



PANORAMA WELDING ELECTRODES

- Full range of covered electrodes (MMA)
- Product development in accordance to customer's requests
- Quick response
- Flexibility
- Technical advice

Initially founded in 1870 FSH WELDING GROUP is a French manufacturer of welding and brazing consumables and has become one of the main actors on the worldwide market.

Today our group is present on all continents through our subsidiaries and partners and we propose the broadest range of products on the welding and brazing market. The quality of our products, the involvement of our staff as well as the continuous improvement of our R&D has placed FSH WELDING GROUP as THE reference for the major companies in the industry.

Our group stands out especially on specific markets in highly technical industries such as aerospace, nuclear, chemical and petrochemical, M&R, ground transportation, heating and air-conditioning.

Our products, sold under our brands **SELECTARC WELDING** and **SELECTARC BRAZING** meet strict requirements as far as quality and security are concerned. To achieve excellence is our goal, quality is in our genes and we reassert this motto every day.



Innovation 
Quality **Responsiveness**
Customization **Flexibility**
■ ■ ■



PRODUITS D'APPORT DE SOUDAGE
WELDING FILLER METALS

Selectarc
WELDING

PRODUITS D'APPORT DE BRASAGE
BRAZING ALLOYS

Selectarc
BRAZING

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OUR INDUSTRY FOCUS:



FORGING & FOUNDRY



FOOD INDUSTRY



NUCLEAR AND THERMAL PLANTS,
POWER INDUSTRY



MINING INDUSTRY



SHIPBUILDING
INDUSTRY



AUTOMOBILE
INDUSTRY



CHEMICAL AND PETROCHEMICAL
INDUSTRY



M&R
INDUSTRY



CLASSIFICATIONS & STANDARDS



UN-ALLOYED STEELS

	Type	Characteristic	Classification		
			AWS A5.1	ISO 2560-A	
RUTILE, BASIC STEELS	■ SELECTARC 48SP	All positions	E6013	E 42 0 RC 1 1	p 14
	■ SELECTARC 51	Universal	E6013	E 42 0 RC 1 1	p 14
	■ SELECTARC 52HP	Universal	E6013	E 42 0 RC 1 1	p 14
	■ SELECTARC 54	Good appearance	E6013	E 42 0 RR 1 2	p 14
	■ SELECTARC 55	Heavy coated	E6013	E 42 0 RR 1 2	p 15
	■ SELECTARC D6	Vertical down	E6013	E 42 0 RC 1 1	p 15
	■ SELECTARC 160	High efficiency (Jet type)	E7024	E 38 0 RR 5 3	p 15
	■ SELECTARC C6010	Cellulosic coating	E6010	E 42 2 C 25	p 15
	■ SELECTARC Galva 46	For welding before galvanization	E6013	E 35 0 RR 3 1	p 15
	■ SELECTARC RR B7	For root pass welding	E6013	E 38 2 RB 1 2	p 15
BASIC UN-ALLOYED STEELS	■ SELECTARC B56S	Universal basic	E7018-1	E 42 4 B 3 2 H5	p 16
	■ SELECTARC B7016Sp	Double coated, special for repairing	E7016	E 38 2 B 1 2 H10	p 16
	■ SELECTARC B58	Universal basic 7018	E7018	E 42 4 B 3 2 H5	p 16
	■ SELECTARC B7018S	Universal 7018-1	E7018-1	E 46 4 B 3 2 H5	p 16

LOW ALLOYED STEELS

	Type	Characteristic	Classification				
			AWS A5.5	ISO 18275-A	ISO 3580-A	ISO 2560-A	
BASIC HIGH STRENGTH	■ SELECTARC B70	High strength	E10018-G	E 62 5 1,5NiMo B 4 2 H5	-	-	p 17
	■ SELECTARC B72	High strength	E9018-G	E 55 5 1NiMo B 4 2 H5	-	-	p 17
	■ SELECTARC B73	High strength	E9018-D1	E 55 4 MnMo B 4 2 H5	-	-	p 17
	■ SELECTARC B74	High strength	E 8018-G	-	-	E 50 2 Mo B 4 2 H5	p 17
	■ SELECTARC B75Cu	For welding weather resistance steel	E8018-W2	-	-	E 46 2 Z B 4 2 H5	p 18
	■ SELECTARC B77	High strength steel	E11018-M	E 69 4 Mn2NiCrMo B 4 2 H5	-	-	p 18
BASIC CREEP RESISTANT	■ SELECTARC B60	High temperature	E7018-A1	-	E Mo B 4 2 H5	-	p 18
	■ SELECTARC B63	For creep resisting steels	E8018-B2	-	E CrMo1 B 4 2 H5	-	p 18
	■ SELECTARC B68	For creep resisting steels	E9018-B3	-	E CrMo2 B 4 2 H5	-	p 18
	■ SELECTARC B69	For creep resisting steels	E8018-B6	-	E CrMo5 B 4 2 H5	-	p 19
	■ SELECTARC B609	For creep resisting steels	E8016-B8	-	E CrMo9 B 4 2 H5	-	p 19
	■ SELECTARC B691	Basic coated for creep resisting steels	E9015-B9	-	E CrMo91 B 4 2 H5	-	p 19
	■ SELECTARC B691N	For creep resisting steels	E9018-B9	-	E CrMo9 1 B 42 H5	-	p 19
	■ SELECTARC B81	For cold tough steels ≤ -60°C	E8018-C3	-	-	E 46 5 1Ni B 4 2 H5	p 20
BASIC LOW TEMPERATURE	■ SELECTARC B82	For cold tough steels at -60°C	E8018-C1	-	-	E 46 6 2Ni B 4 2 H5	p 20
	■ SELECTARC B84	For cold tough steels < -80°C	E8018-C2	-	-	E 46 6 3Ni B 4 2 H5	p 20
	■ SELECTARC B842	For cold tough steels ≤ -60°C	E 7018-G	-	-	E 42 6 1Ni B 4 2 H5	p 20

CLASSIFICATION & STANDARDS

HIGH ALLOYED STEELS

Type	Characteristic	Classification		
		AWS A5.4	EN 1600 / ISO 3581-A	
■ SELECTARC 20/10BC	Standard 308L rutile coated	E308L-16	E 19 9 L R 3 2	p 22
■ SELECTARC INOX 308B	308L basic coated	E308L-15	E 19 9 L B 4 2	p 22
■ SELECTARC 308HR	High efficiency (Jet type)	E308L-26	E 19 9 L R 7 3	p 22
■ SELECTARC INOX 308HB	High carbon/basic	E308H-15	E 19 9 H B 4 2	p 22
■ SELECTARC INOX 347	Niobium - stabilised	E347-17	E 19 9 Nb R 3 2	p 22
■ SELECTARC INOX 16-8-2B	High carbon/basic	E16 8 2-15	E 16 8 2 B 4 3	p 22
■ SELECTARC 20/10MBC	Standard 316L rutile coated	E316L-16	E 19 12 3 L R 3 2	p 23
■ SELECTARC INOX 316L	Spray and fine rippled weld bead	E316L-17	E 19 12 3 L R 3 2	p 23
■ SELECTARC 316VD	For vertical down	E316L-16	E 19 12 3 L R 3 1	p 23
■ SELECTARC INOX 316NG	Basic coated	E316L-15	E 19 12 3 L B 4 2	p 23
■ SELECTARC 316HR	High efficiency (Jet type)	E316L-26	E 19 12 3 L R 7 3	p 23
■ SELECTARC INOX 318	Niobium stabilised	E318-17	E 19 12 3 Nb R 3 2	p 24
■ SELECTARC 317L	Stainless steel electrode with 3.5 % Mo	E317L-17	E Z 19 13 4 L R 3 2	p 24
■ SELECTARC 24/12S	Rutile coated	E309L-16	E 23 12 L R 3 2	p 24
■ SELECTARC 309HR	High efficiency (Jet type)	E309L-26	E 23 12 L R 7 3	p 24
■ SELECTARC 24/12Mo	For repairing	E309LMo-17	E 23 12 2 L R 3 2	p 24
■ SELECTARC 307R	High manganese / rutile	~E307-16	E 18 8 Mn R 3 2	p 24
■ SELECTARC 307B	High manganese / basic	~E307-15	E 18 8 Mn B 3 2	p 25
■ SELECTARC 18/8Mn	High manganese / synthetic (Jet type)	~E307-26	E 18 8 Mn R 7 3 X	p 25
■ SELECTARC INOX 308Mo	For repairing	E308Mo-17	E 20 10 3 R 3 2	p 25
■ SELECTARC 29/9	For maintenance and repair	~E312-16	E 29 9 R 3 2	p 25
■ SELECTARC INOX 312HR	For galvanised steels and repair (Jet type)	~E312-26	E Z 26 9 R 7 3	p 25
■ SELECTARC 25/20R	High temperature / rutile	~E310-16	E 25 20 R 3 2	p 26
■ SELECTARC 25/20B	High temperature / basic	E310-15	E 25 20 B 4 2	p 26
■ SELECTARC INOX 310H	High temperature / high carbon	E310H-15	E 25 20 H B 4 2	p 26
■ SELECTARC INOX 253MA-AC	High temperature	-	E 22 12 R 3 2	p 26
■ SELECTARC INOX 21/33Mn	High temperature	-	E Z 21 33 Mn Nb B 4 2	p 26
■ SELECTARC 25/35H	High temperature	-	E Z 25 35 Nb H B 4 2	p 27
■ SELECTARC INOX 2209	For duplex steels / rutile	E2209-17	E 22 9 3 N L R 3 2	p 27
■ SELECTARC INOX 2209B	For duplex steels / basic	E2209-15	E 22 9 3 N L B 4 2	p 27
■ SELECTARC INOX 2509MoB	For super-duplex stainless steels / basic	E2594-15	E 25 9 4 N L B 4 2	p 27
■ SELECTARC INOX 2509MoWB	For super-duplex stainless steels / basic	E 2595-15	E 25 9 4 N L B 4 2	p 27
■ SELECTARC INOX 385	Highly corrosion resistant type 904L	E385-16	E 20 25 5 Cu N L R 1 2	p 28
■ SELECTARC INOX 383	Highly corrosion resistant	E383-16	E 27 31 4 Cu L R 1 2	p 28
■ SELECTARC INOX 410B	13 % Cr / basic	E410-15	E 13 B 4 2	p 28
■ SELECTARC INOX 13/4	13 % Cr - 4 % Ni / basic	E410NiMo-15	E 13 4 B 4 2	p 28
■ SELECTARC INOX 17/4Mo	16 % Cr - 5 % Ni - 1 % Mo / basic	-	E Z 16 5 1 B 4 2	p 28



CAST IRON

Type	Characteristic	Classification		
		AWS A5.15	ISO 1071	
■ SELECTARC Fonte Ni	Pure nickel - AC/DC	E Ni-CI	E C Ni-CI 3	p 29
■ SELECTARC Fonte Ni2	Pure nickel - AC/DC -	E Ni-CI	E C Ni-CI 3	p 29
■ SELECTARC Fonte Ni4	Pure nickel non conductive coating	E Ni-CI	E C Ni-CI 3	p 29
■ SELECTARC Ferro-Ni	Ferro nickel - AC/DC +	E NiFe-CI	E C NiFe-CI 3	p 29
■ SELECTARC Bimetal-NiFe	"Bimetal" - AC/DC -	E NiFe-CI	E C NiFe-CI 3	p 29
■ SELECTARC Fonte BMP	"Bimetal" - AC/DC +	E NiFe-CI	E C NiFe-CI 1	p 30
■ SELECTARC FeNi/Cu	Ferro nickel / copper coated - AC/DC +	E NiFe-CI	E C NiFe-1 3	p 30
■ SELECTARC Fonte NiFe2	Ferro nickel - AC/DC -	E NiFe-CI	E C NiFe-CI 1	p 30
■ SELECTARC Fonte Fe	Iron based / for repair	E St	E C Fe-1 3	p 30
■ SELECTARC Fonte Fe 2	Iron based / for repair	"E St"	E C Fe-2 3	p 30
■ SELECTARC Fonte Fe3	For hot welding	"E CI-B"	E C FeC-GF 3	p 30

NICKEL ALLOYS

Type	Characteristic	Classification		
		AWS A5.11	ISO 14172	
■ SELECTARC B90	Inconel® type 600 high recovery	E NiCrFe-3	E-Ni 6182 (NiCr15Fe6Mn)	p 31
■ SELECTARC B91	High strength	E NiCrMo-3	E-Ni 6625 (NiCr22Mo9Nb)	p 31
■ SELECTARC B94	Special AC/DC	E NiCrFe-2	E-Ni 6092 (NiCr16Fe12NbMo)	p 31
■ SELECTARC B96	For 9 % nickel steels/AC	E NiCrMo-6	E-Ni 6620 (NiCr14Mo7Fe)	p 31
■ SELECTARC Ni59	Highly corrosion resistant	E NiCrMo-13	E-Ni 6059 (NiCr23Mo16)	p 32
■ SELECTARC Ni82	Inconel® type 600	~E NiCrFe-3	E-Ni 6082 (NiCr20Mn3Nb)	p 32
■ SELECTARC Ni182	Nickel alloy 600	E NiCrFe-3	E-Ni 6182 (NiCr15Fe6Mn)	p 32
■ SELECTARC Ni190	NiCu type "Monel®"	E NiCu-7	E-Ni 4060 (NiCu30Mn3Ti)	p 32
■ SELECTARC Ni276	Alloys NiCrMo (C-276)	E NiCrMo-4	E-Ni 6276 (NiCr15Mo15Fe6W4)	p 32
■ SELECTARC Ni617	High temperature	~E NiCrCoMo-1	E-Ni 6617 (NiCr22Co12Mo)	p 33
■ SELECTARC Ni625	Highly corrosion resistant	E NiCrMo-3	E-Ni 6625 (NiCr22Mo9Nb)	p 33
■ SELECTARC Ni625BF	Highly corrosion resistant	E NiCrMo-3	E-Ni 6625 (NiCr22Mo9Nb)	p 33
■ SELECTARC Ni-A	High temperature / repair	E NiCrFe-2	E-Ni 6092 (NiCr16Fe12NbMo)	p 33
■ SELECTARC NiTi3	Pure nickel	E Ni-1	E-Ni 2061 (NiTi3)	p 33

ALUMINIUM ALLOYS

Type	Characteristic	Classification		
		AWS A5.3	DIN 1732	
■ SELECTARC Al105	Aluminium 5 % Si	E4043	EL-AISi5	p 34
■ SELECTARC Al112	Aluminium 12 % Si	~E4047	EL-AISi12	p 34

COPPER ALLOYS

Type	Characteristic	Classification		
		AWS A5.6	DIN 1733	
■ SELECTARC Cu110	Pure copper	~E Cu	EL-CuMn2	p 36
■ SELECTARC Cu114	Copper tin	E CuSn-A	EL-CuSn7	p 36
■ SELECTARC Cu115	Copper tin for DC	E CuSn-C	EL-CuSn7	p 36
■ SELECTARC Cu116	Basic coated Cu-Al bronze	~E CuAl-A2	EL-CuAl9	p 36
■ SELECTARC Cu118	Complex aluminium bronze	E CuMnNiAl	EL-CuMn14Al	p 36
■ SELECTARC CuNi30	Cupronickel	E CuNi	EL-CuNi30Mn	p 36

CLASSIFICATION & STANDARDS

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All technical data sheets and MSDS are available on:
www.fsh-welding.com/en

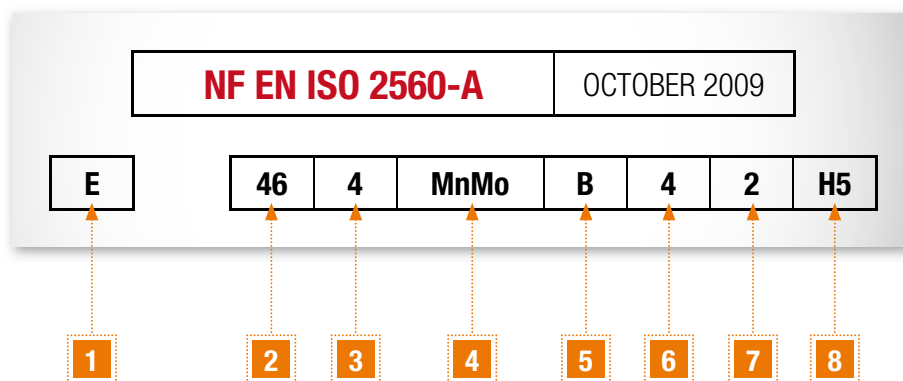
MAINTENANCE & REPAIR, HARDFACING

Type	Characteristic	Classification	
■ SELECTARC G330	Universal maintenance	-	p 39
■ SELECTARC HB25	Machinable / 250 HB (Build-up)	-	p 40
■ SELECTARC HB300B	Semi-hard machinable / 300 HB (Build-up)	-	p 40
■ SELECTARC HB40	Surfacing / 400 HB (Build-up)	-	p 40
■ SELECTARC HB60	Rutile hardfacing / 600 HB	-	p 40
■ SELECTARC HB40HT	Hot working steel tools / 40 HRC	-	p 41
■ SELECTARC HB48HT	Hot working steel tools / 48 HRC	-	p 41
■ SELECTARC HB56HT	Hot-working / 56 HRC	-	p 41
■ SELECTARC HB450HT	For metal wear / 45 HRC	-	p 41
■ SELECTARC HB600HT	For metal wear / 60 HRC	-	p 41
■ SELECTARC HB50Co	Hardfacing electrode for high temperatures	-	p 41
■ SELECTARC HBMar50	Age-hardenable	-	p 42
■ SELECTARC HBC62	For cutting tools / 62 HRC	-	p 42
■ SELECTARC HB61B	Impact, compression and abrasion - basic / 58 HRC	-	p 42
■ SELECTARC HB61R	Impact, compression and abrasion - rutile / 60 HRC	-	p 42
■ SELECTARC HMn	High impact	-	p 43
■ SELECTARC HB MnCr	For cavitation, abrasion and impact	-	p 43
■ SELECTARC HB14Mn	High impact	-	p 43
■ SELECTARC HB Cavit	Highly resistant to cavitation	-	p 43
■ SELECTARC HB63	Mineral abrasion / 63 HRC	-	p 43
■ SELECTARC HBA	Mineral abrasion, without slag / 62 HRC	-	p 44
■ SELECTARC HB64S	Special sugar mills / arcing	-	p 44
■ SELECTARC HB65	Severe mineral abrasion / 64 HRC	-	p 44
■ SELECTARC HB66	Mineral abrasion, high temperature / 65 HRC	-	p 44
■ SELECTARC HB68	Hardfacing against high abrasion	-	p 44
■ SELECTARC HB68Nb	Hardfacing against high abrasion	-	p 45
■ SELECTARC HBC 63	Hardfacing for cutting tools	-	p 45
■ SELECTARC Co1	"Grade 1" type cobalt base / high abrasion	-	p 45
■ SELECTARC Co6	"Grade 6" type cobalt base / metal abrasion	-	p 46
■ SELECTARC Co12	"Grade 12" type cobalt base / hot cutting	-	p 46
■ SELECTARC Co21S	"Grade 21" type cobalt base / motor valves	-	p 46
■ SELECTARC Co25	"Grade 25" type cobalt base / hot working	-	p 46
■ SELECTARC B92	Ni base / hot working	-	p 46
■ SELECTARC B92Co	Ni base / hot working	-	p 47
■ SELECTARC HB95CoB	Hardfacing for hot forging dies	-	p 47
■ SELECTARC HRT60	Tubular electrode (mineral abrasion) / 60 HRC	-	p 47
■ SELECTARC HRT63	Tubular electrode (abrasion + impact) / 63 HRC	-	p 47
■ SELECTARC HRT68	Tubular electrode (extreme abrasion) / 68 HRC	-	p 47

OTHERS

Type	Characteristic	Classification	
■ SELECTARC DCS	Bevelling / Gouging	-	p 48
■ SELECTARC CUT 100	Cutting electrode	-	p 48
■ SELECTARC Goug	Bevelling / Gouging	-	p 48

COVERED ELECTRODE FOR MANUAL METAL ARC WELDING OF NON-ALLOY AND FINE GRAIN STEELS



1 COVERED ELECTRODE FOR MANUAL ARC WELDING

2 MECHANICAL PROPERTIES

Symbol	Minimal yield strength (MPa)	Tensile strength (MPa)	Minimal elongation (%)
35	355	440 to 570	22
38	380	470 to 600	20
42	420	500 to 640	20
46	460	530 to 680	20
50	500	560 to 720	18

3 TEMPERATURE FOR A MINIMAL AVERAGE

Symbol	Temperature for a minimal average values of 47J in impact test (°C)	Symbol	Temperature for a minimal average values of 47J in impact test (°C)
Z	No specification	3	-30
A	+20	4	-40
0	0	5	-50
2	-20	6	-60

4 CHEMICAL COMPOSITION SYMBOL

Alloy	Chemical composition (% of weight)		
Symbol	Mn	Mo	Ni
No symbol	2,0	-	-
Mo	1,4	0,3 to 0,6	-
MnMo	1,4 to 2,0	0,3 to 0,6	-
1Ni	1,4	-	0,6 to 1,2
Mn1Ni	1,4 to 2,0	-	0,6 to 1,2
2Ni	1,4	-	1,8 to 2,6
Mn2Ni	1,4 to 2,0	-	1,2 to 2,6
3Ni	1,4	-	2,6 to 3,8
1NiMo	1,4	0,3 to 0,6	0,6 to 1,2
Z	All other chemical composition		

5 TYPE OF COATING

Symbol	Type of coating	Symbol	Type of coating
A	Acid	RC	Rutilo cellulosic
C	Cellulosic	RA	Rutilo acid
R	Rutile	RB	Rutilo basic
RR	Rutile thick coated	B	Basic

6 METAL RECOVERY AND POLARITY

Symbol	Metal recovery (%)	Current type AC (Alternative Current) DC (Direct Current)
1	≤ 105	AC & DC
2	≤ 105	DC
3	> 105 ≤ 125	AC & DC
4	> 105 ≤ 125	DC
5	> 125 ≤ 160	AC & DC
6	> 125 ≤ 160	DC
7	> 160	AC & DC
8	> 160	DC

7 WELDING POSITIONS

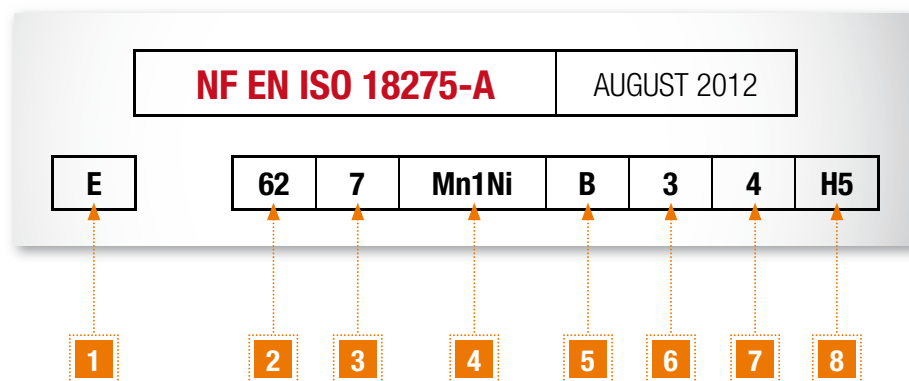
Symbol	Welding positions according to ISO 6947:2011
1	PA, PB, PC, PD, PE, PF, PG
2	PA, PB, PC, PD, PE, PF
3	PA, PB
4	PA
5	PA, PB, PG

8 HYDROGEN DIFFUSIBLE MAXIMUM

Symbol	Hydrogen diffusible maximum ml/100 g of weld metal (°C)
H5	5
H10	10
H15	15

CLASSIFICATION & STANDARDS

COVERED ELECTRODE FOR MANUAL ARC WELDING OF HIGH STRENGTH STEELS



1 COVERED ELECTRODE FOR MANUAL ARC WELDING

2 MECHANICAL PROPERTIES

Symbol	Minimal yield strength (MPa)	Tensile strength (MPa)	Minimal elongation (%)
55	550	610 to 780	18
62	620	690 to 890	18
69	690	760 to 960	17
79	790	880 to 1080	16
89	890	980 to 1180	15

3 TEMPERATURE FOR A MINIMAL AVERAGE

Symbol	Temperature for a minimal average values of 47J in impact test (°C)	Symbol	Temperature for a minimal average values of 47J in impact test (°C)
Z	No specification	4	-40
A	+20	5	-50
0	0	6	-60
2	-20	7	-70
3	-30	8	-80

4 CHEMICAL COMPOSITION SYMBOL

Alloy	Chemical composition (% of weight)			
Symbol	Mn	Ni	Cr	Mo
MnMo	1,4 to 2,0	-	-	0,3 to 0,6
Mn1Ni	1,4 to 2,0	0,6 to 1,2	-	-
1NiMo	1,4	0,6 to 1,2	-	0,3 to 0,6
1,5NiMo	1,4	1,2 to 1,8	-	0,3 to 0,6
2NiMo	1,4	1,8 to 2,6	-	0,3 to 0,6
Mn1NiMo	1,4 to 2,0	0,6 to 1,2	-	0,3 to 0,6
Mn2NiMo	1,4 to 2,0	1,8 to 2,6	-	0,3 to 0,6
Mn2NiCrMo	1,4 to 2,0	1,8 to 2,6	0,3 to 0,6	0,3 to 0,6
Mn2Ni1CrMo	1,4 to 2,0	1,8 to 2,6	0,6 to 1,0	0,3 to 0,6
Z	All other chemical composition			

5 TYPE OF COATING

Symbol	Type of coating
B	Basic

6 METAL RECOVERY AND POLARITY

Symbol	Metal recovery (%)	Current type AC (Alternative Current) DC (Direct Current)
1	≤ 105	AC & DC
2	≤ 105	DC
3	> 105 ≤ 125	AC & DC
4	> 105 ≤ 125	DC
5	> 125 ≤ 160	AC & DC
6	> 125 ≤ 160	DC
7	> 160	AC & DC
8	> 160	DC

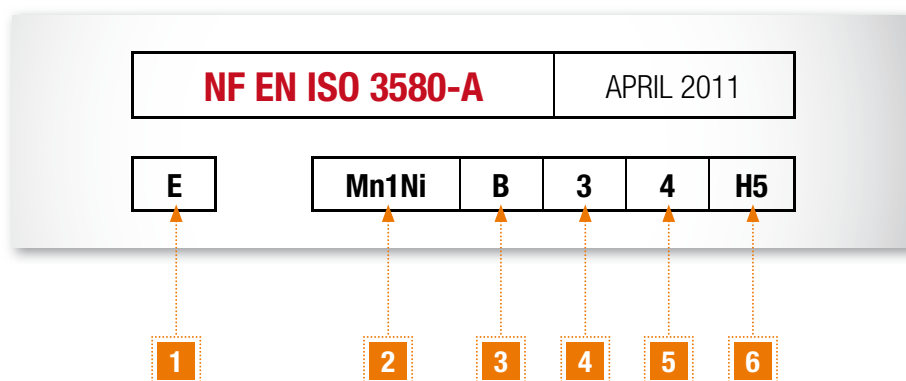
7 WELDING POSITIONS

Symbol	Welding positions according to ISO 6947:2011
1	PA, PB, PC, PD, PE, PF, PG
2	PA, PB, PC, PD, PE, PF
3	PA, PB
4	PA
5	PA, PB, PG

8 HYDROGEN DIFFUSIBLE MAXIMUM

Symbol	Hydrogen diffusible maximum ml/100 g of weld metal (°C)
H5	5
H10	10
H15	15

COVERED ELECTRODE FOR MANUAL ARC WELDING OF CREEP RESISTING STEELS



1 COVERED ELECTRODE FOR MANUAL ARC WELDING

2 CHEMICAL COMPOSITION SYMBOL

Alloy	Chemical composition (% of weight)			
Symbol	Mn	Ni	Cr	Mo
MnMo	1,4 to 2,0	-	-	0,3 to 0,6
Mn1Ni	1,4 to 2,0	0,6 to 1,2	-	-
1NiMo	1,4	0,6 to 1,2	-	0,3 to 0,6
1,5NiMo	1,4	1,2 to 1,8	-	0,3 to 0,6
2NiMo	1,4	1,8 to 2,6	-	0,3 to 0,6
Mn1NiMo	1,4 to 2,0	0,6 to 1,2	-	0,3 to 0,6
Mn2NiMo	1,4 to 2,0	1,8 to 2,6	-	0,3 to 0,6
Mn2NiCrMo	1,4 to 2,0	1,8 to 2,6	0,3 to 0,6	0,3 to 0,6
Mn2Ni1CrMo	1,4 to 2,0	1,8 to 2,6	0,6 to 1,0	0,3 to 0,6
Z	All other chemical composition			

3 TYPE OF COATING

Symbol	Type of coating
B	Basic
R	Rutile

4 METAL RECOVERY AND POLARITY

Symbol	Metal recovery (%)	Current type AC (Alternative Current) DC (Direct Current)
1	≤ 105	AC & DC
2	≤ 105	DC
3	> 105 ≤ 125	AC & DC
4	> 105 ≤ 125	DC

5 WELDING POSITIONS

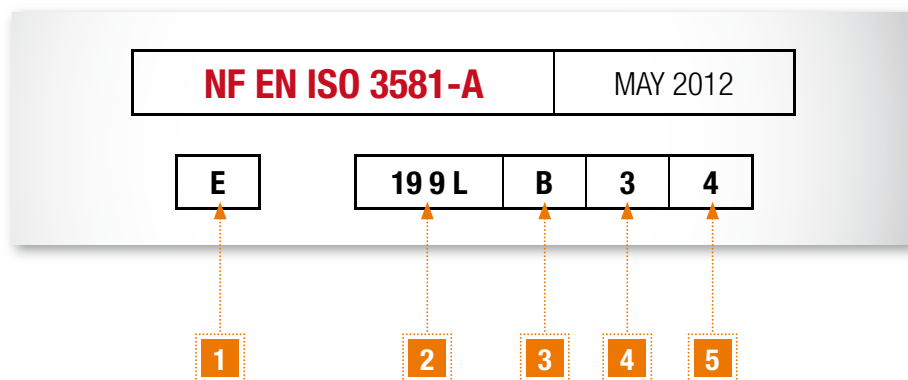
Symbol	Welding positions according to ISO 6947:2011
1	PA, PB, PC, PD, PE, PF, PG
2	PA, PB, PC, PD, PE, PF
3	PA, PB
4	PA

6 HYDROGEN DIFFUSIBLE MAXIMUM

Symbol	Hydrogen diffusible maximum ml/100 g of weld metal (°C)
H5	5
H10	10
H15	15

CLASSIFICATION & STANDARDS

COVERED ELECTRODE FOR MANUAL METAL ARC WELDING OF STAINLESS STEELS AND HEAT RESISTING STEELS



1 COVERED ELECTRODE FOR MANUAL ARC WELDING

2 CHEMICAL SYMBOL

Symbol	Symbol	Symbol
13	19 9	22 9 3 N L
13 4	19 9 L	25 7 2 N L
17	19 9 Nb	25 9 3 Cu N L
-	19 12 2	25 9 4 N L
-	19 12 3 L	-
-	19 12 3 Nb	-
-	19 13 4 N L	-

Symbol	Symbol	Symbol
18 15 3 L	18 8 Mn	16 8 2
18 16 5 N L	18 9 Mn Mo	19 9 H
20 25 5 Cu N L	20 10 3	25 4
20 16 3 Mn N L	23 12 L	22 12
20 16 3 Mn N L	23 12 Nb	25 20
25 22 2 N L	23 12 2 L	25 20 H
27 31 4 Cu L	29 9	18 36

3 TYPE OF COATING

Symbol	Type of coating
B	Basic
R	Rutile

4 METAL RECOVERY AND POLARITY

Symbol	Metal recovery (%)	Current type AC (Alternative Current) DC (Direct Current)
1	≤ 105	AC & DC
2	≤ 105	DC
3	> 105 ≤ 125	AC & DC
4	> 105 ≤ 125	DC
5	> 125 ≤ 160	AC & DC
6	> 125 ≤ 160	DC
7	> 160	AC & DC
8	> 160	DC

5 WELDING POSITIONS

Symbol	Welding positions according to ISO 6947:2011
1	PA, PB, PD, PF, PG
2	PA, PB, PD, PF
3	PA, PB
4	PA
5	PA, PB, PG



UN-ALLOYED STEEL
LOW ALLOYED STEEL
HIGH ALLOYED STEEL
CAST IRON
NICKEL ALLOYS
ALUMINIUM ALLOYS
COPPER ALLOYS

JOINING



UN-ALLOYED STEELS



RUTILE, BASIC STEELS

SELECTARC 48SP

ALL POSITIONS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.1	C	<0.10	- 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 parts (oil, grease, oxides). - Applied in metal constructions, for piping systems, tanks, locksmithing, craft works.	Rm (MPa)	520	2.0 x 300	50 A	= -
E6013	Mn	0.6		Re (MPa)	450	2.5 x 350	70 A	
ISO 2560-A	Si	0.4		A5 (%)	26	3.2 x 350	110 A	~40 V
E 42 0 RC 1 1	S	<0.025		KV (J)	+20°C → 90	3.2 x 450	110 A	
	P	<0.025			0°C → 80	4.0 x 350	140 A	
	Fe	Rem.			-10°C → 50	4.0 x 450	140 A	

SELECTARC 51

UNIVERSAL

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.1	C	<0.10	- Universal rutile 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.	Rm (MPa)	510-580	1.6 x 300	30 A	= -
E6013	Mn	0.45		Re (MPa)	> 420	2.0 x 300	50 A	
ISO 2560-A	Si	0.4		A5 (%)	> 22	2.5 x 350	70 A	~40 V
E 42 0 RC 1 1	S	<0.025		KV (J)	+20°C → >65	3.2 x 350	110 A	
	P	<0.025			0°C → >47	3.2 x 450	110 A	
	Fe	Rem.			-20°C → >28	4.0 x 350	140 A	
						4.0 x 450	140 A	
						5.0 x 450	170 A	

SELECTARC 52HP

UNIVERSAL

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.1	C	<0.10	- Universal rutile all position mild steel electrode. Good operability and easy slag removal. Suitable for current supplies with low open arc voltage. - In metal constructions, for piping systems, tanks, blacksmithing, craft works.	Rm (MPa)	> 530	1.6 x 300	30 A	= -
E6013	Mn	0.45		Re (MPa)	> 460	2.0 x 300	50 A	
ISO 2560-A	Si	0.4		A5 (%)	> 22	2.5 x 350	70 A	~40 V
E 42 0 RC 1 1	S	<0.025		KV (J)	+20°C → >65	3.2 x 350	110 A	
	P	<0.025			0°C → >47	3.2 x 450	110 A	
	Fe	Rem.			-20°C → >28	4.0 x 350	140 A	
						4.0 x 450	140 A	
						5.0 x 450	170 A	

SELECTARC 54

GOOD APPEARANCE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.1	C	<0.10	- Heavy coated rutile electrode for general use. Especially recommended for downhand welding, for fillet welds and vertical up position. Soft arc, low spatters, self lifting slag, excellent bead appearance. - Currently used for welding mechanical constructions, shipbuilding, locksmithing, boiler making...	Rm (MPa)	510-580	2.0 x 300	55 A	= -
E6013	Mn	0.6		Re (MPa)	> 420	2.5 x 350	70 A	
ISO 2560-A	Si	0.4		A5 (%)	> 22	3.2 x 350	115 A	~45 V
E 42 0 RR 1 2	S	<0.025		KV (J)	+20°C → >64	3.2 x 450	115 A	
	P	<0.025			0°C → >47	4.0 x 350	150 A	
	Fe	Rem.			-20°C → >28	4.0 x 450	150 A	
						5.0 x 450	180 A	

SELECTARC 55

HEAVY COATED

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.1	C	<0.10	- Thick coated rutile electrode destined for flat or for fillet welding when a nice aspect of the weld bead is searched. Concave bead in angle, very soft fusion and self releasing slag, supports high current. - Frequently used for final passes.	Rm (MPa)	510-580	2.0 x 300	70 A	= -
E6013	Mn	0.6		Re (MPa)	> 420	2.5 x 350	90 A	~45 V
ISO 2560-A	Si	0.45		A5 (%)	> 22	3.2 x 350	135 A	
E 42 0 RR 1 2	S	<0.025		KV (J)	+20°C → > 64	3.2 x 450	135 A	
	P	<0.025			0°C → > 47	4.0 x 450	180 A	
	Fe	Rem.			-20°C → > 28	5.0 x 450	250 A	

SELECTARC D6

VERTICAL DOWN

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.1	C	<0.10	- 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. - Also used as universal electrode for metal constructions.	Rm (MPa)	510-580	2.0 x 300	60 A	= -
E6013	Mn	0.6		Re (MPa)	> 420	2.5 x 350	80 A	~40 V
ISO 2560-A	Si	0.4		A5 (%)	> 22	3.2 x 350	130 A	
E 42 0 RC 1 1	S	<0.025		KV (J)	+20°C → > 70	4.0 x 350	170 A	
	P	<0.025			0°C → > 50			
	Fe	Rem.			-20°C → > 30			

SELECTARC 160

HIGH EFFICIENCY (JET TYPE)

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.1	C	<0.10	- 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. - Frequently used for butt-welding plates with a heavy thickness and for fillet welds.	Rm (MPa)	500-580	3.2 x 450	150 A	= -
E7024	Mn	0.6		Re (MPa)	> 380	4.0 x 450	200 A	~40 V
ISO 2560-A	Si	0.45		A5 (%)	> 22	5.0 x 450	260 A	
E 38 0 RR 5 3	S	<0.025		KV (J)	+20°C → > 64			
	P	<0.025			0°C → > 47			
	Fe	Rem.						

SELECTARC C6010

CELLULOSIC COATING

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.1	C	0.12	- Selectarc C6010 is a cellulose covered electrode developed for field welding of pipelines in the vertical-down position. Excellent weldability in root-, hot-, filler- and cap-pass welding. Easy slag removal. - Particularly suitable for root pass welding (DC ±), also in the vertical-up position. Hand-warm preheating: 80-100°C. Interpass: 180°C.	Rm (MPa)	> 500	2.5 x 350	70 A	= +
E6010	Mn	0.45		Re (MPa)	> 420	3.2 x 350	110 A	
ISO 2560-A	Si	0.2		A5 (%)	26	4.0 x 350	150 A	
E 42 2 C 25	S	<0.025		KV (J)	-20°C → 70			
	P	<0.025						
	Fe	Rem.						

SELECTARC Galva 46

FOR WELDING BEFORE GALVANIZATION

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.1	C	0.06	- Heavy coated rutile electrode to weld construction steels which will be galvanised after welding. Good weldability in all positions, also possible to weld short beads in vertical down position. - Easy slag removal, regular rippled weld beads.	Rm (MPa)	460	2.0 x 300	70 A	= -
E6013	Mn	0.2		Re (MPa)	400	2.5 x 350	90 A	~40 V
ISO 2560-A	Si	0.3		A5 (%)	25	3.2 x 350	130 A	
E 35 0 RR 3 1	S	<0.025		KV (J)	+20°C → 100	4.0 x 450	180 A	
	P	<0.025			0°C → > 47			
	Fe	Rem.						

SELECTARC RR B7

FOR ROOT PASS WELDING

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.1	C	<0.10	- Special rutile-basic coated electrode. Especially designed for root welding. Good operability, good penetration and easy slag removal. Supports high current. - Applied in metal constructions, for piping systems, tanks.	Rm (MPa)	470-600	2.5 x 350	70-90 A	= -
E6013	Mn	0.6		Re (MPa)	> 430	3.2 x 350	100-140 A	~40 V
ISO 2560-A	Si	0.3		A5 (%)	> 20	4.0 x 350	140-180 A	
E 38 2 RB 1 2	S	<0.025		KV (J)	+20°C → 95	5.0 x 450	200-260 A	
	P	<0.025			-20°C → 60			
	Fe	Rem.						

UN-ALLOYED STEELS

BASIC UN-ALLOYED STEELS

SELECTARC B56S

UNIVERSAL BASIC

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.1	C	<0.1	- 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 cracking. Slag easy to remove. - For frames, cases, supports, shipbuilding, pressure vessels.	Rm (MPa)	510-610	2.5 x 350	65-100 A	= +
E7018-1	Mn	1.1		Re (MPa)	>420	3.2 x 350	95-140 A	
ISO 2560-A	Si	0.4		A5 (%)	>22	3.2 x 450	95-140 A	~70 V
E 42 4 B 3 2 H5	S	<0.025		KV(J)	+20°C → >120	4.0 x 450	135-180 A	
	P	<0.025			-20°C → >70	5.0 x 450	160-250 A	
	Fe	Rem.			-50°C → >40			
					-40°C → >47			

SELECTARC B7016Sp

DOUBLE COATED, SPECIAL FOR REPAIRING

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.1	C	<0.1	- Basic coated electrode with outstanding welding characteristics due to its double coating. Stable arc in all positions. Universal use for all construction steels and repairs. - Recommended for root pass and also for bad edge preparation.	Rm (MPa)	550	2.5 x 350	80 A	= +
E7016	Mn	0.9		Re (MPa)	450	3.2 x 350	115 A	
ISO 2560-A	Si	0.7		A5 (%)	27	3.2 x 450	115 A	~70 V
E 38 2 B 1 2 H10	S	<0.02		KV(J)	+20°C → 150	4.0 x 450	150 A	
	P	<0.02			-20°C → 80	5.0 x 450	190 A	
	Fe	Rem.			-50°C → 70			

SELECTARC B58

UNIVERSAL BASIC 7018

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.1	C	0.07	- Universal basic coated, low hydrogen (with iron powder, recovery 118%) electrode for welding highly stressed connections with high security. Good low temperature properties down to -40°C and to cold cracking. Stable arc, uniform weld beads, and easy slag removal. - Pressure vessels, piping, ship building...	Rm (MPa)	580	2.5 x 350	70-90 A	= +
E7018	Mn	1.4		Re (MPa)	480	3.2 x 350	90-120 A	
ISO 2560-A	Si	0.5		A5 (%)	28	4.0 x 450	130-180 A	~65 V
E 42 4 B 3 2 H5	S	<0.02		KV(J)	-20°C → 180	5.0 x 450	170-220 A	
	P	<0.02			-40°C → 70			
	Fe	Rem.						

SELECTARC B7018S

UNIVERSAL 7018-1

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.1	C	<0.1	- 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, shipbuilding, pressure vessels.	Rm (MPa)	530-660	2.5 x 350	80 A	= +
E7018-1	Mn	1.3		Re (MPa)	>460	3.2 x 350	115 A	
ISO 2560-A	Si	0.5		A5 (%)	>24	3.2 x 450	115 A	~70 V
E 46 4 B 3 2 H5	S	<0.025		KV(J)	+20°C → >160	4.0 x 450	150 A	
	P	<0.025			-20°C → >100	5.0 x 450	190 A	
	Fe	Rem.			-40°C → >47			



LOW ALLOYED STEELS

BASIC HIGH STRENGTH

SELECTARC B70

HIGH STRENGTH

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.5	C	<0.1	- Basic coated electrode highly resistant to cracking for welding steels with high mechanical characteristics (Rm up to 800 MPa). - Defect free high quality weld. Regular fusion, stable arc, low spatters.	Rm (MPa)	720-820	2.5 x 350	80 A
E10018-G	Mn	1.4		Re (MPa)	>620	3.2 x 350	115 A
ISO 18275-A	Si	0.5		A5 (%)	>22	4.0 x 450	150 A
E 62 5 1,5NiMo B 4 2 H5	Mo	0.4		KV (J)	+20°C → >130	5.0 x 450	190 A
	Ni	1.5			-20°C → >90		
	Cr	0.2			-50°C → >50		
	Fe	Rem.					

SELECTARC B72

HIGH STRENGTH

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.5	C	<0.1	- Low hydrogen basic coated electrode, particularly recommended for root passes on fine grain steels resistant to a tensile strength between 550 and 700 MPa. - Crane mounting rails...	Rm (MPa)	>620	2.5 x 350	80 A
E9018-G	Mn	1.2		Re (MPa)	>550	3.2 x 350	115 A
ISO 18275-A	Si	0.5		A5 (%)	>20	4.0 x 450	150 A
E 55 5 1NiMo B 4 2 H5	Mo	0.3		KV (J)	+20°C → >150	5.0 x 450	190 A
	Ni	0.8			-50°C → >50		
	Cr	0.1			-60°C → >28		
	Fe	Rem.		After stress relieving at 600°C/1h.			

SELECTARC B73

HIGH STRENGTH

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.5	C	<0.1	Low hydrogen basic coated electrode with high yield strength for welding fine grain steels applied at temperatures between -50 to +500°C. Resistant to fatigue, corrosion in the presence of phosphorus and sulphur.	Rm (MPa)	630-710	2.5 x 350	80 A
E9018-D1	Mn	1.5		Re (MPa)	550-600	3.2 x 350	115 A
ISO 18275-A	Si	0.5		A5 (%)	>18	4.0 x 450	150 A
E 55 4 MnMo B 4 2 H5	Mo	0.4		KV (J)	+20°C → >150	5.0 x 450	190 A
	Fe	Rem.			-40°C → >50		
					-50°C → >30		
				After stress relieving at 620°C/1h.			

SELECTARC B74

HIGH STRENGTH

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.5	C	0.06	Low hydrogen basic coated electrode with increased yield strength for welding fine grain steels applied at temperatures between -40 to +500°C. Thermal treated low alloyed steels with C-Mn. Smooth fusion, easy slag removal, nice aspect of weld seam.	Rm (MPa)	650	2.5 x 350	80 A
E 8018-G	Mn	1.4		Re (MPa)	570	3.2 x 350	115 A
ISO 2560-A	Si	0.4		A5 (%)	25	4.0 x 450	150 A
E 50 2 Mo B 4 2 H5	Mo	0.5		KV (J)	+20°C → 160	5.0 x 450	190 A
	Ni	0.2			-30°C → 60		
	S	<0.02					
	P	<0.02					
	Fe	Rem.					

LOW ALLOYED STEELS

SELECTARC B75Cu

FOR WELDING WEATHER RESISTANCE STEEL

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	<0.1	- Low hydrogen basic coated electrode with a steel deposit containing Cu- Ni- Cr, for welding all steels resistant to atmospheric corrosion. - Public buildings, department of civil engineering, navy, tanks, water tower, bridges, crash barrier, electrical pylons.	Rm (MPa)	>550	2.5 x 350	80 A	= +
E8018-W2	Mn	1.0		Re (MPa)	>460	3.2 x 350	115 A	
ISO 2560-A	Si	0.4		A5 (%)	>19	4.0 x 450	150 A	
E 46 2 Z B 4 2 H5	Ni	0.5		KV (J)	-20°C → >60	5.0 x 450	190 A	
	Cr	0.5						
	Cu	0.4						
	S	<0.025						
	P	<0.025						
	Fe	Rem.						

SELECTARC B77

HIGH STRENGTH STEEL

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	<0.1	- Basic electrode with a deposit which is very resistant to cracking and has a high tensile strength. For welding similar fine grain steels, with a yield strength of Re >650 MPa. - Very good radiographic quality, lifting machines.	Rm (MPa)	>760	2.5 x 350	80 A	= +
E11018-M	Mn	1.5		Re (MPa)	>690	3.2 x 350	115 A	
ISO 18275-A	Si	0.4		A5 (%)	>20	4.0 x 450	150 A	
E 69 4 Mn2NiCrMo B 4 2 H5	Ni	2.1		KV (J)	+20°C → >120	5.0 x 450	190 A	
	Cr	0.4			-40°C → >60			
	Mo	0.5			-50°C → >27			
	Fe	Rem.						

BASIC CREEP RESISTANT

SELECTARC B60

HIGH TEMPERATURE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	<0.1	- Low hydrogen basic coated electrode with Mo for welding creep resisting steels used at temperatures up to 500°C. Good resistance to hydrogen attack (chemical installations). - Used for piping systems, vessels...	Rm (MPa)	>550	2.5 x 350	80 A	= +
E7018-A1	Mn	0.8		Re (MPa)	>450	3.2 x 350	115 A	
ISO 3580-A	Si	0.4		A5 (%)	>22	4.0 x 450	150 A	
E Mo B 4 2 H5	Mo	0.5		KV (J)	+20°C → >100	5.0 x 450	190 A	
	S	<0.025		After heat treatment at 650°C/1h.				
	P	<0.025						
	Fe	Rem.						

SELECTARC B63

FOR CREEP RESISTING STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	<0.12	- Low hydrogen basic coated electrode with Cr and Mo for welding creep resisting steels (1% Cr - 0.5 % Mo). Resistant to high temperature up to 500-550°C. - For piping systems, vessels, superheaters	Rm (MPa)	>550	2.5 x 350	80 A	= +
E8018-B2	Mn	0.8		Re (MPa)	>460	3.2 x 350	115 A	
ISO 3580-A	Si	0.4		A5 (%)	>19	4.0 x 450	150 A	
E CrMo1 B 4 2 H5	Cr	1.1		KV (J)	+20°C → >120	5.0 x 450	190 A	
	Mo	0.5		After heat treatment at 700°C/1h.				
	S	<0.025						
	P	<0.025						
	Fe	Rem.						

SELECTARC B68

FOR CREEP RESISTING STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	0.07	- Low hydrogen basic coated electrode with Cr and Mo for welding creep resisting steels used in service up to 600°C (2 % Cr - 1 % Mo). High resistance to H2S... - For superheaters, valve bodies, pipes, boilers, hydrocrackers.	Rm (MPa)	>570	2.5 x 350	80 A	= +
E9018-B3	Mn	0.8		Re (MPa)	>450	3.2 x 350	115 A	
ISO 3580-A	Si	0.4		A5 (%)	>17	4.0 x 450	150 A	
E CrMo2 B 4 2 H5	Cr	2.25		KV (J)	+20°C → >100	5.0 x 450	190 A	
	Mo	1.0		After heat treatment: 700 at 750°C/1h.				
	S	<0.025						
	P	<0.025						
	Fe	Rem.						

SELECTARC B69

FOR CREEP RESISTING STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.5	C	<0.1	- Low hydrogen basic coated electrode with Cr and Mo for welding steels of similar chemical composition. Deposit resisting up to 600°C. - Highly resistant to hot gas and superheated steam.	Rm (MPa)	>590	2.5 x 350	80 A	= +
E8018-B6	Mn	0.8		Re (MPa)	>420	3.2 x 350	115 A	
ISO 3580-A	Si	0.4		A5 (%)	>20	4.0 x 450	150 A	
E CrMo5 B 4 2 H5	Cr	5.0		KV (J)	+20°C → >70	5.0 x 450	190 A	
	Mo	0.5		After heat treatment at 730°C/1h.				
	S	<0.025						
	P	<0.025						
	Fe	Rem.						

SELECTARC B609

FOR CREEP RESISTING STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.5	C	<0.1	- 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 resisting to temperature and creep up to 600°C. Highly resistant to hot gas and overheated steam. - For power plants, heat exchangers, tubes, steam boilers...	Rm (MPa)	>650	2.5 x 350	80 A	= +
E8016-B8	Mn	0.8		Re (MPa)	>500	3.2 x 350	115 A	
ISO 3580-A	Si	0.4		A5 (%)	>19	4.0 x 450	150 A	
E CrMo9 B 4 2 H5	Cr	9.0		KV (J)	+20°C → >60			
	Mo	1.0		After heat treatment at 750°C/1h.				
	S	<0.025						
	P	<0.025						
	Fe	Rem.						

SELECTARC B691

BASIC COATED FOR CREEP RESISTING STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.5	C	0.1	Low hydrogen basic coated electrode with an alloyed core wire for welding creep resistant steels of similar chemical composition (known as P91) used at service temperatures up to 650°C. Deposit resisting to temperature and creep up to 650°C. Highly resistant to hot gas and overheated steam.	Rm (MPa)	750	2.5 x 300	80 A	= +
E 9015-B9	Mn	0.7		Re (MPa)	630	3.2 x 350	115 A	
ISO 3580-A	Si	0.25		A5 (%)	18	4.0 x 450	150 A	
E CrMo91 B 4 2 H5	Cr	9.0		KV (J)	+20°C → 60			
	Ni	0.7						
	Mo	1.0						
	Cu	0.04						
	V	0.2						
	Nb	0.05						
	N	0.05						
	S	0.008						
	P	0.01						
	Fe	Rem.						

SELECTARC B691N

FOR CREEP RESISTING STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.5	C	0.09	Low hydrogen basic coated electrode for welding creep resistant steels of similar chemical composition (known as P91) used at service temperatures up to 620°C. The deposit is resisting to temperature and creep up to 620°C ; highly resistant to hot gas and overheated steam.	Rm (MPa)	720	2.5 x 300	90 A	= +
E9018-B9	Mn	0.6		Re (MPa)	600	3.2 x 350	120 A	
ISO 3580-A	Si	0.25		A5 (%)	19	4.0 x 450	150 A	
E CrMo9 1 B 42 H5	Cr	9.0		KV (J)	+20°C → 80 0°C → 50			
	Ni	0.6						
	Mo	0.9						
	Cu	0.05						
	V	0.2						
	Nb	0.04						
	N	0.03						
	P	0.01						
	S	0.008						
	Fe	Rem.						

LOW ALLOYED STEELS

BASIC LOW TEMPERATURE

SELECTARC B81

FOR COLD TOUGH STEELS ≤ - 60°C

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	<0.12	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.	Rm (MPa)	>550	2.5 x 350	80 A	= +
E8018-C3	Mn	1.1		Re (MPa)	>470	3.2 x 350	115 A	
ISO 2560-A	Si	0.5		A5 (%)	>24	4.0 x 450	150 A	
E 46 5 1Ni B 4 2 H5	Ni	1.0		KV (J)	-40°C → >70 -50°C → >47	5.0 x 450	190 A	
	S	<0.025						
	P	<0.025						
	Fe	Rem.						

SELECTARC B82

FOR COLD TOUGH STEELS AT - 60°C

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	<0.12	- Low hydrogen basic coated electrode alloyed with nickel for welding cold tough fine grain steels applied at low temperature -60°C. - For liquid gas distribution pipes, tanks, off shore, and petrochemical industry.	Rm (MPa)	>550	2.5 x 350	80 A	= +
E8018-C1	Mn	1.0		Re (MPa)	>460	3.2 x 350	115 A	
ISO 2560-A	Si	0.4		A5 (%)	>19	4.0 x 450	150 A	
E 46 6 2Ni B 4 2 H5	Ni	2.5		KV (J)	-40°C → >70 -60°C → >47 -73°C → >27	5.0 x 450	190 A	
	S	<0.025						
	P	<0.025						
	Fe	Rem.						

SELECTARC B84

FOR COLD TOUGH STEELS < - 80°C

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	<0.1	- 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.	Rm (MPa)	>550	2.5 x 350	80 A	= +
E8018-C2	Mn	0.9		Re (MPa)	>460	3.2 x 350	115 A	
ISO 2560-A	Si	0.3		A5 (%)	>19	4.0 x 450	150 A	
E 46 6 3Ni B 4 2 H5	Ni	3.5		KV (J)	-73°C → >80 -100°C → >30	5.0 x 450	190 A	
	S	<0.025						
	P	<0.025						
	Fe	Rem.						

SELECTARC B842

FOR COLD TOUGH STEELS ≤ - 60°C

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.5	C	0.06	Low hydrogen basic coated electrode alloyed with nickel for welding steels with high tensile strength, with high toughness, resistant to low temperature down to -60°C. Used for weld joints exposed to low temperature. Regular fusion, good uniformed weld bead.	Rm (MPa)	550-680	2.5 x 350	80 A	= +
E 7018-G	Mn	1.2		Re (MPa)	>470	3.2 x 350	115 A	
ISO 2560-A	Si	0.4		A5 (%)	>22	4.0 x 450	150 A	
E 42 6 1Ni B 4 2 H5	Ni	0.9		KV (J)	-60°C → 50	5.0 x 450	190 A	
	S	<0.020						
	P	<0.025						
	Fe	Rem.						



HIGH ALLOYED STEELS

STAINLESS STEEL WELDING

BASE METAL	STEEL	308L	308H	308LF	347	321	316L	318	309L	309LMO	310	310H	410	410 NiMo	U B6	U 45N	U 52N+
Material n°	-	1.4306	1.4948	-	1.4450	1.4541	1.4404	1.4580	1.4XXX	1XX	1.4841	1.44848	1.4006	1.4407	1.4539	1.4462	1.4507
	18/8	18/8 C	18/8 C	18/8 LF	18/8 NB	18/8 TI	18/8/3	18/8/3 NB	24/12	24/12 Mo	25/20	25/20 C	13CR	13/4	385	2209	25/9/4 N LB
	AUSTENITIC										HEAT RESISTANT STEELS		MARTENSITIC		DUPLEX STEELS		
U 52N+	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB	2509MoB Inox 385	2509MoB	2509MoB
U 45N	Inox 2209	Inox 2209	Inox 2209	Inox 2209	Inox 2209	Inox 2209	Inox 2209	Inox 2209	Inox 2209	Inox 2209	25/20B	25/20B	Inox 2209	Inox 2209	Inox 385	2209	
U B6	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	Inox 385	385		
410 NiMo	Inox 13/4 24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	25/20B	25/20B	Inox 13/4	13/4			
410	Inox 410B 24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	25/20B	25/20B	410B				
310H	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	310H					
310	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20B	25/20R						
309LMO	24/12Mo	24/12Mo 24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12Mo							
309L	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S	24/12S								
318	24/12S	20/10MBC Inox 318	20/10MBC Inox 318	20/10MBC Inox 318	20/10MBC	20/10MBC	Inox 318 20/10MBC	318									
316L	24/12Mo	20/10MBC	20/10MBC	20/10MBC	20/10MBC	20/10MBC	20/10MBC										
321	24/12S	20/10BC Inox 347	20/10BC Inox 347	20/10BC Inox 347	Inox 347	321											
347	24/12S	Inox 347 20/10BC	Inox 347 20/10BC	Inox 347 20/10BC	347												
308LF	24/12S	20/10BC	20/10BC	308LF													
308H	24/12S Ni82	20/10BC Inox308HB	308HB														
308L	24/12S	20/10BC															

CHOICE

HIGH ALLOYED STEELS

SELECTARC 20/10BC

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Low carbon Rutile-basic-coated austenitic stainless steel electrode. Coating with very low moisture pick up. - Applied for all 18/8 type stainless steels at service temperatures from -120°C up to +350°C : tubes, tanks, heat exchangers, piping systems.	Rm (MPa)	>540	2.0 x 300	45 A	= +
E308L-16	Mn	0.7		Rp0,2 (MPa)	>360	2.5 x 350	70 A	
EN 1600	Si	0.8		A5 (%)	>35	3.2 x 350	100 A	~70 V
ISO 3581-A	Ni	9.5		KV (J)	+20°C → >70	4.0 x 350	135 A	
E 19 9 L R 3 2	Cr	19.0				5.0 x 450	180 A	
	Fe	Rem.						

STANDARD 308L RUTILE COATED

SELECTARC INOX 308B

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.04	- Low carbon stainless steel electrode, basic type coating. Excellent in all position and especially on bad prepared joints. Very good mechanical properties. - Used on 18/8 stainless steels for service temperatures from -196°C up to +350°C.	Rm (MPa)	>560	2.5 x 300	70 A	= +
E308L-15	Mn	1.6		Rp0,2 (MPa)	>380	3.2 x 350	90 A	
EN 1600	Si	0.4		A5 (%)	>35	4.0 x 350	120 A	
ISO 3581-A	Ni	9.5		KV (J)	+20°C → >90			
E 19 9 L B 4 2	Cr	19.0			-196°C → >30			
	Fe	Rem.						

308L BASIC COATED

SELECTARC 308HR

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.04	- Synthetic electrode with high recovery (160 %). Rutile-basic coated with a deposit of 19% Cr - 9% Ni stainless steel type. Easy striking, stable arc, clean spatter-free welds. - To use on similar (304 type) stainless steels. For tubes, tanks, stainless steel constructions.	Rm (MPa)	>550	1.6 x 250	50 A	= +
E308L-26	Mn	0.7		Rp0,2 (MPa)	>360	2.0 x 350	60 A	
EN 1600	Si	0.9		A5 (%)	>35	2.5 x 350	90 A	~55 V
ISO 3581-A	Ni	9.5		KV (J)	+20°C → >60	3.2 x 350	120 A	
E 19 9 L R 7 3	Cr	19.0				4.0 x 450	150 A	
	Fe	Rem.						

HIGH EFFICIENCY (JET TYPE)

SELECTARC INOX 308HB

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.05	- Austenitic stainless steel electrode, basic type coating with approx. 5% ferrite and higher carbon content. Excellent mechanical properties. Used on 18/8 stainless steels (304H type) for elevated service temperatures up to +750°C. - For petrochemical industry: tubes, heat exchangers, piping systems.	Rm (MPa)	>560	2.5 x 300	70 A	= +
E308H-15	Mn	1.8		Rp0,2 (MPa)	>380	3.2 x 350	90 A	
EN 1600	Si	0.4		A5 (%)	>35	4.0 x 350	120 A	
ISO 3581-A	Ni	9.5		KV (J)	+20°C → >80			
E 19 9 H B 4 2	Cr	19.5						
	Fe	Rem.						

HIGH CARBON / BASIC

SELECTARC INOX 347

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	Rutile-basic coated electrode 18% Cr - 8% Ni type stainless steel, with Niobium stabilised, suited to weld Ti or Nb stabilised stainless steels. Smooth fusion without spatters, easy striking and restriking, excellent slag removal. The weld deposit resists to intercrystalline corrosion up to 400°C.	Rm (MPa)	>550	2.0 x 300	45 A	= +
E347-17	Mn	0.7		Rp0,2 (MPa)	>350	2.5 x 350	70 A	
EN 1600	Si	0.8		A5 (%)	>30	3.2 x 350	100 A	~70 V
ISO 3581-A	Ni	9.5		KV (J)	+20°C → >60	4.0 x 350	135 A	
E 19 9 Nb R 3 2	Cr	19.0				5.0 x 450	180 A	
	Nb	0.3						
	Fe	Rem.						

NIOBIUM - STABILISED

SELECTARC INOX 16-8-2B

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.05	- Austenitic stainless steel electrode, basic type coating with approx. 5% ferrite and increased carbon content. Stable arc, good slag removal, regular weld bead. Good behavior in positional welding and on bad prepared joints. Excellent mechanical properties. Used on 18/8 stainless steels (304H type) and 17-12-2 stainless steels (316H type) as well as for stabilized grades, applied for elevated service temperatures up to +750°C. - For petrochemical industry: tubes, heat exchangers, piping systems.	Rm (MPa)	>560	2.5 x 300	70 A	= +
E16 8 2-15	Mn	1.8		Rp0,2 (MPa)	>380	3.2 x 350	90 A	
EN 1600	Si	0.4		A5 (%)	>35	4.0 x 350	120 A	
ISO 3581-A	Ni	9.0		KV (J)	+20°C → >60			
E 16 8 2 B 4 3	Cr	16.0						
	Mo	1.7						
	Fe	Rem.						

HIGH CARBON / BASIC

SELECTARC 20/10MBC

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Rutile-basic stainless steel electrode that has coating with very low moisture pick-up. Smooth fusion, without spatters, excellent slag removal, easy restriking. For welding and cladding on austenitic Cr-Ni-Mo stainless steels. - Applied in the chemical and petrochemical industries, refineries, food industry and for shipbuilding to weld pipes, tanks, heat exchangers...	Rm (MPa)	>560	1.6 x 250	30 A	= + ~70 V
E316L-16	Mn	0.7		Rp0,2 (MPa)	>400	2.0 x 300	45 A	
EN 1600	Si	0.8		A5 (%)	>35	2.5 x 300	70 A	
ISO 3581-A	Ni	12.0		KV (J)	+20°C → 70	3.2 x 350	100 A	
E 19 12 3 L R 3 2	Cr	18.5			-120°C → 40	4.0 x 350	135 A	
	Mo	2.7				5.0 x 450	180 A	
	Fe	Rem.						

STANDARD 316L RUTILE COATED

SELECTARC INOX 316L

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Rutile-basic coated electrode with a coating that has very with very low moisture pick-up. Smooth fusion, without spatters, self releasing slag, exceptional bead appearance and restriking. For welding and cladding on austenitic Cr-Ni-Mo stainless steels and clad plates. - For service temperatures from -120°C up to +400°C in the chemical and petrochemical industries, refineries, food industry and in shipbuilding to weld pipes, tanks, heat exchangers, pulp and paper...	Rm (MPa)	580	2.0 x 300	45 A	= + ~70 V
E316L-17	Mn	0.7		Rp0,2 (MPa)	450	2.5 x 350	75 A	
EN 1600	Si	0.8		A5 (%)	40	3.2 x 350	110 A	
ISO 3581-A	Ni	12.2		KV (J)	+20°C → 70	4.0 x 450	140 A	
E 19 12 3 L R 3 2	Cr	18.5			-120°C → 40			
	Mo	2.8						
	Fe	Rem.						

SPRAY AND FINE RIPPLED WELD BEAD

SELECTARC 316VD

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Low carbon Rutile-basic coated electrode, 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 +350°C. - Chemical and petrochemical industries, refineries, pulp and paper...	Rm (MPa)	>560	2.0 x 300	50 A	= + ~80 V
E316L-16	Mn	0.7		Rp0,2 (MPa)	>400	2.5 x 300	70 A	
EN 1600	Si	0.8		A5 (%)	>30	3.2 x 350	100 A	
ISO 3581-A	Ni	11.5		KV (J)	+20°C → >60			
E 19 12 3 L R 3 1	Cr	18.0						
	Mo	2.5						
	Fe	Rem.						

FOR VERTICAL DOWN

SELECTARC INOX 316NG

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.04	- Low carbon basic coated stainless steel electrode. For welding and cladding on austenitic Cr-Ni-Mo stainless steels and clad plates. Good behaviour in positional welding and especially on bad prepared joints. Applied for service temperatures from -196°C up to +350°C. - Chemical and petrochemical industries, refineries and in shipbuilding to weld pipes, tanks, heat exchangers...	Rm (MPa)	>560	2.5 x 300	70 A	= +
E316L-15	Mn	1.6		Rp0,2 (MPa)	>380	3.2 x 350	90 A	
EN 1600	Si	0.4		A5 (%)	>35	4.0 x 350	120 A	
ISO 3581-A	Ni	12.0		KV (J)	+20°C → >80			
E 19 12 3 L B 4 2	Cr	18.0			-120°C → >50			
	Mo	2.7						
	Fe	Rem.						

BASIC COATED

SELECTARC 316HR

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.04	- Synthetic electrode with high recovery (160%) and a Rutile-basic coating giving a 316L deposit with approx. 8 % delta ferrite. Easy striking and restriking, smooth arc, clean spatter-free welds. - Used for high efficiency welds. To weld stainless steels of similar composition, pulp and paper industry, foodstuff industry...	Rm (MPa)	>560	1.6 x 250	50 A	= + ~55 V
E316L-26	Mn	0.7		Rp0,2 (MPa)	>380	2.0 x 350	60 A	
EN 1600	Si	0.9		A5 (%)	>30	2.5 x 350	90 A	
ISO 3581-A	Ni	11.5		KV (J)	+20°C → >60	3.2 x 350	120 A	
E 19 12 3 L R 7 3	Cr	18.0				4.0 x 450	150 A	
	Mo	2.5						
	Fe	Rem.						

HIGH EFFICIENCY (JET TYPE)

HIGH ALLOYED STEELS

SELECTARC INOX 318

NIOBIUM STABILISED

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Rutile-basic coated electrode suited to weld Ti or Nb (Cb) stabilised CrNiMo austenitic stainless steels. Smooth fusion without spatters, easy striking and restriking, moisture resistant coating. - Used for service temperatures from -120°C up to +350°C in petrochemical industries and for sea water applications.	Rm (MPa)	>550	2.0 x 300	45 A	= +
E318-17	Mn	0.7		Rp0,2 (MPa)	>350	2.5 x 350	70 A	
EN 1600	Si	0.8		A5 (%)	>30	3.2 x 350	100 A	~70 V
ISO 3581-A	Ni	12.0		KV (J)	+20°C → >60	4.0 x 350	135 A	
E 19 12 3 Nb R 3 2	Cr	18.0				5.0 x 450	180 A	
	Mo	2.7						
	Nb	0.3						
	Fe	Rem.						

SELECTARC INOX 317L

STAINLESS STEEL ELECTRODE WITH 3,5% Mo

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.02	- Low carbon Rutile-coated austenitic stainless steel electrode with ~3,5% of Molybdenum and approx. 8% ferrite. This electrode has a coating with very low moisture pick up. Smooth fusion, spatter-free, very easy slag removal, exceptional weld bead appearance, easy striking and restriking. Higher pitting corrosion resistance than Inox 316L. - Designed for welding and hardfacing stainless steels like 316L and 317L as well as stabilised grades.	Rm (MPa)	600	2.0 x 300	45 A	= +
E317L-17	Mn	0.7		Rp0,2 (MPa)	470	2.5 x 350	75 A	
EN 1600	Si	0.8		A5 (%)	35	3.2 x 350	110 A	~70 V
ISO 3581-A	Ni	13		KV (J)	+20°C → 60	4.0 x 350	140 A	
EZ 19 13 4 LR 3 2	Cr	19						
	Mo	3.5						
	Fe	Rem.						

SELECTARC 24/12S

RUTILE COATED

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Rutile-basic electrode for welding dissimilar steels as stainless steels to low alloyed steels. Also suitable for welding high temperature steels and as buffer layer before hardfacing. - Buffer layer on construction steels for 18/8 cladding.	Rm (MPa)	>560	2.0 x 300	45 A	= +
E309L-16	Mn	0.7		Rp0,2 (MPa)	>400	2.5 x 350	70 A	
EN 1600	Si	0.8		A5 (%)	>35	3.2 x 350	100 A	~70 V
ISO 3581-A	Ni	12.5		KV (J)	+20°C → >60	4.0 x 350	135 A	
E 23 12 L R 3 2	Cr	22.5				5.0 x 450	180 A	
	Fe	Rem.						

SELECTARC 309HR

HIGH EFFICIENCY (JET TYPE)

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.04	- Synthetic electrode with high recovery (160 %). Rutile-basic coated 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.	Rm (MPa)	>560	2.0 x 350	65 A	= +
E309L-26	Mn	0.7		Rp0,2 (MPa)	>400	2.5 x 350	90 A	
EN 1600	Si	0.9		A5 (%)	>35	3.2 x 350	130 A	~50 V
ISO 3581-A	Ni	12.5		KV (J)	+20°C → >50	4.0 x 450	170 A	
E 23 12 L R 7 3	Cr	22.5						
	Fe	Rem.						

SELECTARC 24/12Mo

FOR REPAIRING

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- 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 before a 316 L type cladding. - Also used as an universal repairing electrode in maintenance welding. Highly crack resistant.	Rm (MPa)	>650	2.0 x 300	45 A	= +
E309LMo-17	Mn	0.7		Rp0,2 (MPa)	>450	2.5 x 350	70 A	
EN 1600	Si	0.8		A5 (%)	>25	3.2 x 350	100 A	~70 V
ISO 3581-A	Ni	12.5		KV (J)	+20°C → >55	4.0 x 350	135 A	
E 23 12 2 L R 3 2	Cr	22.5			-40°C → >45	5.0 x 450	180 A	
	Mo	2.3						
	Fe	Rem.						

SELECTARC 307R

HIGH MANGANESE / RUTILE

Classification			Weld metal composition (%)		Characteristics and applications		Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4			C	0.10	▪ 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. ▪ For civil engineering, railways, cement works.	Rm (MPa)	>600	2.5 x 300	70 A	= +	
~E307-16			Mn	4.5		Rp0,2 (MPa)	>400	3.2 x 350	100 A		
EN 1600			Si	1.2		A5 (%)	>30	4.0 x 350	125 A	~70 V	
ISO 3581-A			Ni	8.0		KV (J)	+20°C → >70	5.0 x 350	160 A		
E 18 8 Mn R 3 2			Cr	18.0		Hardness: as welded ~200 HB, work hardened ~500 HB					
			Fe	Rem.							

SELECTARC 307B

HIGH MANGANESE / BASIC

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	0.1	- Austenitic (non-magnetic) basic coated stainless steel electrode for joining and overlaying on manganese steels (up to 14 % Mn) and high sulphur and phosphorus bearing steels, also for joining dissimilar steels, construction steels to stainless steels, for cushion layers prior hardfacing. - Repairing of pieces subject to shocks or wear by friction.	Rm (MPa)	600-750	2.5 x 300	65 A	= +
~E307-15	Mn	6.0		Rp0,2 (MPa)	>400	3.2 x 350	90 A	
EN 1600	Si	0.4		A5 (%)	>35	4.0 x 350	120 A	
ISO 3581-A	Ni	8.0		KV (J)	+20°C → >90	5.0 x 350	150 A	
E 18 8 Mn B 3 2	Cr	18.0		Hardness:				
	Fe	Rem.		as welded ~200 HB,				
				work hardened ~500 HB				

SELECTARC 18/8Mn

HIGH MANGANESE / SYNTHETIC (JET TYPE)

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	0.1	- 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. - For repairs of rails, earthmoving, cement works, different types of crushers.	Rm (MPa)	600-750	2.5 x 350	90 A	= +
~E307-26	Mn	5.0		Rp0,2 (MPa)	>400	3.2 x 350	130 A	
EN 1600	Si	0.8		A5 (%)	>30	4.0 x 450	160 A	
ISO 3581-A	Ni	8.5		KV (J)	+20°C → >70			
E 18 8 Mn R 7 3 X	Cr	18.0		Hardness:				
	Fe	Rem.		as welded ~200 HB,				
				work hardened ~500 HB				

SELECTARC INOX 308Mo

FOR REPAIRING

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	0.04	- 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.	Rm (MPa)	>620	2.5 x 300	50-80 A	= +
E308Mo-17	Mn	1.0		Rp0,2 (MPa)	>450	3.2 x 350	80-115 A	
EN 1600	Si	0.8		A5 (%)	>30	4.0 x 350	90-140 A	
ISO 3581-A	Ni	10.5		KV (J)	+20°C → >50			
E 20 10 3 R 3 2	Cr	20.5						
	Mo	3.0						
	Fe	Rem.						

SELECTARC 29/9

FOR MAINTENANCE AND REPAIR

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	0.1	- Rutile-basic electrode with an austenitic-ferritic stainless steel deposit, adapted for welding dissimilar steels (stainless steels with low alloyed steels) and hard to weld steels as tool steels, Mn steels, spring steels... - Weld deposits highly resistant to cracks, suitable for buffer layers before hardfacing and for building up cutting tools. Soft fusion, smooth and fine ripple beads.	Rm (MPa)	700-850	1.6 x 250	35 A	= +
~E312-16	Mn	0.6		Rp0,2 (MPa)	>500	2.0 x 300	45 A	
EN 1600	Si	1.0		A5 (%)	>20	2.5 x 300	70 A	
ISO 3581-A	Ni	9.5		KV (J)	-	3.2 x 350	110 A	
E 29 9 R 3 2	Cr	29.0		Hardness	~240 HB	4.0 x 350	135 A	
	Mo	0.5				5.0 x 450	180 A	
	Fe	Rem.						

SELECTARC INOX 312HR

FOR GALVANISED STEELS AND REPAIR (JET TYPE)

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	0.06	- Synthetic electrode with high recovery (160 %). 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.	Rm (MPa)	>700	2.0 x 300	50-80 A	= +
~E312-26	Mn	1.0		Rp0,2 (MPa)	>550	2.5 x 350	70-100 A	
EN 1600	Si	1.1		A5 (%)	>25	3.2 x 350	100-140 A	
ISO 3581-A	Ni	9.5		KV (J)	-	4.0 x 450	150-200 A	
E Z 26 9 R 7 3	Cr	26.5		Hardness	~240 HB			
	Mo	0.2						
	Fe	Rem.						

HIGH ALLOYED STEELS

SELECTARC 25/20R

HIGH TEMPERATURE / RUTILE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.1	- 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 cracking, easy slag removal and nice bead aspect. - Construction of steam boilers, chemical installations, gas industry, ovens, thermal equipment.	Rm (MPa)	>550	2.0 x 300	45 A	= +
~E310-16	Mn	2.0		Rp0,2 (MPa)	>400	2.5 x 300	70 A	
EN 1600	Si	0.9		A5 (%)	>30	3.2 x 350	100 A	
ISO 3581-A	Ni	20.5		KV (J)	+20°C → >60	4.0 x 350	135 A	
E 25 20 R 3 2	Cr	25.5				5.0 x 450	180 A	
	Fe	Rem.						

SELECTARC 25/20B

HIGH TEMPERATURE / BASIC

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.12	- Basic coated electrode with an austenitic stainless steel deposit resisting to corrosion and oxidation up to 1200°C. Regular and stable fusion. Resistant against hot cracking. - Construction of ovens, boilers, thermal equipment for heat treatment, chemical installations.	Rm (MPa)	>550	2.5 x 300	70 A	= +
E310-15	Mn	2.2		Rp0,2 (MPa)	>380	3.2 x 350	100 A	
EN 1600	Si	0.5		A5 (%)	>30	4.0 x 350	135 A	
ISO 3581-A	Ni	20.5		KV (J)	+20°C → >70	5.0 x 450	180 A	
E 25 20 B 4 2	Cr	25.5						
	Fe	Rem.						

SELECTARC INOX 310H

HIGH TEMPERATURE / HIGH CARBON

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.4	- 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... resisting to scaling and oxidation up to 1100°C. - Used in the petrochemical industry, for furnaces, reformer and steam cracker tubes, piping systems.	Rm (MPa)	>650	2.5 x 300	70 A	= +
E310H-15	Mn	2.0		Rp0,2 (MPa)	>450	3.2 x 350	100 A	
EN 1600	Si	0.7		A5 (%)	>15	4.0 x 350	135 A	
ISO 3581-A	Ni	21.0		KV (J)	-			
E 25 20 H B 4 2	Cr	26.0						
	Mo	0.2						
	Fe	Rem.						

SELECTARC INOX 253MA-AC

HIGH TEMPERATURE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.1	- Basic coated electrode with an austenitic stainless steel deposit resisting to scaling and oxidation up to 1100°C. Regular and stable fusion, good slag removal, nice bead aspect. - Construction of ovens, thermal equipments for heat treatment, chemical installations.	Rm (MPa)	>550	2.5 x 300	70 A	= +
-	Mn	0.8		Rp0,2 (MPa)	>350	3.2 x 350	100 A	
EN 1600	Si	1.0		A5 (%)	>25	4.0 x 350	130 A	
ISO 3581-A	Ni	11.0		KV (J)	-			
E 22 12 R 3 2	Cr	22.0						
	N	0.1						
	Mo	0.1						
	Fe	Rem.						

SELECTARC INOX 21/33Mn

HIGH TEMPERATURE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.1	- 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 bead aspect. - Chemical and petrochemical industries.	Rm (MPa)	610	2.5 x 300	70 A	= +
-	Mn	4.5		Rp0,2 (MPa)	420	3.2 x 350	100 A	
EN 1600	Si	0.5		A5 (%)	29	4.0 x 350	130 A	
ISO 3581-A	Ni	33.0		KV (J)	-			
E Z21 33 Mn Nb B 4 2	Cr	21.0						
	Nb	1.0						
	Fe	Rem.						

SELECTARC 25/35H**HIGH TEMPERATURE**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	0.4	- 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... resisting to scaling and oxidation up to 1200°C. - For petrochemical industry, for welding centrifugally cast pyrolysis coils, reformer tubes, piping systems.	Rm (MPa)	>660	2.5 x 300	70 A	= +
-	Mn	1.8		Rp0,2 (MPa)	>440	3.2 x 350	100 A	
EN 1600	Si	1.0		A5 (%)	>12	4.0 x 350	135 A	
ISO 3581-A	Ni	35.0		KV (J)	-			
E Z 25 35 Nb H B 4 2	Cr	26.0						
	Nb	1.2						
	Fe	Rem.						

SELECTARC INOX 2209**FOR DUPLEX STEELS / RUTILE**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Rutile-basic electrode with an austenitic- ferritic microstructure (duplex). Stable arc, regular drop transfer, easy slag removal. For operation temperatures up to 250°C and resistant in chloride containing media against pitting corrosion as well as crevice and stress corrosion. - For butt welding and cladding of steels and castings with an austenitic- ferritic structure, which are used for pumps, vessels, piping systems... attacked by chloride containing solutions. Also for impellers and other components which require high strength combined with corrosion attack.	Rm (MPa)	>700	2.5 x 300	50-75 A	= +
E 2209-17	Mn	0.9		Rp0,2 (MPa)	>550	3.2 x 350	70-100 A	
EN 1600	Si	0.9		A5 (%)	>22	4.0 x 350	90-150 A	
ISO 3581-A	Ni	9.0		KV (J)	+20°C → >50 -40°C → >37			
E 22 9 3 N L R 3 2	Cr	22.5						
	Mo	3.0						
	N	0.18						
	Fe	Rem.						

SELECTARC INOX 2209B**FOR DUPLEX STEELS / BASIC**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- 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. 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. For pumps, vessels, piping systems... attacked by chloride containing solutions.	Rm (MPa)	>810	2.5 x 300	50-75 A	= +
E 2209-15	Mn	1.0		Rp0,2 (MPa)	>620	3.2 x 350	70-100 A	
EN 1600	Si	0.5		A5 (%)	>25	4.0 x 350	90-150 A	
ISO 3581-A	Ni	9.0		KV (J)	+20°C → >100 -50°C → 60			
E 22 9 3 N L B 4 2	Cr	22.5						
	Mo	3.0						
	N	0.18						
	Fe	Rem.						

SELECTARC INOX 2509MoB**FOR SUPER-DUPLEX STAINLESS STEELS / BASIC**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.04	- Basic coated electrode with an austenitic- ferritic microstructure (Super-Duplex ~40% ferrite). The weld metal can be applied for operating temperatures up to 250°C and resists to 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... attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion attack.	Rm (MPa)	850	2.5 x 300	50-75 A	= +
E 2594-15	Mn	1.5		Rp0,2 (MPa)	720	3.2 x 350	70-100 A	
EN 1600	Si	0.5		A5 (%)	25	4.0 x 350	90-150 A	
ISO 3581-A	Ni	9.5		KV (J)	+20°C → >70 -40°C → >45			
E 25 9 4 N L B 4 2	Cr	25.0						
	Mo	4.0						
	Cu	0.7						
	N	0.23						
	Fe	Rem.						

SELECTARC INOX 2509MoWB**FOR SUPER-DUPLEX STAINLESS STEELS / BASIC**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.4	C	<0.04	- Basic coated electrode with an austenitic- ferritic microstructure (Super-Duplex ~40% ferrite). The weld metal can be applied for operating temperatures up to 250°C and resists to 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..., attacked by chloride solution. But also for impellers and other components which require high strength combined with corrosion attack. Pitting index: >40.	Rm (MPa)	900	2.5 x 300	50-75 A	= +
E 2595-15	Mn	1.5		Rp0,2 (MPa)	700	3.2 x 350	70-100 A	
EN 1600	Si	0.5		A5 (%)	24	4.0 x 350	90-150 A	
ISO 3581-A	Ni	9.3		KV (J)	+20°C → 75 -50°C → 50			
E 25 9 4 N L B 4 2	Cr	25.0						
	Mo	3.6						
	Cu	0.7						
	N	0.23						
	W	0.5						
	Fe	Rem.						

HIGH ALLOYED STEELS

SELECTARC INOX 385

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Rutile-basic coated electrode for welding fully austenitic highly corrosion resistant stainless steels (904L, B6). Due to its alloy composition, high Mo-content and Cu, the weld metal is resistant against attacks by phosphoric and sulphuric acids, it shows a high resistance against pitting and stress corrosion in chloride containing media. Can be used at operating temperatures up to 400°C. - For pulp and paper industry, transport containers, installations of the chemical industry.	Rm (MPa)	>570	2.5 x 300	50-70 A	= + ~70 V
E385-16	Mn	1.4		Rp0,2 (MPa)	>370	3.2 x 350	70-100 A	
EN 1600	Si	0.8		A5 (%)	>35	4.0 x 350	90-130 A	
ISO 3581-A	Ni	25.0		KV (J)	+20°C → >70			
E20255CuNLR12	Cr	20.5						
	Mo	4.5						
	Cu	1.5						
	Fe	Rem.						

HIGHLY CORROSION RESISTANT TYPE 904L

SELECTARC INOX 383

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.03	- Rutile-basic coated electrode for welding fully austenitic highly corrosion resistant stainless steels (Sanicro 28, Uranus B28) of the same composition or lower alloyed. Due to its alloy composition, 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. - For pulp and paper industry, transport containers, installations of the chemical industry.	Rm (MPa)	>580	2.5 x 300	50-70 A	= + ~70 V
E383-16	Mn	1.4		Rp0,2 (MPa)	>380	3.2 x 350	70-100 A	
EN 1600	Si	0.8		A5 (%)	>35	4.0 x 350	90-130 A	
ISO 3581-A	Ni	31.0		KV (J)	+20°C → >70			
E27314CuLR12	Cr	27.0						
	Mo	3.8						
	Cu	1.0						
	Fe	Rem.						

HIGHLY CORROSION RESISTANT

SELECTARC INOX 410B

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.1	- Basic coated electrode for repair and construction welding on heat resistant ferritic 14 % Cr steels of similar composition. Corrosion and scale resistant up to 900°C. Stable arc, easy slag removal, regular weld beads. - For hardfacing on fittings and valves for gas, water and steam systems.	Rm (MPa)	>650	2.5 x 350	80-100 A	= +
E410-15	Mn	0.6		Rp0,2 (MPa)	>450	3.2 x 350	110-130 A	
EN 1600	Si	0.5		A5 (%)	>18	4.0 x 450	120-150 A	
ISO 3581-A	Cr	13.0		KV (J)	-	5.0 x 450	150-180 A	
E13B42	Fe	Rem.		Hardness	~250 HB			
				After heat treatment at 750°C/2h.				

13% Cr / BASIC

SELECTARC INOX 13/4

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	0.04	- Basic coated electrode for repair and construction welding of martensitic CrNi steels of similar composition. Stable arc, easy slag removal, good weld bead aspect. Excellent mechanical properties. - For hydraulic turbines, pumps, valve bodies, compressor parts...	Rm (MPa)	>830	2.5 x 350	90 A	= +
E410NiMo-15	Mn	0.6		Rp0,2 (MPa)	>630	3.2 x 350	130 A	
EN 1600	Si	0.3		A5 (%)	>15	4.0 x 450	150 A	
ISO 3581-A	Ni	4.2		KV (J)	+20°C → >50			
E13B42	Cr	12.0		After heat treatment at 580-620°C/8h.				
	Mo	0.5						
	Fe	Rem.						

13% Cr - 4% Ni / BASIC

SELECTARC INOX 17/4Mo

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.4	C	<0.04	- Basic coated electrode for repair and construction welding of martensitic CrNi and CrNiMo-stainless steels. Used for hydraulic turbines, pumps, valve bodies, compressor parts... Stable arc, easy slag removal, regular weld beads. - Used for hydraulic turbines, pumps, valve bodies, compressor parts...	Rm (MPa)	>850	2.5 x 300	90 A	= +
-	Mn	0.6		Rp0,2 (MPa)	>650	3.2 x 350	120 A	
EN 1600	Si	0.3		A5 (%)	>13	4.0 x 450	150 A	
ISO 3581-A	Ni	5.0		KV (J)	+20°C → >40			
EZ1651B42	Cr	16.0		After annealing 580°C/8h.				
	Mo	1.0						
	Fe	Rem.						

16% Cr - 5% Ni - 1% Mo / BASIC

CAST IRON



SELECTARC Fonte Ni

PURE NICKEL - AC/DC

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.15	C	1.2	- Pure nickel electrode with a graphite-basic coating. Recommended for cold welding and repairing of grey cast iron, repairing cracks. Homogeneous and machinable weld deposit. - Repairing of engine blocks, frames of tool machines, gearboxes, reducing pieces, valve and pump bodies.	Rm (MPa)	>300	2.5 x 350	70 A	= -
E Ni-CI	Mn	<1.0		Hardness	~180 HB	3.2 x 350	100 A	~40 V
ISO 1071	Si	<2.0				4.0 x 350	145 A	
E C Ni-CI 3	Fe	<2.0				5.0 x 450	180 A	
	Ni	>95.0						

SELECTARC Fonte Ni2

PURE NICKEL - AC/DC-

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.15	C	1.0	- Pure nickel electrode with graphite-basic coating to weld on DC- and AC. For cold welding and repairing of grey cast iron and repairing 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.	Rm (MPa)	>300	2.5 x 350	80 A	= -
E Ni-CI	Si	<1.2		Hardness	~180 HB	3.2 x 350	120 A	~40 V
ISO 1071	Fe	<2.0				4.0 x 350	150 A	
E C Ni-CI 3	Ni	>95.0						

SELECTARC Fonte Ni4

PURE NICKEL NON CONDUCTIVE COATING

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.15	C	0.6	- Electrode with a graphite-basic barium free non conductive coating. Weld deposit consists of pure nickel. Recommended for cold welding and repairing of grey cast iron and repairing cracks. Especially designed to weld in deep holes or on parts where the coating may touch the casting. Easy machinable weld deposit. - Repairing of engine blocks, frames of tool machines, gearboxes, reducing pieces, valve and pumps bodies.	Rm (MPa)	>300	2.5 x 350	80 A	= +
E Ni-CI	Si	0.5		Hardness	~170 HB	3.2 x 350	110 A	~40 V
ISO 1071	Fe	6.0				4.0 x 350	140 A	
E C Ni-CI 3	Ni	Rem.						

SELECTARC Ferro-Ni

FERRO NICKEL - AC/DC+

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.15	C	1.0	- Graphite basic coated electrode with a Ferro-Nickel alloy deposit for repairing nodular cast iron. Deposit homogeneous and highly resistant to cracking. Particularly recommended for dissimilar welding of cast iron to steels. - For defects in castings, repairing of engine blocks, houses of tool machines, gearboxes, reducing parts, pump bodies, cast pieces, valve bodies.	Rm (MPa)	>400	2.5 x 350	70 A	= +
E NiFe-CI	Mn	<1.0		Hardness	~200 HB	3.2 x 350	100 A	~40 V
ISO 1071	Si	<2.0				4.0 x 350	145 A	
E C NiFe-CI 3	Ni	56.0				5.0 x 350	170 A	
	Fe	Rem.						

SELECTARC Bimetal-NiFe

"BIMETAL" - AC/DC-

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.15	C	1.3	- Graphite-basic coating and "Bimetal" core wire with high electrical conductivity. The "Bimetal" core wire improves the importance of fusion speeds with direct current as well as alternative current without any overheating risk of the electrode. - For repair and construction welding of all cast iron types and dissimilar joints between cast iron and steels. Excellent mechanical properties.	Rm (MPa)	500-600	2.5 x 350	80 A	= -
E NiFe-CI	Mn	0.3		Rp0.2 (MPa)	>300	3.2 x 350	120 A	~50 V
ISO 1071	Si	0.8		A5 (%)	>15	4.0 x 350	145 A	
E C NiFe-CI 3	Ni	55.0		Hardness	~190 HB			
	Fe	Rem.						

CAST IRON

SELECTARC Fonte BMP

"BIMETAL" - AC/DC+

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.15	C	0.8	- Graphite-basic coating (barium free) and "Bimetal" core wire with high electrical conductivity for cold welding of various cast iron on DC+ or AC. The "Bimetal" core wire improves the importance of 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 of all cast iron types and dissimilar joints between cast iron and steels.	Rm (MPa)	540	2.5 x 350	85 A	= +
E NiFe-Cl	Mn	0.3		Rp0,2 (MPa)	370	3.2 x 350	110 A	
ISO 1071	Si	0.8		A5 (%)	22	4.0 x 350	135 A	
E C NiFe-Cl 1	Ni	55.0		Hardness	~180 HB			~50 V
	Fe	Rem.						

SELECTARC FeNi/Cu

FERRO NICKEL / COPPER COATED - AC/DC+

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.15	C	1.1	- Graphite-basic coating with a copper clad core wire and a Ferro-Nickel alloy deposit for welding and repairing of nodular cast iron. Principal advantage of this electrode : exceptional resistance against overheating during welding due to the copper coated core wire. Exceptional welding characteristics. - For foundry defects, repairing of engine blocks, frame of tool machines, gearboxes, pump and valve bodies.	Rm (MPa)	>400	2.5 x 350	70 A	= +
E NiFe-Cl	Mn	0.8		Rp0,2 (MPa)	-	3.2 x 350	100 A	
ISO 1071	Si	1.2		A5 (%)	-	4.0 x 350	150 A	
E C NiFe-1 3	Ni	53.0		Hardness	~200 HB			~40 V
	Cu	4.0						
	Fe	Rem.						

SELECTARC Fonte NiFe2

FERRO Ni - AC/DC-

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.15	C	1.7	- Graphite basic coated electrode with a Ferro-Nickel alloy deposit for joining and repairing nodular cast iron. Particularly recommended for dissimilar welding of cast iron to steels and constructions of cast iron. - Repairing of defects in castings, repairing of engine blocks, houses of tool machines, gearboxes, reducing parts, pump and valve bodies.	Rm (MPa)	>400	2.5 x 350	70 A	= -
E NiFe-Cl	Mn	0.7		Rp0,2 (MPa)	-	3.2 x 350	100 A	
ISO 1071	Si	1.4		A5 (%)	-	4.0 x 350	145 A	
E C NiFe-Cl 1	Ni	55.0		Hardness	~200 HB			~40 V
	Fe	Rem.						

SELECTARC Fonte Fe

IRON BASED / FOR REPAIR

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.15	C	0.13	- Special iron base electrode. 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. - For repair welding of poor quality, dirty or oily old cast iron (furnace parts, boxes, heaters, pumps, ...).	Rm (MPa)	-	2.5 x 350	70-90 A	= + -
E St	Mn	0.5		Rp0,2 (MPa)	-	3.2 x 350	80-110 A	
ISO 1071	Si	0.9		A5 (%)	-	4.0 x 350	100-140 A	
E C Fe-1 3	Fe	Rem.		Hardness	~350 HB			~70 V

SELECTARC Fonte Fe2

IRON BASED / FOR REPAIR

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.15	C	0.05	- 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. - To weld defects in castings, for repair welding of cast iron, as first layer before surfacing of cast iron.	Rm (MPa)	-	2.5 x 350	75 A	= + -
"E Cl-B"	Mn	0.4		Rp0,2 (MPa)	-	3.2 x 350	110 A	
ISO 1071	Si	0.5		A5 (%)	-	4.0 x 350	140 A	
E C Fe-2 3	V	10.0		Hardness	~250 HB			~40 V
	Fe	Rem.						

SELECTARC Fonte Fe3

FOR HOT WELDING

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.15	C	3.0	- 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.	Rm (MPa)	450	3.2 x 350	110 A	= -
"E Cl-B"	Mn	0.3		Rp0,2 (MPa)	320	4.0 x 450	150 A	
ISO 1071	Si	3.2		A5 (%)	15	5.0 x 450	180 A	
E C FeC-GF 3	Fe	Rem.		Hardness	220 HB	6.0 x 450	250 A	~40 V
				After heat treatment at 900°C/2h then 700°C/4h.				

NICKEL ALLOYS



SELECTARC B90

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.11	C	<0.05	▪ 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). ▪ 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. <i>**Inconel®** and "Incoloy®**" are registered trade names of Inco Alloys.</i>	Rm (MPa)	640	2.5 x 350	75 A	⊕
E NiCrFe-3	Si	0.5		Rp0,2 (MPa)	380	3.2 x 350	110 A	
ISO 14172	Mn	5.5		A5 (%)	46	4.0 x 350	135 A	
E-Ni 6182	Cr	16.0		KV (J)	+20°C → >80	5.0 x 450	160 A	
(NiCr15Fe6Mn)	Nb	2.0			-196°C → >60			
	Fe	<10.0		Hardness	-			
	Mo	0.2						
	Ni	Rem.						

**Inconel® and "Incoloy®" are registered trade names of Inco Alloys.

INCONEL® TYPE 600 HIGH RECOVERY

SELECTARC B91

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.11	C	0.04	- High recovery (170 %) rutile-basic coated electrode for welding of Nickel-Chromium-Molybdenum alloys to lower alloys 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.	Rm (MPa)	>760	2.5 x 350	70-90 A	= + ~70 V
E NiCrMo-3	Si	0.6		Rp0,2 (MPa)	>450	3.2 x 350	90-120 A	
ISO 14172	Mn	0.8		A5 (%)	>30	4.0 x 350	120-140 A	
E-Ni 6625	Cr	21.0		KV (J)	-			
(NiCr22Mo9Nb)	Nb	3.3		Hardness	~240 HB			
	Fe	4.0						
	Mo	8.5						
	Ni	Rem						

HIGH STRENGTH

SELECTARC B94

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.11	C	0.06	▪ High recovery (150 %) basic coated electrode for welding Nickel-Chromium-Iron alloys 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 alternative current.	Rm (MPa)	>620	2.5 x 350	70-90 A	= - + ~70 V
E NiCrFe-2	Si	0.5		Rp0,2 (MPa)	>380	3.2 x 350	90-120 A	
ISO 14172	Mn	2.8		A5 (%)	>30	4.0 x 350	120-140 A	
E-Ni 6092	Cr	16.0		KV (J)	+20°C → >80			
(NiCr16Fe12NbMo)	Nb	1.7			-196°C → >60			
	Fe	7.0		Hardness	-			
	Mo	1.8						
	Ni	Rem.						

SPECIAL AC/DC

SELECTARC B96

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
AWS A5.11	C	<0.08	▪ High recovery (160 %) basic coated electrode. The electrode is especially designed to weld with alternative current to avoid magnetic arc blow. ▪ Construction and repair welding of high strength cold-tough 5 and 9 % Ni-steels used for transportation and storage tanks of liquid natural gas.	Rm (MPa)	>690	2.5 x 350	70-100 A	= - + ~70 V
E NiCrMo-6	Si	0.6		Rp0,2 (MPa)	>420	3.2 x 350	100-130 A	
ISO 14172	Mn	3.6		A5 (%)	>35	4.0 x 350	120-160 A	
E-Ni 6620	Cr	13.5		KV (J)	+20°C → >90			
(NiCr14Mo7Fe)	Nb	1.2			-196°C → >70			
	Fe	7.5		Hardness	-			
	Mo	7.0						
	W	1.2						
	Ni	Rem.						

FOR 9 % NICKEL STEELS / AC

NICKEL ALLOYS

SELECTARC Ni59

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters
AWS A5.11	C	<0.02	Basic coated electrode with an alloyed core wire for welding of Nickel-base alloys (alloy 59) and other highly corrosion resistant Ni-Cr-Mo, Ni-Cr-Mo-W alloys as well as special stainless steel types. Stable arc, regular drop transfer, high control weld pool, nice weld bead aspect. Very resistant in sulfurous acid environment, highly concentrated with chlorides and also in the presence of oxidizing solutions (FeCl₃, CuCl₂).	Rm (MPa)	>720	2.5 x 300	50-70 A
E NiCrMo-13	Si	<0.2		Rp0,2 (MPa)	>470	3.2 x 350	70-100 A
ISO 14172	Mn	0.2		A5 (%)	>30	4.0 x 350	90-120 A
E-Ni 6059	Cr	23.0		KV (J)	+20°C → >70		
(NiCr23Mo16)	Fe	<1.5		Hardness	-		
	Mo	15.8					
	Cu	0.1					
	Ni	Rem.					

HIGHLY CORROSION RESISTANT

SELECTARC Ni82

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters
AWS A5.11	C	0.03	- 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 -196°C up to 900°C. - 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.	Rm (MPa)	650	2.5 x 300	50-70 A
~E NiCrFe-3	Si	0.4		Rp0,2 (MPa)	400	3.2 x 350	70-95 A
ISO 14172	Mn	5.0		A5 (%)	46	4.0 x 350	90-120 A
E-Ni 6082	Cr	19.0		KV (J)	+20°C → >80	5.0 x 450	120-160 A
(NiCr20Mn3Nb)	Nb	2.2			-196°C → >65		
	Fe	3.0		Hardness	-		
	Mo	1.5					
	Ni	Rem. (>60%)					

INCONEL® TYPE 600

SELECTARC Ni182

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters
AWS A5.11	C	<0.04	- Basic coated electrode with an NiCrFe type Nickel base weld deposit. Used for repairing and joining of Nickel alloys, cryogenic stainless steels (down to -196°C). For joining dissimilar materials as stainless steels / low alloyed steels, Stainless steels / Nickel alloys, buttering of difficult to weld steels. Deposit insensitive to cracking. - Oven parts, burners, heat treatment equipment, cement works. Chemical and petrochemical industries, glassworks, civil engineering, repairing and maintenance workshops.	Rm (MPa)	>620	2.5 x 300	50-70 A
E NiCrFe-3	Si	0.4		Rp0,2 (MPa)	>380	3.2 x 350	70-95 A
ISO 14172	Mn	6.0		A5 (%)	>35	4.0 x 350	90-120 A
E-Ni 6182	Cr	16.5		KV (J)	+20°C → >80	5.0 x 450	120-160 A
(NiCr15Fe6Mn)	Nb	2.0			-196°C → >65		
	Fe	6.0		Hardness	-		
	Mo	0.2					
	Ni	Rem. (>60%)					

NICKEL ALLOY 600

SELECTARC Ni190

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters
AWS A5.11	C	<0.05	- Basic coated electrode with a Monel® type Nickel- Copper weld deposit for welding and surfacing of Nickel-copper, Copper-Nickel and Copper-Nickel clad steels. Also recommended for dissimilar joining of steels / Nickel-Copper or steel / Copper / Copper-Nickel. Excellent resistance to stress corrosion in Cl⁻ containing environments. - Construction of equipment for the chemical and petrochemical industry, naval constructions and installations for sea water desalination.	Rm (MPa)	>480	2.5 x 300	50-75 A
E NiCu-7	Si	0.7		Rp0,2 (MPa)	>300	3.2 x 350	80-110 A
ISO 14172	Mn	3.2		A5 (%)	>30	4.0 x 350	90-130 A
E-Ni 4060	Fe	1.2		KV (J)	+20°C → >80		
(NiCu30Mn3Ti)	Ti	0.5		Hardness	-		
	Cu	29.0					
	Ni	Rem. (≥65%)					

NiCu TYPE "MONEL®"

SELECTARC Ni276

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters
AWS A5.11	C	<0.02	- Basic coated electrode with an alloyed core wire for welding of Nickel-Base alloys (alloy C-276) and other highly corrosion resistant NiCrMo-alloys, high resistance to sulphurous acid environment highly concentrated with chlorides and also in the presence of oxidising solutions (FeCl₃, CuCl₂). - Welding of Off-shore components, boilers, containers, piping systems in the chemical and petrochemical industries as well as components of flue gas desulfurizing plants.	Rm (MPa)	>720	2.5 x 300	50-70 A
E NiCrMo-4	Si	0.2		Rp0,2 (MPa)	>450	3.2 x 350	70-100 A
ISO 14172	Mn	0.6		A5 (%)	>30	4.0 x 350	90-120 A
E-Ni 6276	Cr	16.2		KV (J)	+20°C → >70		
(NiCr15Mo15Fe6W4)	Fe	5.0		Hardness	-		
	Mo	16.0					
	W	4.0					
	V	0.15					
	Ni	Rem.					

ALLOYS NiCrMo (C-276)

SELECTARC Ni617**HIGH TEMPERATURE**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.11	C	0.06	- Basic coated nickel base electrode, with an alloyed core wire, for joining and repairing of high temperature alloys up to 1100°C. - Construction of gas turbines, combustion chambers, ovens, thermal equipment for heat treatment, petrochemical installations.	Rm (MPa)	730	2.5 x 300	45-60 A
~E NiCrCoMo-1	Si	0.8		Rp0,2 (MPa)	460	3.2 x 350	75-95 A
ISO 14172	Mn	0.3		A5 (%)	40	4.0 x 350	90-120 A
E-Ni 6617	Cr	21.0		KV (J)	+20°C → 100		
(NiCr22Co12Mo)	Co	11.0		Hardness	-		
	Fe	1.0					
	Mo	9.0					
	Al	0.7					
	Ti	0.3					
	Ni	Rem.					

SELECTARC Ni625**HIGHLY CORROSION RESISTANT**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.11	C	<0.04	- Basic coated electrode with an alloyed core wire for welding of Nickel-Chromium-Molybdenum alloys as well as for welding of special austenitic stainless steels. The weld metal is highly resistant to corrosion with an exceptional high yield and tensile strength. - Welding of Off-shore components, boilers, vessels, piping systems in the chemical and petrochemical industries as well as components of flue gas desulfurizing plants.	Rm (MPa)	>760	2.5 x 300	50-70 A
E NiCrMo-3	Si	0.4		Rp0,2 (MPa)	>450	3.2 x 350	70-100 A
ISO 14172	Mn	0.6		A5 (%)	>30	4.0 x 350	90-120 A
E-Ni 6625	Cr	22.0		KV (J)	+20°C → >70	5.0 x 450	140-160 A
(NiCr22Mo9Nb)	Nb	3.4		Hardness	-		
	Fe	3.0					
	Mo	9.0					
	Ni	Rem.					

SELECTARC Ni625BF**HIGHLY CORROSION RESISTANT / IRON BASED**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.11	C	<0.04	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, good slag removal, regular weld beads. Due to its composition the weld metal is highly resistant to corrosion with an exceptional high yield and a high tensile strength.	Rm (MPa)	>760	2.5 x 300	50-70 A
E NiCrMo-3	Si	0.4		Rp0,2 (MPa)	>450	3.2 x 350	70-100 A
ISO 14172	Mn	0.56		A5 (%)	>30	4.0 x 350	90-120 A
E-Ni 6625	Cr	22.0		KV (J)	+20°C → >70	5.0 x 450	140-160 A
(NiCr22Mo9Nb)	Nb	3.3		Hardness	-		
	Fe	0.7					
	Mo	8.8					
	Ni	Rem.					
				Redrying at 250-300°C/1h.			

SELECTARC Ni-A**HIGH TEMPERATURE / REPAIR**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.11	C	0.04	- Basic coated nickel base electrode, with an alloyed core wire, for joining and repairing high temperature alloys, dissimilar joining of stainless steel to creep resistant steels, for joining alloy 800, 800H, HK40, HP45... - Thermal power stations, ovens, thermal equipment for heat treatment, petrochemical installations.	Rm (MPa)	650	2.5 x 300	50-70 A
E NiCrFe-2	Si	0.4		Rp0,2 (MPa)	390	3.2 x 350	70-95 A
ISO 14172	Mn	3.0		A5 (%)	40	4.0 x 350	90-120 A
E-Ni 6092	Cr	16.0		KV (J)	+20°C → >80	5.0 x 450	120-160 A
(NiCr16Fe12NbMo)	Nb	2.2		Hardness	-		
	Fe	6.0					
	Mo	1.5					
	Ni	Rem. (>60%)					

SELECTARC NiTi3**PURE NICKEL**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters
AWS A5.11	C	<0.03	- Basic coated electrode with a pure Nickel deposit containing 1-2 % Ti ; designated for welding and surfacing of pure Nickel (alloy 200), Nickel-copper, Copper-Nickel and Copper-Nickel plate steels. Also recommended for dissimilar joining like steels / Nickel-Copper or steel / Copper / Copper-Nickel. Excellent resistance to NaOH. - Construction of equipment for the chemical industry and petrochemical industry, food stuff industrie. For caustic soda production, soap and detergents.	Rm (MPa)	>420	2.5 x 350	70-90 A
E Ni-1	Si	0.7		Rp0,2 (MPa)	>280	3.2 x 350	90-120 A
ISO 14172	Mn	0.3		A5 (%)	>28	4.0 x 350	120-160 A
E-Ni 2061	Fe	0.3		KV (J)	+20°C → >160		
(NiTi3)	Al	0.3			-196°C → >160		
	Ti	1.6		Hardness	-		
	Ni	Rem.					

ALUMINIUM ALLOYS



SELECTARC AI105

ALUMINIUM 5% Si

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.3	Si	5.0	- 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, for cast aluminium alloys.	Rm (MPa)	110-160	2.5 x 350	60 A	= +
E4043	Mn	<0.5		Rp0,2 (MPa)	70-100	3.2 x 350	90 A	
DIN 1732	Fe	<0.5		A5 (%)	>15	4.0 x 350	120 A	
EL-AlSi5	Al	Rem.		KV (J)	-			
				Hardness	~50 HB			

SELECTARC AI112

ALUMINIUM 12% Si

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.3	Si	12.0	- 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.	Rm (MPa)	180	2.5 x 350	60 A	= +
~E4047	Mn	<0.5		Rp0,2 (MPa)	80	3.2 x 350	90 A	
DIN 1732	Fe	<0.5		A5 (%)	>5	4.0 x 350	120 A	
EL-AlSi12	Al	Rem.		KV (J)	-			
				Hardness	~50 HB			



COPPER ALLOYS

COPPER ALLOYED WELDING

BASE METAL	STEEL	STAINLESS STEEL	GALVA	CORTEN	COPPER	Cu Al	BRONZE Al	BRONZE Sn	BRASS	NICKEL SILVER	Cu Ni	MONEL METAL
	Fe	Cr Ni	Fe Zn	Fe Cu	Cu	Cu Al	Cu Sn Al	Cu Sn	Cu Zn	Cu Ni Zn	Cu Ni	Ni Cu
MONEL METAL	Ni190	Ni190	Ni190	Ni190	NiTi3 Ni190	Ni190	Ni190	Ni190	Cu114	Ni190	Ni190	Ni190
Cu Ni	Ni190	Ni190	Ni190	Ni190	Ni190	Ni190	Ni190	Cu114	Cu114	Ni190	CuNi30	
NICKEL SILVER	Cu118	Ni190	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118		
BRASS	Cu114	Ni190	Cu114	Cu114	Cu114	Cu116	Cu118	Cu114	Cu114			
BRONZE Sn	Cu114	<Cu114 Ni190	Cu114	Cu114	Cu114	Cu116	Cu118	Cu114				
BRONZE Al	Cu118	^Ni190 Cu118	Cu118	Cu118	Cu118	Cu118	Cu118					
Cu Al	Cu118	^Ni190 Cu118	Cu118	Cu118	Cu118	Cu116						
COPPER	Cu118	<NiTi3 Ni190	Cu114	Cu114	Cu110							
CORTEN	B75Cu	24/12S	B75Cu	B75Cu								
GALVA	54	24/12S	54									
STAINLESS STEEL	24/12S	20/10MBC										
STEEL	51											

CHOICE

LEGEND

^ < Buttering on base metal is indicated by the direction of the arrow

307R Filler Metal

^Ni190 Example : Buttering with the electrode Selectarc Ni190 on a stainless steel support, joining is done with the electrode Selectarc Cu118.

COPPER ALLOYS

SELECTARC Cu110

PURE COPPER

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.6	Mn	1.5	- Basic coated copper electrode for welding different pure copper grades. 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. - Joining of electrical copper electrodes used in furnaces, for joining copper to steel bars in electrically heated drive ways.	Rm (MPa)	~200	2.5 x 350	70-90 A	= +
~E Cu	Fe	0.1		Rp0,2 (MPa)	-	3.2 x 350	90-120 A	
DIN 1733	Sn	0.8		A5 (%)	35	4.0 x 350	110-140 A	
EL-CuMn2	Cu	Rem.		KV (J)	-			
				Hardness	~60 HB			

SELECTARC Cu114

COPPER TIN

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.6	Mn	0.8	- Basic coated tin bronze electrode for welding copper tin bronzes (Cu-Sn 6-8 %) and bronzes (Cu-Zn) in some cases too. Also used for dissimilar joints. For repairing wrought bronzes (Cu-Sn), for surfacing on bronzes, steels and cast iron. The weld deposit is resistant to salt water corrosion. - This electrode is especially designed to weld with alternative current, but it can also be used either on DC + or -. Naval constructions and installations for sea water desalination, repair works.	Rm (MPa)	300	2.5 x 350	70-90 A	= + -
E CuSn-A	Fe	0.1		Rp0,2 (MPa)	120	3.2 x 350	90-110 A	
DIN 1733	Sn	6.0		A5 (%)	>20	4.0 x 350	110-130 A	
EL-CuSn7	P	0.1		KV (J)	-			
	Cu	Rem.		Hardness	100 HB			

SELECTARC Cu115

COPPER TIN FOR DC

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.6	Mn	0.9	- Basic coated tin bronze electrode for welding copper tin bronzes (Cu-Sn 6-8 %) and bronzes (Cu-Zn) in some cases too. Also used for dissimilar joints. For repairing wrought bronzes (Cu-Sn), for surfacing on bronzes, steels and cast iron. The weld deposit is resistant to salt water corrosion. - Construction of equipment for the chemical and petrochemical industry, naval constructions and installations for sea water desalination, repair works.	Rm (MPa)	300	2.5 x 350	70-90 A	= +
E CuSn-C	Fe	0.15		Rp0,2 (MPa)	120	3.2 x 350	90-110 A	
DIN 1733	Sn	7.0		A5 (%)	>20	4.0 x 350	110-130 A	
EL-CuSn7	P	0.1		KV (J)	-			
	Cu	Rem.		Hardness	110 HB			

SELECTARC Cu116

BASIC COATED Cu-Al BRONZE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.6	Mn	1.0	- Basic coated aluminium bronze 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, low spatters, easy slag removal. - Shipbuilding, sea water applications, desalination plants, chemical industry, pump parts which are attacked by salt water (propellers, bearings,...).	Rm (MPa)	420	2.5 x 350	80-100 A	= +
~E CuAl-A2	Fe	0.7		Rp0,2 (MPa)	180	3.2 x 350	90-120 A	
DIN 1733	Al	8.0		A5 (%)	>20	4.0 x 350	120-140 A	
EL-CuAl9	Cu	Rem.		KV (J)	-			
				Hardness	180 HB			

SELECTARC Cu118

COMPLEX ALUMINIUM BRONZE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.6	Mn	12.0	- 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. - Its favourable coefficient of friction makes this electrode ideal to overlay sliding guides.	Rm (MPa)	640	2.5 x 350	60-80 A	= +
E CuMnNiAl	Fe	2.2		Rp0,2 (MPa)	400	3.2 x 350	80-100 A	
DIN 1733	Al	6.0		A5 (%)	>20	4.0 x 350	90-120 A	
EL-CuMn14Al	Ni	2.2		KV (J)	-			
	Pb	<0.02		Hardness	200 HB			
	Cu	Rem.						

SELECTARC CuNi30

CUPRONICKEL

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
AWS A5.6	C	<0.03	- Basic coated copper nickel electrode for joining CuNi alloys up to 30 % Ni and for surfacing the final layer on CuNi70/30 clad steel. The electrode can be welded in all positions except vertical down, easy slag removal and good bead aspect. - The weld metal is resistant against sea water.	Rm (MPa)	>380	2.5 x 300	55-75 A	= +
E CuNi	Si	0.2		Rp0,2 (MPa)	>240	3.2 x 350	80-100 A	
DIN 1733	Mn	1.2		A5 (%)	>30	4.0 x 350	110-130 A	
EL-CuNi30Mn	Ni	30.0		KV (J)	-			
	Fe	0.5		Hardness	-			
	Ti	0.2						
	Pb	<0.02						
	Cu	Rem.						



MAINTENANCE & REPAIR,
HARDFACING

M&R, HARDFACING

HOW TO CHOOSE?

SELECTION CRITERIAS FOR SELECTARC HARDFACING ELECTRODES

Applications	SELECTARC Reference	HRC (Before dilution)	Weld metal composition	Mineral abrasion	Metal abrasion	Shock	Pressure	Friction	Temp. (°C) > 500°C	Corrosion	Cracking resistance	Machining
Buffer layer	18/8Mn	35 work hardened	Cr-Ni-Mn	●	●	★★★★	★★★★	★★	●	★★	👍	★★★★
	HB25	25	Cr-Mn	★	★	★★★★	★★★★	★	●	●	★★★★	★★★★
	HMn	22-45	Mn-Cr-Ni	★★	★	👍	👍	★★	●	★★	★★★★	★★
Economic	HB60	57	Cr-Mn	★★	★	★★	★★	★	●	●	★★	★
Metal abrasion	HB450HT	45	Cr-Mo	●	★★★★	★★	★★	★	★★	●	★★★★	★★
	HB600HT	60	Cr-Mo	★	★★★★	★	★★	★	★★	●	★★	★
	HBC62	63	Cr-Mo-V-W	★	👍	★	★	★	★	●	★	●
Abrasion and shocks	HB61R	58	Cr-Si	★★★★	★★	★★	★★	★	●	●	★★	★
Shock	HMn	22-45	Cr-Ni-Mn	★★	★	👍	👍	★★	●	★★	★★★★	★★
	HBMnCr	22-50	Mn-Cr	★	★	👍	👍	★★	●	★★	★★	★★
Mineral abrasion	HBA	62	C-Cr	👍	★	★	●	●	●	★	●	●
	HRT60	62 TUB	C-Cr	👍	★	●	●	●	●	★	●	●
	HB63	63	C-Cr	👍	★	★	●	●	●	★	●	●
	HRT63	64 TUB	C-Cr-Nb-Mo	👍	★	★★	★	●	★	★★	●	●
	HB65	64	C-Cr-Nb	👍	★	★★	★	●	★★★★	★★	●	●
	HB66	65	C-Cr-Nb-W-Mo	👍	★	★★	★	●	👍	★★	●	●
	HRT68	68 TUB	C-W-Cr	👍	★	★	★	●	★★	★	●	●
Friction	Cu118	20	Cu-Al-Mn-Ni	★	★	★	★	👍	●	👍	👍	👍
Temperature > 600°C	Co1	52	C-Co-Cr-W	👍	★★★★	●	★	★	👍	★★★★	●	★
	Co6	39	C-Co-Cr-W	★★	★★★★	★★	★★	★	★★★★	👍	★	★★
	Co12	44	Co-Cr-W	★★★★	★★★★	●	★	★	👍	👍	★	★
	Co21S	32-44	Co-Cr-Mo-Ni	●	👍	👍	★★★★	★★	★★★★	👍	👍	★★
	Co25	20-45	Co-Cr-Ni-W	●	★★★★	★★★★	👍	👍	👍	👍	👍	★★
	B92	20-40	Ni-Cr-Mo-W	●	★★★★	★★★★	👍	★★★★	👍	👍	★★★★	★★
	B92Co	20-40	Ni-Cr-Mo-W-Co	●	★★★★	★★★★	👍	★★★★	👍	👍	★★★★	★★



UNSUITABLE



STANDARD



GOOD



VERY GOOD



EXCELLENT

MAINTENANCE & REPAIR, HARDFACING

MAINTENANCE & REPAIR (M & R)

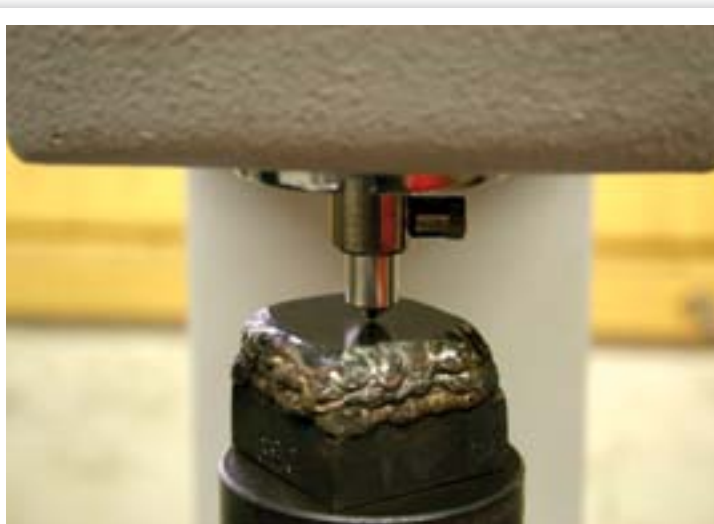
SELECTARC G330

UNIVERSAL MAINTENANCE

Classification	Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
-	■ Multipurpose high strength ferrite-austenitic electrode for repair welding on alloy and high alloy-steels, tool steels, stainless steels and dissimilar assemblies. ■ Used for dies, mould, press tools, crane booms, shafts, gears, rails armour plates buckets...	Rm (MPa)	800	2.0 x 300	50 A	= +
		Re (MPa)	550	2.5 x 300	80 A	
		A5 (%)	25	3.2 x 350	110 A	~50 V
		Hardness	-	4.0 x 350	140 A	



MAINTENANCE & REPAIR - HARDFACING



HARDFACING

SELECTARC HB25

MACHINABLE / 250 HB (BUILD UP)

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile coated electrode for rebuilding on equipment parts, build up and tools ; resistant to medium friction and compression. Good resistance to cavitation, highly resistant to shocks. Sound, crack free deposit, machinable with standard tools. - Surfacing of rails and switches, roller guides, slideways, build up before hardfacing.	Hardness	~250 HB	2.5 x 350 90 A = -
				3.2 x 450 115 A
				4.0 x 450 160 A ~45 V
				5.0 x 450 230 A

SELECTARC HB300B

SEMI-HARD MACHINABLE / 300 HB (BUILD UP)

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Basic coated electrode semi-hard, machinable with approx. 120 % recovery, for rebuilding on equipment parts and tools. Resists to medium friction and compression, highly resistant to shocks, dense deposit and free of cracks. - Mainly used for heavy build up and as cushion layer on forging die cavities, mandrels, gear teeth, chains, sprockets, punches, blades, drawing dies.	Hardness	~300 HB	3.2 x 350 80-110 A = +
				4.0 x 450 110-140 A
				5.0 x 450 140-180 A ~70 V

SELECTARC HB40

SURFACING / 400 HB (BUILD UP)

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- 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. Crack free deposit, machinable with carbide cutting tools. - Surfacing of rollers, gear teeth, stamps, hammers, guide rails...	Hardness	~400 HB	2.5 x 350 90 A = -
				3.2 x 450 115 A
		Hardness	39-42 HRC	4.0 x 450 160 A ~45 V

SELECTARC HB60

RUTILE HARDFACING / 600 HB

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- 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. Sound, crack free deposit, machinable by grinding.	Hardness	~600 HB	2.5 x 350 90 A = -
				3.2 x 450 115 A
		Hardness	55-60 HRC	4.0 x 450 160 A ~45 V
				5.0 x 450 230 A

SELECTARC HB40HT

HOT WORKING STEEL TOOLS / 40 HRC

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Basic coated electrode. 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. It can be used at operating temperatures up to 550°C. - For building up dies, rollers, hot shear blades...	Hardness	38-42 HRC	2.5 x 300 60-90 A 3.2 x 350 80-110 A 4.0 x 450 100-140 A
				= + - ~70 V

SELECTARC HB48HT

HOT WORKING STEEL TOOLS / 48 HRC

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Basic coated electrode. 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. - Used for building up hammers, dies, swages, hot shear blades, rollers...	Hardness	45-50 HRC	2.5 x 300 60-90 A 3.2 x 350 80-110 A 4.0 x 450 100-140 A
				= + - ~70 V

SELECTARC HB56HT

HOT-WORKING / 56 HRC

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Basic coated electrode. 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...	Hardness	53-58 HRC	2.5 x 300 60-90 A 3.2 x 350 80-110 A 4.0 x 450 100-140 A
				= + - ~70 V

SELECTARC HB450HT

FOR METAL WEAR / 45 HRC

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile coated electrode. 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 treatment (see data sheet). Can be used for build up, before final pass using HB600HT. - Hardfacing of trimming and blanking dies, of shear blades, cold and hot working dies, punches, hot shearing knives, forging dies...	As welded	40-45 HRC	2.5 x 350 90 A 3.2 x 350 115 A 4.0 x 450 160 A
		Work hardened: 1100°C → 50 HCR		= + ~50 V

SELECTARC HB600HT

FOR METAL WEAR / 60 HRC

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile coated electrode. 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. Weld deposit machinable by grinding. - Hardfacing of shear blades, moulds, pressing and forging dies.	Hardness	58-61 HRC	2.5 x 350 80 A 3.2 x 350 110 A 4.0 x 450 150 A
				= + ~45 V

SELECTARC HB50Co

HARDFACING ELECTRODE FOR HIGH TEMPERATURES

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile-basic coated electrode with a stable arc, regular drop transfer and a smooth deposit. The weld deposit resists to 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 650°C. The deposit is resistant to thermal shock and can be machined with tungsten carbide tipped tools. - For building up dies, for hot working tools, for moulds, continuous driving rolls, mandrels, forming tools...	Hardness	45-50 HRC	2.5 x 300 60-90 A 3.2 x 350 90-120 A 4.0 x 450 110-150 A
		Hardness after age-hardening: up to 55 HRC.		= +

MAINTENANCE & REPAIR - HARDFACING

SELECTARC HBMar50

AGE-HARDENABLE

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Basic coated electrode with a stable arc, regular drop transfer and a smooth deposit. The weld deposit resists to wear at higher temperatures and can be is 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 than age-hardened by a subsequent heat treatment. - For building up dies for extrusion of Al-castings and plastic, for hot working tools, for moulds...	Hardness ~33-37 HRC Hardness after age-hardening: 3-4h in 480°C 50-54 HRC.	2.5 x 350 3.2 x 350 4.0 x 450	60-90 A 90-120 A 110-140 A = +

SELECTARC HBC62

FOR CUTTING TOOLS / 62 HRC

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile-basic coated electrode for surfacing all kinds of cutting tools such as lathe and plane tools. C-Cr-Mo-W martensitic deposit, resistant up to 500°C. Also used for surfacing of pieces subject to metal/metal wear. Withstands moderate shock. The weld deposit is machinable by grinding. For machining by tools, carry out a soft annealing heat treatment, see data sheet. - Hardfacing of machining tools, cutting tools made of steel, punches, drills, shear blades.	Hardness 60-63 HRC	2.5 x 350 3.2 x 350 4.0 x 450	80 A 110 A 150 A = + ~50 V

SELECTARC HB61B

IMPACT, COMPRESSION AND ABRASION - BASIC / 58 HRC

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Basic coated electrode. For applications subject to impact, compression and abrasive wear. For hardfacing on components made of C-steel, cast steel. Tough-hard and crack resistant deposit. - Hardfacing of block presses, crusher jaws, wheel rims, rollers, caterpillar tracks, ploughshares, running surfaces, cutting edges...	Hardness ~58 HRC	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	60-90 A 90-120 A 110-160 A 170-210 A = + ~70 V

SELECTARC HB61R

IMPACT, COMPRESSION AND ABRASION - RUTILE / 60 HRC

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile-basic coated 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. - Hardfacing of block presses, crusher jaws, wheel rims, rollers, caterpillar tracks, ploughshares, running surfaces, cutting edges...	Hardness ~60 HRC	2.5 x 350 3.2 x 350 4.0 x 450	60-90 A 90-120 A 110-160 A = + ~50 V



SELECTARC HMn

HIGH IMPACT

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Rutile-basic heavy coated electrode. Destined to rebuild all parts subject to high impacts and to build up parts before applying abrasion resistant final layers, using HBA or HB63. The work hardened austenitic deposit is exceptionally resistant to impact and wear factors combined with impact. - Repairing of used parts or preventive protection of new parts used for railway applications (rails, switches, crossings, tongues) in quarries and mines (crusher jaws, excavator and grab teeth, mill hammers, rock crusher).	As welded 200-250 HB	3.2 x 450 4.0 x 450 5.0 x 450	120 A 150 A 200 A = + ~65 V
		Work hardened	400-500 HB	

SELECTARC HBMnCr

FOR CAVITATION, ABRASION AND IMPACT

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Basic coated electrode. Designated 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 work hardened austenitic deposit is exceptionally resistant to impact and wear combined with impact. The high amount of Cr increases the resistance against corrosion, abrasion and cavitation. - Used for 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).	As welded ~260 HB	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	90 A 130 A 160 A 220 A = +
		Work hardened	400-500 HB	

SELECTARC HB14Mn

HIGH IMPACT

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Rutile-basic coated electrode suitable to surface all pieces subject to high impact. Allows to build up and then to apply final layer, using HBA or HB63. The deposit is austenitic and is exceptionally resistant to impact and wear. - Repairing of used pieces or preventive protection of new pieces. Used for railway applications (rails, switches, crossings, tongues) in quarries and mines (crusher jaws, excavator and grab teeth, mill hammers, rock crusher).	As welded 200-250 HB	3.2 x 450 4.0 x 450 5.0 x 450	120 A 160 A 200 A = + - ~65 V
		Work hardened	400-500 HB	

SELECTARC HB Cavit

HIGHLY RESISTANT TO CAVITATION

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Synthetic basic coated electrode with high efficiency (160 %). The deposit is austenitic and is exceptionally resistant to impact and wear. The high amount of Cr highly increases the resistance to corrosion. - Destined to surface all pieces subject to high impact, erosion and cavitation. Also used as cushion layer before hardfacing in case of heavy reclaiming.	As welded 200-250 HB	3.2 x 350 4.0 x 450	110-130 A 130-160 A = +
		Work hardened	400-500 HB	

SELECTARC HB63

MINERAL ABRASION / 63 HRC

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Rutile coated with high recovery (160 %). For applications subject to abrasive wear by minerals, combined with medium shocks and compression. Austenitic matrix containing Cr carbides. Deposit resists to corrosion. Self releasing slag. Weld metal is machinable by grinding. - 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.	Hardness ~58 HRC 1st layer	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	90 A 130 A 160 A 210 A = + ~50 V
		Hardness all well metal: ~60 HRC.		

MAINTENANCE & REPAIR - HARDFACING

SELECTARC HBA

MINERAL ABRASION, WITHOUT SLAG / 60 HRC

Classification	Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
-	- Basic coated electrode, slag free, with high recovery (190 %). Highly resistant to abrasion due to the high content of Cr and C. Austenitic matrix containing Cr carbides. Deposit 1 or 2 layers maximum. Resists to heavy mineral abrasion and moderate shock. Only machinable by grinding. - For all pieces subject to low or moderate shock where an important resistance to abrasion is searched. For endless screws, mixer paddles, pump bodies for abrasive materials, excavator teeth, crashing of mineral materials, concrete pumps, screws for brick presses, wear plates.	Hardness	60-63 HRC 2 nd layer	3.2 x 350	140 A	= +
				4.0 x 350	200 A	
				5.0 x 450	250 A	~50 V

SELECTARC HB64S

SPECIAL SUGAR MILLS / ARCING

Classification	Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
-	- Electrode with a high content of carbide forming elements. For hardfacing of parts subject to high abrasion, friction and corrosion. Recovery approx. 200 %. - Especially designed for claddings in sugar mills , roughing or arcing of mill rollers for better gripping...	Hardness	~61 HRC	3.2 x 350	120-150 A	= +
				4.0 x 450	170-210 A	
				5.0 x 450	220-260 A	~50 V

SELECTARC HB65

SEVERE MINERAL ABRASION / 64 HRC

Classification	Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
-	- Electrode with a high alloy content of carbide forming elements. Especially used for hardfacing of parts subject to high abrasion, friction, heat and corrosion. Easy to weld, smooth drop transfer, and low slag content. Recovery approx. 190 %. - 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.	Hardness	~64 HRC	2.5 x 350	90-110 A	= +
				3.2 x 350	130-150 A	
				4.0 x 450	140-190 A	~50 V
				5.0 x 450	190-250 A	

SELECTARC HB66

MINERAL ABRASION / HIGH TEMPERATURE / 65 HRC

Classification	Characteristics and applications	Mechanical properties		Ø x L (mm)	Parameters	
-	- Electrode especially used for hardfacing of parts subject to high abrasion, friction, heat and corrosion. Easy to weld, smooth drop transfer and negligible slag content. Recovery approx. 200 %. - 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... Operation temperatures up to 550°C.	Hardness	~65 HRC	3.2 x 350	110-140 A	= +
				4.0 x 450	140-190 A	
				5.0 x 450	190-250 A	~50 V

SELECTARC HB68

HARDFACING AGAINST HIGH ABRASION

Classification	Characteristics and applications	Mechanical properties		ø x L (mm)	Parameters	
-	- 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 low slag content and easy striking and restriking. Recovery approx. 240 %. - For use in steel mills, on crushers, conveyor screws, dredger parts, sieves.	Hardness	~64 HRC	3.2 x 350	130-150 A	= +
			1 st layer	4.0 x 350	160-190 A	
			Hot hardness: 400°C → ~57 HRC 600°C → ~55 HRC			

SELECTARC HB68Nb

HARDFACING AGAINST HIGH ABRASION

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Basic coated, hardfacing electrode almost slag free, with high recovery (230 %). Highly resistant to abrasion due to its high content of Cr and other Carbide forming elements. The service life of surfaced pieces is up to 5 times longer than for conventional Chrome-Carbide electrodes. For hard-facing apply one or maximum two layers. Resists to heavy mineral abrasion and moderate impact. Only machining by grinding. Regular top transfer, smooth beads. The formation of transversal cracks in the weld deposit is normal for this type of composition. - For all pieces subject to low or moderate shock where an important resistance to abrasion is searched.	Hardness	~64 HRC	3.2 x 350 140 A
				4.0 x 350 180 A
				5.0 x 450 220 A

SELECTARC HBC 63

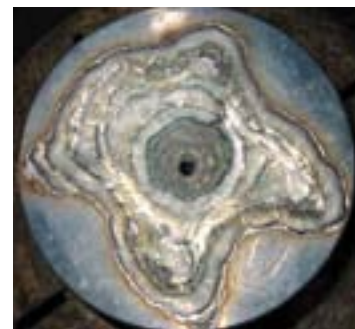
HARDFACING FOR CUTTING TOOLS

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- High recovery, 140 % rutile-basic coated electrode. The sharpness obtained has an exceptional quality. Martensitic deposit, alloyed with C-Cr-W-Mo-Co, resistant up to 550°C. - Destined to surface all kinds of cutting tools such as lathe and plane tools. This electrode is also used for surfacing of pieces subject to metal/metal wear. Withstands moderate shock. Weld metal is machinable by grinding.	Hardness	61-65 HRC Before dilution	2.5 x 350 90 A
				3.2 x 350 120 A
				4.0 x 450 150 A

SELECTARC Co1

"GRADE 1" TYPE COBALT BASE / HIGH ABRASION

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Rutile-basic coated. Cobalt base deposit of "stellite grade 1" type. Hardest Selectarc Co-type. 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. - Facing of rollers, rails, bearings and shafts of pumps, extrusion nozzles, hot cutting tools, conveyor screws.	As welded	+20°C → 53-57 HRC	3.2 x 350 100 A
				4.0 x 350 140 A
				5.0 x 450 180 A
		As welded	+600°C → 42-45 HRC	



MAINTENANCE & REPAIR - HARDFACING

SELECTARC Co6

"GRADE 6" TYPE COBALT BASE / METAL ABRASION

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile-basic coated. 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. Stable arc, easy slag removal, regular and smooth weld profile. - Hardfacing of valves, valve seats and sealing surfaces, hot shear blades, hot pressing tools, beaters for coke pulverises.	As welded +20°C → 40-45 HRC	2.5 x 300 3.2 x 350 4.0 x 350 5.0 x 450	75 A 100 A 140 A 180 A = + ~70 V
		As welded +600°C → ~30 HRC		

SELECTARC Co12

"GRADE 12" TYPE COBALT BASE / HOT CUTTING

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile-basic coated. Cobalt base deposit of "stellite grade 12" type. 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 1000°C, within the presence of moderate shocks. Highly resistant to erosion and cavitation. Highly recommended when an important hardness is searched and for 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), pressing tools, hot cut tools, hot shear blades, extrusion screws...	As welded +20°C → ~50 HRC	3.2 x 350 4.0 x 350 5.0 x 450	100 A 140 A 180 A = + ~70 V
		As welded +600°C → 38-40 HRC		

SELECTARC Co21S

"GRADE 21" TYPE COBALT BASE / MOTOR VALVES

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile-basic coated electrode. Cobalt base deposit of "stellite grade 21" type*. Deposit characterised by a good metal-metal wear up to 1000°C, even in presence of sulphurous atmosphere. Good behaviour to important thermal and mechanical shocks, excellent resistance to cracking, highly resistant to cavitation and erosion, deposit amagnetic. - Surfacing of motor valves, gas turbine blades, extrusion nozzles, forging dies, forging tools, mixers, valves for gas/water/vapour/acids.	As welded +20°C → 32-38 HRC	2.5 x 300 3.2 x 350 4.0 x 350	75 A 100 A 140 A = + ~70 V
		As welded +600°C → 250-300 HB		

* "Stellite" is a trade mark of Deloro Stellite (Haynes International).

SELECTARC Co25

"GRADE 25" TYPE COBALT BASE / HOT WORKING

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Rutile-basic coated electrode. Cobalt base deposit of "grade 25" type. Deposit characterised by a good resistance to metal-metal wear up to 1000°C. Good behaviour to important thermal and mechanical shocks. Excellent resistance to cracking, highly resistant to cavitation and erosion, deposit non-magnetic. - Surfacing of motor valves, gas turbine blades, extrusion nozzles, forging dies, forging tools.	As welded +20°C → ~230 HB	3.2 x 350 4.0 x 350	100 A 140 A = + ~70 V
		As welded +600°C → ~300 HB		

SELECTARC B92

NI BASE / HOT WORKING

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Special surfacing electrode rutile basic coated, with 170 % recovery and outstanding welding characteristics. Deposit resists to corrosion in presence of chloride (up to 160°C) and in general to oxidation. Deposit workhardens under impact, and is machinable. 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. - Surfacing of hot working tools as hot shear blades, deburring tools, swages, dies, press tools as well pump parts, valves and reservoirs.	As welded ~250 HB	2.5 x 350 3.2 x 350 4.0 x 350	75 A 110 A 135 A = + ~70 V
		Work hardened 350-400 HB		

SELECTARC B92Co

NI BASE / HOT WORKING

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Special hardfacing electrode with 170 % recovery. Rutile-basic coated with outstanding welding characteristics. Machinable deposit resistant to corrosion, scaling, oxidation and thermal shocks. To surface parts subject to compression, corrosion, high temperatures (400-800°C) as well as thermal shocks. As compared to Selectarc B 92, this electrode has a higher hot strength and is more resistant against thermal shocks and metallic abrasion. - Surfacing of hot working tools, as hot shear blades, deburring tools, swages, dies, press tools.	As welded ~250 HB Work hardened 350-400 HB	2.5 x 350 3.2 x 350 4.0 x 350	75 A 110 A 135 A = + ~70 V

SELECTARC HB95CoB

HARDFACING FOR HOT FORGING DIES

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- 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 it 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. Surfacing of dies, hot working dies, swages, press tools as well as hot rolls.	As welded ~220 HB Work hardened ~350 HB	2.5 x 350 3.2 x 350 4.0 x 350	90 A 120 A 150 A = +

SELECTARC HRT60

TUBULAR ELECTRODE (MINERAL ABRASION) / 60 HRC

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- 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. No slag. Deposit not machinable. Surfacing of all austenitic and Mn steels types, grey cast iron (without any preheating), and high alloyed steels. - Principally destined to agriculture, cement industries, quarries, brickyards, civil engineering, for screws of brick press, excavating jars...	Hardness 55-60 HRC 1 st layer Hardness 58-62 HRC 2 nd layer	6 x 450 8 x 450 12 x 450	80-120 A 120-180 A 210-250 A = + ~45 V

SELECTARC HRT63

TUBULAR ELECTRODE (ABRASION + IMPACT) / 63 HRC

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Tubular electrode filled with metal powders (carbides of Cr and Nb). Deposit characterised by an exceptional hardness and resistance to mineral 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, corrosion resistance, resists to temperature up to 300°C. Use with low current. No slag, only machinable by grinding. Surfacing of carbon steels, of grey cast iron without buffer layer and alloyed steels. - Principally destined to civil engineering, cement industries, agriculture, for press screws, mixing blades, jars teeth and blades, scrapers, crushing hammers, sieving gates, excavator teeth...	Hardness 57-60 HRC 1 st layer Hardness 60-64 HRC 2 nd layer	6 x 450 8 x 450 12 x 450	80-120 A 120-180 A 210-250 A = + ~45 V

SELECTARC HRT68

TUBULAR ELECTRODE (EXTREME ABRASION) / 68 HRC

Classification	Characteristics and applications	Mechanical properties	ø x L (mm)	Parameters
-	- Tubular electrode filled with W and Cr carbides. Deposit highly resistant to abrasion without impact (or moderate shocks). Stainless matrix, excellent friction coefficient, agreeable melting, no slag, deposit not machinable. Surfacing of all austenitic steels, cast iron and highly alloyed steels. Apply 1 or 2 layers maxi. - Mainly destined to pieces subject to a high mineral abrasion and temperature up to 300°C. Material of civil engineering, agriculture, quarries, mines, (mixer, blade, conveyer screws...)	Hardness 64-68 HRC	6 x 450 8 x 450 12 x 450	80-120 A 120-180 A 210-250 A = + ~45 V

OTHERS



SELECTARC DCS

BEVELLING / GOUGING

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Electrode for beveling, grooving and gouging all metals, including stainless steels, cast iron and Cu alloys. Strong blowing characteristic. Smooth and uniform cut. - Beveling of steels, hardfacing deposits. Elimination of screws, rivets, welding beads...	-	2.5 x 350	130 A
			3.2 x 350	200 A
			4.0 x 450	250 A
			5.0 x 450	300 A

SELECTARC CUT 100

CUTTING ELECTRODE

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Electrode for cutting, beveling and piercing of all industrial metals, including stainless steels, cast iron and Cu alloys. Smooth and uniform cut. - Cutting of steels. Piercing of holes, elimination of screws...	-	3.2 x 450	130-180 A
			4.0 x 450	170-230 A

SELECTARC Goug

BEVELLING / GOUGING

Classification	Characteristics and applications	Mechanical properties	Ø x L (mm)	Parameters
-	- Electrode for beveling, grooving and gouging all metals, including stainless steels, cast iron and Cu alloys. Non conductive coating. - Beveling of steels. Beveling of foundry defects or cracks before repair welding...	-	3.2 x 350	200 A
			4.0 x 450	250 A



HOW TO CHOOSE?



SELECTION TABLE FOR DISSIMILAR WELDING

BASE METAL	DENATURED CAST IRON	LAMELLAR CAST IRON	SPHEROIDAL CAST IRON	STEEL	LOW ALLOYED	TOOL STEEL	GALVA	STAINLESS STEEL	HEAT RESISTANT STEELS	NI BASE	DEOXYDIZED COPPER	Cu Ni	Cu Al	BRONZE	BRASS	EROSION
				E24	35CD4	Z 200C13	STEEL	316L	25/20	INCO 600		70/30	9% Al	<10% Sn	<30% Zn	STEEL PLATE
EROSION	^Fonte Fe	^Fonte Ni	^FeNi/Cu			^B90						<B90				
STEEL PLATE	307R	307R	307R	307R	307R	B90	307R	B90	B90	B90	Cu114	Ni190	Cu118	Cu114	Cu114	307R
BRASS	^Fonte Fe			<Cu114	<Cu114	^Ni190		<Cu114	<Cu114	<Cu114		<Cu114				
	Cu114	Cu114	Cu114	Cu118	Cu118	Cu116	Cu114	Ni190	Ni190	Ni190	Cu114	CuNi30	Cu116	Cu114	Cu114	
BRONZE	^Fonte Fe							<Cu114	<Cu114			<Ni190				
	Cu114	Cu114	Cu114	Cu114	Cu114	Cu114	Cu114	B90	B90	Ni190	Cu114	CuNi30	Cu116	Cu114		
CU AL	^Fonte Fe							^Ni190	^Ni190							
	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu118	Cu116			
CU NI	^Fonte Fe	^Fonte Ni	^Fonte Ni													
	Ni190	Ni190	Ni190	Ni190	Ni190	Ni190	Ni190	Ni190	Ni190	Ni190	Ni190	CuNi30				
DESOXYDIZED COPPER	^Fonte Fe							<NiTi3	<NiTi3							
	Cu114	Cu114	Cu114	Cu114	Cu114	Cu114	Cu114	B90	B90	Ni190	Cu110					
NI BASE	^Fonte Fe	^Fonte Ni	^FeNi/Cu			^B90	^B90									
	Ni82	Ni82	Ni82	B90	B90	B90	B90	Ni82	Ni82	Ni182						
HEAT RESISTANT STEELS	^Fonte Fe	^Fonte Ni	^FeNi/Cu			^B90										
	Ni82	Ni82	Ni82	25/20R	24/12S	B90	29/9	25/20R	25/20R							
STAINLESS STEEL	^Fonte Fe	^Fonte Ni	^FeNi/Cu			^B90										
	Ni82	Ni82	Ni82	24/12S	24/12S	B90	29/9	20/10MBC								
GALVA	^Fonte Fe	^Fonte Ni				^B90										
	Bimetal-NiFe	Bimetal-NiFe	Bimetal-NiFe	54	29/9	B90	54									
TOOL STEEL	^Fonte Fe	^Fonte Ni				^B90										
	Bimetal-NiFe	Bimetal-NiFe	Bimetal-NiFe	B90	B90	B90										
LOW ALLOYED	^Fonte Fe	^Fonte Ni	^FeNi/Cu													
	FeNi/Cu	FeNi/Cu	FeNi/Cu	29/9	29/9											
STEEL	^Fonte Fe	^Fonte Ni														
	FeNi/Cu	FeNi/Cu	FeNi/Cu	54												
SPHEROIDAL CAST IRON	^Fonte Fe															
	Ferro Ni	Fonte Ni	Bimetal-NiFe													
LAMELLAR CAST IRON	^Fonte Fe															
	Fonte Ni	Fonte Ni														
DENATURED CAST IRON																
	Fonte Fe															



LEGEND

^ < Buttering on base metal is indicated by the direction of the arrow

307R Filler Metal

^Ni190 Example : Buttering with the electrode Selectarc Ni190 on a stainless steel support, joining is done with the electrode Selectarc Cu118.

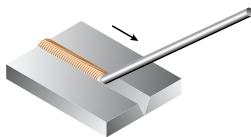
WELDING POSITIONS: BUTT WELDS - PLATES AND PIPES

ACCORDING TO: EN ISO 6947

BUTT WELDS - PLATES

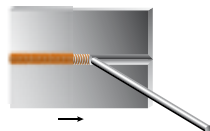
PA

Horizontal flat position



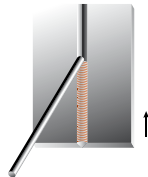
PC

Transverse position



PF

Vertical up position



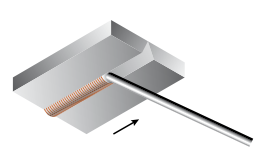
PG

Vertical down position



PE

Overhead position



PA **HORIZONTAL FLAT POSITION :**
plates are in horizontal position filler metal deposit over.

PF **VERTICAL UP POSITION:**
plates and welding axis are in vertical up position. Metal deposit from the bottom up.

PG **VERTICAL DOWN POSITION :**
plates and welding axis are vertical. Metal deposit from the top to the bottom.

PE **OVERHEAD POSITION :**
plates are in horizontal position, filler metal deposit from below.

PC **TRANSVERSE POSITION :**
plates are in vertical up position, horizontal welding axis.

BUTT WELDS - PIPES

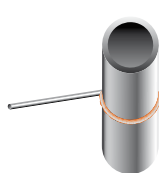
PA

Horizontal axis



PC

Vertical axis



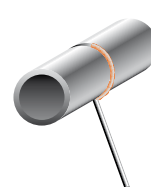
PF

Horizontal axis



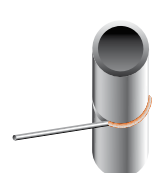
PG

Horizontal axis



H-L045

Lean axis



PA **PIPE ROTATES WITH HORIZONTAL AXIS.**
Pipe turns during welding Metal deposited in the most convenient area for the welder.

PC **PIPE FIXED WITH VERTICAL AXIS.**
Horizontal welding. Welding is said "fillet weld".

PF **PIPE FIXED WITH HORIZONTAL AXIS.**
Welding from the bottom up in vertical up position. Welding is said "in position".

PG **PIPE FIXED WITH HORIZONTAL AXIS.**
Welding from the top to the bottom in vertical position. Welding is said "in position".

H-L045 **PIPE FIXED WITH AXIS UNDER 45°.**
Welding from the bottom up with axis under 45° compared to vertical position. Welding is said "inclined pipe build".

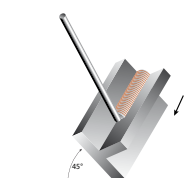
WELDING POSITIONS: FILLET WELDS - PLATES AND PIPES

ACCORDING TO: EN ISO 6947

FILLET WELDS - PLATES

PA

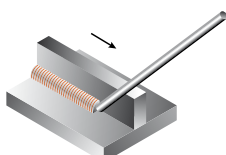
Horizontal flat position



PA HORIZONTAL FLAT WELD

PB

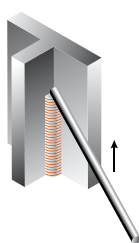
Horizontal downhand position



PB HORIZONTAL DOWNHAND POSITION

PF

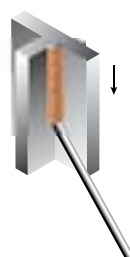
Vertical up position



PF VERTICAL UP WELD

PG

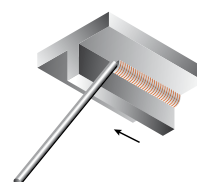
Vertical down position



PG VERTICAL DOWN WELD

PD

Horizontal overhead position



PD HORIZONTAL OVERHEAD WELD

FILLET WELDS - PIPES

PB

Horizontal axis



PB PIPE: ROTATED AXIS: HORIZONTAL

PG

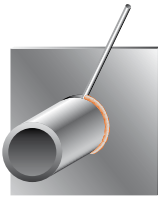
Horizontal axis



PG PIPE: FIXE AXIS: HORIZONTAL

PF

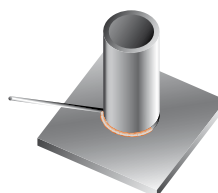
Horizontal axis



PF PIPE: FIXE AXIS: HORIZONTAL

PB

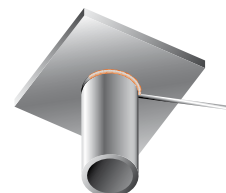
Vertical axis



PB PIPE: FIXE AXIS: VERTICAL

PD

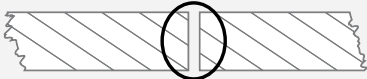
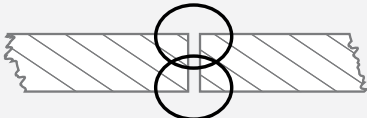
Vertical axis



PD PIPE: FIXE AXIS: VERTICAL

WELD METAL VOLUME PER METER

■ IN BUTT WELDING WITHOUT BEVEL

Type of joining	Thickness (mm)	Gap (mm)	Ø electrode (mm)	Intensity recommended (A)	Number of electrodes per meter
In one layer 	1	0	1.6	30/35 A	6
	1.5	1	1.6	35/40 A	8
			2	50 A	6
	2	1	2.5	60 A	8
			3.15	80 A	4
	3	2	3.15	90 A	6
In two layers with a standard electrode 	3	2	1 st layer : 3.2	95 A	5
			2 nd layer : 4	160 A	4
	4	3	1 st layer : 4	130 A	4
			2 nd layer : 4	170 A	4
	5	4	1 st layer : 5	150 A	5
			2 nd layer : 5	200 A	4
	6	4	1 st layer : 5	180 A	4
			2 nd layer : 5	220 A	4
	7	4	1 st layer : 5	180 A	5
			2 nd layer : 5	220 A	4

■ IN BUTT WELDING BEVEL

Plates thickness (mm)	Layers	Bevel angle	Nb of layers	Ø electrode (mm)	Intensity (A)	Nb of electrodes per meter	Speed (m/h)
6		80°	2	3.15	100 A	3.3	4.8
				4	160 A	5	
8		70°	3	3.15	100 A	3.3	3.0
				4	170 A	4	
				4	160 A	6	
10		70°	3	3.15	100 A	3.3	2.4
				4	170 A	6	
				4	160 A	8	
12		60°	5	3.15	105 A	3.3	1.8
				4 - 4 - 4 - 4	170 A	18	
12		60°	4	3.15	105 A	3.3	2.2
				4	170 A	5	
				5 - 5	200 A	10	
14		60°	5	3.15	105 A	3.3	1.6
				4	170 A	5	
				5 - 5 - 5	200 A	13	
16		60°	6	3.15	110 A	4	1.2
				4	170 A	5	
				5 - 5	220 A	10	
				6.3 - 6.3*	260 A	7	
20		60°	8	4	150 A	3	0.95
				4	170 A	5	
				5 - 5	220 A	9	
				6.3 - 6.3 - 6.3 - 6.3*	260 A	16	

For thickness > 10 mm, bevel in X is advised. Above values can be extrapolated, taking double values of half thickness of plates to be joint.

* Can be replaced by high efficiency electrodes Ø 5mm.

WELD METAL VOLUME AND WEIGHT PER METER

■ IN BUTT WELDING BEVEL WITH NO STANDARD

Plates thickness (mm) (e)	Bevel angle (α)	Gap (mm) (E)	Weld metal volume (cm ³)	Weld metal weight (kg/m)
5	80°	0	26	0.20
6	80°	1	42	0.323
8	70°	1	69	0.534
10	70°	1	100	0.78
12	60°	1.5	125	0.97
14	60°	1.5	164	1.28
16	60°	2	211	1.64
18	60°	2	259	2.02
20	60°	2	310	2.42

CONVERSIONS

ALLOYS	ALUMINIUM d : 2,7 g/cm ³		TITANIUM d : 4,5 g/cm ³		STAINLESS STEEL d : 7,85 g/cm ³		COPPER d : 8,9 g/cm ³	
	g/m	m/kg	g/m	m/kg	g/m	m/kg	g/m	m/kg
0.6	0.76	1310	1.27	786	2.22	450	2.52	397
0.8	1.36	735	2.26	442	3.94	254	4.47	224
1.0	2.12	472	3.53	283	6.16	162	6.98	143
1.2	3.05	328	5.08	197	8.87	113	10.06	100
1.6	5.42	184	9.04	111	15.77	63	17.88	56
2.0	8.48	118	14.13	71	24.65	41	27.95	36
2.4	12.21	82	20.34	49	35.48	28	40.23	25
3.0	19.07	52	31.79	31	55.46	18	62.88	16
3.2	21.70	46	36.17	28	63.10	16	71.54	14
4.0	33.91	29	56.52	18	98.59	10	111.78	9
5.0	52.99	19	88.31	11	154.06	7	174.66	6

d : density, g/m : gr. per meter, m/kg : meter per kg

1" = 1 inch = 25,4 mm

ø (mm)	ø (inch)	ø (inch)
0.6	1/44	0.0236
0.8	1/32	0.0315
1.0	1/26	0.0393
1.2	3/64	0.0472
1.6	1/16	0.0629
2.0	5/64	0.0781
2.4	3/32	0.0945
3.2	1/8	0.1259
4.0	5/32	0.1574

TECHNICAL ADVICE

SCHAEFFLER DIAGRAM

SCHAEFFLER DIAGRAM IS USED TO CALCULATE APPROXIMATELY THE CRISTAL STRUCTURE OF A HIGH-ALLOYED STEEL WELDING, AFTER COOLING AT AMBIENT AIR.

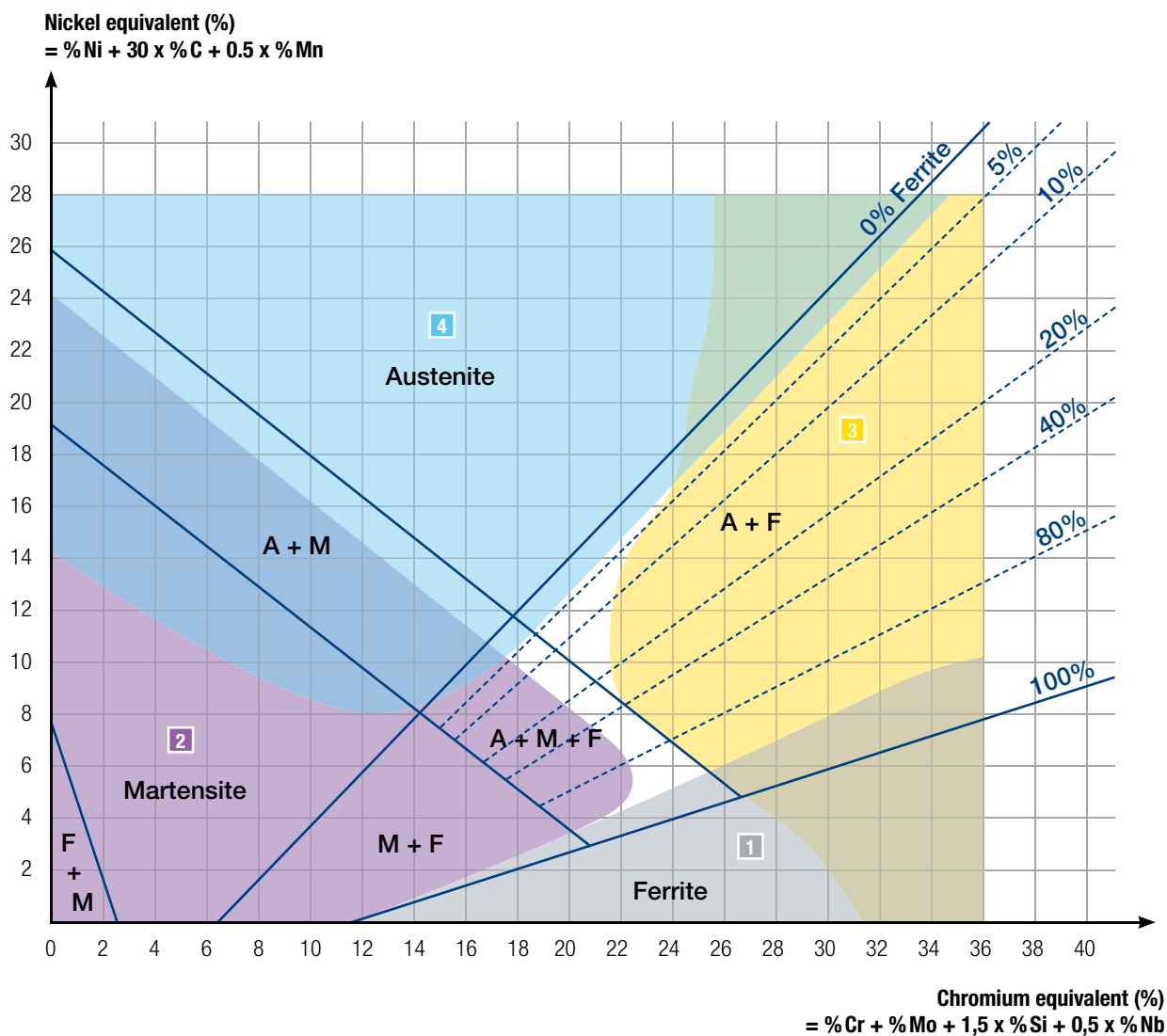
Chemical composition is required to calculate :

CHROMIUM EQUIVALENT :

$$= \% \text{Cr} + \% \text{Mo} + 1.5 \times \% \text{Si} + 0.5 \times \% \text{Nb}$$

NICKEL EQUIVALENT :

$$= \% \text{Ni} + 30 \times \% \text{C} + 0.5 \times \% \text{Mn}$$



1 AREA 1

Risk of grains thickness
 > 1150°C.

2 AREA 2

Risk of fragilisation : cold
 cracking.
 Quench cracks < 400°C.

3 AREA 3

Risk of formation of sigma
 phase between 450°C
 and 900°C.

4 AREA 4

Risk of fissuration of hot
 cracking > 1250°C.

CARBON EQUIVALENT AND PREHEATING TEMPERATURE

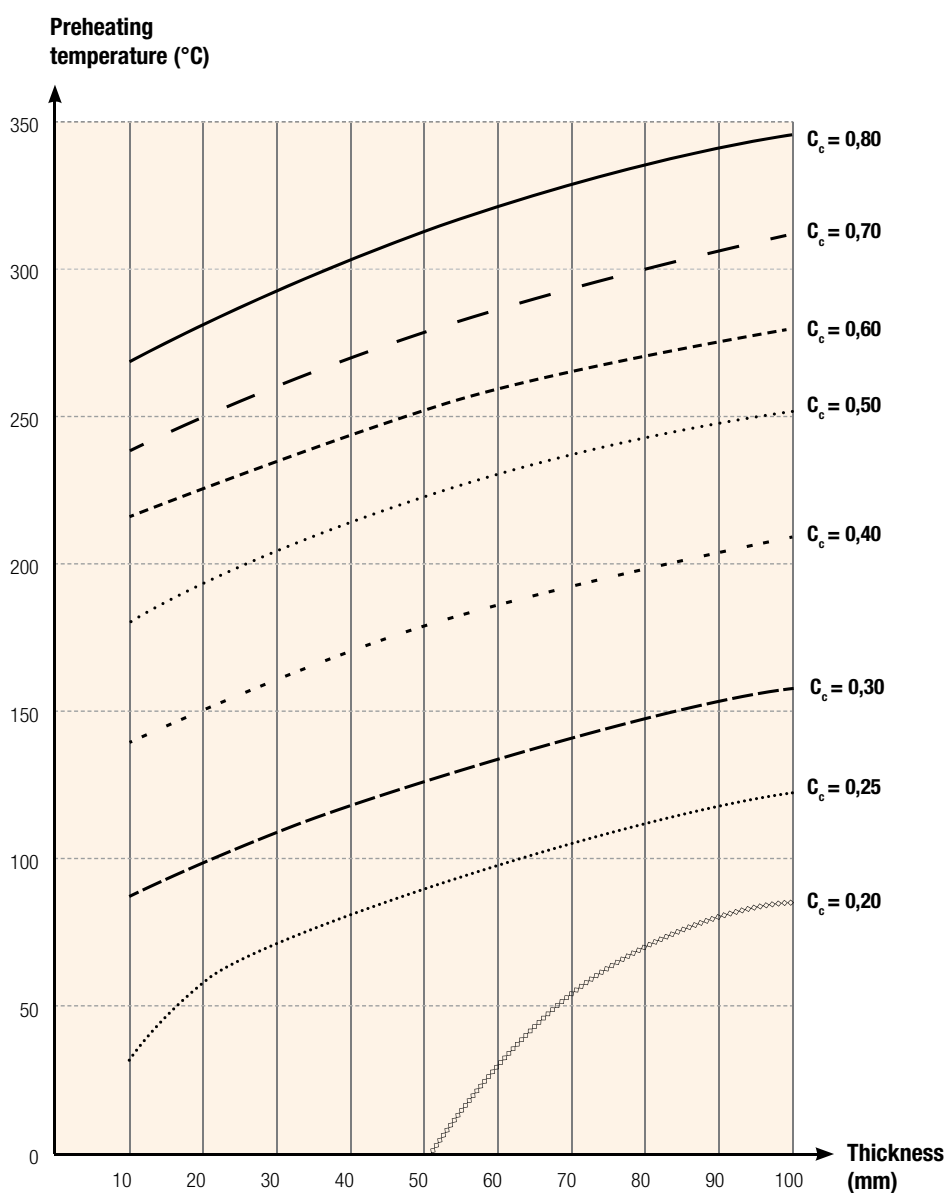
CALCULATION METHOD OF THE PREHEATING TEMPERATURE OF A STEEL
ACCORDING TO ITS CHEMICAL COMPOSITION.

■ FORMULA ACCORDING TO IIS DOC. IX 646-69

$$C_e = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

$$C_{e.c} = C_e + 0.0254 e$$

(e : piece thickness in cm)



TECHNICAL ADVICE

HARDNESS CONVERSION TABLE: BRINELL - VICKERS - ROCKWELL - SHORE

Tensile strength (kg/mm ²)	BRINELL HB Hardness (P = 30 D2)	ROCKWELL Hardness		VICKERS HV Hardness (P = 30 kg)	ROCKWELL DIAMOND		SHORE Hardness
		HRB	HRC		Charge 30 kg (N)	Charge 15 kg (N)	
28	80	36,4		80			
30	85	42,4		85			
32	90	47,4		90			
33	95	52,0		95			
35	100	56,4		100			
37	105	60,0		105			
39	110	63,4		110			15
40	115	66,4		115			18
42	120	69,4		120			19
43	125	72,0		125			20
45	130	74,4		130			-
47	135	76,4		135			-
48	140	78,4		140			21
50	145	80,4		145			22
51	150	82,2		150			23
53	155	83,8		155			-
55	160	85,4		160			25
56	165	86,8		165			-
58	170	88,2		170			26
60	175	89,6		175			-
62	180	90,8		180			28
63	185	91,8		185			-
65	190	93,0		190			29
67	195	94,0		195			30
68	200	95,0		200			31
70	205	95,8		205			32
72	210	96,6		210			-
73	215	97,6		215			33
75	220	98,2		220			-
77	225	99,0		225			-
78	230		19,2	230	41,9	69,7	34
80	235		20,2	235	42,9	70,3	35
82	240		21,2		43,9	70,9	36
84	245		22,1				-
85	250		23,0		45,1	71,7	37
87	255		23,8		46,2	72,5	38
89	260		24,6	260			-
90	265		25,4	265	47,3	73,1	39
92	270		26,2	270	48,3	73,7	40
94	275		26,9	275			-
96	280		27,6	280	49,3	74,4	41
97	285		28,3	285			-
99	290		29,0	290	50,3	75,0	42
101	295		29,6	295			-
103	300		30,3	300	51,2	75,5	43
106	310		31,5	310	52,2	76,1	45
110	320		32,7	320	53,3	76,7	46

VALID ON UN-ALLOYED AND ANNEALED STEELS

Tensile strength (kg/mm ²)	BRINELL HB Hardness (P = 30 D2)	ROCKWELL Hardness		VICKERS HV Hardness (P = 30 kg)	ROCKWELL DIAMOND		SHORE Hardness
		HRB	HRC		Charge 30 kg (N)	Charge 15 kg (N)	
113	330		33,8	330	54,3	77,3	47
117	340		34,9	340	55,4	78,0	48
120	350		36,0	350	56,4	78,6	50
123	359		37,0	360	57,6	79,3	51
126	368		38,0	370			
129	376		38,9	380	58,7	80,0	52
132	385		39,8	390	59,9	80,6	54
135	392		40,7	400			
138	400		41,5	410	61,1	81,4	56
141	408		42,4	420	62,3	82,0	58
144	415		43,2	430			
146	423		44,0	440	63,5	82,8	59
149	430		44,8	450			
153	439		45,5	460	64,6	83,4	61
159	444		46,3	470	65,8	84,0	63
160			47,0	480	66,0	84,1	-
165	461		47,7	490	67,2	84,7	65
167			48,3	500	67,4	84,9	-
171	477		49,0	510	68,2	85,3	66
174			49,7	520	68,7	85,6	-
178	495		50,3	530	69,4	85,9	68
182			50,9	540	69,9	86,3	-
185	514		51,5	550	70,3	86,5	70
192	534		52,1	560	71,6	87,2	71
200	555		52,8	570	72,7	87,8	73
208	578		53,3	580	73,9	88,4	75
217			53,8	590	75,1	89,0	77
227			54,4	600	76,3	89,6	79
228			54,9	610	76,4	89,7	-
231			55,4	620	76,8	89,8	80
			55,9	630			
			56,4	640			
			56,9	650			
			57,4	660			
			57,9	670	77,2	90,1	
			58,4	680	77,5	90,2	81
			58,9	690	77,6	90,3	-
			59,3	700	78,4	90,7	83
			60,2	720	79,0	91,0	84
			61,1	740	79,1	91,0	-
			61,9	760	79,7	91,2	86
			62,8	780	80,4	91,5	87
			63,5	800	81,1	91,8	88
			64,3	820	81,7	92,0	90
			65,0	840	82,2	92,1	91
			65,7	860	82,7	92,3	92
			66,3	880	83,1	92,5	93
			66,9	900	83,6	92,7	95
			67,5	920	84,0	92,9	96
			68,0	940	84,4	93,0	97
				970	84,8	93,4	
				1000	85,3	93,6	
				1050	85,8	93,9	
				1100	86,4	94,1	
				1200	87,2	94,5	

VALID ON UN-ALLOYED AND ANNEALED STEELS

PACKAGING OF COATED ELECTRODES (MMA)

THE PACKAGING OF OUR ARC WELDING ELECTRODES RANGE DEPENDS ON GRADES AND USE:
CARTON PLASTIC, METAL BOX, VACUUM.

STANDARD PACKAGING

■ CARTON BOXES (~ 5 kg):

- Un-alloyed steel ⁽¹⁾
- Low alloyed steel ⁽¹⁾
- High alloyed steel ⁽²⁾
- Stainless steel ⁽²⁾

■ PLASTIC BOXES (ST) WITH ERGONOMIC RE CLOSABLE CAP (~ 5 kg):

- Stainless steel ⁽¹⁻³⁾
- Cast iron
- Nickel alloys
- Cobalt alloys
- Copper alloys
- Hardfacing

■ TELESCOPIC BOXES (PE) (~ 1 kg):

- Un-alloyed steel
- Low alloyed steel
- Stainless steel
- Cast iron
- Hardfacing

■ TELESCOPIC BOXES (PE) (~ 300 g):

- Stainless steel
- High alloyed steel
- Stainless steel
- Cast iron
- Hardfacing

■ METCAN:

- Aluminium alloys

■ VACUUM PACKING (~ 1 kg AND ~ 2 kg):

- Basic electrodes
- Low alloyed steel
- Stainless steel

(1) : Some products are also available in vacuum or metcan.

(2) : Assembly range.

(3) : Maintenance and repair range.

(4) : For safety purposes some products are put in a plastic sleeve before reconditioning in carton box.

OVERPACKING

- Boxes are put into **carton overpacking** or **filmed by 3**.
- Electrodes boxes may be stored in layers to a **maximum of 4 on a pallet**.

VACUUM PACKAGING

Basic coated electrodes supplied by **Selectarc** in vacuum packaging are available in:

- **BOXES: 1 kg overpacked by 12,**
- **BOXES: 2 kg overpacked by 6.**

PACKAGING

- **STANDARD PACKAGING:** 5 kg / box
- **OVERPACKING:** 4 boxes / package
- **VACUUM PACKING:** 1 kg, 2 kg / box
- **METCAN**

GRADES IN SMALL PACKAGING

- **AVAILABLE IN PE CASES 1 kg:** 51, 54, 20/10MBC, 29/9, 48Sp, B7016Sp, B90, FeNi/Cu, Ferro-Ni, Fonte Ni, HB61R, HB63, HRT60.
- **AVAILABLE IN PR CASES ~ 300 g:** 51, 20/10MBC, 29/9, Ferro-Ni, HB61R.



All specific packaging can be studied on request:
sales@fsh-welding.com.

STORAGE AND HANDLINE ADVICE



FOR STANDARD PACKAGING

Electrodes provided by **Selectarc** in standard packaging shall be used under the following considerations:

■ STORAGE AND PRECAUTION

COMMON RULES FOR ELECTRODES STORAGE ARE:

- **First-In/ First-Out (FIFO)** ;
- **Separating electrode types and lots;**
- **Electrodes should be stored in a dry place;**
- **High variations of the temperature should be prevented to eliminate the risk of condensation in the boxes.**

RECOMMENDED STORAGE CONDITIONS:

- **Temperature : 15-35°C ;**
- **Relative Humidity: as low as possible, not exceeding 70 %.**
- **Storage of boxes or cases should be on pallet or shelf, rather than on the ground.**
- **It is recommended to stock the electrodes not longer than 5 years, but no maximum storage time is given.**

■ REDRYING

- **Rutile and cellulose electrodes** can be used directly without re-drying. Rutile electrodes which show any sign of damage from moisture pick-up can be re-dried at a temperature of 90-110°C for 0.5-1 hour.
- **Basic coated electrodes** are re-dried normally at a temperature of around 350°C for 1-2 hours, to achieve a hydrogen level of < 5 ml / 100 g in the weld deposit. Re-dried basic electrodes can be stored in a heated cabinet or kiln at 80-120°C without further moisture pick-up.
- **Selectarc rutile-basic coated stainless steel electrodes** are produced with a coating which is highly resistant to moisture pick-up. Therefore they can be used without re-drying. However if, for some reason, the electrodes are damp, they should be re-baked for 2 h at 250-300°C.

VACUUM PACKAGING

Basic coated electrodes provided by **Selectarc** in vacuum packaging shall be used under the following considerations:

■ STORAGE AND PRECAUTION

- **The Vac Packed electrodes** should be stored in **closed packs in a dry place.**
- **The storage period shouldn't be longer than 12 month.**

■ USAGE

- **Only the necessary packs needed for a welding period of about 4 hours should be taken from the stock area to the working place.**
- **Before use make sure that the pack has not lost his vacuum.**
- **Open the pack with an appropriate tool, knife or scissors.**
- **Mark the pack with date and opening time.**
- **Once the pack has been opened the electrodes have to be used straight from the pack. The electrodes taken from the opened pack should be welded within the maximum time indicated on the label, i.e. 4 hours.**
- **Make sure that during this working time the pack or the electrodes are not in contact with water, rain ect.**
- **Electrodes that remain unused in opened packs shall be discarded or re-baked** according to the instructions on the label.

■ DIFFUSIBLE HYDROGEN

- **If the above procedure has been fully respected Selectarc Industries guarantees that the diffusible Hydrogen content of the weld deposit will meet the maximum level indicated in standard on the label, i.e.**
 - <5ml/ 100 g weld metal for H5
 - and <10ml/100 g weld metal for H10.



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