Designation	Standard	Weld Metal Analysis [Wt.%]											
capilla®	EN 14700 (DIN 8555):	C	Mn	Si	Cr	Ni	Mo	Nb	Co	Others	Fe	SG	Hardness*)
5201 WIG	G Fe 10 (WSG 8-GZ-200 KPZ)	0,05	6	0,5	19	7,5	-	-	-	-	Bal.	I1	180HB/400HB**
250 WIG	S Fe 1 (WSG 1-GZ-250)	0,1	1	0,4	1	-	-	-	-	-	Bal.	I1	250 HB
300 WIG	S Fe 1 (WSG 1-GZ-300)	0,15	1,5	0,4	1	-	-	-	-	-	Bal.	I1	300 HB
600 WIG	S Fe 8 (WSG 6-GZ-60)	0,45	1	2,5	9	-	-	-	-	-	Bal.	I1	60 HRC
54 WIG	S Fe 8 (WSG 6-GZ-60 P)	0,5	0,5	2	9,5	-	-	-	-	-	Bal.	I1	58 HRC
655 WIG	S Fe 8 (WSG6-GZ-60 GZ)	0,5	1,2	1,2	5	-	1,2	-	-	W=1,5; V=0,5	Bal.	I1	60 HRC

***) Min. values at AT / no heat treatment; shielding gas (SG) acc. EN ISO 14175;**
****) strain hardening;**
Dimensions: Ø 1,6; 2,0; 2,4 [mm]; length 1000mm; other dimensions and packing units on demand

5.2.3 Tubular wires for gas shielded arc welding of claddings and hardfacings

Designation	Standard	Weld Metal Analysis [Wt.%]											
capilla®	EN 14700 (DIN 8555):	C	Mn	Si	Cr	Ni	Mo	Nb	Co	Others	Fe	SG	Hardness*
G 350 MM	T Fe 1 (MF 1-GF-350 P	0,22	1,5	0,5	2	-	-	-	-	-	Bal.	M21	350 HB
G 500 MM	T Fe 1 (MF 2-GF-50 GP)	1	2	0,3	2	-	0,2	-	-	-	Bal.	M21	50 HRC
G 600 MM	T Fe 8 (MF 6-GF-60 GZ)	0,45	1,5	0,6	5,5	-	0,5	-	-	-	Bal.	M21	59 HRC
G 600 Si MM	T Fe 8 (MF 6-GF-60 GZ)	0,45	1	2,5	9	-	-	-	-	-	Bal.	M21	60 HRC
G 655 MM	T Fe 8 (MF 6-GF-60 GZ)	0,5	1,2	1,2	5	-	1,2	-	-	W=1,5; V=0,5	Bal.	M21	60 HRC
561 RLD	T Fe 9 (MF 7-GF-200/450 KPN)	1,1	13,5	0,3	3,5	0,4	-	-	-	-	Bal.	OA	200HB/450HB**
562 RLD	T Fe 9 (MF 7–GF-200/450 KPN)	1,2	21	0,3	5	-	-	-	-	-	Bal.	OA	200HB/450HB**
56 RLD	T Fe 9 (MF 7-GF-200/50 CKP)	0,38	16	0,3	13	-	-	-	-	-	Bal.	OA	200HB/52HRC**
52 RLD	T Fe 11 (MF 8-GF-150/400 KPZ)	0,14	7	0,3	19	8,5	-	-	-	-	Bal.	OA	160HB/400HB**
5201 RLD	T Fe 10 (MF 8-GF-150/400 KPZ)	0,11	6,6	0,4	18,2	8	-	-	-	-	Bal.	OA	150HB/400HB**
354 RLD	~T Fe 14 (MF 10 GF-50 G)	3,2	1,5	1,5	16	-	-	-	-	-	Bal.	OA	50 HRC
G 154 MM	T Fe 1 (MF 1-GF-40 P)	0,13	1,5	0,75	2,5	-	-	-	-	-.	Bal.	OA	41 HRC
G 254 MM	T Fe 1 (MF 1-GF-45 G)	0,18	2,8	0,9	2,8	-	-	-	-	-	Bal.	OA	44 HRC
5600 RLD	T Fe 9 (MF 7-GF-40 GKP)	1,2	17,5	0,35	8,5	-	-	2,6	-	Ti=0,1	Bal.	OA	250HB/40HRC**

***) Min. values at AT / no heat treatment; shielding gas (SG) acc. EN ISO 14175; OA = self shielding wire (open arc);**
****) strain hardening; ***) strain and precipitation hardening;**
Dimensions: Ø 1,6; 2,0; 2,4 [mm]; Spools: B 300; other dimensions and packing units on demand

5.2.3 Tubular wires for gas shielded arc welding of claddings and hardfacings (continued)

Designation	Standard	Weld Metal Analysis [Wt.%]											
capilla®	EN 14700 (DIN 8555):	C	Mn	Si	Cr	Ni	Mo	Nb	Co	Others	Fe	SG	Hardness*
G 54 MM	T Fe 8 (MF 6-GF-55 GP)	0,4	0,9	2,7	9,3	-	-	-	-	-	Bal.	M21	55 HRC
G 54 N MM	T Fe 8 (MF 6-GF- 60 G)	1,6	1,5	0,5	6,3	-	1,4	-	-	Ti=5	Bal.	M21	57 HRC
55 RLD	T Fe 15 (MF 10-GF-60 G)	4,5	0,75	0,5	26	-	-	-	-	B=0,5	Bal.	OA	57 HRC
60 RLD	T Fe 15 (MF 10-GF-60 CG)	4,7	0,6	0,6	30	-	-	-	-	B=0,6	Bal.	OA	60 HRC
540 RLD	T Fe 14 (MF 10-GF-60 CGT)	3,7	1,5	1,2	32	-	0,5	-	-	-	Bal.	OA	59 HRC
540 Nb RLD	T Fe 15 (MF10-GF-65-CGT)	5,5	0,2	1,6	21	-	-	6,7	-	-	Bal.	OA	64 HRC
540 N RLD	T Fe 16 (MF 10-GF-65 CGT)	5,7	0,2	0,8	21	-	6,7	6,1	-	W=1,8; V=0,85	Bal.	OA	63HRC
540 V RLD	T Fe 13 (MF 10-GF-65 GRZ	4,8	1	0,8	21	-	-	-	-	V= 9	Bal.	OA	65 HRC
540 B RLD	T Fe 13 (MF 10-GF-70 GT)	0,5	1,7	1	-	3	-	-	-	B=4,8; V=0,85	Bal.	OA	68 HRC
68 HRC RLD	T Fe 15 (MF 10-GF-70 CZ)	5	0,4	0,8	38	-	-	-	-	B = 2	Bal.	OA	67 HRC
HR MAG	special alloy (MF 21-GF-55 G)	0,05	0,3	0,1	-	-	-	-	-	WSC=50	Bal.	M12	55 HRC
911 G	special alloy (MF 21-GF-65 G)	0,03	1	0,5	-	Bal.	-	-	-	WSC=50	-	I1	65 HRC

***) Min. values at AT / no heat treatment; shielding gas (SG) acc. EN ISO 14175; OA = self shielding wire (open arc);**
****) strain hardening;**
*****) strain and precipitation hardening;**
Dimensions: Ø 1,6; 2,0; 2,4 [mm]; Spools: B 300; other dimensions and packing units on demand

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