



## PANORAMA WIRES GTAW - GMAW

- Wide range of wires for GTAW-MAG and GMAW welding
- Special ranges:  
Breaking wires, Orbital Tig welding, Micro-laser...
- Bespoke work:  
Special wire drawing, finishing, packaging, custom identifications...



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.

Fabricación  
Dinamismo Développement  
Team Qualité  
R&D Savoir-faire  
Progrès Know-How  
Excellence Innovation  
Partenariat  
Performance Équipe  
Fabrication Dynamisme

1796 1870 2001 2012

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



PRODUITS D'APPORT DE SOUDAGE  
WELDING FILLER METALS



PRODUITS D'APPORT DE BRASAGE  
BRAZING ALLOYS



# CONTENTS

CLASSIFICATION & STANDARDS .....	7
<b>1/ OUR PRODUCT RANGE</b>	
UN-ALLOYED STEELS .....	12
LOW ALLOYED STEELS .....	13
STAINLESS STEELS .....	16
NICKEL ALLOYS .....	22
ALUMINIUM ALLOYS .....	25
MAGNESIUM ALLOYS .....	27
COPPER ALLOYS .....	28
TITANIUM ALLOYS .....	31
COBALT ALLOYS .....	32
HARDFACING - REPAIR AND MAINTENANCE .....	34
SPECIAL RANGES: BREAKING WIRES, ORBITAL TIG, MICRO-LASER .....	37
<b>2/ VARIOUS</b>	
CUSTOM WIRE DRAWING MANUFACTURING .....	41
PACKAGING / STORAGE .....	42
SERVICE & QUALITY .....	43
SCHAEFFLER DIAGRAM .....	44
CARBON EQUIVALENT AND PREHEATING TEMPERATURE .....	44
ALLOYS AND DIAMETER CONVERSION .....	45
HARDNESS CONVERSION TABLE .....	46





# OUR INDUSTRY FOCUS:



AERONAUTICS



FOOD INDUSTRY



NUCLEAR AND THERMAL PLANTS,  
POWER INDUSTRY



SHIPBUILDING  
INDUSTRY



AUTOMOBILE  
INDUSTRY



CHEMICAL AND PETROCHEMICAL  
INDUSTRY



MEDICAL  
INDUSTRY



## NEW PRODUCT NAMES!

### SELECTARC WIRES

for a homogeneous offer of welding products: Electrodes and Wires!

**NOTE CHANGE  
OF NAME OF  
OUR PRODUCTS!**

	OLD NAME FPS	OLD NAME FSH	NEW PRODUCT NAMES
UN-ALLOYED STEEL	-	GALVARC	■ SELECTARC F55
	70S3	70S3	■ SELECTARC F56
	70S6/SG2	70S6/SG2	■ SELECTARC F57
	-	-	■ SELECTARC F57N
LOW ALLOYED STEEL	80SD2	80SD2	■ SELECTARC F60
	70SA 1	70SA 1	■ SELECTARC F61
	Cr1Mo	80SB2	■ SELECTARC F63
	Cr2Mo	90SB3	■ SELECTARC F68
	Cr5Mo	CrMo5	■ SELECTARC F69
	-	80SB8	■ SELECTARC F609
	90SB9	90SB9	■ SELECTARC F691
	CORTEN	CORTEN	■ SELECTARC F75
	100 S1	100 S1	■ SELECTARC F77
	-	80SNi1	■ SELECTARC F81
	-	80SNi2	■ SELECTARC F82
	A 60	A 60	■ SELECTARC A 60
	B.M.S	HB36	■ SELECTARC BMS
	SCVS	15CDV6	■ SELECTARC SCVS
F66S	25CD4	■ SELECTARC F66S	
STAINLESS STEEL	FINOX 19.9.7	307 Si	■ SELECTARC 18/8MN
	FINOX 308L	308L	■ SELECTARC 20/10
	FINOX 308L	308LSi	■ SELECTARC 20/10S
	-	-	■ SELECTARC INOX 8
	-	-	■ SELECTARC INOX 8S
	-	308H	■ SELECTARC 20/10C
	Z10CNT18-10	321	■ SELECTARC 20/10T
	FINOX 347	347	■ SELECTARC 20/10NB
	FINOX 347SI	347 Si	■ SELECTARC 20/10NBS
	FINOX 316L	316L	■ SELECTARC 20/10M
	FINOX 316LSI	316LSi	■ SELECTARC 20/10MS
	-	-	■ SELECTARC INOX 16
	-	-	■ SELECTARC INOX 16S
-	316MnN	■ SELECTARC 20/10MN	

	OLD NAME FPS	OLD NAME FSH	NEW PRODUCT NAMES
STAINLESS STEEL	FINOX 318	318	■ SELECTARC 20/10MNB
	FINOX 318SI	318 Si	■ SELECTARC 20/10MNBS
	FINOX 309L	309L	■ SELECTARC 24/12
	FINOX 309LSI	309LSi	■ SELECTARC 24/12S
	FINOX 309LM	309LMo	■ SELECTARC 24/12M
	FINOX 310	310	■ SELECTARC 25/20
	FINOX 312	312	■ SELECTARC 29/9
	FINOX 317L	317L	■ SELECTARC 18/15
	URANUS B6	385	■ SELECTARC 20/25CU
	-	383	■ SELECTARC 27/31CU
	FINOX 410	410	■ SELECTARC M13/0
	FINOX 14R	420	■ SELECTARC M13/0C
	FINOX 410 NiMo	410NiMo	■ SELECTARC M13/4
	FINOX 430	430	■ SELECTARC F17/0
	FINOX 45	2209	■ SELECTARC D22/09
	FINOX 52	2509	■ SELECTARC D25/09
	253MA	253MA	■ SELECTARC 21/10MA
	16.8.2	16-8-2	■ SELECTARC 16/8M
	FINOX 17-4 CU	17-4 Cu	■ SELECTARC 17/4CU
	APX 4S	17-4 Mo	■ SELECTARC 17/4MO
Z12CNDV12	Z12CNDV12	■ SELECTARC 11/3M	
FINOX N155	N155	■ SELECTARC 22/21CO	
NICKEL ALLOYS	FINI 22	Ni22	■ SELECTARC NI22
	FINI 059	Ni059	■ SELECTARC NI59
	FINICU 60	Ni60	■ SELECTARC NI60
	FINI 61	NiTi4	■ SELECTARC NI61
	FINI65	Ni65	■ SELECTARC NI65
	FINOX 82	Ni82	■ SELECTARC NI82
	FINI90	Ni90	■ SELECTARC NI90
	FINI 20 D	Ni263	■ SELECTARC NI263
	FINI 276	Ni276	■ SELECTARC NI276
	FINOX 601	Ni601	■ SELECTARC NI601
	FINOX 617	Ni617	■ SELECTARC NI617

**Alloys:** ■ Un-alloyed steels, ■ Low alloyed steels ■ Stainless steels, ■ Nickel alloys, ■ Aluminium alloys, ■ Magnesium alloys, ■ Copper alloys, ■ Titanium alloys, ■ Cobalt alloys, ■ Hardfacing - Repair and Maintenance, ■ Others.

## NEW PRODUCT NAMES!

SELECTARC WIRES  
for a homogeneous offer of welding  
products: Electrodes and Wires!

**NOTE CHANGE  
OF NAME OF  
OUR PRODUCTS!**

	OLD NAME FPS	OLD NAME FPS	NEW PRODUCT NAMES
NICKEL ALLOYS	FINOX 625	Ni625	■ SELECTARC NI625
	FINOX 718	Ni718	■ SELECTARC NI718
	FINICRO 80.20	NiCr80.20	■ SELECTARC NICR80
	FINI 004	NiW	■ SELECTARC NIW
	FINI 002	NiX	■ SELECTARC NIX
	FENI36	FeNi36	■ SELECTARC FENI36
	FENI50	FeNi50	■ SELECTARC FENI50
ALUMINIUM ALLOYS	FIAL 2	Al99.5	■ SELECTARC AL99.7
	FIAL 4	AlMg3	■ SELECTARC ALG3
	FIAL 6	AlMg5	■ SELECTARC ALG5
	FIAL 7	AlMg4.5Mn	■ SELECTARC ALG4M
	FIAL 8	AlMg5Mn	■ SELECTARC ALG5M
	FIAL 12	AlMg4Z2	■ SELECTARC ALG4Z2
	FIAL 10	AlCu6	■ SELECTARC ALC6
	FIAL 15	AlSi5	■ SELECTARC ALS5
	FIAL 14	AlSi7	■ SELECTARC ALS7
	FIAL 17	AlSi12	■ SELECTARC ALS12
Mg ALLOYS	AZ92A	-	■ SELECTARC AZ92A
	EZ33A	-	■ SELECTARC EZ33A
COPPER ALLOYS	FICU 1	Cu110	■ SELECTARC CUS
	FICU 10	Cu114	■ SELECTARC CUS6
	FICU 11	CuSn8	■ SELECTARC CUS8
	FICU 12	CuSn13	■ SELECTARC CUS13
	FICU 2	CuSi3	■ SELECTARC CUSIL
	FICU 3	CuAg	■ SELECTARC CUAG
	FICU 5	CuAl8	■ SELECTARC CUA8
	FICU 6D	CuAl9Mn	■ SELECTARC CUA8NI
	FICU 4	CuAl9	■ SELECTARC CUA9
	FICU 8	CuAl9Ni	■ SELECTARC CUA9NI
	FICU 7	Cu118	■ SELECTARC CUMN13
	FICUNI90.10	CuNi90.10	■ SELECTARC CUNI10
	FICUNI 67	CuNi30	■ SELECTARC CUNI30

**Alloys:** ■ Un-alloyed steels, ■ Low alloyed steels, ■ Stainless steels,  
■ Nickel alloys, ■ Aluminium alloys, ■ Magnesium alloys,  
■ Copper alloys, ■ Titanium alloys, ■ Cobalt alloys, ■ Hardfacing -  
Repair and Maintenance, ■ Others.

	OLD NAME FPS	OLD NAME FPS	NEW PRODUCT NAMES	
TITANIUM ALLOYS	T40	-	■ SELECTARC T40	
	TPd0,2	-	■ SELECTARC TPDO.2	
	TA6V4	-	■ SELECTARC TA6V4	
	TA6V4 ELI	-	■ SELECTARC TA6V4 ELI	
COBALT ALLOYS	FICO 1	Co1	■ SELECTARC CO1	
	FICO 6	Co6	■ SELECTARC CO6	
	FICO 12	Co12	■ SELECTARC CO12	
	FICO 21	Co21	■ SELECTARC CO21	
	-	Co25	■ SELECTARC CO25	
	FICO 25	-	■ SELECTARC FICO25	
	FICO 31	-	■ SELECTARC FICO31	
	FICO 188	-	■ SELECTARC FICO188	
	FICO 414	-	■ SELECTARC FICO414	
	FICO 694	-	■ SELECTARC FICO694	
	FICO 918	-	■ SELECTARC FICO918	
	FICO T800	-	■ SELECTARC FICOT800	
	HARDFACING - REPAIR AND MAINTENANCE	819 BS	819 BS	■ SELECTARC 819 BS
		BMS	HB36	■ SELECTARC BMS
MV5S		HB60HT	■ SELECTARC MV5S	
MARVAL 18S		HBMAR50	■ SELECTARC MARVAL 18S	
SMV3S		HB58HT	■ SELECTARC SMV3S	
SCVS		15CDV6	■ SELECTARC SCVS	
-		-	■ SELECTARC HB48HT	
-		-	■ SELECTARC HB56HT	
R250B		R250B	■ SELECTARC HB25	
R350B		R350B	■ SELECTARC HB35	
R500B		R500B	■ SELECTARC HB50	
R600B		600 HB	■ SELECTARC HB60	
F400C		HBCrMo17-1	■ SELECTARC HBF17	
F820D		HBC62	■ SELECTARC HBC62	
FICU BE2	CuBe2	■ SELECTARC HCUBE		
OTHERS	Z 2 CN 18.10	-	■ SELECTARC Z 2 CN 18-10	
	Z 6 CNT 18.10	-	■ SELECTARC Z 6 CNT 18-10	
	NC 15 Fe	-	■ SELECTARC NC 15 FE	

# CLASSIFICATION & STANDARDS



## HETEROGENEOUS WELDING - REPAIR AND MAINTENANCE

BASE METAL	STEEL	LOW ALLOYED	TOOL STEEL	GALVA	STAINLESS STEEL	HEAT RESISTANT STEEL	Ni BASE	DESOXI-DIZED COPPER	Cu Ni	Cu Al	BRONZE	BRASS	EROSION STEEL PLATE
EROSION STEEL PLATE	18/8MN	18/8MN	^Ni82 Ni82	18/8MN	Ni82	Ni82	Ni82	CUS6	<Ni82 Ni60	CUMN13	CUS6	CUS6	18/8MN
BRASS	CUMN13	<CUS6 CUMN13	^Ni60 CUA9	CUS6	<CUS6 Ni60	<CUS6 Ni60	<CUS6 Ni60	CUS6	<CUS6 CUNI30	CUA8	CUS6	CUS6	
BRONZE	CUS6	CUS6	CUS6	CUS6	<CUS6 Ni82	<CUS6 Ni82	Ni60	CUS6	<Ni60 CUNI30	CUA8	CUS6		
Cu Al	CUMN13	CUMN13	CUMN13	CUA8	^Ni60 CUMN13	^Ni60 CUMN13	CUMN13	CUMN13	CUMN13	CUA8			
Cu Ni	Ni60	Ni60	Ni60	Ni60	Ni60	Ni60	Ni60	Ni60	CUNI30				
DESOXIDIZED COPPER	CUS6	CUS6	CUS6	CUS6	<Ni61 Ni82	<Ni61 Ni82	Ni60	CUS					
Ni BASE	Ni82	Ni82	^Ni82 Ni82	^Ni82 CUA8	Ni82	Ni82	Ni82						
HEAT RESISTANT STEEL	25/20	24/12	^Ni82 Ni82	24/12S	25/20	25/20							
STAINLESS STEEL	24/12	24/12	^Ni82 Ni82	24/12S	20/10M								
GALVA	F55	18/8MN	^Ni82 Ni82	CUA8									
TOOL STEEL	Ni82	Ni82	Ni82										
LOW ALLOYED	18/8MN	18/8MN											
STEEL	F56												

**LEGEND**

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

18/8MN Filler Metal

**EXAMPLE**

^Ni60 Joining stainless steel with a CuAl. Buttering with a wire Ni60, CUMN13 on a stainless steel support.

CUMN13 Joining is done with the wire CUMN13.



# CLASSIFICATION & STANDARDS

## UN-ALLOYED STEELS

Type	TIG	MIG	TIG / Classification			MIG / Classification			P 12
			AWS A5.18	ISO 636-A	MATÉRIEL N°	AWS A5.18	ISO 14341-A	MATERIAL N°	
■ <b>SELECTARC F55</b>		x	-	-	-	ER70S-2	G2Ti	-	P 12
■ <b>SELECTARC F56</b>	x		ER70S-3	W2Si	1.5112	-	-	-	P 12
■ <b>SELECTARC F57</b>	x	x	ER70S-6	W3Si1	~1.5125	ER70S-6	G3Si1	~1.5125	P 12
■ <b>SELECTARC F57N</b>	x		ER70S-G	W0	-	-	-	-	P 12

## LOW ALLOYED STEELS

Type	TIG	MIG	TIG / Classification				MIG / Classification				MATERIAL N°	P 13
			AWS A5.28	ISO 636	ISO 21952	ISO 16834-A	AWS A5.28	ISO 14341-A	ISO 16834-A	ISO 21952		
■ <b>SELECTARC F60</b>	x	x	ER80S-D2	W4M31	-	-	ER80S-D2	G4Mo	-	-	-	P 13
■ <b>SELECTARC F61</b>	x	x	ER70S-A1	W2Mo	-	-	ER70S-A1	G2Mo	-	-	1.5124	P 13
■ <b>SELECTARC F63</b>	x	x	ER80S-B2	-	W 1CM	-	ER80S-B2	-	-	G 1CM	1.7338	P 13
■ <b>SELECTARC F68</b>	x	x	ER90S-B3	-	W 2C1M	-	ER90S-B3	-	-	G 2C1M	1.7383	P 13
■ <b>SELECTARC F69</b>	x	x	ER80S-B6	-	-	-	ER80S-B6	-	-	-	-	P 13
■ <b>SELECTARC F609</b>	x	x	ER80S-B8	-	W CrMo9	-	ER80S-B8	-	-	G CrMo9	-	P 14
■ <b>SELECTARC F691</b>	x	x	ER90S-B9	-	W CrMo91	-	ER90S-B9	-	-	G CrMo91	-	P 14
■ <b>SELECTARC F75</b>	x	x	ER80S-G	-	-	W Mn3Ni1Cu	ER80S-G	-	G Mn3Ni1Cu	-	-	P 14
■ <b>SELECTARC F77</b>	x	x	ER100S-1	-	-	W Z Mn3Ni1.5Mo	ER100S-1	-	G Z Mn3Ni1.5Mo	-	-	P 14
■ <b>SELECTARC F81</b>	x	x	ER80S-Ni1	W3Ni1	-	-	ER80S-Ni1	G3Ni1	-	-	-	P 14
■ <b>SELECTARC F82</b>	x	x	ER80S-Ni2	W2Ni2	-	-	ER80S-Ni2	G2Ni2	-	-	-	P 14

## LOW ALLOYED STEELS: AERONAUTICAL RANGE

\* Hardfacing Aubert &amp; Duval

Type	TIG	MIG	Classification		P 15	
			EN / ISO	AIR 9117		
■ <b>SELECTARC A60</b>	x	x	-	-	A 60	P 15
■ <b>SELECTARC BMS*</b>	x	x	EN 4332	8CrMnMo12-4-9	8 CD 12	P 15
■ <b>SELECTARC SCVS*</b>	x	x	EN 4334	15CrMnMoV5-4-9-3	15 CDV 6	P 15
■ <b>SELECTARC F66S*</b>	x	x	EN 4331	25CrMnMo4-2-2	25 CD 4	P 15





## STAINLESS STEELS

Type	TIG	MIG	Classification					MATERIAL N°	
			AWS A5.9	EN / ISO 14343-A		AMS	AIR 9117		
SELECTARC 18/8MN	x	x	~ER307	W 18 8 Mn	G 18 8 Mn	-	-	1.4370	P 16
SELECTARC 20/10	x		ER308L	W 19 9 L	-	-	-	1.4316	P 17
SELECTARC 20/10S	x	x	ER308LSi	W 19 9 L Si	G 19 9 L Si	-	-	1.4316	P 17
SELECTARC INOX 8	x		ER308L	W 19 9 L	-	-	-	1.4316	P 17
SELECTARC INOX 8S		x	ER308LSi	-	G 19 9 L Si	-	-	1.4316	P 17
SELECTARC 20/10C	x	x	ER308H	W 19 9 H	G 19 9 H	-	-	1.4948	P 17
SELECTARC 20/10T	x	x	~ER321	W Z 19 9 Ti	G Z 19 9 Ti	-	-	1.4541	P 17
SELECTARC 20/10NB	x		ER347	W 19 9 Nb	-	5680	-	1.4551	P 17
SELECTARC 20/10NBS	x	x	ER347Si	W 19 9 Nb Si	G 19 9 Nb Si	-	-	1.4551	P 18
SELECTARC 20/10M	x		ER316L	W 19 12 3 L	-	-	-	1.4430	P 18
SELECTARC 20/10MS	x	x	ER316LSi	W 19 12 3 L Si	G 19 12 3 L Si	-	-	1.4430	P 18
SELECTARC INOX 16	x		ER316L	W 19 12 3 L	-	-	-	1.4430	P 18
SELECTARC INOX 16S		x	ER316LSi	-	G 19 12 3 L Si	-	-	1.4430	P 18
SELECTARC 20/10MN	x	x	ER316LMn	W 20 16 3 Mn L	G 20 16 3 Mn L	-	-	1.4455	P 18
SELECTARC 20/10MNB	x		ER318	W 19 12 3 Nb	-	-	-	1.4576	P 18
SELECTARC 20/10MNBS		x	~ER318	-	G 19 12 3 Nb Si	-	-	1.4576	P 19
SELECTARC 24/12	x		ER309L	W 23 12 L	-	-	-	1.4332	P 19
SELECTARC 24/12S	x	x	ER309LSi	W 23 12 L Si	G 23 12 L Si	-	-	1.4332	P 19
SELECTARC 24/12M	x	x	~ER309LMo	W 23 12 2 L	G 23 12 2 L	-	-	1.4459	P 19
SELECTARC 25/20	x	x	ER310	W 25 20	G 25 20	-	-	~1.4842	P 19
SELECTARC 29/9	x	x	ER312	W 29 9	G 29 9	-	-	1.4337	P 19
SELECTARC 18/15	x	x	ER317L	W 18 15 3 L	G 18 15 3 L	-	-	1.4438	P 19
SELECTARC 20/25CU	x	x	ER385	W 20 25 5 Cu L	G 20 25 5 Cu L	-	-	1.4519	P 20
SELECTARC 27/31CU	x	x	ER383	W 27 3 14 Cu L	G 27 3 14 Cu L	-	-	1.4583	P 20
SELECTARC M13/0	x	x	ER410	W 13	G 13	5776	-	1.4009	P 20
SELECTARC M13/0C	x		ER420	-	-	-	-	1.4028	P 20
SELECTARC M13/4	x	x	ER410NiMo	W 13 4	G 13 4	-	-	~1.4351	P 20
SELECTARC F17/0	x	x	ER430	W 17	G 17	-	-	1.4016	P 20
SELECTARC D22/09	x	x	ER2209	W 22 9 3 N L	G 22 9 3 N L	-	-	~1.4462	P 20
SELECTARC D25/09	x	x	ER2594	W 25 9 4 N L	G 25 9 4 N L	-	-	-	P 21
SELECTARC D25/09W	x	x	ER2594	W 25 9 4 N L	G 25 9 4 N L	-	-	-	P 21
SELECTARC 21/10MA	x	x	-	W Z 21 10 N H	G Z 21 10 N H	-	-	~1.4835	P 21
SELECTARC 16/8M	x	x	ER16-8-2	W 16 8 2	G 16 8 2	-	-	-	P 21
SELECTARC 17/4CU	x	x	ER630	EN 3889 / X5CrNiCu17-4	-	5825	Z5CNDV17-04	-	P 21
SELECTARC 17/4MO	x	x	-	EN 4683 / X4CrNiMo16-5-1	-	-	Z8CND17-04	1.4418	P 21
SELECTARC 11/3M	x	x	-	EN 3890 / X11CrNiMoVN12-3	-	-	Z12CNDV12	1.4938	P 21
SELECTARC 22/21CO	x	x	-	W Z 22 21 3 CoWNBn	-	5794	Z12CNKW20	-	P 21

## NICKEL ALLOYS

Type	TIG	MIG	Classification			MATERIAL N°	
			AWS A5.14	ISO 18274	AMS		
SELECTARC NI22	x	x	ERNiCrMo-10	S-Ni6022 (NiCr21Mo13Fe4W3)	-	2.4635	P 22
SELECTARC NI59	x	x	ERNiCrMo-13	S-Ni 6059 (NiCr23Mo16)	-	2.4607	P 22
SELECTARC NI60	x	x	ERNiCu-7	S-Ni 4060 (NiCu30Mn3Ti)	-	2.4377	P 22
SELECTARC NI61	x	x	ERNi-1	S-Ni 2061 (NiTi3)	-	2.4155	P 22
SELECTARC NI65	x	x	ERNiFeCr-1	S-Ni 8065 (NiFe30Cr21Mo3)	-	2.4858	P 22
SELECTARC NI82	x	x	ERNiCr-3	S-Ni 6082 (NiCr20Mn3Nb)	-	2.4806	P 23
SELECTARC NI90	x	x	-	S-Ni 7090 (NiCr20Co18Ti3)	5829	2.4632	P 23
SELECTARC NI263	x	x	-	S-Ni 7263 (NiCr20Co20Mo6Ti2)	5966	2.4650	P 23
SELECTARC NI276	x	x	ERNiCrMo-4	S-Ni 6276 (NiMo16Cr15Fe6W4)	-	2.4886	P 23
SELECTARC NI601	x	x	ERNiCrFe-11	S-Ni 6601 (NiCr23Fe15Al)	-	2.4626	P 23
SELECTARC NI617	x	x	ERNiCrCoMo-1	S-Ni6617 (NiCr22Co12Mo9)	-	2.4627	P 23
SELECTARC NI625	x	x	ERNiCrMo-3	S-Ni 6625 (NiCr22Mo9Nb)	5837	2.4831	P 23
SELECTARC NI690	x	x	ERNiCrFe-7	S-Ni 6052 (NiCr30Fe9)	-	-	P 24
SELECTARC NI718	x	x	ERNiFeCr-2	S-Ni 7718 (NiFe19Cr19Nb5Mo3)	5832	2.4667	P 24
SELECTARC NICKR80	x	x	~ERNiCr-6	-	5676	2.4639	P 24
SELECTARC NIW	x	x	ERNiMo-3	S-Ni 1004 (NiMo25Cr5Fe5)	5786	-	P 24
SELECTARC NIX	x	x	ERNiCrMo-2	S-Ni 6002 (NiCr21Fe18Mo9)	5798	-	P 24
SELECTARC FENI36	x	x	-	-	-	-	P 24
SELECTARC FENI50	x	x	-	-	-	2.4472	P 24

# CLASSIFICATION & STANDARDS



## ALUMINIUM ALLOYS

Type	TIG	MIG	Classification				MATERIAL N°	
			AWS A5.10	ISO 18273	AMS			
SELECTARC AL99.7	x	x	ER1070	S Al 1070 (Al99.7)	-	3.0259	P 25	
SELECTARC ALG3	x	x	ER5754	S Al 5754 (AlMg3)	-	3.3536	P 25	
SELECTARC ALG5	x	x	ER5356	S Al 5356 (AlMg5Cr (A))	-	3.3556	P 26	
SELECTARC ALG4M	x	x	ER5183	S Al 5183 (AlMg4.5Mn0.7)	-	3.3548	P 26	
SELECTARC ALG5M	x	x	ER5556	S Al 5556A (AlMg5Mn)	-	-	P 26	
SELECTARC ALG4Z2	x	x	-	S Al Z (AlMg4Zn2)	-	-	P 26	
SELECTARC ALC6	x	x	ER2319	S Al 2319 (AlCu6MnZrTi)	4191	-	P 26	
SELECTARC ALS5	x	x	ER4043	S Al 4043 (AlSi5)	4190	3.2245	P 26	
SELECTARC ALS7	x	x	R-357.0	Al 4011 (AlSi7Mg0.5Ti)	4246	-	P 26	
SELECTARC ALS12	x	x	ER4047	S Al 4047 (AlSi12)	4185	3.2585	P 26	

## MAGNESIUM ALLOYS

Type	TIG	MIG	Classification				MATERIAL N°	
			AWS A5.19	AFNOR	AMS			
SELECTARC AZ92A	x		ERAZ92A	Mg Al 9	4395	-	P 27	
SELECTARC EZ33A	x		EREZ33A	Mg Zn 2	4396	-	P 27	

## COPPER ALLOYS

Type	TIG	MIG	Classification			MATERIAL N°	
			AWS A5.7	ISO 24373			
SELECTARC CUS	x	x	ERCu	S Cu 1898 (CuSn1)	2.1006		P 28
SELECTARC CUS6	x	x	ERCuSn-A	S Cu 5180A (CuSn6P)	2.1022		P 28
SELECTARC CUS8	x	x	ERCuSn-C	S Cu 5210 (CuSn8P)	2.1025		P 28
SELECTARC CUS13	x	x	-	S Cu 5410 (CuSn12P)	2.1056		P 28
SELECTARC CUSIL	x	x	ERCuSi-A	~S Cu 6560 (CuSi3Mn1)	2.1461		P 29
SELECTARC CUAG	x	x	~ERCu	S Cu 1897 (CuAg1)	2.1211		P 29
SELECTARC CUA8	x	x	ERCuAl-A1	S Cu 6100 (CuAl7)	2.0921		P 29
SELECTARC CUA8NI	x	x	-	S Cu 6327 (CuAl8Ni2Fe2Mn2)	2.0922		P 29
SELECTARC CUA9	x	x	ERCuAl-A2	S Cu 6180 (CuAl10Fe)	-		P 30
SELECTARC CUA9NI	x	x	ERCuNiAl	S Cu 6328 (CuAl9Ni5Fe3Mn2)	-		P 30
SELECTARC CUMN13	x	x	ERCuMnNiAl	S Cu 6338 (CuMn13Al8Fe3Ni2)	2.1368		P 30
SELECTARC CUNI10	x	x	-	S Cu 7061 (CuNi10)	2.0873		P 30
SELECTARC CUNI30	x	x	ERCuNi	S Cu 7158 (CuNi30Mn1FeTi)	2.0837		P 30

## TITANIUM ALLOYS

Type	TIG	MIG	Classification				MATERIAL N°	
			AWS A5.16	ISO 24034	AMS			
■ SELECTARC T40	x	x	ERTi-2	Ti 0120 (Ti99,6)	4951	3.7035	P 31	
■ SELECTARC TP00.2	x	x	ERTi-7	Ti 2401 (TiPd0,2A)	-	-	P 31	
■ SELECTARC TA6V4	x	x	ERTi-5	Ti 6402 (TiAl6V4B)	4954	3.7165	P 31	
■ SELECTARC TA6V4 ELI	x	x	ERTi-23	Ti 6408 (TiAl6V4A)	4956	-	P 31	

## COBALT ALLOYS

Type	TIG	MIG	Classification				MATERIAL N°	
			AWS A5.21	EN 14700	DIN 8555			
■ SELECTARC CO1	x		ERCoCr-C	S Co3	WSG-20-GO-55-CSTZ	-	P 32	
■ SELECTARC CO6	x		ERCoCr-A	S Co2	WSG-20-GO-40-CTZ	-	P 32	
■ SELECTARC CO12	x		ERCoCr-B	S Co2	WSG-20-GO-50-CSTZ	-	P 32	
■ SELECTARC CO21	x		ERCoCr-E	S Co1	WSG-20-GO-300-CKTZ	-	P 32	
■ SELECTARC CO25	x	x	-	S Co1	WSG-20-GZ-250-CKTZ	-	P 32	

## COBALT ALLOYS: AERONAUTICAL RANGE

Type	TIG	MIG	Classification				MATERIAL N°	
			EN	AMS	AFNOR			
■ SELECTARC FICO25	x	x	EN 3887	5796	KC 20 WNX	2.4964	P 33	
■ SELECTARC FICO31	x	x	EN 4327	5789	KC 26 NW	-	P 33	
■ SELECTARC FICO188	x	x	EN 3888	5801	KCN 22 W	2.4683	P 33	
■ SELECTARC FICO414	x	x	-	-	KC 29 NW	-	P 33	
■ SELECTARC FICO694	x	x	EN 4326	-	KC 28 WN	-	P 33	
■ SELECTARC FICO918	x	x	-	5814	KC 20 NTa	-	P 33	
■ SELECTARC FICOT800	x	x	-	-	KD 28 CS	-	P 33	

## HARDFACING - REPAIR AND MAINTENANCE

\* Hardfacing Aubert & Duval

Type	TIG	MIG	Classification				MATERIAL N°	
			EN 14700	DIN 8555	AIR 9117 / AFNOR			
■ SELECTARC 819 BS*	x	x	S Fe3	-	-	1.6773	P 34	
■ SELECTARC BMS*	x	x	-	-	8 CD 12	-	P 34	
■ SELECTARC MV5S*	x	x	S Fe4	MSG 3-GZ-60-P	-	-	P 34	
■ SELECTARC MARVAL 18S*	x	x	S Fe5	-	Z2NKD18	1.6359	P 34	
■ SELECTARC SMV3S*	x	x	S Fe3	-	-	1.2343	P 34	
■ SELECTARC SCVS*	x	x	-	-	15 CDV 6	1.7734	P 35	
■ SELECTARC HB48HT	x	x	S Fe8	-	-	~1.2367	P 35	
■ SELECTARC HB56HT	x	x	S Fe6	-	-	~1.2343	P 35	
■ SELECTARC HB25	x	x	-	WSG 1-GZ-250-P	-	-	P 36	
■ SELECTARC HB35	x	x	-	WSG 2-GZ-350-P	-	-	P 36	
■ SELECTARC HB50	x	x	-	WSG 2-GZ-50	-	-	P 36	
■ SELECTARC HB60	x	x	-	WSG 6 GZ-60-S	-	-	P 36	
■ SELECTARC HBF17	x	x	-	WSG 6-GZ-50-RZ	-	-	P 36	
■ SELECTARC HBC62	x	x	-	WSG 4-GZ-60-S	-	-	P 36	
■ SELECTARC HCUBE	x	x	S Z Cu 1	-	AFNOR / CuBe2	-	P 36	

## OTHERS

Type	Classification				MATERIAL N°	
	NFL 23-320	DMD	EN			
■ SELECTARC Z 2 CN 18.10	Z 2 CN 18-10	200-44	-	1.4314.9	P 37	
■ SELECTARC Z 6 CNT 18.10	Z 6 CNT 18-10	-	EN 3628 / EN 2573	1.4544	P 37	
■ SELECTARC NC 15 FE	NC 15 Fe	422-44	-	-	P 37	



# UN-ALLOYED STEELS

**+ PRODUCT ADVANTAGES:** wide range to meet all technical requirements, repeatability of quality product on all fabrications, products available in different shapes, diameters and volumes of sale, direct contact with a technical adviser.

## SELECTARC F55

MIG

Classification		Weld metal composition (%)										Mechanical properties			
AWS A5.18	ISO 14341-A	C	Si	Mn	Al	Ti	Cu	Zr	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER70S-2	G2Ti	0.06	0.6	1.2	0.1	0.1	0.2	0.08	0.015	0.01	Balance	460	560	28	-20°C → 120

- **DESCRIPTION:** Filler metal used for welding low alloy steels to be galvanized or zinc plated.
- **APPLICATIONS:** Metal construction, foundries, shipyards.

## SELECTARC F56

TIG

Classification		Weld metal composition (%)							Mechanical properties					
AWS A5.18	ISO 636-A	C	Si	Mn	Cu	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)		
ER70S-3	W2Si	0.07	0.65	1.1	0.2	<0.02	<0.02	Balance	460	560	26	+20°C → 200	-20°C → 90	-50°C → 50

- **DESCRIPTION:** Filler metal used for welding carbon steel and low alloy types S235, S355, P235, P310.
- **APPLICATIONS:** General metal constructions, automobile industry, blacksmithing, ship building, piping systems. Used for root passes.

## SELECTARC F57

TIG MIG

Classification		Weld metal composition (%)							Mechanical properties				
AWS A5.18	ISO 636-A	C	Si	Mn	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)		
ER70S-6	W3Si1	0.07	0.85	1.45	<0.02	<0.015	Balance	460	560	26	+20°C → 120	-20°C → 90	-40°C → 60
AWS A5.18	ISO 14341-A	C	Si	Mn	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)		
ER70S-6	G3Si1	0.07	0.85	1.45	<0.025	<0.02	Balance	470	550	25	+20°C → 150	-30°C → 80	-

- **DESCRIPTION:** Filler metal used for welding carbon steel and low alloy types S235, S355, S255N, S420N P235, P310.
- **APPLICATIONS:** General metal constructions, automobile industry, blacksmithing, ship building, piping systems.

## SELECTARC F57N

TIG

Classification		Weld metal composition (%)												Mechanical properties				
AWS A5.18	ISO 636-A	C	Si	Mn	Cr	Mo	Cu	Ni	V	Ti	Zr	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER70S-G	W0	0.09	0.61	1.1	0.32	0.02	0.16	0.09	0.001	0.002	0.002	0.012	0.012	Balance	530	610	25	-20°C → 160

- **DESCRIPTION:** Copper coated solid wire for GTAW to weld low alloyed standard construction / boiler steels like S235-S355, P235-P355, S255N-S355. This chromium content higher than ER70S-3 or ER70S-6 gives a particular resistance to corrosion/erosion due to the water.
- **APPLICATIONS:** For pipping (in particular Nuclear) for root pass for high quality level of welding with specific control.

\*After heat treatment, for more informations, see our technical data sheets.

# LOW ALLOYED STEELS

**+ PRODUCT ADVANTAGES:** wide range to meet all technical requirements, repeatability of quality product on all fabrications, products available in different shapes, diameters and volumes of sale, direct contact with a technical adviser.



## SELECTARC F60

TIG MIG

Classification		Weld metal composition (%)							Mechanical properties			
TIG	<b>AWS A5.28</b>	<b>ISO 636-B</b>	C	Si	Mn	Mo	Cu	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
	ER80S-D2	W4M31	0.08	0.7	1.8	0.5	0.2	Balance	500*	620	25	+20°C → 140
MIG	<b>AWS A5.28</b>	<b>ISO 14341-A</b>	C	Si	Mn	Mo	Cu	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
	ER80S-D2	G4Mo	0.08	0.7	1.8	0.5	0.2	Balance	500*	620	25	+20°C → 140

- **DESCRIPTION:** Filler metal used for welding low alloy steels with molybdenum (0.5% Mo) 15Mo3 type 18MnMo4 and High Strength Steels when need elongation. Creep resistant up to 500°C.
- **APPLICATIONS:** Chemical and petrochemical industry, boilers and pressure vessels.

## SELECTARC F61

TIG MIG

Classification		Weld metal composition (%)							Mechanical properties					
TIG	<b>AWS A5.28</b>	<b>ISO 636-A</b>	C	Si	Mn	Mo	Cu	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
	ER70S-A1	W2Mo	0.09	0.6	1.2	0.5	0.15	0.01	0.01	Balance	520	630	26	+20°C → 200

- **DESCRIPTION:** Filler metal used for welding steels, such as 16Mo3, P355GH, P460N, S460N, to withstand higher temperatures than low-alloy chromium-molybdenum standard steels. Good resistance to attack by hydrogen.
- **APPLICATIONS:** Chemical industry and thermal power: high temperature heat exchangers, tubes, steam boiler.

## SELECTARC F63

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties				
TIG	<b>AWS A5.28</b>	<b>ISO 21952-B</b>	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
	ER80S-B2	W 1CM	0.1	0.5	0.6	1.3	0.5	0.2	-	<0.02	<0.01	Balance	490*	590	25	+20°C → 200
MIG	<b>AWS A5.28</b>	<b>ISO 21952-B</b>	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
	ER80S-B2	G 1CM	0.09	0.6	0.6	1.3	0.5	0.2	0.03	0.01	0.01	Balance	480*	580	25	+20°C → 150

- **DESCRIPTION:** Filler metal used for welding low alloy steels with 1.25% Cr and 0.5% Mo - such as types 13CrMo4, 25CrMo4, A537. Creep resistant up to 550°C.
- **APPLICATIONS:** Chemical and petrochemical industry, boiler and pressure vessel.

## SELECTARC F68

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties				
TIG	<b>AWS A5.28</b>	<b>ISO 21952-B</b>	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
	ER90S-B3	W 2C1M	0.1	0.5	0.6	2.4	1.0	0.2	-	<0.01	<0.011	Balance	550*	630	22	+20°C → 180
MIG	<b>AWS A5.28</b>	<b>ISO 21952-B</b>	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)
	ER90S-B3	G 2C1M	0.1	0.6	0.6	2.4	1.0	0.2	0.03	<0.015	<0.015	Balance	520*	650	22	+20°C → 150

- **DESCRIPTION:** Filler metal used for welding low alloy steels, type semi-refractory with 2.5% Cr and 1% Mo. Creep resistant up to 600°C. High resistance to H<sub>2</sub>S.
- **APPLICATIONS:** High temperature heat exchangers, pipes, steam boilers, hydrocrackers.

## SELECTARC F69

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties			
TIG	<b>AWS A5.28</b>	<b>ISO 21952-A</b>	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)
	ER80S-B6	W CrMo5Si	0.08	0.4	0.5	5.6	0.55	0.15	0.1	<0.02	<0.02	Balance	500*	620	20
MIG	<b>AWS A5.28</b>	<b>ISO 21952-A</b>	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)
	ER80S-B6	G CrMo5Si	0.08	0.4	0.5	5.6	0.55	0.15	0.1	<0.02	<0.02	Balance	500*	620	20

- **DESCRIPTION:** Filler metal used for welding low alloy steels with chromium-molybdenum, types 17CrMo3 5, ASTM A215 Gr C5. Creep resistant up to 600°C. Good resistance to hot gases. Former standard AWS 5.9: ER502.
- **APPLICATIONS:** Chemical and thermal power industries, piping systems, steam boilers.

\*After heat treatment, for more informations, see our technical data sheets.

## LOW ALLOYED STEELS

## SELECTARC F609

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.28	ISO 21952-A		C	Si	Mn	Cr	Mo	Cu	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER80S-B8	W CrMo9	G CrMo9	0.07	0.4	0.5	9.0	1.0	0.2	<0.015	<0.015	Balance	530*	670	24	+20°C → 150	

- **DESCRIPTION:** Filler metal used for welding low alloy steels with chromium-molybdenum types X12CrMo9-1. Creep resistant up to 600°C. Good resistance to the hot gases. Former AWS 5.9: ER505.
- **APPLICATIONS:** High temperature heat exchanger, piping systems, steam boilers.

## SELECTARC F691

TIG MIG

Classification			Weld metal composition (%)												Mechanical properties		
AWS A5.28	ISO 21952-A		C	Si	Mn	Cr	Mo	Cu	Ni	V	Nb	N	P	S	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ER90S-B9	W CrMo91		0.09	0.25	0.6	8.8	0.95	0.03	0.65	0.2	0.06	0.05	0.002	0.007	650*	750	18
AWS A5.28	ISO 21952		C	Si	Mn	Cr	Mo	Cu	Ni	V	Nb	N	P	S	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ER90S-B9	G CrMo91		0.09	0.25	0.6	8.8	0.95	0.03	0.65	0.2	0.06	0.05	0.007	0.002	650*	720	18

- **DESCRIPTION:** Filler metal used for welding low alloy steels with chromium-molybdenum. Creep resistant up to 650°C. Good resistance to hot gases.
- **APPLICATIONS:** Chemical industry and thermal power plants, high temperature heat exchangers, piping systems, steam boilers.

## SELECTARC F75

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.28	ISO 16834-A		C	Si	Mn	Cr	Cu	Ni	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER80S-G	W Mn3Ni1Cu	G Mn3Ni1Cu	0.08	0.8	1.4	0.4	0.4	0.8	0.02	0.01	Balance	530	620	26	-20°C → 90	

- **DESCRIPTION:** Filler metal used for welding copper, chromium, nickel (such as Corten: self-weathering steel) low alloy steels resistant to the atmospheric corrosion.
- **APPLICATIONS:** Metal constructions, bridges, water towers, cladding, guard rails, electric pylons.

## SELECTARC F77

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.28	ISO 16834-A		C	Si	Mn	Cr	Mo	Ni	Fe	Re (MPa)	Rm (MPa)	A5 (%)	KV (J)			
ER100S-1	W Z Mn3Ni1.5Mo	G Z Mn3Ni1.5Mo	0.08	0.5	1.5	0.15	0.35	1.6	Balance	730	820	19	-51°C → 70			

- **DESCRIPTION:** Filler metal used for welding steels with high yield strength (Rm > 800 MPa et Re > 690 Mpa).
- **APPLICATIONS:** Metal construction, automotive industry, foundry, steel construction, boilers...

## SELECTARC F81

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.28	ISO 636-A		C	Si	Mn	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)		
ER80S-Ni1	W3Ni1		0.1	0.6	1.2	0.2	1.0	<0.015	<0.015	Balance	500	600	26	+20°C → 130 -40°C → 80		
AWS A5.28	ISO 14341-A		C	Si	Mn	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)		
ER80S-Ni1	G3Ni1		0.1	0.6	1.2	0.2	1.0	<0.015	<0.015	Balance	500	600	25	+20°C → 130 -40°C → 80		

- **DESCRIPTION:** Filler metal used for welding low alloy high strength steels, requiring good low-temperature toughness.
- **APPLICATIONS:** Cryogenics up to -40°C.

## SELECTARC F82

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.28	ISO 636-A		C	Si	Mn	Mo	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)		
ER80S-Ni2	W2Ni2		0.08	0.6	1.1	0.05	2.5	<0.02	<0.02	Balance	530	620	26	+20°C → 130 -40°C → 80 -60°C → 50		
AWS A5.28	ISO 14341-A		C	Si	Mn	Mo	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)		
ER80S-Ni2	G2Ni2		0.08	0.6	1.1	0.05	2.5	<0.02	<0.02	Balance	500	600	>24	+20°C → 130 -40°C → 80 -80°C → 50		

- **DESCRIPTION:** Filler metal used for welding low alloy high strength steels, requiring good low-temperature toughness.
- **APPLICATIONS:** Cryogenics up to -60°C.

\*After heat treatment, for more informations, see our technical data sheets.



AERONAUTICAL RANGE

SELECTARC A60

TIG MIG

Classification		Weld metal composition (%)								Mechanical properties		
AIR 9117	A60	C	Si	Mn	Si+Al+Ti	Cu	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)
		<0.12	0.6	1.0	<0.9	0.2	<0.02	<0.02	Balance	380	550	24

- **DESCRIPTION:** Filler metal used for welding steels types XC18S, E26, E36.
- **APPLICATIONS:** Aerospace industry. Available bare or Copper coated.

SELECTARC BMS

Aubert & Duval product name

TIG MIG

Classification		Weld metal composition (%)								Mechanical properties			
EN 4332	AIR 9117	C	Si	Mn	Cr	Mo	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	Hardness (HRC)
8CrMnMo12-4-9	8CD12	0.06	0.7	1.1	2.7	1.0	<0.015	<0.015	Balance	440*	570	24	~36

- **DESCRIPTION:** Filler metal 8CrMo12 type used for welding low alloy steels: 30CrMoV12 type 55NiCrMoV7, 55CrNiMo4. Product of high purity, porosity free deposit.
- **APPLICATIONS:** Hardfacing of fins, tool steels, molds for plastic items. Available bare or Copper coated.

SELECTARC SCVS

Aubert & Duval product name

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties			
EN 4334	AIR 9117	C	Si	Mn	Cr	Mo	V	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	Hardness (HRC)
15CrMnMoV5-4-9-3	15CDV6	0.14	0.15	1.0	1.4	0.9	0.25	<0.02	<0.02	Balance	930*	1080-1280*	10	42 (As welded)

- **DESCRIPTION:** Filler metal 15CrMoV6 type used for welding homogeneous and similar low alloy steels.
- **APPLICATIONS:** Hardfacing of fins, tool steels. Available bare or Copper coated.

SELECTARC F66S

Aubert & Duval product name

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties			
EN 4331	AIR 9117	C	Si	Mn	Cr	Mo	Ni	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	Hardness (HRC)
25CrMnMo4-2-2	25CD4	0.23	0.2	0.7	1.2	0.2	0.15	<0.02	<0.02	Balance	750*	880-1080*	12	46 (As welded)

- **DESCRIPTION:** Metal 24CrMo4 type of input used for welding low alloy steels: and type as 25CrMo4 35CrMo4, 20CrMo12...
- **APPLICATIONS:** Hardfacing of fins, tool steels. Available bare or Copper coated.

\*After heat treatment, for more informations, see our technical data sheets.



# STAINLESS STEELS

**+ PRODUCT ADVANTAGES:** products that meet the most demanding customer specifications! A wide and exclusive product range by its grades, sizes and types of packaging.

- Diameters from 4 mm to 0.3 mm (micro-laser range),
- Identification of customized products (flagging, painting, stamping...),
- Packaging: a varied choice depending on type and shape of products.

## STAINLESS STEELS WELDING

BASE METAL	STEEL	304L	308H	347	321	316L	318	309L	309LMo	310 - 310H	410	410 NiMo	904L - UB6	Duplex 2205 - U45N	Duplex 2505 - U52N
		18/8	18/8	18/8Nb	18/8Ti	18/8/3	18/8/3Nb	24/12	24/12Mo	25/20	13Cr	13Cr - 4Ni			
Duplex 2505 - U52N	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09	D25/09
Duplex 2205 - U45N	D22/09	D22/09	D22/09	D22/09	D22/09	D22/09	D22/09	D22/09	D22/09	25/20	D22/09	D22/09	20/25CU	D22/09	
385	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU	20/25CU		
410 NiMo	M13/4	24/12	24/12	24/12	24/12	24/12	24/12	24/12	24/12	25/20	M13/4	M13/4			
410	M13/0	24/12	24/12	24/12	24/12	24/12	24/12	24/12	24/12	25/20	M13/0				
310	25/20	25/20	25/20	25/20	25/20	25/20	25/20	25/20	25/20	25/20					
309LMo	24/12M	24/12M	24/12	24/12	24/12	24/12	24/12	24/12	24/12M						
309L	24/12	24/12	24/12	24/12	24/12	24/12	24/12	24/12							
318	24/12	20/10M	20/10M	20/10MNB	20/10MNB	20/10MNB	20/10MNB								
316L	24/12M	20/10M	20/10M	20/10M	20/10M	20/10M									
321	24/12	20/10BC	20/10BC	20/10NB	20/10NB										
347	24/12	20/10NB	20/10NB	20/10NB											
308H	24/12	20/10	20/10C												
304L	24/12	20/10													



In some cases, the MIG version has a higher rate of Si.  
Example: TIG 20/10 and MIG 20/10S

### SELECTARC 18/8MN

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
~ER307	W 18 8 Mn G 18 8 Mn	0.09	0.9	7.0	19.0	0.1	0.08	8.5	<0.02	<0.01	Balance	450	650	40	+20°C → 120

- **DESCRIPTION:** Filler metal used for welding austenitic stainless steels and manganese steels considered difficult to weld or misidentified.
- **APPLICATIONS:** Civil engineering, road, rail or fluviale, quarry, cement. Ideal as buffer layer before hardfacing of grades sensitive to cracking, or in the case of dissimilar joints between stainless steel and steel construction...

**SELECTARC 20/10**

TIG

Classification		Weld metal composition (%)									Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Ni	P	S	Fe	RP0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER308L	W 199 L	0.015	0.42	1.8	19.5	9.8	<0.02	<0.01	Balance	430	600	38	+20°C → 150   -196°C → 50	

- **DESCRIPTION:** Low carbon filler metal for welding stainless steel types: 304/1.4301. The low impurity and tightened chemical analysis allow greater mastery of mechanical properties and resistance to corrosion. The surface of the wire and its high level of cleanliness allow optimal feeding in automated applications (eg: Orbital TIG).
- **APPLICATIONS:** Boilers, piping systems, pressure vessels.

**SELECTARC 20/10S**

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	Fe	RP0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER308L Si	W 199 L Si   G 199 L Si	0.015	0.9	1.8	20.0	0.1	0.08	10.0	Balance	400	600	38	+20°C → 110   -196°C → 50	

- **DESCRIPTION:** Low carbon filler metal for welding stainless steel types: 304/1.4301. The low impurity and the tightened chemical analysis allow greater mastery of mechanical properties and resistance to corrosion. The presence of a higher rate of silicon allow a better flow of the bath. The surface of the wire and its high level of cleanliness ensure optimal feeding especially for automated applications.
- **APPLICATIONS:** Boilers, piping systems, pressure equipment.

**SELECTARC INOX 8**

TIG

Classification		Weld metal composition (%)									Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Ni	P	S	Fe	RP0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER308L	W 199 L	0.015	0.42	1.8	19.9	9.8	<0.03	<0.02	Balance	350	520	35	+20°C → 80	

- **DESCRIPTION:** Filler metal used for welding type 304 stainless steels.
- **APPLICATIONS:** Joining of standard stainless steels.

**SELECTARC INOX 8S**

MIG

Classification		Weld metal composition (%)									Mechanical properties				
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	RP0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER308LSi	G 199 L Si	0.015	0.9	1.8	20.0	0.1	0.08	10.0	<0.03	<0.02	Balance	350	520	35	+20°C → 80

- **DESCRIPTION:** Filler metal used for welding 304 type of stainless steel. The increased silicon promotes weld pool fluidity.
- **APPLICATIONS:** Joining of standard stainless steels.

**SELECTARC 20/10C**

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Ni	P	S	Fe	FN	RP0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER308H	W 199 H   G 199 H	0.05	0.4	1.8	19.9	9.7	<0.02	<0.015	Balance	6	380	580	35	+20°C → 100

- **DESCRIPTION:** Filler metal used for welding 304H stainless steels with higher carbon content (0.04 % to 0.08 %).
- **APPLICATIONS:** Parts to have creep resistance and resistance to temperature oxidation (400°C-750°C): piping systems, pressure vessels.

**SELECTARC 20/10T**

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties					
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	Ti	P	S	Fe	RP0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
~ER321	W Z 199 Ti   G Z 199 Ti	0.03	0.5	1.5	18.0	0.3	0.3	10.5	0.2	<0.03	<0.02	Balance	460	630	35	+20°C → 110

- **DESCRIPTION:** Filler metal Titanium stabilized used for welding stainless steel types: 321, 316Ti. Good protection against intergranular corrosion. Temperature: up to 800°C.
- **APPLICATIONS:** Aerospace, gas turbines, piping systems.

**SELECTARC 20/10NB**

TIG

Classification			Weld metal composition (%)									Mechanical properties					
AWS A5.9	ISO 14343-A	AMS	C	Si	Mn	Cr	Mo	Cu	Ni	Nb	P	S	Fe	RP0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER347	W 199 Nb	5680	0.045	0.4	1.5	19.4	0.1	0.1	9.3	0.6	<0.02	<0.01	Balance	490	660	35	+20°C → 140

- **DESCRIPTION:** Filler metal Niobium stabilized used for welding of stainless steel types: 347, 321, 316Ti. Good protection from intergranular corrosion. Temperature: up to 800°C.
- **APPLICATIONS:** Aerospace, petrochemical, energy fields.

All names or trademarks mentioned in this document are the property of their respective owners.



## STAINLESS STEELS

## SELECTARC 20/10NBS

TIG MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	Nb	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER347Si	W 19 9 Nb Si   G 19 9 Nb Si	0.03	0.8	1.5	19.5	0.2	0.1	9.8	0.5	0.02	0.01	Balance	460	630	33	+20°C → 110   -196°C → 30

- **DESCRIPTION:** Filler metal Niobium stabilized used for welding of stainless steel types: 347, 321, 316Ti. Good protection from intergranular corrosion. Temperature: up to around 800°C. The presence of a higher rate of silicon allows a better flow of the puddle.
- **APPLICATIONS:** Aerospace, petrochemical industry, energy fields.

## SELECTARC 20/10M

TIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER316L	W 19 12 3 L	0.02	0.45	1.8	18.6	12.3	2.8	0.08	<0.02	<0.01	Balance	410	610	35	+20°C → 120   -196°C → 45	

- **DESCRIPTION:** Low carbon filler metal for welding stainless steel types: 316/1.4401 type and 316L. Good resistance to atmospheric and saline corrosion. The low impurity and tightened chemical analysis allows greater mastery of mechanical properties and resistance to corrosion. The surface of the wire and its high level of cleanliness allow optimal feeding in automated applications (eg: Orbital TIG).
- **APPLICATIONS:** Boilers, piping systems, pressure equipments, thermal power plants, all buildings by the sea and all types of metal construction not exceeding 400°C in operating temperature.

## SELECTARC 20/10MS

TIG MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER316LSi	W 19 12 3 L Si   G 19 12 3 L Si	0.018	0.85	1.7	18.5	2.7	0.1	12.2	<0.02	<0.01	Balance	430	620	35	+20°C → 120   -196°C → 45	

- **DESCRIPTION:** Low carbon filler metal for welding stainless steel types: 316/1.4401 and 316L. Good resistance to atmospheric and saline corrosion. The low impurity and tightened chemical analysis allow greater mastery of mechanical properties and resistance to corrosion. The presence of a higher rate of silicon allows a better flow of the puddle. The surface of the wire and its high level of cleanliness ensures optimal feeding especially for automated applications.
- **APPLICATIONS:** Boilers, piping systems, pressure equipments, thermal power plants, buildings by the sea and all types of metal construction not exceeding 400°C in operating temperature.

## SELECTARC INOX 16

TIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER316L	W 19 12 3 L	0.02	0.45	1.8	18.6	2.7	0.08	11.6	<0.03	<0.02	Balance	350	520	30	+20°C → 80	

- **DESCRIPTION:** Filler metal used for welding stainless steel type: 316.
- **APPLICATIONS:** For joining standard stainless steel.

## SELECTARC INOX 16S

MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER316LSi	G 19 12 3 L Si	0.08	0.85	1.7	18.5	2.7	0.1	11.6	<0.03	<0.02	Balance	350	510	30	+20°C → 80   -120°C → 32	

- **DESCRIPTION:** Filler metal used for welding stainless steel type: 316. The increased silicon promotes weld pool fluidity.
- **APPLICATIONS:** For joining standard stainless steel.

## SELECTARC 20/10MN

TIG MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	N	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER316LMn	W 20 16 3 Mn N L G 20 16 3 Mn N L	0.02	0.5	7.0	20.0	3.0	0.15	16.0	<0.02	<0.01	0.15	Balance	500	650	30	+20°C → 140   -196°C → 95

- **DESCRIPTION:** Filler metal used for welding stainless steel types: 316, 316L 316Ti, 304, 304L. The addition of Mn allows a ferrite-free deposit, therefore non magnetic.
- **APPLICATIONS:** Cryogenics applications.

## SELECTARC 20/10MNB

TIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	Nb	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER318	W 19 12 3 Nb	0.04	0.4	1.7	19.6	2.6	0.2	11.5	0.6	<0.02	<0.01	Balance	400	620	35	+20°C → 120

- **DESCRIPTION:** Filler metal used for welding stainless steel types 318, 316Ti. Good protection against intergranular and pitting corrosion. Operating temperature: -120°C à 400°C.
- **APPLICATIONS:** Petrochemicals, marine application.

All names or trademarks mentioned in this document are the property of their respective owners.

**SELECTARC 20/10MNBS**

MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	Nb	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
~ER318	G 19 12 3 Nb Si	0.04	0.85	1.7	19.6	2.6	0.2	11.5	0.6	<0.02	<0.01	Balance	400	620	35	+20°C → 120

- **DESCRIPTION:** Filler metal used for welding stainless steel types 318, 316Ti. Good protection against intergranular and pitting corrosion. Operating temperature: -120°C à 400°C. The presence of a higher rate of silicon allows a better flow of the puddle.
- **APPLICATIONS:** Petrochemicals, marine application.

**SELECTARC 24/12**

TIG MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER309L	W 23 12 L	0.015	0.4	1.8	23.2	0.1	0.08	13.8	<0.02	<0.01	Balance	420	620	35	+20°C → 140	

- **DESCRIPTION:** Filler metal used for welding stainless steel types 309, 309L and for dissimilar joining type 304 or 316 on low alloy steels.
- **APPLICATIONS:** Metal structures/boiler-manufacturer, civil engineering and repair/maintenance.

**SELECTARC 24/12S**

TIG MIG

Classification		Weld metal composition (%)												Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	FN	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER309LSi	W 23 12 L Si   G 23 12 L Si	0.015	0.85	1.8	23.3	0.1	0.1	13.7	<0.02	<0.01	Balance	~12	420	600	35	+20°C → 130	

- **DESCRIPTION:** Filler metal used for welding stainless steel types 309, 309L and for dissimilar joining types 304 or 316 on low alloy steels. Silicon content higher for a better fluidity of the puddle.
- **APPLICATIONS:** Sheets metal equipment, civil engineering and repair/maintenance.

**SELECTARC 24/12M**

TIG MIG

Classification		Weld metal composition (%)												Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	FN	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
~ER309LMo	W 23 12 2 L   G 23 12 2 L	0.015	0.55	1.5	21.5	2.6	0.1	14.5	<0.02	<0.01	Balance	~12	400	600	35	+20°C → 120	

- **DESCRIPTION:** Similar to 309L and 309LSi, the presence of Molybdenum limits the corrosion on acids.
- **APPLICATIONS:** Sheet metal structure, civil engineering and repair/maintenance.

**SELECTARC 25/20**

TIG MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER310	W 25 20   G 25 20	0.1	0.45	1.7	26.0	0.1	0.1	20.5	<0.02	<0.01	Balance	380	580	40	+20°C → 170	-196°C → 60

- **DESCRIPTION:** Filler metal used for welding of austenitic stainless steels resistant type 310 and for dissimilar joints between refractory steel and stainless steel.
- **APPLICATIONS:** Assembly subjected to temperatures of about 1100°C and in an oxidizing atmosphere.

**SELECTARC 29/9**

TIG MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.9	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER312	W 29 9   G 29 9	0.1	0.4	1.8	30.2	0.15	0.1	9.3	<0.02	<0.02	Balance	520	730	25	+20°C → 100	

- **DESCRIPTION:** Filler metal used for welding subjected to high stresses or heterogeneous assemblies. Good resistance to cracking, temperature and oxidation.
- **APPLICATIONS:** Highly stressed joining, and difficult-to-weld steels such as tool steels, high strength steels, molded steel, piston rod...

**SELECTARC 18/15**

TIG MIG

Classification		Weld metal composition (%)											Mechanical properties			
AWS A5.28	ISO 14343-A	C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	FN	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ER317L	W 18 15 3 L   G 18 15 3 L	0.01	0.4	1.4	18.8	3.5	0.10	13.6	<0.03	<0.02	Balance	~10	>380	>580	>30	-

- **DESCRIPTION:** Filler metal 3,5% Mo bearing, used for welding stainless steels type Cr-Ni-Mo. Better resistance to crevice and pitting corrosion than the 316L.
- **APPLICATIONS:** Chemical and petrochemical industry, paper mills, condensers.

All names or trademarks mentioned in this document are the property of their respective owners.

# STAINLESS STEELS

## SELECTARC 20/25CU

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties				
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER385	W 20 25 5 Cu L	G 20 25 5 Cu L	0.01	0.4	1.8	20.0	4.5	1.5	25.0	<0.02	<0.01	Balance	350	550	36	+20°C → 120	-196°C → 80

- **DESCRIPTION:** Filler metal used for welding fully austenitic steels type 904L, such as Uranus B6. Very good resistance to corrosion by sulfuric, hydrochloric or phosphoric acids.
- **APPLICATIONS:** Chemical and petrochemical industry, agriculture.

## SELECTARC 27/31CU

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties				
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER383	W 27 31 4 Cu L		0.01	0.15	1.8	27.0	3.5	1.0	31.0	<0.02	<0.01	Balance	350	550	35	+20°C → 100	

- **DESCRIPTION:** Filler metal used for welding fully austenitic steels such Uranus B28, Sanicro 28. Very good resistance to corrosion by sulfuric, hydrochloric or phosphoric acids.
- **APPLICATIONS:** Chemical and petrochemical industry.

## SELECTARC M13/O

TIG MIG

Classification				Weld metal composition (%)								Mechanical properties			
AWS A5.9	ISO 14341-A		AMS	C	Si	Mn	Cr	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER410	W 13	G 13	5776	0.3	0.3	0.5	13.0	<0.03	<0.02	Balance	250*	450	15	+20°C → 90	

- **DESCRIPTION:** Filler metal used for welding ferritic and martensitic steels with 13% Cr, types 410, 420, 403, 405, 416. Good resistance to atmospheric corrosion (water and steam) and sulfur oxidation (up to 900 °C).
- **APPLICATIONS:** Automotive (exhaust pipes), taps, valves.

## SELECTARC M13/OC

TIG

Classification			Weld metal composition (%)								Mechanical properties			
AWS A5.9	ISO 14341-A		C	Si	Mn	Cr	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	Hardness (HB)	
ER420	-		0.3	0.5	0.55	13.0	<0.03	<0.02	Balance	-	-	-	~350	

- **DESCRIPTION:** Stainless filler metal used for hardfacing steel with 13% chromium designed to resist at atmospheric, water and steam corrosion.
- **APPLICATIONS:** Used for pipind, valves, taps with a service temperature up to 450°C.

## SELECTARC M13/4

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties				
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	KV (J)
ER410NiMo	W 13 4	G 13 4	0.02	0.45	0.5	12.3	0.5	0.08	4.2	<0.03	<0.01	Balance	750*	840	19	+20°C → 120	-60°C → 50

- **DESCRIPTION:** Filler metal used for welding Cr-Ni martensitic steels, type 410NiMo.
- **APPLICATIONS:** Repair of pumps and turbines made of cast steel.

## SELECTARC F17/O

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties				
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER430	W 17	G 17	0.05	0.4	0.5	16.5	0.1	0.08	0.3	<0.02	<0.01	Balance	300*	450	15	-	

- **DESCRIPTION:** Filler metal used for welding ferritic and martensitic steels with 17% Cr, type 430. Good resistance to saline environment, to organic acids diluted at an operating temperatures <450°C, as well as to sulfur oxidation (up to 900 °C).
- **APPLICATIONS:** Automotive (exhaust pipes), taps, valves.

## SELECTARC D22/09

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties				
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Mo	Ni	N	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER2209	W 22 9 3 N L		0.012	0.5	1.7	23.0	3.2	8.8	0.14	<0.02	<0.01	Balance	600	780	26	+20°C → 150	-50°C → 100

- **DESCRIPTION:** Low carbon filler metal used for Duplex welding steels (austenitic-ferritic) such as Uranus 45N, 2205, 2304. Resistant to severe corrosive environments (inter crystalline attack, pitting corrosion, crevice, stress corrosion).
- **APPLICATIONS:** Pumps, vessels, pumping systems attacked by chloride containing solutions (sea water).

\*After heat treatment, for more informations, see our technical data sheets.



**SELECTARC D25/09**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties				
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Mo	Ni	N	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER2594	W 25 9 4 N L	G 25 9 4 N L	0.012	0.5	0.6	25.5	4.0	9.2	0.25	<0.03	<0.015	Balance	630	820	25	+20°C → 130	-40°C → 90

- **DESCRIPTION:** Low carbon filler metal used for Super Duplex welding steels (austenitic-ferritic) such as Uranus 52N, 52N+, 70N. Resistant to severe corrosive environments (inter crystalline attack, pitting corrosion, crevice, stress corrosion).
- **APPLICATIONS:** Pumps, vessels, pumping systems attacked by chloride containing solutions (sea water).

**SELECTARC D25/09W**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties						
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Mo	W	Cu	Ni	N <sub>2</sub>	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER2594	W 25 9 4 N L	G 25 9 4 N L	0.018	0.3	0.8	25.2	3.7	0.7	0.6	9.3	0.25	<0.03	<0.015	Balance	730	900	25	+20°C → 150	-40°C → 120

- **DESCRIPTION:** Very low carbon content solid GTAW rod for joining Duplex and Super Duplex Stainless Steels (austenitic-ferritic microstructure). Resistant in chloride containing media against pitting corrosion as well as crevice and stress corrosion. Pitting index (PREN): > 40.
- **APPLICATIONS:** For pumps, vessels, piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion attack.

**SELECTARC 21/10MA**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Ni	N	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
-	W Z 21 10 N H		0.08	1.5	0.5	21.0	10.0	0.15	<0.02	<0.01	Balance	450	650	38	+20°C → 120	

- **DESCRIPTION:** Filler metal used for welding steels of similar compositions 253MA kind. Temperature resistance up to over 1000°C, high creep resistance.
- **APPLICATIONS:** Oven, petrochemical, refinery.

**SELECTARC 16/8M**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties				
AWS A5.9	ISO 14343-A		C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ER16-8-2	W 16 8 2	G 16 8 2	0.1	0.45	2.1	16.5	2.0	<0.2	8.6	<0.03	<0.02	Balance	-	-	-	-	

- **DESCRIPTION:** Filler metal used for welding stainless steels types 304H, 321, 316H, 347H.
- **APPLICATIONS:** Petrochemicals, incinerators, nuclear industry.

**SELECTARC 17/4CU**

TIG MIG

Classification						Weld metal composition (%)									
AWS A5.9	EN 3889	ISO 14343-A		AIR 9117	AMS	C	Si	Mn	Cr	Cu	Ni	Nb	P	S	Fe
ER630	X5CrNiCu17-4	W Z 17 4 Cu	G Z 17 4 Cu	Z5CNP17-04	5825	0.03	0.5	0.6	16.0	3.5	5.0	0.2	<0.02	<0.01	Balance

- **DESCRIPTION:** Filler metal used for welding stainless steels of similar compositions type 17-4PH-X5CrNiCuNb17 4-4. XAS.
- **APPLICATIONS:** Aerospace, marine pump and turbine.

**SELECTARC 17/4MO**

TIG MIG

Classification				Weld metal composition (%)									
EN4683	ISO 14343-A		AIR 9117	C	Si	Mn	Cr	Mo	Ni	P	S	Fe	
X4CrNiMo16-5-1	W Z 17 4 Mo	G Z 17 4 Mo	Z8CND17-04	0.05	0.3	0.9	16.0	1.0	4.4	<0.03	<0.02	Balance	

- **DESCRIPTION:** Filler metal used for welding stainless steels of similar compositions type X2CrNiMo 13-4, APX4S\*.
- **APPLICATIONS:** Aerospace, marine pump and turbine...

**SELECTARC 11/3M**

TIG MIG

Classification				Weld metal composition (%)										
EN3890	ISO 14343-A		AIR 9117	C	Si	Mn	Cr	Ni	Mo	V	N	P	S	Fe
X11CrNiMo12-3	W Z 12 3 Mo V	G Z 12 3 Mo V	Z12CNDV12	0.12	0.3	0.7	11.8	2.7	1.7	0.3	0.03	<0.035	<0.025	Balance

- **DESCRIPTION:** Filler metal used for welding steels of similar compositions.
- **APPLICATIONS:** Repair of turbine blades.

**SELECTARC 22/21CO**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties					
ISO 14343-A	AIR 9117	AMS	C	Si	Mn	Cr	Ni	Mo	Co	W	Nb	N	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
W Z 22 21 3 CoWNBn G Z 22 21 3 CoWNBn	Z12CNKW20	5794	0.1	0.4	1.5	22.0	21.0	3.2	20.0	2.8	1.0	0.15	Balance	750	900	16	+20°C → 55	

- **DESCRIPTION:** Filler metal used for welding alloys of similar composition type N155. Good resistance to high temperatures and corrosion.
- **APPLICATIONS:** Aeronautics.

# NICKEL ALLOYS



**+ PRODUCT ADVANTAGES:** broad range can weld all nickel grades in the market. The exceptional quality meets the requirements of the energy, aeronautics and space industry.

- Products also available as "super clean" on request (chemical stripping: grade Y!).

## SELECTARC NI22

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274	C	Si	Mn	Cr	Mo	W	Fe	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiCrMo-10	S-Ni6022 (NiCr21Mo13Fe4W3)	0.01	0.05	0.1	21.4	13.2	3.0	3.0	<0.01	<0.01	Balance	350	550	35	+20°C → 100

- **DESCRIPTION:** Filler metal used for welding Nickel alloys C22 and C276 similar shade, stainless steel with high corrosion resistance.
- **APPLICATIONS:** Petrochemical, Chemical, Off-Shore equipment, desulfurization smoke appliances.

## SELECTARC NI59

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274	C	Si	Mn	Cr	Mo	Al	Fe	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiCrMo-13	S-Ni6059 (NiCr23Mo16)	0.01	0.05	0.1	23.0	15.0	0.1	0.2	<0.01	<0.01	Balance	420	740	30	-

- **DESCRIPTION:** Filler metal used for welding Nickel alloys such as Alloy 59 and special stainless steels. Excellent resistance to corrosion.
- **APPLICATIONS:** Pollution cleaning units, desalination and desulfurization.

## SELECTARC NI60

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274	C	Si	Mn	Cu	Ti	Fe	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ERNiCu-7	S-Ni 4060 (NiCu30Mn3Ti)	0.03	0.4	3.5	29.0	2.2	0.6	<0.01	<0.01	Balance	320	510	38	+20°C → 180	

- **DESCRIPTION:** Filler metal used for welding and hardfacing Copper-Nickel alloys and Copper-Nickel plated steels, such as Alloy 400, CuNi 90/10, CuNi 70/30 NiCu30Fe. Also used for dissimilar welding of above mentioned grades with carbon steels.
- **APPLICATIONS:** Chemicals, petrochemicals, shipbuilding, desalination unit.

## SELECTARC NI61

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274	C	Si	Mn	Cu	Ti	Fe	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ERNi-1	S-Ni 2061 (NiTi3)	0.02	0.2	0.3	0.1	3.3	0.1	<0.01	<0.01	Balance	350	540	40	+20°C → 250	

- **DESCRIPTION:** Filler metal used for welding pure Nickel grades, types: 200, Ni 201, Ni 99.2, LC-Ni99. Also used in heterogeneous welding of steel on Nickel or cupro-Nickel alloys.
- **APPLICATIONS:** Chemical and Power Industry (working soda, synthetic fibers), sub-assembly layer.

## SELECTARC NI65

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties				
AWS A5.14	ISO 18274	C	Si	Mn	Cr	Mo	Cu	Ti	Fe	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiFeCr-1	S-Ni 8065 (NiFe30Cr21Mo3)	0.02	0.2	0.6	20.5	3.2	1.8	0.9	30.0	<0.01	<0.01	41.0	-	550 (Typical value)	-	-

- **DESCRIPTION:** Filler metal used for welding Ni-Fe-Cr-Mo alloys, such as Alloy 825, NiCr21Mo. Good resistance to oxidizing, reducing, phosphoric and sulfuric acid, as well as sea water.
- **APPLICATIONS:** Chemical, petrochemical, naval construction, desalination unit...

All names or trademarks mentioned in this document are the property of their respective owners.

**SELECTARC NI82**

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274	C	Si	Mn	Cr	Nb	Ti	Fe	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiCr-3	S-Ni 6082 (NiCr20Mn3Nb)	0.03	0.2	3.2	20.5	2.3	0.3	2.0	<0.01	<0.01	Balance	430	670	42	+20°C → 200   -196°C → 100

- **DESCRIPTION:** Filler metal used for welding high Nickel content alloys such as Inconel 600, 800 Incolloy. Used for dissimilar joining: low alloy steel with stainless steel or Nickel base.
- **APPLICATIONS:** Cryogenics (5% base and 9% Nickel), equipment subject to acid at very high temperatures, repair of difficult to weld steels, buffer layer.

**SELECTARC NI90**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274	AMS	C	Si	Mn	Cr	Cu	Al	Ti	Fe	Co	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
-	S-Ni 7090 (NiCr20Co18Ti3)	5829	<0.13	0.3	0.5	20.0	0.1	1.5	2.5	1.0	16.0	Balance	-	-	-	-

- **DESCRIPTION:** Filler metal used for welding Nickel alloys like Nimonic 80A and 90.
- **APPLICATIONS:** Combustion engines, gas turbines, combustion chambers, petrochemical industry, oven.

**SELECTARC NI263**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274	AMS	C	Si	Mn	Cr	Mo	Al	Ti	Fe	Co	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
-	S-Ni 7263 (NiCr20Co20Mo6Ti2)	5966	0.05	0.25	0.05	20.0	5.9	0.5	2.15	0.7	20.0	Balance	-	630	12	-

- **DESCRIPTION:** Filler metal used for welding Nickel alloys like 263 Nimonic.
- **APPLICATIONS:** Aerospace (repair and maintenance of engines).

**SELECTARC NI276**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274		C	Si	Mn	Cr	Mo	Fe	W	Ni		Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ERNiCrMo-4	S-Ni 6276 (NiMo16Cr15Fe6W4)		0.01	0.05	0.4	16.0	16.0	6.0	3.5	Balance		480	780	35	+20°C → 100	

- **DESCRIPTION:** Filler metal used for welding high Nickel content alloys, such as Alloy C 276, NiMo16Cr15W, Hastelloy 276. Excellent resistance to oxides, chlorides, acids and saline environment.
- **APPLICATIONS:** Piping systems or main part equipment used in the chemical industry or cleaning pollution units (gas desulfurization).

**SELECTARC NI601**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties				
AWS A5.14	ISO 18274		C	Si	Mn	Cr	Cu	Al	Fe	Co	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiCrFe-11	S-Ni 6601 (NiCr23Fe15Al)		0.05	0.2	0.5	23.0	0.1	1.3	14.0	0.3	<0.01	<0.01	Balance	-	650 (Typical value)	-	-

- **DESCRIPTION:** Filler metal used for welding alloys of Ni-Cr-Fe-Al Alloy type 601. This alloy is used in structures subjected to temperatures of 1150 °C.
- **APPLICATIONS:** Oven, equipment for heat treatment.

**SELECTARC NI617**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274		C	Si	Mn	Cr	Mo	Al	Ti	Co	Fe	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiCrCoMo-1	S-Ni6617 (NiCr22Co12Mo9)		0.07	0.2	0.5	22.0	8.5	1.0	0.4	11.2	0.9	Balance	>450	>750	>42	+20°C → >110

- **DESCRIPTION:** Filler metal used for welding refractory alloys with operating temperatures of about 1100 °C.
- **APPLICATIONS:** Gas turbines, combustion chambers, petrochemical industry, oven.

**SELECTARC NI625**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.14	ISO 18274	AMS	C	Si	Mn	Cr	Mo	Fe	Nb	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiCrMo-3	S-Ni 6625 (NiCr22Mo9Nb)	5837	0.01	0.15	0.1	22.0	8.7	0.3	3.6	<0.01	<0.01	Balance	520	790	40	+20°C → 160   -196°C → 100

- **DESCRIPTION:** Filler metal used for welding high Nickel content alloys like Inconel 625, stainless steel super alloyed or heterogeneous welding low alloy steel and stainless steel or Nickel base. Good resistance to various types of corrosion.
- **APPLICATIONS:** Cryogenics (9% Ni steels), device under oxidizing or corrosive attacks, aeronautics.



# NICKEL ALLOYS

## SELECTARC NI690

TIG MIG

Classification			Weld metal composition (%)												Mechanical properties			
AWS A5.14	ISO 18274	AMS	C	Si	Mn	Cr	Mo	Fe	Nb	Al	Ti	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiCrFe-7	S-Ni 6052 (NiCr30Fe9)	-	0.01	0.2	0.9	30.0	<0.1	9.0	<0.1	0.5	0.5	<0.01	<0.01	Balance	410	640	37	+20 °C → 180

- **DESCRIPTION:** Filler metal in nickel alloy with a high chromium use for Nickel alloys type Alloy 690. Excellent resistance to corrosion and high temperature corrosion. Could be used in cladding for low alloys or stainless steel but also for heterogeneous joining steel/nickel.
- **APPLICATIONS:** Nuclear industry...

## SELECTARC NI718

TIG MIG

Classification			Weld metal composition (%)												Mechanical properties			
AWS A5.14	ISO 18274	AMS	C	Si	Mn	Cr	Mo	Al	Ti	Fe	Nb	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	Hardness (HRC)		
ERNiFeCr-2	S-Ni 7718 (NiFe19Cr19Nb5Mo3)	5832	0.04	0.2	0.2	19.0	3.0	0.5	0.9	Balance	5.0	52.0	>900	>1200	>8	~45 (after heat treatment)		

- **DESCRIPTION:** Filler metal used for welding Nickel alloys like Inconel 718, X750 and 706. Very good resistance to metal abrasion up to 700 °C.
- **APPLICATIONS:** Aerospace, cryogenic tank, hardfacing of hot working tools.

## SELECTARC NICR80

TIG MIG

Classification			Weld metal composition (%)												Mechanical properties			
AWS A5.14	EN 4329	AMS	C	Si	Mn	Cr	Cu	Fe	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)			
~ERNiCr-6	NiCr20	5676	0.1	0.2	0.5	20.0	0.1	0.5	<0.02	<0.01	Balance	-	>560	>25	-			

- **DESCRIPTION:** Filler metal used for welding Nickel alloys such Incoloy DS, Inconel 600, Brightray, Nimonic75.
- **APPLICATIONS:** Aeronautics, exhaust pipes.

## SELECTARC NIW

TIG MIG

Classification			Weld metal composition (%)												Mechanical properties			
AWS A5.14	ISO 18274	AMS	C	Si	Mn	Cr	Cu	Co	Mo	Fe	W	P	S	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
ERNiMo-3	S-Ni 1004 (NiMo25Cr5Fe5)	5786	0.03	0.2	0.4	5.0	<0.01	<0.01	24.0	6.0	0.03	<0.01	<0.01	0.02	-	690 (Typical value)	-	-

- **DESCRIPTION:** Filler metal used for welding Nickel alloys type Hastelloy W.
- **APPLICATIONS:** Aeronautics, petrochemical industry (hydrocracker).

## SELECTARC NIX

TIG MIG

Classification			Weld metal composition (%)												Mechanical properties			
AWS A5.14	ISO 18274	AMS	C	Si	Mn	Cr	Mo	Cu	Co	Al	Fe	W	Ni	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)	
ERNiCrMo-2	S-Ni 6002 (NiCr21Fe18Mo9)	5798	0.07	0.3	0.6	22.0	8.5	0.25	1.0	0.3	19.3	0.8	Balance	420	680	23	-	

- **DESCRIPTION:** Filler metal used for welding Nickel alloys type Hastelloy X. Very good compromise between oxidation resistance and mechanical characteristics at high temperatures.
- **APPLICATIONS:** Aeronautics, gas turbine, combustion chambers.

## SELECTARC FENI36

TIG MIG

Classification			Weld metal composition (%)							Mechanical properties			
-	-	-	C	Si	Mn	Ni	P	S	Fe	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
-	-	-	0.01	0.1	0.3	36.0	<0.010	<0.010	Balance	300	400	28	-

- **DESCRIPTION:** Filler metal filling a Ferro-Nickel alloy used for welding alloys Invar-type. Materials having a very low thermal expansion.
- **APPLICATIONS:** Molds for composite, cladding of natural gas tanks.

## SELECTARC FENI50

TIG MIG

Classification			Weld metal composition (%)							Mechanical properties			
-	-	-	C	Si	Mn	Ni	Fe	P	S	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	KV (J)
-	-	-	0.03	0.2	0.5	55.0	43.0	<0.015	<0.015	320	550	25	-

- **DESCRIPTION:** Filler metal used for welding spheroidal graphite or highly stressed cast iron.
- **APPLICATIONS:** Motor housing, gas turbine.

All names or trademarks mentioned in this document are the property of their respective owners.

# ALUMINIUM ALLOYS

**+ PRODUCT ADVANTAGES:** an historical experience in the drawing of aluminium, excellent cleanliness of the wire, a perfect unwinding, a range meeting all specific requirements in shipbuilding, in the nuclear sector, agriculture, aeronautics and aerospace...

- Wire drawing from 0.3 mm, customized packaging and identification (stamping, flagging, painting),
- Possibility to custom work.

ASK FOR OUR LEAFLET:  
"CUSTOM WIRE DRAWING  
MANUFACTURER"

View our full range on [www.fsh-welding.com](http://www.fsh-welding.com)!

## ALUMINIUM WELDING

BASE METAL	1XXX	2219	3XXX	4XXX	5XXX Mg < 3%	5XXX Mg > 3%	6XXX	7XXX
7XXX	a: ALS5 b: ALG5	a: ALS12	a: ALS5 b: ALG5	a: ALS5 b: ALG4M	a: ALS5 b: ALG4M	a: ALG5 b: ALG4M	a: ALG5 b: ALG5 c: ALG5	a: ALG5 b: ALG4M c: ALG4M
6XXX	a: ALS5 b: ALG5	a: ALS5 b: ALG5	a: ALS5 b: ALG5	a: ALS5 b: ALG5	a: ALS5 b: ALG5	a: ALS5 b: ALG5	a: ALS5 b: ALG5	
5XXX Mg > 3%	a: ALG5 b: ALG5 c: ALG5	a: ALG5 b: ALG5 c: ALG5	a: ALG5 b: ALG5 c: ALG5	a: ALG5 b: ALG5 c: ALG5	a: ALG5 b: ALG4M c: ALG5	a: ALG5 b: ALG5 c: ALG4M		
5XXX Mg < 3%	a: ALG5 b: ALG5 c: ALG5	a: ALG5 b: ALG5 c: ALG5	a: ALG5 b: ALG5 c: ALG5	a: ALG5 b: ALG5 c: ALG5	a: ALG3 b: ALG5 c: ALG5			
4XXX	a: AL99.7 b: AL99.7 c: AL99.7	a: AL99.7 b: AL99.7 c: AL99.7	a: ALS5 b: ALG5	a: ALS12 b: ALS5 c: ALS5				
3XXX	a: ALS5 b: AL99.7	a: ALS5 b: ALG5	a: ALS5 b: ALG5					
2219	a: ALS12	a: ALC6 b: ALC6 c: ALC6						



### TYPE OF CHOICE OF THE FILLER METAL

- a: Welder appeal
- b: Best mechanical property
- c: Corrosion resistance

### SELECTARC AL99.7

TIG MIG

Classification		Weld metal composition (%)							Mechanical properties		
AWS A5.10	ISO 18273	Si	Mn	Cu	Fe	Zn	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
ER1070	SAI 1070 (Al99.7)	0.03	0.01	0.001	0.13	0.01	Balance	70	100	30	

- **DESCRIPTION:** Filler metal used for welding pure aluminium.
- **APPLICATIONS:** Food industry, boiler, cover, chemical industry.

### SELECTARC ALG3

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273	Si	Mn	Cu	Ti	Fe	Zn	Mg	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
ER5754	SAI 5754 (AlMg3)	0.05	0.15	0.002	0.08	0.13	0.01	3.1	Balance	120	250	22	

- **DESCRIPTION:** Al-Mg filler metal used for welding aluminium alloys such as AlMg1, ALMG3, 5005, 3303, 3004.
- **APPLICATIONS:** Shipbuilding.

## SELECTARC ALG5

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273		Si	Mn	Cr	Cu	Ti	Fe	Zn	Mg	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ER5356	S Al 5356 (AlMg5Cr (A))		0.05	0.15	0.1	0.002	0.13	0.13	0.01	4.8	Balance	120	280	30

- **DESCRIPTION:** Al-Mg filler metal used for welding aluminium alloys such as AlMg5, 5056, 5083, 5454, 6005 A.
- **APPLICATIONS:** Shipbuilding, railway construction, dump trucks and trailers.

## SELECTARC ALG4M

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273		Si	Mn	Cr	Cu	Ti	Fe	Zn	Mg	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ER5183	S Al 5183 (AlMg4.5Mn0.7)		0.1	0.7	0.1	0.02	0.10	0.15	0.02	4.8	Balance	125	275	30

- **DESCRIPTION:** Filler metal used for welding aluminium alloys of similar compositions like 5083, 5086, 5454, 7020. The presence of manganese increases its mechanical characteristics compared to AlMg5.
- **APPLICATIONS:** Shipbuilding, railway construction, automobile.

## SELECTARC ALG5M

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273		Si	Mn	Cr	Cu	Ti	Fe	Zn	Mg	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ER5556	S Al 5556A (AlMg5Mn)		0.2	0.7	0.1	0.01	0.1	0.4	0.02	5.2	Balance	145	295	25

- **DESCRIPTION:** Filler metal used for welding aluminium alloys of similar composition such AG5MC. High mechanical characteristics.
- **APPLICATIONS:** Weapon industry, boiler...

## SELECTARC ALG4Z2

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273		Si	Mn	Cr	Cu	Ti	Fe	Zn	Mg	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
-	S Al Z (AlMg4Zn2)		0.05	0.4	0.09	0.003	0.1	0.1	2.0	4.0	Balance	-	-	-

- **DESCRIPTION:** Filler metal used for welding aluminium alloys AZ5G types.
- **APPLICATIONS:** Nuclear industry, weapon industry, aerospace.

## SELECTARC ALC6

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273	AMS	Si	Mn	Cu	Ti	Fe	Zr	V	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
ER2319	S Al 2319 (AlCu6MnZrTi)	4191	0.2	0.3	6.5	0.16	0.1	0.12	0.08	Balance	-	-	-	

- **DESCRIPTION:** Filler metal used for welding aluminium alloys, types: 2319, 2219, 2693, 2036. Working temperature up to 300 °C and in cryogenics.
- **APPLICATIONS:** Nuclear industry, weapon industry, aerospace.

## SELECTARC ALS5

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273	AMS	Si	Mn	Cu	Ti	Fe	Zn	Mg	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
ER4043	S Al 4043 (AlSi5)	4190	5.0	0.03	0.001	0.006	0.15	0.003	Balance		80	120	20	

- **DESCRIPTION:** Al - 5% Si filler metal, used for welding aluminium alloys, types: 6060 6061, 6063, 6070, 6071, 6351.
- **APPLICATIONS:** Nuclear industry, weapon industry, aerospace, repair of casting parts...

## SELECTARC ALS7

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273	AMS	Si	Mn	Cu	Ti	Fe	Mg	Al	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
R-357.0	S Al 4011 (AlSi7Mg0.5Ti)	4246	7.0	0.01	0.001	0.1	0.1	0.5	Balance		85	130	19	

- **DESCRIPTION:** Al - 7% Si filler metal used for welding aluminium alloys types: AS7, 6060, 6061, 6063, 6070, 6071, 6351.
- **APPLICATIONS:** Nuclear industry, weapon industry, aerospace, repair of casting parts...

## SELECTARC ALS12

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.10	ISO 18273	AMS	Si	Mn	Cu	Fe	Zn	Mg	Al	Al	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
ER4047	S Al 4047 (AlSi12)	4185	12.0	0.01	0.007	0.2	0.03	0.02	Balance		80	140	20	

- **DESCRIPTION:** Al - 12% Si filler metal used to weld undefined aluminium alloys. Its almost eutectic composition (570-585 °C) give it a behavior similar to a solder (wettability, fluidity).
- **APPLICATIONS:** Nuclear industry, weapon industry, aerospace, agricultural, foundry.

# MAGNESIUM ALLOYS



View our full range on [www.fsh-welding.com/](http://www.fsh-welding.com/)

- + PRODUCT ADVANTAGES:** a highly technical niche range for specific very demanding markets such as: automotive and aerospace.
- Our metallurgical engineers will answer all technical questions.

## SELECTARC AZ92A

TIG

Classification			Weld metal composition (%)								Mechanical properties		
AWS A5.19	AFNOR	AMS	Al	Si	Mn	Cu	Fe	Zn	Be	Mg	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERAZ92A	Mg Al 9	4395	9.0	0.01	0.3	0.001	0.002	1.8	0.0005	Balance	-	-	-

- **DESCRIPTION:** Filler metal used for the welding of most magnesium alloys.
- **APPLICATIONS:** Welding of AM100A, aerospace.

## SELECTARC EZ33A

TIG

Classification			Weld metal composition (%)								Mechanical properties		
AWS A5.19	AFNOR	AMS	Si	Mn	Cu	Zr	Fe	Zn	Ce	Mg	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
EREZ33A	Mg Zn 2	4396	<0.01	<0.03	<0.01	0.6	0.002	2.5	3.2	Balance	-	-	-

- **DESCRIPTION:** Filler metal used for welding of magnesium alloys working at high temperature.
- **APPLICATIONS:** Motorsport.



MAGNESIUM ALLOYS



# COPPER ALLOYS

- + PRODUCT ADVANTAGES:** range for welding copper, bronze, brass, aluminium bronze. The copper wires complete the already very comprehensive range of copper brazing alloys.
  - These alloys are particularly suitable for heterogeneous assemblies or buttering.



## SELECTARC CUS

TIG MIG

Classification		Weld metal composition (%)					Mechanical properties		
AWS A5.7	ISO 24373	Si	Mn	Sn	P	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERCu	S Cu 1898 (CuSn1)	0.2	0.4	0.8	0.01	Balance	50	190	35

- **DESCRIPTION:** Filler metal used for welding oxygen free Copper and Copper alloys.
- **APPLICATIONS:** Electrical lead.

## SELECTARC CUS6

TIG MIG

Classification		Weld metal composition (%)				Mechanical properties		
AWS A5.7	ISO 24373	Sn	P	Pb	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERCuSn-A	S Cu 5180A (CuSn6P)	6.0	0.2	<0.01	Balance	150	300	20

- **DESCRIPTION:** Filler metal used for welding Copper and Copper-Tin (bronze) alloys type: CuSn2, CuSn6Zn, CuSn8, G-CuSn10.
- **APPLICATIONS:** Repair of bronze and brass.

## SELECTARC CUS8

TIG MIG

Classification		Weld metal composition (%)			Mechanical properties		
AWS A5.7	ISO 24373	Sn	P	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERCuSn-C	S Cu 5210 (CuSn8P)	8.0	0.1	Balance	-	260	20

- **DESCRIPTION:** Filler metal used for welding alloys of similar composition and coated sheets.
- **APPLICATIONS:** Soldering by MIG process of galvanized steel, surfacing of friction surfaces.

## SELECTARC CUS13

TIG MIG

Classification		Weld metal composition (%)			Mechanical properties		
AWS A5.7	ISO 24373	Sn	P	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
-	S Cu 5410 (CuSn12P)	13.0	0.2	Balance	-	320	5

- **DESCRIPTION:** Filler metal used for welding Copper-Tin alloys. High wear resistance.
- **APPLICATIONS:** Copper-Tin molding, hardfacing of friction surfaces.

## SELECTARC CUSIL

TIG MIG

Classification		Weld metal composition (%)							Mechanical properties		
AWS A5.7	ISO 24373	Sn	Mn	Si	Zn	Al	Pb	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERCuSi-A	~S Cu 6560 (CuSi3Mn1)	0.8	1.0	3.0	<0.1	<0.01	<0.02	Balance	150	350	42

- **DESCRIPTION:** Filler metal used for welding Cu-Si, Cu-Mn alloys between themselves, or weld with ordinary steel and coated and galvanized sheets.
- **APPLICATIONS:** Automobile assembly and other joining industries.

## SELECTARC CUAG

TIG MIG

Classification		Weld metal composition (%)					Mechanical properties			
AWS A5.7	ISO 24373	Ag	Mn	P	Pb	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	Electrical conductivity (Sxm/mm <sup>2</sup> )
~ERCu	S Cu 1897 (CuAg1)	1.0	0.06	0.03	0.01	Balance	60	190	35	40-46

- **DESCRIPTION:** Solid wire used for welding oxides free Copper and copper alloys where a good electrical conductivity is required.
- **APPLICATIONS:** Electrical lead.

## SELECTARC CUA8

TIG MIG

Classification		Weld metal composition (%)								Mechanical properties		
AWS A5.7	ISO 24373	Fe	Mn	Si	Ni	Al	Pb	Zn	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERCuAl-A1	S Cu 6100 (CuAl7)	0.05	0.1	0.03	0.2	8.1	<0.02	<0.1	Balance	180	400	40

- **DESCRIPTION:** Solid wire used for welding Copper-Aluminium alloys, aluminium bronze type (up to 10% Al) but also for dissimilar joining Copper/Steel and for brazing galvanized steel.
- **APPLICATIONS:** Shipbuilding, chemical industry.

## SELECTARC CUA8NI

TIG MIG

Classification		Weld metal composition (%)							Mechanical properties		
AWS A5.7	ISO 24373	Fe	Al	Mn	Ni	Zn	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
-	S Cu 6327 (CuAl8Ni2Fe2Mn2)	1.4	8.5	1.8	2.3	0.017	Balance	330	650	27	

- **DESCRIPTION:** Filler metal used for welding Copper-Aluminium alloys of similar composition. It has better mechanical properties than CUA9.
- **APPLICATIONS:** Welding and repair of pumps and pipes for sea water, anti-wear surfacing, shipbuilding (according to Indret N°108 specification).

## SELECTARC CUA9

TIG MIG

Classification		Weld metal composition (%)							Mechanical properties		
AWS A5.7	ISO 24373	Fe	Si	Ni	Al	Pb	Zn	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERCuAl-A2	S Cu 6180 (CuAl10Fe)	1.2	<0.1	0.007	9.8	<0.02	<0.02	Balance	-	500	35

- **DESCRIPTION:** Solid filler metal used for welding Copper-Aluminium alloys of similar composition. It has a hardness greater than CUA8.
- **APPLICATIONS:** Hardfacing of ferritic/perlitic steel, aluminium covered steels, cast iron for tools machine and shipbuilding.

## SELECTARC CUA9NI

TIG MIG

Classification		Weld metal composition (%)					Mechanical properties		
AWS A5.7	ISO 24373	Fe	Mn	Al	Ni	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERCuNiAl	S Cu 6328 (CuAl9Ni5Fe3Mn2)	3.2	1.3	9.0	4.5	Balance	400	700	15

- **DESCRIPTION:** Solid wire used for welding aluminium bronze alloys of similar composition. Better wear resistance than CUA8NI.
- **APPLICATIONS:** Vessel accessories, ship propellers, valves, power plants, oil recovery pumps, gearboxes and propellers.

# COPPER ALLOYS

## SELECTARC CUMN13

TIG MIG

Classification		Weld metal composition (%)								Mechanical properties		
AWS A5.7	ISO 24373	Fe	Mn	Si	Ni	Al	Zn	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
ERCuMnNiAl	S Cu 6338 (CuMn13Al8Fe3Ni2)	2.5	12.0	0.03	2.0	7.5	<0.15	Balance	400	650	20	

- **DESCRIPTION:** Filler metal used for welding Copper-Aluminium alloys types: CuAl10Fe3Mn2, CuAl9Mn2. Also recommended for steel or cast iron hardfacing requiring good resistance to cavitation. Good resistance to marine corrosion.
- **APPLICATIONS:** Shipbuilding, chemical industry, hardfacing of friction surfaces, assemblies exposed to sea water, heterogeneous repair.

## SELECTARC CUNI10

TIG MIG

Classification		Weld metal composition (%)								Mechanical properties		
AWS A5.7	ISO 24373	Fe	Mn	Si	Ni	Ti	P	Pb	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
-	S Cu 7061 (CuNi10)	1.0	0.8	<0.2	10.5	0.4	<0.02	<0.02	Balance	200	320	15

- **DESCRIPTION:** Filler metal used for welding of Cupro-Nickel alloys 90/10 type.
- **APPLICATIONS:** Vessel pipelines, oil rigs, sea hydropower plants, heat-exchangers in petrochemical and power plants.

## SELECTARC CUNI30

TIG MIG

Classification		Weld metal composition (%)								Mechanical properties		
AWS A5.7	ISO 24373	Fe	Mn	Si	Ni	Ti	P	Pb	Cu	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERCuNi	S Cu 7158 (CuNi30Mn1FeTi)	0.6	0.7	<0.2	30.0	0.4	<0.02	<0.02	Balance	240	400	32

- **DESCRIPTION:** Filler metal used for welding Copper-Nickel alloys, types 70/30, 80/20.
- **APPLICATIONS:** Off-shore, desalination plant, shipbuilding and chemical industries.



# TITANIUM ALLOYS

**+ PRODUCT ADVANTAGES:** an excellent range of highly technical special wires. Their very good quality meets the needs of the major players in cutting-edge aeronautical and aerospace programmes. The main advantages of this range are: consistent quality of products on all fabrications, products available in different grades, diameters and sales volumes, specific packaging, and direct contact with a technical adviser.



View our full range on [www.fsh-welding.com](http://www.fsh-welding.com)!

## SELECTARC T40

TIG MIG

Classification			Weld metal composition (%)							Mechanical properties		
AWS A5.16	ISO 24034	AMS	C	N	H	O	Fe	Ti	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
ERTi-2	Ti 0120 (Ti 99,6)	4951	<0.03	<0.015	<0.008	0.08-0.16	<0.12	Balance	290	390-540	20	

- **DESCRIPTION:** Filler metal used for welding of pure Titanium Grade 2 type.
- **APPLICATIONS:** Aeronautics, navy, chemical industry.

## SELECTARC TPDO,2

TIG MIG

Classification			Weld metal composition (%)							Mechanical properties		
AWS A5.16	ISO 24034	C	N	H	O	Fe	Pd	Ti	Rp0.2 (MPa)	Rm (MPa)	A5 (%)	
ERTi-7	Ti 2401 (TiPd0,2A)	<0.03	<0.015	<0.008	0.08-0.16	<0.12	0.12-0.25	Balance	-	-	-	

- **DESCRIPTION:** Filler metal used for welding of pure Titanium. The addition of palladium increases the corrosion resistance in reducing acid medium.
- **APPLICATIONS:** Heat exchange units.

## SELECTARC TA6V4

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.16	ISO 24034	AMS	C	N	H	O	Fe	Al	V	Y	Ti	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERTi-5	Ti 6402 (TiAl6V4B)	4954	<0.05	<0.03	<0.005	0.12-0.20	<0.22	6.0	4.0	<0.005	Balance	900	960-1270	8

- **DESCRIPTION:** Filler metal alloy used for welding Titanium-Aluminium alloys. This alloy has high mechanical properties.
- **APPLICATIONS:** Aircraft Industry (compressor blade) chemical industry.

## SELECTARC TA6V4 ELI

TIG MIG

Classification			Weld metal composition (%)									Mechanical properties		
AWS A5.16	ISO 24034	AMS	C	N	H	O	Fe	Al	V	Y	Ti	Rp0.2 (MPa)	Rm (MPa)	A5 (%)
ERTi-23	Ti 6408 (TiAl6V4A)	4956	<0.05	<0.03	<0.005	0.12-0.20	<0.22	6.0	4.0	<0.005	Balance	900	960-1270	8

- **DESCRIPTION:** Filler metal used for welding Titanium-Aluminium alloys. The decrease in the number of interstitial elements allows better weldability and higher hardness.
- **APPLICATIONS:** Chemical industry, marine, aerospace, surgical implants.







# COBALT ALLOYS

**+ PRODUCT ADVANTAGES:** very technical and consistent high quality alloys to meet the most demanding needs of the energy, aeronautics and aerospace market sectors. In addition to the high characteristics, the extreme cleanliness and the specific identification make it one of the most remarkable product lines. Products are available in different sizes, shapes, volumes of sales and special packaging. A technical adviser is at your disposal.

## SELECTARC CO1

TIG

Classification			Weld metal composition (%)										Mechanical properties		
AWS A5.21	EN 14700	DIN 8555	C	Si	Mn	Cr	Ni	W	Fe	P	S	Co	Hardness (HRC)		
ERCoCr-C	S Co3	WSG-20-G0-55-CSTZ	2.4	1.2	0.2	31.0	2.2	12.5	2.5	<0.02	<0.03	Balance	20°C→55	400°C→47	600°C→41

- **DESCRIPTION:** Cobalt base filler metal type Stellite® Grade 1 used for hardfacing of parts subject to simple or combined wear: abrasion, metal-metal wear, corrosion of 500°C to 800°C.
- **APPLICATIONS:** Hot press tools, shear blades, valve seats and other sealing faces.

## SELECTARC CO6

TIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.21	EN 14700	DIN 8555	C	Si	Mn	Cr	Ni	W	Mo	Fe	P	S	Co	Hardness (HRC)		
ERCoCr-A	S Co2	WSG-20-G0-40-CTZ	1.2	1.3	0.1	29.5	2.5	4.6	0.3	2.4	<0.02	<0.03	Balance	20°C→42	400°C→34	600°C→≤20

- **DESCRIPTION:** Filler metal cobalt based Stellite® Grade 6 kind used for hardfacing of parts subject to wear or not combined: abrasion and pressure, corrosion of 500°C to 800°C. Retains its hardness up to 600°C.
- **APPLICATIONS:** Hot shear blades, valve seats and litters.

## SELECTARC CO12

TIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.21	EN 14700	DIN 8555	C	Si	Mn	Cr	Ni	W	Mo	Fe	P	S	Co	Hardness (HRC)		
ERCoCr-B	S Co2	WSG-20-G0-50-CSTZ	1.4	1.4	0.1	30.5	2.4	8.4	0.2	2.0	<0.02	<0.03	Balance	20°C→49	400°C→34	600°C→37

- **DESCRIPTION:** Cobalt base filler metal type Stellite® Grade 12 used for hardfacing parts subject to wear, combined or not: hot abrasion, metal-metal wear, corrosion of 500°C to 800°C. Maintains its hardness up to 650°C.
- **APPLICATIONS:** Cutting tools, mixing and shredding tools, extrusion screws (plastic industry), paper industry, hot working tools with thermal shock.

## SELECTARC CO21

TIG

Classification			Weld metal composition (%)										Mechanical properties			
AWS A5.21	EN 14700	DIN 8555	C	Si	Mn	Cr	Ni	W	Mo	Fe	P	S	Co	Hardness (HRC)		
ERCoCr-E	S Co1	WSG-20-G0-300-CKTZ	0.25	0.6	0.3	27.8	2.4	0.01	5.4	1.4	<0.02	<0.03	Balance	20°C→32	400°C→≤20	600°C→20

- **DESCRIPTION:** Cobalt base filler metal Stellite® Grade 21 type, used for hardfacing of parts subject to wear combined or not: wear, shock, high temperature pressure in sulphurous atmosphere.
- **APPLICATIONS:** Scope and valve seats, hot forging dies, gas turbines, large hardfacing areas.

## SELECTARC CO25

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties		
AWS A5.21	EN 14700	DIN 8555	C	Si	Mn	Cr	Ni	W	Mo	Fe	Co	Hardness (HRC)			
-	S Co1	WSG-20-GZ-250-CKTZ	0.15	0.9	0.7	21.0	9.8	15.0	0.03	3.0	Balance	~230 HRC			

- **DESCRIPTION:** Cobalt base filler metal Stellite® Grade 25 type, used for hardfacing of parts subject to wear combined or not. Very good behavior to thermal and mechanical shock. Suitable for polishing.
- **APPLICATIONS:** Scope and valve seats, hot forging dies, gas turbines, forging tools.

All names or trademarks mentioned in this document are the property of their respective owners.

AERONAUTICAL RANGE

**SELECTARC FICO25**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties
AFNOR	EN 3887	AMS	C	Si	Mn	Cr	Ni	W	Fe	P	S	Co	Hardness (HRC)
KC 20 WNx	CoCr20W15Ni	5796	0.1	0.8	1.5	20.0	10.0	15.0	2.5	0.01	0.006	Balance	~230 HB

- **DESCRIPTION:** Cobalt base filler metal Stellite® Grade 25 type, used for hardfacing of parts types: Alloy 25, AMS 5537, CoCr20W15Ni. Resistant to wear combined or not: wear, metal-metal contact to hot 1000°C even in sulphurous atmosphere.
- **APPLICATIONS:** Aeronautics, gas turbines (areas subject to erosion by hot gas), hardfacing of hot working tools (forging tools).

**SELECTARC FICO31**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties
AFNOR	EN 4327	AMS	C	Si	Mn	Cr	Ni	W	Fe	P	S	Co	Hardness (HRC)
KC 26 NW	CoCr126Ni11W8	5789	0.5	0.8	0.8	25.0	10.5	7.5	1.0	0.01	0.006	Balance	~230 HB

- **DESCRIPTION:** Cobalt base filler metal Stellite® Grade 31 types: used for hardfacing of parts. Creep and oxidation resistant up to 1150°C. Excellent resistance to mechanical and thermal shock.
- **APPLICATIONS:** Gas turbine (areas subject to erosion by hot gas), aerospace, hardfacing of hot working tools.

**SELECTARC FICO188**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties
AFNOR	EN 3888	AMS	C	Si	Mn	Cr	Ni	W	Fe	La	Co	Hardness (HRC)	
KCN 22 W	CoCr22Ni22W15	5801	0.1	0.3	0.8	22.0	23.0	14.0	<3.0	0.06	Balance	-	

- **DESCRIPTION:** Cobalt base filler metal for welding cobalt alloy Alloy types: 188, AMS 5608 or CoCr22NiW. Creep and oxidation resistant up to 1150°C.
- **APPLICATIONS:** Joining and hardfacing parts of reactors.

**SELECTARC FICO414**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties
AFNOR	EN	AMS	C	Si	Mn	Cr	Ni	W	Fe	B	Co	Hardness (HRC)	
KC 29 NW	-	-	0.12	0.8	0.9	29.0	10.2	7.0	0.1	0.002	Balance	-	

- **DESCRIPTION:** Cobalt base filler metal used for hardfacing contact parts where lubrication is difficult (low friction) even at high temperatures.
- **APPLICATIONS:** Aircraft Industry (GE B50A823).

**SELECTARC FICO694**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties
AFNOR	EN 4326	AMS	C	Si	Mn	Cr	Ni	W	Fe	B	V	Co	Hardness (HRC)
KC 28 WN	CoCr28W20Ni5V1	-	0.85	0.6	0.3	28.0	5.8	20.0	<3.0	<0.05	1.0	Balance	47-54

- **DESCRIPTION:** Cobalt base filler metal used for hardfacing contact parts where lubrication is difficult (low friction) even at high temperatures.
- **APPLICATIONS:** Hardfacing of gas turbine blade shroud interlock surfaces and other wear attacked areas (GE B50A842, GE B50TF55).

**SELECTARC FICO918**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties
AFNOR	EN	AMS	C	Si	Mn	Cr	Ni	Ta	Fe	Al	Cu	Co	Hardness (HRC)
KC 20 NTa	-	5814	0.07	0.1	0.1	20.0	20.0	7.5	0.05	0.07	0.06	Balance	-

- **DESCRIPTION:** Cobalt base filler metal used for hardfacing contact parts where lubrication is difficult (low friction) even at high temperatures.
- **APPLICATIONS:** Aircraft Industry (GE B50A824, blades reactors), molding repair, repair of litters valves.

**SELECTARC FICOT800**

TIG MIG

Classification			Weld metal composition (%)										Mechanical properties
AFNOR	EN	AMS	C	Si	Cr	Mo	Ni	Fe	N	P	S	Co	Hardness (HRC)
KD 28 CS	-	-	0.01	3.5	18.0	29.0	1.0	1.0	0.01	<0.01	<0.01	Balance	-

- **DESCRIPTION:** Cobalt base filler metal used for hardfacing contact parts where lubrication is difficult (low friction) even at high temperatures.
- **APPLICATIONS:** Aircraft Industry (GE B50TF193, blades reactors), gas turbine blades.

All names or trademarks mentioned in this document are the property of their respective owners.

# HARDFACING REPAIR AND MAINTENANCE

**+ PRODUCT ADVANTAGES:** a range of high quality wires perfectly mastered for decades. We give technical advice on all areas of hardfacing, chemistry and controlled purity. Our company has the exclusivity of drawing special Aubert & Duval steels.

## HARDFACING AUBERT & DUVAL

### SELECTARC 819 BS

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties	
EN 14700	AIR 9117	C	Si	Mn	Cr	Ni	Mo	P	S	Fe	Hardness (HRC)	
S Fe3	-	0.35	0.3	0.4	1.7	3.8	0.3	<0.015	<0.010	Balance	~48	

- **DESCRIPTION:** Solid wire for welding and hardfacing steels such as 36NiCrMo16, 45NiCrMo18, 60NiCrMo11... Product of high purity for welding without micro porosity.
- **APPLICATIONS:** Used for cold Working tools, Swages for forging and Punching tools as well as for Moulds for plastics.

### SELECTARC BMS

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties			
EN 4332	AIR 9117	C	Si	Mn	Cr	Mo	P	S	Fe	Re (MPa)	Rm (MPa)	A5 (%)	Hardness (HRC)	
8 CrMnMo12-4-9	8CD12	0.06	0.7	1.1	2.7	1.0	<0.015	<0.015	Balance	440*	570	24	~36	

- **DESCRIPTION:** Filler wire for welding of steels such as 8CrMo12, 30CrMoV12, 55NiCrMoV7, 55CrNiMo4... Product of high purity for welding without micro porosity.
- **APPLICATIONS:** Joining of steels such as 15CrMoV6, 25CrMo4, 35CrMo4, 20CrMo12... Also used for hardfacing of tool steels.

### SELECTARC MV5S

TIG MIG

Classification		Weld metal composition (%)							Mechanical properties	
EN 14700	AIR 9117	C	Cr	Mo	V	W	Fe	Hardness (HRC)		
S Fe4	-	0.5	5.0	1.3	0.4	1.3	Balance	60		

- **DESCRIPTION:** Solid wire for hardfacing of steels such as X50CrMoV5. Mainly used for build up on equipments stressed by high impact and abrasion. Resistant to temperatures up to 550°C. Product of high purity for welding without micro porosity.
- **APPLICATIONS:** Moulds for plastic injections, Cold working Tools, Shredder hammers.

### SELECTARC MARVAL 18S

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties	
EN 14700	AIR 9117	C	Si	Mn	Ni	Co	Mo	Ti	Al	Fe	Hardness (HRC)	
S Fe5	Z2NKD18	<0.01	<0.1	<0.1	18.0	8.5	5.0	0.5	0.1	Balance	~35/~50	

- **DESCRIPTION:** Solid filler metal Type X2NiCoMoTi18-8 (Maraging steel, structural hardening steel) used for hardfacing low alloy steels or Maraging steels (X2NiCoMo18, 9-5, Maraging 200).
- **APPLICATIONS:** Aeronautical industry (part structure, tail hook, body propellant missile).

### SELECTARC SMV3S

TIG MIG

Classification		Weld metal composition (%)									Mechanical properties	
EN 14700	AIR 9117	C	Si	Mn	Cr	Mo	V	Fe	Hardness (HRC)			
S Fe3	-	0.38	0.9	0.3	5.0	1.3	0.5	Balance	~58			

- **DESCRIPTION:** Filler metal like X38CrMoV5 for homogeneous hardfacing, and similar grades like X32MoCrV2S type X40CrMoV12... High wear resistance, high temperature oxidation and thermal shock resistance. Good in polishing.
- **APPLICATIONS:** Moulds for light alloys and Glass, Stamping dies and Inserts.

\*After heat treatment, for more informations, see our technical data sheets.

## SELECTARC SCVS

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties
EN 4334	AIR 9117	C	Si	Mn	Cr	Mo	V	P	S	Fe	Hardness (HRC)	
15CrMnMoV5-4-9-3	15 CDV 6	0.14	0.15	1.0	1.4	0.9	0.25	<0.02	<0.02	Balance	42	

- **DESCRIPTION:** Filler metal 15CrMoV6 shade used for homogeneous hardfacing and of similar grades of low-alloy steels. Available as bare or copper coated.
- **APPLICATIONS:** Strong hardfacing on fins, tool steels.

## SELECTARC HB48HT

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties
EN 14700		C	Si	Mn	Cr	Mo	Ti	P	S	Fe	Hardness (HRC)	
	S Fe8	0.25	0.3	0.6	5.0	3.6	0.6	<0.015	<0.010	Balance	42-47	

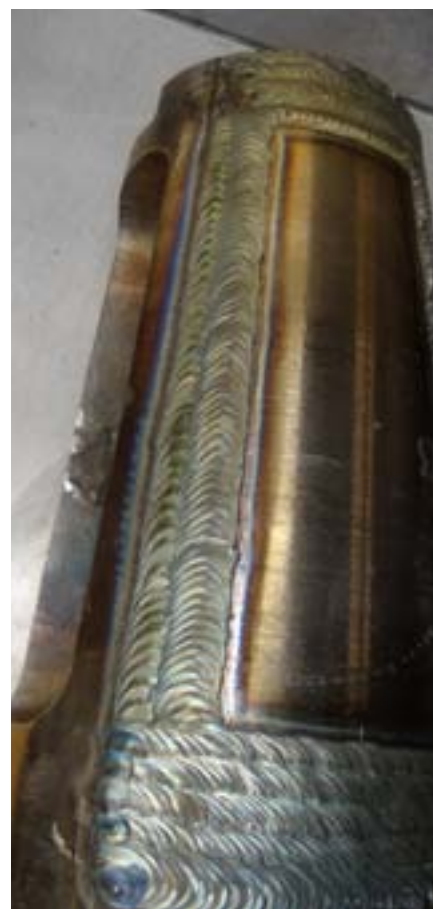
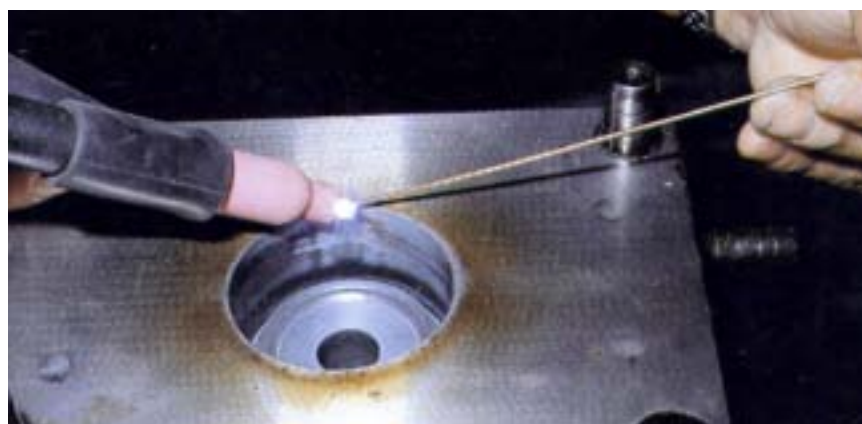
- **DESCRIPTION:** Solid wire for hardfacing steels of similar chemical composition. The weld deposit distinguishes itself by its toughness and heat resistance. Therefore this grade is used for overlay and builds up of machinery parts and tools subject to impact, compression and wear used at operating temperatures up to 550°C.
- **APPLICATIONS:** It is widely used for building up hammers, dies, swages, hot shear blades, rollers...

## SELECTARC HB56HT

TIG MIG

Classification		Weld metal composition (%)										Mechanical properties
EN 14700		C	Si	Mn	Cr	Mo	Ti	P	S	Fe	Hardness (HRC)	
	S Fe6	0.35	0.4	1.1	7.0	2.2	0.3	<0.015	<0.010	Balance	52-57	

- **DESCRIPTION:** Solid wire for hardfacing steels of similar chemical composition. The weld deposit distinguishes itself by its toughness and heat resistance. Therefore this grade is used for overlay and builds up of machinery parts and tools subject to impact, compression and wear used at operating temperatures up to 550°C.
- **APPLICATIONS:** It is widely used for building up hammers, dies, swages, hot shear blades, rollers...





# HARDFACING - REPAIR & MAINTENANCE

## SELECTARC HB25

TIG MIG

Classification	Weld metal composition (%)	Mechanical properties
-	Fe	Hardness (HB)
-	Balance	225-275

- **DESCRIPTION:** Filler metal for hardfacing low-alloy steels or cast iron.
- **APPLICATIONS:** Machine Parts: rails, wheels, rims, rails, pulleys. Can be used as buffer layer prior to a higher hardness overlay.

## SELECTARC HB35

TIG MIG

Classification	Weld metal composition (%)	Mechanical properties
-	Fe	Hardness (HB)
-	Balance	330-370

- **DESCRIPTION:** Filler metal for TIG welding to surfacing structural or molded steel.
- **APPLICATIONS:** Machinery parts: pulleys, guiding surface.

## SELECTARC HB50

TIG MIG

Classification	Weld metal composition (%)	Mechanical properties
-	Fe	Hardness (HRC)
-	Balance	~50

- **DESCRIPTION:** Filler metal for surfacing structural and high manganese steel.
- **APPLICATIONS:** Caterpillar, drilling parts, jaws, parts subject to mineral abrasion.

## SELECTARC HB60

TIG MIG

Classification	Weld metal composition (%)	Mechanical properties
-	Fe	Hardness (HRC)
-	Balance	~60

- **DESCRIPTION:** Filler metal for surfacing structural steel and high manganese.
- **APPLICATIONS:** Drilling tools, blenders/mixers, civil engineering equipment, parts subject to mineral abrasion.

## SELECTARC HBF17

TIG MIG

Classification	Weld metal composition (%)						Mechanical properties
-	C	Si	Mn	Cr	Mo	Fe	Hardness (HRC)
-	0.4	0.5	0.4	16.5	1.1	Balance	~53

- **DESCRIPTION:** Stainless steel filler metal used for hardfacing high-alloyed grades such as X55Cr14, X160CrMoV12. Resistance to corrosion and heat to 500 °C.
- **APPLICATIONS:** Cutting tools (blades, shears), stamping dies, spinning wheels.

## SELECTARC HBC62

TIG MIG

Classification	Weld metal composition (%)								Mechanical properties
-	C	Si	Mn	Cr	Mo	V	W	Fe	Hardness (HRC)
-	1.0	0.4	0.2	3.6	8.5	1.8	1.6	Balance	~62

- **DESCRIPTION:** Filler metal for hardfacing tool steel cold working.
- **APPLICATIONS:** Cutting tools (blades, shears), stamping dies, spinning wheels.

## SELECTARC HCUBE

TIG MIG

Classification		Weld metal composition (%)						Mechanical properties
EN 14700	AFNOR	Be	Co	Ni	Cr	Fe	Cu	Hardness (HRC)
S Z Cu1	CuBe2	2.0	0.25	0.02	3.6	0.01	Balance	-

- **DESCRIPTION:** Filler metal for welding and surfacing of copper-beryllium alloys. Good mechanical and heat resistance (hot and cold). Non-magnetic alloy.
- **APPLICATIONS:** Electromechanics, connectors, aerospace, plastic injection.

# BREAKING WIRES

**+ PRODUCT ADVANTAGES:** breaking wires ready for use, intended primarily for locking nuts in the aviation industry.



View our full range on [www.fsh-welding.com](http://www.fsh-welding.com)!

## SELECTARC Z 2 CN 18.10

Classification				
NFL 23-320/AC	AMS	DMD	EN	N° Material
Z 2 CN 18.10	5697	200-44	-	1.4314.9

▪ **APPLICATIONS:** Safety wire for brake nuts mainly used in the aeronautical industry during maintenance and repair of “cold” parts.

## SELECTARC Z 6 CNT 18.10

Classification				
NFL 23-320/VQ	AMS	DMD	EN	N° Material
Z 6 CNT 18.10	5645	-	EN 3628 / EN 2573	1.4544

▪ **APPLICATIONS:** Safety wire for brake nuts mainly used in the aeronautical industry during maintenance and repair of “cold” parts.

## SELECTARC NC 15 FE

Classification				
NFL 23-320/TC	AMS	DMD	EN	N° Material
NC 15 Fe	5687	422-44	-	-

▪ **APPLICATIONS:** Safety wire for brake nuts mainly used in the aeronautical industry during maintenance and repair of “hot” parts.



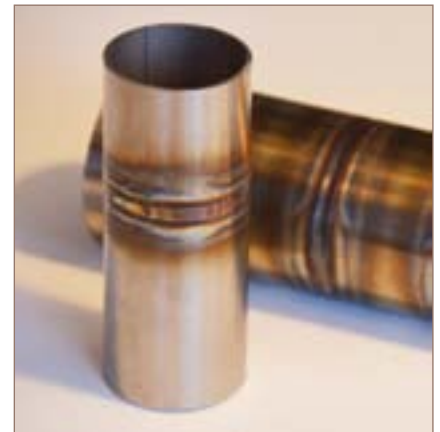
# ORBITAL TIG

ASK FOR OUR WIRES CATALOGUE  
"ORBITAL TIG"

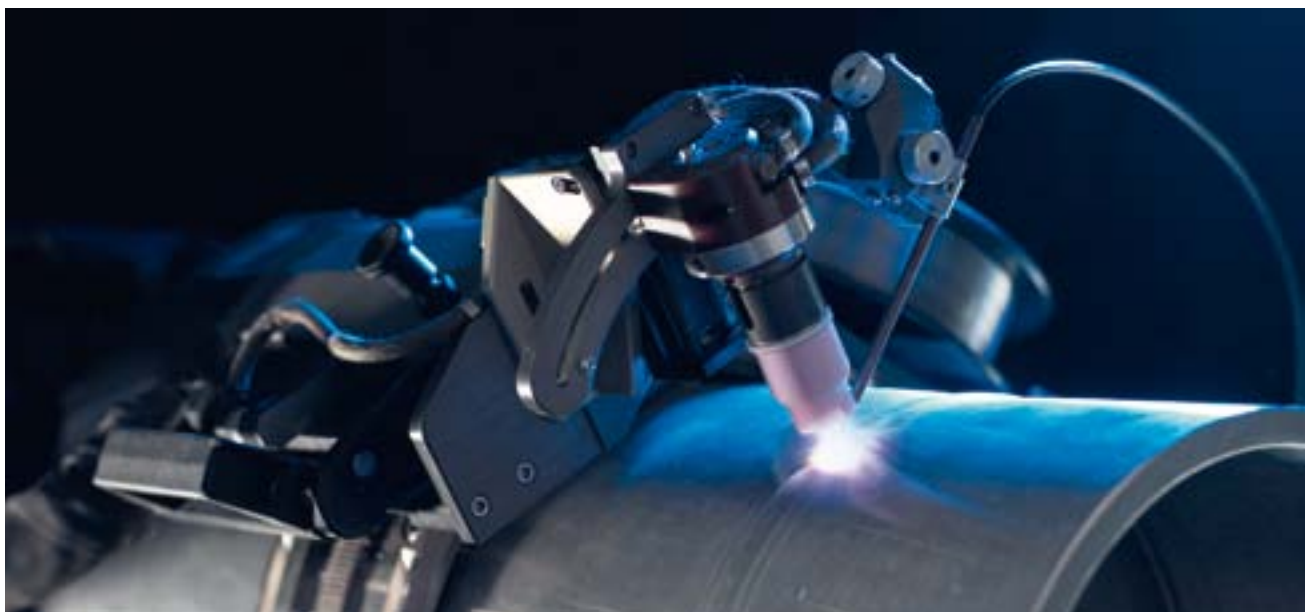
**+ PRODUCT ADVANTAGES:** to meet the most demanding customers' needs in terms of stability and quality alloys: a wide range of alloys for various applications (unalloyed and low alloyed steels, stainless steels, duplex, super duplex, nickel, titanium, aluminium and copper alloys).

• **The cleanliness of the wires**, which is essential in this type of use, is guaranteed through electrochemical and mechanical scouring processes.

- The reeling in best joined spirals provides **for a perfect spooling of the wire.**
- Diameters of the wires: available from **Ø 0.6 mm to 1.2 mm.**
- The filler metal wires are available **in standard packaging, in specific reels** D100 and D200, of 0.500kg, 1 kg, 1.5 kg, 2kg et 5kg, or in any type of packaging made to customer specifications.
- **Special requests:** RCCM, certificates 3.1 mechanical...



Type	Classification			
	AWS		ISO	
■ <b>SELECTARC F57</b>	<b>A5.18</b>	ER70S-6	<b>636-A</b>	W3Si1
■ <b>SELECTARC 20/10</b>	<b>A5.9</b>	ER308L	<b>14343-A</b>	W 19 9 L
■ <b>SELECTARC 20/10M</b>	<b>A5.9</b>	ER316L	<b>14343-A</b>	W 19 12 3 L
■ <b>SELECTARC D22/09</b>	<b>A5.9</b>	ER2209	<b>14343-A</b>	W 22 9 3 N L
■ <b>SELECTARC ALG5</b>	<b>A5.10</b>	ER5356	<b>18273</b>	S Al 5356
■ <b>SELECTARC NI82</b>	<b>A5.14</b>	ERNiCr-3	<b>18274</b>	S Ni 6082
■ <b>SELECTARC NI625</b>	<b>A5.14</b>	ERNiCrMo-3	<b>18274</b>	S Ni 6625
■ <b>SELECTARC T40</b>	<b>A5.16</b>	ERTI-2	<b>24034</b>	Ti 99,6
■ <b>SELECTARC TA6V4</b>	<b>A5.16</b>	ERTI-5	<b>24034</b>	TiAl6V4B



*All types of grades can be studied on request, please contact us!*

# MICRO-LASER

**+ PRODUCT ADVANTAGES:** many metallic grades can be welded by laser micro-process: carbon steel, stainless steel, nickel base, aluminium alloys, titanium alloys...

▪ This highly specialized process allows deposits with the same or higher characteristics than the original ones.



View our full range on [www.fsh-welding.com](http://www.fsh-welding.com)!



This welding method used in the automotive, electronics, aeronautics, medical, jewelry... has several advantages:

- Depose the minimum amount of material without altering the metal properties,
- No distortion of parts, or too high temperature rises,
- Shiny bead appearance and no heating trace on peripheral areas,
- Seal set guarantee,
- Joining elements of small dimensions,
- All possible configurations: edge to edge...

THE MICRO-LASER FILLER METAL RANGE IS AVAILABLE IN:

- 1 meter rods packed by 50 meters boxes,
- 50 meter spools on D100,
- Diameter from 0,2 mm.

## UN-ALLOYED STEELS

Type	Classification	Weld metal composition (%)						0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)
	AWS A5.28	C	Mn	Si	Cr	Mo	Fe				
■ <b>SELECTARC F63</b>	A5-28 ER80SB2	0.11	1.0	0.6	1.1	0.5	Balance	x	x	x	x

## LOW ALLOYED STEELS: AERONAUTICAL RANGE

Type	Classification	Weld metal composition (%)										0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)
	AFNOR	C	Mn	Si	Cr	Ni	Mo	S	P	V	Fe				
■ <b>SELECTARC SCVS</b>	15 CDV6	<0.15	1.0	<0.2	1.40	-	0.95	<0.020	<0.020	0.25	Balance	x	x	x	x
■ <b>SELECTARC F66S</b>	25CD4	<0.25	0.6	0.25	1.0	<0.3	0.23	<0.020	<0.020	-	Balance	x	x	x	x

## STAINLESS STEELS

Type	Classification	Weld metal composition (%)								0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)
	AWS A5.9	C	Mn	Si	Cr	Ni	Mo	V	Fe				
■ <b>SELECTARC 20/10</b>	ER308 L	<0.03	1.75	<0.6	20	10	-	-	Balance	x	x	x	-
■ <b>SELECTARC 29/9</b>	ER312	0.12	1.75	<0.6	30	9.5	-	-	Balance	x	-	-	-
■ <b>SELECTARC 20/10M</b>	ER316 L	<0.03	1.75	<0.6	19	13.5	2.5	-	Balance	x	x	x	-
■ <b>SELECTARC M13/0</b>	ER410	<0.10	0.55	<0.6	13	-	-	-	Balance	x	x	x	x
■ <b>SELECTARC F17/0</b>	ER430	<0.10	<1.00	<0.75	17	-	-	-	Balance	x	x	x	x
■ <b>SELECTARC 11/3M</b>	-	0.12	0.7	0.5	12	3	1.5	0.3	Balance	x	x	x	x
■ <b>SELECTARC M13/0C</b>	ER420	0.3	0.55	<0.6	13	-	-	-	Balance	x	x	x	x

## NICKEL ALLOYS

Type	Classification	Weld metal composition (%)								0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)
	AWS A5.14	Ni	Cr	Fe	Ti	Nb	Mo	Co	Al				
■ <b>SELECTARC NI625</b>	ERNiCrMo-3 / 5837	> 58	22	< 5	< 0.4	3.5	9	-	< 0.4	-	-	-	x
■ <b>SELECTARC NI718</b>	ERNiFeCr-2 / 5832	52	19	Balance	0.9	5	3	< 1	< 0.5	-	-	-	x



## MICRO-LASER

## ALUMINIUM ALLOYS

Type	Classification	Weld metal composition (%)								0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)
		AWS A5.10	Mn	Fe	Si	Mg	Al	Zn	Cr				
■ <b>SELECTARC ALG5</b>	ER5356	0.15	0.4	0.2	4.7	Balance	< 0.1	0.15	0.15	x	x	x	x
■ <b>SELECTARC ALS5</b>	ER4043	-	0.4	5.2	-	Balance	< 0.1	-	-	x	x	x	x
■ <b>SELECTARC ALS7</b>	R-357.0	-	0.1	7	0.55	Balance	-	-	0.1	-	-	-	x
■ <b>SELECTARC ALS12</b>	ER4047	0.1	0.5	12	-	Balance	<0.1	-	-	-	-	-	x

## COPPER ALLOYS

Type	Classification	Weld metal composition (%)		0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)	
		ISO 24373	Cu					Ag
■ <b>SELECTARC CUAG</b>	CuAg1		98.5	1	x	x	-	-

## TITANIUM ALLOYS

Type	Classification	Weld metal composition (%)						0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)
		AWS A5.16 / AMS	C	N <sub>2</sub>	H <sub>2</sub>	O <sub>2</sub>	Fe				
■ <b>SELECTARC T40</b>	ERTI-2 / 4951	< 0.05	< 0.02	< 0.008	< 0.10	< 0.20	Balance	-	-	-	x

## COBALT ALLOYS

Type	Classification	Weld metal composition (%)							0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)
		AMS	Fe	Cr	Ni	W	Co	Si				
■ <b>SELECTARC FICO25</b>	5796	< 3	20	10	15	Balance	1	1.5	-	-	-	x

## HARDFACING FOR EQUIPEMENT

Type	Hardness (HRC)	Weld metal composition (%)														0,3 (mm)	0,4 (mm)	0,5 (mm)	0,6 (mm)
		C	Si	Mn	Cr	Ni	Mo	Al	Co	Ti	V	W	P	S	Fe				
■ <b>SELECTARC 819 BS</b>	~48	0.35	0.3	0.4	1.7	3.8	0.3	-	-	-	-	-	<0.015	<0.010	Balance	x	x	x	x
■ <b>SELECTARC BMS</b>	~36	0.06	0.7	1.1	2.7	-	1.0	-	-	-	-	-	<0.015	<0.015	Balance	x	x	x	x
■ <b>SELECTARC MV5S</b>	60	0.5	-	-	5.0	-	1.3	-	-	-	0.4	1.3	-	-	Balance	x	x	x	x
■ <b>SELECTARC MARVAL 18S</b>	~35 / ~50	<0.01	<0.1	<0.1	-	18.0	5.0	0.1	8.5	0.5	-	-	-	-	Balance	x	x	x	x
■ <b>SELECTARC SMV3S</b>	~58	0.38	0.9	0.3	5.0	-	1.3	-	-	-	0.5	-	-	-	Balance	x	x	x	x
■ <b>SELECTARC HBF17</b>	~53	0.4	0.5	0.4	16.5	-	1.1	-	-	-	-	-	-	-	Balance	-	x	x	x



*All types of grades can be studied on request, just contact us!*

# CUSTOM WORK

**+ PRODUCT ADVANTAGES:** realization of work on request (wire drawing, straightening, winding, forming, stripping, specific identification...) all types of wires, this is a specialty of FSH Welding Group!

ASK FOR OUR LEAFLET:  
"CUSTOM WIRE DRAWING  
MANUFACTURER"



## WIRE DRAWING

From Ø 9 mm to 0.2 mm for aluminium alloys, and from 4 mm to 0.2 mm for carbon steel, stainless steel, nickel, copper and cobalt alloys.

**Straightening and cutting all types of alloys to specific lengths from Ø 6 to Ø 0.3 mm:**

- aluminium,
- copper,
- cobalt,
- titanium,
- and other metals.



## PICKLING

The purity of alloys is an essential condition in specific industrial setting, such as nuclear and aerospace.

To meet this need, two pickling methods guarantee a product to be "super clean" and 100% oxide free:

- chemical pickling,
- mechanical stripping.

## CUSTOM MANUFACTURING IDENTIFICATIONS

Reduce the risk of product mixing during production, quick identification of alloys and/or diameters, customize labeling or packaging...

FP Welding allows you to distinguish your products to suit your own preferences. Choose from all the options offered, the ones best meet your expectations!

- **Stamping, Painting, Flagging.**



## SPOOLING

To meet customer specifications, FSH Welding Group spools all kinds of metal wires in different diameters, using a variety of media types for different weight:

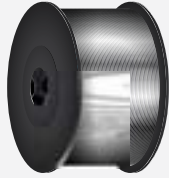
**Plastic and metal spools:** D300, D200, D100, special spools K400, K500, SD400...

**Weight from** 0,5 kg to 40kg depending on grades.

# 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:

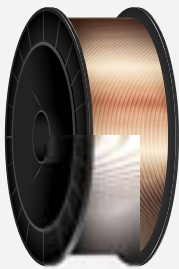
0.80 mm

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

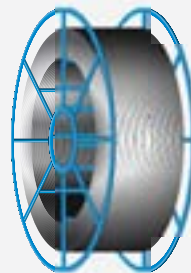
1.40 mm

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
Aluminium	2,5 kg or 5 kg
Steel / Copper / Nickel	5 kg
Grades flagging	1 kg or 2.5 kg (according to diameter)

### PACKAGING GTAW-MAG / CASE CRYSTAL

CASE	LENGHT
Micro-laser wires	50 m (rods of 1 m)



All specific packaging can be studied on request:  
[sales@fsh-welding.com](mailto: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)**

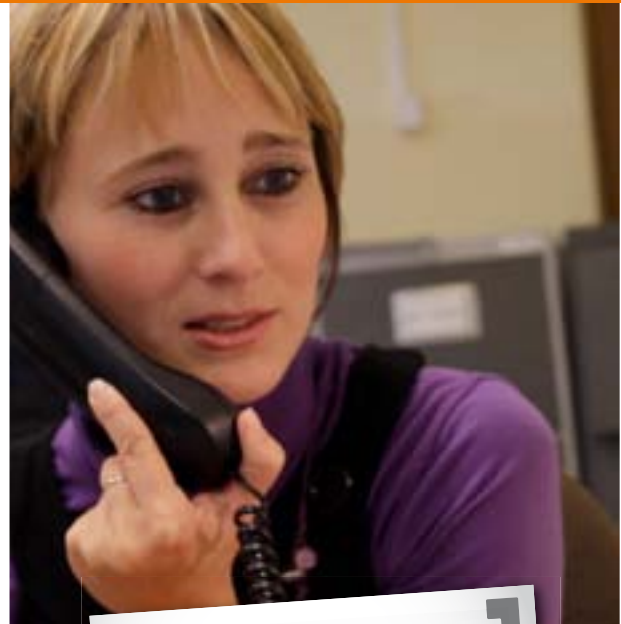
The R&D department ensures the tests products (mechanical and non-destructive testing) according to customer requests.

- **Customer service**

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

- **Specific applications**

RCCM, mechanical certificates 3.1, ...



FIND ALL OUR RANGE ON  
[WWW.FSH-WELDING.COM](http://WWW.FSH-WELDING.COM)

## QUALITY

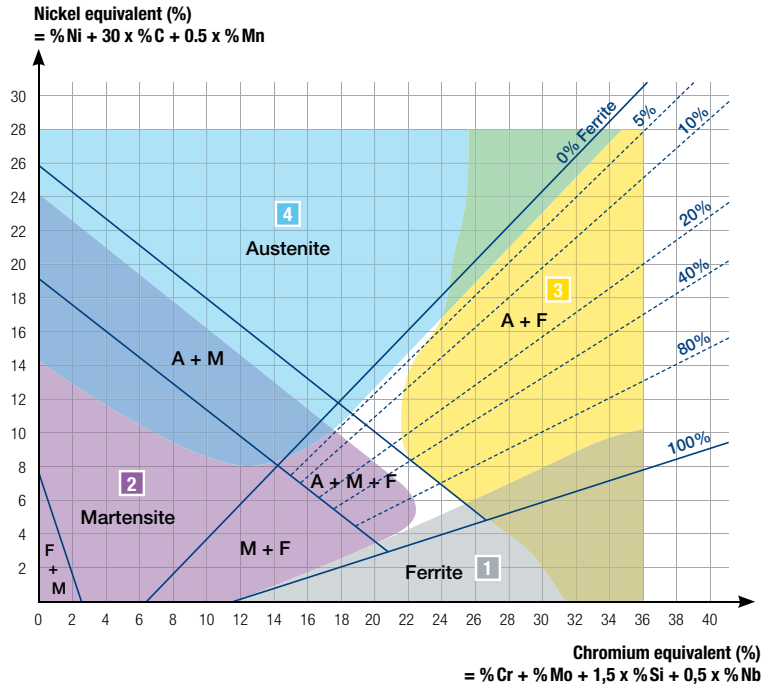
ISO 9001 Certification, with a commitment to an EN 9100 Approach.





## 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:

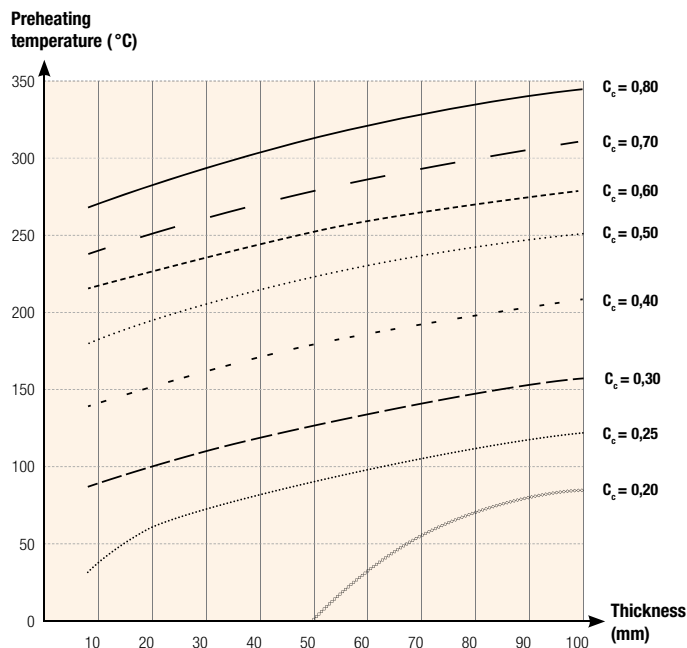
$$\text{CHROMIUM EQUIVALENT} = \% \text{Cr} + \% \text{Mo} + 1.5 \times \% \text{Si} + 0.5 \times \% \text{Nb}$$

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

- 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

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

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

(e: piece thickness in cm)



## HARDNESS CONVERSION TABLE

ALLOYS	ALUMINIUM d: 2,7 g/cm <sup>3</sup>		TITANIUM d: 4,5 g/cm <sup>3</sup>		STAINLESS STEEL d: 7,85 g/cm <sup>3</sup>		COPPER d: 8,9 g/cm <sup>3</sup>	
	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 en 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

## HARDNESS CONVERSION TABLE: BRINELL - VICKERS - ROCKWELL - SHORE

Tensile strength (kg/mm <sup>2</sup> )	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 <sup>2</sup> )	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





FSH Welding Group, 4 rue de la Fonderie, 25220 Roche-Lez-Beaupré

- > tél. : +33 3 81 60 51 72 > fax : +33 3 81 57 02 75
- > info@fsh-welding.com > www.fsh-welding.com



#### FSH WELDING ITALY

Grassobbio (BG)  
ITALY  
> tél. : +39 035 525 575  
> info@fsh-welding.it  
> www.fsh-welding.com

#### WESTBROOK WELDING ALLOYS

Warrington  
UNITED KINGDOM  
> tél. : +44 1925 839 983  
> sales@westbrookwelding.co.uk  
> www.westbrookwelding.co.uk

#### FSH WELDING CANADA

Montreal  
CANADA  
> tél. : +1 514-631-7670  
> info@fsh-welding.ca  
> www.fsh-welding.ca

#### SOLDADURAS CENTRO S.A

Buenos Aires  
ARGENTINA  
> tél. : +54 11 4754-3500  
> ventas@soldacentro.com.ar  
> www.soldadurascentro.com.ar