



# FSH WELDING GROUP

***selectarc***   
welding electrodes

## 1-RUTILE LOW ALLOY

<b>48SP</b>	EN 499	E42 0 RC 11
<b>51</b>	AWS A5.1	E6013
<b>54</b>	AWS A5.1	E6013
<b>55</b>	EN 499	E42 0 RR 12
<b>D6</b>	AWS A5.1	E6013
<b>160</b>	AWS A5.1	E7024
<b>180</b>	AWS A5.1	E7024
<b>C6010</b>	AWS A5.1	E6010
<b>C8010</b>	AWS A5.5	E8010-G
<b>Galva46</b>	AWS A5.1	E6013
<b>RRB7</b>	EN 499	E38 2 RB 12
<b>R63</b>	AWS A5.5	E8013-G

## 2-BASIC LOW ALLOY

<b>B56</b>	AWS A5.1	E7018-1
<b>B7016Sp</b>	AWS A5.1	E7016
<b>B7028</b>	AWS A5.1	E7028
<b>B7018S</b>	AWS A5.1	E7018-1

## 3-BASIC CREEP RESISTANT

<b>B60</b>	AWS A5.5	E7018-A1
<b>B63</b>	AWS A5.5	E8018-B2
<b>B68</b>	AWS A5.5	E9018-B3
<b>B69</b>	AWS A5.5	E8018-B6
<b>B609</b>	AWS A5.5	E8016-B8

## 4-BASIC HIGH STRENGTH

<b>B70</b>	AWS A5.5	E10018-G
<b>B72</b>	AWS A5.5	E9018-G
<b>B73</b>	AWS A5.5	E9018-D1
<b>B75Cu</b>	AWS A5.5	E8018-W2
<b>B77</b>	AWS A5.5	E11018-M

## 5-BASIC LOW TEMPERATURE

<b>B81</b>	AWS A5.5	E8018-C3
<b>B82</b>	AWS A5.5	E8018-C1
<b>B84</b>	AWS A5.5	E8018-C2

## 6-STAINLESS STEEL

<b>20/10BC</b>	AWS A5.4	E308L-16
<b>Inox 308B</b>	AWS A5.4	E308L-15
<b>308HR</b>	AWS A5.4	E308L-26
<b>Inox 308HB</b>	AWS A5.4	E308H-15
<b>Inox 347</b>	AWS A5.4	E347-17
<b>20/10MBC</b>	AWS A5.4	E316L-16
<b>Inox 316L</b>	AWS A5.4	E316L-17
<b>316VD</b>	AWS A5.4	E316L-16
<b>Inox 316B</b>	AWS A5.4	E316L-15
<b>316HR</b>	AWS A5.4	E316L-26
<b>Inox 318</b>	AWS A5.4	E318-17
<b>24/12S</b>	AWS A5.4	E309L-16
<b>309HR</b>	AWS A5.4	E309L-26
<b>24/12Mo</b>	AWS A5.4	E309MoL-17
<b>307R</b>	AWS A5.4	~E307-16
<b>307B</b>	AWS A5.4	~E307-15
<b>18/8Mn</b>	AWS A5.4	~E307-26
<b>Inox 308Mo</b>	AWS A5.4	E308Mo-17
<b>29/9</b>	AWS A5.4	E312-16
<b>Inox 312HR</b>	AWS A5.4	~E312-26
<b>25/20R</b>	AWS A5.4	~E310-16
<b>25/20B</b>	AWS A5.4	E310-15
<b>Inox 310H</b>	AWS A5.4	E310H-15
<b>Inox 253MA</b>	EN 1600	E22 12 B 42
<b>Inox 2133Mn</b>	EN 1600	Z21 33 Mn Nb B 42
<b>Inox 25/35H</b>	EN 1600	Z25 35 Nb H B 42
<b>Inox 2209</b>	AWS A5.4	E2209-17
<b>Inox 2209B</b>	AWS A5.4	E2209-15
<b>Inox 2509MoB</b>	AWS A5.4	E2594-15
<b>Inox 385</b>	AWS A5.4	E385-16
<b>Inox 383</b>	AWS A5.4	E383-16
<b>Inox 410B</b>	AWS A5.4	E410-15
<b>Inox 13/4</b>	AWS A5.4	E410NiMo-15
<b>Inox 17/4Mo</b>	EN 1600	Z16 5 1 B 42

<b>7-CAST IRON</b>		
Fonte Ni	AWS A5.15	E Ni-CI
Fonte Ni2	AWS A5.15	E Ni-CI
Fonte Ni4	AWS A5.15	E Ni-CI
Ferro-Ni	AWS A5.15	E NiFe-CI
Bimetal-NiFe	AWS A5.15	E NiFe-CI
FeNi/Cu	AWS A5.15	E NiFe-CI
Fonte NiCu	AWS A5.15	E NiCu-B
Fonte NiFe2	AWS A5.15	E NiFe-CI
Fonte Fe	AWS A5.15	E St
Fonte Fe2	AWS A5.15	E St
Fonte Fe3	AWS A5.15	E CI-B
Fonte Fe4/F	DIN 8573	G FeC-1
<b>8-NICKEL BASE</b>		
B90	AWS A5.11	E NiCrFe-3
B91	AWS A5.11	E NiCrMo-3
B94	AWS A5.11	E NiCrFe-2
B96	AWS A5.11	E NiCrMo-6
Ni82	EN 14172	E-Ni6082
Ni182	AWS A5.11	E NiCrFe-3
Ni190	AWS A5.11	E NiCu-7
Ni276	AWS A5.11	E NiCrMo-4
Ni617	EN 14172	E-Ni6617
Ni625	AWS A5.11	E NiCrMo-3
Ni-A	AWS A5.11	E NiCrFe-2
NiT3	AWS A5.11	E Ni-1
<b>9-NON FERROUS</b>		
Al 105	AWS A5.3	E4043
Al112	AWS A5.3	E4047
Cu110	AWS A5.6	~ECu
Cu114	AWS A5.6	E CuSn-A
Cu115	AWS A5.6	E CuSn-C
Cu116	AWS A5.6	E CuAl-A2
Cu118	AWS A5.6	E CuMnNiAl
CuNi30	AWS A5.6	E CuNi

<b>10-HARDFACING</b>		
HB25	DIN 8555	E 1-UM- 250
HB300B	DIN 8555	E 1-UM-300-P
HB40	DIN 8555	E 1-UM-400
HB60	DIN 8555	E 2-UM-60
HB40HT	DIN 8555	E 3-UM-40-PT
HB48HT	DIN 8555	E 3-UM-50-T
HB56HT	DIN 8555	E 3-UM-55-ST
HB450HT	DIN 8555	E 3-UM-45-T
HB600HT	DIN 8555	E 3-UM-60-ST
HB50Co	DIN 8555	E 3-UM-50-CRTZ
HB Mar50	DIN 8555	E 3-UM-350-T
HBC62	DIN 8555	E 4-UM-60-ST
HB61B	DIN 8555	E 6-UM-60-S
HB61R	DIN 8555	E 6-UM-60-S
HMn	DIN 8555	E 7-UM-250-KP
HBMnCr	DIN 8555	E 7-UM-250-KPR
HB14Mn	DIN 8555	E 7-UM-250-KP
HB Cavit	DIN 8555	E 7- UM-250-KPR
HB63	DIN 8555	E 10-UM-60-GRPZ
HBA	DIN 8555	E 10-UM-60-GRZ
HB64S	DIN 8555	E 10-UM-60-GR
HB65	DIN 8555	E 10-UM-65-G
HB66	DIN 8555	E 10-UM-65-G
HB68	DIN 8555	E 10-UM-65-GR
Co1	AWS A5.13	E CoCr-C
Co6	AWS A5.13	E CoCr-A
Co12	AWS A5.13	E CoCr-B
Co21S	AWS A5.13	E CoCr-E
Co25	DIN 8555	E 20-UM-250-CKTZ
B92	AWS A5.11	E NiCrMo-5
B92Co	DIN 8555	E 23-UM-250-CKNTZ
HB95CoB	DIN 8555	E23-UM-200-CKPTZ
HRT60		
HRT63		
HRT68		
HRT60WC	DIN 8555	E 21-UM-62-G
<b>11-CUTTING &amp; GOUGING + VARIOUS</b>		
DCS		
Cut100		
Goug		
Therm200		
B-Fonte	DIN 8573	G FeC-1
Fonte Fe4/F	DIN 8573	G FeC-1

**selectarc****48SP****Special Rutile Electrode  
for all positions**


**FSH WELDING GROUP**  
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**Classification**

AWS A5.1 : E6013                      EN 499 : E 42 0 RC 11  
ISO 2560-A : E 42 0 RC 11

**Description & Applications**

Special rutile cellulosic mild steel electrode to weld in all positions, including vertical down. Good operability, easy striking, strong arc with low spatters, good penetration and easy slag removal- suitable for current supplies with low open arc voltage. Less sensitive when used on poor prepared pieces (oil, grease, oxides).

Applied in metal constructions, for piping systems, tanks, blacksmithing, craft works.

**Base materials**

Construction steels for general use, Tube steels, Ship steels

EN- Designation	S185 – S355 P235 – P355	L210 – L360
Ship steels	Quality A and B	
ASTM	A285 grade C A442 grade 55, 60	A414 grade C, D, E, F A515 grade 55, 60, 65

**Typical Weld Metal Composition (%)**

C	Si	Mn	P	S
<0.10	0.4	0.6	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re (MPa)	Rm (MPa)	A <sub>5</sub> (%)	KV (J)	
450	520	26	+20°C	90
			0°C	80
			-10°C	50

**Welding Current & Instructions**

Electrode	ØxL (mm)	2,0x300	2,5x350	3,2x350	3,2x450	4,0x350	4,0x450
Current	(A)	50	70	110	110	140	140



1G/PA



2F/PB



2G/PC



3G/PF



3G/PG



4G/PE

= -	~ 40V
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ind.05



**selectarc****51****Universal  
Rutile Electrode**


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**Classification**

AWS A5.1 : E6013                      EN 499 : E 42 0 RC 11  
ISO 2560-A : E 42 0 RC 11

**Description & Applications**

Universal all position mild steel electrode. Good operability and easy slag removal. Suitable for current supplies with low open arc voltage.

Applied in metal constructions, for piping systems, tanks, blacksmithing, craft works.

**Base materials**

Construction steels for general use , Tube steels, Ship steels

EN- Designation	S185 – S355 P235 – P355	L210 – L360
Ship steels	Quality A and B	
ASTM	A285 grade C A442 grade 55, 60	A414 grade C, D, E, F A515 grade 55, 60, 65

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.4	0.45	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>420	510-580	>22	+20°C	> 65
			0°C	> 47
			-20°C	> 28

**Welding Current & Instructions**

Electrode	ØxL ( mm )	1,6x300	2,0x300	2,5x350	3,2x350	3,2x450	4,0x350	4,0x450	5,0x450
Current	( A )	30	50	70	110	110	140	140	170



1G/PA



2F/PB



2G/PC



3G/PF



3G/PG



4G/PE

= - ~ 40V



**selectarc****54****Rutile Electrode  
Nice appearance**


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**Classification**

AWS A5.1 : E6013                      EN 499 : E 42 0 RR 12  
ISO 2560-A : E 42 0 RR 12

**Description & Applications**

Heavy coated rutile electrode for general use. Especially recommended for downhand welding, for fillet welds and vertical up position. Soft arc, few spatters, self lifting slag, excellent bead appearance. Currently used for welding mechanical constructions, shipbuilding, blacksmithing, boiler making ...

**Base materials**

Construction steels for general use , Tube steels, Ship steels

EN- Designation	S185 – S355 P235 – P355	L210 – L360
Ship steels	Quality A and B	
ASTM	A285 grade C A442 grade 55, 60	A414 grade C, D, E, F A515 grade 55, 60, 65

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.4	0.6	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>400	510-580	>22	+20°C	> 64
			0°C	> 47
			-20°C	> 28

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x300	2,5x350	3,2x350	3,2x450	4,0x350	4,0x450	5,0x450
Current	( A )	55	70	115	115	150	150	180



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= - ~ 45V



**selectarc****55****Rutile Electrode  
with a very thick coating**

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**Classification**
 AWS A5.1 : E6013                      EN 499 : E 42 0 RR 12  
 ISO 2560-A : E 42 0 RR 12
**Description & Applications**

Thick coated rutile electrode destined for flat or for fillet welding when a nice aspect of the weld bead is searched. Concave bead on fillet welds, very soft fusion and a self releasing slag ; supports high current. Frequently used for final passes.

**Base materials**

Construction steels for general use , Tube steels, Ship steels

EN- Designation	S185 – S355	L210 – L360
	P235 – P355	
Ship steels	Quality A and B	
ASTM	A285 grade C	A414 grade C, D, E, F
	A442 grade 55, 60	A515 grade 55, 60, 65

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.45	0.6	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>400	510-580	>22	+20°C	> 64
			0°C	> 47
			-20°C	> 28

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x300	2,5x350	3,2x350	3,2x450	4,0x450	5,0x450
Current	( A )	70	90	135	135	180	250



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= -

~ 45V

ind.05



**selectarc****D6****Rutile Electrode  
Vertical down**


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**Classification**

AWS A5.1 : E6013                      EN 499 : E 42 0 RC 11  
ISO 2560-A : E 42 0 RC 11

**Description & Applications**

Universal rutile cellulosic electrode especially elaborated for welding in vertical down position. Good penetration, regular weld beads and a little bit convex in flat position, self releasing slag in vertical down position. Destined for general construction works where the majority of welds are effected in vertical down position, but also used as universal electrode for metal constructions, blacksmithing and maintenance works, frame, piping...

**Base materials**

Construction steels for general use , Tube steels, Ship steels

EN- Designation	S185 – S355 P235 – P355	L210 – L360
Ship steels	Quality A and B	
ASTM	A285 grade C A442 grade 55, 60	A414 grade C, D, E, F A515 grade 55, 60, 65

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.4	0.6	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>400	510-580	>22	+20°C	> 70
			0°C	> 50
			-20°C	> 30

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x300	2,5x350	3,2x350	4,0x350
Current	( A )	60	80	130	170



1G/PA



2F/PB



2G/PC



3G/PF



3G/PG



4G/PE

= - ~ 40V

ind.05



**selectarc****160****High efficiency  
Rutile Electrode**


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**Classification**

AWS A5.1 : E7024                      EN 499 : E 38 0 RR 53  
ISO 2560-A : E 38 0 RR 53

**Description & Applications**

High efficiency rutile electrode (160%) with a high deposition rate. Applied for long beads and when a nice aspect of the weld seams is searched.

Soft fusion and self releasing slag.

Frequently used for butt-welding plates with a heavy thickness and for fillet welds

**Base materials**

Construction steels for general use , Tube steels, Ship steels

EN- Designation	S185 – S355 P235 – P355	L210 – L360
Ship steels	Quality A and B	
ASTM	A285 grade C A442 grade 55, 60	A414 grade C, D, E, F A515 grade 55, 60, 65

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.45	0.6	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>400	510-580	>22	+20°C > 64

**Welding Current & Instructions**

Electrode	ØxL ( mm )	3,2x450	4,0x450	5,0x450
Current	( A )	150	200	260



1G/PA



2F/PB

= - ~ 40V

ind.05



**selectarc****180****High efficiency  
Rutile Electrode**


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**Classification**

AWS A5.1 : E7024                      EN 499 : E 42 0 RR 74  
ISO 2560-A : E 42 0 RR 74

**Description & Applications**

High efficiency rutile electrode (180%) with a high deposition rate. Applied for long beads and when a nice aspect of the weld seams is searched.

Soft fusion and self releasing slag.

Frequently used for butt-welding plates with a heavy thickness and for fillet welds.

**Base materials**

Construction steels for general use , Tube steels, Ship steels

EN- Designation	S185 – S355 P235 – P355	L210 – L360
Ship steels	Quality A and B	
ASTM	A285 grade C A442 grade 55, 60	A414 grade C, D, E, F A515 grade 55, 60, 65

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.6	1.0	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>420	500-580	>22	+20°C > 64

**Welding Current & Instructions**

Electrode	ØxL ( mm )	3,2x450	4,0x450	5,0x450
Current	( A )	150	200	260



1G/PA



2F/PB

= - ~ 40V



***selectarc***

**C6010**

**Cellulose Electrode**

  
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### Classification

AWS A5.1 : E6010                      EN 499 : E 42 2 C 25  
ISO 2560-A : E 42 2 C 25

### Description & Applications

Cellulose electrode for pipe welding in vertical down position.  
Particularly recommended for root passes.  
Very good behaviour on bad prepared joints (rust, painting...).  
Very thin slag.

**Base materials**      Tube steels:  
EN 10208                      : L210 , L240  
EN 10208-2                 : L210 , L240 , L360  
EN10216-1                 : P235 , P275 , P355  
EN10217-1  
API SPEC 5LX               : X42 – X52.

### Typical Weld Metal Composition ( % )

C	Si	Mn	P	S
0.12	0.2	0.45	<0.025	<0.025

### All Weld Metal Mechanical Properties

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
430	530	26	-20°C    70

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70	110	150

Direct current ( - pole on the electrode in the root pass, then + pole for the following passes).



1G/PA



2F/PB



2G/PC



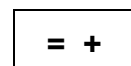
3G/PF



3G/PG



4G/PE



ind.05



**selectarc****C8010****High strength  
Cellulose Electrode**


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**Classification**

AWS A5.5 : E8010-G                      EN 499 : E 46 4 1Ni C 25  
ISO 2560-A : E 46 4 1Ni C 25

**Description & Applications**

High strength cellulose electrode for pipe welding in vertical down position.  
Particularly recommended for root passes.  
Very good behaviour on bad prepared joints (rust, painting...).  
Stable arc, very thin slag.

**Base materials**

Construction steels for general use:

ASTM : A570 gr 50\*  
DIN 17100 : St50-2\*

Tube steels:

EN 10208 : L 415 NB , L 485 NB , L 415 MB, L 485 MB  
DIN : StE415.7, StE445.7 TM  
API SPEC 5LX : X56 – X70.

\*with eventual pre- and post weld heat treatment in the case of heavy thickness.

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Ni	P	S
0.12	0.2	0.8	0.8	<0.025	<0.025

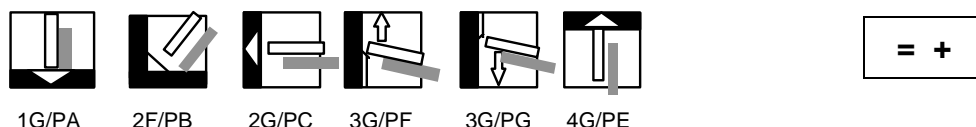
**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
510	590	24	-20°C 75

**Welding Current & Instructions**

Electrode	ØxL ( mm )	3,2x350	4,0x350	5,0x350
Current	( A )	110	150	190

Direct current ( - pole on the electrode in the root pass, then + pole for the following passes).



***selectarc***

## Galva 46

**Rutile Electrode  
to be galvanised**

  
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### Classification

AWS A5.1 : E6013  
ISO 2560-A : E 35 0 RR 31

EN 499 : E 35 0 RR 31

### Description & Applications

Heavy coated Rutile electrode to weld steel constructions which will be galvanised after welding. Easy to use in all positions, also possible to weld short beads in vertical down position. Easy slag removal, regular rippled weld beads.

Applied in metal constructions, locksmithing ...

### Base materials

EN- Designation	S235JR , S235JO , S235J2
ASTM	A283 grade B , C , D A570 grade 30 , 33 , 40

### Typical Weld Metal Composition ( % )

C	Si	Mn	P	S
0.06	0.3	0.2	<0.025	<0.025

### All Weld Metal Mechanical Properties

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
400	460	25	+20°C 100

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,0x300	2,5x350	3,2x350	4,0x450
Current	( A )	70	90	130	180



1G/PA



2F/PB



2G/PC



3G/PF



3G/PG



4G/PE

= - ~ 40V

ind.05



**selectarc****RR B7****Rutile-Basic Electrode  
for root passes**


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**Classification**

AWS A5.1 : E6013

EN 499 : E 38 2 RB 12

ISO 2560-A : E 38 2 RB 12

**Description & Applications**

Special rutile-basic coated electrode to weld in all positions. Especially designed for welding root passes. Good operability, easy striking, strong arc with low spatters, good penetration and easy slag removal. Supports high current.

Applied in metal constructions, for piping systems, tanks, locksmithing, craft works.

**Base materials**

Construction steels for general use, Tube steels, Ship steels

EN- Designation	S185 – S355 P235 – P355	L210 – L360
Ship steels	Quality A and B	
ASTM	A285 grade C A442 grade 55, 60	A414 grade C, D, E, F A515 grade 55, 60, 65

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.3	0.6	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>430	470-600	>20	+20°C	95
			-20°C	60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350	5,0x450
Current	( A )	70-90	100-140	140-180	200-260



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= - ~ 40V

ind.05



**selectarc****R63****Rutile Electrode  
for low alloyed steels**


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**Classification**

AWS A5.5 : E8013-G

EN 1599 : E CrMo1 R 32

ISO 3580-A : E CrMo1 R 32

**Description & Applications**

Rutile coated electrode alloyed with chrome and molybdenum for welding low alloyed steels, creep resistant steels ( 1%Cr and 0.5%Mo ) as well as heat-treatable steels and nitriding steels .

Service temperature up to 550°C.

Very good welding characteristics, soft arc, easy slag removal, regular weld beads.

**Base materials**

Steels and pipes for boiler and pressure vessels:

NF A 36-206 : 15D3 , 18MD4.05 , 15CD2.05 , 15CD4.05

DIN 17155 : 13CrMo4 4 , 15CrMo3 , 13CrMoV4 2 ,

DIN 1681 : A283grB. C, D. A570gr30, 33, 40.

ASTM : A537 , A299 , A355 grade P11 and P12

Heat treatable steels:

NF A 35-551 : 18CD4 , 16CM5

DIN : 25CrMo4 , 34CrMo4

Material N° : 1.7218 , 1.7220

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Mo	P	S
<0.10	0.4	0.6	1.1	0.5	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>490	>590	>20	+20°C >50

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	90	120	150

Redrying: 1h / 150°C . Preheating of the joints to weld: 200-250°C. Interpass temperature: 150-250°C.

A post welding heat treatment is advised: 1-2h / 700°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= - ~ 60V



**selectarc****B56****Universal  
Basic Electrode**


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**Classification**

AWS A5.1 : E7018-1                      EN 499 : E 42 4 B 32 H5  
ISO 2560-A : E 42 4 B 32 H5

**Description & Applications**

Universal basic coated electrode (115% recovery) for welding highly stressed connections with high security. Good low temperature properties down to – 50 °C. Resistant to cold cracks. Slag easy to remove. For frames, cases, supports, ship building, pressure vessels.

**Base materials**

Construction steels for general use, Tube steels, Ship steels, Steels for Boiler and Pressure Vessels, High strength steels, Heat resisting steels, Cold tough steels		
EN-Designation	S185 – S355 GP240R L210 – L360	P235 – P355 P235GH – P265GH
Ship steels	Quality A, B, C and D	
ASTM	A285 grade C A442 grade 55 , 60 A516 grade 55 , 60 , 65 , 70	A414 grade C, D, E, F A515 grade 55 , 60 , 65 , 70

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.4	1.1	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>420	510-610	>22	+20°C	>120
			-20°C	> 70
			-50°C	> 40

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	3,2x450	4,0x450	5,0x450
Current	( A )	65-100	95-140	95-140	135-180	160-250

Redrying: 2h at 300°C, if necessary. Interpass temperature: ~ 250°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +	~ 70V
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ind.05



**selectarc****B7016Sp****Basic Electrode  
Double coated**


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**Classification**

AWS A5.1 : E7016

EN 499 : E 38 2 B 12 H10

ISO 2560-A : E 38 2 B 12 H10

**Description & Applications**

Basic coated electrode presenting exceptional welding characteristics due to its double coating. Arc very stable in all positions, almost spatter free, easy removal of the slag. Universal use for welding metal constructions and for repairing. Recommended for root passes and on badly prepared joints too.

**Base materials**

Construction steels for general use, Tube steels, Ship steels, Steels for Boiler and Pressure Vessels, High strength steels, Heat resisting steels, Cold tough steels		
EN-Designation	S185 – S355 GP240R L210 – L360	P235 – P355 P235GH – P265GH
Ship steels	Quality A, B, C and D	
ASTM	A285 grade C A442 grade 55 , 60 A516 grade 55 , 60 , 65 , 70	A414 grade C, D, E, F A515 grade 55 , 60 , 65 , 70

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.7	0.9	<0.02	<0.02

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
450	550	27	+20°C	150
			-20°C	80
			-50°C	70

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	3,2x450	4,0x450	5,0x450
Current	( A )	80	115	115	150	190

Redrying: 2h at 300°C, if necessary. Interpass temperature: ~ 250°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 70V

ind.08



**selectarc****B7028****High recovery  
Basic Electrode**


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**Classification**

AWS A5.1 : E7028                      EN 499 : E 42 2 B 83  
ISO 2560-A : E 42 2 B 83

**Description & Applications**

Basic coated electrode with high recovery (180%) and low hydrogen content to weld heavy section construction steels. Easy to apply, high efficiency in flat position (downhand welding). The deposition rate is nearly as high as for semi-automatic processes. Despite its high recovery this electrode guarantees good impact values down to - 20°C.

Applications : Heavy supports, ship building, pressure vessels, steel works, agricultural equipment.

**Base materials**

Construction steels for general use, Tube steels, Ship steels, Steels for Boiler and Pressure Vessels, High strength steels, Heat resisting steels, Cold tough steels		
EN-Designation	S185 – S355	P235 – P355
	GP240R	P235GH – P265GH
	L210 – L360	
Ship steels	Quality A, B, C and D	
ASTM	A285 grade C	A414 grade C, D, E, F
	A442 grade 55 , 60	A515 grade 55 , 60 , 65 , 70
	A516 grade 55 , 60 , 65 , 70	

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.4	1.2	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>450	>500	>24	+20°C >160 -20°C > 80

**Welding Current & Instructions**

Electrode	ØxL ( mm )	3,2x450	4,0x450	5,0x450
Current	( A )	140	180	220

Redrying: 2h at 300°C, if necessary. Interpass temperature: < 250°C.



1G/PA



2F/PB

= +



ind.05

**selectarc****B7018S****Universal  
Basic Electrode**


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**Classification**

AWS A5.1 : E7018-1                      EN 499 : E 46 4 B 32 H5  
 AWS A5.1M : E 49 18 – H4              ISO 2560-A : E 46 4 B 32 H5

**Description & Applications**

Universal basic coated electrode (115% recovery) for welding highly stressed connections with high security. Good low temperature properties down to – 40 °C. Resistant to cold cracks.

Stable arc, slag easy to remove.

For frames, cases, supports, ship building, pressure vessels.

**Base materials**

Construction steels for general use, Tube steels, Ship steels, Steels for Boiler and Pressure Vessels, High strength steels, Heat resisting steels, Cold tough steels		
EN-Designation	S185 – S355 GP240R L210 – L360	P235 – P355 P235GH – P265GH
Ship steels	Quality A, B, C and D	
ASTM	A285 grade C A442 grade 55 , 60 A516 grade 55 , 60 , 65 , 70	A414 grade C, D, E, F A515 grade 55 , 60 , 65 , 70

**Typical Weld Metal Composition ( % )**

C	Si	Mn	P	S
<0.10	0.5	1.3	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>420	510-610	>24	+20°C	> 160
			-20°C	> 100
			-40°C	> 47

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	3,2x450	4,0x450	5,0x450
Current	( A )	80	115	115	150	190

Redrying: 2h at 300°C, if necessary. Interpass temperature: ~ 250°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +	~ 70V
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ind.08

**selectarc****B60****High temperature  
Basic coated Electrode**


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**Classification**

AWS A5.5 : E7018-A1  
ISO 3580-A : E Mo B 42

EN 1599 : E Mo B 42

**Description & Applications**

Low hydrogen basic coated electrode with Mo for welding creep resisting steels used at temperatures up to 500°C. Good resistance to Hydrogen attacks (chemical installations).

Used for piping systems, boilers...

Soft fusion, easy slag removal and nice aspect of the metal deposit.

Base materials	Mat. N°	EN	DIN	NF	ASTM
	1.0425	P265GH	H11		
	1.0473	P355GH	19Mn6		A537 Cl1; A414 Gr G ; A612
	1.0481	P295GH	17Mn4		
	1.0482	P310G	19Mn5		
	1.0619	GP240GH	GS-C 25		
	1.5415	16Mo3	15Mo3	15D3	
	1.5419	G20Mo5	GS-22Mo4		
	1.5423		16 Mo 5		A161/A209/A250 Gr T1 ; A335 Gr P1
	1.5424	10MnMo4-5		18MD4-05	A204 Gr A, B, C

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Mo	P	S
<0.10	0.4	0.8	0.5	<0.025	<0.025

**All Weld Metal Mechanical Properties \***

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>450	>550	>22	+20°C >100

\* After heat treatment at 650°C/1h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Redrying: 2h at 350°C, if necessary. Interpass temperature: 100-250°C.  
Annealing after welding is advised at 650°C/1h.



1G/PA



2F/PB



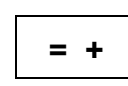
2G/PC



3G/PF



4G/PE



**selectarc****B63****Basic coated Electrode  
for creep resisting steels**


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**Classification**

AWS A5.5 : E8018-B2                      EN 1599 : E CrMo1 B 42  
ISO 3580-A : E CrMo1 B 42

**Description & Applications**

Low hydrogen basic coated electrode alloyed with Cr and Mo for welding creep resisting steels with 1% Cr - 0.5% Mo. Resistant to high temperature up to 500-550°C.  
For piping systems, boilers, overheaters. Soft fusion, good slag removal. Nice aspect of the weld bead.  
Main applications : petrochemistry, chemical industry.

Base materials	Mat. N°	EN	DIN	NF	ASTM
	1.7218	25CrMo4		25CD4	
	1.7243	18CrMo4		18CD4	
	1.7258		24CrMo5		
	1.7335	13CrMo4-5	13CrMo4 4	15CD4.05	A182 Gr F11, F12 ; A387 Gr 12 A213/A250 Gr T12 ; A335 Gr P12 ; A336 Gr F12
	1.7337		16 CrMo 4-4		A213/A250 Gr T11 ; A335 Gr P11
	1.7350		22 CrMo 4 4		
	1.7354	G22CrMo5-4	GS-22 CrMo 5 4		

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Mo	P	S
<0.12	0.4	0.8	1.1	0.5	<0.025	<0.025

**All Weld Metal Mechanical Properties \***

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>460	>550	>19	+20°C >120

\* After heat treatment at 700°C/1h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Redrying: 1h at 350°C, if necessary. Preheating of joints to weld: 200-250°C.  
Interpass temperature: 150-250°C. Annealing after welding is advised at 700°C/1-2h.



1G/PA



2F/PB



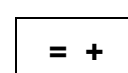
2G/PC



3G/PF



4G/PE



**selectarc****B68****Basic coated Electrode  
for creep resisting steels**


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**Classification**

AWS A5.5 : E9018-B3  
ISO 3580-A : E CrMo2 B 42

EN 1599 : E CrMo2 B 42

**Description & Applications**

Low hydrogen basic coated electrode alloyed with Cr and Mo for welding creep resisting steels used in service up to 600°C (including 2%Cr -1%Mo castings) . High resistance to H<sub>2</sub>S, ...  
For overheaters, valve bodies, pipes, boilers, hydrocrackers.

Base materials	Mat. N°	EN	DIN	NF	ASTM
	1.7375		12CrMo9 10	15CD4-05	A182 Gr F22 ; A336 Gr F22-F22a ; A387 Gr22
	1.7379	G17CrMo9-10	GS-18CrMo9 10		
	1.7380	10CrMo9-10	10CrMo9 10	10CD9-10	A200/A213 GrT22 ; A335 Gr P22 A199 Gr T22

Nuance Vallourec: Chromesco 3

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Mo	P	S
0.07	0.4	0.8	2.25	1.0	<0.025	<0.025

**All Weld Metal Mechanical Properties \***

Re ( MPa )	Rm ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>450	>570	>17	+20°C >100

\* After heat treatment at 700°C/1h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Redrying: 1h at 300°C, if necessary. Preheating of joints to weld at 250°C.

Interpass temperature: 150-300°C. Annealing after welding is advised at 700-750°C/1h.



1G/PA



2F/PB



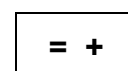
2G/PC



3G/PF



4G/PE



ind.07

**selectarc****B69****Basic coated Electrode  
for creep resisting steels**


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**Classification**

AWS A5.5 : E8018-B6                      EN 1599 : E CrMo5 B 42  
ISO 3580-A : E CrMo5 B 42

**Description & Applications**

Low hydrogen basic coated electrode with Cr and Mo for welding steels of similar chemical composition. Deposit resisting to temperature and creep up to 600°C. Highly resistant to hot gas and overheated steam. For heat exchangers, tubes, steam boilers, overheaters...

Base materials	Mat. N°	EN	DIN	NF	ASTM
	1.7362	X12CrMo5	12CrMo19-5	Z10CD5.05	A200/A213 Gr T5 ; A182 Gr F5 A 335 Gr P5 ; A336 Gr F5 ; A369 Gr FP5
	1.7363		GX12CrMo5		A217 Gr C5

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Mo	P	S
<0.10	0.4	0.8	5.0	0.5	<0.025	<0.025

**All Weld Metal Mechanical Properties \***

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>420	>590	>20	+20°C >70

\* After heat treatment at 730°C/2h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Redrying: 1h at 300°C, if necessary. Preheating of joints to weld at 300°C.  
Interpass temperature: 250-350°C. Annealing after welding is advised at 730°C/2h, then slow cooling ( maxi 55°C/h, until 580°C , followed by cooling at calm air).



1G/PA



2F/PB



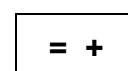
2G/PC



3G/PF



4G/PE



ind.07

**selectarc****B609****Basic coated Electrode  
for creep resisting steels**


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**Classification**

AWS A5.5 : E8016-B8                      EN 1599 : E CrMo9 B 42  
ISO 3580-A : E CrMo9 B 42              AWS A5.4 : E505-15

**Description & Applications**

Low hydrogen basic coated electrode with Cr and Mo for welding steels of similar chemical composition used at service temperatures up to 600°C. Deposit r esisting to temperature and creep up to 600°C. Highly resistant to hot gas and overheated steam.  
For power plants, heat exchangers, tubes, steam boilers,...

Base materials	Mat. N°	EN	ASTM
	1.7386	X12CrMo9-1	A187 Gr F9 ; A336 Gr F9
	1.7386	X12CrMo9-1	A335 Gr P9
	1.7386	X12CrMo9-1	A199 / A200 / A213 Gr T9
	1.7389	GX12CrMo10-1	A217 C12

Steels and pipes for boiler and pressure vessels

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Mo	P	S
<0.10	0.4	0.8	9.0	1.0	<0.025	<0.025

**All Weld Metal Mechanical Properties \***

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>500	>650	>19	+20°C >60

\* After heat treatment at 750°C/1h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x450
Current	( A )	80	115	150

Redrying: 1h at 300°C, if necessary. Preheating of joints to weld at 300°C.  
Interpass temperature: 250-350°C. Annealing after welding is advised at 750°C/1h, then slow cooling ( maxi 55°C/h, until 580°C , followed by cooling at calm air).



1G/PA



2F/PB



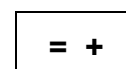
2G/PC



3G/PF



4G/PE



**selectarc****B70****High Strength  
Basic Electrode**


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**Classification**

AWS A 5.5 : E10018-G  
EN 757 : E 62 5 1,5NiMo B 42

**Description & Applications**

Basic coated electrode highly resistant to cracks and elaborated for welding fine grain steels and steels with high mechanical strength (Rm up to 800 MPa).

Welds of high security, buffer layers before hardfacing.

Regular fusion, stable arc, low spatters, good removal of the slag and nice aspect of the weld seam.

**Base materials**

Construction steels for general use:

NF A 35-501 : A50-2\*. A60-2\*,3. E36-2\*,3\*,4\*.

DIN 17100 : St50-2\*. St60-2\*. St70-2\*.

ASTM : A 678grC\*. A709gr50\*,100\*. A710gr A.

High strength steels :

NF A 36-204 : E500T\*. E550T\*. E620T\*. E690T\*.

DIN 17102 : StE460, 500\*, 590\*,690\*.

Also suitable for welding heat- treatable steels like: 15CD4\*. 25CD4\*. 35CD4\*.

XC38. XC48\*. 32C4....., also for construction steels self-patining (consult us)

\* eventual preheating and post-weld heat treatment in the case of heavy thickness.

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo
<0.10	0.5	1.4	0.2	1.5	0.4

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>620	720-820	>22	+20°C	>130
			-20°C	> 90
			-50°C	> 50

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Rebaking of the electrodes at 350°C during 2 hours. Eventual preheating depends on the thickness and the nature of the steel (100°C). Interpasses temperature <200°C. A stress relieving heat treatment is advised in most cases, at 600°C during 2 hours.



Ind.08



1G/PA



2F/PB



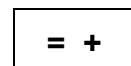
2G/PC



3G/PF



4G/PE



**selectarc****B72****High Strength  
Basic Electrode**


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[www.fsh-welding.com](http://www.fsh-welding.com)

**Classification**

AWS A5.5 : E9018-G  
EN 757 : E 55 5 1NiMo B 42

**Description & Applications**

Low hydrogen basic coated electrode with a deposit which has a high yield strength and is very tough. Particularly recommended for root passes on fine grain steels resistant to a tensile strength between 550 and 700 MPa (ex : rails of travelling crane...).

**Base materials**

Construction steels for general use:

DIN 17100 : St50 - St52 - St60-2.

High strength steels :

NF A 36-207 : A550AP, FP – A590AP, FP

NF A 36-210 : 16MND5

ASTM A202 Gr A &amp; B – A236 F &amp; B – A238GrB – A486Gr90

A607Gr70 – A615Gr60 – A706 Gr60.

DIN : StE355 to WStE500

17MnMoV6.4 – 15NiCrMo10.6

N-AXTRA55, N-AXTRA60 (Thyssen)

API : X65 - X70

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo
<0.10	0.5	1.2	0.1	0.8	0.3

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>530	>620	>20	+20°C	>150
			-50°C	> 50
			-60°C	> 28

After stress relieving at 600°C/1h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Eventual rebaking of the electrodes at 350°C during 2 hours. Eventual preheating depends on the nature and the thickness of the steel (100°C). Interpass temperature <200°C. A thermal stress relieving is advised in most cases at 600°C during 2 hours



Ind.08



1G/PA



2F/PB



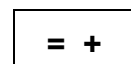
2G/PC



3G/PF



4G/PE



**selectarc****B73****High Strength  
Basic Electrode**


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**Classification**

AWS A5.5 : E9018-D1  
EN 757 : E 55 4 MnMo B 42

**Description & Applications**

Low hydrogen basic coated electrode with high yield strength for welding fine grain steels applied at temperatures between -50 to +500°C. Thermal treated low alloyed steels with C-Mn. Resistant to fatigue - corrosion in the presence of phosphorus and sulphur.

**Base materials**

Construction steels for general use:

NF A 35-501 : A50.2 A60.2.  
DIN 17100 : St60-2. St 70-2.

Steels for boiler and pressure vessels:

NF A36-207 : A550AP, FP. A590AP, PP  
NF A36-205 : A37 CP, AP, FP.  
DIN 17155 : HI to HIV, 19 Mn6, 19Mn5, 17Mn4

High strength steels

DIN 17102 : StE255 to 380.

Heat resisting steels : WstE255 to 380

Cold tough steels : TstE255 to 380.

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Mo
<0.10	0.5	1.5	0.4

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
540-600	630-710	>18	+20°C > 150 -40°C > 50 -50°C > 30

After stress relieving at 620°C/1h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Preheating of the base metal is recommended (150°C) . Interpass temperature: < 250°C.  
Thermal stress relieving depending on the thickness of welded pieces (620°C).



1G/PA



2F/PB



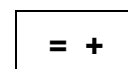
2G/PC



3G/PF



4G/PE



**selectarc****B75Cu****Basic Electrode For steels resistant  
To Atmospheric corrosion**


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**Classification**

AWS A 5.5 : E8018-W2  
EN 499 : E 46 2 Z B 42

ISO 2560-A : E 46 2 Z B 42

**Description & Applications**

Low hydrogen basic coated electrode with a steel deposit containing Cu- Ni- Cr, for welding all steels resistant to atmospheric corrosion (industrial, sea, rural). Regular fusion, good removal of the slag. Nice aspect of the weld seams.

Principal applications : public buildings, department of civil engineering, navy, tanks, water tower, bridges, crash barrier, electrical pylons.

**Base materials**

Steels with improved resistance to atmospheric corrosion:

NF A 35-502 : E24W Quality 2 to 4 , E36W A2-A4  
DIN : WT St37-2 , WT St37-3 , WT St52  
Trade marks : COR-TEN A,B,C – PATINAX – INDATEN – ACOR...

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Cu	P	S
<0.10	0.4	1.0	0.5	0.5	0.4	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>460	>550	>19	-20°C >60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Rebaking of the electrodes at 350°C during 1 hour.



1G/PA



2F/PB



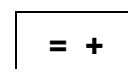
2G/PC



3G/PF



4G/PE



Ind.07

**selectarc****B77****Basic Electrode with  
High Strength**


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**Classification**

AWS A5.5 : E11018-M  
EN 757 : E 69 4 Mn 2NiCrMo B 42

**Description & Applications**

Basic electrode with a deposit which is very resistant to cracks and has a high strength. The deposit contains Ni, Cr, Mo, Mn for welding similar fine grain steels (service temperatures : -40 to +450°C)  
Example : low alloyed, tempered coated steels, pressure vessels, with a yield strength  $Re > 650$  MPa.  
Very good radiographic quality - very low diffusible hydrogen ( 3 ml H<sub>2</sub>/100g metal deposit ).  
Regular fusion - stable arc - low spatters - good removal of the slag.

**Base materials**

Fine grain and cold tough steels:

NF A 36-204 : E 500T\* . E 620T\* ,. E 690T\* .  
DIN 17102 : StE 590\* . StE690\* . TStE 500\* . WStE 500\* .  
17MnCrMo 33, 11 NiMnCrMo 55, 16 NiCrMo 12, 12MnNiMo 55.  
Werkstoff Nr. : 1.8928\* - 1.7279\* - 1.6780\* - 1.6782\* - 1.6343\* etc.  
ASTM : A517 - A533GrA - A537 - A678 - A633Gr C bis E  
N-A XTRA; N-A TRA70\* (Thyssen).  
Tube steels : API 5 LX: X70\* . X75\* . X80\*  
(\* ) with eventual pre- and post weld heat treatment (consult us)

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo
<0.10	0.4	1.5	0.4	2.1	0.5

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>690	>760	>20	+20°C	>120
			-40°C	> 60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Rebaking of the electrodes at 350 °C during 2 hours before use. Eventual preheating of the base metal depends on the thickness and the nature of the steel (50 to 130°C).  
Maintain an interpass temperature <150°C.



1G/PA



2F/PB



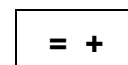
2G/PC



3G/PF



4G/PE



Ind.07

**selectarc****B81****Basic Electrode  
for cold tough steels**


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**Classification**

AWS A5.5 : E8018-C3  
EN 499 :

ISO 2560-A : E 46 5 1Ni B 42

**Description & Applications**

Low hydrogen basic coated electrode alloyed with Nickel for welding steels with high strength and high toughness, resistant to low temperature down to -60°C. For weld joints exposed to low temperature. Regular fusion, nice aspect of the deposit.

**Base materials**

Fine grain construction steels, cold tough:

EN : S185 – S355 – P235GH – P355 – L210 – L415 – S/P275 – S/P460  
E295 – E335 – E360 – P295GH – P355GH – P235 – P265 –  
A St35 – A St52 – GP240R.

ASTM : A302 Gr A, B, C, D – A333 Gr 126 – A414 Gr G – A487 Gr BQ CQ  
A521 Gr AA, AB, CE, CF, LF1 – A537 C12 – A572 Gr 60&65  
A350 Gr 126 – A350 Gr LF1, LF2 – A607 Gr 60&65 – A633 Gr A&B  
LF5 A668 Gr E&F – A714 Gr I à VI

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Ni	P	S
<0.12	0.5	1.1	1.0	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>470	>550	>24	-40°C >70

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Rebaking of the electrodes at 350 °C during 2 hours , if necessary. Eventual preheating of the weld joint at 100°C. Interpass temperature : < 250°C.

A thermal stress relieving heat treatment is advised at 550°C during 1 - 2 hours.



1G/PA



2F/PB



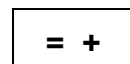
2G/PC



3G/PF



4G/PE



Ind.07

**selectarc****B82****Basic Electrode  
For cold tough steels**


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**Classification**

AWS A5.5 : E8018-C1  
EN 499 : E 46 6 2Ni B 42

ISO 2560-A : E 46 6 2Ni B 42

**Description & Applications**

Low hydrogen basic coated electrode alloyed with Nickel for welding cold tough fine grain steels (steels with Nickel, heat treated steels) applied at low temperature -60°C. Good characteristics of cold toughness. Frequently used for liquid gas distribution pipes, tanks, off shore, and petrochemistry.

**Base materials**

Fine grain construction steels, cold tough:

NF A 36-204 : E420T – E460T  
NF A 36-205 : A37FP – A42FP – 48FP – A52FP  
NF A 36-207 : A510FP1 – A550FP2  
NF A 36-208 : 0.5 Ni 285 and 355 (10N2) – 1.5 Ni 285 and 355 (15N6)  
DIN 17102 : TStE 255 to TStE 420  
DIN 17780 : 14Ni6 – 10Ni14 – 11MnNi5.3 – 12MnNi6.3 – 13MnNi6.3.  
ASTM : A203Cr A and B – A352CrLC2 – A334Cr7 – A714Cr 1 à 6  
A707Cr L4 à L6 – A662Cr A and B

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Ni	P	S
<0.12	0.4	1.0	2.5	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>460	>550	>19	-40°C	>70
			-60°C	>30
			-73°C	>27

\*After thermal stress relieving at 620°C/1h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Rebaking of the electrodes at 350 °C during 1 hour if necessary.  
Eventual preheating of the welding joints (above 100 °C), in the case of heavy thickness.



1G/PA



2F/PB



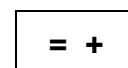
2G/PC



3G/PF



4G/PE



Ind.07

**selectarc****B84****Basic Electrode  
With high toughness**


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**Classification**

AWS A5.5 : E8018-C2  
EN 499 : E 46 6 3Ni B 42

ISO 2560-A : E 46 6 3Ni B 42

**Description & Applications**

Low hydrogen basic coated electrode alloyed with Nickel (above 3%) for welding fine grain steels used at low temperature (-60 to -80°C). Cryogenic and petrochemical industries. Storage and distribution of liquid gas or products volatile.

**Base materials**

Plates and tubes of fine grain steels, cold tough:  
 NF A 35-207 : A510FP1 – A550FP2  
 NF A 36-208 : 3.5 Ni 285 and 355 (12N14)  
 DIN : 10Ni14 – 14Ni6 – 16Ni14  
 ASTM : A203G D&E – A352GrLC3 – A334Gr3 – A350Gr LF3

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Ni	P	S
<0.10	0.3	0.9	3.5	<0.025	<0.025

**All Weld Metal Mechanical Properties**

Re ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>460	>550	>19	-73°C	>80
			-100°C	>30

\*After thermal stress relieving at 620°C/1h

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80	115	150	190

Eventual rebaking at 350°C during 2 hours. An eventual preheating depends on the thickness of the parent metal. A stress relieving heat treatment is recommended in most of cases (620°C/1h).



1G/PA



2F/PB



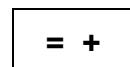
2G/PC



3G/PF



4G/PE



Ind.07

**selectarc****20/10BC****Stainless Steel  
Rutile Electrode**


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**Classification**

AWS A5.4 : E308L-16  
ISO 3581-A : E 19 9 L R 32

EN 1600 : E 19 9 L R 32

**Description & Applications**

Low carbon Rutile-basic-coated austenitic stainless steel electrode with approx. 8% ferrite. Coating with very low moisture pick up. Soft fusion without spatters, very easy slag removal, exceptional weld bead appearance, easy restriking.

Applied for all 18/8 type stainless steels at service temperatures from -120°C up to +350°C .

General applications : tubes, tanks, heat exchangers, piping systems.

**Base materials**

Stainless steels for general use:

UNS	Alloy	EN 10088	Material N°	UGINE
S30400	304	X5CrNi18-10	1.4301	UGINOX 18-9 B, D, E
S30403	304L	X2CrNi19-11	1.4306	UGINOX 18-10 L
S32100	321	X6CrNiTi18-10	1.4541	UGINOX 18-10 T
S34700	347	X6CrNiNb18-10	1.4550	

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni
<0.03	0.8	0.7	19.0	9.5

**All Weld Metal Mechanical Properties**

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>360	>540	>35	+20°C >70

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x300	2,5x300	3,2x350	4,0x350	5.0x450
Current	( A )	45	70	100	135	180

Rebaking if necessary 1h at 250°C. Interpass temperature: < 200°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +

~ 70V



ind.05



**selectarc****308HR****High Efficiency  
Stainless Electrode**


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**Classification**

AWS A5.4 : E308L-26  
ISO 3581-A : E 19 9 L R 73

EN 1600 : E 19 9 L R 73

**Description & Applications**

Synthetic electrode with high recovery (160%)-Rutile-basic coating with a deposit of 19%Cr - 9%Ni stainless steel type. Easy striking, soft arc, clean spatter-free welds, slag lifts by itself, concave finely rippled fillet welds. Fast deposition, long beads.

To use on similar (304 type) stainless steels.

General applications : for tubes, tanks, stainless steel constructions

**Base materials**

Stainless steels for general use:

UNS	Alloy	EN 10088	Material N°	UGINE
S30400	304	X5CrNi18-10	1.4301	UGINOX 18-9 B , D , E
S30403	304L	X2CrNi19-11	1.4306	UGINOX 18-10 L
S32100	321	X6CrNiTi18-10	1.4541	UGINOX 18-10 T
S34700	347	X6CrNiNb18-10	1.4550	

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni
<0.04	0.9	0.7	19	9.5

**All Weld Metal Mechanical Properties**

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>360	>550	>35	+20°C >60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	1,6x250	2,0x350	2,5x350	3,2x350	4,0x450
Current	( A )	50	60	90	120	150

Redrying of the electrodes (1h at 300°C, if necessary). Interpass temperature : < 200°C.



1G/PA



2F/PB

= + ~ 55V

**selectarc**

## Inox 308HB

**Basic type Stainless Steel  
Electrode with increased carbon**

  
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### Classification

AWS A5.4 : E308H-15  
ISO 3581-A : E 19 9 H B 42

EN 1600 : E 19 9 H B 42

### Description & Applications

Austenitic stainless steel electrode, basic type coating with approx. 5% ferrite and increased carbon content. Stable arc, good slag removal, regular weld beads. Good behaviour in positional welding and on bad prepared joints. Excellent mechanical properties.

Used on 18/8 stainless steels (304H- type) for elevated service temperatures up to + 750°C.  
Petrochemical industry: tubes, heat exchangers, piping systems.

### Base materials

Stainless steels for high temperature applications:

UNS	Alloy	EN 10088	Material N°	UGINE
S30409	304H	X6CrNi18-11	1.4948	
S30400	304	X5CrNi18-10	1.4301	UGINOX 18-9 B, D, E
S32100	321	X6CrNiTi18-10	1.4541	UGINOX 18-10 T
		X10CrNiTi18-10	1.6903	
		X10CrNi18-8	1.4310	

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni
0.05	0.4	1.8	19.5	9.5

### All Weld Metal Mechanical Properties

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>380	>560	>35	+20°C >80

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	70	90	120

Rebaking at 250°C during 1 hour if necessary. Inter pass temperature : < 200°C.



1G/PA



2F/PB



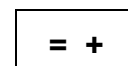
2G/PC



3G/PF



4G/PE



ind.05

***selectarc***

# Inox 347

**Stainless Steel Electrode  
Niobium - stabilised**

  
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## Classification

AWS A5.4 : E347-17

EN 1600 : E 19 9 Nb R 32

ISO 3581-A : E 19 9 Nb R 32

## Description & Applications

Rutile-basic coated electrode 18%Cr-8%Ni type stainless steel Niobium / columbium stabilised, suited to weld Ti or Nb stabilised stainless steels. The weld metal contains about 8% delta ferrite.

Soft fusion without spatters, easy striking and restriking- very easy slag removal.

The weld deposit is resistant to intercrystalline corrosion for service temperatures up to 400°C.

## Base materials

Stainless steels for general use:

UNS	Alloy	EN 10088	Material N°	UGINE
S30400	304	X5CrNi18-10	1.4301	UGINOX 18-9 B , D , E
S30403	304L	X2CrNi19-11	1.4306	UGINOX 18-10 L
S32100	321	X6CrNiTi18-10	1.4541	UGINOX 18-10 T
S34700	347	X6CrNiNb18-10	1.4550	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Nb
0.03	0.8	0.7	19.0	9.5	0.3

## All Weld Metal Mechanical Properties

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>350	>550	>30	+20°C >60

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,0x300	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	45	70	100	135	180

Redrying: 1h at 250°C. Interpass temperature : < 20 0°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 70V



ind.06

# ***selectarc*** **20/10MBC**

**Stainless Steel  
Rutile Electrode**



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[www.fsh-welding.com](http://www.fsh-welding.com)

## Classification

AWS A5.4 : E316L-16  
ISO 3581-A : E 19 12 3 L R 32

EN 1600 : E 19 12 3L R 32

## Description & Applications

Low carbon Rutile-basic-coated Mo containing austenitic stainless steel electrode with approx. 8% ferrite. Coating with very low moisture pick-up. Soft fusion without spatters, very easy slag removal, exceptional bead appearance, easy restriking.

For welding and cladding on austenitic Cr-Ni-Mo stainless steels and clad plates. Applied for service temperatures from -120°C up to +400°C in the chemical and petrochemical industries, in refineries, in the food industries and for ship building to weld pipes, tanks, heat exchangers.

## Base materials

Stainless steels for general use:

UNS	Alloy	EN 10088	Material N°	UGINE
S31600	316	X5CrNiMo17-12-2	1.4401	UGINOX 17-10 M
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
J92900		G-X5CrNiMo 19 11 2	1.4408	
S31635	316Ti	X6CrNiMoTi17-12-2	1.4571	UGINOX 17-11 MT
S31635	316Ti	X10CrNiMoTi18-12	1.4573	
S31640	316Cb	X6NiCrMoNb17-12-2	1.4580	
		G-X5CrNiMoNb19-11-2	1.4581	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo
<0.03	0.8	0.7	18.5	12	2.7

## All Weld Metal Mechanical Properties

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>400	>560	>35	+20°C	70
			-120°C	40

## Welding Current & Instructions

Electrode	ØxL ( mm )	1,6x250	2,0x300	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	30	45	70	100	135	180

Redrying: 1h at 250°C if necessary. Interpass temperature : < 200°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 70V

# ***selectarc*** **Inox 316L**

**Stainless Steel  
Rutile Electrode**



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## Classification

AWS A5.4 : E316L-17  
ISO 3581-A : E 19 12 3 LR 32

EN 1600 : E 19 12 3 L R 32

## Description & Applications

Low carbon Rutile-basic-coated Mo containing austenitic stainless steel electrode with approx. 8% ferrite. Coating with very low moisture pick-up. Soft fusion without spatters, very easy slag removal, exceptional bead appearance, easy restriking. Exceptional welding in position.

For welding and cladding on austenitic Cr-Ni-Mo stainless steels and clad plates. Applied for service temperatures from -120°C up to +400°C in the chemical and petrochemical industries, in refineries, in the food industries and for ship building to weld pipes, tanks, heat exchangers.....

## Base materials

Stainless steels for general use:

UNS	Alloy	EN 10088	Material N°	UGINE
S31600	316	X5CrNiMo17-22-2	1.4401	UGINOX 17-10 M
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
J92900		G-X5CrNiMo 19 11 2	1.4408	
S31635	316Ti	X6CrNiMoTi17-12-2	1.4571	UGINOX 17-11 MT
S31635	316Ti	X10CrNiMoTi18-12	1.4573	
S31640	316Cb	X6NiCrMoNb17-12-2	1.4580	
		G-X5CrNiMoNb19-11-2	1.4581	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo
<0.03	0.8	0.7	18.5	12.2	2.8

## All Weld Metal Mechanical Properties

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
450	580	40	+20°C	70
			-120°C	40

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,0x300	2,5x350	3,2x350	4,0x450
Current	( A )	45	75	110	140

Redrying: 1h at 250°C if necessary. Interpass temperature : < 200°C.



ind.07



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +	~ 70V
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**selectarc****316VD****Stainless Steel Electrode  
for vertical down**


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**Classification**

AWS A5.4 : E316L-16  
ISO 3581-A : E 19 12 3 L R 31

EN 1600 : E 19 12 3 L R 31

**Description & Applications**

Low carbon Rutile-basic coated electrode, giving a Mo-containing austenitic stainless steel deposit. This electrode is designed for vertical down welding on Cr-Ni-Mo stainless steels and clad steels which are applied at service temperatures from -120°C up to +400°C in the chemical and petrochemical industries, in refineries.....

**Base materials**

Stainless steels for general use:

UNS	Alloy	EN 10088	Mat. N°	UGINE
S31600	316	X5CrNiMo17-12-2	1.4401	UGINOX 17-10 M
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
J92900		G-X5CrNiMo 19-11-2	1.4408	
S31635	316Ti	X6CrNiMoTi17-12-2	1.4571	UGINOX 17-11 MT
S31635	316Ti	X10CrNiMoTi18-12	1.4573	
S31640	316Cb	X6NiCrMoNb17-12-2	1.4580	
		G-X5CrNiMoNb19-11-2	1.4581	

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo
<0.03	0.8	0.7	18.0	11.5	2.5

**All Weld Metal Mechanical Properties**

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>400	>560	>30	+20°C >60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x300	2,5x300	3,2x350
Current	( A )	50	70	100

Redrying : 1h at 250°C . Interpass temperature : < 200°C.



1G/PA



2F/PB



2G/PC



3G/PG



4G/PE

= +	~ 80V
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# *selectarc* Inox 316B

Basic type Stainless  
Steel Electrode



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## Classification

AWS A5.4 : E316L-15  
ISO 3581-A : E 19 12 3 L B 42

EN 1600 : E 19 12 3 L B 42

## Description & Applications

Low carbon basic coated Mo- containing austenitic stainless steel electrode with approx. 8% ferrite. Stable arc, easy to watch weld pool, good slag removal, regular weld beads. Good behaviour in positional welding and on bad prepared joints. Excellent mechanical properties.

For welding and cladding on austenitic Cr-Ni-Mo stainless steels and clad plates. Applied for service temperatures from -196°C up to +400°C in the chemical and petrochemical industries, in refineries and for ship building to weld pipes, tanks, heat exchangers...

## Base materials

Stainless steels for general use:

UNS	Alloy	EN 10088	Mat. N°	UGINE
S31600	316	X5CrNiMo17 12 2	1.4401	UGINOX 17-10 M
S31603	316L	X2CrNiMo17 12 2	1.4404	UGINOX 18-11 ML
S31651	316LN	X2CrNiMoN17 12 2	1.4406	
J92900		G-X5CrNiMo19 11 2	1.4408	
S31635	316Ti	X6CrNiMoTi1712 2	1.4571	UGINOX 17-11 MT
S31635	316Ti	X10CrNiMoTi18 12	1.4573	
S31640	316Cb	X6NiCrMoNb17 12 2	1.4580	
		G-X5CrNiMoNb19 11 2	1.4581	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo
<0.04	0.4	1.6	18.0	12.0	2.7

## All Weld Metal Mechanical Properties

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )	
>380	>560	>35	+20°C	>80
			-120°C	>50

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	70	90	120

Rebaking at 250°C during 1 hour if necessary. Inter pass temperature : < 200°C.



1G/PA



2F/PB



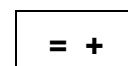
2G/PC



3G/PF



4G/PE



**selectarc****316HR****High efficiency  
Stainless Electrode**


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**Classification**

AWS A5.4 : E316L-26  
ISO 3581-A : E 19 12 3 L R 73

EN 1600 : E 19 12 3 L R 73

**Description & Applications**

Synthetic electrode with high recovery (160%) and a Rutile-basic coating giving a 316 L deposit with approx. 8% delta ferrite. Easy striking, soft arc, slag lifts by itself, clean spatter-free welds, finely rippled beads. Used for high efficiency welds, fast deposition, long beads. To weld stainless steels of similar composition in : pulp and paper industry, foodstuff industry...

**Base materials**

Stainless steels for general use:

UNS	Alloy	EN 10088	Mat. N°	UGINE
S31600	316	X5CRNiMo17-12-2	1.4401	UGINOX 17-10 M
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
J92900		G-X5CrNiMo19-11-2	1.4408	
S31635	316Ti	X6CrNiMoTi17-12-2	1.4571	UGINOX 17-11 MT
S31635	316Ti	X10CrNiMoTi18-12	1.4573	
S31640	316Cb	X6NiCrMoNb17-12-2	1.4580	
		G-X5CrNiMoNb19-11-2	1.4581	

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo
<0.04	0.9	0.7	18.0	11.5	2.5

**All Weld Metal Mechanical Properties**

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>380	>560	>30	+20°C >60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	1,6x250	2,0x350	2,5x350	3,2x350	4,0x450
Current	( A )	50	60	90	120	150

Redrying of the electrodes (1h at 300°C, if necessary). Interpass temperature : < 200°C.



1G/PA



2F/PB

= + ~ 55V



ind.05

**selectarc**

# Inox 318

**Stainless Steel Electrode  
Niobium stabilised**


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## Classification

AWS A5.4 : E318-17  
ISO 3581-A : E 19 12 3 Nb R 32

EN 1600 : E 19 12 3 Nb R 32

## Description & Applications

Rutile-basic coated electrode Niobium (Columbium) - stabilised 18Cr 12Ni 3Mo austenitic stainless steel deposit with approx. 8% delta ferrite.

The electrode is suited to weld Ti or Nb (Cb) stabilised CrNiMo austenitic stainless steels. Soft fusion without spatters, easy strike and restrike, in most cases self peeling slag, moisture resistant coating.

Deposit resistant against intercrystalline corrosion, and highly corrosion resistant against different attacks. Used for service temperatures from -120°C up to +400°C in petrochemical industries and for sea water applications.

## Base materials

Stainless steels for general use:

UNS	Alloy	EN 10088	Mat. N°	UGINE
S31600	316	X5CrNiMo17-12-2	1.4401	UGINOX 17-10 M
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
J92900		G-X5CrNiMo19-11-2	1.4408	
S31635	316Ti	X6CrNiMoTi17-12-2	1.4571	UGINOX 17-11 MT
S31635	316Ti	X10CrNiMoTi18-12	1.4573	
S31640	316Cb	X6NiCrMoNb17-12-2	1.4580	
		G-X5CrNiMoNb19-11-2	1.4581	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo	Nb
<0.03	0.8	0.7	18.0	12.0	2.7	0.3

## All Weld Metal Mechanical Properties

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>350	>550	>30	+20°C >60

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,0x300	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	45	70	100	135	180

Redrying : 1h at 250°C if necessary. Interpass temperature : < 200°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +

~ 70V

ind.05

**selectarc****24/12S****Rutile type Stainless  
Steel Electrode**


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**Classification**

AWS A5.4 : E309L-16                      EN 1600 : E 23 12 L R 32  
ISO 3581-A: E 23 12 LR 32

**Description & Applications**

Low carbon Rutile-basic electrode with an austenitic stainless steel deposit containing 15% ferrite for welding dissimilar steels as stainless steels to low alloyed steels. Also suitable for welding high temperature steels and as buffer layer before hardfacing. For repairing of machine parts for civil engineering. First layer on construction steels for 18/8 cladding.  
Soft fusion, nice aspect of the bead, self releasing slag.

**Base materials**

Stainless steels for general use and for high temperature applications:

UNS	Alloy	EN	Material N°	UGINE
S30900	309	X15CrNiSi 20-12	1.4828	UGINOX R20-12
S30453	304 LN	X2CrNiN 18-10	1.4311	
S30908	309S	X12CrNi23-13	1.4833	UGINOX R24-13S
		X10CrSi6	1.4712	
		X10CrAl 18	1.4742	

All construction steels, low alloyed in combinations with stainless steels.

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni
<0.03	0.8	0.7	22.5	12.5

**All Weld Metal Mechanical Properties**

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>400	>560	>35	+20°C >60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x300	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	45	70	100	135	180

Redrying 1 hour at 250°C, if necessary. Interpass temperature : < 200°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +

~ 70V



ind.05

**selectarc****309HR****Stainless Electrode  
with high efficiency**


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**Classification**

AWS A5.4 : E309L-26                      EN 1600 : E 23 12 L R 73  
ISO 3581-A : E 23 12 L R 73

**Description & Applications**

Synthetic electrode with high recovery (160%). Rutile-basic coating with a 24%Cr-13%Ni stainless steel type deposit. Used when a high efficiency is desired. For buffer layers before hardfacing and for dissimilar joints - stainless steels to ordinary steel....

**Base materials**

Stainless steels for general use and for high temperature applications:

UNS	Alloy	EN	Material N°	UGINE
S30900	309	X15CrNiSi20-12	1.4828	UGINOX R20-12
S30453	304 LN	X2CrNiN18-10	1.4311	
S30908	309S	X12CrNi23-13	1.4833	UGINOX R24-13S
		X10CrSi6	1.4712	
		X10CrAl18	1.4742	

+ all mild steels and low alloyed steels in combination with stainless steels.

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni
<0.04	0.9	0.7	22.5	12.5

**All Weld Metal Mechanical Properties**

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>400	>560	>35	+20°C >50

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x350	2,5x350	3,2x350	4,0x450
Current	( A )	65	90	130	170

Redrying 1 hour at 250°C, if necessary. Interpass temperature : < 200°C.



1G/PA



2F/PB

= + ~ 50V



ind.05

**selectarc****24/12Mo****Stainless Electrode  
for Repairing**


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**Classification**

AWS A5.4 : E309Mo L-17  
ISO 3581-A: E 23 12 2 LR 32

EN 1600 : E 23 12 2 LR 32

**Description & Applications**

Low carbon Rutile-basic coated 23Cr 12Ni 2Mo stainless steel type electrode, used to weld on 316L stainless steels and for dissimilar joints between construction / mild steels and stainless steels. Intermediate layer for a 316L type cladding.

Due to its high level of delta ferrite also used as an universal repairing electrode in maintenance welding. Highly crack resistant. Soft fusion, nice aspect of the bead, slag lifts by itself.

**Base materials**

Stainless steels:

UNS	Alloy	EN 10088	Material N°	UGINE
S31600	316	X5CrNiMo17-12-2	1.4401	UGINOX 17-10 M
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
S31635	316Ti	X6CrNiMoTi17-12-2	1.4571	UGINOX 17-11 MT

+ for dissimilar joints, low alloy to stainless steels.

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo
<0.03	0.8	0.7	22.5	12.5	2.3

**All Weld Metal Mechanical Properties**

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>450	>650	>25	+20°C	>55
			-40°C	>45

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x300	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	45	70	100	135	180

Redrying 1 hour at 250°C if necessary. Interpass temperature : < 200°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +	~ 70V
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**selectarc****307R****High manganese stainless  
Rutile Electrode**


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**Classification**

AWS A5.4 : ~E307-16

EN 1600 : E 18 8 Mn R 32

ISO 3581-A : E 18 8 Mn R 32

**Description & Applications**

Austenitic (non-magnetic) rutile coated electrode for joining and overlaying on manganese steels (up to 14% Mn) and high sulphur and phosphorus containing steels, also for joining dissimilar steels, construction steels to stainless steels, for cushion layers prior hardfacing. Repairing of pieces submitted to shocks or wear by friction. Excellent maniability, easy slag removal, nice aspect of the bead. For civil engineering, railways, cement works (screening steels, digger buckets, crusher jaws...).

**Base materials****Screening steels****Tools steels\*****Austenitic steels with Mn:** type Z 120 M 12, X 120 Mn 12, 1.3401**Spring steels:** 45 Cr 4, 1.7035, 46 Si 7, 1.5024, 51 Si 7, 1.5025, 56 Si 7, 1.5026

(\*) with eventual pre- and post weld heat treatment.

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni
0.1	1.2	4.5	18.0	8.0

**All Weld Metal Mechanical Properties**

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>400	>600	>30	+20°C >70

Hardness: as welded ~ 200 HB, work hardened ~ 500 HB.

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350	5,0x350
Current	( A )	70	100	125	160

Rebaking : 1 hour at 300°C. Never preheat Mn-steels because of its sensitivity to hot cracks.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +

~ 70V

ind.05

**selectarc****307B****High manganese stainless  
Basic coated Electrode**


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**Classification**

AWS A5.4 : ~E307-15                      EN 1600 : E 18 8 Mn B 32  
ISO 3581-A: E 18 8 Mn B 32

**Description & Applications**

Austenitic (non-magnetic) basic coated stainless steel electrode for joining and overlaying on manganese steels (up to 14% Mn) and high sulphur and phosphorus containing steels, also for joining dissimilar steels, construction steels to stainless steels, for cushion layers prior hardfacing. Repairing of pieces submitted to shocks or wear by friction.

Stable arc ease of use, good slag removal, nice aspect of the beads.

For civil engineering, railways, cement works (screening steels, digger buckets, crusher jaws...)

**Base materials****Screening steels****Tools steels\*****Low alloyed steels\*****Austenitic steels with Mn:** type Z 120 M 12, X 120 Mn 12, 1.3401**Spring steels:** 45 Cr 4, 1.7035, 46 Si 7, 1.5024, 51 Si 7, 1.5025, 56 Si 7, 1.5026**Stainless steels to low alloyed steels**

(\*) with eventual pre- and post weld heat treatment.

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni
0.1	0.4	6	18.0	8.0

**All Weld Metal Mechanical Properties**

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>400	600-750	>35	+20°C >90

Hardness: as welded ~ 200 HB, work hardened ~ 500 HB.

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	65	90	120	150

Rebaking : 1 hour at 300°C. Never preheat Mn-steels because of its sensitivity to hot cracks.



1G/PA



2F/PB



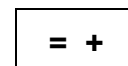
2G/PC



3G/PF



4G/PE



# ***selectarc***

## **18/8Mn**

**High Mn Stainless Electrode  
for repairing and surfacing**

  
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### Classification

AWS A5.4 : ~E307-26  
ISO 3581-A : E 18 8 Mn R 73 X

EN 1600 : E 18 8 Mn R 73 X

### Description & Applications

Rutile-basic electrode with high recovery (160%). Fully austenitic stainless steel deposit with a high Mn-content. For welding and cladding on Mn-steels (14% Mn), for dissimilar joints and difficult to weld materials, cushion layers prior hardfacing, repairing of pieces submitted to shocks. Easy to use, soft fusion, low spatters, slag easy to remove, regular weld beads, deposit highly resistant to cracks.

For shops doing repairs on railways, earth moving, in quarries or on construction machinery, in cement works, on different types of crushers.

### Base materials

**Screening steels**

**Tools steels\***

**Austenitic steels with Mn:** type Z 120 M 12, X 120 Mn 12, 1.3401

**Spring steels:** 45 Cr 4, 1.7035, 46 Si 7, 1.5024, 51 Si 7, 1.5025, 56 Si 7, 1.5026

(\*) with eventual pre- and post weld heat treatment.

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni
0.1	0.8	5.0	18.0	8.5

### All Weld Metal Mechanical Properties

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>400	600-750	>30	+20°C >70

Hardness: as welded ~ 200 HB, work hardened ~ 500 HB.

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	90	130	160

Redrying 2 hours at 250°C if necessary.



1G/PA



2F/PB



2G/PC

= +

~ 50V

# *selectarc* Inox 308Mo

**Stainless Electrode  
for repairing**



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## Classification

AWS A5.4 : ~ E308Mo-17      EN 1600 : E 20 10 3 R 32  
ISO 3581-A : E 20 10 3 R 32

## Description & Applications

Rutile-basic coated stainless steel type electrode with an austenitic-ferritic structure used to weld dissimilar joints between construction / mild steels and stainless steels.

Due to its high level of delta ferrite ( ~25% ) also used as an universal repairing electrode in maintenance welding. Highly crack resistant. Soft fusion, nice aspect of the beads, slag lifts by itself.

### Base materials

UNS	Alloy	EN 10088	Mat. N°	UGINE
S31600	316	X5CrNiMo17-12-2	1.4401	UGINOX 17-10 M
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
J92900		G-X5CrNiMo19-11-2	1.4408	
S31635	316Ti	X6CrNiMoTi17-12-2	1.4571	UGINOX 17-11 MT
S31635	316Ti	X10CrNiMoTi18-12	1.4573	
S31640	316Cb	X6NiCrMoNb17-12-2	1.4580	
		G-X5CrNiMoNb19-11-2	1.4581	

+ for dissimilar joints between low alloy/mild steels and stainless steels.

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo
0.04	0.8	0.7	20.5	10.5	3.0

## All Weld Metal Mechanical Properties

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>450	>620	>30	+20°C >50

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	50-80	80-115	90-140

Interpass temperature : < 200°C. Redrying 1 hour at 250°C if necessary.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 70V

**selectarc****29/9****Stainless Electrode  
for repairing**


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**Classification**

AWS A5.4 : ~ E312-16                      ISO 3581-A : E 29 9 R 32  
EN 1600 : E 29.9 R 32

**Description & Applications**

Rutile-basic electrode with an austenitic-ferritic stainless steel deposit, adapted for welding dissimilar steels (stainless steels with low alloyed steels) and steels difficult to weld as tool steels, Mn steels, spring steels.... Metal deposit highly resistant to cracks, suitable for buffer layers before hardfacing and for building up cutting tools. Soft fusion, nice aspect of the beads, self releasing slag.

**Base materials****Stainless steels****Tool steels****Low alloyed steels****Austenitic steels with Mn** : Z 120 M 12 type, X 120 Mn 12, 1.3401**Screening steels****Spring steels** : 45 Cr 4, 1.7035, 46 Si 7, 1.5024, 51 Si 7, 1.5025, 56 Si 7, 1.5026**Armatures and wire lattice for reinforced concrete****Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo
0.1	1.0	0.6	29	9.5	0.5

**All Weld Metal Mechanical Properties**

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
>500	700 - 850	>20	Approx. 240 HB

**Welding Current & Instructions**

Electrode	ØxL ( mm )	1,6x250	2,0x300	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	35	45	70	110	135	180

Redrying : 2h at 250°C, if necessary. Interpass temperature : < 250°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 50V



ind.05

***selectarc***

## Inox 312HR

**Synthetic Electrode for  
difficult to weld steels**

  
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### Classification

AWS A5.4 : ~ E312-26      DIN 8555 : E9-UM-250-KRZ

### Description & Applications

Synthetic electrode with high recovery (160%). With a rutile coating, for overlaying and welding high strength steels with each other and with stainless steels. Also recommended for buffer layers before hardfacing and to weld galvanised steels. Highly resistant against cracks. Offers soft fusion, very little spatters, self releasing slag.

#### Base materials

**Low alloyed steels, carbon steels, galvanised steels, high strength steels.  
Stainless steels  
Tools steels  
Austenitic steels with Mn  
Screening steels  
Spring steels  
Armatures and wire lattice for reinforced concrete**

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo
0.06	1.1	1.0	26.5	9.5	0.2

### All Weld Metal Mechanical Properties

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
>550	>700	>25	Approx. 240 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,0x300	2,5x350	3,2x350	4,0x450
Current	( A )	50-80	70-100	100-140	150-200

Preheating of base materials with a high carbon equivalent to 100-250°C.  
Redrying of the electrodes : 1h at 300°C.



1G/PA



2F/PB

= + ~ 50V

ind.05

**selectarc****25/20R****High Temperature  
Stainless Steel Electrode**


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**Classification**

AWS A5.4 : ~ E310-16                      EN 1600 : E 25 20 R 32  
ISO 3581-A : E 25 20 R 32

**Description & Applications**

Rutile-basic electrode with a high temperature resistant austenitic stainless steel deposit. Resistant to corrosion and oxidation up to 1200°C, good resistance against hot cracks, easy slag removal and nice aspect of the weld beads.

Principal applications: construction of steam boilers, chemical installations, gas industry, ovens, thermal equipments.

**Base materials**

Stainless and high temperature steels:

UNS	Alloy	EN	Material N°	UGINE
S31000	310	X15CrNiSi25-20	1.4841	
S31008	310S	X12CrNi25-21	1.4845	UGINOX R 25-20
S31400	314	X15CrNiSi25-20	1.4841	
S30900	309	X15CrNiSi20-12	1.4828	UGINOX R 20-12
		G-X15CrNi25-20	1.4840	
J93503		G-X40CrNiSi25-12	1.4837	
J94204	HK40	G-X40CrNiSi25-20	1.4848	

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni
0.1	0.9	2.0	25.5	20.5

**All Weld Metal Mechanical Properties**

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>400	>550	>30	+20°C >60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,0x300	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	45	70	100	135	180

Redrying : 2h at 250°C, if necessary. Avoid prolonged stay at 600-850°C (sigma phase formation).  
Interpass temperature : < 150°C



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 70V



ind.05

**selectarc****25/20B****High Temperature  
Stainless Steel Electrode**


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**Classification**

AWS A5.4 : E310-15                      EN 1600 : E 25 20 B 42  
ISO 3581-A : E 25 20 B 42

**Description & Applications**

Basic coated electrode with an austenitic stainless steel deposit resisting to corrosion and oxidation up to 1150°C. Regular and stable fusion, good slag removal, nice aspect of the bead, resistant against hot cracks.

Principal applications: ovens, boilers, thermal equipments for heat treatment, chemical installations.

**Base materials**

Stainless and high temperature steels:

UNS	Alloy	EN	Material N°	UGINE
S31000	310	X15CrNiSi25-20	1.4841	
S31008	310S	X12CrNi25-21	1.4845	UGINOX R 25-20
S31400	314	X15CrNiSi25-20	1.4841	
S30900	309	X15CrNiSi20-12	1.4828	UGINOX R 20-12
		G-X15CrNi25-20	1.4840	
J93503		G-X40CrNiSi25-12	1.4837	
J94204	HK40	G-X40CrNiSi25-20	1.4848	

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni
<0.12	0.5	2.2	25.5	20.5

**All Weld Metal Mechanical Properties**

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
>380	>550	>30	+20°C >70

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	70	100	135	180

Rebaking at 250°C during 2 hours, if necessary. Avoid long stay at 600-850°C (sigma phase formation).  
Interpass temperature : < 150°C.



1G/PA



2F/PB



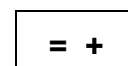
2G/PC



3G/PF



4G/PE



# *selectarc* Inox 310H

High Temperature  
Stainless Steel Electrode



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## Classification

AWS A5.4 : E310H-15                      EN 1600 : E 25 20 H B 42

## Description & Applications

Basic coated austenitic stainless steel electrode with 26%Cr ,21%Ni and an increased carbon content. Used to weld austenitic heat resistant alloys, centrifugally cast tubes etc. resisting to scaling and oxidation up to 1100°C.

Regular and stable fusion, good slag removal, nice aspect of the bead.

Principal applications: Petrochemical industry, for furnaces, reformer and steam cracker tubes, piping systems.

## Base materials

UNS	Alloy	EN	Material N°
J93503		G-X40CrNiSi25-12	1.4837
J94204	HK 40	G-X40CrNiSi25-20	1.4848

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo
0.4	0.7	2.0	26.0	21.0	0.2

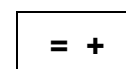
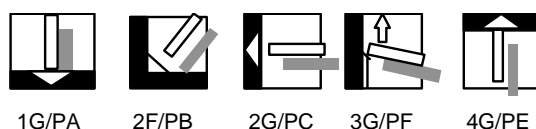
## All Weld Metal Mechanical Properties

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )
>450	>650	>15

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	70	100	135

Rebaking at 250°C during 2 hours, if necessary. Int erpass temperature : < 150°C.



ind.05

# *selectarc* Inox 253MA

High Temperature  
Stainless Steel Electrode



## Classification

EN 1600 : E 22 12 B 42

## Description & Applications

Basic coated electrode with an austenitic stainless steel deposit resisting to scaling and oxidation up to 950°C. Regular and stable fusion, good slag removal, nice aspect of the bead.

Principal applications: ovens, thermal equipments for heat treatment, chemical installations.

### Base materials

UNS	Alloy	EN 10095	Material N°	UGINE
S30815	253MA	X15CrNiSi20-12	1.4828	UGINOX R 20-12
		X12CrNi22-12	1.4829	
		X8CrNiSiN21-11	1.4893	
		X9CrNiSiN21-11-2	1.4835	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	N
0.1	1	1.5	22.0	11.0	0.1

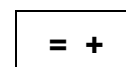
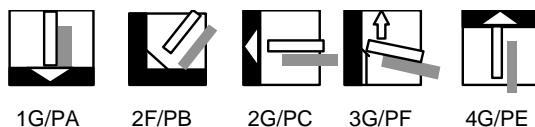
## All Weld Metal Mechanical Properties

Rp0.2 ( MPa )	Rm ( MPa )	A5 ( % )
380	550	35

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	70	100	130

Rebacking at 250°C during 2 hours, if necessary. In terpass temperature: < 150°C.



ind.05

# ***selectarc*** **Inox 21/33Mn**

**High Temperature  
Stainless Steels Electrode**



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## Classification

EN 1600 : Z 21 33 Mn Nb B 42

## Description & Applications

Basic coated austenitic stainless steel electrode with 21%Cr ,33%Ni, 1.2%Nb and an increased manganese content , used to weld austenitic heat resistant alloys, castings and plates resisting to scaling and oxidation up to 1050°C. Regular and stable fusion, good slag removal, nice aspect of the bead.

Principal applications: Chemical and Petrochemical industries.

## Base materials

UNS	Alloy	EN	Material N°
N08800	800	X10NiCrAlTi32-20	1.4876
		G-X10NiCrNb32-20	1.4859
N08810		X5NiCrAlTi31-20	1.4958
N08811		X8NiCrAlTi32-21	1.4959

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Nb	Fe
0.12	0.4	3.5	21.0	33.0	1.2	base.

## All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )
420	610	29

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	70	100	130

Rebaking at 250°C during 2 hours, if necessary. Interpass temperature : < 150°C.



1G/PA



2F/PB



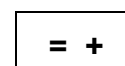
2G/PC



3G/PF



4G/PE



ind.05

# ***selectarc*** **Inox 25/35H**

**High Temperature  
Stainless Steel Electrode**



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## Classification

EN 1600 : Z 25 35 Nb H B 42

## Description & Applications

Basic coated austenitic stainless steel electrode with 26%Cr, 35%Ni, 1.2%Nb and an increased carbon content. Used to weld austenitic heat resistant alloys, centrifugally cast tubes etc. resisting to scaling and oxidation up to 1200°C. Regular and stable fusion, good slag removal, nice aspect of the bead. Principal applications: Petrochemical industry, for welding centrifugally cast pyrolysis coils, reformer tubes, piping systems.

## Base materials

UNS	Alloy	EN	Material N°
J93503		G-X40CrNiSi25-12	1.4837
J94204	HK40	G-X40CrNiSi25-20	1.4848
N08705	HP45	G-X40NiCrSi35-25	1.4857
		G-X40NiCr38-18	1.4849
		G-X40NiCrNb35-25	1.4852

## Typical Weld Metal Composition (%)

C	Si	Mn	Cr	Ni	Nb	Fe
0.4	1.0	1.8	26.0	35.0	1.2	base.

## All Weld Metal Mechanical Properties

R <sub>p0,2</sub> (MPa)	R <sub>m</sub> (MPa)	A <sub>5</sub> (%)
>440	>660	>12

## Welding Current & Instructions

Electrode	ØxL (mm)	2,5x300	3,2x350	4,0x350
Current	(A)	70	100	135

Rebaking at 250°C during 2 hours, if necessary. Interpass temperature : < 150°C.



1G/PA



2F/PB



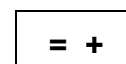
2G/PC



3G/PF



4G/PE



ind.05

**selectarc****Inox 2209****Stainless Electrode  
for Duplex Steels**


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**Classification**

AWS A 5.4 : E2209-17

EN 1600 : E 22 9 3 N L R 32

**Description & Applications**

Rutile-basic electrode with an austenitic- ferritic microstructure ( duplex ). The weld metal can be applied for operation temperatures up to 250°C and is resistant in chloride containing media, like sea water, against pitting corrosion as well as crevice and stress corrosion.

Easy to weld in all positions, except vertical down. Stable arc, regular drop transfer, easy slag removal, finely rippled weld beads.

For butt welding and cladding of steels and castings with an austenitic - ferritic structure, which are used for pumps, vessels , piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion attack.

**Base materials**

UNS	Alloy	EN 10088	Material N°	CLI
S31803		X2CrNiMoN22-5-3	1.4462	URANUS 45N
S32304	35N	X2CrNi23-4	1.4362	
S32900	329	X3CrNiMoN27-5-2	1.4460	
		G-X8CrNiN26-7	1.4347	
		G-X6CrNiMo24-8-2	1.4463	

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo	N	Fe
<0.030	0.9	0.9	22.5	9.0	3.0	0.18	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>540	>680	>22	+20°C	>50
			-40°C	>37

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	50-75	70-100	90-150

Rebaking : 2-3 hours at 250-300°C. Guide electrodes with a slight declination and weld with a short arc. Interpass temperature : < 170°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 70V



ind.05

**selectarc**

# Inox 2209B

**Basic Coated Electrode  
for Duplex Stainless Steels**

  
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## Classification

AWS A 5.4 : E2209-15

EN 1600 : E 22 9 3 N L B 42

## Description & Applications

Basic coated electrode with an austenitic - ferritic microstructure ( duplex ). The weld deposit is characterised by a high resistance against pitting, crevice and stress corrosion in chloride containing media, like sea water, combined with a very high tensile strength. The weld metal can be applied for operation temperatures up to 250°C. For butt welding and cladding of steels and castings with an austenitic- ferritic structure of a similar composition. Easy to weld with, stable arc, easy to remove slag, regular weld beads.

General applications: For pumps, vessels , piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion attack.

## Base materials

UNS	Alloy	EN 10088	Material N°	CLI
S31803		X2CrNiMoN22-5-3	1.4462	URANUS 45N
S32304	35N	X2CrNi23-4	1.4362	URANUS 35N
S32900	329	X3CrNiMoN27-5-2	1.4460	
		G-X8CrNiN26-7	1.4347	
		G-X6CrNiMo24-8-2	1.4463	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo	N	Fe
<0.030	0.5	1.0	22.5	9.0	3.0	0.18	base

## All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>520	>700	>25	+20°C	>70
			-40°C	>40

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	50-75	70-100	90-150

Rebaking of the electrodes 2-3h at 250 – 300°C. Gui de electrodes with a slight declination and weld with a short arc. Respect an interpass temperature of <170°C.



1G/PA



2F/PB



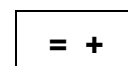
2G/PC



3G/PF



4G/PE



ind.05

**selectarc**

# Inox 2509MoB

**Basic Coated Electrode for  
Super-Duplex Stainless Steels**



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## Classification

AWS A5 : E2594-15  
ISO 3581-A : E 25 9 4 N LB 42

EN1600 : E 25 9 4 N LB 42

## Description & Applications

Basic coated electrode with an austenitic - ferritic microstructure ( duplex ~ 40% ferrite ). The weld metal can be applied for operation temperatures up to 250°C and is resistant in chloride containing medias against pitting as well as crevice and stress corrosion.

For but welding and cladding of steels and castings with an austenitic - ferritic structure, of the same or similar composition, which are used for pumps, vessels , piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion attack. Pitting index: > 40.

## Base materials

UNS	Alloy	EN 10088	Material N°	CLI
S31803		X2CrNiMoN22-5-3	1.4462	URANUS 45
S32304	35N	X2CrNi23-4	1.4362	URANUS 35N
S32550	52N	G-X2CrNiMoCuN26 6 3	1.4517	URANUS 52N
	52N+	X2CrNiMoCuN25-6-3	1.4507	URANUS 52N+
S32750	2507	X2CrNiMoN25-7-4	1.4410	
S32760	100	X2CrNiMoCuWN25-7-4	1.4501	URANUS 70N
S32900	329	X3CrNiMoN27-5-2	1.4460	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo	Cu	N	Fe
<0.040	0.5	1.5	25.0	9.5	4.0	0.7	0.23	base

## All Weld Metal Mechanical Properties

Rp0,2 ( MPa )	Rm ( MPa )	A5 ( % )	KV ( J )
720	850	25	+20°C 70 -40°C 45

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	50-75	70-100	90-150

Rebaking : 2-3 hours at 250-300°C. Guide electrodes with a slight declination and weld with a short arc. Interpass temperature : < 170°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +



ind.08



**selectarc****Inox 383****Stainless Electrode  
highly corrosion resistant**


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**Classification**

AWS A5.4 : E383-16                      EN 1600 : E 27 31 4 Cu L R 12

**Description & Applications**

Rutile-basic coated electrode for welding fully austenitic highly corrosion resistant stainless steels (Sanicro 28 , Uranus B28 ) of the same composition or lower alloyed. Good weldability in all positions, except vertical down, stable arc, good slag removal, regular finely rippled weld beads. Due to its alloy composition, high Mo-content and Cu, the weld metal is suited against attacks by phosphoric- and sulphuric acids, it shows a high resistance against pitting and stress corrosion in chloride containing media. It is used at operation temperatures up to 400°C.

Special applications are: Pulp and paper industry, transport containers, installations of the chemical industry.

( Sanicro is a trade name of Sandvik, Uranus is a trade name of Creusot Loire Industries )

**Base materials**

UNS	Alloy	EN 10088	Material N°	UGINE / CLI
N08028	28	X1NiCrMoCu31-27-4	1.4563	URANUS B28
N08904	904L	X1NiCrMoCu25-20-5	1.4539	URANUS B6

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Ni	Mo	Cu	Fe
<0.03	0.8	1.4	27.0	31.0	3.8	1.0	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>380	>580	>35	+20°C >70

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	50-70	70-100	90-130

Rebake electrodes 2-3h at 250-300°C. Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ). Interpass temperature : < 150°C.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +

~ 70V



ind.05

# ***selectarc*** **Inox 410B**

**Stainless Electrode  
with 13% Cr**



## Classification

AWS A5.4 : E410-15                      EN 1600 : E 13 B 42  
ISO 3581-A : E 13 B 42

## Description & Applications

Basic coated electrode for repair and construction welding on heat resistant ferritic 14% Cr steels of similar composition. For surfacing on fittings and valves for gas, water and steam systems. Corrosion and scale resistant up to 900°C.

Stable arc, easy slag removal, regular weld beads.

### Base materials

Ferritic stainless steels for general use:

UNS	Alloy	EN	Material N°	UGINE
S41000	410	X12Cr13	1.4006	
S41008	410S	X6Cr13	1.4000	UGINOX F 13 S
S42000	420	X20Cr13	1.4021	
		X7Cr14	1.4001	
		X15Cr13	1.4024	

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
0.1	0.5	0.6	13.0	base.

## All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
>450	>650	>18	Approx. 250 HB

After PWHT 750°C / 2h

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	80-100	110-130	120-150	150-180

Rebake electrodes 2h at 300°C. Guide electrodes with a slight declination, weld with a short arc. Preheat base material to 200-300°C and keep this temperature during welding. Cool down to room temperature and perform the PWHT.



1G/PA



2F/PB



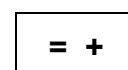
2G/PC



3G/PF



4G/PE



ind.05

***selectarc***

## Inox 13/4

**Stainless Electrode  
with 13% Cr & 4% Ni**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

AWS A 5.4 : E410NiMo-15  
ISO 3581-A : E 13 4 B 42

EN 1600 : E 13 4 B 42

### Description & Applications

Basic coated electrode for repair and construction welding of martensitic CrNi steels of similar composition. These steels / castings are used for hydraulic turbines, pumps, valve bodies, compressor parts...

Stable arc, easy slag removal, regular weld beads.

### Base materials

Martensitic stainless steels and castings:

UNS	Alloy	EN/ Symbol	Material N°
J91540	CA6-NM	G-X5CrNi13-4	1.4313
S41500		X3CrNiMo13-4	1.4313
		G-X4CrNi13-4	1.4317
		G-X5CrNiMo13-4	1.4407
		X3CrNiMo13-4	1.4413
		G-X4CrNiMo13-4	1.4414

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo	Fe
0.04	0.3	0.6	12.0	4.2	0.5	base

### All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>630	>830	>15	+20°C >50

After PWHT 580°C/8h

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	90	130	150

Rebake electrodes 2h at 300°C. Guide electrodes with a slight declination, weld with a short arc. Preheat base material to 100-150°C and keep this temperature during welding. Cool down to room temperature and perform the PWHT.



1G/PA



2F/PB



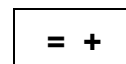
2G/PC



3G/PF



4G/PE



***selectarc***

## Inox 17/4 Mo

**Basic Coated Electrode  
16% Cr - 5% Ni – 1% Mo**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

EN 1600 : Z 16 5 1 B 42

### Description & Applications

Basic coated electrode for repair and construction welding of martensitic CrNi and CrNiMo-stainless steels. These steels / castings are used for hydraulic turbines, pumps, valve bodies, compressor parts etc.

Stable arc, easy slag removal, regular weld beads.

#### Base materials

Martensitic stainless steels and castings:

EN	Material N°
G-X4CrNiMo 16-5-1	1.4405
X4CrNiMo 16-5-1	1.4418

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo	Fe
< 0.04	0.3	0.6	16.0	5.0	1.0	base

### All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>650	>850	>13	+20°C >40

After annealing 8h/ 580°C.

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x450
Current	( A )	90	120	150

Rebake electrodes 2h at 300°C. Guide electrodes with a slight declination, weld with a short arc. Preheat base material to 100-150°C and keep this temperature during welding. Cool down to room temperature and perform the PWHT.



1G/PA



2F/PB



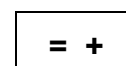
2G/PC



3G/PF



4G/PE



ind.05

***selectarc***

**Fonte Ni**

**Pure Nickel Electrode**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

AWS A 5.15 : ENi-CI  
ISO 1071 : E C Ni-CI 3

DIN 8573 : E Ni BG 11

### Description & Applications

Electrode with a graphite-basic coating. Weld deposit consists of pure nickel. Recommended for cold welding and repairing of grey cast iron, repairing of cracks. Homogeneous and easy to machine deposit. Good bonding and flow of the weld metal. Repairing of engine blocks, frames of tool machines, gearboxes, reducing pieces, valve and pump bodies.

### Base materials

Grey cast iron to different steels :

**ASTM**

A48 Class 25B – A48 Class 60B

**DIN**

GG-15 to GG-40

**NFA**

FGL 150 to FGL 400

### Typical Weld Metal Composition ( % )

C	Si	Mn	Fe	Ni
1.2	<2.0	<1.0	<2.0	> 95

### All Weld Metal Mechanical Properties

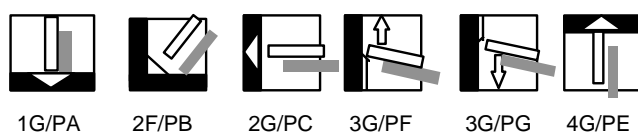
R <sub>m</sub> ( MPa )	Hardness
>300	approx. 180 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350	5,0x450
Current	( A )	70	100	145	180

Weld on clean and exempt from grease surfaces (previous grinding of the joint). Apply a heat input as low as possible and keep the temperature low ( < 70°C). Weld with lowest practical current and depose short and narrow beads to reduce the risk of producing cracks in the base metal.

To reduce stresses, produced during welding, hammering of the beads is recommended after the deposition of short runs (essential on rigid pieces).



= +, -    ~ 40 V



ind.08

# *selectarc* Fonte Ni2

Pure Nickel Electrode



## Classification

AWS A 5.15 : ENi-CI  
ISO 1071 : E C Ni-CI 3

DIN 8573 : E Ni BG 12

## Description & Applications

Electrode with graphite-basic coating to weld on DC - and AC. Weld deposit consists of pure nickel. Recommended for cold welding and repairing of grey cast iron, repairing of cracks. Homogeneous and easy to machine deposit. Good bonding and flow of the weld metal. Repairing of engine blocks, frames of tool machines, gearboxes, reducing pieces, valve and pump bodies.

## Base materials

Grey cast iron to different steels :

**ASTM**

A48 Class 25B – A48 Class 60B

**DIN**

GG-15 to GG-40

**NFA**

FGL 150 to FGL 400

## Typical Weld Metal Composition ( % )

C	Si	Fe	Ni
1.0	<1.2	<2.0	>95

## All Weld Metal Mechanical Properties

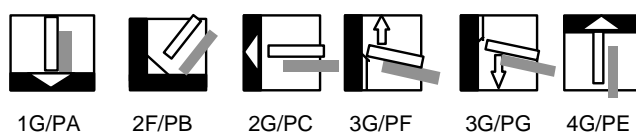
Rm ( MPa )	Hardness
>300	approx. 180 HB

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	80	120	150

Weld on clean and exempt from grease surfaces (previous grinding of the joint). Apply a heat input as low as possible and keep the temperature low ( < 70°C). Weld with lowest practical current and depose short and narrow beads to reduce the risk of producing cracks in the base metal.

To reduce stresses, produced during welding, hammering of the beads is recommended after the deposition of short runs (essential on rigid pieces).



= - ~ 40 V



ind.08

***selectarc***

## Fonte Ni4

Pure Nickel Electrode  
DC+ for cast iron



### Classification

AWS A 5.15 : ENi-CI  
ISO 1071 : E C Ni-CI 3

DIN 8573 : E Ni BG 13

### Description & Applications

Electrode with graphite-basic Barium free non conductive coating. Weld deposit consists of pure nickel. Recommended for cold welding and repairing of grey cast iron, repairing of cracks. Especially designed to weld in deep holes or on parts where the coating may touch the casting. Homogeneous and easy to machine deposit. Good bonding and flow of the weld metal. Repairing of engine blocks, frames of tool machines, gearboxes, reducing pieces, valve and pumps bodies.

### Base materials

Grey cast iron to different steels :

**ASTM**

A48 Class 25B – A48 Class 60B

**DIN**

GG-15 to GG-40

**NFA**

FGL 150 to FGL 400

### Typical Weld Metal Composition (%)

C	Si	Mn	Fe	Cu	Ni
0.6	0.5	0.2	6	0.6	base

### All Weld Metal Mechanical Properties

R <sub>m</sub> (MPa)	Hardness
>300	approx. 170 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	80	110	140

Weld on clean and exempt from grease surfaces (previous grinding of the joint). Apply a heat input as low as possible and keep the temperature low ( < 70°C). Weld with lowest practical current and depose short and narrow beads to reduce the risk of producing cracks in the base metal.

To reduce stresses, produced during welding, hammering of the beads is recommended after the deposition of short runs (essential on rigid pieces).



= + ~ 50 V



***selectarc***

**Ferro-Ni**

**Ferro Nickel Electrode**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

AWS A 5.15 : ENiFe-CI  
ISO 1071 : E C NiFe-CI 3

DIN 8573 : E NiFe-1 BG 13

### Description & Applications

Graphite basic coated electrode with a Ferro-Nickel alloy deposit for joining and repairing nodular cast iron. Deposit homogeneous and highly resistant against cracks. Particularly recommended for dissimilar welding of cast iron to steels and cast iron constructions. Good bonding and flow of the weld metal.

Main applications : Welding of defects in foundries, repairing of engine blocks, houses of tool machines, gearboxes, reducing parts, pump bodies, cast pieces, valve bodies.

### Base materials

Grey cast iron, malleable and nodular cast iron :

ASTM	DIN	NFA
A48 class 25B to 60B	GG-15 to GG-40	FGL 150 to FGL 400
A536 Grade 60-80	GGG-40 to GGG-60	FGS 400-12 to FGS 600-3
	GTS-35 to GTS-65	MN350-10 to MN650-3

### Typical Weld Metal Composition ( % )

C	Si	Mn	Ni	Fe
1.0	<2.0	<1.0	56	base

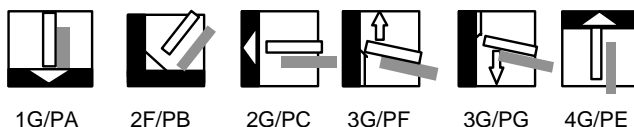
### All Weld Metal Mechanical Properties

R <sub>m</sub> ( MPa )	Hardness
>400	approx. 200 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350	5,0x350
Current	( A )	70	100	145	170

Weld on clean and exempt from grease surfaces (previous grinding of the joint). Reduce the heat input to a minimum, weld with the lowest practical amperage, keep the temperature low ( < 100°C) in order to reduce the risk of cracks in the base metal. Depose short beads of about 6 cm and peen immediately. Reignite on the weld metal.



= +   ~ 40 V



ind.08

**selectarc**

# Bimetal-NiFe

**“Bimetal” Electrode  
for Cast Iron Welding**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

## Classification

AWS A 5.15 : ENiFe-CI  
ISO 1071 : E C NiFe-CI 3

DIN 8573 : E NiFe-1 BG 21

## Description & Applications

Graphite-basic coating and «Bimetal» core wire with high electrical conductivity. The «Bimetal» core wire authorises very important fusion speeds with direct current as well as with alternative current without any risk of overheating the electrode (phenomenon often noticed with conventional Ferro-Nickel electrodes). For repair and construction welding on all cast iron types and dissimilar joints between cast iron and steels.

### Base materials

Grey cast iron, malleable and nodular cast iron :

#### ASTM

A48 Class 25B-60B  
A536 Grade 60-100

A439 Type D-2

#### DIN

GG-15 to GG-40  
GGG-40 to GGG-70  
GTS-35 to GTS-65  
GGG-NiCr20-2

#### NFA

FGL 150 to FGL 400  
FGS 400-12 to FGS 700-3  
MN 350-10 to MN 650-3  
S-NC20-2

## Typical Weld Metal Composition ( % )

C	Si	Mn	Ni	Fe
1.3	0.8	0.3	55	base

## All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
>300	500-600	>15	approx. 190 HB

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	80	120	145

Alternative current favours the welding in all positions. The polarity + is essentially reserved when an important deposit speed on large chamfers is searched, or on areas with difficult access (reduced visibility of the joint). For some applications, it's recommended to deposit short beads followed by immediate hammering to release stresses.



1G/PA



2F/PB



2G/PC



3G/PF



3G/PG



4G/PE

= - ~ 50 V

***selectarc***

**Fe-Ni/Cu**

**Ferro Nickel Electrode  
Core Wire Copper Coated**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

AWS A 5.15 : ENiFe-CI  
ISO 1071 : E C NiFe-1 3

DIN 8573 : E NiFe-1 BG 13

### Description & Applications

Graphite-basic coating with a copper coated core wire and a Ferro-Nickel alloy deposit (55%Ni - 45%Fe) for welding and repairing of nodular cast iron. Particularly recommended for steels/cast iron or pipe to flange welding in cast iron. Good wash-in and flow of the weld metal. Principal advantage of this electrode : exceptional resistance against overheating during welding due to the copper plated core wire. Exceptional welding characteristics. For foundry defects, repairing of engine blocks, frame of tool machines, gearboxes, reducing pieces, pump bodies, valve bodies.

### Base materials

Grey cast iron, malleable and nodular cast iron :

#### ASTM

A48 class 25B to 60B  
A536 Grade 60-80

#### DIN

GG-15 to GG-40  
GGG-40 to GGG-60  
GTS-35 to GTS-65

#### NFA

FGL 150 to FGL 400  
FGS 400-12 to FGS 600-3  
MN350-10 to MN650-3

### Typical Weld Metal Composition ( % )

C	Si	Mn	Ni	Cu	Fe
1.1	1.2	0.8	53	4.0	base

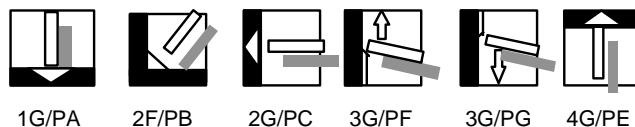
### All Weld Metal Mechanical Properties

R <sub>m</sub> ( MPa )	Hardness
>400	approx. 200 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70	100	150

Weld on clean and exempt from grease surfaces (previous grinding of the joint). Reduce the heat input to a minimum, weld with the lowest practical amperage, keep temperature low ( < 100°C) in order to reduce the risk of cracks in the base metal, depose short beads of about 6 cm and peen immediately. Reignite on the weld metal –not on the casting.



= + ~ 40 V

***selectarc***  
**Fonte NiCu**  
**Nickel Copper**  
**Cast Iron Electrode**



**Classification**

AWS A 5.15 : ENiCu-B  
 ISO 1071 : E C NiCu 3

DIN 8573 : E NiCu BG 12

**Description & Applications**

Graphite-basic coating electrode for cold welding and repairing of grey and malleable cast iron. Due to a nearly colour matching deposit and its good welding properties this electrode is suited especially for repairing casting defects.

**Base materials**

Grey cast iron, malleable and nodular cast iron :

ASTM	DIN	NFA
A48 class 25B to 60B	GG-15 to GG-40	FGL 150 to FGL 400
A536 Grade 60	GGG-40 to GGG-50	FGS 400-12

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Fe	Cu	Ni
0.8	0.9	2	4	30	base

**All Weld Metal Mechanical Properties**

R <sub>m</sub> ( MPa )	Hardness
>450	approx. 160 HB

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	80	110	140

Weld on clean and exempt from grease surfaces (previous grinding of the joint). Reduce the heat input to a minimum, weld with the lowest practical amperage, keep temperature low ( < 100°C) in order to reduce the risk of cracks in the base metal, depose short beads of about 6 cm and peen immediately. Reignite on the weld metal –not on the casting.



= - ~ 50 V

**selectarc**

## Fonte NiFe2

**Ferro Nickel Electrode  
Graphite-basic Coated**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

AWS A 5.15 : ENiFe-CI  
ISO 1071 : E C NiFe-CI 1

DIN 8573 : E NiFe-1 BG 12

### Description & Applications

Graphite basic coated electrode with a Ferro-Nickel alloy deposit for joining and repairing nodular cast iron. Sound deposit, highly resistant against cracks. Particularly recommended for dissimilar welding of cast iron to steels and constructions of cast iron. Good bonding and flow of the weld metal.

Main applications: Repairing of defects in foundries, repairing of engine blocks, houses of tool machines, gearboxes, reducing parts, pump bodies, cast pieces, valve bodies.

### Base materials

Grey cast iron, malleable and nodular cast iron :

ASTM	DIN	NFA
A48 class 25B to 60B	GG-15 to GG-40	FGL 150 to FGL 400
A536 Grade 60-80	GGG-40 to GGG-60 GTS-35 to GTS-65	FGS 400-12 to FGS 600-3 MN350-10 to MN650-3

### Typical Weld Metal Composition ( % )

C	Si	Mn	Ni	Fe
1.7	1.4	0.7	55	base

### All Weld Metal Mechanical Properties

R <sub>m</sub> ( MPa )	Hardness
>400	approx. 200 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70	100	145

Weld on clean and exempt from grease surfaces (previous grinding of the joint). Reduce the heat input to a minimum, weld with the lowest practical amperage, keep temperature low ( < 100°C ) in order to reduce the risk of cracks in the base metal, deposite short beads of about 6 cm and peen immediately. Reignite on the weld metal –not on the casting.



= - ~ 40 V

ind.08

***selectarc***

## Fonte Fe

**Basic Coated Special  
Electrode for Cast Iron**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

AWS A 5.15 : ESt  
ISO 1071 : E C Fe-1 3

DIN 8573 : E Fe-1

### Description & Applications

Special iron base electrode for repair welding of poor quality, slag or oil containing old cast iron (furnace parts, boxes, heaters, pumps, ...). Smooth arc, deep penetration. Weld deposit can only be machined by grinding. For butt welding it is important to use Fonte-Fe only as initial bonding pass, then take Selectarc Fonte-Ni and Ferro-Ni to fill.

### Typical Weld Metal Composition ( % )

C	Si	Mn	Fe
0.13	0.9	0.5	base

### All Weld Metal Mechanical Properties

Hardness

approx. 350 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	70-90	80-110	100-140

Use only dry electrodes. Redrying : 2h/250°C. Use a low amperage, maintain the arc short, deposit thin layers.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +,- ~ 70 V



# *selectarc* Fonte Fe2

Special Ni-free  
Cast Iron Electrode



**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

## Classification

AWS A 5.15 : "EST"  
ISO 1071 : E C Fe-2 3

DIN 8573 : E Fe-2 B 24

## Description & Applications

Special basic coated " Nickel-Free "electrode for cold welding of cast iron with a colour matching deposit. Stable arc, good bonding and flow of the weld metal.

General applications: To weld defects in foundries, for repair welding of cast iron, as first layer before surfacing of cast iron.

### Base materials

Grey cast iron, malleable and nodular cast iron :

#### ASTM

A48 Class 25B-60B

A536 Grade 60-100

#### DIN

GG-15 to GG-40

GGG-40 to GGG-70

GTS-35 to GTS-65

#### NFA

FGL 150 to FGL 400

FGS 400-12 to FGS 700-3

MN 350-10 to MN 650-3

## Typical Weld Metal Composition ( % )

C	Si	Mn	V	Fe
0.05	0.5	0.4	10.0	base

## All Weld Metal Mechanical Properties

Hardness

250 HB

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	75	110	140

Weld on clean and exempt from grease surfaces (previous grinding of the joint). Apply a heat input as low as possible and keep the temperature low in order to reduce the risk of producing cracks in the base metal, Weld with lowest practical current and depose short and narrow beads. To reduce internal stresses, hammering of the beads is recommended after each pass (essential on rigid pieces).



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +,- ~ 40 V

# ***selectarc*** **Fonte Fe3**

**Cast Iron Electrode  
for hot welding**



**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

## Classification

AWS A 5.15 : "ECI-B"  
ISO 1071 : E C FeC-GF 3

DIN 8573 : E FeC-G-BG 42

## Description & Applications

Graphite basic coated electrode for hot welding nodular cast iron with a colour and structure matching deposit. Stable arc, can weld over hot slag, good bonding and flow of the weld metal. Mainly used to weld defects in foundries.

### Base materials

Nodular cast iron:

#### ASTM

A536 Grade 60-40-28

A536 Grade 80-55-06

A536 Grade 100-70-03

#### DIN

GGG-40

GGG-40.3

GGG-50

GGG-60

GGG-70

#### NFA

FGS 400-12

FGS 370-17

FGS 500-7

FGS 600-3

FGS 700-2

## Typical Weld Metal Composition ( % )

C	Si	Mn	Fe
3.0	3.2	0.3	base.

## All Weld Metal Mechanical Properties

R <sub>p0,2</sub> (MPa)	R <sub>m</sub> (MPa)	A <sub>5</sub> (%)	Hardness
320	450	15	220 HB

After PWHT 900°C/2h + 700°C/4h

## Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x450	5,0x450	6,0x450
Current	( A )	110	150	180	250

Prepare the casting defect to be repaired, preheat the piece to 550 – 650°C, keep this temperature during welding, use a current as high as possible, without overheating the electrode. Assure that sufficient base metal is melted to get a good bonding. When welding over the hot slag don't move too fast with the arc to avoid trapped slag. After welding a PWHT, 2h at 900°C followed by 4h at 700°C and slow cooling in the furnace, insures a colour matching deposit and a regular hardness, even in the heat affected zone.



1G/PA

= - ~ 40 V

***selectarc***

## Fonte Fe4/F

**Cast Iron Rod  
Flux Coated for hot Welding**



**FSH WELDING GROUP**

INNOVATIVE WELDING CONSUMABLES

[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

DIN 8573 : G FeC-1  
ISO 1071 : R C FeC-1

### Description & Applications

Flux coated welding rod for oxy-acetylene hot welding of grey cast iron.  
The deposit shows the same colour and structure as grey cast iron.  
Mainly used to weld defects in foundries.

### Base materials

Cast iron:

**ASTM**

A48 Class 25B – Class 60B

**DIN**

GG-15 to GG-40

**NFA**

FGL 150 to FGL 400

### Typical Weld Metal Composition ( % )

C	Si	Mn	Ni	Cu	Fe
3.3	3.2	0.6	0.5	0.1	base

### All Weld Metal Mechanical Properties

Hardness after PWHT

~ 185 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	4,0x450	5,0x450
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Prepare the casting defect to be repaired, preheat the piece to 550 – 650°C , keep this temperature during welding , cool slowly down, preferable in a furnace.  
Use a neutral flame.



**selectarc****B90****Inconel type Electrode  
for fabrication and repair**


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**Classification**

AWS A5.11 : ENiCrFe-3  
UNS : W 86182

EN/ISO14172: E-Ni 6182  
NiCr15Fe6Mn

**Description & Applications**

Semi-synthetic basic coated electrode with 140% recovery and an Inconel 600 type nickel base deposit. Used for repairing and joining of Nickel alloys, 5 % Nickel steels, cryogenic stainless steels (down to – 196°C), Incoloy 800 and other high temperature steels. High performance for joining dissimilar materials as stainless steels to low alloyed steels, stainless steels to Nickel alloys, buttering of difficult to weld steels. Deposit insensitive to cracks, very good resistance to acids, salt and alkaline solutions, molten salt. Resistant in oxidizing and carburizing atmospheres ( avoid sulphurous atmosphere).

Main applications : Oven parts, burners, heat treatment equipment, cement works , moulds, tanks, transport and storage of liquid gas. Chemical industries, petrochemical industries, glassworks, civil engineering, repair and maintenance workshops.

Note: "Inconel" and "Incoloy" are registered trade names of Inco Alloys

Base materials	UNS	Alloy	DIN	Material N°
		5%Ni	12Ni19	1.5680
	N06600	600	NiCr15Fe	2.4816
	N08800	800	X10NiCrAlTi3220	1.4876
	N08810	800H	X5NiCrAlTi3120	1.4958
		DS	X8NiCrSi3818	1.4862

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Nb	Fe	Mo	Ni
<0.05	0.5	5.5	16.0	2.0	<10	0.2	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>380	>600	>30	+20°C	>80
			-196°C	>60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350	5,0x450
Current	( A )	75	110	135	160

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks . Weld with a minimum heat input in order to eliminate the phenomena of hot cracks. For welding carbon steels a preheating of 200-500°C, depending on the carbon equivalent, is recommended.



1G/PA



2F/PB



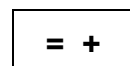
2G/PC



3G/PF



4G/PE



**selectarc****B91****Highly corrosion resistant  
high recovery NiCrMo-Electrode**


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**Classification**

AWS A5.11 : ENiCrMo-3  
UNS : W86112

EN/ISO 14172: E-Ni6625  
NiCr22Mo9Nb

**Description & Applications**

Rutile-basic coated electrode with a high recovery (170%) for welding of Nickel-Chromium-Molybdenum alloys to themselves and to lower alloyed steels as well as for welding of special austenitic stainless steels. Often used for butt-welding and surfacing on low alloyed and high strength steels as well as for dissimilar joints, buffer layers and for difficult to weld steels. Crack resistant buffer layers on machine parts in earth movement and steel-industries subject to impact and pressure.

Base materials	UNS	Alloy	DIN	Material N°
	K81340	9%Ni	X8Ni9	1.5662
	N06625	625	NiCr22Mo9Nb	2.4856
	N08825	825	NiCr21Mo	2.4858
	N08904	904L	X1NiCrMoCuN25 20 5	1.4539

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Nb	Fe	Mo	Ni
0.04	0.6	0.8	21.0	3.3	4.0	8.5	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
>450	>760	>30	Approx. 240HB

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70-90	90-120	120-140

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ).

For repair welding a preheating, depending on the carbon equivalent of the base material, in the range of 100-250°C is recommended.



1G/PA



2F/PB



2G/PC

= + ~ 70V



ind.05

**selectarc****B94****Basic coated NiCrFe- Electrode  
for alternative current**


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**Classification**

AWS A5.11 : ENiCrFe-2                      EN/ISO 14172: E-Ni6092  
UNS : W86133                                  NiCr16Fe12NbMo

**Description & Applications**

Basic coated electrode with 150% recovery, for welding Nickel-Chromium-Iron alloys to themselves and to lower alloyed steels as well as for welding cryogenic 5 and 9% Ni-steels and high temperature steels, for CrMo-creep resistant steels to stainless steels, for repair on HK and HP reformer grades. The electrode is especially designed to weld with alternating current.

Base materials	UNS	Alloy	DIN	Material N°
		5%Ni	12Ni19	1.5680
	K81340	9%Ni	X8Ni9	1.5662
	N06600	600	NiCr15Fe	2.4816
	N08800	800	X10NiCrAlTi3220	1.4876
	N08810	800H	X5NiCrAlTi3120	1.4958
	J94204	HK40	GX40CrNiSi25 20	1.4848
	J95705	HP30	GX40NiCrNb35 25	1.4852

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Nb	Fe	Mo	Ni
0.06	0.5	2.8	16.0	1.7	7.0	1.8	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>380	>620	>30	+20°C >80 -196°C >60

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70-90	90-120	120-140

Rebaking :1 h at 300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2-3 times core wire diameter ).

For repair welding a preheating, depending on the carbon equivalent of the base material, in the range of 100-250°C, is recommended.



ind.05



1G/PA



2F/PB



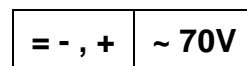
2G/PC



3G/PF



4G/PE



**selectarc****B96****Basic coated high strength  
Ni-base Electrode for AC**


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**Classification**

AWS A5.11 : ENiCrMo-6                      EN/ISO 14172: E-Ni6620  
UNS : W86620                                      NiCr14Mo7Fe

**Description & Applications**

Basic coated electrode with approx. 160% recovery. The electrode is especially designed to weld with alternating current to avoid magnetic arc blow.

Main applications: Construction and repair welding of high strength cold-tough 3; 5 and 9% Ni-steels used for transportation and storage tanks of liquid natural gas.

Base materials	UNS	Alloy	DIN	Material N°
	K34718	3,5%Ni	10Ni14	1.5638
		5%Ni	12Ni19	1.5680
	K81340	9%Ni	X8Ni9	1.5662

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Nb	Fe	Mo	W	Ni
<0.08	0.6	3.6	13.5	1.2	7.5	7.0	1.2	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>420	>690	>35	+20°C	>90
			-196°C	>70

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70-100	100-130	120-160

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ).



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= -, +	~70V
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ind.05

**selectarc****Ni82****Basic coated  
Nickel base type Electrode**


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**Classification**

AWS A5.11 : ~ENiCrFe-3  
Material N° : 2.4648

EN/ISO 14172: E-Ni6082  
NiCr20Mn3Nb

**Description & Applications**

Basic coated nickel base electrode, with an alloyed core wire, for cladding of low alloyed and alloyed steels, for welding iron- and nickel base alloys and for dissimilar joints. Used for low temperature alloys as well as for high temperature alloys, for service temperatures from -269°C up to 900°C.

Main applications are construction- and repair welding of high strength steels, tool steels, corrosion resistant steels, high temperature and nickel alloys in component manufacturing, furnace construction, cement industry

Base materials	UNS	Alloy	DIN	Material N°
	K81340	9%Ni	X8Ni9	1.5662
	N06600	600	NiCr15Fe	2.4816
	N06601	601	NiCr23Fe	2.4851
	N08800	800	X10NiCrAlTi3220	1.4876
	N08810	800H	X5NiCrAlTi3120	1.4958
		DS	X8NiCrSi3818	1.4862

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Nb	Fe	Mo	Ni
0.03	0.4	5.0	19.0	2.2	3.0	1.5	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
390	650	40	+20°C >80 -196°C >65

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	50-70	70-95	90-120	120-160

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2-3 times core wire diameter ).



1G/PA



2F/PB



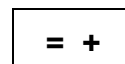
2G/PC



3G/PF



4G/PE



ind.05

**selectarc****Ni182****Basic coated  
Inconel type Electrode**


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**Classification**

AWS A5.11 : ENiCrFe-3  
UNS : W86182  
Material N° : 2.4620

EN/ISO 14172: E-Ni6182  
NiCr15Fe6Mn

**Description & Applications**

Basic coated electrode with an NiCrFe type nickel base deposit. Used for repairing and joining of Nickel alloys, 5 % Nickel steels, cryogenic stainless steels (down to  $-196^{\circ}\text{C}$ ), Incoloy 800 and other high temperature steels. For joining dissimilar materials as stainless steels to low alloyed steels, stainless steels to Nickel alloys, for buttering of difficult to weld steels. Deposit insensitive to cracks, very good resistance against acids, salt and alkaline solutions, molten salt. Resistant in oxidizing and carburizing atmospheres ( avoid a sulphurous atmosphere).

Main applications : Oven parts, burners, heat treatment equipment, cement works , moulds, tanks, transport and storage of liquid gas. Chemical industries, petrochemical industries, glassworks, civil engineering, repairing and maintenance workshops.

Note: "Inconel" and "Incoloy" are registered trade names of Inco Alloys.

Base materials	UNS	Alloy	DIN	Material N°
	N06600	600	NiCr15Fe	2.4816
	N08800	800	X10NiCrAlTi3220	1.4876
	N08810	800H	X5NiCrAlTi3120	1.4958
		DS	X8NiCrSi3818	1.4862

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Nb	Fe	Mo	Ni
<0.04	0.4	6.0	16.5	2.0	6.0	0.2	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV (J)
>380	>620	>35	+20°C >80 -196°C >65

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	50-70	70-95	90-120	120-160

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2-3 times core wire diameter ).



1G/PA



2F/PB



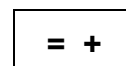
2G/PC



3G/PF



4G/PE



ind.05

**selectarc****Ni190****Basic coated NiCu type  
Electrode**


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**Classification**

AWS A5.11 : ENiCu-7                      EN/ISO 14172: E-Ni4060  
 UNS : W84190                              NiCu30Mn3Ti  
 Material N° : 2.4366

**Description & Applications**

Basic coated electrode with a Monel\* type Nickel-Copper deposit designated for butt welding and surfacing of Nickel-copper, Copper-Nickel and Copper-Nickel plated steels. Also recommended for dissimilar joining like steels to Nickel-Copper or steel to Copper / Copper-Nickel.

Excellent resistance to stress corrosion in Cl- containing environments.

Main applications: construction of equipment for the chemical industry and petrochemical industry, naval constructions and installations for sea water desalination.

Note: "Monel" is a registered trade name of Inco Alloys.

Base materials	UNS	Alloy	DIN	Material N°
	C70600	CuNi90/10	CuNi10Fe1Mn	2.0872
	C71500	CuNi70/30	CuNi30Mn1Fe	2.0882
	N04400	400	NiCu30Fe	2.4360
	N05500	K-500	NiCu30Al	2.4375

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Fe	Ti	Cu	Ni
<0.05	0.7	3.2	1.2	0.5	29	base (65)

**All Weld Metal Mechanical Properties**

R <sub>p0.2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>300	>480	>30	+20°C >80

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	50-75	80-110	90-130

Rebaking : 2 h at 250°C. Joints to weld must be clean, exempt from grease, cracks.

Guide electrodes with a slight declination (10-20° inclined in direction of travel), weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ).



1G/PA



2F/PB



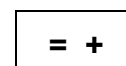
2G/PC



3G/PF



4G/PE



ind.05

**selectarc****Ni276****Nickel base Electrode  
NiCrMo (C-276) type**


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**Classification**

AWS A5.11 : ENiCrMo-4                      EN/ISO 14172: E-Ni6276  
 UNS : W80276                                NiCr15Mo15Fe6W4  
 Material N° : 2.4887

**Description & Applications**

Basic coated electrode with an alloyed core wire for welding of Nickel-Base alloys ( alloy C-276) and other highly corrosion resistant Ni Cr Mo-alloys as well as special stainless steel types.

Stable arc, regular drop transfer, easy to watch weld pool, nice aspect of the weld beads.

Very resistant in sulphurous acid environment, highly concentrated with chlorides and also in the presence of oxidising solutions ( Fe Cl, Cu Cl ).

Special applications are: Welding of Off-shore components, boilers, containers, piping systems in the chemical and petrochemical industries as well as components of flue gas desulfurizing plants

Base materials	UNS	Alloy	DIN	Material N°
	N10276	C-276	NiMo16Cr15W	2.4819
	N06455	C-4	NiMo16Cr16Ti	2.4610
	N06625	625	NiCr22Mo9Nb	2.4856
	N08825	825	NiCr21Mo	2.4858
	N08926	254SMo	X1NiCrMoCuN25 20 6	1.4529

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Mo	W	Fe	V	Ni
<0.02	0.2	0.6	16.2	16.0	4.0	5.0	0.15	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>450	>720	>30	+20°C >70

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	50-70	70-100	90-120

Rebaking :2 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ).



ind.05



1G/PA



2F/PB



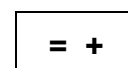
2G/PC



3G/PF



4G/PE



**selectarc****Ni617****High temperature  
Nickel base Electrode**


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**Classification**

AWS A5.11 : ~ENiCrCoMo-1  
UNS : W86117

EN/ISO 14172: E-Ni6617  
NiCr22Co12Mo

**Description & Applications**

Basic coated nickel base electrode, with an alloyed core wire, for joining and repairing of high temperature alloys used at operation temperatures up to 1100°C.

The electrode distinguishes itself by a soft arc, easy slag removal and regular weld beads.

Principal applications are: Construction of gas turbines, combustion chambers, ovens, thermal equipment for heat treatment, petrochemical installation.

Base materials	UNS	Alloy	DIN	Material N°
	N08810	800H	X5NiCrAlTi3120	1.4958
		DS	X8NiCrSi3818	1.4862
	N06601	601	NiCr23Fe	2.4851
	N06617	617	NiCr23Co12Mo	2.4663

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Co	Mo	Fe	Al	Ti	Ni
0.06	0.8	0.3	21.0	11.0	9.0	1.0	0.7	0.3	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
460	730	40	+20°C 100

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	45-60	75-95	90-120

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ).

Nickel base alloys are welded without preheating and an interpass temperature <150°C.

For repair welding of steels with a high carbon content a preheating between 200- 500°C has to be applied. A post weld heat treatment can be performed without influence on the weld deposit.



1G/PA



2F/PB



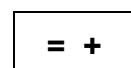
2G/PC



3G/PF



4G/PE



**selectarc****Ni625****Nickel base Electrode  
highly corrosion resistant**


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**Classification**

AWS A5.11 : ENiCrMo-3                      EN/ISO 14172: E-Ni6625  
UNS : W86112                                  NiCr22Mo9Nb

**Description & Applications**

Basic coated electrode with an alloyed core wire for welding of Nickel-Chromium-Molybdenum alloys to themselves and to lower alloyed steels as well as for welding of special austenitic stainless steels. Good weldability in all positions, except vertical down; stable arc, medium slag removal, regular weld beads. Due to its composition the weld metal is highly resistant to corrosion and presents a high yield and a high tensile strength.

Special applications are: Welding of Off-shore components, boilers, vessels, piping systems in the chemical and petrochemical industries as well as components of flue gas desulfurizing plants.

Base materials	UNS	Alloy	DIN	Material N°
	K81340	9%Ni	X8Ni9	1.5662
	N06625	625	NiCr22Mo9Nb	2.4856
	N08825	825	NiCr21Mo	2.4858
	N08904	904L	X1NiCrMoCuN25 20 5	1.4539
	N08926	254SMo	X1NiCrMoCuN25 20 6	1.4529

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Nb	Fe	Mo	Ni
<0.04	0.4	0.6	22.0	3.4	3.0	9.0	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
>450	>760	>30	+20°C >70

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	50-70	70-100	90-120	140-160

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ).

Nickel base alloys are welded without preheating and an interpass temperature <150°C.



1G/PA



2F/PB



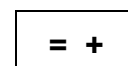
2G/PC



3G/PF



4G/PE



**selectarc****Ni-A****Nickel base Electrode  
for fabrication and repair**


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**Classification**

AWS A5.11 : ENiCrFe-2                      EN/ISO 14172 : E-Ni6092  
UNS : W86133                                      NiCr16Fe12NbMo

**Description & Applications**

Basic coated nickel base electrode, with an alloyed core wire, for joining and repairing of high temperature alloys, dissimilar joining of stainless steel to creep resistant steels , for joining alloy 800, 800H, HK40, HP45 etc.

The electrode distinguishes itself by a soft arc, easy slag removal and regular weld beads.

Principal applications are: Thermal power stations, ovens, thermal equipment for heat treatment, petrochemical installations.

Base materials	UNS	Alloy	DIN	Material N°
	N08705	HP45	G-X40NiCrSi3525	1.4857
	J94204	HK40	G-X40NiCrNb3525	1.4852
	N08800	800	G-X40CrNiSi2520	1.4848
	N08810	800H	X10NiCrAlTi3220	1.4876
		DS	X5NiCrAlTi3120	1.4958
			X8NiCrSi3818	1.4862

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Nb	Fe	Mo	Ni
0.04	0.4	3.0	16.0	2.2	6.0	1.5	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )
390	650	40	+20°C >80

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	50-70	70-95	90-120	120-160

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ).

Nickel base alloys are welded without preheating and an interpass temperature <150°C.

For repair welding of steels with a high carbon content a preheating between 200- 500°C has to be applied. A post weld heat treatment can be performed without influence on the weld deposit.



1G/PA



2F/PB



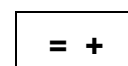
2G/PC



3G/PF



4G/PE



**selectarc****NiTi3****Pure Nickel Electrode**


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**Classification**

AWS A5.11 : ENi-1  
 Material N° : 2.4156

EN/ISO 14172 : E-Ni2061  
 NiTi3

**Description & Applications**

Basic coated electrode with a Nickel deposit containing 1-2%Ti designated for butt welding of pure Nickel (alloy 200) and surfacing of Nickel-copper, Copper-Nickel and Copper-Nickel plated steels. Also recommended for dissimilar joining like steels to Nickel-Copper or steel / Copper to Copper-Nickel. Excellent resistance to NaOH up to 400°C.

Main applications: construction of equipment for the chemical industry and petrochemical industry, food stuff industry. For caustic soda production as well as for soap and detergents.

Base materials	UNS	Alloy	DIN	Material N°
	N02200	200	Ni99.2	2.4066
	N02201	201	LC-Ni99	2.4068
	N02205	205	LC-Ni99.6	2.4061
			Ni99.6	2.4060

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Fe	Ti	Al	Ni
<0.03	0.7	0.3	0.3	1.6	0.3	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	KV ( J )	
>280	>420	>28	+20°C	>160
			-196°C	>160

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70-90	90-120	120-160

Rebaking : 1 h at 250-300°C. Joints to weld must be clean, exempt from grease, cracks .

Guide electrodes with a slight declination (10-20° inclined in direction of travel), weld with a short arc and apply the stringer bead technique ( weaving max. 2 times core wire diameter ). To improve degassing of the deposit, adopt a low welding speed.



1G/PA



2F/PB



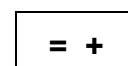
2G/PC



3G/PF



4G/PE



**selectarc**

**Al105**

**Aluminium Electrode  
with 5% Si**

  
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### Classification

AWS A5.3 : E4043  
UNS : A94043

DIN 1732 : EL-AISi5  
Material N : 3.2245

### Description & Applications

Aluminium electrode with 5%Si for welding and repairing aluminium or aluminium alloy pieces (AlSi, AlCuSiMn, AlSiMg, AlZnMg...). For joints between aluminium and aluminium-alloys, as well as for aluminium castings.

General applications: engine blocks, cylinder heads, tanks, containers, frames, lorry tipper.

Base materials	DIN	Material N°
	G-AISi6Cu4	3.2151
	AlMgSi1	3.2315
	G-AISi5Mg	3.2341
	G-AISi7Mg	3.2371
	AlMgSi0,5	3.3206
	AlMgSi0,7	3.3210
	AlMg1SiCu	3.3211

### Typical Weld Metal Composition ( % )

Si	Mn	Fe	Al
5.0	<0.5	<0.5	base

### All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
70-100	110-160	>15	~50 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	60	90	120

Clean the weld zone, preheat massive pieces ( more than 6mm of thickness ) to 150 – 250°C.

In order to avoid all risks of porosity, weld with a short arc and guide the electrode at 90° to the piece to be welded. Use a fast travel speed, remove slag between passes and when finished.

**Warning!** Aluminium electrodes are very sensitive to humidity pick-up, therefore keep the opened tins in a dry place. In case of humidity pick-up dry the electrodes 3h/100°C.



ind.05



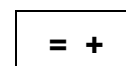
1G/PA



2F/PB



2G/PC



**selectarc**

**Al112**

**Aluminium Electrode  
with 12% Si**

  
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### Classification

AWS A5.3 : „E4047“  
UNS : A94047

DIN 1732 : EL-AISi12  
Material N° : 3.2585

### Description & Applications

Aluminium electrode with 12%Si for welding and repairing aluminium or aluminium alloy pieces ( AlSi, AlCuSiMn, AlSiMg ). Specially designed for welding cast or extruded aluminium alloys with Si-levels higher than 7%. Dissimilar joints between aluminium and aluminium alloys.

General applications: engine blocks, cylinder heads, tanks, containers, frames, lorry tipper.

Base materials	DIN	Material N°
	G-AlSi9Mg	3.2373
	G-AlSi10Mg	3.2381
	G-AlSi10MgCu	3.2383
	G-AlSi12	3.2581
	G-AlSi12Cu	3.2583

### Typical Weld Metal Composition ( % )

Si	Mn	Fe	Al
12	<0.5	<0.5	base

### All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
80	180	>5	~50 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	60	90	120

Clean the weld zone, preheat massive pieces ( more than 6mm of thickness ) to 150 – 250°C.

In order to avoid all risks of porosity, weld with a short arc and guide the electrode at 90° to the piece to be welded. Use a fast travel speed, remove slag between passes and when finished.

**Warning!** Aluminium electrodes are very sensitive to humidity pick-up, therefore keep the opened tins in a dry place. In case of humidity pick-up dry the electrodes 3h/100°C.



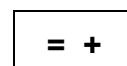
1G/PA



2F/PB



2G/PC



ind.05

***selectarc***

**Cu110**

**Copper Electrode**

  
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### Classification

AWS A5.6 : ~ECu                      DIN 1733 : EL-CuMn2  
UNS : ~W60189                      Material N° : 2.1363

### Description & Applications

Basic coated electrode for welding different pure copper grades and copper-nickel alloys in some cases too. Also used for dissimilar joints and surfacing.

The deposit is free of porosity and gives a tensile strength similar to that of most commercial copper types.

Application fields : Joining of electrical copper electrodes used in furnaces, for joining copper to steel bars in electrically heated drive ways .

Base materials	UNS	DIN	Material N°
	C10100	OF-Cu	2.0040
	C11000	E-Cu	2.0060
	C10300	SE-Cu	2.0070
		SW-Cu	2.0076
	C11020	F-Cu	2.0080
	C12200	SF-Cu	2.0090

### Typical Weld Metal Composition ( % )

Mn	Sn	Fe	Cu
1.5	0.8	0.1	Base

### All Weld Metal Mechanical Properties

Rm ( MPa )	A5 ( % )	Hardness	Electrical conductivity
~200	35	~60 HB	15-20 S*m/mm <sup>2</sup>

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70-90	90-120	110-140

Rebaking : 2 h at 150°C. Joints to weld must be clean.

Guide electrodes with a slight declination (10-20°) inclined in direction of travel).

weld with a short arc. To improve degassing of the deposit, adopt a low welding speed.

Material up to 5 mm can be welded without preheating, when using the adopted electrode diameter. Heavier sections have to be preheated up to about 500°C.



ind.05



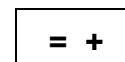
1G/PA



2F/PB



2G/PC



***selectarc***

**Cu114**

**Copper Tin Electrode  
for AC**

  
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### Classification

AWS A5.6 : ECuSn-A                      DIN 1733 : EL-CuSn7  
UNS : W60518                              Material N° : 2.1025

### Description & Applications

Basic coated electrode for welding copper tin bronzes ( Cu-Sn 6-8% ) and brasses ( Cu-Zn ) in some cases too. Also used for dissimilar joints. Selectarc Cu114 is recommended for repairing wrought bronzes ( Cu-Sn ), for surfacing on brasses, steels and cast iron. The deposit is resistant to salt water corrosion. This electrode is especially designed to weld with alternating current, but it can also be used either on DC + or -.

Application field : construction of equipment for the chemical industry and petrochemical industry, naval constructions and installations for sea water desalination, repair works.

Base materials	UNS	DIN	Material N°
	C50700	CuSn2	2.1010
	C51100	CuSn4	2.1016
	C51900	CuSn6	2.1020
	C52100	CuSn8	2.1030
		CuSn6Zn	2.1080
	C52400	G-CuSn10	2.1050

### Typical Weld Metal Composition ( % )

Sn	Mn	Fe	P	Cu
6.0	0.8	0.1	0.1	base

### All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
120	300	>20	100 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70-90	90-110	110-130

Rebaking : 2 h at 150°C. Joints to weld must be clean, exempt from grease, cracks .  
Guide electrodes with a slight declination (10-20°) inclined in direction of travel).  
Weld with a short arc. To improve degassing of the deposit, adopt a low welding speed.  
Heavy pieces ( sections above 6 mm ) have to be preheated to 150 – 300°C.



ind.05



1G/PA



2F/PB



2G/PC

~ 60V = + , -

***selectarc***

**Cu115**

**Copper Tin Electrode  
for DC**

  
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### Classification

AWS A5.6 : ECuSn-C                      DIN 1733 : EL-CuSn7  
UNS : W60521                              Material N° : 2.1025

### Description & Applications

Basic coated electrode for welding copper tin bronzes ( Cu-Sn 6-8% ) and brasses ( Cu-Zn ) in some cases too. Also used for dissimilar joints. Selectarc Cu115 is recommended for repairing wrought bronzes ( Cu-Sn ), for surfacing on brasses, steels and cast iron. The deposit is resistant to salt water corrosion.

Application field : construction of equipment for the chemical industry and petrochemical industry, naval constructions and installations for sea water desalination, repair works.

Base materials	UNS	DIN	Material N°
	C50700	CuSn2	2.1010
	C51100	CuSn4	2.1016
	C51900	CuSn6	2.1020
	C52100	CuSn8	2.1030
		CuSn6Zn	2.1080
	C52400	G-CuSn10	2.1050

### Typical Weld Metal Composition ( % )

Sn	Mn	Fe	P	Cu
7.0	0.9	0.15	0.1	base

### All Weld Metal Mechanical Properties

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )	Hardness
120	300	>20	110 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	70-90	90-110	110-130

Rebaking : 2 h at 150°C. Joints to weld must be clean, exempt from grease, cracks .  
Guide electrodes with a slight declination (10-20°) inclined in direction of travel).  
Weld with a short arc. To improve degassing of the deposit, adopt a low welding speed.  
Heavy pieces ( sections above 6 mm ) have to be preheated to 150 – 300°C.



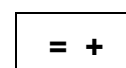
1G/PA



2F/PB



2G/PC



ind.05

***selectarc***

**Cu116**

**Basic coated Cu-Al  
Bronze Electrode**

  
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### Classification

AWS A5.6 : ECuAl-A2  
UNS : W60614

DIN 1733 : EL-CuAl9

### Description & Applications

Basic coated electrode for joining and surfacing on aluminium bronzes with up to 10%Al and for dissimilar joints between steels and CuAl-bronzes. Also recommended for overlays on cast iron, steels and copper alloys. Excellent weldability, stable arc, less spatters, easy to remove slag.

Application field : ship building, sea water applications, desalination plants, chemical industry, pump parts which are attacked by salt water ( propellers , bearings,...).

Base materials	UNS	Alloy	DIN	Material N°
	C60600		CuAl5	2.0916
	C61000		CuAl8	2.0920
	C68700	Yorcalbro	CuZn20Al2	2.0460

### Typical Weld Metal Composition ( % )

Al	Mn	Fe	Cu
8.0	1.0	0.7	base

### All Weld Metal Mechanical Properties

Rp0,2 ( MPa )	Rm ( MPa )	A5 ( % )	Hardness
180	420	>20	180 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	80-100	90-120	120-140

Rebaking : 2 h at 250°C. Joints to weld must be clean, exempt from grease, cracks .  
Guide electrodes with a slight declination (10-20°) inclined in direction of travel).  
Weld with a short arc. To improve degassing of the deposit, adopt a low welding speed.  
Heavy pieces ( sections above 6 mm ) have to be preheated to 150 – 250°C.



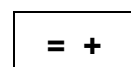
1G/PA



2F/PB



2G/PC



ind.05

***selectarc***

**Cu118**

**Complex Aluminium  
Bronze Electrode**

  
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### Classification

AWS A5.6 : ECuMnNiAl      DIN 1733 : EL-CuMn14Al  
UNS : W60633      Material N° : 2.1368

### Description & Applications

Basic coated manganese bronze electrode ( Cu Mn Al Ni Fe ) for welding and surfacing on aluminium bronzes and for dissimilar joints between steels and copper alloys. Also recommended for overlays on cast iron, steels and copper alloys. Excellent welding characteristics, stable arc, low spatters, very easy slag removal.

Application field : Naval constructions, sea water applications and chemical industry ( pumps, propellers ...). Its favourable coefficient of friction makes this electrode ideal to overlay sliding guides.

Base materials	UNS	DIN	Material N°
	C62300	CuAl10Fe3Mn2	2.0936
	C63000	CuAl10Ni5Fe4	2.0966
		G-CuAl10Fe	2.0940
		CuAl9Mn2	2.0960
		G-CuAl8Mn	2.0962

### Typical Weld Metal Composition ( % )

Mn	Al	Fe	Ni	Pb	Cu
12.0	6.0	2.2	2.2	0.02	base

### All Weld Metal Mechanical Properties

Rp0,2 ( MPa )	Rm ( MPa )	A5 ( % )	Hardness
400	640	>20	200 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	60-80	80-100	90-120

Rebaking : 2 h at 250°C. Joints to weld must be clean, exempt from grease, cracks.

Guide electrodes with a slight declination (10-20°) inclined in direction of travel.

Weld with a short arc. To improve degassing of the deposit, adopt a low welding speed.

Heavy pieces ( sections above 8 mm ) have to be preheated to 150 – 250°C.



1G/PA



2F/PB



2G/PC

= +



ind.05

**selectarc****CuNi30****Copper Nickel  
basic coated Electrode**


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**Classification**

AWS A5.6 : ECuNi  
UNS : W60715

DIN 1733 : EL-CuNi30Mn

**Description & Applications**

Basic coated copper nickel electrode for joining CuNi-alloys with up to 30%Ni and for surfacing the final layer on CuNi70/30 clad steel. The weld metal is resistant against seawater.

The electrode can be welded in all positions except vertical down, the slag is easy to remove and the weld beads are regular.

Principal applications are: In ship building, oil refineries, desalination plants.

Base materials	UNS	Alloy	DIN	Material N°
	C70600	CuNi90/10	CuNi10Fe1Mn	2.0872
	C71500	CuNi70/30	CuNi30Mn1Fe	2.0882

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Ni	Fe	Ti	Pb	Cu
<0.03	0.2	1.2	30	0.5	0.2	<0.02	base

**All Weld Metal Mechanical Properties**

R <sub>p0,2</sub> ( MPa )	R <sub>m</sub> ( MPa )	A <sub>5</sub> ( % )
>240	>380	>30

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350
Current	( A )	55-75	80-100	110-130

Rebaking : 2 h at 200-250°C. Joints to weld must be clean, exempt from grease, cracks.

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input by applying the stringer bead technique ( weaving max. 2 times core wire diameter ).

Interpass temperature <150°C.

When applied on steel, use selectarc Ni190 as intermediate layer.



1G/PA



2F/PB



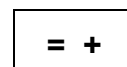
2G/PC



3G/PF



4G/PE



ind.05

***selectarc***

**HB25**

**Surfacing Electrode**

  
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### Classification

DIN 8555 : E1-UM-250  
EN 14700 : E Fe1

### Description & Applications

Rutile coated electrode for surfacing of equipment parts, constructions and tools, resistant to medium friction and compression. Good resistance to cavitation, highly resistant to shocks. Sound, crack free deposit, machinable with standard tools.

**General applications:** Surfacing of rails and switches, roller guides, slideways, build up before hardfacing.

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
0.25	0.5	1.0	1.0	base

### All Weld Metal Mechanical Properties

Hardness

~ 250 HB

Obtained in pour weld metal

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x450	4,0x450	5,0x450
Current	( A )	90	115	160	230

Preheating is not required on mild and medium carbon steels. Low alloyed, high carbon tool steels etc. have to be preheated to 200 – 400°C, depending on their composition and thickness. Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= - ~ 45V



ind.05

**selectarc**

**HB300B**

**Semi-hard machinable  
Surfacing Electrode**

  
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#### Classification

DIN 8555 : E1-UM-300-P  
EN 14700 : E ZFe1

#### Description & Applications

Basic coated electrode semi-hard , machinable and tough with approx. 120% recovery for surfacing on equipment parts and tools. Resisting to medium friction and compression - highly resistant to shocks - dense deposit and free of cracks.

Soft fusion - low spatters - self releasing slag - nice aspect of the beads.

Mainly used for heavy build up and as cushion layer on forging die cavities, mandrels, gear teeth, chains, sprockets, punches, blades, drawing dies.

#### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Mo	Fe
0.1	0.4	1.0	1.0	3.0	1.0	base

#### All Weld Metal Mechanical Properties

Hardness

~ 300 HB

Obtained in pour weld metal

#### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x450	5,0x450
Current	( A )	80-110	110-140	140-180

Redrying, if necessary, 2h/250°C. Preheating is not required on mild and medium carbon steels. Low alloyed, high carbon tool steels etc. have to be preheated to 200 – 400°C, depending on their composition and thickness. Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 70V



ind.05

***selectarc***

**HB40**

**Surfacing Electrode**

  
**FSH WELDING GROUP**  
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### Classification

DIN 8555 : E1-UM-400  
EN 14700 : E Fe1

### Description & Applications

Rutile coated electrode for surfacing of machine and construction parts, as well as of tools made of low-alloyed and cast steels which are mainly stressed by pressure and shock.  
Electrodes are easy to weld even on small welding equipment with low open arc voltage.  
Soft flow, almost no spatters, self releasing slag, nice aspect of the weld beads.  
Sound, crack free deposit, machinable with carbide cutting tools.

**General applications:** Surfacing of rollers, gear teeth, stamps, hammers, guide rails etc.

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
0.3	0.5	1.0	1.5	base

### All Weld Metal Mechanical Properties

Hardness  
~ 400 HB ; 39-42 HRC  
Obtained in pour weld metal

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x450	4,0x450
Current	( A )	90	115	160

Redrying, if necessary, 1h/150°C. Preheating is not required on mild and medium carbon steels. Low alloyed, high carbon tool steels etc. have to be preheated to 250–400°C, depending on their composition and thickness. Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= - ~ 45V



ind.05

***selectarc***

**HB60**

**Rutile Electrode  
for hardfacing**

  
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### Classification

DIN 8555 : E2-UM-60  
EN 14700 : E Fe2

### Description & Applications

Rutile-basic coated electrode for surfacing of machine and construction parts, as well as of tools made of low-alloyed and cast steels, resistant to medium abrasion, shock and pressure.

Air hardening deposit, good compromise between resistance to abrasion and resistance to shock.

Electrodes are easy to weld even on small welding equipment with low open arc voltage.

Soft flow, almost no spatters, self releasing slag, nice aspect of the weld beads.

Sound, crack free deposit, machinable by grinding.

**General applications:** Hardfacing of moulds, scrapers, buckets and bucket teeth, excavator parts, chisels, conveyer screws, track links, cutting tools, crusher cones.

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
1.0	0.5	1.3	4.5	base

### All Weld Metal Mechanical Properties

Hardness

~ 600 HB ; 55-60 HRC

Obtained in pour weld metal, 2-3 layers

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x450	4,0x450	5,0x450
Current	( A )	90	115	160	230

Redrying, if necessary, 1h/150°C. For substantial build up on highly alloyed steels, like tool steels, a cushion layer with selectarc 29/9 or 18/8Mn is recommended. Low alloyed, high carbon tool steels etc. have to be preheated to 250 – 400°C, depending on their composition and thickness.

Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= -

~ 45V



ind.05

***selectarc***

**HB40HT**

**Basic Coated Electrode  
for hot working tools**

  
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### Classification

DIN 8555 : E3-UM-40-PT  
EN 14700 : ~E Fe3

### Description & Applications

The weld deposit distinguishes itself by its toughness and heat resistance. Therefore the electrode is used for overlay and build up of machinery parts and tools subject to impact, compression and wear used at operating temperatures up to 550°C.

It is widely used for building up dies, rollers, hot shear blades, etc. ...

### Base materials High strength carbon steels and hot working steels

Material N°	DIN classification	Material N°	DIN classification
1.2311	40CrMnMo 7	1.2367	X38CrMoV 5 3
1.2343	X38CrMoV 5 1	1.2606	X37CrMoW 5 1
1.2344	X40CrMoV 5 1	1.2713	55NiCrMoV 6
1.2365	X32CrMoV 3 3	1.2714	56NiCrMoV 7

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Mo	Fe
0.15	0.5	0.7	6.5	3.5	base

### All Weld Metal Mechanical Properties

Hardness (as welded )

38-42 HRC

Obtained in pour weld metal

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x450
Current	( A )	60-90	80-110	100-140

Preheat the workpiece to 250-400°C depending on thickness and alloy. Hold the electrode vertically with a short arc. Keep temperature during welding and let the workpiece cool slowly. Subsequent machining is possible by grinding or with tungsten carbide tools.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +,- ~ 70V

***selectarc***

**HB48HT**

**Basic Coated Electrode  
for hot working tools**

  
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### Classification

DIN 8555 : E3-UM-50-T  
EN 14700 : E Fe3

### Description & Applications

The weld deposit distinguishes itself by its toughness and heat resistance. Therefore the electrode is used for overlay and build up of machinery parts and tools subject to impact, compression and wear used at operating temperatures up to 550°C.

It is widely used for building up hammers, dies, swages, hot shear blades, rollers, etc ...

**Base materials High strength carbon steels and hot working steels**

Material N°	DIN classification	Material N°	DIN classification
1.2311	40CrMnMo 7	1.2367	X38CrMoV 5 3
1.2343	X38CrMoV 5 1	1.2606	X37CrMoW 5 1
1.2344	X40CrMoV 5 1	1.2713	55NiCrMoV 6
1.2365	X32CrMoV 3 3	1.2714	56NiCrMoV 7

### Typical Weld Metal Composition (%)

C	Si	Mn	Cr	Mo	Fe
0.3	0.5	0.6	5.2	4.0	base

### All Weld Metal Mechanical Properties

Hardness (as welded)

45-50 HRC

Obtained in pour weld metal

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x450
Current	( A )	60-90	80-110	100-140

Preheat the workpiece to 250-400°C depending on the thickness and alloy. Hold the electrode vertically with a short arc. Keep temperature during welding and let the workpiece cool slowly.

Subsequent machining is possible by grinding or with tungsten carbide tools.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +,- ~ 70V



ind.05

# ***selectarc*** **HB56HT**

**Basic coated Electrode  
for hot working tools**



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## Classification

DIN 8555 : E3-UM-55-ST  
EN 14700 : E Fe3

## Description & Applications

The weld deposit distinguishes itself by its high hardness, toughness and heat resistance. Therefore the electrode is used for overlay and build up of machinery parts and tools subject to impact, compression and wear used at operating temperatures up to 550°C .

It is widely used for building up hammers, dies, swages, hot shear blades, rollers, extrusion press pistons, valves, etc ...

**Base materials High strength carbon steels and hot working steels**

Material N°	DIN classification	Material N°	DIN classification
1.2311	40CrMnMo 7	1.2367	X38CrMoV 5 3
1.2343	X38CrMoV 5 1	1.2606	X37CrMoW 5 1
1.2344	X40CrMoV 5 1	1.2713	55NiCrMoV 6
1.2365	X32CrMoV 3 3	1.2714	56NiCrMoV 7

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Mo	Fe
0.4	0.5	1.2	7.0	2.5	base

## All Weld Metal Mechanical Properties

Hardness (as welded )  
Approx. 53-58 HRC

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x450
Current	( A )	60-90	80-110	100-140

Preheat the workpiece to 250-400°C depending on thickness and alloy. Hold the electrode vertically with a short arc. Keep temperature during welding and let the workpiece cool slowly. Subsequent machining is possible by grinding or with tungsten carbide tools.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +,-

~ 70V



ind.05

# *selectarc* HB450HT

**Hardfacing Electrode  
for metal wear**



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## Classification

DIN 8555 : E3-UM-45-T  
EN 14700 : ~E Fe3                      Werkstoff Nr : 1.2567

## Description & Applications

Rutile coated electrode with a martensitic steel deposit containing fine carbides of W, Cr and V. The principal property of the deposit is its resistance to metal/ metal wear up to 550°C. The deposit is only machinable after soft annealing at 750 – 800°C / 4 hours, followed by slow cooling in an oven. In order to obtain a hardness of 50HRC the deposit can be tempered after machining ( 1100°C/ oil or compressed air ).

Can be used for reclaiming, a final pass using HB600HT is often recommended.

Soft fusion, no spatters, self releasing slag.

Special applications: Hardfacing of trimming and blanking dies, of shear blades, of cold and hot working dies of punches, hot shearing knives, forging dies,...

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	V	W	Fe
0.15	0.6	0.5	3.0	0.8	4.2	base

## All Weld Metal Mechanical Properties

Hardness (as welded )	Soft annealed, 750-800°C	Hardened 1100°C/oil
40-45 HRC	20-25 HRC	50 HRC
Obtained in pour weld metal		

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	90	115	160

Redrying, if necessary, 1h/250°C.

Low alloyed, high carbon tool steels etc. have to be preheated to 250 – 450°C, depending on their composition and thickness. Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +      ~ 50V



ind.05

# ***selectarc*** **HB600HT**

**Hardfacing Electrode  
for metal/metal wear**



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## Classification

DIN 8555 : E3-UM-60-ST  
EN 14700 : ~E Fe3

## Description & Applications

Rutile coated electrode with a Cr-Mo-C martensitic steel deposit, resistant to metal/ metal wear up to 550°C. For all pieces subject to hot or cold metal abrasion, even in the presence of shocks and pressure. As welded only machinable by grinding.

Soft fusion, no spatters, self releasing slag

Special applications: Hardfacing of shear blades, moulds, pressing and forging dies.

## Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Mo	Fe
0.5	0.7	0.5	6.0	5.0	base

## All Weld Metal Mechanical Properties

Hardness

58–61 HRC

Obtained in pour weld metal

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	80	110	150

Redrying, if necessary, 1h/250°C.

Low alloyed, high carbon tool steels etc. have to be preheated to 250 – 450°C, depending on their composition and thickness. Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= +

~ 45V



ind.05

***selectarc*****HB50Co****Hardfacing Electrode  
High Temperatures****FSH WELDING GROUP**

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**Classification**DIN 8555 : E3-UM-50-CRTZ  
EN 14700 : ~E Fe3**Description & Applications**

The weld deposit resists against metal to metal wear, corrosion and high temperatures. Therefore the electrode is used for overlay and build up of machinery parts and tools subject to impact, compression and wear, used at operating temperatures up to 650° C. The deposit is resistant to thermal shock and can be machined with tungsten carbide tipped tools.

Rutile-basic coated electrode with a stable arc, regular drop transfer and a smooth deposit.

General applications: For building up dies, for hot working tools, for moulds, continuous driving rolls, mandrels, forming tools etc. ...

**Base materials High strength carbon steels, tool steels and hot working steels**

Material N°	DIN classification	Material N°	DIN classification
1.2311	40CrMnMo 7	1.2367	X38CrMoV 5 3
1.2343	X38CrMoV 5 1	1.2606	X37CrMoW 5 1
1.2344	X40CrMoV 5 1	1.2713	55NiCrMoV 6
1.2365	X32CrMoV 3 3	1.2714	56NiCrMoV 7

**Typical Weld Metal Composition ( % )**

C	Si	Mn	Cr	Co	Mo	Fe
0.15	0.6	0.6	14.0	13.0	2.3	base

**All Weld Metal Mechanical Properties**

Hardness (as welded)	After work hardening
45-50 HRC	Up to 55 HRC

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x450
Current	( A )	60-90	90-120	110-150

Re-dry, if necessary, 2h/300°C. Clean weld zone properly. Preheat massive work pieces to 150-400°C, depending on the composition. Hold the electrode vertically with a short arc. Keep temperature during welding and let the work piece cool slowly.



1G/PA



2F/PB



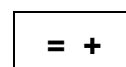
2G/PC



3G/PF



4G/PE



ind.05

# *selectarc* HB Mar50

**Basic Coated Electrode  
Age-hardenable**



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## Classification

DIN 8555 : E3-UM-350-T  
EN 14700 : E Fe5

## Description & Applications

The weld deposit resists to metal/metal wear at higher temperatures and can be age-hardened. Therefore the electrode is used for overlay and build up of machinery parts and tools subject to impact, compression and wear used at operating temperatures up to 500°C. The deposit can be machined with standard tools after welding and then age hardened by a subsequent heat treatment.

Basic coated electrode with a stable arc, regular drop transfer and a smooth deposit.

General applications: For building up dies for extrusion of Al-castings and plastic, for hot working tools , for moulds, etc. ...

**Base materials High strength carbon steels, tool steels and hot working steels**

Material N°	DIN classification	Material N°	DIN classification
1.2311	40CrMnMo 7	1.2367	X38CrMoV 5 3
1.2343	X38CrMoV 5 1	1.2606	X37CrMoW 5 1
1.2344	X40CrMoV 5 1	1.2713	55NiCrMoV 6
1.2365	X32CrMoV 3 3	1.2714	56NiCrMoV 7

## Typical Weld Metal Composition ( % )

C	Si	Mn	Ni	Co	Mo	Fe
0.03	0.3	0.7	20.0	10.0	4.0	base

## All Weld Metal Mechanical Properties

Hardness(as welded)	After age hardening	
Approx. 33-37 HRC	3-4h at 480°C	50-54 HRC

## Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	60-90	90-120	110-140

Clean weld zone properly. Preheat massive work pieces to 100-150°C . Hold the electrode vertically with a short arc. Keep temperature during welding and let the workpiece cool slowly.

Subsequent machining is possible with standard tools before applying the age hardening heat treatment.



1G/PA



2F/PB



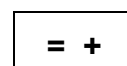
2G/PC



3G/PF



4G/PE



***selectarc***

**HBC62**

**Hardfacing Electrode  
for cutting tools**

  
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### Classification

DIN 8555 : E4-UM-60-ST      AWS A5.13 : ~EFe5-B  
EN 14700 : E Fe4

### Description & Applications

Rutile-basic coated electrode destined to surface all kinds of cutting tools such as lathe and plane tools. The sharpness obtained has an exceptional quality. C-Cr-Mo-W martensitic deposit, resistant up to 500°C. This electrode is also used for surfacing of pieces subject to metal/metal wear. Withstands moderate shock. In the as welded condition only machinable by grinding. For machining by tools, carry out a soft annealing heat treatment at 850°C during 2 hours followed by slow cooling ( approx. 3°C/min . ) in an oven. In order to re-obtain the hardness, temper the deposit: 1200°C/ 1h , cooling in oil or with compressed air and annealing 2x500°C .

Special applications: Hardfacing of machining tools, cutting tools made of steel, punches, drills, shear blades.

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Mo	V	W	Fe
0.8	0.5	0.5	5.0	10.0	1.5	1.5	base

### All Weld Metal Mechanical Properties

Hardness

60-63 HRC

Obtained in pour weld metal, untreated

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	80	110	150

Redrying, if necessary, 1h/250°C.

Low alloyed, high carbon tool steels etc. have to be preheated to 250 – 450°C, depending on their composition and thickness. Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 50V



ind.05

***selectarc***

**HB61B**

**Hardfacing Electrode resistant to  
Impact, compression and abrasion**

  
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### Classification

DIN 8555 : E6-UM-60-S  
EN 14700 : E Fe6

### Description & Applications

Basic coated general purpose hardfacing electrode for applications subject to impact, compression and abrasive wear.

For hardfacing on components made of C-steel, cast steel and Manganese steel. The deposit is tough-hard and crack resistant. Recovery of the electrode approx. 120%.

Special applications: Hardfacing of block presses, crusher jaws, wheel rims, rollers, caterpillar tracks, ploughshares, running surfaces, cutting edges etc.

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
0.5	2.0	0.6	9.5	base

### All Weld Metal Mechanical Properties

Hardness

~ 58 HRC

Obtained in pour weld metal

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	60-90	90-120	110-160	170-210

Redrying, if necessary, 2h/300°C. Guide electrode almost vertically with a short arc. On materials sensitive to cracks a buffer-layer with selectarc 18/8Mn is recommended. Low alloyed, high carbon tool steels etc. have to be preheated to 200 – 400°C, depending on their composition and thickness. Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC



3G/PF



4G/PE

= + ~ 70V



ind.05

***selectarc***

**HB61R**

**Hardfacing Electrode resistant to  
Impact, compression and abrasion**

  
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#### Classification

DIN 8555 : E6-UM-60-S  
EN 14700 : E Fe8

#### Description & Applications

Rutile-basic coated general purpose hardfacing electrode for applications subject to impact, compression and abrasive wear.

For hardfacing on components made of C-steel, cast steel and Manganese steel. The deposit is tough-hard and crack resistant. Recovery of the electrode approx. 120%.

Special applications: Hardfacing of block presses, crusher jaws, wheel rims, rollers, caterpillar tracks, ploughshares, running surfaces, cutting edges etc.

#### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	V	Mo	Fe
0.4	1.0	1.0	9.0	1.0	1.0	base

#### All Weld Metal Mechanical Properties

Hardness

~ 60 HRC

Obtained in pour weld metal

#### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450
Current	( A )	60-90	90-120	110-160

Redrying, if necessary, 2h/300°C. Guide electrode almost vertically with a short arc. On materials sensitive to cracks a buffer-layer with selectarc 18/8Mn is recommended.

Low alloyed, high carbon tool steels etc. have to be preheated to 200 – 400°C, depending on their composition and thickness.

Slow cooling in still air after surfacing.



1G/PA



2F/PB



2G/PC

= + ~ 50V



ind.05

**selectarc**

**HMn**

**Electrode highly  
Resistant to Impact**

  
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### Classification

DIN 8555 : E7-UM-250-KP  
EN 14700 : E Fe9

AWS A5.13 : EFeMn-C

### Description & Applications

Rutile-basic heavy coated electrode (efficiency ~ 120% ) , destined to surface all pieces subject to high impact. Sometimes used, instead of selectarc 18/8Mn, for 13% Mn-steel assembling ( Hadfield steels ). Frequently used as cushion layer before hardfacing in case of heavy reclaiming. Allows to build up and then to apply abrasion resistant final layers, 1 or 2, using HBA or HB63. The deposit is austenitic and is exceptionally resistant to impact and wear combined with impact. The addition of Ni and Cr increases the resistance against cracks and abrasion.

Special applications: Repairing of used pieces or preventive protection of new pieces used in railway applications ( rails, switches, crossings, tongues) in quarries and mines ( crusher jaws, excavator and grab teeth, mill hammers, rock crusher ).

**Base materials** Austenitic steels with high Mn:  
DIN 17145 and 17155 : X110Mn14  
AFNOR : Z120M12

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Fe
0.9	0.6	13.0	3	3.5	base

### All Weld Metal Mechanical Properties

Hardness as welded	Hardness after work hardening
200-250 HB	400-500 HB
Obtained in pour weld metal	

### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x450	4,0x450	5,0x450
Current	( A )	120	150	200

Redrying, if necessary, 1h/300°C. Weld with a minimum heat input ( low current, short beads ) in order to respect an interpass temperature of 250°C maximum. Do not preheat the piece to weld! When surfacing other steels than 13%Mn types, apply a cushion layer with selectarc 18/8Mn.



1G/PA

= + ~ 65V



ind.07

***selectarc***

**HBMnCr**

**Electrode highly  
Resistant to Cavitation**

  
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### Classification

DIN 8555 : E7-UM-250-KPR  
EN 14700 : E Fe9

AWS A5.13 : E FeMnCr

### Description & Applications

Synthetic basic coated electrode with high efficiency (140%), intended to surface all pieces subject to high impact and cavitation combined with corrosion. Also used for dissimilar joints between Mn- and construction steels and as cushion layer before hardfacing in case of heavy reclaiming. The deposit is austenitic and is exceptionally resistant to impact and wear combined with impact. The high amount of Cr increases the resistance against corrosion, abrasion and cavitation.

Special applications: Repairing of used pieces or preventive protection of new pieces used in railway applications ( rails, switches, crossings, tongues) in quarries and mines ( crusher jaws, excavator and grab teeth, mill hammers, rock crusher ) for hydro power stations and other industries ( pistons of hydraulic presses, turbines).

**Base materials** Austenitic steels with high Mn:  
DIN 17145 and 17155 : X110Mn14  
AFNOR : Z120M12

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
0.6	0.3	16.0	14.0	base

### All Weld Metal Mechanical Properties

Hardness as welded	Hardness after work hardening
~ 260 HB	400-500 HB
Obtained in pour weld metal	

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	90	130	160	220

Redrying, if necessary, 1h/300°C. Weld with a minimum heat input ( low current, short beads ) in order to respect an interpass temperature of 250°C maximum. Do not preheat the piece to weld!



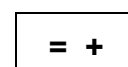
1G/PA



2F/PB



2G/PC



***selectarc***

**HB14Mn**

**Electrode highly  
Resistant to Impact**

  
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### Classification

DIN 8555 : E7-UM-250-KP  
EN 14700 : E Fe9

AWS A5.13 : ~EFeMn-C

### Description & Applications

Rutile-basic coated electrode, suitable to surface all pieces subject to high impact. Sometimes used, instead of selectarc 18/8Mn, for 13% Mn-steel assembling ( Hadfield steels ). Frequently used as cushion layer before hardfacing in case of heavy reclaiming. Allows to build up and then to apply abrasion resistant final layers, 1 or 2, using HBA or HB63. The deposit is austenitic and is exceptionally resistant to impact and wear combined with impact. The addition of Ni and Cr increases the resistance against cracks and abrasion.

Special applications: Repairing of used pieces or preventive protection of new pieces used in railway applications ( rails, switches, crossings, tongues) in quarries and mines ( crusher jaws, excavator and grab teeth, mill hammers, rock crusher ).

**Base materials** Austenitic steels with high Mn:  
DIN 17145 and 17155 : X110Mn14  
AFNOR : Z120M12

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	Fe
0.8	0.3	13.0	2.0	2.0	base

### All Weld Metal Mechanical Properties

Hardness as welded	Hardness after work hardening
200-250 HB	400-500 HB
Obtained in pour weld metal	

### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x450	4,0x450	5,0x450
Current	( A )	120	160	200

Redrying, if necessary, 1h/300°C. Weld with a minimum heat input ( low current, short beads ) in order to respect an interpass temperature of 250°C maximum. Do not preheat the piece to weld! When surfacing other steels than 13%Mn types, apply a cushion layer with selectarc 18/8Mn.



1G/PA



2F/PB



2G/PC

= +,- ~ 65V

***selectarc***

## HB Cavit

**Electrode highly  
Resistant to Cavitation**

  
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### Classification

DIN 8555 : E7-UM-250-KPR  
EN 14700 : ~E Fe10

### Description & Applications

Synthetic basic coated electrode with high efficiency (160%), destined to surface all pieces subject to high impact, erosion and cavitation. Also used as cushion layer before hardfacing in case of heavy reclaiming. The deposit is austenitic and is exceptionally resistant to impact and wear. The high amount of Cr highly increases the resistance to corrosion.

Repairing of used pieces or protection of new pieces in hydro power stations, pistons of hydraulic presses, different types of turbines, valves, ...)

**Base materials** Austenitic steels with high Mn , martensitic stainless steels:  
DIN 17145 and 17155 : X110Mn14  
X4CrNi 13 4 1.4313 ; G-X5CrNiMo 13 4 1.4407

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Co	N	Fe
0.2	1.2	9.5	18.0	9.5	0.2	base

### All Weld Metal Mechanical Properties

Hardness as welded	Hardness after work hardening
200-250 HB	400-500 HB
Obtained in pour weld metal	

### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x450
Current	( A )	110-130	130-160

Re-drying of the electrodes : 1h/300°C, if necessary.

Guide electrodes with a slight declination, weld with a short arc and prevent a high heat input in order to respect an interpass temperature of 260°C maximum. Do not preheat the piece to weld up to more than 100°C. Heat treatment depends on the base metal.



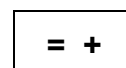
1G/PA



2F/PB



2G/PC



**selectarc**

**HB63**

**High efficiency Electrode  
for hardfacing**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

DIN 8555 : E10-UM-60-GRPZ  
EN 14700 : E Fe14

#### Description & Applications

Synthetic rutile coated hardfacing electrode with high recovery ( 160% ). For applications subject to abrasive wear by minerals, combined with medium impact and compression.

Austenitic matrix containing Cr carbides.

The deposit resists to corrosion due to the high chromium content as well as heat up to 200°C.

Easy flow, smooth bead surface, self releasing slag.

Surfacing in 1 - 2 or eventual 3 layers for all pieces subject to high abrasion combined with a good resistance to shocks. Only machinable by grinding.

**Special applications:** For excavating and crashing equipment, surfacing of endless screws, mixer blades, pump bodies for abrasive materials, excavator teeth, crashing installations for minerals, concrete pumps, ores crushing, ploughshares, lumps break, screw presses for bricks

#### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
3.3	1.0	0.5	29	base

#### All Weld Metal Mechanical Properties

Hardness 1 <sup>st</sup> layer	Hardness all weld metal
~ 58 HRC	~ 60 HRC

#### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	90	130	160	210

Redrying, if necessary, 1h/250°C. Guide electrode almost vertically with a short arc.

In case of hardfacing high alloyed steels like stainless steels, it is recommended to apply a cushion layer with selectarc 29/9 or 18/8Mn.



1G/PA

= + ~ 50V



ind.07

***selectarc***

**HBA**

**Hardfacing Electrode  
High Cr-carbides**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

DIN 8555 : E10-UM-60-GRZ  
EN 14700 : E Fe15

#### Description & Applications

Basic coated, slag free, hardfacing electrode with high recovery ( 190% ). Highly resistant to abrasion due to its high content of Cr and C. The service life of surfaced pieces is up to 50 times longer than for conventional electrodes of similar hardness.

Austenitic matrix containing Cr carbides. Deposit 1 or 2 layers maximum. Resists to heavy mineral abrasion and moderate impact. Only machinable by grinding.

Regular drop transfer, no slag, smooth beads. The formation of cracks in the weld deposit is normal for this type of composition.

For all pieces subject to low or moderate impact where an important resistance to abrasion is searched. Special applications: For endless screws, mixer paddles, pump bodies for abrasive materials, excavator teeth, crushing of mineral materials, concrete pumps, screws for brick presses, wear plates.

#### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
5.0	1.0	0.5	35	base

#### All Weld Metal Mechanical Properties

Hardness

60-63 HRC

Hardness in the 2<sup>nd</sup> layer

#### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x350	5,0x450
Current	( A )	140	200	250

Re-drying, if necessary, 1h/250°C. Guide electrode almost vertically with a short arc.

In case of hardfacing high alloyed steels like tool steels, it is recommended to apply a cushion layer with selectarc 29/9 or 18/8Mn and to preheat the pieces to surface at 200 – 400°C-depending on the material and thickness, followed by slow cooling.



1G/PA

= + ~50V



ind.05

***selectarc***

**HB64S**

**Coated Electrode for  
Surfacing in sugar mills**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

DIN 8555 : E10-UM-60-GR  
EN 14700 : E Fe14

#### Description & Applications

Electrodes with a high alloy content of elements which form carbides. Therefore especially used for hard facing of parts subject to high abrasion, friction and corrosion.

The electrode is easy to weld, has a smooth drop transfer and only a negligible slag content, easy re-striking even on wet pieces. Recovery approx. 200%.

Applications : Especially designed for claddings in sugar mills , roughing or arcing of mill rollers for better gripping etc.

#### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Fe
4.0	2.0	2.0	25	base

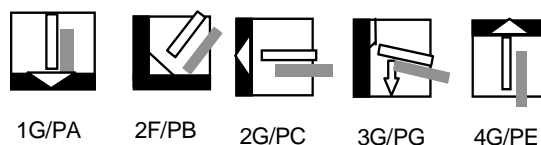
#### All Weld Metal Mechanical Properties

Hardness  
~ 61 HRC

#### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x450	5,0x450
Current	( A )	120-150	170-210	220-260

Hold a short arc and the electrode almost vertical. Select lowest amperage possible to keep dilution low and weave only slightly.



= +    ~50V



ind.05

***selectarc***

**HB65**

**Coated Electrode for  
Protection against high abrasion**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

DIN 8555 : E10-UM-65-GR  
EN 14700 : E Fe15

#### Description & Applications

Electrodes with a high alloy content of elements which form carbides. Therefore especially used for hardfacing of parts subject to high abrasion, friction, heat and corrosion.

The electrode is easy to weld, has a smooth drop transfer and only a negligible slag content. Recovery approx. 190%.

Applications : ash plows, coke crusher segments, screw conveyers, valves, exhaust fans, agitator fingers, mill guides, mixer paddles, rake teeth in furnaces, tong bits, slag ladles, elevator bucket-tips etc at operation temperatures up to 450°C.

#### Typical Weld Metal Composition ( % )

C	Si	Cr	Nb	Fe
5.0	1.5	24	7.0	base

#### All Weld Metal Mechanical Properties

Hardness  
~ 64HRC

#### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x450	5,0x450
Current	( A )	90 - 110	130-150	140-190	190-250

Hold a short arc and the electrode almost vertical. Select lowest amperage possible to keep dilution low and weave only slightly.



1G/PA

= + ~ 50V



ind.07

***selectarc***

**HB66**

**Coated Electrode for  
Protection against high abrasion**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

DIN 8555 : E10-UM-65-GRZ  
EN 14700 : E Fe16

#### Description & Applications

Electrodes with a high alloy content of elements which form carbides. Therefore especially used for hardfacing of parts subject to high abrasion, friction, heat and corrosion.

The electrode is easy to weld, has a smooth drop transfer and only a negligible slag content. Recovery approx. 200%.

Applications : ash plows, coke crusher segments, screw conveyers, valves, exhaust fans, agitator fingers, mill guides, mixer paddles, rake teeth in furnaces, tong bits, slag ladles, elevator bucket-tips etc.  
Operation temperatures up to 550°C.

#### Typical Weld Metal Composition ( % )

C	Si	Cr	Mo	Nb	W	V	Fe
5.0	1.5	22	7.0	7.0	2.0	1.0	base

#### All Weld Metal Mechanical Properties

Hardness  
~ 65 HRC

#### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x450	5,0x450
Current	( A )	110-140	140-190	190-250

Hold a short arc and the electrode almost vertical. Select lowest amperage possible to keep dilution low and weave only slightly.



1G/PA

= + ~ 50V



ind.05

***selectarc***

**HB68**

**Coated Electrode for  
Hardfacing against high abrasion**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

DIN 8555 : E10-UM-65-GR  
EN 14700 : E Fe15

#### Description & Applications

Heavy coated electrode with a high alloy content of elements which form carbides. Therefore especially used for hardfacing of parts subject to high abrasion, moderate impact and temperature. The electrode is easy to weld, has a smooth drop transfer, only a negligible slag content and easy re-striking . Recovery approx. 240%.  
Applications : For use in steel mills, on crushers, conveyor screws , dredger parts, sieves.

#### Typical Weld Metal Composition ( % )

C	Cr	Others	Fe
5.0	36	4	base

#### All Weld Metal Mechanical Properties

Hardness	Hot Hardness
~ 64 HRC on the 1 <sup>st</sup> layer	400°C ~57 HRC 600°C ~ 55HRC

#### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x350
Current	( A )	130-150	160-190

Hold a short arc and the electrode almost vertical. Select lowest amperage possible to keep dilution low and weave only slightly.



1G/PA

= + ~ 50V



ind.05

**selectarc**

**Co1**

**“Grade 1” type cobalt base  
hardfacing Electrode**

  
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### Classification

AWS A5.13 : ECoCr-C                      DIN 8555 : E20-UM-55-CTZ  
EN 14700 : E Co3

### Description & Applications

Hardfacing electrode with a rutile-basic coating. Cobalt based deposit of « stellite grade 1 » type (Co-Cr-W). Hardest Selectarc Co-type (superior to all other types of stellite). Very good resistance to metal-metal wear and to corrosion up to 800°C. Coefficient of friction very low. Highly resistant to erosion and cavitation.

Hardfacing of rollers, rails, bearing and shafts of pumps, extrusion nozzles, hot cutting tools, conveyor screws.

\* Note : "Stellite" is a trade mark of Deloro Stellite (Haynes International)

### Typical Weld Metal Composition ( % )

C	Si	Cr	W	Fe	Co
2.1	1.0	30.0	12.5	3.0	base

### All Weld Metal Mechanical Properties

Hardness (as welded) +20°C	Hardness (as welded) +600°C
53-57 HRC	42-45 HRC

### Welding Current & Instructions

Electrode	ØxL ( mm )	3.2x350	4,0x350	5,0x450
Current	( A )	100	140	180

Redrying of the electrodes :250°C/1h if necessary. Preheat massive pieces 250-400°C. Use a low welding current in order to limit the dilution with the base metal and to achieve the hardness of this alloy. Cool down slowly in order to limit the risks of cracks in the deposit. Weld eventual cushion layers with Selectarc 307 R or 29/9.



**= +    ~ 70V**



Ind.05

**selectarc**

**Co6**

**“Grade 6” type cobalt base  
hardfacing Electrode**

  
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### Classification

AWS A5.13 : ECoCr-A                      DIN 8555 : E20-UM-45-CRTZ  
EN 14700 : E Co2

### Description & Applications

Hardfacing electrode with a rutile-basic coating. Cobalt base deposit of « stellite grade 6 » type (Co-Cr-W). The deposit is highly resistant to metal-metal wear and to corrosion up to 800°C. High resistance to thermal and mechanical shocks. Good aptitude to polishing and to machining. Soft arc, easy to remove slag, regular and smooth weld profile.

Hardfacing of valves, valve seats and sealing surfaces, hot shear blades, hot pressing tools, beaters for coke pulverisers.

\* Note : "Stellite" is a trade mark of Deloro Stellite (Haynes International).

### Typical Weld Metal Composition ( % )

C	Si	Cr	W	Fe	Co
1.1	1.0	28.0	4.5	3.0	base

### All Weld Metal Mechanical Properties

Hardness (as welded) +20°C	Hardness (as welded) +600°C
40-45 HRC	~30 HRC

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x300	3,2x350	4,0x350	5,0x450
Current	( A )	75	100	140	180

Redrying of the electrodes : 250°C/1h if necessary; Preheat massive pieces 250-400°C. Keep the dilution with the parent metal low and cool down slowly to reduce the risk of cracking while cooling. Weld eventual cushion layer with Selectarc 18/8 Mn.



1G/PA



2F/PB



2G/PC

= + ~ 70V



ind.05

**selectarc**

**Co12**

**“Grade 12” type cobalt base  
Hardfacing Electrode**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

AWS A5.13 : ECoCr-B                      DIN 8555 : E20-UM-50-CTZ  
EN 14700 : E Co2

#### Description & Applications

Hardfacing electrode with a rutile-basic coating. Cobalt base deposit of « stellite grade 12 » type (Co-Cr-W). The deposit with a high hardness is characterised by a very good resistance to metal and mineral abrasion combined with corrosion and high temperature up to 800°C, in the presence of moderate shocks. Highly resistant to erosion and cavitation. Highly recommended when an important hardness is searched and for a deposit stressed by temperature, corrosion, abrasion and impact. Excellent welding characteristics.

Hardfacing of tools for processing plastics, for wood and paper (carton and paper cutting) characteristics, pressing tools, hot cut tools , hot shear blades, extrusion screws, ...

\* Note : "Stellite" is a trade mark of Deloro Stellite (Haynes International).

#### Typical Weld Metal Composition ( % )

C	Si	Cr	W	Fe	Co
1.6	1.0	29.0	8.5	3.0	base

#### All Weld Metal Mechanical Properties

Hardness (as welded) +20°C	Hardness (as welded) +600°C
~ 50 HRC	38-40 HRC

#### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x350	5,0x450
Current	( A )	100	140	180

Redrying of the electrodes: 250°C/1h if necessary. Preheat massive pieces 250-400°C. Use a low current in order to limit the dilution with the base metal and to conserve the hardness of this alloy. Cool down slowly in order to limit the risk of cracks in the deposit.

Weld eventual cushion layers with Selectarc 307 R.



1G/PA



2F/PB



2G/PC

= + ~ 70V



ind.05

***selectarc***

**Co21S**

**Cobalt base Hardfacing  
Electrode "Grade 21" type**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

AWS A5.13 : ECoCr-E                      DIN 8555 : E20-UM-350-CKTZ  
EN 14700 : E Co1

### Description & Applications

Hardfacing electrode with a rutile-basic coating. Cobalt base deposit of « stellite grade 21 » type (Co-Cr-Mo-Ni). Deposit characterised by a good metal-metal wear and oxidation resistance up to 1000°C, even in presence of sulphurous atmosphere. Good behaviour to important thermal and mechanical shocks, excellent resistance to cracks, highly resistant to cavitation and erosion, deposit non-magnetic.

Surfacing of motor valves, gas turbine blades, extrusion nozzles, forging dies, forging tools, mixers, valves for gas/water/vapour/acids.

\* Note : "Stellite" is a trade mark of Deloro Stellite (Haynes International).

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Mo	Ni	Fe	Co
0.3	0.8	0.5	28.0	5.0	2.5	2.0	base

### All Weld Metal Mechanical Properties

Hardness (as welded) +20°C	Hardness (as welded) +600°C
32-38 HRC	250-300 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	75	100	140

Redrying of the electrodes: 250°C/1h if necessary. Preheat massive pieces 250-400°C. Keep this temperature during welding, cool down slowly to reduce the risk of cracks while cooling. Weld eventual cushion layers with Selectarc B 90.



1G/PA



2F/PB



2G/PC

= + ~ 70V



**selectarc**

**Co25**

**Cobalt base Hardfacing  
Electrode "Grade25" type**

  
**FSH WELDING GROUP**  
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[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

DIN 8555 : E20-UM-250-CKTZ  
EN 14700 : E Co1

#### Description & Applications

Surfacing electrode with a rutile-basic coating. Cobalt base deposit of « grade 25 » type (Co-Cr-W-Ni). Deposit characterised by a good resistance to metal-metal wear and oxidation resistant up to 1000°C. Good behaviour to important thermal and mechanical shocks. Excellent resistance to cracks, highly resistant to cavitation and erosion, deposit non-magnetic.

Surfacing of motor valves, gas turbine blades, extrusion nozzles, forging dies, forging tools.

#### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Ni	W	Fe	Co
0.1	0.8	1.0	20.0	10.0	15.0	2.0	base

#### All Weld Metal Mechanical Properties

Hardness (as welded) +20°C	Hardness at +600°C
~ 230 HB	~300 HB

#### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x350
Current	( A )	100	140

Redrying of the electrodes: 250°C/1h if necessary. Preheat massive pieces 250-400°C. Keep this temperature during welding, cool down slowly after welding to reduce the risk of cracking while cooling.

= + ~ 70V



1G/PA



2F/PB



2G/PC



ind.05

**selectarc**

**B92**

**Alloy C type Electrode  
for surfacing**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

#### Classification

AWS A5.11 : ENiCrMo-5  
EN 14700 : E Ni2

DIN 8555 : E23-UM-250-CKTZ

#### Description & Applications

Special surfacing electrode with 170% recovery and a deposit composition of alloy C (Ni-Cr-Mo) Rutile-basic coating with outstanding welding characteristics. Deposit resists to corrosion in presence of chloride acid (up to 160°C) and in general to all type of oxidation. Deposit work-hardens under impact and is machinable. B 92 is destined in general to surface all pieces subject to mechanical stress combined with corrosion and/or high temperatures (from 400 - 750°C). Also used for pieces subject to high thermal shocks.

Principal applications :Surfacing of hot working tools as hot shear blades, deburring tools, swages, dies, press tools as well as pump parts, installations for chlorisation, valves and reservoirs.

#### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Mo	W	Fe	Ni
<0.10	0.5	0.8	16.0	16.0	4.0	5.5	base

#### All Weld Metal Mechanical Properties

Hardness (as welded)	Hardness (work-hardened)
~ 250 HB	350-400 HB

#### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	75	110	135

Pieces to surface must be clean. When there is a build up of important thickness, carry out a cushion layer with Selectarc B90 electrodes.



1G/PA



2F/PB

= + ~ 70V



ind.05

***selectarc***

**B92Co**

**Hardfacing Electrode  
Thermal shock resistant**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

AWS A5.11 : ~ENiCrMo-5      DIN 8555 : E23-UM-250-CKTZ  
EN 14700 : E Ni2

### Description & Applications

Special hardfacing electrode with 170% recovery and a deposit composition of alloy C (Ni-Cr-Mo) + Co. Rutile-basic coating with outstanding welding characteristics. Deposit resists against corrosion, scaling, oxidation and thermal shocks. It is machinable. Selectarc B92Co is used to surface parts subject to compression, corrosion, high temperatures (400-800°C) as well as thermal shocks. This electrode has a higher hot strength and is more resistant against thermal shocks and metallic abrasion compared to Selectarc B 92. Special applications: Surfacing of hot working tools, as hot shear blades, deburring tools, swages, forging saddles, forging and hot trimming dies, press tools as well as pump parts.

### Typical Weld Metal Composition (%)

C	Si	Mn	Cr	Mo	W	Co	Fe	Ni
<0.10	0.5	0.8	16.0	16.0	3.7	3.5	3.0	base

### All Weld Metal Mechanical Properties

Hardness (as welded)	Hardness (work-hardened)
~ 250 HB	350-400 HB

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	75	110	135

For heavier overlays use only for the last two cover passes. For intermediate layers use Selectarc B90 electrodes. Keep amperage low, preheat heavy workpieces to 300-500°C. Guide electrodes steep, keep arc short, prevent excessive weaving. Workpiece should be kept at temperature during surfacing and then cooled down slowly.



1G/PA



2F/PB

= + ~ 70V



ind.05

***selectarc***  
**HB95CoB**

**Hardfacing Electrode  
for hot forging**



**Classification**

DIN 8555 : E23-UM-200-CKPTZ  
EN 14700 : E Ni2

**Description & Applications**

Special basic coated hardfacing electrode with 150% recovery and a deposit composition of alloy UD520.

Deposit resists corrosion, scaling, oxidation and thermal shocks. It offers a high temperature strength and is machinable.

Selectarc HB95CoB is used to surface parts subject to metal-metal wear at high temperatures, combined with heavy impacts, compression, as well as thermal shocks.

Special applications :

Surfacing of dies, hot working dies, swages , press tools as well as hot rolls.

**Typical Weld Metal Composition ( % )**

C	Si	Cr	Mo	Co	W	Al	Ti	Ni
0.06	0.8	19.0	6.0	12.0	1.0	0.8	2.5	base

**All Weld Metal Mechanical Properties**

Hardness (as welded)	Hardness (work-hardened)
~220 HB	~350 HB

**Welding Current & Instructions**

Electrode	ØxL ( mm )	2,5x350	3,2x350	4,0x350
Current	( A )	90	120	150

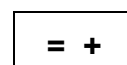
For heavier overlays use HB95CoB only for the last three cover passes. For intermediate and build up layers use Selectarc Ni82 and B92Co. Keep amperage low, preheat heavy work-pieces to 300-500°C. Guide electrodes steep, keep arc short, prevent excessive weaving. Work-piece should be kept at temperature during surfacing and then cooled down slowly. Don't overheat the electrode weld with the lowest practical amperage.



1G/PA



2F/PB



***selectarc***

**HRT60**

**Tubular Electrode  
for hardfacing (mineral abrasion)**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

EN 14700 : E Fe15

### Description & Applications

Tubular electrode filled with chromium carbide powder. Deposit highly resistant to abrasion and mineral erosion. High amount of Cr carbides in an austenitic matrix, very compact. To consume with very low current. Agreeable melting. No slag. Deposit not machinable. Possibility to increase deposition by introducing a second electrode in the arc (double the recommended current)

Surfacing of all austenitic and Mn steels types, grey cast iron (without any preheating), tool steels or high alloyed steels (in this case, carry out a cushion layer with Selectarc 29/9 or 18/8Mn electrodes). Principally destined for agriculture, cement industries, quarries, brickyards, civil engineering, for screws of brick press, for excavating jars,...

### Typical Weld Metal Composition ( % )

C	Mn	Cr	Fe
5.0	0.5	35.0	base

### All Weld Metal Mechanical Properties

Hardness (1 <sup>st</sup> layer)	Hardness (2 <sup>nd</sup> layer)
55-60 HRC	58-62 HRC

### Welding Current & Instructions

Electrode	ØxL ( mm )	6x450	8x450	12x450
Current	( A )	80-120	120-180	210-250

Maintain an arc length of 2 to 5 mm, weave with the electrodes. Hold the electrode perpendicularly to the surface. Do not apply more than 2 or 3 layers.



1G/PA

= + ~ 45V



ind.05

***selectarc***

**HRT63**

**Tubular Electrode for  
Hardfacing (abrasion + impact)**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

EN 14700 : E Fe15

### Description & Applications

Tubular electrode filled with metal powders (carbides of Cr and Nb). This electrode produces a deposit characterised by an exceptional hardness and resistance to abrasion, combined with moderate impact. Higher resistant than conventional electrodes (because of the low dilution with the base metal). Deposit essentially composed of complex carbides of Cr and Nb, in an austenitic matrix. Good resistance to mineral abrasion and impact due to the very fine presence of Nb carbides. Rust proof deposit resists to temperature up to 300°C. Use with low current. No slag, only machinable by grinding, possibility to increase the deposition rate by introducing a second electrode in the arc (in this case, double the recommended current).

Surfacing of C steels, of grey cast iron without buffer layer, alloyed steels and tool steels (in this case, carry out a cushion layer with Selectarc 29/9 or 18/8 Mn electrodes). Principally destined to civil engineering, cement industries, agriculture for press screws, mixing blades, jars teeth and blades, jars teeth and blades, scrapers, crushing hammers, sieving gates, excavator teeth, ....

### Typical Weld Metal Composition ( % )

C	Si	Mn	Cr	Mo	Nb
4.5	1.0	0.8	26.5	1.0	8.0

### All Weld Metal Mechanical Properties

Hardness (1 <sup>st</sup> layer)	Hardness (2 <sup>nd</sup> layer)
57-60 HRC	60-64 HRC

### Welding Current & Instructions

Electrode	ØxL ( mm )	6x450	8x450	12x450
Current	( A )	80-120	120-180	210-250

Maintain an arc length of 2 to 5 mm, weave with the electrodes. Hold the electrode perpendicularly to the surface. Do not apply more than 2 or 3 layers.



1G/PA

= + ~ 45V

***selectarc***

**HRT68**

**Tubular Electrode  
against extreme abrasion**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

EN 14700 : E Fe20

### Description & Applications

Tubular electrode filled with W and Cr carbides. Deposit highly resistant to abrasion without impact (or moderate shocks). Essentially composed of W carbides (exceptional resistance to abrasion). Stainless matrix, excellent friction coefficient, agreeable melting, no slag, deposit not machinable. Possibility to increase the deposition rate by introducing a second electrode in the arc (double the recommended intensity).

Surfacing of all austenitic steels, cast iron, tool steels or highly alloyed steels (in this case, carry out a cushion layer with Selectarc 29/9 or 18/8 Mn electrodes). Apply 1 or 2 layers maxi. Mainly destined to pieces subject to a high mineral abrasion and to temperature up to 300°C.

General applications: material of civil engineering, agriculture, quarries, mines, (mixer, blade, conveyer screws, ...)

### Typical Weld Metal Composition (%)

C	Si	Cr	W
5.5	1.2	22.0	25.0

### All Weld Metal Mechanical Properties

Hardness  
64-68 HRC

### Welding Current & Instructions

Electrode	ØxL ( mm )	6x450	8x450	12x450
Current	( A )	80-120	120-180	210-250

Maintain an arc length of 2 to 5 mm, weave with the electrodes. Hold the electrode perpendicularly to the surface. Do not apply more than 2 or 3 layers.



1G/PA

= + ~ 45V



ind.05

***selectarc***

**HRT60WC**

**Tungsten Carbide Electrode  
against extreme abrasion**



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#### Classification

DIN 8555 : E 21-UM-65-G  
EN 14700 : E Fe20

#### Description & Applications

Tubular electrode filled with Tungsten carbides. Deposit highly resistant to abrasion without impact. Steel matrix with a high amount of tungsten carbides and an exceptional resistance to scraping abrasion . The electrode has a smooth fusion and a stable arc, the slag is easy to remove, the weld deposit is not machinable.

Surfacing of parts which are subject to extremely mineral abrasion in agriculture, earth moving, mining and steel industry. For concrete and sand mixer blades, conveyer screws, brick dies, shredder knives, etc. .

Apply 1 or maximum 2 layers.

General applications: material of civil engineering, agriculture, quarries, mines; for mixer blades , conveyer screws, plough shares, ...

#### Typical Weld Metal Composition ( % )

WC/W <sub>2</sub> C	Fe
65	base

#### All Weld Metal Mechanical Properties

Hardness  
64-68 HRC

#### Welding Current & Instructions

Electrode	ØxL ( mm )	4x350
Current	( A )	90-120

Keep the arc short , weave with the electrodes. Hold the electrode perpendicularly to the surface. Do not apply more than 2 layers.



1G/PA

= + ~ 45V



ind.05

***selectarc***

**DCS**

**Chamfering Electrode**



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### Classification

Without

### Description & Applications

Electrode for chamfering, grooving and gouging all metals, including stainless steels, cast iron and Cu alloys. Strong blowing characteristic to remove metal with high efficiency, smooth and uniform cut. Surface carbonised, therefore remove 0,1 mm by grinding if necessary.

Chamfering of steels, cast iron, ...

Elimination of screws, rivets, welding beads, ...

Chamfering of foundry defects or cracks before repair welding.

Chamfering of hardfacing deposits or tempered steels.

### Welding Current & Instructions

Electrode	ØxL ( mm )	2,5X350	3,2X350	4,0X450	5,0X450
Current	( A )	130	200	250	300

Select the amperage depending on the diameter of the electrode. Hold the electrode at an angle of approx. 20°, push in direction of travel using a saw like (forward and back) motion. Incline the workpiece, if possible, to favour the molten metal to flow away.

= +    ~ 45V



ind.05

***selectarc***

**Cut100**

**Cutting Electrode**



**FSH WELDING GROUP**

INNOVATIVE WELDING CONSUMABLES

[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

Without

### Description & Applications

Electrode for cutting, bevelling and piercing of all industrial metals and alloys including stainless steels, cast iron and Cu alloys.

Strong blowing characteristic to remove metal with high efficiency. Smooth and uniform cut. The surface will carbonise, remove 0,1mm by grinding if necessary.

Cutting of steels, cast iron, ....

Piercing of holes, elimination of screws, ...

### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x450	4,0x450
Current	( A )	130 - 180	170 - 230

Position work piece that the molten metal can run off. Select the electrode diameter according to the metal thickness, e.g. 3,2mm for base metal 5mm.

Put electrode into the holder, set sufficient amperage and press slightly against parent metal.

To proceed use an up and down moving motion.

For piercing holes, strike the arc and push in and out until the arc burns through and the hole is finished.

= -	~ 45V
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ind.05

***selectarc***

**Goug**

**Chamfering Electrode**



**FSH WELDING GROUP**

INNOVATIVE WELDING CONSUMABLES

[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

Without

### Description & Applications

Electrode for chamfering, grooving and gouging all metals, including stainless steels, cast iron and Cu alloys. Strong blowing characteristic to remove metal with high efficiency, smooth and uniform cut. Non-conductive coating. Surface becomes carbonised, therefore remove 0,1 mm by grinding if necessary.

Chamfering of steels, cast iron, ...

Elimination of screws, rivets, welding beads, ...

Chamfering of foundry defects or cracks before repair welding.

Chamfering of hardfacing deposits or tempered steels.

### Welding Current & Instructions

Electrode	ØxL ( mm )	3,2x350	4,0x450
Current	( A )	200	250

Select the amperage depending on the diameter of the electrode. Hold the electrode at an angle of approx. 20°, push in direction of travel using a sa w like (forward and back) motion. Incline the workpiece, if possible, to favour the molten metal to flow away.

= +      ~ 55V



ind.05

***selectarc***  
**Therm 200**  
**Preheating Electrode**



**Classification**

Without

**Description & Applications**

Special coated electrode for heating up pieces of small and medium sizes.  
The electrode will heat up the pieces and the deposit is easy to remove by using a steel brush.

**Welding Current & Instructions**

Electrode	ØxL ( mm )	3,2x450
Current	( A )	100-150

Set a relatively high amperage, ignite the electrode, start the arc and draw him long ~ 20 – 25mm.  
The electrode will melt and the arc energy will heat up the piece.  
Remove the deposit with a steel brush.

= -	~ 60V
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***selectarc***

## B-Fonte

**Cast Iron Rod  
for hot Welding**

  
**FSH WELDING GROUP**  
INNOVATIVE WELDING CONSUMABLES  
[www.fsh-welding.com](http://www.fsh-welding.com)

### Classification

DIN 8573 : G FeC-1  
ISO 1071 : R C FeC-1

### Description & Applications

Welding rod for oxy- acetylene hot welding of grey cast iron .  
The deposit shows the same colour and structure as grey cast iron.  
Mainly used to weld defects in foundries.

### Base materials

Cast iron:

**ASTM**

A48 Class 25B – Class 60B

**DIN**

GG-15 to GG-40

**NFA**

FGL 150 to FGL 400

### Typical Composition ( % )

C	Si	Mn	Ni	Cu	Fe
3.3	3.2	0.5	0.5	0.1	base

### All Weld Metal Mechanical Properties

Hardness

~ 185 HB

After PWHT

### Welding Current & Instructions

Electrode	ØxL ( mm )	4,0x450	5,0x450	6,0x450	8,0x450	10,0x450
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Prepare the casting defect to be repaired, preheat the piece to 550 – 650°C , keep this temperature during welding , cool slowly down preferable in a furnace.  
Use a neutral flame and a corresponding flux.



ind.08