



PANORAMA CORED WIRES

- High productivity
- Consistent quality of the weld
- High welding speed
- Responsiveness
- 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



STEEL
CONSTRUCTION



CHEMICAL AND PETROCHEMICAL
INDUSTRY



M&R
INDUSTRY



SELECTARC CORED WIRES

THE ECONOMICAL TECHNOLOGICAL SOLUTION

THE SELECTARC RANGE OF CORED WIRES SUPPLEMENTS THE BROAD RANGE OF SELECTARC WELDING WELDING CONSUMABLES.

This selection covers all the main **assembly and hardfacing applications**.

▪ **For manufacturing:** This product technology provides **high productivity while ensuring the final quality of the assembly**.

▪ **For hardfacing:** the cored wire **increases the lifespan and performance of industrial parts of all sizes**.

The decision to use cored wire instead of solid wire or electrodes **maintains the same level of quality while increasing performance:** increased productivity (reduced downtime, increased yield), and reduced production costs, consistent weld quality.

Technological and economic benefits required to gain competitiveness in certain industries, such as energy, mining and quarrying, cement, chemical and petrochemical industry, food processing, automotive, maintenance and repair and many others.

+ OF THE PRODUCT RANGE

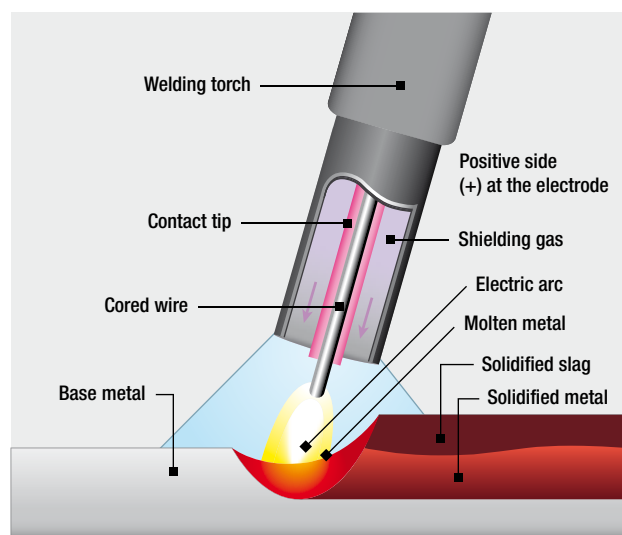
- ★ Higher productivity than electrodes or solid wire
- ★ Constant weld quality
- ★ High welding speed
- ★ Ease of use
- ★ Excellent reliability
- ★ Beautiful seams
- ★ Good current transfer
- ★ Very good mechanical properties
- ★ Low diffusible hydrogen
- ★ Limited number of reworks
- ★ All position welding possible with certain cored wires

● WELDING PROCESSES

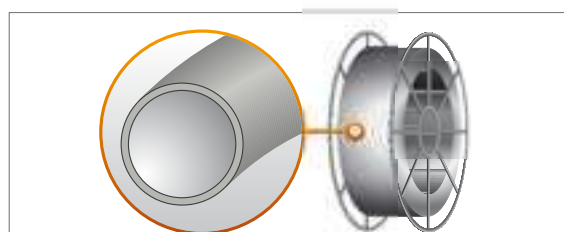
There are different types of cored wire processes for the same metal to be deposited.

The Selectarc range covers the welding processes:

- **Without gas (114), FCO range,**
- **With gas (136-138), FCW range.**

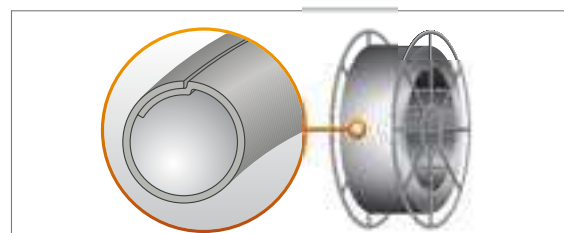


● TUBULAR OR STAPLE WIRES



TUBULAR WIRES

So-called "**seamless**" tubular wires can limit the moisture absorption and improve the conductivity of the arc. Tubular wires are mostly made of copper.



STAPLE WIRES

So-called "**strip**" or "**staple**" wire allows a higher deposit rate and lower cost relative to tubular wire. However, it is more susceptible to moisture absorption.

CLASSIFICATION & STANDARDS

FOR ALL REQUESTS:
>> CONSULT US!

UN-ALLOYED STEELS

Type	Characteristic	Classification			
		AWS A5.20	AWS A5.18	ISO 17632-A	
■ SELECTARC FCW 51-M	Universal metal cored non alloy	-	E 70C-6M H4	T 42 3 M M 1 H5	p 10
■ SELECTARC FCW 51-M HP	Universal metal cored, tubular copper, high performance	-	AWS A5.36 : E70T15-M21A8-CS1-H4 / E70T15-C1A6-CS1-H4	T 46 6 M M 1 H5 / T 42 5 M C 1 H5	p 10
■ SELECTARC FCW 51-R	Universal rutile flux cored wire	-	E71T1-1M	T 46 2 P M 1 H10	p 11
■ SELECTARC FCW 56-R	Universal seamless rutile cored wire, tubular copper, all positions	E71T-1(M) H4	AWS A5.36 : E71T1-M21A4-CS1-H4 / E71T1-C1A2-CS1-H4	T 46 4 P M 1 H5 / T 42 2 P C 1 H5	p 11
■ SELECTARC FCO 56	Flux wire without gas, all positions	E71T-11	-	T 38 Z Z N 1	p 11
■ SELECTARC FCW OA	Flux cored wire Open-Arc	E71T-GS	-	T 42 Z W N 1 H15	p 11

LOW ALLOYED STEELS

Type	Characteristic	Classification		
		AWS A5.36	ISO 18276-A	
■ SELECTARC FCW 75CuM	Metal cored wire grade Corten	AWS A5.28 : E70C-G H4	ISO 17632-A : T 46 2 Z M M 1 H5	p 12
■ SELECTARC FCW 81-M	Metal cored wire for cold tough steel	E80T15-M21A8-Ni1-H4	ISO 17632-A : T 50 6 1 Ni M M 1 H5	p 12
■ SELECTARC FCW 81-R	Rutile cored wire all positions for cold tough steels	E81T1-M21A8-Ni1-H4	ISO 17632-A : T 50 6 1 Ni P M 1 H5	p 12
■ SELECTARC FCW 77-M	Metal cored wire for high strength steels	E110T15-M21A8-K4-H4	T 69 6 Mn2NiCrMo M M 1 H5	p 13
■ SELECTARC FCW 77-R	Rutile flux cored wire, all positions, for high strength steels	E111T1-M21A8-GH4	T 69 6 Z P M 1 H5	p 13
■ SELECTARC FCW 77-B	Basic flux cored wire, for high strength steels	E110T5-M21A8-K4-H4	T 69 6 Mn2NiCrMo B M 3 H5	p 13
■ SELECTARC FCW 79-M	Metal cored wire, all positions, for high strength steels	AWS A5.28 : E120C-H4	T 89 6 Z M M 1 H5	p 13

STAINLESS STEELS

Type	Characteristic	Classification		
		AWS A5.22	ISO 17633-A	
■ SELECTARC FCW 308L	High productivity 308L grade flux cored wire	E308LT0-1/-4	T 19 9 L R M21(C1) 3	p 14
■ SELECTARC FCW 308LP	All positions 308L grade flux cored wire	E308LT1-1/-4	T 19 9 L P M21(C1) 1	p 14
■ SELECTARC FCW 316L	High productivity 316L grade flux cored wire	E316LT0-1/-4	T 19 12 3 L R M21(C1) 3	p 14
■ SELECTARC FCW 316LP	All positions 316L grade flux cored wire	E316LT1-1/-4	T 19 12 3 L P M21(C1) 1	p 15
■ SELECTARC FCW 309L	Rutile cored wire for heterogeneous assembly	E309LT0-1/-4	T 23 12 L R M21(C1) 3	p 15
■ SELECTARC FCW 309LP	All positions rutile cored wire, for heterogeneous assembly	E309LT1-1/-4	T 23 12 L P M21(C1) 1	p 15
■ SELECTARC FCW 310	High productivity 310 grade flux cored wire	~E310T0-1/-4	T 25 20 R M21(C1) 3	p 15
■ SELECTARC FCW 310LP	All positions, 310 grade flux cored wire	~E310T1-1/-4	T 25 20 R M21(C1) 1	p 16
■ SELECTARC FCW 2209	High productivity duplex flux cored wire	E2209T0-1/-4	T 22 9 3 N L R M21(C1) 3	p 16
■ SELECTARC FCW 2209P	All positions, duplex flux cored wire	E2209T1-1/-4	T 22 9 3 N L P M21(C1) 1	p 16
■ SELECTARC FCW 2509MO	High productivity, super duplex flux cored wire	~E2594T0-4	T Z 25 9 4 Cu N L R M21 3	p 16
■ SELECTARC FCW 2509MOP	All positions, super duplex flux cored wire	~E2594T-1	T Z 25 9 4 Cu N L P M21 1	p 17
■ SELECTARC FCW 307M	Metal cored wire 307 grade	AWS A5.9 : ~EC307	T 18 8 Mn M M12 1	p 17
■ SELECTARC FCW 307	High productivity, metal cored 307 grade	~E307T0-1/-4	T 18 8 Mn R M21(C1) 3	p 18
■ SELECTARC FCW 307P	All positions, metal cored 307 grade	~E307T1-4	T 18 8 Mn R 21 1	p 18
■ SELECTARC FCO 307	Maintenance and repair, stainless steel Open-Arc wire	~E307T0-3	T 18 8 Mn U N0 3	p 18
■ SELECTARC FCT 308L	TIG cored wire for root pass on 304L	R308LT1-5	-	p 19
■ SELECTARC FCT 316L	TIG cored wire for root pass on 316L	R316LT1-5	-	p 19
■ SELECTARC FCT 309L	TIG cored wire for root pass on dissimilar joint	R309LT1-5	-	p 19
■ SELECTARC FCT 347	TIG Cored Wire for root pass on 347/321	R347T1-5	-	p 19



NICKEL ALLOYS

Type	Characteristic	Classification		
		AWS A5.34	ISO 12153	
■ SELECTARC FCW NI182	Rutile-basic cored wire Alloy 600 type*	ENiCrFe3T0-4	T Ni 6182 (NiCr15Fe6Mn)	p 20
■ SELECTARC FCW NI625	Rutile-basic cored wire Alloy 625 type*	ENiCrMo3T0-4	T Ni 6625 (NiCr22Mo9Nb)	p 20

* Inconel® is a registered trade name of Inco Companies.

CAST IRON

Type	Characteristic	Classification		
		AWS A5.15	ISO 1071	
■ SELECTARC FCW FENI	Rutile flux cored wire for cast iron	-	T C NiFe-2	p 21

COBALT ALLOYS

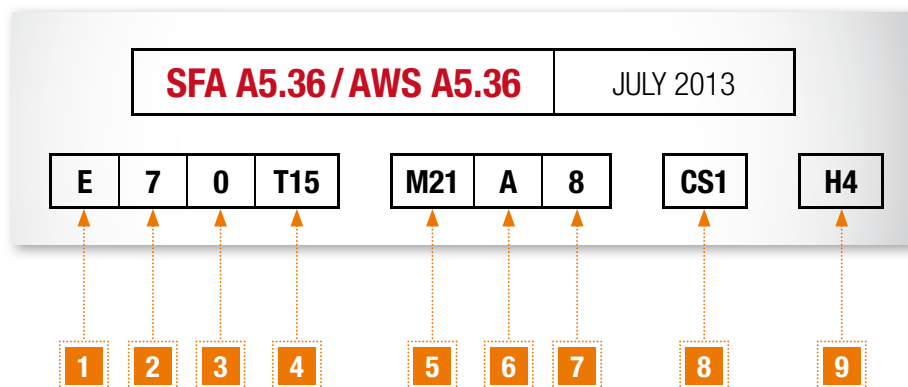
Type	Characteristic	Classification			
		AWS A5.21	EN 14700	DIN 8555	
■ SELECTARC FCW CO6	Cobalt grade 6 flux cored wire	ERCCoCr-A	T Co2	MSG 20-GF-40-CTZ	p 22
■ SELECTARC FCW CO21	Cobalt grade 21 flux cored wire	ERCCoCr-C	T Co1	MSG 20-GZ-250-CKTZ	p 22

HARFACING - REPAIR AND MAINTENANCE

Type	Characteristic	Classification		
		EN 14700	DIN 8555	
■ SELECTARC FCW 45	Hardfacing metal cored wire - 450HB	T Fe2	MSG 1-GF-400	p 24
■ SELECTARC FCW 60	Hardfacing metal cored wire - 600HB	T Fe2	MSG 6-GF-55-GSP	p 24
■ SELECTARC FCO 65A	Hardfacing metal cored wire without gas for extreme abrasion	T Z Fe13	MF 10-GF-65-G	p 24
■ SELECTARC FCO 65	Hardfacing metal cored wire without gas, against abrasion	T Fe15	MF 10-GF-65-GRZ	p 25
■ SELECTARC FCO 63	Self-shielded high chromium, hardfacing metal cored wire	T Fe15	MF 10-GF-60-GRZ	p 25
■ SELECTARC FCO 63TI	Self-shielded hardfacing wire, for abrasion and impact	T Fe8	MF 6-GF-55-GP	p 25
■ SELECTARC FCO FE60WC	Hardfacing flux cored wire, with tungsten carbide	T Fe20	MF 21-GF-50-GR	p 26
■ SELECTARC FCW 60G	Hardfacing flux cored wire, without slag	T Fe2	MSG 6-GF-55-GSP	p 26
■ SELECTARC FCO HBMNCR	Flux cored wire for cavitation, abrasion and impact	T Fe9	MF 7-GF-250	p 26
■ SELECTARC FCW HB50CO	Flux cored hardfacing wire, for hot working	T Z Fe3	MSG 4 GF 45 CRTZ	p 26
■ SELECTARC FCW 65BO	Flux cored hardfacing wire, chrome-Nickel-Bore alloys for extreme abrasion	T Fe13	MSG 10-GF-65-G	p 27

CLASSIFICATION & STANDARDS

FLUX CORED ARC WELDING WIRE FOR CARBON AND LOW-ALLOY STEELS



1 DESIGNATE AN ELECTRODE

2 TENSILE STRENGTH DESIGNATOR

Symbol US unit	Symbol SI unit	Re min (MPa)	Rm (MPa)	A (%) (min)
6	43	330	430-550	22
7	49	400	490-660	22
8	55	470	550-690	19
9	62	540	620-760	17
10	69	610	690-830	16
11	76	680	760-900	15
12	83	740	830-970	14
13	90	810	900-1040	14

3 POSITIONS DESIGNATOR

Symbol	Descriptif
0 ou 1	0 : Flat position / Horizontal position 1 : All positions

4 USABILITY DESIGNATOR

Symbol	Descriptif
T1 à T17	LETTER T FOLLOWED BY SOME NUMBER 1 THROUGH 17 : > Letter T identifies the electrode as Flux Cored or Metal Cored electrode. > Designator refers to the usability of the electrode with requirement for polarity and general operating characteristics.

5 SHIELDING GAS DESIGNATOR

Symbol according to AWS A5.36	Symbol according to ISO 14175
C1	C1
M12	M12 – ArC – 3
M13	M13 – ArO – 2
M14	M14 – ArCO – 3/2
M20	M20 – ArC – 10
M21	M21 – ArC – 20
M22	M22 – ArO – 7
M23	M23 – ArOC – 7/3
M24	M24 – ArCO – 10/2
M25	M25 – ArCO – 10/7
M26	M26 – ArCO – 20/2
M27	M27 – ArCO – 20/7
M31	M31 – ArC – 38
M32	M32 – ArO – 12.5
M33	M33 – ArCO – 38/6
M34	M34 – ArCO – 15/12.5
M35	M35 – ArCO – 38/12.5

6 HEAT TREATMENT DESIGNATOR

Symbol	Descriptif
A or P	A : As welded P : PWHT



7 IMPACT DESIGNATOR

Symbol US unit	Symbol SI unit	Temperature for a minimum average energy level of 27J (°C)
Y	Y	+20
0	0	0
2	2	-20
4	3	-30
5	4	-40
6	5	-50
8	6	-60
10	7	-70
15	10	-100
Z	Z	No impact requirements
G	As agreed between supplier and purchaser	

8 DEPOSIT COMPOSITION DESIGNATOR

Symbol	Descriptif
1, 2 or 3	are used to designate the composition of the deposited weld metal.
Letter G	indicates that the chemical composition is not specified.

9 DIFFUSIBLE HYDROGEN DESIGNATOR

Symbol	Average diffusible Hydrogen Maximum mL/100g deposit metal
H2	2
H4	4
H8	8
H16	16

UN-ALLOYED STEELS

SELECTARC FCW 51-M

UNIVERSAL METAL CORED NON ALLOY

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
				Intensity (A)	Voltage (V)		Stick out (mm)	FCAW		
AWS A5.18	C	0.04	■ Metal cored wire for gas shielded arc welding low alloys in all positions for Ar-CO ₂ mix. ■ APPLICATIONS: General steel constructions, foundries, shipyards...	Re (MPa)	465	1.2	150-340	16-35	10-25	= +
E 70C-6M H4	Si	0.6		Rm (MPa)	530					
ISO 17632-A	Mn	1.25		A5 (%)	30					
	T 42 3 M M 1 H5	Ni		0.02	KV (J)					
	Cr	0.04								
	Cu	0.02								
	Mo	0.01								
	V	0.01								
	S	0.010								
	P	0.015								
	Fe	Balance								
							ISO 14175			
							M21 (Ar/CO₂)		12-15 l/min	

SELECTARC FCW 51-M HP

UNIVERSAL METAL CORED, TUBULAR COPPER, HIGH PERFORMANCE

Classification	Weld metal composition (%)			Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
	Gas	M21	C1					Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.36	C	0.06	0.05	■ Metal cored wire for welding in all positions of Carbon steel, Carbon–Manganese and similar types of steels, including fine grain steels with Ar-CO₂ or pure CO₂ shielding gas. High yield, good weldability, excellent bead appearance, very low spatter losses. Excellent mechanical properties at low temperature (-60°C) in as welded conditions or after post weld heat treatment. Especially used for automated-robotized applications and for root pass welding on pipe or plate. ■ APPLICATIONS: General steel constructions, shipyards...	As welded (M21: Ar/CO₂)		1.0	40-270	11-32	10-25	+
E70T15-M21A8-CS1-H4	Si	0.8	0.6		Re (MPa)	500	1.2	50-320	12-35	10-25	
E70T15-C1A6-CS1-H4	Mn	1.6	1.5		Rm (MPa)	600	1.4	60-360	14-36	10-25	
ISO 17632-A	Ni	0.02	0.02		A5 (%)	29	1.6	60-390	16-37	10-25	
T 46 6 M M 1 H5	Cr	0.03	0.03		KV (J)	-40°C → 90 -60°C → 60					
T 42 5 M C 1 H5	Cu	0.07	0.07		As welded (C1: CO₂)						
	Mo	0.01	0.01		Re (MPa)	460					
	V	0.005	0.005		Rm (MPa)	560					
	S	0.01	0.01		A5 (%)	30					
	P	0.01	0.01		KV (J)	-40°C → 80 -50°C → 60					
	Fe	Balance	Balance		TTAS 620°C/2h						
					Re (MPa)	420					
					Rm (MPa)	510					
					A5 (%)	24					
					KV (J)	-40°C → 90					
							Shielding gas			+	
							ISO 14175		12-15 l/min		
							M21 (Ar/CO₂)				
							C1 (CO₂)				



SELECTARC FCW 51-R

UNIVERSAL RUTILE FLUX CORED

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
AWS A5.18	C	0.05	▪ Rutile flux cored wire for welding low alloy steel whith gas shielded arc in all positions whith Ar-CO ₂ mix. APPLICATIONS: General steel constructions, foundries, shipyards...	Re (MPa)	560	1.2	120-350	15-25	10-25		
E71T-1M	Si	0.4		Rm (MPa)	590	1.6	180-450	18-30	10-25		
ISO 17632-A	Mn	1.1		A5 (%)	28						
T 46 2 P M 1 H10	Ni	0.01		KV (J)	-20°C → 70						
	Cr	0.06									
	Cu	0.01									
	Mo	0.01									
	V	0.02									
	S	0.01									
	P	0.015									
	Fe	Balance									
							Shielding gas		20-25 l/min		
							ISO 14175				
							M21 (Ar/CO₂)				

SELECTARC FCW 56-R

UNIVERSAL SEAMLESS RUTILE CORED WIRE, TUBULAR COPPER, ALL POSITIONS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
				Intensity (A)	Voltage (V)		Stick out (mm)	FCAW			
AWS A5.20	C	0.065	■ Copper coated rutile flux cored wire for gas shielded arc welding low alloys in all positions whith Ar-CO ₂ mix or whith pure CO ₂ gas. The fast freezing and easy slag remove and is designed to weld in all positions. ■ APPLICATIONS: General steel constructions, pressure vessels, shipyards...	Re (MPa)	510	1.0	160-270	21-34	10-25	= +	
E71T-1(M) H4	Si	0.5		Rm (MPa)	580	1.2	190-320	22-35	10-25		
AWS A5.36	Mn	1.6		A5 (%)	26	1.4	200-350	23-36	10-25		
E71T1-M21A4-CS1-H4	Ni	0.02		KV (J)	-40°C→75	1.6	210-380	23-37	10-25		
E71T1-C1A2-CS1-H4	Cr	0.04		Re (MPa)	>420						
ISO 17632-A	Cu	0.1		Rm (MPa)	500-640						
T 46 4 P M 1 H5	Mo	0.005		A5 (%)	>22						
T 42 2 P C 1 H5	V	0.01		KV (J)	-20°C→>60						
	Nb	0.01									
	Al	0.005									
	Ti	0.05						Shielding gas		14-20 l/min	
	B	0.005					ISO 14175				
	S	0.01					M21 (Ar/CO ₂)				
	P	0.015					C1 (CO ₂)				
	Fe	Balance									

SELECTARC FCO 56

FLUX WIRE WITHOUT GAS, ALL POSITIONS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.20	C	0.1	▪ Flux cored wire for welding low alloys steels without gas in all positions. Especially used for welding in position on Thin plate (< 5 mm). ▪ APPLICATIONS: General steel constructions, foundries, shipyards...	Re (MPa)	440	1.2	100-200	20-22	30-40	= -
E71T-11	Si	0.3		Rm (MPa)	600	1.6	150-300	20-24	30-40	
ISO 17632-A T 38 Z Z N 1	Mn	0.5		A5 (%)	25					
	Ni	0.02		KV (J)	-					
	Cr	0.02								
	Cu	0.1								
	Mo	0.01								
	V	0.01								
	Al	1.4								
	S	0.012								
	P	0.015								
	Fe	Balance								
						Shielding gas				
						Without gas				

SELECTARC FCW OA

FLUX CORED WIRE OPEN-ARC

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.20	C	0.15	▪ Flux cored wire to weld carbon steels for Open-Arc welding without shielding gas in all positions. Easy slag removal. ▪ APPLICATIONS: Steel constructions, for shipbuilding, for railways, for maintenance works in mines, quarries, agriculture.	Re (MPa)	470	1.0	90-240	15-28	-	= -
E71T-GS	Si	0.4		Rm (MPa)	570	1.2	90-310	16-35	-	
ISO 17632-A	Mn	1.0		A5 (%)	24					
T 42 Z W N 1 H15	Ni	0.03		KV (J)	-					
	Cr	0.02								
	Cu	0.02								
	Mo	0.02								
	V	0.005								
	Al	0.9								
	S	0.010								
	P	0.015								
	Fe	Balance								
							Shielding gas			
							Without gas			

LOW ALLOYED STEELS



SELECTARC FCW 75CuM

METAL CORED WIRE TYPE CORTEN

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
				Intensity (A)	Voltage (V)		Stick out (mm)	FCAW			
AWS A5.28	C	0.05	■ Metal cored wire with Chromium, Nickel and Copper alloyed for welding CORTEN type steels with Ar+CO ₂ gas shielded. Good weldability, low spatter. ■ APPLICATIONS: Public works, steels construction, shipyard...	Re (MPa)	510	1.2	100-350	15-35	12-25	⊞ ⊞	
E70C-G H4	Si	0.5		Rm (MPa)	570	1.6	130-450	15-35	15-25		
ISO 17632-A	Mn	1.1		A5 (%)	24					/ pulsed	
T 46 2 Z M M 1 H5	Ni	0.4		KV (J)	-20°C → 80						
	Cr	0.5									
	Cu	0.4									
	S	0.015									
	P	0.015									
	Fe	Balance									
							Shielding gas				
							ISO 14175		12-15 l/min		⏏ ⏏
							M21 (Ar/CO₂)				

SELECTARC FCW 81-M

METAL CORED WIRE FOR COLD TOUGH STEEL

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
AWS A5.36	C	0.06	▪ Metal cored wire, Nickel alloyed, for welding of carbon steel, carbon-manganese and high strength steels with Ar+CO ₂ shielding gas. Resistant to low temperature down to -60°C. Good characteristics of cold toughness up to -60°C. Good weldability, very low spatter and excellent weld bead appearance. Easy slag removal. ▪ APPLICATIONS: General steel constructions, foundries, shipyards...	Re (MPa)	530	1.0	160-270	21-34	10-25	= +	
E80T15-M21A8-Ni1-H4	Si	0.5		Rm (MPa)	620	1.2	190-320	22-35	10-25		
ISO 17632-A	Mn	1.3		A5 (%)	27	1.4	200-350	23-36	10-25		
T 50 6 1Ni M M 1 H5	Ni	0.9		KV (J)	-60°C → 90	1.6	210-380	23-37	10-25		
	Cr	0.02									
	Cu	0.12									
	Mo	0.01									
	V	0.02									
	S	0.010									
	P	0.015									
	Fe	Balance									
							Shielding gas				
							ISO 14175	-			
							M21 (Ar/CO ₂)				

SELECTARC FCW 81-R

RUTILE CORED WIRE ALL POSITIONS FOR COLD TOUGH STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
AWS A5.36	C	0.07	▪ Rutile cored wire, Nickel alloyed for welding in all positions of Carbon steel, carbon-manganese and high strength steels with Ar-CO ₂ shielding gas. High yield, good weldability, excellent bead appearance, very low spatter, fast freezing and easy to remove slag. Excellent mechanical properties at low temperature (-60°C) in as welded conditions or after post weld heat treatment. ▪ APPLICATIONS: Offshore...	As welded (M21:Ar/CO ₂)		1.0	160-270	21-34	10-25	= +	
E81T1-M21A8-Ni1-H4	Si	0.45		Re (MPa)	550	1.2	190-320	22-35	10-25		
ISO 17632-A	Mn	1.3		Rm (MPa)	610	1.4	200-350	23-36	10-25		
	Ni	0.85		A5 (%)	25	1.6	210-380	23-37	10-25		
T 50 6 1 Ni P M 1 H5	Gr	0.04		KV(J)	+20°C → 110						
	Cu	0.12			-40°C → 90						
	Mo	0.005			-50°C → 70						
	V	0.02			-60°C → 65						
	S	0.010		TTAS 620°C/2h							
	P	0.015			Re (MPa)	520			Shielding gas		
	Fe	Balance			Rm (MPa)	580					
					A5 (%)	29			ISO 14175	-	
					KV(J)	-40°C → 60			M21 (Ar/CO₂)		

SELECTARC FCW 77-M

METAL CORED WIRE FOR HIGH STRENGTH STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.36	C	0.06	■ Metal cored wire, Nickel, Chromium and Molybdenum alloyed for welding low alloyed and high strength steels with Ar + CO₂ shielding gas. Exceptional mechanical properties at low temperatures (-60°C). Good weldability, excellent bead appearance and low spatter. ■ APPLICATIONS: Cranes, vessel and apparatus construction...	Re (MPa)	760	1.0	160-270	21-34	10-25	= + / pulsed
E110T15-M21A8-K4-H4	Si	0.5		Rm (MPa)	820	1.2	190-320	22-35	10-25	
ISO 18276-A	Mn	1.6		A5 (%)	17	1.4	200-350	23-36	10-25	
T 69 6 Mn2NiCrMo M M 1 H5	Ni	2.5		KV (J)	-60°C → 70	1.6	210-380	23-37	10-25	
	Cr	0.5								Shielding gas ISO 14175 M21 (Ar/CO₂) 12-15 l/min

SELECTARC FCW 77-R

RUTILE FLUX CORED WIRE, ALL POSITIONS, FOR HIGH STRENGTH STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.36	C	0.07	■ Rutile flux cored wire alloyed with Nickel and molybdenum for high strength steels with Ar + CO₂ shielding gas. Exceptional mechanical properties at low temperatures (-60°C). Good weldability, excellent bead appearance and low spatter. ■ APPLICATIONS: Cranes, vessel and apparatus construction...	Re (MPa)	770	1.0	160-270	21-34	10-25	= +
E111T1-M21A8-GH4	Si	0.4		Rm (MPa)	800	1.2	190-320	22-35	10-25	
ISO 18276-A	Mn	1.7		A5 (%)	19	1.4	200-350	23-36	10-25	
T 69 6 Z P M 1 H5	Ni	2.0		KV (J)	-40°C → 75 -60°C → 60	1.6	210-380	23-37	10-25	
	Cr	0.2								Shielding gas ISO 14175 M21 (Ar/CO₂) 12-15 l/min

SELECTARC FCW 77-B

BASIC FLUX CORED WIRE, FOR HIGH STRENGTH STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.36	C	0.06	■ Basic flux cored wire, Nickel, Chromium and Molybdenum alloyed for welding low alloyed and high strength steels with Ar + CO₂ shielding gas. Exceptional mechanical properties at low temperatures (-60°C). Good weldability in flat position, excellent bead appearance and low spatter. ■ APPLICATIONS: Cranes, vessel and apparatus construction...	Re (MPa)	740	1.0	160-270	21-34	10-25	= +
E110T5-M21A8-K4-H4	Si	0.4		Rm (MPa)	800	1.2	190-320	22-35	10-25	
ISO 18276-A	Mn	1.4		A5 (%)	20	1.4	200-350	23-36	10-25	
T 69 6 Mn2NiCrMo B M 3 H5	Ni	2.2		KV (J)	-60°C → 80	1.6	210-380	23-37	10-25	
	Cr	0.4								Shielding gas ISO 14175 M21 (Ar/CO₂) 12-15 l/min

SELECTARC FCW 79-M

METAL CORED WIRE, ALL POSITIONS, FOR HIGH STRENGTH STEELS

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.28	C	0.1	■ Metal cored wire, Nickel, Chromium and Molybdenum alloyed for welding in all positions low alloyed and high strength steels with Ar + CO₂ shielding gas. Exceptional mechanical properties at low temperatures (-60°C). Good weldability, excellent bead appearance and low spatter. ■ APPLICATIONS: Cranes, vessel and apparatus construction...	Re (MPa)	980	1.0	160-270	21-34	10-25	= +
E120C-H4	Si	0.5		Rm (MPa)	1080	1.2	190-320	22-35	10-25	
ISO 18276-A	Mn	1.85		A5 (%)	17	1.4	200-350	23-36	10-25	
T 89 6 Z M M 1 H5	Ni	2.6		KV (J)	-40°C → 58 -60°C → 55	1.6	210-380	23-37	10-25	
	Cr	0.4								Shielding gas ISO 14175 M21 (Ar/CO₂) 12-15 l/min

STAINLESS STEELS



SELECTARC FCW 308L

HIGH PRODUCTIVITY 308L GRADE FLUX CORED WIRE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar+CO ₂) arc welding for 304L stainless steel. Flux cored wire with high productivity in down hand and fillet welding. Easy slag removal. For all type of steel stainless construction with a service temperature that does not exceed 400°C. ▪ APPLICATIONS: Thermal Plant, piping, construction on sea coast.	Rp0,2 (MPa)	400	1.2	100-280	23-33	10-25	= +	
E308LT0-1/-4	Si	0.7		Rm (MPa)	560	1.6	150-400	23-35	10-25		
ISO 17633-A	Mn	1.4		A5 (%)	40						
T 199 LRM21 (C1) 3	Ni	10.5		KV (J)	+20°C → 60 -196°C → 32						
	Cr	19.5									
	Cu	0.10									
	Mo	0.01									
	P	0.02									
	S	0.008									
	Fe	Balance									
							Shielding gas		12-20 l/min		
							ISO 14175				
							M21 (Ar/CO₂)				

SELECTARC 308LP

ALL POSITIONS 308L GRADE FLUX CORED WIRE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar + CO ₂) arc welding for 304L stainless steel. Wire with rutile fast freezing to weld in all positions. For all type of steel stainless construction with service temperature that does not exceed 400°C. ▪ APPLICATIONS: Thermal Plant, piping, construction on sea coast.	Rp0,2 (MPa)	460	1.2	130-270	22-35	12-25	= +
E308LT1-1/-4	Si	0.7		Rm (MPa)	620					
ISO 17633-A	Mn	1.4		A5 (%)	40					
T 199 L P M21 (C1) 1	Ni	10.5		KV (J)	-196°C → 35					
	Cr	20.0								
	Cu	0.1								
	Mo	0.01								
	P	0.02								
	S	0.008								
	Fe	Balance								
							Shielding gas		10-20 l/min	↕ ↕ ↕ ↕
							ISO 14175			
							M21 (Ar/CO₂)			

SELECTARC FCW 316L

HIGH PRODUCTIVITY 316L GRADE FLUX CORED WIRE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar+CO ₂) arc welding for 316L stainless steel. Wire with rutile fast freezing to weld in all positions. For all type of steel stainless construction with a service temperature does not exceed 400 °C. ▪ APPLICATIONS: Thermal Plant, piping, construction on sea coast.	Rp0,2 (MPa)	490	1.2	130-270	22-35	12-25	= +	
E316LT1-1/-4	Si	0.8		Rm (MPa)	600						
ISO 17633-A	Mn	1.4		A5 (%)	35						
T 19 12 3 L P M21 (C1) 1	Ni	12.0		KV (J)	-60°C → 50						
	Cr	19.0									
	Cu	0.1									
	Mo	2.9									
	P	0.02									
	S	0.008									
	Fe	Balance									
							Shielding gas		10-20 l/min		
							ISO 14175				
							M21 (Ar/CO₂)				

SELECTARC FCW 316LP

ALL POSITIONS 316L GRADE FLUX CORED WIRE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar+CO₂) arc welding for 316L stainless steel. Wire with rutile fast freezing to weld in all positions. For all type of steel stainless construction with service temperature that does not exceed 400°C. ▪ APPLICATIONS: Thermal Plant, piping, construction on sea coast.	Rp0,2 (MPa)	490	1.2	130-270	22-35	12-25	⊞ ⊕ ⊞ ⊕
E316LT1-1/-4	Si	0.8		Rm (MPa)	600					
ISO 17633-A	Mn	1.4		A5 (%)	35					
T 19 12 3 L P M21 (C1) 1	Ni	12.0		KV (J)	-60°C → 50					
	Cr	19.0								
	Cu	0.1								
	Mo	2.90								
	P	0.02								
	S	0.008								
	Fe	Balance								
							Shielding gas			
							ISO 14175		10-20 l/min	
							M21 (Ar/CO₂)			

SELECTARC FCW 309L

RUTILE CORED WIRE FOR HETEROGENEOUS ASSEMBLY

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar+CO ₂) arc welding for 309L stainless steel and for dissimilar joining type 304 or 316 to low alloys steels. The high ferrite content allows an important dilution without cracks. Flux cored wire with high productivity in down hand and fillet welding. Easy slag removal. ▪ APPLICATIONS: Pressure vessels, maintenance and repair. Buttering before Low carbon cladding or Final hardfacing.	Rp0,2 (MPa)	460	1.2	100-280	23-33	10-25	= +
E309LT0-1/-4	Si	0.7		Rm (MPa)	580	1.6	150-400	23-35	10-25	
ISO 17633-A	Mn	1.4		A5 (%)	32					
T 23 12 L R M21 (C1) 3	Ni	13.0		KV (J)	-60°C → 40					
	Cr	23.5								
	Mo	0.1								
	Cu	0.1								
	P	0.02								
	S	0.008								
	Fe	Balance								
							Shielding gas			12-20 l/min
							ISO 14175			
							M21 (Ar/CO ₂)			

SELECTARC FCW 309LP

ALL POSITIONS RUTILE CORED WIRE, FOR HETEROGENEOUS ASSEMBLY

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
				Intensity (A)	Voltage (V)		Stick out (mm)	FCAW		
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar + CO ₂) arc welding for 309L stainless steel and for dissimilar joining type 304 or 316 to low alloys steels. The high ferrite content allows an important dilution without cracks. Wire with rutile fast freezing to weld in all positions. ▪ APPLICATIONS: Pressure vessels, maintenance and repair. Buttering before Low carbon cladding or Final hardfacing.	Rp0,2 (MPa)	460	1.2	130-270	22-35	12-25	
E309LT1-1/-4	Si	0.7		Rm (MPa)	580					
ISO 17633-A T 23 12 L P M21 (C1) 1	Mn	1.4		A5 (%)	35					
	Ni	13.0		KV (J)	-60°C → 40					
	Cr	23.5								
	Mo	0.1								
	Cu	0.1								
	P	0.02								
	S	0.008								
	Fe	Balance								
							Shielding gas		10-20 l/min	
							ISO 14175			
							M21 (Ar/CO ₂)			

SELECTARC FCW 310

HIGH PRODUCTIVITY 310 GRADE FLUX CORED WIRE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
AWS A5.22	C	0.12	▪ Flux cored wire for gas shielded (Ar+CO ₂) arc welding for 310 type stainless steel and adapted for welding dissimilar steels as heat resistant steels to stainless steels. Deposit resisting to corrosion and oxidation up to 1100°C and against hot cracks. High deposit rate in flat position. Could be used in positions. ▪ APPLICATIONS: Ovens, boilers, thermal equipment for heat treatment, chemical and petrochemical installations.	Rp0,2 (MPa)	410	1.2	100-280	23-33	10-25		
~E310T0-1/-4	Si	0.5		Rm (MPa)	600	1.6	150-400	23-35	10-25		
ISO 17633-A	Mn	2.4		A5 (%)	35						
T 25 20 R M21(C1) 3	Ni	20.5		KV (J)	+20°C → 60						
	Cr	24.0									
	Mo	0.25									
	Cu	0.1									
	P	0.02									
	S	0.008									
	Fe	Balance									
							Shielding gas		12-20 l/min		
							ISO 14175				
							M21 (Ar/CO₂)				

SELECTARC FCW 310LP

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.22	C	0.1	▪ Flux cored wire for gas shielded (Ar+CO ₂) arc welding for 310 grade stainless steel and adapted for welding dissimilar steels as heat resistant steels to stainless steels. Deposit resisting to corrosion and oxidation up to 1100°C and against hot cracks. Mainly used for welding in positions. ▪ APPLICATIONS: Ovens, boilers, thermal equipment for heat treatment, chemical and petrochemical installations.	Rp0,2 (MPa)	410	1.2	130-270	22-35	12-25	
~E310T1-1/-4	Si	0.5		Rm (MPa)	600					
ISO 17633-A T 25 20 R M21(C1) 1	Mn	2.5		A5 (%)	35					
	Ni	20.0		KV (J)	+20°C → 60					
	Cr	25.0								
	Cu	0.1								
	Mo	0.30								
	P	0.02								
	S	0.008								
	Fe	Balance								
							Shielding gas		10-20 l/min	
							ISO 14175			
							M21 (Ar/CO₂)			

SELECTARC FCW 2209

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
				Intensity (A)	Voltage (V)		Stick out (mm)	FCAW			
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar + CO ₂) arc welding in flat and down hand positions of duplex steels such as Uranus 45N*, 2205, 2304. Resistant to severe corrosive environments (inter crystalline attack, pitting corrosion, crevice, and stress corrosion). High productivity in flat positions and horizontal fillet weld due to easy slag removal. ▪ APPLICATIONS: For pumps, vessels, piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion resistance.	Rp0,2 (MPa)	650	1.2	100-280	23-30	10-25	= +	
E2209T0-1/-4	Si	0.8		Rm (MPa)	830	1.6	150-400	23-35	10-25		
ISO 17633-A	Mn	1.3		A5 (%)	28						
T 22 9 3 N L R M21 (C1) 3	Ni	9.1		KV (J)	-20°C → 40						
	Cr	23.0									
	Cu	0.1									
	Mo	3.2									
	N ₂	0.16									
	P	0.02									
	S	0.008									
	Fe	Balance									
							Shielding gas		12-20 l/min		
							ISO 14175				
							M21 (Ar/CO ₂)				

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SELECTARC FCW 2209P

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
				Intensity (A)	Voltage (V)		Stick out (mm)	FCAW		
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar+CO ₂) arc welding in all positions of duplex steels such as Uranus 45N*, 2205, 2304. Resistant to severe corrosive environments (inter crystalline attack, pitting corrosion, crevice, and stress corrosion). Wire with rutile fast freezing to weld in all positions. ▪ APPLICATIONS: For pumps, vessels, piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion resistance.	Rp0,2 (MPa)	630	1.2	130-270	22-35	12-25	
E2209T1-1/-4	Si	0.8		Rm (MPa)	780					
ISO 17633-A	Mn	1.4		A5 (%)	28					
T 22 9 3 N L P M21 (C1) 1	Ni	9.5		KV (J)	-60°C → 37					
	Cr	23.0		PREN	>35					
	Cu	0.1								
	Mo	3.3								
	N ₂	0.15								
	P	0.02								
	S	0.008								
	Fe	Balance								
						Shielding gas				
						ISO 14175		10-20 l/min		
						M21 (Ar/CO₂)				

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SELECTARC FCW 2509MO

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
AWS A5.22	C	0.03	▪ Flux cored wire for gas shielded (Ar+CO ₂) arc welding in flat and down hand positions for Duplex and Super Duplex steels such as Uranus 45N*, 52N, 2205, 2304, 2507. Resistant to severe corrosive environments (inter crystalline attack, pitting corrosion, crevice, stress corrosion). For all construction with service temperature up to 250°C. ▪ APPLICATIONS: For pumps, vessels, piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion resistance.	Rp0,2(MPa)	830	1.2	130-250	24-35	12-20	= +	
~E2594T0-4	Si	0.6		Rm (MPa)	950	1.6	150-300	24-35	12-25		
ISO 17633-A	Mn	1.4		A5 (%)	22						
TZ 25 9 4 Cu N L R M21 3	Ni	9.0		KV(J)	-29°C → 30						
	Cr	25.0		PREN	>40						
	Cu	1.0									
	Mo	3.8									
	N ₂	0.26									
	P	0.015									
	S	0.008									
	Fe	Balance									
							Shielding gas		10-20 l/min		
							ISO 14175				
							M21 (Ar/CO ₂)				
* (Trademarks of CREUSOT LOIRE Industries)											

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SELECTARC FCW 2509MOP**ALL POSITIONS, SUPER DUPLEX FLUX CORED WIRE**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.22 ~E2594T-1	C	0.03	▪ Flux cored wire for gas shielded (Ar+CO₂) arc welding in all positions for Super Duplex steels such as Uranus 45N*, 52N, 2205, 2304, 2507. Resistant to severe corrosive environments (inter crystalline attack, pitting corrosion, crevice, stress corrosion). For all construction with service temperature up to 250°C. Wire with rutile fast freezing to weld in all positions. ▪ APPLICATIONS: For pumps, vessels, piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion resistance. *(Trademarks of CREUSOT LOIRE Industries)	Rp0,2 (MPa)	710	1.2	130-250	24-35	12-20	ISO 14175 M21 (Ar/CO₂) 10-20 V/min 
	Si	0.6		Rm (MPa)	890					
ISO 17633-A	Mn	1.4		A5 (%)	24					
T Z 25 94 Cu N L P M 21 1	Ni	9.4		KV (J)	-29°C → 30					
	Cr	25.0		PREN	>40					
	Cu	1.5								
	Mo	3.8								
	N ₂	0.24								
	P	0.015								
	S	0.008								
	Fe	Balance								

SELECTARC FCW 307M**METAL CORED WIRE 307 GRADE**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.9 ~EC307	C	0.1	▪ Metal cored wire for gas shielded (Ar+CO₂) arc welding of austenitic stainless steels and manganese steels considered difficult to weld or misidentified. Nonmagnetic stainless steel, resistant against hot cracking and work hardening weld deposit. Ideal as buffer layer before hardfacing of grades sensitive to cracking or in case of dissimilar joints between stainless steel and steel construction. Wire especially designed for flat position welding. ▪ APPLICATIONS: Civil engineering, road, rail and fluvial, quarry, cement...	Rp0,2 (MPa)	450	1.2	-	-	12-25	ISO 14175 M21 (Ar/CO₂) 10-20 V/min 
	Si	0.6		Rm (MPa)	630	1.6	-	-	12-25	
ISO 17633-A	Mn	6.0		A5 (%)	40					
T 18 8 Mn M M12 1	Ni	8.5		KV (J)	+20°C → 70					
	Cr	19.5		Hardness	170 HB (as welded)					
	Cu	0.1		Hardness	500 HB (work hardened)					
	Mo	0.15								
	P	0.02								
	S	0.008								
	Fe	Balance								



STAINLESS STEELS



SELECTARC FCW 307

HIGH PRODUCTIVITY, METAL CORED 307 GRADE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.22	C	0.1	■ Metal cored wire for gas shielded (Ar+CO₂) arc welding of austenitic stainless steels and manganese steels considered difficult to weld or misidentified. Nonmagnetic stainless steel, resistant against hot cracking and work hardening weld deposit. Ideal as buffer layer before hardfacing of grades sensitive to cracking or in case of dissimilar joints between stainless steel and steel construction. Used for repair parts exposed to shocks and friction. Wire especially designed for flat position welding. ■ APPLICATIONS: Civil engineering, road, rail and fluvial, quarry, cement...	Rp0,2 (MPa)	480	1.2	100-280	23-33	10-25	= +
~E307T0-1/-4	Si	0.9		Rm (MPa)	630	1.6	150-400	23-55	10-25	
ISO 17633-A	Mn	6.0		A5 (%)	40					
T 18 8 Mn R M21(C1) 3	Ni	9.5		KV (J)	+20°C → 50					
	Cr	19.0		Hardness	170 HB (as welded)					
	Cu	0.1		Hardness	500 HB (work hardened)					
	Mo	0.15								
	P	0.02								
	S	0.008								
	Fe	Balance								
								Shielding gas		↺ ↻ ↻ ↺
								ISO 14175		
								M21 (Ar/CO₂)		
								12-20 l/min		

SELECTARC FCW 307P

ALL POSITIONS, METAL CORED 307 GRADE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
				Intensity (A)	Voltage (V)		Stick out (mm)	FCAW			
AWS A5.22	C	0.1	■ Metal cored wire for gas shielded (Ar+ CO₂) arc welding of austenitic stainless steels and manganese steels considered difficult to weld or misidentified. Nonmagnetic stainless steel, resistant against hot cracking and work hardening weld deposit. Ideal as buffer layer before hardfacing of grades sensitive to cracking or in case of dissimilar joints between stainless steel and steel construction. Used for repair parts exposed to shocks and friction. Used for welding in all positions. ■ APPLICATIONS: Civil engineering, road, rail and fluvial, quarry, cement...	Rp0,2 (MPa)	410	1.2	130-270	22-35	12-25	= +	
~E307T1-4	Si	0.7		Rm (MPa)	600						
ISO 17633-A	Mn	6.0		A5 (%)	30						
	T 18 8 Mn R 21 1	Ni		9.0	KV (J)	+20°C → 60					
	Cr	19.0		Hardness	170 HB (as welded)						
	Cu	0.1									
	Mo	0.15		Hardness	500 HB (work hardened)						
	P	0.02									
	S	0.008									
	Fe	Balance									
							Shielding gas		10-20 l/min		
							ISO 14175				
							M21 (Ar/CO ₂)				

SELECTARC FCO 307

MAINTENANCE AND REPAIR, STAINLESS STEEL OPEN-ARC WIRE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
AWS A5.22	C	0.1	■ Flux cored wire in stainless steel without gas use for welding austenitic stainless steels and manganese steels considered difficult to weld or misidentified. Could be used as buffer layer before hardfacing. Good resistance against cavitation, shocks and corrosion. ■ APPLICATIONS: Civil engineering, road, rail and fluvial, quarry, cement. Ideal as buffer layer before hardfacing of grades sensitive to cracking or in case of dissimilar joints between stainless steel and steel construction.	Rp0,2 (MPa)	>400	1.2	100-300	21-35	12-20	= +	
~E307T0-3	Si	0.5		Rm (MPa)	650	1.6	150-300	24-35	15-25		
ISO 17633-A	Mn	6.0		A5 (%)	32						
	T 18 8 Mn U NO 3	Ni		9.0	KV (J)	-					
	Cr	19.0		Hardness (3 rd layer)	180 HB (as welded)						
	P	0.015			47 HRC (work hardened)						
	S	0.008									
							Shielding gas				
							Without gas				

SELECTARC FCT 308L**TIG CORED WIRE FOR ROOT PASS ON 304L**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	TIG	
AWS A5.22 R308LT1-5	C	0.03	■ Flux cored wire for TIG welding for 304L stainless steel. This product is dedicated to the root pass. Indeed this slag protects the reverse side from the oxidation by the atmosphere. Used for application with service temperature between -196°C and +350°C. ■ APPLICATIONS: Root pass for stainless steel piping, petro chemical.	Rp0,2 (MPa)	460	2.2	80-140	-	-		
	Si	0.6		Rm (MPa)	620						
	Mn	0.9		A5 (%)	45						
	Ni	10.0		KV (J)	-20°C → 140						
	Cr	19.5			-196°C → 60						
	Cu	0.1									
	Mo	0.1									
	P	0.02									
	S	0.008									
	Fe	Balance									
						Shielding gas					
						ISO 14175		6-12 l/min			
						11 (Ar)					

SELECTARC FCT 316L**TIG CORED WIRE FOR ROOT PASS ON 316L**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	TIG
AWS A5.22 R316LT1-5	C	0.03	▪ Flux cored wire for TIG welding for 316L stainless steel. This product is dedicated to the root pass. Indeed this slag protects the reverse side from the oxidation by the atmosphere. Used for application with service temperature between -196°C and +350°C. ▪ APPLICATIONS: Root pass for stainless steel piping, petro chemical.	Rp0,2(MPa)	510	2.2	80-140	-	-	= +
	Si	0.5		Rm (MPa)	630					
	Mn	0.9		A5 (%)	32					
	Ni	12.0		KV (J)	+20°C → 140					
	Cr	18.5			-196°C → 50					
	Cu	0.1								
	Mo	2.8								
	P	0.02								
	S	0.008								
	Fe	Balance								
							Shielding gas		6-12 l/min	
							ISO 14175			
							I1 (Ar)			

SELECTARC FCT 309L**TIG CORED WIRE FOR ROOT PASS ON DISSIMILAR JOINT**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	TIG
AWS A5.22 R309LT1-5	C	0.03	▪ Flux cored wire for TIG welding for 309L stainless steel and dissimilar joint (steel with stainless steel). This product is dedicated to the root pass. Indeed this slag protects the reverse side from the oxidation by the atmosphere. Used for application with service temperature between -196°C and +400°C. ▪ APPLICATIONS: Root pass for stainless steel piping, petro chemical.	Rp0,2 (MPa)	460	2.2	80-140	-	-	= +
	Si	0.8		Rm (MPa)	580					
	Mn	1.5		A5 (%)	35					
	Ni	13.0		KV (J)	+20°C → 70					
	Cr	24.5								
	Cu	0.1								
	Mo	0.1								
	P	0.02								
	S	0.008								
	Fe	Balance								
							Shielding gas		6-12 l/min	
							ISO 14175			
							I1 (Ar)			

SELECTARC FCT 347**TIG CORED WIRE FOR ROOT PASS ON 347/321**

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters			
				Intensity (A)	Voltage (V)		Stick out (mm)	TIG		
AWS A5.22 R347T1-5	C	0.03	▪ Flux cored wire for TIG welding for 347 or 321 stainless steel. This product is dedicated to the root pass. Indeed this slag protects the reverse side from the oxidation by the atmosphere. Used for application with service temperature between 0°C and +350°C. ▪ APPLICATIONS: Root pass for stainless steel piping, petro chemical.	Rp0,2 (MPa)	460	2.2	80-140	-	-	= +
	Si	0.70		Rm (MPa)	620					
	Mn	1.40		A5 (%)	45					
	Ni	10.5		KV (J)	+20°C → 140					
	Cr	19.0								
	Cu	0.10								
	Mo	0.10								
	P	0.02								
	S	0.008								
	Nb	0.50								
	Fe	Balance								
							Shielding gas		6-12 l/min	↑ ↓
							ISO 14175			
							I1 (Ar)			

NICKEL ALLOYS

CAST IRON

SELECTARC FCW FENI

RUTILE FLUX CORED WIRE FOR CAST IRON

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
ISO 1071 T C NiFe-2	C	0.75	■ Rutile flux cored wire for gas shielded (Ar+CO ₂) arc welding of grey, malleable, nodular cast irons. Iron/Nickel weld deposit. Also used for dissimilar weldments between cast irons and steels. ■ APPLICATIONS: Foundry defects, repairing of engine blocks, frames of tool machines, gearboxes, reducing pieces, valve and pump bodies.	Rp0,2 (MPa)	340	1.2	180-280	20-28	12-25	= +
	Si	0.6		Rm (MPa)	550	1.6	180-350	22-28	12-25	
	Mn	4.0		A5 (%)	16					
	Ni	45.0		KV (J)	-					
	P	<0.015		Hardness	165 HB (as welded)		Shielding gas		10-20 l/min	
	S	<0.015								
	Fe	Balance					ISO 14175 M21 (Ar/CO₂)			



COBALT ALLOYS



SELECTARC FCW C06

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
AWS A5.21	C	1.05	▪ Cobalt base tubular wire for gas shielded (Ar 100%) hardfacing of Grade 6 Cobalt. Exceptional resistance to wear combined with abrasion, metal-metal wear, corrosion up to 1000°C. Nonmagnetic weld deposit. ▪ APPLICATIONS: Hot shear blades, valve seats and litters...	Hardness (3 rd layer)	~42 HRC	1.2	100-250	16-29	15-30	= + / pulsed
ERCCoCr-A	Si	1.0				1.6	140-350	16-30	15-30	
EN 14700	Mn	1.0								
T Co2	Cr	29.0								
DIN 8555	Ni	0.15								
MSG 20-GF-40-CTZ	Mo	0.05								
	W	4.6								
	Fe	4.0								
	P	0.01								
	S	0.01								
	Co	Balance								
							Shielding gas			
							ISO 14175		10-20 l/min	ISO 14175 I1 (Ar)
							I1 (Ar)			

COBALT GRADE 6 FLUX CORED WIRE

SELECTARC FCW C021

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters						
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW			
AWS A5.21	C	0.25	▪ Cobalt base tubular wire for gas shielded (Ar 100%) hardfacing of Grade 21 Cobalt. Exceptional resistance to wear combined with shock, corrosion resistant to high temperature pressure in sulphurous atmosphere up to 900°C. ▪ APPLICATIONS: Scope and valve seats, hot forging dies, gas turbine, large hardfacing areas...	Hardness	~33 HRC (as welded)	1.2	100-250	16-29	15-30	= + / pulsed			
ERCCoCr-C	Si	1.0				1.6	140-350	16-30	15-30				
EN 14700	Mn	1.0											
T Co1	Cr	28.5											
DIN 8555	Ni	3.0		Hardness	~47 HRC (work hardened)								
MSG 20-GZ-250-CKTZ	Mo	5.5											
	W	0.01											
	Fe	4.0											
	P	0.01											
	S	0.01											
	Co	Balance											
							Shielding gas		ISO 14175 I1 (Ar) 10-20 l/min ISO 14175 I1 (Ar)				
							ISO 14175						
							I1 (Ar)						

COBALT GRADE 21 FLUX CORED WIRE

HOW TO CHOOSE?



SELECTION CRITERIA FOR SELECTARC HARDFACING CORED WIRES

		PROCESSES		WEAR PHENOMENA AND APTITUDES						HARDNESS (HRC)	
		FCO (without gas)	FCW (with gas)	Mineral abrasion	Metal abrasion	Shock	Pressure	Corrosion	Temperature > 500 °C		Machining
Type											
HARFACING - REPAIR AND MAINTENANCE	■ SELECTARC FCW 45		✓	●	★	●	★★	●	●	★★	~45
	■ SELECTARC FCW 60		✓	★★	★	★★	★★	●	●	★	~55
	■ SELECTARC FCO 65A	✓		👍	●	●	●	★	●	●	~65
	■ SELECTARC FCO 65	✓		👍	★	★★	★	★★	★★★	●	~63
	■ SELECTARC FCO 63	✓		★★	★	★★	★★	★	★★	●	~61
	■ SELECTARC FCO 63TI	✓		👍	★	★★★	★★★	★	★★	●	~57
	■ SELECTARC FCO FE60WC	✓		👍	★	●	●	★	★★★	●	~61
	■ SELECTARC FCW 60G		✓	👍	👍	★★	★★	★	●	★	~55
	■ SELECTARC FCO HBMNCR	✓		👍	👍	★★	★★	★★★	●	★	45-55 Work hardened
■ SELECTARC FCW HB50CO	✓		👍	👍	★★	●	●	★★★	★	~47	
COBALT	■ SELECTARC FCW C06		✓	★★	★★★	★★	★★	👍	★★★	★★	~42
	■ SELECTARC FCW C021		✓	●	👍	👍	★★★	👍	★★★	★★	~33



UNSUITABLE



STANDARD



GOOD



VERY GOOD



EXCELLENT

DEFINITION OF WEAR PHENOMENA AND APTITUDES OF ALLOYS

- **MINERAL ABRASION:** Wear by relative movement of a mineral material characterized by its hardness, shape and texture, attacking by cutting the metal surface.
- **METAL ABRASION:** Contact exercised under pressure, with relative movement between the two metal surfaces, with or without lubricant. Degradation by the formation of micro-welds between contacting surfaces.
- **SHOCKS:** Impact of two materials one with another, one of the two causing the deformation or breakage of the surface of the other. This phenomenon is conditioned by the toughness or ductility of the materials present.
- **PRESSURE:** Application of stress to the material by the action of a fluid (often combined with abrasion) or a solid.
- **CORROSION:** Degradation of the material by chemical reaction with its environment. A complex phenomenon resulting from multiple parameters.
- **MACHINING:** Machinability by chipping, for example: turning, milling and drilling.

HARDFACING REPAIR AND MAINTENANCE



SELECTARC FCW 45

HARDFACING METAL CORED WIRE - 450HB

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
EN 14700	C	0.4	▪ Metal cored wire for gas shielded (Ar+CO₂) arc hardfacing of unalloyed or low alloyed steels for resistance against impact and compression. Could be used as buffer layer or for rebuilt thickness of stamped mechanical components. ▪ APPLICATIONS: Conveyors, transport surfaces and tires. Can be used as buffer layer prior to a higher hardness overlay.	Hardness (3 rd layer)	~450 HB (as welded)	1.2	100-300	24-32	12-25	= +
T Fe2	Si	0.7				1.6	150-300	24-32	12-25	
DIN 8555	Mn	1.5								Shielding gas ISO 14175 M21 (Ar/CO₂) 10-20 l/min
MSG 1-GF-400	Cr	2.5								
	Mo	0.5								
	P	0.015								
	S	0.010								
	Fe	Balance								

SELECTARC FCW 60

HARDFACING METAL CORED WIRE - 600HB

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
EN 14700	C	0.5	▪ Metal cored wire for gas shielded (Ar+CO₂) hardfacing without slag for carbon steels and low alloyed steels for an optimal balance between abrasion, friction and impact resistance. Could be used to service temperature up to +300°C. ▪ APPLICATIONS: Dies transporter, cams, gear teeth...	Hardness (3 rd layer)	~57-62 HRC (as welded)	1.2	100-280	23-33	10-25	= +
T Fe2	Si	0.7				1.6	150-400	23-35	10-25	
DIN 8555	Mn	1.5								Shielding gas ISO 14175 M21 (Ar/CO₂) 10-20 l/min
MSG 6-GF-55-GSP	Cr	5.5								
	Mo	0.6								
	P	0.015								
	S	0.010								
	Fe	Balance								

SELECTARC FCO 65A

HARDFACING METAL CORED WIRE WITHOUT GAS FOR EXTREME ABRASION

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
EN 14700	C	0.5	▪ Self-shielded tubular wire for metal core hardfacing. For Alloy and unalloyed steels with C<0.5% to achieve extreme abrasion resistance and hardness are achieved in one layer. ▪ APPLICATIONS: Agriculture equipment, mining, quarrying.	Hardness (3 rd layer)	~65 HRC (as welded)	1.2	100-300	21-35	12-25	= +
T Z Fe13	Si	1.3				1.6	150-300	24-35	15-25	
DIN 8555	Mn	2.0								Shielding gas Without gas
MF 10-GF-65-G	Cr	2.0								
	B	4.5								
	P	0.015								
	S	0.010								
	Fe	Balance								

SELECTARC FCO 65

HARDFACING METAL CORED WIRE WITHOUT GAS, AGAINST ABRASION

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
EN 14700	C	5.0	▪ Self-shielded tubular wire for metal cored hardfacing. High chromium cast iron for hardfacing components subject to extremely severe abrasive wear and moderate impact. The deposits resists to corrosion due to the high chromium content as well as heat up to 300°C. Hardfacing possible on 1, 2 or 3 layers. Machining only by grinding. Austenitic matrix with Chromium carbides. ▪ APPLICATIONS: For excavating and crashing equipment, railway ballast tampers, dredge buckets and lips, dragline buckets, coke hammers, rippers, sizing screens, crushing equipment, brick industry components, Muller tires, catalyst lift pipes, pump impellers, fan blades, Rockwool rolls, wear plates operating at high temperature in the steelmaking industry.	Hardness (3 rd layer)	~62-65 HRC	1.6	150-300	26-35	25	= +	
T Fe15	Si	0.7									
DIN 8555	Mn	0.5									
MF 10-GF-65-GRZ	Cr	22.0									
	Nb	7.0									
	P	0.015									
	S	0.010									
	Fe	Balance									
							Shielding gas				
							Without gas				

SELECTARC FCO 63

SELF-SHIELDED HIGH CHEUMIUM, HARDFACING METAL CORED WIRE

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
EN 14700	C	5.0	▪ Self-shielded tubular wire for metal cored hardfacing. High chromium cast iron for hardfacing components subject to extremely severe abrasive wear and moderate impact. The deposits resists to fiction, mixed with choc and compression. Hardfacing up to 3 layers. Only machining by grinding. Austenitic matrix containing chromium carbides. ▪ APPLICATIONS: For excavating and crushing equipment, surfacing of endless screws, mixer blades, abrasive materials in pump bodies, excavator teeth, concrete pumps, ore crushing...	Hardness (3 rd layer)	~60-62 HRC (as welded)	1.2	100-300	21-35	12-25	= + 
T Fe15	Si	1.5				1.6	150-300	24-35	15-25	
DIN 8555	Mn	1.5								
MF 10-GF-60-GRZ	Cr	27.0								
	P	0.015								
	S	0.010								
	Fe	Balance								
							Shielding gas			
							Without gas			

SELECTARC FCO 63TI

SELF-SHIELDED HARDFACING WIRE, FOR ABRASION AND IMPACT

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters				
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW	
EN 14700	C	1.8	▪ Self-shielded tubular wire for metal cored hardfacing. High chromium cast iron for hardfacing components subject to extremely severe abrasive wear and moderate impact. The deposits resists to fiction, mixed with choc and compression. Hardfacing up to 3 layers. Only machining by grinding. Austenitic matrix containing chromium and titanium carbides. ▪ APPLICATIONS: For excavating and crushing equipment, surfacing of endless screws, mixer blades, abrasive materials in pump bodies, excavator teeth, concrete pumps, ore crushing...	Hardness (3 rd layer)	~57 HRC (as welded)	1.2	140-230	23-32	25-50	= + 	
T Fe8	Si	0.7				1.6	180-300	23-32	25-50		
DIN 8555	Mn	1.2									
MF 6-GF-55-GP	Cr	6.5									
	Mo	0.8									
	Ti	5.0									
	P	0.015									
	S	0.010									
	Fe	Balance									
							Shielding gas				
							Without gas				



HARDFACING - REPAIR & MAINTENANCE

SELECTARC FCO FE60WC

HARDFACING FLUX CORED WIRE, WITH TUNGSTEN CARBIDE

Classification	Weld metal composition (%)	Characteristics and applications	Mechanical properties		ø (mm)	Parameters					
						Intensity (A)	Voltage (V)	Stick out (mm)	FCAW		
EN 14700	Courbure de tungstène (50 à 60 % en % de masse selon le diamètre)	▪ Tubular wire for self-shielded metal arc hardfacing. Composite wire is made from a steel wire with tungsten carbide particles. The deposit is extremely resistant to abrasion with low impact. ▪ APPLICATIONS: Dust extracting ventilators (mining, steel industries), components for agriculture.	Hardness (1 st layer)	52-62 HRC	1.6	120-200	22-27	15-40	= +		
T Fe20											
DIN 8555			Hardness (2 nd layer)	60-64 HRC							
MF 21-GF-50-GR											
								Shielding gas			
						Without gas					

SELECTARC FCW 60G

HARDFACING FLUX CORED WIRE, WITHOUT SLAG

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
EN 14700	C	0.5	▪ Flux cored wire for gas shielded (Ar + CO ₂) arc hardfacing without slag of carbon or low alloyed steels for an optimal balance between abrasion, friction and impact resistance. Could be used to service temperature up to +300°C. ▪ APPLICATIONS: Dies transporter, cams, gear teeth...	Hardness (3 rd layer)	~55 HRC (as welded)	1.2	100-300	24-32	12-25	= +
T Fe2	Si	0.7				1.6	150-300	24-32	12-25	
DIN 8555	Mn	1.2								Shielding gas ISO 14175 M21 (Ar/CO₂) 10-20 l/min 
MSG 6-GF-55-GSP	Cr	6.0								
	Mo	0.7								
	P	0.015								
	S	0.010								
	Fe	Balance								

SELECTARC FCO HBMNCR

FLUX CORED WIRE FOR CAVITATION, ABRASION AND IMPACT

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
EN 14700	C	0.4	▪ Flux cored wire without gas for arc hardfacing designs to surface all pieces subject to high impact and cavitation combined with corrosion. The work hardening austenitic deposit is exceptionally resistant to wear combined with impact. The high amount of chromium increases the resistance against the corrosion, abrasion and cavitation. ▪ APPLICATIONS: Railway applications (rail, switches, crossing, tongues), quarries and mines (crush jaws, excavator teeth, mill hammer).	Hardness (3 rd layer)	210-240 HB (as welded)	1.2	100-300	24-32	12-25	= +
T Fe9	Si	0.5					1.6	150-300	24-35	
DIN 8555	Mn	16.0		Hardness (3 rd layer)	45-55 HRC (work hardened)					Shielding gas Without gas 
MF 7-GF-250	Cr	14.0								
	P	0.015								
	S	0.010								
	Fe	Balance								

SELECTARC FCW HB50CO

FLUX CORED HARDFACING WIRE, FOR HOT WORKING

Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		ø (mm)	Parameters			
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW
EN 14700	C	0.15	■ For hardfacing with flux cored wire without gas. The weld deposit resists to wear at high temperature (up to 550°C), thermal shock and can be machined with tungsten carbide tipped tools. Excellent resistance against cracking. ■ APPLICATIONS: Extrusion pistons, valves, moulds, continuous driving rolls...	Hardness	~47 HRC	1.6	100-300	24-32	12-25	⊞
T Z Fe3	Si	0.7				2.4	150-300	24-35	15-25	
DIN 8555	Mn	0.4								
MSG 4 GF 45 CRTZ	Cr	14.5								
	Ni	0.5								
	Mo	2.5								
	Co	12.5								
	P	0.015								
	S	0.010								
	Fe	Balance								
							Shielding gas			⏏
							Without gas			

SELECTARC FCW 65B0

FLUX CORED HARDFACING WIRE, Cr-Ni-B ALLOYS FOR EXTREME ABRASION

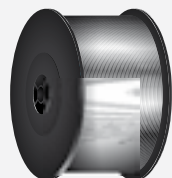
Classification	Weld metal composition (%)		Characteristics and applications	Mechanical properties		Ø (mm)	Parameters						
							Intensity (A)	Voltage (V)	Stick out (mm)	FCAW			
EN 14700	C	0.3	■ Copper coated flux cored wire containing Chromium, Nickel and Boron for gas shielded (Ar + CO ₂)metal arc hardfacing. Excellent resistance against extreme abrasion. Weld deposit is not machinable. Good weld ability, low spatter, without slag. ■ APPLICATIONS: Agriculture equipment, mining, quarrying.	Hardness	62-67 HRC (as welded)	1.2	120-300	18-31	-	⊞ ⊞			
T Fe13	Si	0.4				1.6	180-400	20-33	-				
DIN 8555	Mn	1.1											
MSG 10-GF-65-G	Cr	0.3											
	Ni	1.5											
	B	4.8											
	P	0.015											
	S	0.010											
	Fe	Balance											
						Shielding gas					⏏		
						ISO 14175		15-20 l/min					
						M21 (Ar/CO ₂)							



PACKAGING / STORAGE

GMAW / SPOOLS

PACKAGING PLASTIC SPOOL D100



Dimensions:
Outside diameter 100 mm

Weight spool:
Aluminium: 0.5 kg
Others: 1 kg

Micro-laser: 50 m

Diameters
available in:

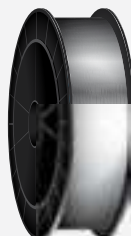
0.80 mm

1.00 mm

1.20 mm

Micro-laser

PACKAGING PLASTIC SPOOL D200



Dimensions:
Outside diameter 200 mm

Weight spool:
Aluminium: 2 kg
Others: 5 kg

Diameters
available in:

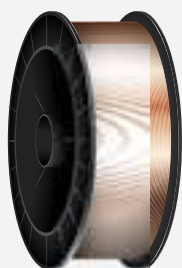
0.80 mm

1.00 mm

1.20 mm

1.60 mm

PACKAGING PLASTIC SPOOL D300



Dimensions:
Outside diameter 300 mm

Weight spool:
Aluminium: 6 kg
Others: 15 kg

Diameters
available in:

0.80 mm

1.00 mm

1.20 mm

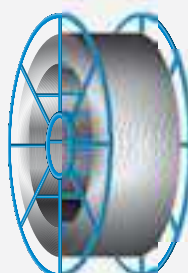
1.40 mm

1.60 mm

2.00 mm

2.40 mm

PACKAGING STAINLESS SPOOL BS300



Dimensions:
Outside diameter 300 mm

Weight spool:
Aluminium: 7 kg
Others: 15 kg

Diameters
available in:

0.80 mm

1.00 mm

1.20 mm

1.40 mm

1.60 mm

2.00 mm

2.40 mm

GTAW-MAG / CASE (1000 mm)

PACKAGING GTAW-MAG / CASE

CASE	WEIGHT
Inox	2,5 kg or 5 kg



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

SERVICE

- **Advice and assistance**

An experienced team of engineers and metallurgists help clients in choosing the most suitable materials for each application.

- **Research and Development (R&D)**

The R&D department ensures the tests products (mechanical and non-destructive testing) according to customer requests.

- **Customer service**

The sales department is available to respond promptly to all requests.

- **Specific applications**

RCCM, mechanical certificates 3.1, ...

QUALITY

ISO 9001 Certification.



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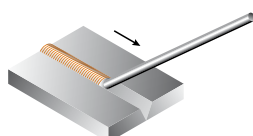
WELDING POSITIONS: FOR BUTT WELDS - PLATES AND PIPES

ACCORDING TO: EN ISO 6947

BUTT WELDS - PLATES

PA

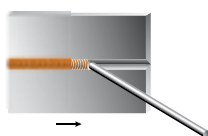
Flat position



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

PC

Horizontal position



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

PF

Vertical up position



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

PG

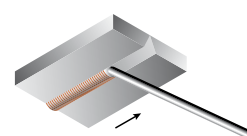
Vertical down position



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

PE

Overhead position



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

BUTT WELDS - PIPES

PA

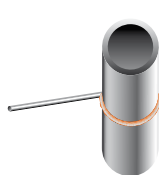
Horizontal axis



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

PC

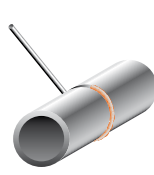
Vertical axis



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

PF

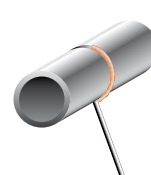
Horizontal axis



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

PG

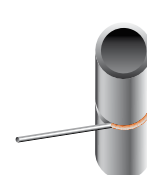
Horizontal axis



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

H-L045

Lean axis



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".

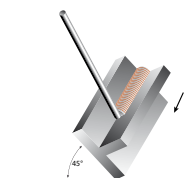
WELDING POSITIONS: FOR FILLET WELDS - PLATES AND PIPES

ACCORDING TO: EN ISO 6947

FILLET WELDS - PLATES

PA

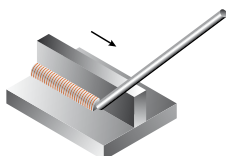
Horizontal flat position



PA HORIZONTAL FLAT WELD

PB

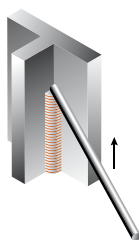
Horizontal downhand position



PB HORIZONTAL DOWNHAND POSITION

PF

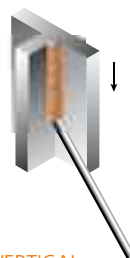
Vertical up position



PF VERTICAL UP WELD

PG

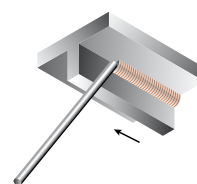
Vertical down position



PG VERTICAL DOWN WELD

PD

Horizontal overhead position



PD HORIZONTAL OVERHEAD WELD

FILLET WELDS - PIPES

PB

Horizontal axis



PB PIPE: ROTATED AXIS: HORIZONTAL

PG

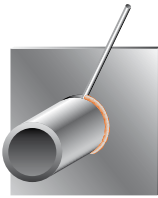
Horizontal axis



PG PIPE: FIXE AXIS: HORIZONTAL

PF

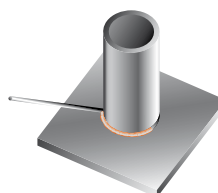
Horizontal axis



PF PIPE: FIXE AXIS: HORIZONTAL

PB

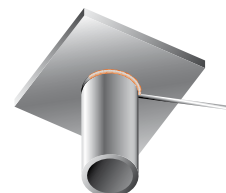
Vertical axis



PB PIPE: FIXE AXIS: VERTICAL

PD

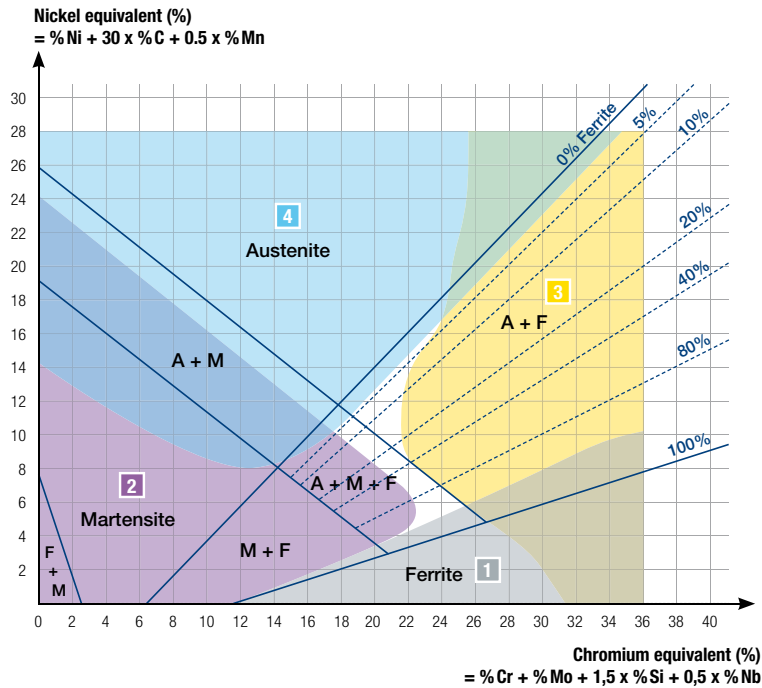
Vertical axis



PD PIPE: FIXE AXIS: VERTICAL

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:

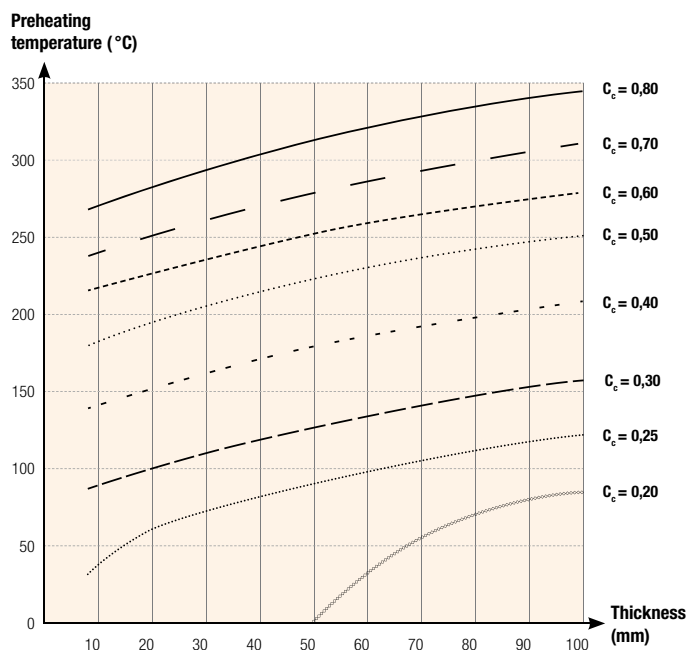
CHROMIUM EQUIVALENT =
% Cr + % Mo + 1.5 x % Si + 0.5 x % Nb

NICKEL EQUIVALENT =
% Ni + 30 x % C + 0.5 x % 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)

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" inch = 25,4 mm

ø (mm)	ø (fraction of 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

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



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