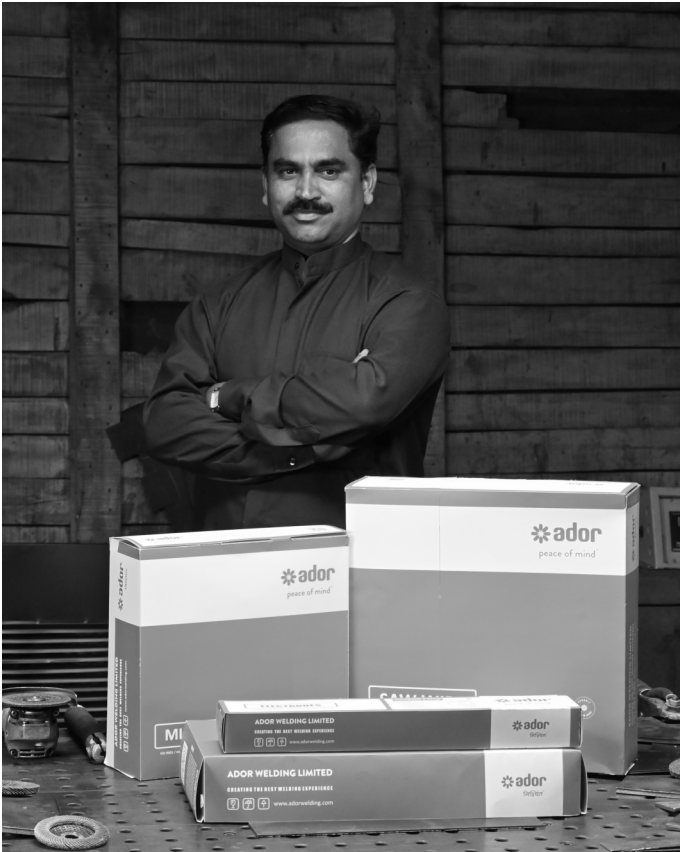


ADOR WELDING LIMITED



Continuous Welding Consumables (Wires & Fluxes)

GMAW/GTAW/FCAW | SUBMERGED ARC WELDING
FLUX CORED ARC WELDING (FCAW)



www.adorwelding.com

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GMAW/GTAW C-Mn Steel
AUTOMIG 70S-6

COPPER COATED C-Mn STEEL GMAW FILLER WIRE FOR 500 MPA TENSILE STRENGTH STEEL



CLASSIFICATION : EN ISO 14341-A

AWS A/SFA 5.18

CSA W48

APPROVALS:

G 42 3 C G3Si1
G 46 3 M G3Si1

ER70S-6

B-G 49A 3C1 S6

ABS/BV/DNV/IRS/IBR/LRA/NPCIL
MND/RDSO/BHEL/CE/CWB

KEY FEATURES :

- C-Mn steel solid wire
- Uniform copper coating
- Smooth wire feeding
- Can be use with 100% CO₂, Ar+CO₂
- Higher level of de-oxidizers makes it suitable for applications where dirt, rust or mill-scale is present
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	12-18	10-20
80Ar+20CO ₂	17-22	10-20

TYPICAL APPLICATIONS :

- Construction and mining equipment
- Pressure vessels, LPG Cylinders
- Root pass pipe welding, Tanks, Structural steel components
- Railcar construction and repair, Frame fabrication
- Thin sheet metal, Auto body
- Farm implements, Steel casings
- High-speed robotic, automatic and semi-automatic welding applications
- Shaft build up, General fabrication

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	S	P	Cu*
Specification	0.06-0.14	1.40-1.60	0.80-1.0	0.025 max	0.025 max	0.50 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

Condition		Shielding Gas	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	100% CO ₂	500-640	420 min	22 min	47 min
Specification	As Welded	80Ar + 20CO ₂	530-680	460 min	24 min	47 min

Hardness, 3 Layer: 200 BHN max (irrespective of type of gas used) With mixed gas mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool	MIGPAC DRUM, Kg
0.8	17 - 27	80 - 250	15 / 18	100 / 250
1.0	18 - 30	100 - 350	15 / 18	100 / 250
1.2	20 - 34	120 - 400	15 / 18	100 / 250
1.6	24 - 36	150 - 450	15 / 18	100 / 250

Also sold as Automig 1

EQUIVALENT :

SMAW Electrode: **Supabase X Plus**

FCAW Wire: **Automig FC 71T-1, Automig FC 121**



GTAW C-Mn Steel
TIGFIL 70S-6

C-Mn STEEL SOLID FILLER ROD



CLASSIFICATION : EN ISO 636-A AWS A/SFA 5.18 CSA W48 **APPROVALS :**

W 42 5 W3Si1 ER 70S-6 B-G 49A 3 C1 S6 CWB

KEY FEATURES :

- C-Mn steel filler rod
- Uniform copper coating
- Controllable weld pool
- Radiographic quality weld

WELDING POSITION :



DCEN

Shielding Gas: Ar

Gas Flow Rate, LPM : 8-15

TYPICAL APPLICATIONS :

- Root pass pipe welding
- Thin sheet metal, Auto body
- Farm implements, Steel casings
- Collision repair, Pressure vessels
- Application in high pressure piping for shipbuilding, petro chemical and nuclear power plant

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	S	P	Cu*
Specification	0.06-0.14	1.40-1.60	0.80-1.0	0.025 max	0.025 max	0.50 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -50°C, J
Specification	As Welded	500-640	420 min	22 min	27 min

PACKING DATA :

Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.5 x 1000	5	4	20



GTAW C-Mn Steel
TIGFIL 70S-2

TRIPLE DEOXIDIZED COPPER COATED C-Mn STEEL FILLER ROD



CLASSIFICATION : EN ISO 636-A

AWS A/SFA 5.18

APPROVALS :

W 42 3 WS2

ER 70S-2

ABS/DNV/LRA/NPCIL/IBR

KEY FEATURES :

- Triple deoxidized copper coated C-Mn steel filler rod
- Excellent choice for welding over rust and mill scale
- High quality, high toughness welds
- Radiographic quality weld

WELDING POSITION :



DCEN

Shielding Gas: Ar

Gas Flow Rate, LPM : 8-15

TYPICAL APPLICATIONS :

- Welding of Pressure vessel, Boilers involving unalloyed and micro-alloyed structural steels with specified UTS up to 520 MPa
- High quality pipe welding of mild and medium tensile steels
- Best suited for single side, melt through welding

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Ti	Zr	Al	Cu*	S	P
Specification	0.07 max	0.90-1.40	0.40-0.70	0.05-0.15	0.02-0.12	0.05-0.15	0.50 max	0.030 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	500 min	420 min	22 min	28 min

SPECIAL TEST :

Hot Tensile Test at 196°C

PACKING DATA :

Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.5 x 1000	5	4	20
3.2 x 1000	5	4	20
4.0 x 1000	5	4	20



GTAW C-Mn Steel

TIGFIL 70S-2 SPL

TRIPLE DEOXIDIZED COPPER COATED C-Mn STEEL FILLER ALLOY MEETS IMPACT AT -46°C



CLASSIFICATION : EN ISO 636-A

AWS A/SFA 5.18

APPROVALS :

W 42 5 WS2

ER 70S-2

ABS/BV/IBR

KEY FEATURES :

- Triple deoxidized C-Mn steel filler rod with very low impurities
- Uniform copper coating
- Strong, tough and ductile weld metal
- Meets impact requirement at -46°C
- Radiographic weld quality

WELDING POSITION :



DCEN

Shielding Gas: Ar

Gas Flow Rate, LPM : 8-15

TYPICAL APPLICATIONS :

- Welding NACE pipes-type A106 Gr.B or equivalent material
- Recommended for root runs of pipes and tubes for offshore application
- Pressure vessels, Boilers involving unalloyed and micro-alloyed structural steels with specified UTS up to 520 MPa

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Ti	Zr	Al	Cu*	S	P
Specification	0.07 max	0.90-1.40	0.40-0.70	0.05-0.15	0.02-0.12	0.05-0.15	0.50 max	0.010 max	0.015 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -46°C, J
Specification	As Welded	500 min	420 min	22 min	28 min

Hardness, 3 Layers : 210 BHN max

SPECIAL TESTS :

HIC and SSCC (NACE)

PACKING DATA :

Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.5 x 1000	5	4	20
3.2 x 1000	5	4	20
4.0 x 1000	5	4	20



GMAW/GTAW C-Mn STEEL
AUTOMIG 70S-G

COPPER COATED GMAW SOLID WIRE FOR WELDING C-Mn STEEL



CLASSIFICATION : EN ISO 14341-A AWS A/SFA 5.18

G 42 3 C G4Si1 ER 70S-G
G 46 3 M G4Si1

KEY FEATURES :

- C-Mn steel GMAW solid wire
- Uniform copper coating
- Smooth wire feeding
- Can be use with 100% CO₂, Ar+CO₂
- Suitable for applications where dirt, rust or mill-scale is present
- All Position Welding capability
- Radiographic quality weld

WELDING POSITION :   **DCEP**

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	12-18	10-20
80Ar+20CO ₂	17-22	10-20

TYPICAL APPLICATIONS :

- Pressure vessels, LPG Cylinders
- Construction and mining equipment
- Pipe and Structural steel welding
- Thin sheet metal, Auto body
- General fabrication
- Farm implements, Steel casings
- High-speed robotic, automatic and semi-automatic welding applications

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	S	P	Cu*
Specification	0.06-0.14	1.60-1.90	0.80-1.15	0.025 max	0.025 max	0.35 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

Condition		Shielding Gas	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	100% CO ₂	520 min	420 min	22 min	47 min
Specification	As Welded	80Ar + 20CO ₂	550 min	460 min	24 min	47 min

Hardness, 3 Layer: 210 BHN max (irrespective of type of gas used) with mixed gas mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool	MIGPAC DRUM, Kg
0.8	17-27	80-250	15	100 / 250
1.0	18-30	100-350	15	100 / 250
1.2	20-34	120-400	15	100 / 250
1.6	24-36	150-450	15	100 / 250



GMAW/GTAW C-Mn STEEL

AUTOMIG 70S-6 N

COPPER FREE C-Mn STEEL GMAW FILLER WIRE



CLASSIFICATION : AWS A/SFA 5.18

EN ISO 14341-A

CSA W48

APPROVALS :

ER70S-6

G 42 4 M 3Si1

B-G 49A 3C1 S6

CWB/CE

KEY FEATURES :

- Copper free C-Mn steel solid wire
- Smooth and stable arc
- Lowest spatter, Smooth feedability
- Best anti-rust properties
- Low smoke levels
- Best suited for high speed welding
- Operates at high current density
- Suitable for applications where dirt, rust or mill-scale is present
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	12-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Construction and mining equipment
- Structural steel components
- Frame fabrication, Tanks
- General fabrication
- Auto body
- Farm implements, Steel casings
- High-speed robotic, automatic and semi-automatic welding applications

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	S	P	Cu
Specification	0.06-0.14	1.40-1.60	0.80-1.0	0.025 max	0.025 max	0.20 max
	Ni	Cr	Mo	V	Al	Ti+Zr
Specification	0.05 max	0.05 max	0.05 max	0.01 max	0.01 max	0.05 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -40°C, J
Specification As Welded	500-640	420 min	22 min	47 min

Hardness, 3 Layer: 200 BHN max (irrespective of type of gas used)

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
0.8	17-27	80-250	15
1.0	18-30	100-350	15
1.2	20-34	120-400	15
1.6	24-36	150-450	15

MIGPAC DRUM in 100 / 250 Kgs can be made available on request.



GMAW/GTAW LOW ALLOY STEEL (High Temperature)

AUTOMIG 70S-A1 / TIGFIL 70S-A1

A COPPER COATED LOW ALLOY WIRE



CLASSIFICATION : EN ISO 21952-A AWS A/SFA 5.28 **APPROVALS:**

Automig 70S-A1: G MoSi
Tigfil 70S-A1: W MoSi

ER 70S-A1
ER 70S-A1

-
IBR/BHEL

KEY FEATURES :

- Copper coated low alloy GMAW wire & rod
- Typical 0.5Mo content
- Smooth feeding and stable arc under optimum welding conditions
- Increase strength at elevated temperature
- Weld deposit highly resistant to cold cracking
- Shiny welds of radiographic quality

WELDING POSITION : 



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar/1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding creep resistant 0.5% Mo steels and fine grained steels with service temperatures up to 500°C
- High temperature and high pressure boilers
- Suitable for 15Mo3, 16Mo3, 14Mo6
- Welding low alloy steels such as type ASTM A335 grade P1 and similar materials
- Pipe line and crane construction as well as in structural steel engineering

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Mo	S	P	Cu*
Specification	0.12 max	1.30 max	0.30-0.70	0.40-0.60	0.020 max	0.020 max	0.35 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	PWHT: 620°C for 1 hr	520 min	420 min	22 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 70S-A1	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 70S-A1	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Molyten**



GMAW/GTAW LOW ALLOY STEEL (High Temperature)

AUTOMIG 80S-B2 / TIGFIL 80S-B2

1.25Cr-0.5Mo COPPER COATED LOW ALLOY WIRE FOR HIGH TEMPERATURE APPLICATION



CLASSIFICATION : EN ISO 21952-A

AWS A/SFA 5.28

APPROVALS :

Automig 80S-B2: G CrMo1Si
Tigfil 80S-B2: W CrMo1Si

ER80S-B2
ER80S-B2

IBR
IBR/NTPC/BHEL

KEY FEATURES :

- Copper coated low alloy steel solid filler wire & rod
- Uniform copper coating
- Deposit notch free welds with excellent mechanical properties
- Typical 1.25 Cr-0.5 Mo weld deposit
- Careful control of pre-heat, interpass temperature & PWHT is essential to avoid cracking
- Radiographic quality weld

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar/1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of 0.5Cr-0.5Mo, 1Cr-0.5Mo and 1.25Cr-0.5Mo steel pipes, plates and castings
- Elevated temperature and corrosive service applications in Refineries, Petrochemicals & fertilizers plant
- Can be used for joining dissimilar combinations of Cr-Mo and Carbon steels
- Suitable for ASTM A 199-76, A 200-75, A 213-76D, A 335 Gr.P11, A 369-76, A 387 Gr.B, DIN 15CrMo3

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Mo	Cu*	S	P
Specification	0.07-0.12	0.40-0.70	0.40-0.70	1.20-1.50	0.40-0.65	0.35 max	0.025 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	PWHT: 620°C for 1 hr	550 min	470 min	19 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 80S-B2	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 80S-B2	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Cromoten**



GTAW LOW ALLOY STEEL (High Temperature)

TIGFIL 80S-B2 SPL

1.25Cr-0.5Mo COPPER COATED SOLID FILLER ROD FOR HIGH TEMPERATURE APPLICATION



CLASSIFICATION : AWS A/SFA 5.28

EN ISO 21952-A

ER80S-B2

W CrMo1Si

KEY FEATURES :

- Copper coated low alloy steel solid filler rod
- Typical 1.25 Cr-0.5 Mo weld deposit
- Notch free welds with excellent mechanical properties
- Meets X factor requirement
- Control on pre-heat, interpass temperature required
- PWHT is essential to avoid cracking
- Radiographic quality weld

WELDING POSITION :



DCEN

Shielding Gas: Ar

Gas Flow Rate, LPM : 10-15

TYPICAL APPLICATIONS :

- Welding of 0.5Cr-0.5Mo, 1Cr-0.5Mo and 1.25Cr-0.5Mo steel pipes, plates and castings
- Elevated temperature and corrosive service applications in Refineries, Petrochemicals & fertilizers plant
- Can be used for joining dissimilar combinations of Cr-Mo and Carbon steels
- Suitable for ASTM A 199-76, A 200-75, A 213-76D, A 335 Gr.P11, A 369-76, A 387 Gr.B, DIN 15CrMo3

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Mo	Cu*
Specification	0.07-0.12	0.40-0.70	0.40-0.70	1.20-1.50	0.40-0.65	0.15 max
	As	Sn	Sb	S	P	
Specification	0.005 max	0.005 max	0.005 max	0.010 max	0.010 max	

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	PWHT: 620°C for 1 Hr	550 min	470 min	19 min	27 min

CREEP TEST DATA:

Condition	Temperature, °C	Stress, MPa	Duration, Hrs	Strain% after 1000 Hrs
PWHT: 695°C for 1 Hr	500	300	1000	1.54
	550	140	1000	0.99

PACKING DATA :

Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.5 x 1000	5	4	20
3.2 x 1000	5	4	20


GMAW/GTAW LOW ALLOY STEEL (High Temperature)
AUTOMIG 90S-B3 / TIGFIL 90S-B3

2.25Cr-1Mo COPPER COATED LOW ALLOY WIRE FOR CREEP RESISTANCE


CLASSIFICATION : EN ISO 21952-A

AWS A5.28

APPROVALS :

Automig 90S-B3: G CrMo2Si

ER90S-B3

IBR

Tigfil 90S-B3: W CrMo2Si

ER90S-B3

IBR/NPCIL/BHEL

KEY FEATURES :

- Copper coated low alloy steel solid filler wire & rod
- Uniform copper coating
- Deposit notch free welds with excellent mechanical properties
- Typical 2.25 Cr-1 Mo weld deposit
- Superior strength and toughness after PWHT
- Radiographic quality weld

WELDING POSITION :

GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar/1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of 2.25Cr-0.5Mo and 2.25Cr-1Mo type creep resistant steels
- Joining ASTM A 335 Gr.P22, A 387 Gr.22 materials
- Refineries, Petrochemicals and fertilizers plant
- Joining of P5A materials
- Cr-Mo and Cr-Mo-V bearing steels for high temperature applications
- Suitable for 12CrMo9-10, 10CrSiMoV7 German steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Mo	Cu*	S	P
Specification	0.07-0.12	0.40-0.70	0.40-0.70	2.30-2.70	0.90-1.20	0.35 max	0.025 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	PWHT: 690°C for 1 Hr	620 min	540 min	17 min

Mechanical properties will vary with the type of shielding gas used.

CREEP TEST DATA FOR TIGFIL 90S-B3:

	Temperature, °C	Stress, MPa	Duration, Hrs	Strain% after 1000 Hrs
PWHT: 690°C for 1 Hr	550	140	1000	0.92
	600	80	1000	1.28

PACKING DATA :

Automig 90S-B3	Ø, mm		Kg/Spool	
	1.2		15	
Tigfil 90S-B3	1.6		15	
	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Cromoten C**



FCAW LOW ALLOY STEEL (High Temperature)

TIGFIL 90S-B3 SPL

2.25Cr-1Mo COPPER COATED SOLID FILLER ROD FOR CREEP RESISTANCE



CLASSIFICATION : AWS A/SFA 5.28 EN ISO 21952-A

ER90S-B3

W CrMo2Si

KEY FEATURES :

- Copper coated low alloy steel solid filler rod
- Typical 2.25 Cr-1 Mo weld deposit
- Notch free welds with excellent mechanical properties
- Superior strength and toughness after PWHT
- Meets X factor requirement
- Radiographic quality weld

WELDING POSITION :



DCEN

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

TYPICAL APPLICATIONS :

- Welding of 2.25Cr-0.5Mo, 2.25Cr-1Mo type creep resistant steels
- Joining ASTM A 335 Gr.P22, A 387 Gr.22 materials
- Refineries, Petrochemicals and fertilizers plant
- Joining of P5A materials
- Cr-Mo and Cr-Mo-V bearing steels for high temperature applications
- Suitable for 12CrMo9-10, 10CrSiMoV7 German steels

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Mo	Cu*
Specification	0.07-0.12	0.40-0.70	0.40-0.70	2.30-2.70	0.90-1.20	0.15 max
	As	Sn	Sb	S	P	
Specification	0.005 max	0.005 max	0.005 max	0.010 max	0.010 max	

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	PWHT: 690°C for 1 Hr	620 min	540 min	17 min	27 min

PARAMETERS - PACKING DATA :

Ø, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.5 x 1000	5	4	20
3.2 x 1000	5	4	20



GMAW/GTAW LOW ALLOY STEEL (High Temperature)

AUTOMIG 80S-B6 / TIGFIL 80S-B6

5Cr-0.5Mo COPPER COATED LOW ALLOY WIRE FOR CREEP RESISTANCE



CLASSIFICATION : EN ISO 21952-A

AWS A/SFA 5.28

APPROVALS :

Automig 80S-B6: G CrMo5Si
Tigfil 80S-B6: W CrMo5Si

ER80S-B6
ER80S-B6

-
-

KEY FEATURES :

- Copper coated low alloy steel solid filler wire & rod
- Uniform copper coating
- Recommended pre-heat and interpass temperature 350-450°C
- Typical 5 Cr-0.5 Mo weld deposit
- Air hardenable alloy resistant to creep at elevated temperature up to 650°C
- Radiographic quality weld

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar/1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of 5 Cr-0.5 Mo creep resistant steels and equivalent grades
- Application in power generation, ammonia synthesis plants and petrochemical industries
- Joining P5/T5 materials of similar composition
- Joining P5B materials e.g. SA 336/336M Gr.F5, SA 387/387M Gr.5

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Mo	Ni	Cu*	S	P
Specification	0.10 max	0.40-0.70	0.50 max	4.50-6.0	0.45-0.65	0.60 max	0.35 max	0.025 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	PWHT: 745°C for 1 hr	560 min	470 min	17 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 80S-B6	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 80S-B6	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Cromoten D**



GMAW/GTAW LOW ALLOY STEEL (High Temperature)

AUTOMIG 80S-B8 / TIGFIL 80S-B8

9Cr-1Mo COPPER COATED LOW ALLOY WIRE FOR ELEVATED TEMPERATURE CREEP RESISTANCE



CLASSIFICATION : EN ISO 21952-A

AWS A/SFA 5.28

APPROVALS :

Automig 80S-B8: G CrMo9
Tigfil 80S-B8: W CrMo9

ER80S-B8
ER80S-B8

-
-

KEY FEATURES :

- Copper coated low alloy steel solid filler wire & rod
- Uniform copper coating
- Careful control over pre-heat, interpass temperature required
- Typical 9 Cr-1 Mo weld deposit
- Air hardenable alloy highly resistant to elevated temperature creep and heat
- Radiographic quality weld

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar/1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of 9Cr-1Mo type and equivalent materials in pipe and tube forms
- Welding of ferritic martensitic chrome steels
- For general corrosion and heat resistance application
- Joining P9/T9 materials of similar composition
- Application in Power plants, Oil refineries, Chemical and Petrochemical industries

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Mo	Ni	Cu*	S	P
Specification	0.10 max	0.40-0.70	0.50 max	8.0-10.5	0.80-1.20	0.50 max	0.35 max	0.025 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	PWHT: 745°C for 1 hr	550 min	470 min	17 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 80S-B8	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 80S-B8	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Cromoten 9**



GMAW/GTAW LOW ALLOY STEEL (High Temperature)

AUTOMIG 90S-B9 / TIGFIL 90S-B9

MODIFIED 9Cr-1Mo-V-Nb COPPER COATED LOW ALLOY WIRE



CLASSIFICATION : EN ISO 21952-A AWS A/SFA 5.28 **APPROVALS :**

Automig 90S-B9:	G CrMo91	ER90S-B9	-
Tigfil 90S-B9:	W CrMo91	ER90S-B9	-

KEY FEATURES :

- Copper coated low alloy steel solid filler wire & rod
- Typical 9Cr-1Mo-V-Nb type weld deposit
- Uniform copper coating
- Smooth wire feeding
- Offers improved long-term creep properties
- Radiographic quality weld

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar+5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Suitable for welding of Cr-Mo-V-Nb steels such as P91, T91 and F91
- Suitable for material 1.4903, SA 387 Gr.91, SA 213 T91, SA 335 P91
- For heavy wall components such as headers, main steam piping and turbine rotors in power generating plants

STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Mo	Ni	V
Specification	0.07-0.13	1.20 max	0.15-0.50	8.0-10.50	0.85-1.20	0.80 max	0.15-0.30
	Cu*	Al	Nb	N	S	P	
Specification	0.20 max	0.04 max	0.02-0.10	0.03-0.07	0.010 max	0.010 max	

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Typical	PWHT: 760°C for 2 Hrs	620 min	410 min	16 min

Mechanical properties will vary with the type of shielding gas used.

CREEP TEST DATA :

Temperature, °C	Stress, MPa	Duration, Hrs	Strain% after 1000 Hrs
550	240	1000	2.26
600	160	1000	3.04

PACKING DATA :

Automig 90S-B9	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 90S-B9	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Cromoten 9M**



GMAW/GTAW LOW ALLOY STEEL (Low Temperature)

AUTMIG 80S-Ni1 / TIGFIL 80S-Ni1

COPPER COATED 1% Ni ALLOYED WIRE FOR LOW TEMPERATURE IMPACT PROPERTIES



CLASSIFICATION : EN ISO 14341-A EN ISO 636-A AWS A/SFA 5.28 APPROVALS :

Autmig 80S-Ni1: G 46 4 M G3Ni1	-	ER80S-Ni1	-
Tigfil 80S-Ni1: -	W 46 4 W3Ni1	ER80S-Ni1	IBR

KEY FEATURES :

- Copper coated low alloy steel solid filler wire & rod
- Typical 1%Ni-Mn alloy
- Uniform copper coating
- Medium strength weld deposit gives high impact at -45°C
- Radiographic quality weld

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar/1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of 1% Ni steels
- Welding fine grained and low alloyed Ni steels
- Welding of steels for application at sub-zero temperature

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Ni	Mo	Cu*	S	P
Specification	0.12 max	1.25 max	0.40-0.80	0.80-1.10	0.35 max	0.35 max	0.025 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -45°C, J
Specification	As Welded	550 min	480 min	24 min	28 min

Hardness, 3 Layer: 210 BHN max (irrespective of type of gas used)

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Autmig 80S-Ni1	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 80S-Ni1	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: Tenalloy 70C



GMAW/GTAW LOW ALLOY STEEL (Low Temperature)

AUTOMIG 80S-Ni2 / TIGFIL 80S-Ni2

COPPER COATED LOW ALLOY WIRE FOR -60°C IMPACT APPLICATION



CLASSIFICATION : EN ISO 14341-A EN ISO 636-A AWS A/SFA 5.28 APPROVALS :

Automig 80S-Ni2: G 46 6 M G2Ni2

Tigfil 80S-Ni2: -

EN ISO 636-A

W 46 6 W2Ni2

AWS A/SFA 5.28

ER80S-Ni2

ER80S-Ni2

APPROVALS :

-

IBR

KEY FEATURES :

- Copper coated low alloy steel solid filler wire & rod
- Typical 2.5% Ni-Mn alloy
- Uniform copper coating
- Tough, crack resistant weld deposit gives high impact at -60°C
- Radiographic quality weld

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar/1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of 2.5% Ni steels
- Welding fine grained and low alloyed Ni steels
- Welding of storage tanks for low temperature application
- Offshore applications

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Ni	Cu*	S	P
Specification	0.12 max	1.25 max	0.40-0.80	2.0-2.75	0.35 max	0.025 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -60°C, J
Specification	PWHT: 620°C for 1 Hr	550 min	480 min	24 min	47 min

Hardness, 3 Layer: 210 BHN max

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 80S-Ni2	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 80S-Ni2	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: Tenalloy 70A



GMAW/GTAW LOW ALLOY STEEL (High Strength)

AUTOMIG 80S-D2 / TIGFIL 80S-D2

COPPER COATED LOW ALLOY WIRE FOR Mn-Mo STEEL



CLASSIFICATION : EN ISO 14341-A

EN 1668

AWS A/SFA 5.28

APPROVALS :

Automig 80S-D2: G 46 3 C G4Mo

-

ER80S-D2

-

Tigfil 80S-D2: -

W 46 3 W4Mo

ER80S-D2

IBR

KEY FEATURES :

- Copper coated solid filler wire and rod
- Mn-0.5 Mo type welds deposit
- Uniform copper coating
- Mo Provide increased strength
- High levels of Mn and Si provide good wetting, rust and scale tolerance
- Excellent sub-zero toughness
- Porosity free radiographic quality weld

WELDING POSITION :



GMAW: DCEP

GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: CO ₂	12-18	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of Mn-0.5 Mo steel
- Application in oil process pipe work and fittings where resistance to sulphide-induced stress corrosion cracking is important
- Suitable for single and multiple pass welding
- Variety of ordinary and difficult to weld carbon and low alloy, higher strength steels in both as welded and PWHT condition

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Mo	Cu*	S	P
Specification	0.07-0.12	1.60-2.10	0.50-0.80	0.40-0.60	0.50 max	0.025 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	550 min	480 min	18 min	30 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 80S-D2	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 80S-D2	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20



GMAW/GTAW LOW ALLOY STEEL (High Strength)

AUTMIG 80S-G / TIGFIL 80S-G

MEDIUM STRENGTH COPPER COATED LOW ALLOY STEEL WIRE



CLASSIFICATION : AWS A/SFA 5.28

APPROVALS :

Autmig 80S-G: ER80S-G

-

Tigfil 80S-G: ER80S-G

-

KEY FEATURES :

- Copper coated low alloy steel solid filler wire & rod
- Characterized by smooth and shiny welds
- Uniform copper coating
- Provide good wetting, rust and scale tolerance
- Weld deposit is resistant to cold cracking
- Recommended with 100% CO₂ shielding gas
- Radiographic quality even over poor cleaned base metals

WELDING POSITION :



GMAW: DCEP

GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: CO ₂	12-18	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of Mn-0.5 Mo steel
- Pipelines and pressure vessels with operating temperatures of about 500°C
- Repair of medium strength steel castings
- Suitable for a wide range of base metals such as problem steels containing high sulfur to the basic carbon and low alloy Cr-Mo base metals

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Mo	S	P
Typical	0.09	1.6	0.6	0.4	0.01	0.01

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	600	540	24	40

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Autmig 80S-G	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 80S-G	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20



GMAW/GTAW LOW ALLOY STEEL (High Strength)

AUTOMIG 90S-D2 (AUTOMIG IV) TIGFIL 90S-D2

COPPER COATED LOW ALLOY WIRE FOR Mn-Mo STEEL WELDING



CLASSIFICATION :

AWS A/SFA 5.28

APPROVALS :

Automig 90S-D2 (Automig IV):
Tigfil 90S-D2:

ER90S-D2
ER90S-D2

IBR/RDSO
-

KEY FEATURES :

- Copper coated solid filler wire and rod
- Mn-0.5 Mo type welds deposit
- Uniform copper coating
- Mo addition for high strength
- High level of deoxidizers for defect free welds
- Excellent low temperature toughness
- Porosity free radiographic quality weld

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar + 1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of high tensile steels like IS 8500 Gr.540B, 570B & 590B, IS 2002 Gr.3, IS 1875 Class 3A
- Welding of Sailma 450/450Hi steel used in CONCOR wagons
- Suitable for singal and multiple pass welding
- High temperature service pipe, fittings, flanges and valves

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Mo	Cu*	S	P
Specification	0.07-0.12	1.60-2.10	0.50-0.80	0.40-0.60	0.50 max	0.025 max	0.025 max

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	620 min	540 min	17 min	30 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 90S-D2	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 90S-D2	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20



GMAW/GTAW LOW ALLOY STEEL (High Strength)
AUTOMIG 90S-G / TIGFIL 90S-G

COPPER COATED HIGH STRENGTH LOW ALLOY STEEL WIRE



CLASSIFICATION : AWS A/SFA 5.28

APPROVALS :

Automig 90S-G: ER90S-G
 Tigfil 90S-G: ER90S-G

-
-

KEY FEATURES :

- Copper coated high strength low alloy steel GMAW wire & rod
- Welds even over poor cleaned base metals
- Recommended Ar+O₂ shielding gas
- Moderately high strength with adequate low temperature toughness
- Exhibits excellent out of position characteristics
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar + 1-5O ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding high sulfur bearing free machining steels, medium carbon steels, 0.5 Mo steels and high temperature resistant steels
- Pipelines and pressure vessels with operating temperatures of about 500°C
- Repair of medium strength steel castings

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Mo	S	P
Typical	0.09	1.6	0.6	0.4	0.01	0.01

* Including Cu in the coating

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	650	570	25	45

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 90S-G	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 90S-G	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20



GMAW/GTAW LOW ALLOY STEEL (High Strength)

AUTOMIG 100S-G / TIGFIL 100S-G

COPPER COATED MEDIUM ALLOYED WIRE FOR HIGH STRENGTH LOW ALLOY



CLASSIFICATION : AWS A/SFA 5.28

APPROVALS :

ER100S-G

-

KEY FEATURES :

- Copper coated alloy steel wire
- Ni-Cr-Mo alloyed
- Smooth feedability, low spatter
- Exhibit high strength as well as low temperature toughness
- Radiographic quality

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: CO ₂	15-20	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of HY 80 and other similar grade materials
- Welding of high strength and low alloy steels
- Joining large vehicles and crane manufacturing
- Suitable for single and multi-pass welding of low alloy steels

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	V	S	P
Typical	0.08	1.5	0.5	0.3	1.4	0.3	0.08	0.015	0.015

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS, MPa	EL%	CVN Impact at -40°C, J
Typical	As Welded	800	710	24	60

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig 100S-G	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 100S-G	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20



GMAW/GTAW LOW ALLOY STEEL (High Strength)

AUTOMIG 110S-G / TIGFIL 110S-G

COPPER COATED MEDIUM ALLOYED WIRE FOR HIGH STRENGTH APPLICATION



CLASSIFICATION : AWS A/SFA 5.28

ER110S-G

KEY FEATURES :

- Copper coated medium alloy steel wire
- Exhibit high strength as well as low temperature toughness
- Excellent welding characteristics
- Exhibit excellent out of position characteristics
- Radiographic quality

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 80Ar+20CO ₂	15-25	15-25
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of high strength low alloy steels
- Welding of HY 80 and other similar grade materials
- Joining large vehicles and crane manufacturing
- Pipelines, tankers, containers

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	Cu	S	P
Typical	0.09	1.6	0.6	0.3	1.4	0.3	0.1	0.015	0.015

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -40°C, J
Typical	As Welded	830	735	23	70

Mechanical properties of weld metal will vary with the type of shielding gas used

PACKING DATA :

Automig 110S-G	Ø, mm		Kg/Spool	
	1.2		15	
	1.6		15	
Tigfil 110S-G	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20



GMAW / GTAW STAINLESS STEEL
MIGINOX 307

18 8 Mn TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A

G 18 8 Mn

KEY FEATURES :

- 18-8-Mn type stainless steel solid wire
- Smooth operating characteristics
- Good crack resistance
- High work hardening characteristics
- Non magnetic weld deposit

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
98Ar/2O ₂	15-22	10-20

TYPICAL APPLICATIONS :

- Suitable for austenitic manganese steels and dissimilar metal welding
- Welding of manganese steels to carbon steels castings or forgings

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni
Specification	0.20 max	5.0-8.0	1.20 max	17.0-20.0	7.0-10.0
	Mo	Cu	S	P	
Specification	0.50 max	0.50 max	0.03 max	0.03 max	

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	As Welded	500 min	350 min	25 min

PACKING DATA :

Ø, mm	Kg/Spool
1.0	12.5
1.2	12.5
1.6	12.5


GMAW / GTAW STAINLESS STEEL
MIGINOX 308L / TIGINOX 308L

EXTRA LOW CARBON AUSTENITIC STAINLESS STEEL SOLID WIRE FOR SS 304 WELDING


CLASSIFICATION : EN ISO 14343-A

AWS A/SFA 5.9

APPROVALS :

Miginox 308L: G 19 9 L

Tiginox 308L: W 19 9 L

ER308L

ER308L

RDSO (Class VI)

NPCIL

KEY FEATURES :

- An extra low carbon 308L type stainless steel solid wire
- Excellent corrosion & scaling resistance up to 800°C
- Excellent crack resistance
- Resistance to intergranular corrosion
- Radiographic quality welds

WELDING POSITION :

GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding Cr-Ni steels represented by AISI 301, 302, 304, 304L, 308, 308L
- Fabrication of boilers, reactors, turbines, pipes, tubes
- SS piping in refineries, oil and gas industries, chemical plants, food processing industries

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.03 max	1.0-2.5	0.30-0.65	19.5-22.0	9.0-11.0	0.75 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	35 min

Mechanical properties will vary with the type of shielding gas used.

SPECIAL TEST : IGC practice E as per ASTM A262

PACKING DATA :

Miginox 308L	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tiginox 308L	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Superinox 1C**

FCAW Wire: **Miginox FC 308L**



GMAW / GTAW STAINLESS STEEL MIGINOX 308LSi

308LSi TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A AWS A/SFA 5.9 **APPROVALS :**

G 19 9 LSi

ER308LSi

-

KEY FEATURES :

- An extra low carbon 20Cr/10Ni type stainless steel solid wire
- High Si content improves wetting characteristics
- Resists intergranular corrosion
- Controlled ferrite content ensures excellent crack resistance
- Excellent corrosion & scaling resistance up to 800°C
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20

TYPICAL APPLICATIONS :

- Welding Cr-Ni steels represented by AISI 301, 302, 304, 304L, 308, 308L
- SS piping in refineries, oil and gas industries, chemical plants, food processing industries
- Fabrication of boilers, reactors, turbines, pipes, tubes

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.03 max	1.0-2.5	0.65-1.0	19.5-22.0	9.0-11.0	0.75 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	35 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Ø, mm	Kg/Spool
0.8	12.5
1.2	12.5
1.6	12.5
2.0	12.5



GMAW / GTAW STAINLESS STEEL TIGINOX 308H

308H TYPE STAINLESS STEEL TIG ROD



CLASSIFICATION : AWS A/SFA 5.9

APPROVALS :

ER308H

-

KEY FEATURES :

- 308H type SS TIG rod
- High carbon than conventional 308 grade wire
- Higher strength at elevated temperature
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

TYPICAL APPLICATIONS :

- Welding of 304H type materials
- Chemical, petrochemical industries
- Distillery, dairy, restaurant equipment
- For high temperature applications

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.04-0.08	1.0-2.5	0.30-0.65	19.5-22.0	9.0-11.0	0.50 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	550 min	35 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Ø, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.5 x 1000	5	4	20
3.15/3.2 x 1000	5	4	20



GMAW / GTAW STAINLESS STEEL

MIGINOX 309L / TIGINOX 309L

23Cr/12Ni TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A

AWS A/SFA 5.9

APPROVALS :

Miginox 309L: G 23 12 L

ER309L

-

Tiginox 309L: W 23 12 L

ER309L

IRS/NPCIL

KEY FEATURES :

- An extra low carbon 23Cr/12Ni type stainless steel wire
- Excellent corrosion and oxidation resistance up to 1100°C
- High ferrite content ensures highest cracking resistance
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP

GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of AISI 309, 309L type steels
- Dissimilar joints between stainless steels and low alloy or carbon steels
- Buffer layer on low alloy and carbon steels
- Joining corrosion resistant clad steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.03 max	1.0-2.5	0.30-0.65	23.0-25.0	12.0-14.0	0.75 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

Mechanical properties will vary with the type of shielding gas used.

SPECIAL TEST : IGC practice E as per ASTM A262

PACKING DATA :

Miginox 309L	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tiginox 309L	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Betanox DL**

FCAW Wire: **Miginox FC 309L**



GMAW / GTAW STAINLESS STEEL
MIGINOX 309LSi

309LSi TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A AWS A/SFA 5.9 **APPROVALS :**

G 23 12 LSi

ER309LSi

-

KEY FEATURES :

- An extra low carbon 24Cr/13Ni type stainless steel solid wire
- High Si content improves wetting characteristics
- Excellent corrosion and oxidation resistance up to 1100°C
- Highest cracking resistance
- Radiographic quality welds

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20

TYPICAL APPLICATIONS :

- Welding of AISI 309, 309L type steels
- Dissimilar joints between stainless steels and low alloy or carbon steels
- Buffer layer on low alloy and carbon steels
- Joining corrosion resistant clad steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.03 max	1.0-2.5	0.65-1.0	23.0-25.0	12.0-14.0	0.75 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Ø, mm	Kg/Spool
0.8	12.5
1.2	12.5
1.6	12.5
2.0	12.5



GMAW / GTAW STAINLESS STEEL

MIGINOX 309Mo / TIGINOX 309Mo

23Cr/12Ni/2.5Mo TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : AWS A/SFA 5.9

APPROVALS :

Miginox 309Mo:	ER309Mo	-
Tiginox 309Mo:	ER309Mo	-

KEY FEATURES :

- A 23Cr/12Ni type stainless steel solid wire
- High ferrite content ensures maximum cracking resistance
- Excellent corrosion & oxidation resistance up to 1100°C
- Mo addition provides high strength and pitting corrosion resistance
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of AISI 309 Mo type steels
- Dissimilar joints between 316 type and low alloy or carbon steels
- Buffer layer on low alloy and carbon steels before deposition of 316 type weld metal

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.12 max	1.0-2.5	0.30-0.65	23.0-25.0	12.0-14.0	2.0-3.0	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	550 min	30 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Miginox 309Mo	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tiginox 309Mo	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Betanox DMO**



GMAW / GTAW STAINLESS STEEL

MIGINOX 310 / TIGINOX 310

25Cr/20Ni TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A AWS A5/SFA 5.9

Miginox 310: G 25 20 ER310
Tiginox 310: W 25 20 ER310

KEY FEATURES :

- A 25Cr/20Ni type austenitic stainless steel wire
- Resistance to cracking and fissuring
- Excellent oxidation resistance upto 1150°C
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-25	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of AISI 310 type steels, Austenitic Mn steels
- Joining of dissimilar steels, straight chrome steels, cladding side of stainless clad steels
- Furnace parts, Annealing boxes, Carburizing pots, Gas turbine combustion chamber parts, hydrogenation and polymerization plant

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.08-0.15	1.0-2.5	0.30-0.65	25.0-28.0	20.0-22.5	0.75 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	550 min	30 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Miginox 310	Ø, mm		Kg/Spool	
	1.2		12.5	
	1.6		12.5	
Tiginox 310	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Betanox C**



GMAW / GTAW STAINLESS STEEL

MIGINOX 316L / TIGINOX 316L

19Cr/12Ni/Mo TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A

AWS A/SFA 5.9

APPROVALS :

Miginox 316L: G 19 12 3 L

ER316L

-

Tiginox 316L: W 19 12 3 L

ER316L

IRS

KEY FEATURES :

- An extra low carbon 19Cr/12Ni/Mo type stainless steel wire
- Offers improved corrosion and pitting resistance in marine and industrial environment
- High resistance against intergranular corrosion
- Resistant to SCC, hot cracking and chemical attack upto 850°C
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP

GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding austenitic alloys represented by AISI 316, 316L, 317, 317L, 318 types
- Joining similar grade wrought and cast material
- Application in textile processing, Naval and Chemical environments, Paper and pulp, Paint and dye industries
- Cladding stainless steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.03 max	1.0-2.5	0.30-0.65	18.0-20.0	11.0-14.0	2.0-3.0	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	490 min	30 min

Mechanical properties will vary with the type of shielding gas used.

SPECIAL TEST:

IGC practice E and B as per ASTM A262

PACKING DATA :

Miginox 316L	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tiginox 316L	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Superinox 2C**

FCAW Wire: **Miginox FC 316L**



GMAW / GTAW STAINLESS STEEL

MIGINOX 316LSi

316LSi TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A

AWS A/SFA 5.9

APPROVALS :

G 19 12 3 Lsi

ER316LSi

-

KEY FEATURES :

- An extra low carbon 19Cr/12Ni/Mo type stainless steel solid wire
- High Si content improves wetting characteristics
- High resistance against intergranular corrosion
- Resistant to SCC, hot cracking and chemical attack up to 850°C
- Offers improved corrosion & pitting resistance in marine and industrial environment
- Radiographic quality welds

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20

TYPICAL APPLICATIONS :

- Welding austenitic alloys represented by AISI 316, 316L, 317, 317L, 318 types
- Joining similar grade wrought and cast material
- Application in textile processing, Naval and Chemical environments, Paper and pulp, Paint and dye industries
- Cladding stainless steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.03 max	1.0-2.5	0.65-1.0	18.0-20.0	11.0-14.0	2.0-3.0	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	490 min	30 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Ø, mm	Kg/Spool
0.8	12.5
1.2	12.5
1.6	12.5
2.0	12.5



GMAW / GTAW STAINLESS STEEL

MIGINOX 347 / TIGINOX 347

Nb STABILIZED STAINLESS STEEL ALLOY FOR HIGHEST RESISTANCE AGAINST INTERGRANULAR CORROSION



CLASSIFICATION : EN ISO 14343-A AWS A/SFA 5.9

Miginox 347: G 19 9 Nb ER347
Tiginox 347: W 19 9 Nb ER347

KEY FEATURES :

- 19Cr/9Ni/Nb type stabilized stainless steel wire
- Resistance to intergranular corrosion and scaling up to 850°C
- Resistance to cracking and embrittlement
- Smooth operating characteristics
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding stabilized Cr-Ni steels such as AISI 321, 321H, 347, 347H
- Refineries, power plants, centrifugal pump impellers and shafts, valve faces, seats
- Recommended for use at high temperatures
- Fabrication of boiler and gas turbine
- Welding of stainless steel tanks, valves, pipes in food, chemical and petrochemical industries

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	Nb	S	P
Specification	0.08 max	1.0-2.5	0.30-0.65	19.0-21.5	9.0-11.0	0.75 max	10xC-1.0	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Miginox 347	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tiginox 347	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Superinox 1B**

FCAW Wire: **Miginox FC 347**



GMAW / GTAW STAINLESS STEEL
MIGINOX 347Si

347Si TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A AWS A/SFA 5.9 **APPROVALS :**

G 19 9 NbSi

ER347Si

-

KEY FEATURES :

- 19Cr/9Ni type Nb stabilized stainless steel solid wire
- High Si content improves wetting characteristics
- Resistance to cracking and embrittlement
- Resistance to intergranular corrosion and scaling up to 850°C
- Smooth operating characteristics
- Radiographic quality welds

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20

TYPICAL APPLICATIONS :

- Welding stabilized Cr-Ni steels such as AISI 321, 321H, 347, 347H
- Refineries, power plants, centrifugal pump Impellers and shafts, valve faces, seats
- Fabrication of boiler and gas turbine
- Welding of stainless steel tanks, valves, pipes in food, chemical and petrochemical industries

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	Nb	S	P
Specification	0.08 max	1.0-2.5	0.65-1.0	19.0-21.5	9.0-11.0	0.75 max	10xC-1.0	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Ø, mm	Kg/Spool
0.8	12.5
1.2	12.5
1.6	12.5
2.0	12.5



GMAW / GTAW STAINLESS STEEL

TIGINOX 385

HIGH ALLOYED STAINLESS STEEL TIG ROD WITH SUPERIOR CORROSION RESISTANCE



CLASSIFICATION : EN ISO 14343-A AWS A/SFA 5.9

W 20 25 5 Cu L ER385

KEY FEATURES :

- Low carbon 20/25/5/Cu type TIG rod
- Resist intergranular corrosion and sulfide stress corrosion cracking
- Resistant to pitting and crevice corrosion in chloride bearing media
- Recommended for highly corrosive conditions in the chemical industries, sea water desalinization plants
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEN

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

TYPICAL APPLICATIONS :

- Welding of 904L, HV-9A, HV-9 stainless steel and similar alloys for high temperature and high corrosion service
- Welding of 904L steel to other grades of stainless steel
- Welding of austenitic stainless steels with enhanced corrosion resistance to reducing media

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni
Specification	0.025 max	1.0-2.5	0.50 max	19.5-21.5	24.0-26.0
	Mo	Cu	S	P	
Specification	4.2-5.2	1.2-2.0	0.03 max	0.02 max	

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

PACKING DATA :

Ø, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.5 x 1000	5	4	20



GMAW / GTAW STAINLESS STEEL

MIGINOX 410 / TIGINOX 410

12% Cr TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : AWS A/SFA 5.9

ER410

KEY FEATURES :

- Typical 12Cr type stainless steel wire
- Air hardenable weld deposit
- Preheat and PWHT recommended
- Resist corrosion, erosion & abrasion
- Smooth operating characteristics
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of similar composition 410 type steels and 13% Cr stainless steels
- Overlay application on carbon steel
- Surfacing of turbine blades, high pressure valves

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.12 max	0.6 max	0.5 max	11.5-13.5	0.6 max	0.75 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	PWHT:740°C for 1 hr	520 min	20 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Miginox 410	Ø, mm		Kg/Spool	
	1.2		12.5	
	1.6		12.5	
Tiginox 410	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20
	3.2 x 1000	5	4	20



GMAW / GTAW STAINLESS STEEL

MIGINOX 410NiMo / TIGINOX 410NiMo

HIGH STRENGTH MARTENSITIC STAINLESS STEEL SOLID WIRE



CLASSIFICATION : EN ISO 14343-A

AWS A/SFA 5.9

APPROVALS :

Miginox 410NiMo: G 13 4

ER410NiMo

-

Tiginox 410NiMo: W 13 4

ER410NiMo

-

KEY FEATURES :

- 13Cr/4Ni type stainless steel wire
- High strength combined with excellent toughness and cracking resistance
- Preheat and PWHT recommended
- Martensitic type alloy resistant to corrosion, erosion, pitting and impact
- Smooth operating characteristics
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP

GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of ASTM CA 6NM casting or similar grades as well as light gauge 410, 410S and 405 base metals
- Surfacing of turbine blades, high pressure valves
- Welding of extra low carbon castings and forgings of similar composition and surfacing applications
- Repair of runners, valve seats, pulp and paper plant equipment

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.06 max	0.6 max	0.5 max	11.0-12.5	4.0-5.0	0.4-0.7	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	PWHT: 600°C for 1 hr	760 min	15 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Miginox 410NiMo	Ø, mm		Kg/Spool	
	1.2		12.5	
	1.6		12.5	
Tiginox 410NiMo	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20
	3.2 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Betachrome 13/4 LB, Betachrome 13/4 LB-R**



GMAW / GTAW STAINLESS STEEL

MIGINOX 430 / TIGINOX 430

16% Cr TYPE STAINLESS STEEL SOLID WIRE



CLASSIFICATION : AWS A/SFA 5.9

ER430

KEY FEATURES :

- Typical 16Cr stainless steel wire
- High corrosion resistance
- Smooth operating characteristics
- Proper preheat and PWHT require to achieve desired mechanical properties
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-25	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of ferritic martensitic chrome steels and steel castings of similar composition
- Welding and cladding of automotive exhaust system components
- Joining and cladding of 17Cr alloy
- For general corrosion and heat resisting applications

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.10 max	0.6 max	0.5 max	15.5-17.0	0.6 max	0.75 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	PWHT: 770°C for 2 hr	450 min	20 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Miginox 430	Ø, mm		Kg/Spool	
	1.2		12.5	
	1.6		12.5	
Tiginox 430	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.5 x 1000	5	4	20
	3.2 x 1000	5	4	20



GMAW / GTAW STAINLESS STEEL
MIGINOX 430 LNb

STABILIZED 430 LNb TYPE FERRITIC STAINLESS STEEL SOLID WIRE



KEY FEATURES :

- Stabilized 430LNb type ferritic stainless steel solid wire
- Resistance to corrosion and thermal fatigue
- Smooth operating characteristics
- Radiographic quality welds

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20

TYPICAL APPLICATIONS :

- Application in Automotive industries
- Used for production of exhaust systems

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	Nb	Cu	S	P
Specification	0.02	0.3	0.4	17.5	0.1	0.05	0.4	0.05	0.01	0.02

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	As Welded	410 min	220 min	15 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Ø, mm	Kg/Spool
0.8	12.5
1.0	12.5
1.2	12.5



GMAW / GTAW DUPLEX STAINLESS STEEL

MIGINOX 2209 / TIGINOX 2209

DUPLEX STAINLESS STEEL ALLOY FOR HIGH STRENGTH AND PITTING RESISTANCE



CLASSIFICATION : EN ISO 14343-A

AWS A/SFA 5.9

APPROVALS :

Miginox 2209: G 22 9 3 N L

ER2209

-

Tiginox 2209: W 22 9 3 N L

ER2209

-

KEY FEATURES :

- An extra low carbon 22Cr/9Ni/3Mo/N type duplex stainless steel wire
- Austenitic-ferritic type weld deposit
- Can be applied for operating temperature upto 200°C
- Excellent combination of high strength and resistance to chloride induced SCC and pitting
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: 98Ar/2O ₂ or Ar/1-5CO ₂	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of 2205, 2209 type duplex stainless steels and similar grades
- Pipelines transporting chloride bearing products and sour gases
- Cladding on carbon and low alloy steels
- Cast pumps, Valve bodies and sea water handling equipment
- For chemical equipments, heat exchangers, off-shore platforms

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo	N	Cu	S	P
Specification	0.03 max	0.5-2.0	0.90 max	21.5-23.5	7.5-9.5	2.5-3.5	0.08-0.20	0.75 max	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	690 min	20 min

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Miginox 2209	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tiginox 2209	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	2.4 x 1000	5	4	20
	3.2 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Betanox 4462**

FCAW Wire: **Miginox FC 2209**



GMAW / GTAWSUPER DUPLEX STAINLESS STEEL **TIGINOX 2594**

25/9/4 TYPE SUPER DUPLEX STAINLESS STEEL TIG ROD



CLASSIFICATION : EN ISO 14343-A AWS A/SFA 5.9 **APPROVALS :**

W 25 9 4 N L

ER2594

-

KEY FEATURES :

- 25/9/4 type super duplex SS TIG rod
- Austenitic-ferritic duplex microstructure
- Improved resistance to pitting and SSC in chloride environment
- High Pitting Resistance Equivalent Number (PREN)
- Radiographic quality weld
- High tensile and yield strength

WELDING POSITION :



DCEN

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

TYPICAL APPLICATIONS :

- Welding of super duplex stainless steels UNS S 32750, S 32760, SFA 2507, Zeron 100 and Casting alloys e.g. ASTM A890 Gr.5A
- Pipe work systems, flow lines, risers, manifolds, pumps & valves
- Process equipment in offshore oil and gas industries, petrochemical plant
- Also to be used on duplex 2205 grade

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni	Mo
Specification	0.03 max	2.5 max	1.0 max	24.0-27.0	8.0-10.5	2.5-4.5

	Cu	S	P	N	W	
Specification	1.5 max	0.02 max	0.03 max	0.20-0.30	1.0 max	

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%	PREN
Specification	As Welded	760 min	15 min	40 min

PACKING DATA :

Ø, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.5 x 1000	5	4	20
3.15/3.2 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Betanox 2594**



GMAW/GTAW NICKEL ALLOYS

AUTOMIG Ni-1 / TIGFIL Ni-1

NICKEL SOLID WIRE FOR NICKEL AND NICKEL BASED ALLOYS



CLASSIFICATION : EN ISO 18274

AWS A/SFA 5.14

APPROVALS :

SNi 2061

ERNi-1

-

KEY FEATURES :

- A low carbon 96Ni/3Ti Nickel wire
- Almost pure Ni deposit
- Extremely strong and ductile weld metal
- Resistant to cracking and oxidation
- Low iron level ensure maximum corrosion resistance
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of wrought and cast form of commercially pure Ni (99.5%)
- Welding of Nickel 200 and 201
- Suitable for ASTM B160/161/162/163
- For dissimilar welding between Nickel 200/201 and various iron-base and nickel-base alloys
- Applications in Pumps and valves, Cryogenics, Chemical plants, Caustic handling equipments, Food processing equipments
- Overlay on carbon and low alloy steel
- Used for handling corrosive alkalis and halides

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Fe	S	P
Specification	0.15 max	1.0 max	1.0 max	0.015 max	0.03 max
	Si	Cu	Al	Ti	Ni
Specification	0.75 max	0.25 max	1.5 max	2.0-3.5	93.0 min

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Typical	As Welded	380	30

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig Ni-1	Ø, mm		Kg/Spool	
	1.2		12.5	
	1.6		12.5	
Tigfil Ni-1	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	2.0 x 1000	5	4	20
	2.4 x 1000	5	4	20
	3.2 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Nicalloy 1**



GMAW/GTAW NICKEL ALLOYS

AUTOMIG NiCr-3 / TIGFIL NiCr-3

NiCr-3 TYPE NICKEL ALLOY WIRE



CLASSIFICATION : EN ISO 18274

AWS A/SFA 5.14

APPROVALS :

Automig NiCr-3: SNi 6082

ERNiCr-3

-

Tigfil NiCr-3: SNi 6082

ERNiCr-3

IBR

KEY FEATURES :

- A low carbon Ni-Cr solid wire
- Typical 72Ni/20Cr/3Mn/2.5Nb+Ta alloy
- Suitable for cryogenic to high temperature application
- High corrosion and oxidation resistance
- Excellent toughness at low temperatures
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of Ni-Cr-Fe alloys
- Dissimilar welding of Ni based alloys and cladding
- For joints sensitive to thermal loading above 300°C to prevent carbon diffusion
- Joining steels to stainless steels or Ni based alloys
- Applications in pressure vessels, boilers, fittings, machines and apparatus constructions

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Fe	S	P	Si
Specification	0.10 max	2.5-3.5	3.0 max	0.015 max	0.03 max	0.50 max
	Cu	Co	Ti	Cr	Nb + Ta	Ni
Specification	0.50 max	0.12 max	0.75 max	18.0-22.0	2.0-3.0	67.0 min

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Typical	As Welded	550	33

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig NiCr-3	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tigfil NiCr-3	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	2.4 x 1000	5	4	20
	3.2 x 1000	5	4	20



GMAW/GTAW NICKEL ALLOYS

AUTOMIG NiCrMo-3 / TIGFIL NiCrMo-3

NiCrMo-3 TYPE NICKEL ALLOY SOLID WIRE



CLASSIFICATION : EN ISO 18274 AWS A/SFA 5.14 **APPROVALS :**

Automig NiCrMo-3: SNi 6625 ERNiCrMo-3 -
Tigfil NiCrMo-3: SNi 6625 ERNiCrMo-3 IBR

KEY FEATURES :

- A low carbon Ni-Cr-Mo solid wire
- Typical 61Ni/22Cr/9Mo/3.5Nb+Ta alloy
- Suitable for cryogenic to high temperature application up to 540°C
- Exceptional resistance to pitting, crevice and stress corrosion cracking in severe chloride media
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Joining Ni-Cr-Mo alloys
- Welding of Inconel 625, Incoloy 825, Alloy 20
- Cladding steel with Ni-Cr-Mo weld metal
- Suitable for joining ASTM B443, B444, B446 to itself, to steel, to other Ni-based alloys

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Fe	S	P	Si	Cu
Specification	0.10 max	0.50 max	5.0 max	0.015 max	0.02 max	0.50 max	0.50 max
	Al	Ti	Cr	Nb+Ta	Mo	Ni	
Specification	0.40 max	0.40 max	20.0-23.0	3.15-4.15	8.0-10.0	58.0 min	

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Typical	As Welded	760	32

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig NiCrMo-3	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tigfil NiCrMo-3	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	2.4 x 1000	5	4	20
	3.2 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Nicalloy Mo-3**



GMAW/GTAW NICKEL ALLOYS

AUTOMIG NiCrMo-4 / TIGFIL NiCrMo-4

NiCrMo-4 TYPE SOLID WIRE



CLASSIFICATION : EN ISO 18274 AWS A5.14 **APPROVALS :**

SNi 6276

ERNiCrMo-4

-

KEY FEATURES :

- Ni-Cr-Mo-W solid wire
- Typical 57Ni/16Cr/15.5Mo/5.5Fe/4W alloy
- Resistant to abrasion, impact, corrosion and high temperatures
- Excellent resistance to stress corrosion in reducing and oxidizing atmosphere
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of alloy C-276 and similar composition steels
- Dissimilar joints between nickel alloys, stainless and low alloy steels
- Die plates, forge dies, hot shear blades, mandrel punches for hot working
- Suitable for joining ASTM B574, B575, B619, B622, B628 to itself, to steel, to other Ni-based alloys
- Application in chemical plants with highly corrosive conditions

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Fe	S	P	Si	Cu
Specification	0.02 max	1.0 max	4.0-7.0	0.03 max	0.04 max	0.08 max	0.50 max
	Co	Cr	Mo	V	W	Ni	
Specification	2.50 max	14.5-16.5	15.0-17.0	0.35 max	3.0-4.5	Bal.	

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	Hardness, HRc	
			As Welded	Work Hardened
Typical	As Welded	690	20-25	30-35

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig NiCrMo-4	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
	2.0		12.5	
Tigfil NiCrMo-4	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	2.4 x 1000	5	4	20
	3.2 x 1000	5	4	20
	4.0 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: Nicalloy Mo-4



GMAW/GTAW NICKEL ALLOYS

AUTOMIG NiCu-7 / TIGFIL NiCu-7

MONEL SOLID WIRE FOR NICKEL-COPPER ALLOY WELDING



CLASSIFICATION : EN ISO 18274

AWS A/SFA 5.14

APPROVALS :

SNi 4060

ERNiCu-7

-

KEY FEATURES :

- Monel solid wire
- Typical 65Ni/30Cu/3Mn/2Ti alloy
- Easily machinable deposit in as welded and stress relieved condition
- Low iron in the deposit exhibit maximum corrosion resistance
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding Monel and NiCu alloys to itself, to mild and low alloyed steels
- Overlaying on steel to obtain a corrosion resistant surface
- Welding of ASTM B127/163/164/165
- Heat exchanger, Piping, Vessels, Salt purification
- Food, Pumps and Valves manufacturing units

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Fe	S	P
Specification	0.15 max	4.0 max	2.5 max	0.015 max	0.02 max
	Si	Cu	Al	Ti	Ni
Specification	1.25 max	Bal.	1.25 max	1.5-3.0	62.0-69.0

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Typical	As Welded	480	32

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig NiCu-7	Ø, mm		Kg/Spool	
	1.2		12.5	
	1.6		12.5	
Tigfil NiCu-7	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	2.0 x 1000	5	4	20
	2.4 x 1000	5	4	20
	3.2 x 1000	5	4	20

EQUIVALENT :

SMAW Electrode: **Supermonel**



GMAW/GTAW NICKEL ALLOYS

TIGFIL 617

Ni-Cr-Co-Mo-Fe TYPE SOLID FILLER ROD



CLASSIFICATION : EN ISO 18274

AWS A/SFA 5.14

SNi 6617

ERNiCrCoMo-1

KEY FEATURES :

- Nickel alloy bare solid wire
- Ni-Cr-Co-Mo-Fe type weld
- Resistant to hot cracking
- Optimum strength, creep and oxidation resistance above 820°C upto 1150°C in wide variety of corrosive media

WELDING POSITION :



DCEN

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

TYPICAL APPLICATIONS :

- Welding of Ni-Cr-Co-Mo type and similar grade alloys to themselves and to steel
- Incoloy 800HT, 803 and cast alloys such as HK-40, HP and HP-45 modified
- Welding of Inconel 617 alloy
- For surfacing steel with Ni-Cr-Co-Mo weld metal
- Suitable for application in ethylene production plants, gas turbines etc.
- Suitable for material 1.4958, 1.4959, 2.4663
- Aerospace industry for engine components, after burners,, turbine seals, heat treating equipment and high temperature service applications

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Fe	P	S	Si	Cu
Specification	0.05-0.15	1.0 max	3.0 max	0.03 max	0.015 max	1.0 max	0.50 max
	Ni	Co	Al	Ti	Cr	Mo	
Specification	Bal.	10.0-15.0	0.8-1.5	0.60 max	20.0-24.0	8.0-10.0	

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	620 min	25 min

PACKING DATA :

Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
1.6 x 1000	5	4	20
2.0 x 1000	5	4	20
2.4 x 1000	5	4	20



GMAW/GTAW ALUMINIUM ALLOYS

AUTOMIG 1100 / TIGFIL 1100

1100 GRADE ALUMINIUM WIRE



CLASSIFICATION : AWS A/SFA 5.10

ER1100

KEY FEATURES :

- 99% aluminium solid wire
- Excellent feedability with consistent welding performance
- High corrosion resistance
- High electrical conductivity
- Excellent colour match with pure aluminium
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
Ar or Ar/He	10-20	10-20

TYPICAL APPLICATIONS :

- Welding of 1XXX series and commercially pure aluminium
- For Al 99.8, Al 99.7, Al 99.5, E-Al
- Tanks, brackets, bus bodies

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Si + Fe	Cu	Mn	Zn	Ti	Be	Al
Specification	0.95 max	0.05-0.20	0.05 max	0.10 max	0.20 max	0.0003 max	99.0 min

PACKING DATA :

Automig 1100	Ø, mm	Kg/Spool
	1.2	7
	1.6	7



GMAW/GTAW ALUMINIUM ALLOYS

AUTOMIG 4043 / TIGFIL 4043

4043 TYPE ALUMINIUM WIRE



CLASSIFICATION : EN ISO 18273

AWS A/SFA 5.10

APPROVALS :

S Al 4043A

ER 4043

-

KEY FEATURES :

- Al/5Si solid wire
- Excellent feedability with consistent welding performance
- Excellent resistance to hot cracking
- Most widely used general purpose filler alloy
- Si addition improves fluidity
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: AC

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of wrought and cast Al alloys with Si up to 7%
- Suitable for Al-Si and Al-Mg-Si alloys
- Ship Building, Mobile Machinery
- Automotive, General Fabrication
- Welding of similar grade Al alloys in the form of pipe, plate, forging and casting

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Si	Fe	Cu	Mn	Mg	Zn	Ti	Al
Specification	4.5-6.0	0.8 max	0.3 max	0.05 max	0.05 max	0.10 max	0.20 max	Bal.

PACKING DATA :

Automig 4043	Ø, mm		Kg/Spool	
	1.0		7	
	1.2		7	
	1.6		7	
Tigfil 4043	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	2	4	8
	2.0 x 1000	2	4	8
	2.4 x 1000	2	4	8

EQUIVALENT :

SMAW Electrode: **Albond 5 Si**



GMAW/GTAW ALUMINIUM ALLOYS

AUTOMIG 5183 / TIGFIL 5183

5183 TYPE ALUMINIUM WIRE



CLASSIFICATION : EN ISO 18273

AWS A/SFA 5.10

APPROVALS :

S Al 5183

ER 5183

-

KEY FEATURES :

- Al-Mg-Mn solid wire
- Excellent feedability with consistent welding performance
- resistance corrosion and sea water
- Higher strength than the conventional 5% Mg alloy
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: AC

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of high strength Al alloys
- Automotive, Marine application
- Structural fabrication
- Application where high strength, high impact fracture toughness and exposure to corrosive environment are important

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Al
Specification	0.40 max	0.40 max	0.10 max	0.5-1.0	4.3-5.2	0.05-0.25	0.25 max	0.15 max	Bal.

PACKING DATA :

Automig 5183	Ø, mm		Kg/Spool	
	1.0		7	
	1.2		7	
	1.6		7	
Tigfil 4043	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	2	4	8
	2.0 x 1000	2	4	8
	2.4 x 1000	2	4	8



GMAW/GTAW ALUMINIUM ALLOYS

AUTOMIG 5356 / TIGFIL 5356

5356 TYPE ALUMINIUM WIRE



CLASSIFICATION : EN ISO 18273

AWS A/SFA 5.10

APPROVALS :

S Al 5356

ER 5356

-

KEY FEATURES :

- Al-5Mg solid wire
- Excellent feedability with consistent welding performance
- Most versatile and universally used filler material
- High strength weld with very good corrosion resistance in marine environment
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: AC

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of similar composition Al-Mg, Al-Mg-Zn and Al-Mg-Si alloys
- Automotive, Marine application
- Structural fabrication
- Welding Al alloys containing more than 3% Mg

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Al
Specification	0.25 max	0.40 max	0.10 max	0.05-0.20	4.5-5.5	0.05-0.20	0.10 max	0.06-0.20	Bal.

PACKING DATA :

Automig 5356	Ø, mm		Kg/Spool	
	1.0		7	
	1.2		7	
	1.6		7	
Tigfil 5356	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	2	4	8
	2.0 x 1000	2	4	8
	2.4 x 1000	2	4	8



GMAW/GTAW ALUMINIUM ALLOYS

AUTOMIG 5556 / TIGFIL 5556

5556 TYPE ALUMINIUM WIRE



CLASSIFICATION : AWS A/SFA 5.10

ER5556

KEY FEATURES :

- Al-5Mg-Mn solid wire
- Excellent feedability with consistent welding performance
- Good ductility and crack resistance
- Increased amounts of manganese and magnesium
- High corrosion resistance in marine environment
- Radiographic weld quality

WELDING POSITION :



GMAW: DCEP
GTAW: AC

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-22	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of similar composition 5XXX alloys like 5083 and 5456
- Automotive, Storage tanks
- Marine application
- Structural fabrication

STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Si	Fe	Cu	Mn	Mg
Specification	0.25 max	0.40 max	0.10 max	0.50-1.0	4.7-5.5
	Cr	Zn	Ti	Al	
Specification	0.05-0.20	0.25 max	0.05-0.20	Bal.	

PACKING DATA :

Automig 5556	Ø, mm		Kg/Spool	
	1.0		7	
	1.2		7	
	1.6		7	
Tigfil 5556	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	2	4	8
	2.0 x 1000	2	4	8
	2.4 x 1000	2	4	8



GMAW COPPER ALLOYS **AUTOMIG CuSn-A**

PHOSPHOR BRONZE SOLID WIRE FOR MIG WELDING



CLASSIFICATION : AWS A/SFA 5.7

ERCuSn-A

KEY FEATURES :

- Copper-Tin solid wire
- Good resistance against corrosion and overheating
- Weld pool should be kept small to reduce hot short cracks
- For thick section, preheating is recommended
- Tin increases the wear resistance of the weld and slows the rate of solidification
- Rapid cooling at room temperature recommended
- Weld deposit easily machinable
- Radiographic quality welds

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
Ar or Ar/He	15-20	10-20

TYPICAL APPLICATIONS :

- Welding of similar base metals such as 509 to 519 series tin bronze alloys
- Bronze, brass and copper welding
- Overlay welding on steel, casting repair

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Sn	P	Al	Pb	Cu+Ag
Specification	4.0-6.0	0.10-0.35	0.01 max	0.02 max	Bal.

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	Average Brinell Hardness, HBW
Specification	As Welded	240 min	70-85

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Ø x L, mm	Kg/Spool
1.2	12.5
1.6	12.5

EQUIVALENT :

SMAW Electrode: **Bronze**



GMAW COPPER ALLOYS

AUTOBRAZE CuSi

SILICON BRONZE SOLID WIRE FOR MIG BRAZING



CLASSIFICATION : EN ISO 24373

AWS A/SFA 5.7

DIN 1733

SCu 6560

ERCuSi-A

SG-CuSi3

KEY FEATURES :

- Copper-Silicon solid wire
- Weld pool should be kept small in order to promote fast solidification and minimize cracking
- Preheating is not recommended
- Interpass temperature to be kept below 65°C
- Excellent for plain or galvanized steel sheet metal and other coated steels
- Radiographic quality welds

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
Ar or Ar/He	15-20	10-20

TYPICAL APPLICATIONS :

- Welding of copper-silicon and copper-zinc base metals to themselves and to steels
- Used for surfacing areas that are subjected to corrosion

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Zn	Sn	Mn	Fe	Si	Al	Pb	Cu+Ag
Specification	1.0 max	1.0 max	1.5 max	0.5 max	2.8-4.0	0.01 max	0.02 max	Bal.

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	Average Brinell Hardness, HBW
Specification	As Welded	345 min	80-100

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Ø x L, mm	Kg/Spool
0.8	12.5
1.0	12.5
1.2	12.5
1.6	12.5



GMAW/GTAW COPPER ALLOYS

AUTOMIG CuNi / TIGFIL CuNi

SOLID WIRE FOR WELDING COPPER – NICKEL ALLOYS



CLASSIFICATION : EN ISO 24373

AWS A/SFA 5.7

SCu 7158

ERCuNi

KEY FEATURES :

- Copper-Nickel solid wire
- Typical 70Cu-30Ni type alloy
- No preheating is required
- Radiographic quality welds

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-25	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Welding of wrought and cast 70/30, 80/20, 90/10 copper-nickel alloys to themselves or to each other
- Clad side of copper-nickel clad steels
- Surfacing applications where high resistance to corrosion, erosion or cavitation is required

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Mn	Fe	Si	Ni+Co	P	Pb	Ti	Cu
Specification	1.0 max	0.40-0.75	0.25 max	29.0-32.0	0.02 max	0.02 max	0.20-0.50	Bal.

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	Brinell Hardness, HBW
Specification	As Welded	345 min	60-80

Mechanical properties will vary with the type of shielding gas used.

PACKING DATA :

Automig CuNi	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
Tigfil CuNi	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	2.0 x 1000	5	4	20
	2.4 x 1000	5	4	20
	3.2 x 1000	5	4	20



GMAW/GTAW COPPER ALLOYS

AUTOMIG CuAl-A1/ TIGFIL CuAl-A1

ALUMINIUM-BRONZE WELDING WIRE OF CuAl-A1 GRADE



CLASSIFICATION : AWS A/SFA 5.7

ERCuAl-A1

KEY FEATURES :

- Iron free Aluminium-Bronze solid wire
- Resistance to many commonly used acids in varying concentrations and temperatures
- Resistance to corrosive media such as salt or brackish water
- Not Recommended for joining

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-25	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Overlay application as a wear resistant surfaces having relatively light loads
- Tube sheets, pickling hooks, valve seats
- Repair and build-up of bearing and corrosion resistant surfaces
- Impellers, chemical plants and pulp mills

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Zn	Mn	Si	Al	Pb	Cu+Ag
Specification	0.20 max	0.50 max	0.10 max	6.0-8.5	0.02 max	Bal.

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	Hardness, HBW
Specification	As Welded	380 min	80-110

PACKING DATA :

Automig CuAl-A1	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
Tigfil CuAl-A1	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	2.0 x 1000	5	4	20
	2.4 x 1000	5	4	20
	3.2 x 1000	5	4	20



GMAW/GTAW COPPER ALLOYS

AUTOMIG CuAl-A2/ TIGFIL CuAl-A2

ERCuAl-A2 GRADE ALUMINIUM-BRONZE WELDING WIRE



CLASSIFICATION : AWS A/SFA 5.7

ERCuAl-A2

KEY FEATURES :

- Iron bearing Aluminium-Bronze solid wire
- Resistance to salt water and many commonly used acids

WELDING POSITION :



GMAW: DCEP
GTAW: DCEN

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
GMAW: Ar or Ar/He	15-25	10-20
GTAW: Ar	10-15	-

TYPICAL APPLICATIONS :

- Joining aluminium bronzes of similar composition, manganese bronze, silicon bronze, and some copper-nickel alloys, ferrous metals and dissimilar metals
- Dissimilar metal combinations of aluminium bronze to steel, copper to steel
- Overlay application for wear and corrosion resistant surfaces

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	Zn	Fe	Si	Al	Pb	Cu+Ag
Specification	0.02 max	1.50 max	0.10 max	8.50-11.0	0.02 max	Bal.

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	Brinell Hardness, HBW
Specification	As Welded	415 min	130-150

PACKING DATA :

Automig CuAl-A2	Ø, mm		Kg/Spool	
	0.8		12.5	
	1.2		12.5	
	1.6		12.5	
Tigfil CuAl-A2	Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
	1.6 x 1000	5	4	20
	2.0 x 1000	5	4	20
	2.4 x 1000	5	4	20



GTAW Cobalt Alloy
TIGFIL ST6

STELLITE 6 GRADE SOLID FILLER ROD



CLASSIFICATION : AWS A/SFA 5.21

ERCoCr-A

KEY FEATURES :

- Cobalt based solid filler rod
- Co-Cr-W type Stellite 6 grade alloy
- Hypoeutectic microstructure
- Resistance to low stress abrasive wear with toughness properties
- Resistance to metal to metal wear and galling
- Excellent resistance to corrosion, oxidation
- Retains hot hardness at elevated temperature upto 650°C

WELDING POSITION : 



DCEN

Shielding Gas: Ar

Gas Flow Rate, LPM : 10-15

TYPICAL APPLICATIONS :

- Automotive and fluid flow valves
- Chain saw guides, hot punches, Valve bearing surface, roll bushings, Shear blades and extruder screws
- Applications where wear is accompanied by elevated temperatures and corrosion

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni
Specification	0.9-1.4	1.0 max	2.0 max	26.0-32.0	3.0 max
	Mo	Fe	W	Co	
Specification	1.0 max	3.0 max	3.0-6.0	Balance	

MECHANICAL PROPERTIES :

	Condition	Hardness, HRc
Specification	As Welded	40-46

PACKING DATA :

Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
2.4 x 1000	5	4	20
3.2 x 1000	5	4	20



GTAW Cobalt Alloy
TIGFIL ST12

STELLITE 12 GRADE SOLID FILLER ROD



CLASSIFICATION : AWS A/SFA 5.21

ERCoCr-B

KEY FEATURES :

- Cobalt based solid filler rod
- Co-Cr-W type Stellite 12 grade alloy
- Hypoeutectic microstructure with higher % of carbides than Stellite 6
- Resistance to low stress abrasive wear with toughness properties
- Resistance to metal to metal wear and galling
- Excellent resistance to corrosion, oxidation
- Retains hot hardness at elevated temperature upto 650°C

WELDING POSITION :



DCEN

Shielding Gas: Ar

Gas Flow Rate, LPM : 10-15

TYPICAL APPLICATIONS :

- Automotive and fluid flow valves
- Chain saw guides, hot punches
- Valve bearing surface, roll bushings
- Shear blades and extruder screws
- Applications where wear is accompanied by elevated temperatures and corrosion

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

	C	Mn	Si	Cr	Ni
Specification	1.2-1.7	1.0 max	2.0 max	26.0-32.0	3.0 max
	Mo	Fe	W	Co	
Specification	1.0 max	3.0 max	7.0-9.5	Balance	

MECHANICAL PROPERTIES :

Condition		Hardness, HRC
Typical	As Welded	40-47

PACKING DATA :

Ø x L, mm	Primary Box, Kg	No. of Primary Boxes	Net Wt. of Carton, Kg
2.4 x 1000	5	4	20
3.2 x 1000	5	4	20



FCAW C-Mn STEEL

AUTOMIG FC 71T-1

FCAW WIRE FOR C-Mn STEEL AND 500 MPa TENSILE STRENGTH STEEL



CLASSIFICATION : EN ISO 17632 A AWS A5.20

T 42 2 R C/M 2 E71T-1C/M

APPROVALS : RDSO (Class I)/ABS/BV/DNV/LRA/IRS/IBR/CWB/CE

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- High deposition rate
- Suitable for high quality single and multi pass welds
- All position capability
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-18	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of C-Mn steel with tensile strength up to 500 Mpa
- Bridges, Shipbuilding, Towers, Cranes
- Chemical plant machinery, Hulls
- Storage tanks, Structural steel
- Construction equipment, Farm machinery, Rolling stocks
- General carbon steel fabrication

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	S	P
Typical	0.08	1.5	0.4	0.01	0.01
Specification	0.10 max	1.75 max	0.90 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -20°C, J
Typical	As Welded	570	470	26	75
Specification		500-640	420 min	22 min	47 min

Hardness, 3 Layer: 140-200 BHN

Chemistry and mechanical properties tested with 100% CO₂ shielding gas

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	20 – 30	130 - 300	15
1.6	24 – 32	200 - 380	15

Use 1-2 volts lower when using mix shielding gas.

EQUIVALENT :

SMAW Electrode: **Supabase, Supabase X Plus**

GMAW Wire: **Automig 70S-6**



FCAW C-Mn STEEL

AUTOMIG FC 121

VACUUM PACKED FCAW WIRE FOR C-Mn STEEL STRUCTURAL FABRICATION



CLASSIFICATION : EN ISO 17632-A AWS A5.20

T 42 2 R C 2

E71T-1C

APPROVALS : ABS/BV/DNV/IRS/LRA/NKK

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Low fumes, least spatters
- Easy slag detachability, smooth welds
- High deposition rate than solid wire electrodes
- High quality single and multi pass welding
- Vacuum packed
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	12-20	10-20

TYPICAL APPLICATIONS :

- Welding of structural and C-Mn steel with tensile strength up to 500 Mpa
- Steel structures, Bridges, Vehicles
- Shipbuilding, Towers, Cranes
- Machinery parts, Steel frames
- Rolling stocks, Hulls
- Chemical plant machinery
- General carbon steel fabrication
- Suitable for joining P.No.1 type ASTM SA 36/36M, SA 285/285M Gr.A/B/C, SA 414/414M Gr.A/B/C/D

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	S	P
Typical	0.06	1.4	0.4	0.01	0.01
Specification	0.10 max	0.90-1.75	0.90 max	0.030 max	0.030 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -20°C, J
Typical	As Welded	500-640	460	27	90
Specification		500 min	420 min	22 min	47 min

Hardness, 3 Layer: 200 BHN max

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	21 - 28	130 - 300	15
1.6	25 - 32	200 - 380	15

EQUIVALENT :

SMAW Electrode: **Supabase, Supabase X Plus**

GMAW Wire: **Automig 70S-6**



FCAW C-Mn STEEL

AUTOMIG FC 71T-5

A BASIC TYPE FCW WIRE FOR 500 MPa TENSILE STRENGTH STEEL



CLASSIFICATION : EN ISO 17632-A

AWS A/SFA 5.20

T 42 3 B C/M 2 H5

E71T-5C/M H4

APPROVALS : ABS/BV/DNV/IRS/IBR/LRA

KEY FEATURES :

- Basic type gas shielded FCW wire
- Stable arc, Easy slag removal
- Smooth and porosity free weld
- Crack resistant and tough welds especially when welding steels with high carbon content
- Very low level of diffusible H₂ content
- Suitable for high quality single and multi pass welding of thicker sections
- Superb mechanical properties
- All position capability
- Sound radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-18	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of structural and boiler quality steels with minimum UTS up to 510 Mpa
- Welding of heavy sections in Pressure vessels, Construction equipment, Off-shore structures, Bridges
- Suitable for IS 226, IS 2002, IS 2062, DIN 17115 HIV
- SA 285 Gr.C, SA 414 Gr.C/D/E
- SA 515 Gr.60/65, SA 516 Gr.60/65

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	S	P
Typical	0.05	1.0	0.3	0.01	0.01
Specification	0.08 max	1.75 max	0.25-0.60	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	575	500	26	50
Specification		500 min	420 min	22 min	47 avg

Diffusible H₂ Content: <4 ml/100 gm

Chemistry and mechanical properties tested with 100% CO₂ shielding gas

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	20 – 30	130 - 300	15
1.6	24 – 32	180 - 380	15

Use 1-2 volts lower when using mix shielding gas.



FCAW C-Mn STEEL

AUTOMIG FC 71T-1C-J

A RUTILE TYPE FCAW WIRE FOR CARBON STEEL WELDING WITH SUB-ZERO IMPACT REQUIREMENT



CLASSIFICATION : EN ISO 17632-A

AWS A/SFA 5.20

APPROVALS :

T 42 4 R C 2

E71T-1C-J

ABS

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Stable arc, Easy slag removal
- Smooth and porosity free weld
- Sound radiographic weld quality
- Excellent combination of T1 performance with very good sub-zero toughness down to -40°C
- All position capability

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20

TYPICAL APPLICATIONS :

- Welding of typical structural and carbon steel SA 36/36M, SA 285/285M Gr.A/B/C, SA 414/414M Gr.A/B/C
- Application in Ship building, Off-shore platform, Pressure vessels, Piping, Low temperature serving storage tanks, Harbor equipment

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.12 max	1.75 max	0.90 max	0.20 max	0.50 max	0.30 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -40°C, J
Specification	As Welded	490 min	400 min	22 min	27 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	20 – 30	130 - 300	15
1.6	24 – 32	200 - 380	15



MCAW C-Mn STEEL

AUTOMIG MC 70C-6C

METAL CORED WIRE FOR MIG / MAG WELDING



CLASSIFICATION : AWS A/SFA 5.18

APPROVALS:

E70C-6CH4

-

KEY FEATURES :

- Metal cored wire suitable with CO₂ shielding gas
- Good weldability, minimal or no slag
- Excellent bead appearance
- Exceptional mechanical properties at low temperatures
- High deposition rate
- Suitable for single and multi pass welding
- Best suited for automated and robotized applications

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
100% CO ₂	14-20	15-25

TYPICAL APPLICATIONS :

- Welding of Carbon, C-Mn and similar types including fine grained steels
- Ship building, Boilers
- Suitable for joining SA 36/36M (P.No.1), SA 285/285M Gr.A/B/C (P.No.1)
- Pressure Vessels, Pipe steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	S	P
Typical	0.06	1.4	0.6	0.01	0.01
Specification	0.12 max	1.75 max	0.90 max	0.03 Max	0.03 Max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	550	500	28	72
Specification		480 min	400 min	22 min	27 min

Diffusible H₂ Content: <4 ml/100 gm

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	24-30	120-350	15
1.6	26-32	180 - 400	15



MCAW C-Mn STEEL

AUTOMIG MC 70C-6M

METAL CORED WIRE FOR MIG / MAG WELDING



CLASSIFICATION : AWS A/SFA 5.18

APPROVALS :

E70C-6MH4

CE

KEY FEATURES :

- Metal cored wire suitable with Ar-CO₂ shielding gas
- Good weldability, minimal or no slag
- Excellent bead appearance
- Exceptional mechanical properties at low temperatures
- High deposition rate
- Suitable for single and multi pass welding
- Best suited for automated and robotized applications

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar+20CO ₂	14-20	15-25

TYPICAL APPLICATIONS :

- Welding of Carbon, C-Mn and similar types including fine grained steels
- Ship building, Boilers
- Suitable for joining SA 36/36M (P.No.1), SA 285/285M Gr.A/B/C (P.No.1)
- Pressure Vessels, Pipe steels

STORAGE / HANDLING :

Keep dry during storage and handling

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	S	P
Typical	0.05	1.5	0.8	0.01	0.01
Specification	0.12 max	1.75 max	0.90 max	0.03 Max	0.03 Max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	571	520	30	80
Specification		480 min	400 min	22 min	27 min

Diffusible H₂ Content: <4 ml/100 gm

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	24-30	120-350	15
1.6	26-32	180 - 400	15



FCAW LOW ALLOY STEEL (High Temperature)

AUTOMIG FC 81T1-B2

LOW ALLOY STEEL FCAW WIRE FOR 1.25Cr-0.5Mo TYPE CREEP RESISTANT ALLOY



CLASSIFICATION : AWS A/SFA 5.29 EN ISO 17634-A **APPROVALS :**

E81T1-B2C

T CrMo1 R C 2

IBR

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- 1.25Cr-0.5Mo type weld deposit
- Resistant to creep and heat up to 550°C
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20

TYPICAL APPLICATIONS :

- Welding of 1.25Cr-0.5Mo, 1Cr-0.5Mo steels
- For Cr and Cr-Mo bearing steels at elevated temperature service
- Suitable for 13CrMo44, 15CrMo5, 15Cr3, 16MnCr5, 20MnCr5
- Joining P4 materials ASTM SA 182/182M Gr.F2/F11/F12, SA 213/213M Gr.T11/T12, SA 335/335M Gr.P11/P12, SA 387/387M Gr.2/11/12
- Steam production plants, steam pipes

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Mo	S	P
Specification	0.05-0.12	1.25 max	0.80 max	1.0-1.50	0.40-0.65	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	PWHT: 690°C for 1 Hr	550-690	470 min	19 min

CREEP TEST DATA :

	Temperature, °C	Stress, MPa	Duration, Hrs	Strain% after 1000 Hrs
PWHT: 690°C for 1 Hr	500	300	1000	1.42
	550	140	1000	1.06

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	20 – 30	130 - 300	15
1.6	24 – 32	200 - 380	15

EQUIVALENT :

SMAW Electrode: **Cromoten**

GMAW Wire: **Automig 80S-B2**

GTAW filler: **Tigfil 80S-B2**



FCAW LOW ALLOY STEEL (High Temperature)

AUTOMIG FC 91T1-B3

LOW ALLOY STEEL FCAW WIRE FOR WELDING OF GRADE 22 TYPE CREEP RESISTANT STEEL



CLASSIFICATION : AWS A/SFA 5.29

E91T1-B3C

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- Low alloy steel Cr-Mo deposit
- Resistant to creep and heat upto 600°C
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20

TYPICAL APPLICATIONS :

- Welding of 2.25Cr-0.5Mo, 2.25Cr-1Mo type creep resistant steels
- Cr-Mo and Cr-Mo-V bearing steels for high temperature applications
- Main steam pipes of boilers in electric power plant, Boiler super heaters
- Joining of P5A materials
- Joining ASTM A 335 Gr.P22, A 387 Gr.22 materials
- Application in refineries, power plants, pressure vessels, boilers

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Mo	S	P
Specification	0.05-0.12	1.25 max	0.80 max	2.0-2.50	0.90-1.20	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Specification	PWHT: 690°C for 1 Hr	620-760	540 min	17 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 – 30	130 - 300	15
1.6	24 – 32	180 - 350	15

EQUIVALENT :

SMAW Electrode: **Cromoten C**

GMAW wire: **Automig 90S-B3**

GTAW filler: **Tigfil 90S-B3**



FCAW LOW ALLOY STEEL (Low Temperature)

AUTOMIG FC 81T1-Ni1

LOW ALLOY STEEL FCAW WIRE FOR 1%Ni STEEL

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CLASSIFICATION : AWS A/SFA 5.29 EN ISO 17632-A

E81T1-Ni1 C

T 46 3 1Ni R C 2

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Typical 1%Ni weld deposit
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- Excellent fracture toughness at -30°C
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20

TYPICAL APPLICATIONS :

- Welding of high tensile steel 1% Ni steel and equivalent materials
- Storage tanks for low temperature
- Offshore application, Bridges
- Refineries, power plants e.g. pressure vessels and heat exchangers, machinery

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Mo	S	P
Specification	0.12 max	1.50 max	0.80 max	0.80-1.10	0.35 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	550-690	470 min	19 min	27 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 – 30	130 - 300	15
1.6	24 – 32	200 - 380	15

EQUIVALENT :

SMAW Electrode: **Tenalloy 70C**

GMAW Wire: **Automig 80S-Ni1**

GTAW filler: **Tigfil 80S-Ni1**



FCAW LOW ALLOY STEEL (Low Temperature)

AUTOMIG FC 81T1-Ni2

LOW ALLOY STEEL FCAW WIRE FOR 2%Ni STEEL



CLASSIFICATION : AWS A/SFA 5.29

E81T1-Ni2C

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Typical 2%Ni weld deposit
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- Excellent combination of strength and toughness at -40°C
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20

TYPICAL APPLICATIONS :

- Welding of high tensile steel 2% Ni steel and equivalent materials
- Offshore platform construction, Ship building
- Earthmoving and mining machinery
- Suitable for ASTM A572, A575, A734 steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	S	P
Specification	0.12 max	1.50 max	0.80 max	1.75-2.75	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -40°C, J
Specification	As Welded	550-690	470 min	19 min	27 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	24 – 32	140 - 320	15
1.6	25 – 34	180 - 350	15

EQUIVALENT :

SMAW Electrode: **Tenalloy 70A**

GMAW Wire: **Automig 80S-Ni2**

GTAW filler: **Tigfil 80S-Ni2**



FCAW LOW ALLOY STEEL (Low Temperature)

AUTOMIG FC 81T1-K2

FCAW WIRE OF TYPICAL 1.5Ni WITH IMPROVED IMPACT TOUGHNESS



CLASSIFICATION : AWS A/SFA 5.29

E81T1-K2C

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- Improved impact properties
- Suitable for medium to high strength applications
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	12-20	10-20

TYPICAL APPLICATIONS :

- Welding high strength, fine grained structural steels like N-A-XTRA 55, N-A-XTRA 60, LA60, Sailma 450/450HI
- Structural applications where low temperature toughness is required
- Suitable for joining HY 80, HY 100, ASTM A710, A514 steels and similar high strength materials
- Offshore structures and structural applications

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Cr	Mo	V	S	P
Specification	0.15 max	0.50-1.75	0.80 max	1.0-2.0	0.15 max	0.35 max	0.05 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	550-690	470 min	19 min	27 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 – 30	130 - 300	15
1.6	24 – 32	200 - 380	15



FCAW LOW ALLOY STEEL (Low Temperature)

AUTOMIG FC 80T5-K2

LOW ALLOY STEEL FCAW WIRE FOR HIGH STRENGTH AND IMPACT PROPERTIES



CLASSIFICATION : AWS A/SFA 5.29

E80T5-K2

KEY FEATURES :

- Basic type gas shielded FCW wire
- Suitable for medium to high strength applications
- Stable arc, low fumes
- Easy slag removal
- Excellent low temperature toughness down to -30°C
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	15-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding high strength, fine grained structural steels like N-A-XTRA 55, N-A-XTRA 60, LA60, Sailma 450/450HI
- High strength application of 550-760 MPa minimum yield strength steels
- Suitable for joining HY 80, HY 100, ASTM A710, A514 steels and similar high strength materials
- Offshore structures and structural applications

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Cr	Mo	V	S	P
Specification	0.15 max	0.50-1.75	0.80 max	1.0-2.0	0.15 max	0.35 max	0.05 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	550-690	470 min	19 min	47 min

Diffusible H₂ Content: <4 ml/100 gm

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 30	130 - 300	15
1.6	24 - 32	200 - 380	15



FCAW LOW ALLOY STEEL (Low Temperature)

AUTOMIG FC 90T5-K2

LOW ALLOY STEEL FCAW WIRE WITH HIGH STRENGTH AND IMPACT PROPERTIES



CLASSIFICATION : AWS A/SFA 5.29

APPROVALS :

E90T5-K2C H4

-

KEY FEATURES :

- Basic type gas shielded FCW wire
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal
- Excellent low temperature toughness down to -50°C
- Suitable for high strength application
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20

TYPICAL APPLICATIONS :

- Welding high strength, fine grained structural steels like N-A-XTRA 55, N-A-XTRA 60, LA60, Sailma 450/450HI
- High strength application of 550-760 MPa minimum yield strength steels
- Suitable for joining HY 80, HY 100, ASTM A710, A514 steels and similar high strength materials
- Offshore structures and structural applications

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Cr	Mo	V	S	P
Specification	0.15 max	0.50-1.75	0.80 max	1.0-2.0	0.15 max	0.35 max	0.05 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -50°C, J
Specification	As Welded	620-760	540 min	17 min	27 min

Diffusible H₂ Content: <4 ml/100 gm

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 30	130 - 300	15
1.6	24 - 32	200 - 380	15



FCAW LOW ALLOY STEEL (High Strength)
AUTOMIG FC 18M SPL

FCAW WIRE FOR HIGH STRENGTH STEEL



CLASSIFICATION : AWS A/SFA 5.29 EN ISO 18276-A

E91T1-D1C/M T 55 4 MnMo R C/M 2

APPROVALS : RDSO Class III

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- Specially designed to produce weld with high tensile strength and moderate impact toughness
- All position capability
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of High Tensile Steels like IS 8500 Gr.540B, 570B and 590B, IS 2002 Gr.III, IS 1875 CL IIIA
- Welding of SAILMA 450/450HI steel used in CONCOR wagons is a typical application for this wire

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Mo	S	P
Specification	0.12 max	1.25-2.0	0.80 max	0.25-0.55	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -40°C, J
Specification	As Welded	620-760	540 min	17 min	27 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 30	130 - 300	15
1.6	24 - 32	200 - 380	15



FCAW LOW ALLOY STEEL (High Strength)

AUTOMIG FC 101T1-K3

LOW ALLOY STEEL FCAW WIRE FOR HIGH STRENGTH STEELS



CLASSIFICATION : AWS A/SFA 5.29

E101T1-K3C

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Stable arc, Easy slag removal
- Low fumes, Minimal spatters
- Smooth and porosity free weld
- Optimal alloy control
- High strength and low temperature toughness combination
- Suitable for all position
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	15-25	10-20

TYPICAL APPLICATIONS :

- Welding of higher strength steel pipes and plates
- Welding of HY-100 and ASTM A 514 and many similar high strength steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Cr	Mo	V	S	P
Specification	0.15 max	0.75-2.25	0.80 max	1.25-2.60	0.15 max	0.25-0.65	0.05 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -20°C, J
Specification	As Welded	690-830	610 min	16 min	27 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 30	130 - 320	15
1.6	24 - 32	180 - 360	15



FCAW LOW ALLOY STEEL (High Strength)

AUTOMIG FC 111T1-K3

LOW ALLOY STEEL FCAW WIRE FOR HIGH STRENGTH STEELS



CLASSIFICATION : AWS A/SFA 5.29

E111T1-K3C

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Stable arc, Easy slag removal
- Low fumes, Minimal spatters
- Smooth and porosity free weld
- Optimal alloy control
- High strength and low temperature toughness combination
- Suitable for all position
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	15-25	10-20

TYPICAL APPLICATIONS :

- Welding of HY 80, HY-100, HSLA 80 and ASTM A 514 and many similar high strength steels, plates and pipes
- Trailer construction, crane fabrication, offshore drilling rigs and other structural applications for higher strength materials

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Cr	Mo	V	S	P
Specification	0.15 max	0.75-2.25	0.80 max	1.25-2.60	0.15 max	0.25-0.65	0.05 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -20°C, J
Specification	As Welded	760-900	680 min	15 min	27 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	23 - 32	140 - 310	15
1.6	24 - 34	200 - 350	15



FCAW LOW ALLOY STEEL (High Strength)

AUTOMIG FC 110T5-K4

LOW ALLOY STEEL FCAW WIRE FOR Q&T HIGH STRENGTH STEELS



CLASSIFICATION : AWS A/SFA 5.29

EN ISO 18276-A

APPROVALS :

E110T5-K4C H4

T 62 5 Mn2NiCrMo B C 4 H5

IBR

KEY FEATURES :

- Basic type gas shielded FCW wire
- Stable arc, Easy slag removal
- Low fumes, Minimal spatters
- Smooth and porosity free weld
- Excellent low temperature toughness down to -50°C
- Suitable for high strength fine grained steels
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20

TYPICAL APPLICATIONS :

- Welding of high strength, quenched and tempered fine grained steels like N-A-XTRA 65 & 70, USST1, T1B, WELTEN 70C
- Welding of SA533/533M Gr. B/C/D Class 2 & 3, SA543/543M Gr.B/C Class 1 & 2, SA225/225M Gr.C/D, SA738/738M Gr.A/B/C

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Cr	Mo	V	S	P
Specification	0.15 max	1.20-2.25	0.80 max	1.75-2.60	0.20-0.60	0.20-0.65	0.03 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -50°C, J
Specification	As Welded	760-900	680 min	15 min	27 min

Diffusible H₂ Content: <4 ml/100 gm

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 30	130 - 300	15
1.6	24 - 32	200 - 380	15



FCAW LOW ALLOY STEEL (High Strength)
AUTOMIG FC 120T5-K4

LOW ALLOY STEEL FCAW WIRE FOR 120 ksi HSLA STEELS



CLASSIFICATION : AWS A/SFA 5.29 EN ISO 18276-A

E120T5-K4 C/M H4 T 69 4 Mn2NiCrMo B C/M 4 H5

KEY FEATURES :

- Basic type gas shielded FCW wire
- Low alloy weld deposit
- Stable arc, Easy slag removal
- Low fumes, Minimal spatters
- Smooth and porosity free weld
- Works with CO₂ and Ar+CO₂ shielding gas
- Weld metal resistant to cracking in highly restrained joints
- High strength above 120 ksi with excellent low temperature impact properties at -50°C
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	15-20	10-20
80Ar+20CO ₂	15-25	10-20

TYPICAL APPLICATIONS :

- Welding of quenched and tempered steels and HSLA steels
- Mining machinery, cranes and construction equipment
- Welding low alloy steel such as T-1, HY 80, HY 100, ASTM A514 and other similar grades
- Repair of high strength castings

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Cr	Mo	V	S	P
Specification	0.15 max	1.20-2.25	0.80 max	1.75-2.60	0.20-0.60	0.20-0.65	0.03 max	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -50°C, J
Specification	As Welded	830-970	745 min	14 min	27 min

Diffusible H₂ Content: <4 ml/100 gm

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 30	130 - 300	15
1.6	24 - 32	180 - 350	15



FCAW LOW ALLOY STEEL (Weathering Steel)

AUTOMIG FC 180R

FCAW WIRE FOR WEATHERING STEEL JOINING



CLASSIFICATION : AWS A/SFA 5.29

APPROVALS :

E81T1-W2 C/M

RDSO Class IV

KEY FEATURES :

- Rutile type gas shielded FCW wire
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- Excellent corrosion resistance
- Matches coloring of ASTM weathering type structural steels
- Optimum combination of strength, ductility and notch toughness
- Radiographic quality weld

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of typical weathering steel such as ASTM A242, A588, CORTEN A and B grade
- Joining medium high tensile steel type D40S used for ship-building

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Cr	Cu	S	P
Specification	0.12 max	0.50-1.30	0.35-0.80	0.40-0.80	0.45-0.70	0.30-0.75	0.025 max	0.025 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Specification	As Welded	550-690	470 min	19 min	27 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 30	130 - 300	15
1.6	24 - 32	200 - 380	15

EQUIVALENT :

SMAW Electrode: **Ultracorten III**



MCAW Low Alloy Steel

AUTOMIG MC 90C-G

METAL CORED WIRE FOR HIGH TENSILE STEELS OF 620 MPa



CLASSIFICATION : AWS A/SFA 5.28

E90C-G

KEY FEATURES :

- Low alloy steel composite metal cored wire
- Smooth and stable arc
- Excellent bead appearance
- Excellent low temperature toughness at -50°C
- Recommended shielding gas Ar+CO₂
- For single and multi-pass welding
- High travel speed and high deposition rates
- Best suited for automated and robotized applications

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar+20CO ₂	15-25	10-20

TYPICAL APPLICATIONS :

- Joining of low alloy, high strength steels such as HY 80, A514, A710
- Heavy fabrication
- Earth moving equipment, mining machinery, cranes
- High grade structural steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Ni	Mo	S	P
Typical	0.04	1.2	0.4	2.5	0.3	0.010	0.015

MECHANICAL PROPERTIES OF ALL WELD METAL :

Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -50°C, J
Typical As Welded	710	660	21	50

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	24 - 32	140 - 350	15
1.6	26 - 34	200 - 400	15



FCAW STAINLESS STEEL MIGINOX OA 307

SELF SHIELD FLUX CORED WIRE FOR AUSTENITIC Mn STEEL WELDING



CLASSIFICATION : AWS A/SFA 5.22

E307T0-3

KEY FEATURES :

- Flux cored self shielded stainless steel wire of 307 type
- Typical 20Cr-9.5Ni-1Mo-4Mn weld deposit
- Smooth arc, less spatter
- Excellent bead appearance
- Excellent crack resistance with moderate strength

WELDING POSITION :



DCEP

TYPICAL APPLICATIONS :

- Dissimilar steel welding such as austenitic manganese steel to carbon steel
- Repairing cracks in austenitic Mn steel parts

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.13 max	3.30-4.75	1.0 max	19.5-22.0	9.0-10.5	0.5-1.5	0.03 max	0.04 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	590 min	30 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Electrical Stickout, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	20	23 - 30	120 - 220	12.5
1.6	20	23 - 33	150 - 250	12.5



FCAW STAINLESS STEEL MIGINOX FC 308L

GAS SHIELD FLUX CORED WIRE FOR EXTRA LOW CARBON 19/9 TYPE STAINLESS STEEL



CLASSIFICATION : AWS A/SFA 5.22 EN ISO 17633-A **APPROVALS:**

E308LT1-1/4 T 19 9 L R C/M 2 RDSO Class VI

KEY FEATURES :

- Rutile based extra low carbon gas shielded stainless steel FCW wire
- Typical 19Cr-10Ni weld deposit
- Stable arc, low spatter and easy slag removal
- Excellent bead appearance
- Excellent crack resistance and corrosion resistance
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of 18Cr-8Ni stainless steels of AISI 301, 302, 304, 304L type
- Application in Chemical, Food processing industries, Pipes & tubes

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.04 max	0.50-2.50	1.0 max	18.0-21.0	9.0-11.0	0.5 max	0.03 max	0.04 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 30	120 - 300	12.5
1.6	24 - 32	200 - 360	12.5

EQUIVALENT :

SMAW Electrode: **Superinox 1C**

GMAW Wire: **Miginox 308L**

GTAW Wire: **Tiginox 308L**



FCAW STAINLESS STEEL MIGINOX FC 309L

STAINLESS STEEL GAS SHIELDED FLUX CORED WIRE FOR DISSIMILAR STEEL JOINING



CLASSIFICATION : AWS A/SFA 5.22 EN ISO 17633-A

E309LT1-1/4 T 23 12 L R C/M 2

KEY FEATURES :

- An extra low carbon gas shielded stainless steel FCW wire
- Typical 23Cr-13Ni type weld deposit
- Stable arc, low spatter and easy slag removal
- Excellent bead appearance
- Excellent crack and corrosion resistance
- High oxidation resistance up to 1100°C
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of AISI 309L type steels and similar grade materials, castings, pipes and tubes
- Joining stainless steel to carbon steel
- For overlays, buttering on carbon and low alloy steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.04 max	0.50-2.50	1.0 max	22.0-25.0	12.0-14.0	0.5 max	0.03 max	0.04 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 32	120 - 300	12.5
1.6	24 - 34	200 - 360	12.5

EQUIVALENT :

SMAW Electrode: **Betanox DL**

GMAW Wire: **Miginox 309L**

GTAW Wire: **Tiginox 309L**



FCAW STAINLESS STEEL MIGINOX FC 316L

GAS SHIELDED FLUX CORED WIRE FOR 316L TYPE STAINLESS STEEL WELDING



CLASSIFICATION : AWS A/SFA 5.22 EN ISO 17633-A

E316LT1-1/4 T 19 12 3 L R C/M 2

KEY FEATURES :

- Rutile based extra low carbon gas shielded stainless steel FCW wire
- Typical 18Cr/12Ni/2.5Mo weld deposit
- Controlled ferrite content ensures resistance against cracking
- Improved corrosion, pitting and intergranular corrosion resistance
- Stable arc and low spatter
- Excellent bead appearance
- Easy slag removal
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of AISI 316, 316L, 317, 317L, 318 type stainless steel and similar grade
- Welding pipes, tubes and vessels
- Cladding stainless steels
- Application in textile processing, Naval and Chemical environments, Paper and pulp, Paint and dye industries, Food processing industries

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.04 max	0.50-2.50	1.0 max	17.0-20.0	11.0-14.0	2.0-3.0	0.03 max	0.04 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	485 min	30 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 32	120 - 300	12.5
1.6	24 - 34	200 - 360	12.5

EQUIVALENT :

SMAW Electrode: **Superinox 2C**

GMAW Wire: **Miginox 316L**

GTAW Wire: **Tiginox 316L**



FCAW STAINLESS STEEL **MIGINOX FC 347**

Nb STABILIZED STAINLESS STEEL GAS SHIELDED FLUX CORED WIRE



CLASSIFICATION : AWS A/SFA 5.22 EN ISO 17633-A

E347T1-1/4

T 19 9 Nb R C/M 2

KEY FEATURES :

- Rutile based gas shielded stainless steel FCW wire
- Typical 19/9/Nb stabilized stainless steel deposit
- Stable arc, low spatter and easy slag removal
- Excellent bead appearance
- Resistance to cracking and embrittlement
- Resistance to intergranular corrosion and scaling up to 850°C
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding stabilized Cr-Ni steels such as AISI 321, 321H, 347, 347H
- Welding of stainless steel tanks, valves, pipes in food, chemical and petrochemical industries
- Fabrication of boiler and gas turbine
- Fabrication of equipments in refineries, power plants, centrifugal pump impellers and shafts, valve faces, seats

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni
Specification	0.08 max	0.50-2.50	1.0 max	18.0-21.0	9.0-11.0
	Mo	Nb+Ta	Cu	S	P
Specification	0.75 max	8xC-1.0	0.75 max	0.03 max	0.04 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 32	120 - 300	12.5
1.6	24 - 34	200 - 360	12.5

EQUIVALENT :

SMAW Electrode: **Superinox 1B**

GMAW Wire: **Miginox 347**

GTAW Wire: **Tiginox 347**



FCAW STAINLESS STEEL

MIGINOX FC 410NiMo

GAS SHIELDED STAINLESS STEEL FLUX CORED WIRE FOR HIGH STRENGTH MARTENSITIC STAINLESS STEEL



CLASSIFICATION : AWS A/SFA 5.22 EN ISO 17633-A

E410NiMoT1-1/4 T 13 4 R C/M 2

KEY FEATURES :

- Rutile based gas shielded stainless steel FCW wire
- Typical 11.5Cr-4.5Ni-0.5Mo stainless steel deposit
- High strength combined with excellent toughness and cracking resistance
- Martensitic type alloy resistant to corrosion, erosion, pitting and impact
- Preheat and PWHT recommended
- Stable arc, low spatter and easy slag removal
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of ASTM CA 6NM casting or similar materials
- Welding of extra low carbon castings and forgings of similar composition and surfacing applications
- Surfacing of turbine blades, high pressure valves
- Repair of runners, valve seats, pulp and paper plant equipment

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.06 max	1.0 max	1.0 max	11.0-12.5	4.0-5.0	0.40-0.70	0.03 max	0.04 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	PWHT:600°C for 1 hr	760 min	15 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 32	120 - 300	12.5
1.6	24 - 34	200 - 360	12.5



FCAW DUPLEX STAINLESS STEEL **MIGINOX FC 2209**

GAS SHIELDED FLUX CORED WIRE FOR DUPLEX STAINLESS STEEL



CLASSIFICATION : AWS A/SFA 5.22 EN ISO 17633-A

E2209T1-1/4

T 22 9 3 N L R C/M 2

KEY FEATURES :

- Rutile based gas shielded duplex stainless steel FCW wire
- Typical 22Cr/8.5Ni/3Mo/N alloy
- Austenitic-ferritic type weld deposit
- Stable arc, low spatter and easy slag removal
- Uniform and fine ripples
- Excellent combination of high strength and resistance to chloride induced SCC and pitting
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-20	10-20
80Ar+20CO ₂	18-25	10-20

TYPICAL APPLICATIONS :

- Welding of 2205, 2209 type duplex stainless steels and similar composition
- Pipelines transporting chloride bearing products and sour gases
- Cast pumps, Valve bodies and seawater handling equipment
- For chemical equipments, heat exchangers, off-shore platforms
- Cladding on carbon and low alloy steels

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni
Specification	0.04 max	0.50-2.0	1.0 max	21.0-24.0	7.5-10.0
	Mo	N	Cu	S	P
Specification	2.5-4.0	0.08-0.20	0.50 max	0.03 max	0.04 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	690 min	20 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 32	120 - 300	12.5
1.6	24 - 34	200 - 360	12.5

EQUIVALENT :

SMAW Electrode: **Betanox 4462**

GMAW Wire: **Miginox 2209**

GTAW Wire: **Tiginox 2209**



MCAW STAINLESS STEEL
MIGINOX MC 409

TITANIUM STABILISED 409 TYPE GAS SHIELDED METAL CORED WIRE



CLASSIFICATION : AWS A/SFA 5.22 EN ISO 17633-A

EC409

T 13 Ti M M13/M21 3

KEY FEATURES :

- Gas shielded metal cored wire
- Typical 12Cr, Ti stabilized SS alloy
- Smooth operating characteristics
- Radiographic weld quality
- Ti addition form carbides to improve corrosion resistance, increase strength at high temperature and promote the ferritic microstructure

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
98Ar/2O ₂ or 80Ar/20CO ₂	15-25	10-20

TYPICAL APPLICATIONS :

- For joining of matching base materials of 409 type
- Automotive industries for automotive exhaust system components

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni
Specification	0.08 max	0.8 max	0.8 max	10.5-13.5	0.6 max
	Mo	Ti	S	P	
Specification	0.50 max	10xC-1.5	0.03 max	0.03 max	

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	As Welded	450 min	15 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	24 – 32	150 - 280	12.5/15
1.6	25 – 33	180 - 310	12.5/15



MCAW STAINLESS STEEL

MIGINOX MC 410NiMo

410NiMo TYPE GAS SHIELDED METAL CORED WIRE



CLASSIFICATION : AWS A/SFA 5.22 EN ISO 17633-A

EC410NiMo

T 13 4 M M13/M21 3

KEY FEATURES :

- Gas shielded metal cored wire
- Typical 12Cr-4.5Ni-0.5Mo deposit
- High strength combined with excellent toughness and cracking resistance
- Martensitic type alloy resistant to corrosion, erosion, pitting and impact
- Preheat and PWHT recommended
- Stable smooth arc, no spatter
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar/20CO ₂ or 98Ar/2O ₂	15-25	10-20

TYPICAL APPLICATIONS :

- Welding of ASTM CA 6NM casting or similar materials
- Welding of extra low carbon castings and forgings of similar composition and surfacing applications
- Surfacing of turbine blades, high pressure valves
- Repair of runners, valve seats, pulp and paper plant equipment

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	C	Mn	Si	Cr	Ni	Mo	S	P
Specification	0.06 max	0.60 max	0.50 max	11.0-12.5	4.0-5.0	0.4-0.7	0.03 max	0.03 max

MECHANICAL PROPERTIES OF ALL WELD METAL :

	Condition	UTS, MPa	EL%
Specification	PWHT:610°C for 1 hr	760 min	15 min

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	24 - 32	150 - 280	12.5/15
1.6	25 - 33	180 - 310	12.5/15



FCAW HARD FACING Abrasion-Impact **AUTOMIG FC 580**

FLUX CORED WIRE FOR RESISTANCE AGAINST HIGH ABRASION AND MODERATE IMPACT



ALLOY BASIS :

Medium Carbon High Chromium

KEY FEATURES :

- Basic type flux cored wire
- Smooth arc characteristics
- Low spatter, low fumes
- Non-machinable air hardenable deposit
- Resist high stress abrasion and friction
- Can withstand impact load of medium severity
- Resistant to spalling and cracking

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	10-15	10-20

TYPICAL APPLICATIONS :

- Hard facing applications on carbon steel and manganese components
- Machine parts subjected to high frictional wear
- Repair on damaged cold cutting tools
- Surfacing on austenitic manganese steels
- Screw conveyers, concrete mixer blades, crusher jaws and cones
- Pug mill screws, coal chutes dipper teeth, bucket teeth, crusher plates
- Brick machinery, pellet plant and tamping tools

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

PHYSICAL PROPERTIES :

Condition	Hardness, 3 Layer HRc (BHN)
As Welded	54-57 (550-600)

Machinability	Abrasion Resistance	Impact Resistance	Corrosion Resistance
-	■ ■ ■ ■ ■	■ ■ ■	■ ■

PARAMETERS - PACKING DATA :

Ø x L, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	23 - 31	120-250	15
1.6	25 - 33	200 - 380	15

Physical Properties: With increase in number of squares, property improves



FCAW HARD FACING Abrasion **AUTOMIG FC 600**

FLUX CORED WIRE FOR HIGH ABRASION RESISTANCE



ALLOY BASIS :

C, Cr, Mo

KEY FEATURES :

- C, Cr, Mo alloyed flux cored wire
- Smooth arc characteristics
- Low spatter, Minimal slag
- Air hardenable deposit
- Non machinable weld can be finished by grinding
- High hardness in single layer
- Can withstand mild impact

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar+20CO ₂ or 100% CO ₂	12-25	10-20

TYPICAL APPLICATIONS :

- Drilling bits, Punches, Dies
- Crane wheels, Shear blades
- Crushers, Hammers
- Paper cutting knives, Mine rails
- Oil expeller worms
- Conveyor parts

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

PHYSICAL PROPERTIES :

Condition	Hardness, 1 Layer HRc (BHN)
As Welded	58 (600)

Machinability	Abrasion Resistance	Impact Resistance	Corrosion Resistance
-	■■■■■	■ ■	■■■

PARAMETERS - PACKING DATA :

Ø x L, mm	Voltage, V	Amperage, A	Kg/Spool
1.2	22 - 32	120 - 300	15
1.6	24 - 34	160 - 350	15

Physical Properties: With increase in number of squares, property improves



FCAW Hard Facing
AUTOMIG FC 400

GAS SHIELDED FLUX CORED WIRE FOR RECLAMATION OF FORGING DIES



ALLOY BASIS :

C, Cr, Mn, Ni, Mo

KEY FEATURES :

- Gas shielded flux cored wire
- Low alloy steel weld deposit
- Stable and smooth arc
- Easy slag removal, smooth weld bead
- Excellent resistance to metal to metal wear and thermal shocks
- Suitable for multi-pass crack free welding
- Radiographic weld quality

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar+20CO ₂	18-25	15-30

TYPICAL APPLICATIONS :

- For surfacing and reclamation of large hot working dies specially drop forging dies, hot working tools
- Suitable for H11, H13, DIN 1.2714 and DB-6 die block material

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

MECHANICAL PROPERTIES OF ALL WELD METAL :

Condition	3 Layer Hardness, HRc
As Welded	38-44

PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
2.40	25 - 32	220 - 400	12.5



MCAW (Hard facing)
AUTOMIG MC 40

GAS SHIELDED METAL CORED WIRE FOR RECLAMATION OF HOT FORGING DIES



ALLOY BASIS :

Cr, Mo, Ni, V

KEY FEATURES :

- Gas shielded metal cored wire
- Low alloy steel weld deposit
- Stable and smooth arc, no spatter
- No slag, smooth weld bead
- Weld deposit free from porosity
- Excellent resistance to metal to metal wear at high temperatures and thermal shocks
- Suitable for multi-pass crack free welding

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar+20CO ₂	18-25	15-30

TYPICAL APPLICATIONS :

- For surfacing and reclamation of large hot working dies specially drop and press forging dies, hot working tools
- Suitable for H11, H13, DIN 1.2714 and DB-6 die block material

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

PHYSICAL PROPERTIES :

Condition	3 Layer Hardness, HRC
As Welded	39-44
Stress Relieved	40-45

Machinability

Metal to Metal Wear Resistance

Impact Resistance

Corrosion Resistance



PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.60	26 – 32	260 – 400	12.5
2.00	27 – 34	280 – 450	12.5
2.40	28 – 36	300 – 500	12.5



MCAW (Hard facing)
AUTOMIG MC 42

GAS SHIELDED METAL CORED WIRE FOR RECLAMATION OF HOT FORGING DIES



ALLOY BASIS :

Cr, Mo, Ni, V

KEY FEATURES :

- Gas shielded metal cored wire
- Low alloy steel weld deposit
- Stable and smooth arc, no spatter
- No slag, smooth weld bead
- Weld deposit free from porosity
- Excellent resistance to metal to metal wear at high temperatures and thermal shocks
- Suitable for multi-pass crack free welding

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar+20CO ₂	18-25	15-30

TYPICAL APPLICATIONS :

- For surfacing and reclamation of large hot working dies specially drop and press forging dies, hot working tools
- Suitable for H11, H13, DIN 1.2714 and DB-6 die block material

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

PHYSICAL PROPERTIES :

Condition	3 Layer Hardness, HRC
As Welded	43-47
Stress Relieved	44-48

Machinability

Metal to Metal Wear Resistance

Impact Resistance

Corrosion Resistance



PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.60	26 – 32	260 – 400	12.5
2.00	27 – 34	280 – 450	12.5
2.40	28 – 36	300 – 500	12.5



MCAW (Hard facing)
AUTOMIG MC 50

GAS SHIELDED METAL CORED WIRE FOR RECLAMATION OF HOT FORGING DIES



ALLOY BASIS :

Cr, Mo, Ni, W, V

KEY FEATURES :

- Gas shielded metal cored wire
- Stable and smooth arc, no spatter
- No slag, smooth weld bead
- Excellent toughness and hardness properties at high temperatures
- Resist metal to metal wear and thermal shocks
- Weld deposit free from porosity
- Multi-pass crack free weld maximum up to 15 mm

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar+20CO ₂	18-25	15-30

TYPICAL APPLICATIONS :

- For surfacing and reclamation of large hot working dies, press forging dies hot working tools
- Hot piercing punches, Impactor dies, Screw press dies
- Forming dies, Trimming dies, Blanking dies
- Suitable for H11, H13, DIN 1.2714 and DB-6 die block material
- Parts of earth moving equipment

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

PHYSICAL PROPERTIES :

Condition	3 Layer Hardness, HRc
As Welded	48-52
Stress Relieved	49-54

Machinability

Metal to Metal Wear Resistance

Impact Resistance

Corrosion Resistance



PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.60	26 – 32	260 – 400	12.5
2.00	27 – 34	280 – 450	12.5
2.40	28 – 36	300 – 500	12.5



MCAW (Hard facing)
AUTOMIG MC 52

GAS SHIELDED METAL CORED WIRE FOR ELEVATED TEMPERATURE ABRASION - CORROSION RESISTANCE



ALLOY BASIS :

C, Ni, Mo, Cr

KEY FEATURES :

- Gas shielded metal cored wire
- Stable and smooth arc, no spatter
- No slag, smooth weld bead
- Special alloying to improve impact resistance and red hardness
- Crack free weld in heavy build up
- Resistant to severe abrasion and corrosion at elevated temperature
- No drop in hardness even at 500°C due to secondary hardening

WELDING POSITION :



DCEP

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
80Ar+20CO ₂	15-25	10-20

TYPICAL APPLICATIONS :

- Blast furnace Bells & Hoppers
- Steel mill equipments
- Tong pins, Hot shears
- Metallurgical plants

STORAGE / HANDLING :

Keep dry and follow handling instructions mentioned on the box

PHYSICAL PROPERTIES :

Condition	3 Layer Hardness, HRc	
As Welded	At Room Temp	50-55
	At 500°C	>55

Machinability

Abrasion Resistance

Impact Resistance

Corrosion Resistance

-



PARAMETERS - PACKING DATA :

Ø, mm	Voltage, V	Amperage, A	Kg/Spool
1.20	24 – 31	200 – 320	12.5 / 15
1.60	26 – 33	250 – 380	12.5 / 15

Physical Properties: With increase in number of squares, property improves



NOTE ON SAW FLUXES



1. BASICITY OF THE FLUX:

Basicity is ratio of Basic oxides to Acidic oxides present in the flux. For the basicities mentioned in AWL literature, formula devised by Boniszewski is used, which is as below:

$$\text{Basicity} = \frac{\text{CaO} + \text{MgO} + \text{CaF}_2 + \text{NaO} + \text{K}_2\text{O} + \frac{1}{2}(\text{MnO} + \text{FeO})}{\text{SiO}_2 + \frac{1}{2}(\text{Al}_2\text{O}_3 + \text{TiO}_2 + \text{ZrO}_2)}$$

Based on Basicity No. Fluxes are divided in following Types:

- Acidic – Basicity ≤ 0.80
- Neutral – $0.80 > \text{Basicity} \leq 1.20$
- Basic – $1.20 > \text{Basicity} < 2.00$
- High Basic – Basicity > 2.00

2. ACTIVITY OF FLUXES:

Activity of the flux is devised by Wall Neutrality Number. Wall Neutrality Number is measured as below:

- Make two chemistry pads with same wire flux combination, same welding parameters, except voltage used for 2nd pad is increased by 8V.
- They are analyzed for Si and Mn.
- The wall neutrality Number is calculated by following formula:

$$\text{Wall Neutrality Number} = 100 (|\Delta \% \text{Si}| + |\Delta \% \text{Mn}|)$$

$$\Delta \% \text{Si} - \text{Difference in Si in two pads}$$

$$\Delta \% \text{Mn} - \text{Difference in Mn in two pads}$$

Wall Neutrality Number is absolute value, ignoring positive and negative sign.

Based on Activity, Fluxes are divided into following types:

- Active Flux – Wall Neutrality Number > 35
- Neutral Flux – Wall Neutrality Number ≤ 35

3. RE-DRYING OF SAW FLUXES:

Recommended cycle for flux re-drying: 300-350°C for minimum 2 hrs.



C-Mn STEEL WIRES FOR SAW WELDING

COPPER COATED C-Mn STEEL SOLID WIRES



CLASSIFICATION :

Product	EN 14171	AWS A/SFA 5.17
AUTOMELT EL8 (AUTOMELT Gr.A)	S1	EL8
AUTOMELT EL8K	S1 Si	EL8 K
AUTOMELT EL12	S1	EL12
AUTOMELT EM12K	S2Si	EM12K
AUTOMELT EH10K	S3	EH10K
AUTOMELT EH12K	S3Si	EH12K
AUTOMELT EH11K		EH11K
AUTOMELT EH14	S4	EH14

KEY FEATURES :

- Uniform copper coating
- Smooth feeding
- Close dimensional tolerances
- Controlled Chemistry

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% (Typical, Including Cu in coating):

Product	C	Mn	Si	Cu
AUTOMELT EL8 (AUTOMELT Gr.A)	0.06	0.50	0.03	0.1
AUTOMELT EL8K	0.07	0.45	0.15	0.1
AUTOMELT EL12	0.09	0.50	0.03	0.1
AUTOMELT EM12K	0.09	1.00	0.20	0.1
AUTOMELT EH10K	0.08	1.40	0.15	0.1
AUTOMELT EH12K	0.10	1.55	0.25	0.1
AUTOMELT EH11K	0.09	1.50	0.90	0.1
AUTOMELT EH14	0.12	1.70	0.04	0.1

DIAMETERS - PACKING DATA :

Product	Ø, mm	Kg / Spool	Kg / Bobbin	SAWPAC DRUM, Kg
AUTOMELT EL8 (AUTOMELT Gr.A)	1.6, 2.0, 2.5, 3.15, 4.0, 5.0	25	250	1.6 - 100 / 250 Others – 350 / 500
AUTOMELT EL8K	1.6, 2.0, 2.5, 3.15, 4.0, 5.0	25	250	1.6 - 100 / 250 Others – 350 / 500
AUTOMELT EL12	1.6, 2.0, 2.5, 3.15, 4.0, 5.0, 5.50	25	250	1.6 - 100 / 250 Others – 350 / 500
AUTOMELT EM12K	1.6, 2.0, 2.5, 3.15, 4.0, 5.0	25	250	1.6 - 100 / 250 Others – 350 / 500
AUTOMELT EH10K	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EH12K	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EH11K	1.6, 2.0, 2.5, 3.15, 4.0, 5.0	25	250	1.6 - 100 / 250 Others – 350 / 500
AUTOMELT EH14	2.5, 3.15, 4.0, 5.0	25	250	350 / 500



WIRES FOR SUBMERGED ARC WELDING OF CREEP RESISTANT STEELS

COPPER COATED LOW ALLOY STEEL SOLID WIRES



CLASSIFICATION :

Product	EN 14171	EN 12070	AWS A/SFA 5.23
AUTOMELT EA2	S2Mo		EA2
AUTOMELT EA3	S4Mo		EA3
AUTOMELT EA4	S3Mo	S MnMo	EA4
AUTOMELT EA2TiB			EG
AUTOMELT EB2		S CrMo1	EB2
AUTOMELT EB2R		S CrMo1	EB2R
AUTOMELT EB3		S CrMo2	EB3
AUTOMELT EB3R		S CrMo2	EB3R
AUTOMELT EB6		S CrMo5	EB6
AUTOMELT EB91		S CrMo91	EB91

KEY FEATURES :

- Uniform copper coating
- Smooth feeding
- Close dimensional tolerances
- Controlled Chemistry

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% (Typical, Including Cu in coating):

Product	C	Mn	Si	Cr	Mo	Cu	Other
AUTOMELT EA2	0.09	1.10	0.15		0.50	0.10	
AUTOMELT EA3	0.09	1.80	0.15		0.50	0.10	
AUTOMELT EA4	0.09	1.40	0.15		0.50	0.10	
AUTOMELT EA2TiB	0.09	1.10	0.15		0.50	0.10	Ti-0.1; B-0.013
AUTOMELT EB2	0.10	0.60	0.15	1.25	0.50	0.10	
AUTOMELT EB2R	0.10	0.60	0.15	1.25	0.50	0.10	S-0.007; P-0.008; As-0.004; Sn-0.004; Sb-0.004; Bruscati factor X < 15
AUTOMELT EB3	0.10	0.60	0.15	2.25	1.00	0.10	
AUTOMELT EB3R	0.10	0.60	0.15	2.25	1.00	0.10	S-0.007; P-0.008; As-0.004; Sn-0.004; Sb-0.004; Bruscati factor X < 15
AUTOMELT EB6	0.08	0.60	0.30	6.0	0.6	0.10	
AUTOMELT EB91	0.10	0.40	0.25	9.00	1.00	0.07	Ni-0.5; V-0.2; Nb-0.05; N-0.05; Al-0.005

DIAMETERS - PACKING DATA :

Product	Ø, mm	Kg / Spool	Kg / Bobbin	SAWPAC DRUM, Kg
AUTOMELT EA2	2.0, 2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EA3	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EA4	2.0, 2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EA2TiB	2.0, 2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EB2	2.0, 2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EB2R	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EB3	2.0, 2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EB3R	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EB6	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EB91	2.5, 3.15, 4.0, 5.0	25	250	350 / 500



WIRES FOR SUBMERGED ARC WELDING FOR CRYOGENIC APPLICATIONS

COPPER COATED LOW ALLOY STEEL SOLID WIRES



CLASSIFICATION :

Product	EN 14171	AWS A/SFA 5.23
Automelt ENi1	S2Ni1	ENi1
Automelt ENi2	S2Ni2	ENi2
Automelt ENi3	S2Ni3	ENi3
Automelt ENi5	--	ENi5

KEY FEATURES :

- Uniform copper coating
- Smooth feeding
- Close dimensional tolerances
- Controlled Chemistry

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% (Typical, Including Cu in coating):

Product	C	Mn	Si	Ni	Cu	Mo
AUTOMELT ENi1	0.10	1.00	0.20	1.00	0.10	-
AUTOMELT ENi2	0.10	1.00	0.20	2.20	0.10	-
AUTOMELT ENi3	0.10	1.00	0.20	3.25	0.10	-
AUTOMELT ENi5	0.10	1.30	0.20	1.00	0.10	0.20

DIAMETERS - PACKING DATA :

Product	Ø, mm	Kg / Spool	Kg / Bobbin	SAWPAC DRUM, Kg
AUTOMELT ENi1	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT ENi2	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT ENi3	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT ENi5	2.5, 3.15, 4.0, 5.0	25	250	350 / 500



WIRES FOR SUBMERGED ARC WELDING OF HIGH STRENGTH STEELS

COPPER COATED LOW ALLOY STEEL SOLID WIRES



CLASSIFICATION :

Product	EN 14171	EN 26304-A	AWS A/SFA 5.23
AUTOMELT EF1	S2Ni1Mo		EF1
AUTOMELT EF2			EF2
AUTOMELT EF3	S3Ni1Mo		EF3
AUTOMELT EF4			EF4
AUTOMELT EF5			EF5
AUTOMELT S3NiCrMo2.5		S3Ni2.5CrMo	EG

KEY FEATURES :

- Uniform copper coating
- Smooth feeding
- Close dimensional tolerances
- Controlled Chemistry

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% (Typical, Including Cu in coating):

Product	C	Mn	Si	Mo	Ni	Cr	Cu
AUTOMELT EF1	0.10	1.20	0.25	0.45	1.00		0.10
AUTOMELT EF2	0.12	1.80	0.20	0.50	0.60		0.10
AUTOMELT EF3	0.12	1.75	0.20	0.55	0.90		0.10
AUTOMELT EF4	0.18	0.80	0.25	0.25	0.60	0.50	0.10
AUTOMELT EF5	0.12	1.80	0.15	0.50	2.50	0.40	0.10
AUTOMELT S3NiCrMo2.5	0.12	1.50	0.20	0.50	2.50	0.60	0.10

DIAMETERS - PACKING DATA :

Product	Ø, mm	Kg / Spool	Kg / Bobbin	SAWPAC DRUM, Kg
AUTOMELT EF1	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EF2	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EF3	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EF4	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT EF5	2.5, 3.15, 4.0, 5.0	25	250	350 / 500
AUTOMELT S3NiCrMo2.5	2.5, 3.15, 4.0, 5.0	25	250	350 / 500



WIRES FOR SUBMERGED ARC WELDING OF STAINLESS STEELS

STAINLESS STEEL SOLID WIRES



CLASSIFICATION :

Product	EN ISO 14343-A	AWS A/SFA 5.9
SUBINOX 308L	S 19 9 L	ER308L
SUBINOX 308H		ER308H
SUBINOX 316L	S 19 12 3 L	ER316L
SUBINOX 309L	S 23 12 L	ER309L
SUBINOX 309LMO		ER309LMO
SUBINOX 347	S 19 9 Nb	ER347
SUBINOX 410	S 13	ER410
SUBINOX 410NiMo	S 13 4	ER410NiMo
SUBINOX 430	S 17	ER430
SUBINOX 2209	S 22 9 3 NL	ER2209
SUBINOX 2553		ER2553
SUBINOX 2594		ER2594

KEY FEATURES :

- Smooth feeding
- Close dimensional tolerances
- Controlled Chemistry

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

Product	C	Mn	Si	Cr	Ni	Mo	Other Elements
SUBINOX 308L	0.025	1.50	0.40	19.5	9.3	--	--
SUBINOX 308H	0.05	1.50	0.40	19.5	9.2	--	--
SUBINOX 316L	0.025	1.50	0.40	18.5	11.5	2.2	--
SUBINOX 309L	0.025	1.50	0.40	23.5	12.2	--	--
SUBINOX 309LMO	0.025	1.50	0.40	23.5	12.2	2.2	--
SUBINOX 347	0.03	1.50	0.30	19.8	9.7	--	Nb + Ta – 0.60
SUBINOX 410	0.05	0.40	0.30	12.0	--	--	--
SUBINOX 410NiMo	0.03	0.40	0.30	12.0	4.5	0.45	--
SUBINOX 430	0.04	0.40	0.30	16.0	--	--	--
SUBINOX 2209	0.02	1.20	0.45	22.5	8.0	2.7	N – 0.12
SUBINOX 2553	0.02	0.60	0.40	25.0	5.5	3.5	Cu – 2.0
SUBINOX 2594	0.015	0.55	0.40	25.2	9.1	4.0	N – 0.25, W – 0.10



WIRES FOR SUBMERGED ARC WELDING OF STAINLESS STEELS

STAINLESS STEEL SOLID WIRES



DIAMETERS - PACKING DATA :

Product	Ø, mm	Kg / Spool	Kg / Bobbin	SAWPAC DRUM, Kg
SUBINOX 308L	0.8, 1.2, 1.6, 2.0, 2.5, 3.15, 4.0, 5.0	0.8 to 1.6 mm – 12.5 kg spool	2.0 to 5.0 mm - 250	0.8 to 1.6 – 100 & 250
SUBINOX 308H				
SUBINOX 316L				
SUBINOX 309LMo		1.6 to 5.0 – 25 kg Spool		2.0 to 5.0 - 350 & 500
SUBINOX 309L				
SUBINOX 347				
SUBINOX 410				
SUBINOX 410NiMo				
SUBINOX 430				
SUBINOX 2209				
SUBINOX 2553				
SUBINOX 2594				



WIRES FOR SUBMERGED ARC WELDING OF NICKEL & NICKEL ALLOYS

NICKEL & NICKEL ALLOY SOLID WIRES



CLASSIFICATION :

Product	AWS A/SFA 5.14
AUTOMELT NiCrMo3	ERNiCrMo3
AUTOMELT NiCrMo4	ERNiCrMo4

KEY FEATURES :

- Smooth feeding
- Close dimensional tolerances
- Controlled Chemistry

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% :

Product	C	Mn	Fe	Si	Cr	Mo	Other Elements
AUTOMELT NiCrMo3	0.03	0.20	4.0	0.15	22.0	9.1	Nb-3.5; Al-0.1; Ti-0.1; Ni > 62.0
AUTOMELT NiCrMo4	0.01	0.60	5.0	0.03	15.0	16.0	W-4.0; Co-0.2; Cu- 0.01

DIAMETERS - PACKING DATA :

Product	Ø, mm	Kg / Spool	Kg / Bobbin	SAWPAC DRUM, Kg
Automelt NiCrMo3	2.5, 3.15, 4.0, 5.0	25	250	350 & 500
Automelt NiCrMo4	2.5, 3.15, 4.0, 5.0	25	250	350 & 500



SAW Fluxes

AUTOMELT A55 (AUTOMELT Gr II)



GENERAL DESCRIPTION:

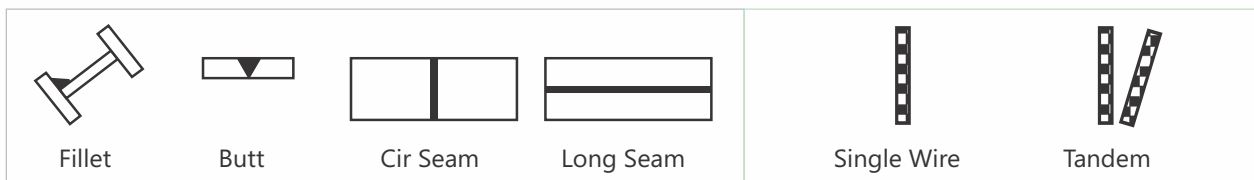
- Agglomerated Flux
- Aluminate- Rutile Type Flux
- Acidic Flux having Basicity Index of 0.6
- Active Flux with moderate Si and Mn pick-up
- For Single and Multi-pass Butt and fillet welding (With EM12K Wire restrict to 15 mm thickness for multi-pass)
- For Carbon Steels
- Suitable for Single Wire & Tandem System
- Suitable for Welding Speeds of 0.35-0.60 m/min
- Grain Size – 0.25-2.00 mm
- Type of Current – DCEP / AC 800A
- Wall Neutrality Number with EL8 Wire is 56

CLASSIFICATION :

With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8 (AUTOMELT Gr.A)	F7AZ/PZ-EL8	Multi-pass
AUTOMELT EL12	F7AZ/PZ-EL12	Multi-pass
AUTOMELT EM12K	F7A0/P0-EM12K	Limited Multi-pass
AUTOMELT EH11K	F7AZ-EH11K	Single Pass

TYPICAL APPLICATIONS :

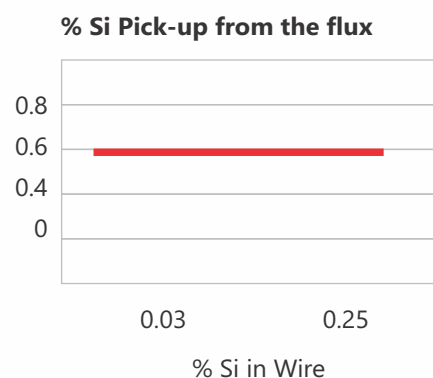
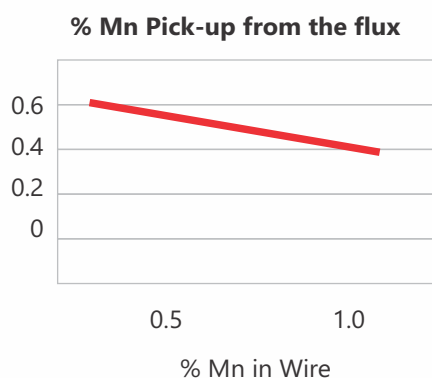
- General Structural Welding
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Cylinders and vessels



APPROVALS:

RDSO, ABS, BV, DNV, IRS, LRA, MND, IBR

ACTIVITY OF THE FLUX:



(continue...)



SAW Fluxes

AUTOMELT A55 (AUTOMELT Gr II)



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
30	10	45	15

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8 (Automelt Gr.A)	0.06	1.10	0.65
Automelt EL12	0.08	1.20	0.65
Automelt EM12K	0.07	1.40	0.80
Automelt EH11K	0.07	1.80	1.10

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact	
					0°C	-20°C
Automelt EL8 (Automelt Gr.A)	AW	530	440	25	50	--
Automelt EL8	PW	500	420	27	60	--
Automelt EL12	AW	540	450	26	50	--
Automelt EL12	PW	510	430	28	60	--
Automelt EM12K	AW	540	450	28	--	40
Automelt EM12K	PW	510	430	30	--	50

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes

AUTOMELT A57



GENERAL DESCRIPTION:

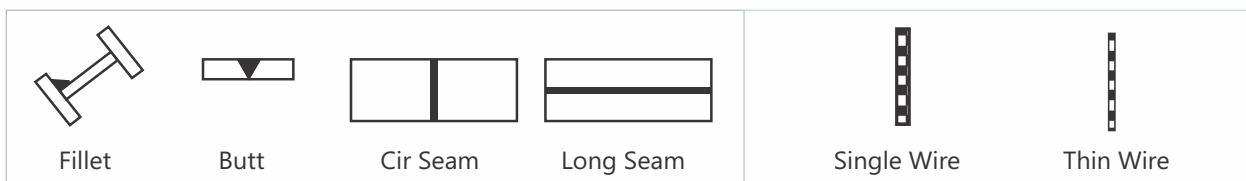
- Agglomerated Flux
- Aluminate-Rutile Type Flux
- Acidic Flux having Basicity Index of 0.5
- Active Flux with moderate Si and Mn pick-up
- For Single and Multi-pass Butt and fillet welding (With EM12K Wire restrict to 15 mm thickness for multi-pass)
- For Carbon Steels
- Suitable for Single Wire System & thin wire SAW
- Suitable for Welding Speeds of 0.20-0.75 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP 800A
- Wall Neutrality Number with EL8 Wire is 60

CLASSIFICATION :

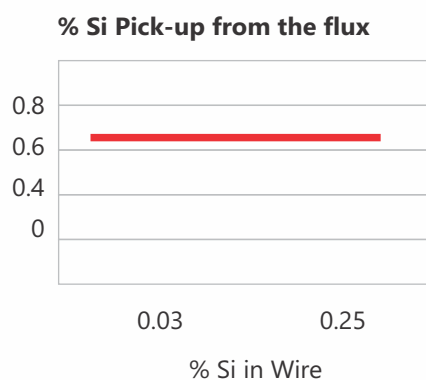
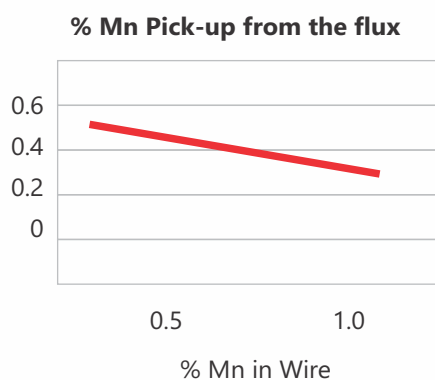
With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8	F7AZ/PZ-EL8	Multi-pass
AUTOMELT EL12	F7AZ/PZ-EL12	Multi-pass
AUTOMELT EM12K	F7AZ-EM12K	Limited Multi-pass
AUTOMELT EH11K	F7AZ-EH11K	Single Pass

TYPICAL APPLICATIONS :

- General Structural Welding
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Cylinders and vessels



ACTIVITY OF THE FLUX:



(continue...)



SAW Fluxes

AUTOMELT A57



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
25	10	55	5

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8	0.07	1.00	0.70
Automelt EL12	0.08	1.10	0.70
Automelt EM12K	0.07	1.30	0.80
Automelt EH11K	0.07	1.90	1.20

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J) 0°C
Automelt EL8	AW	530	440	25	40
Automelt EL8	PW	500	420	27	50
Automelt EL12	AW	540	450	26	40
Automelt EL12	PW	510	430	28	50
Automelt EM12K	AW	540	450	28	40

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes **AUTOMELT A81**



GENERAL DESCRIPTION:

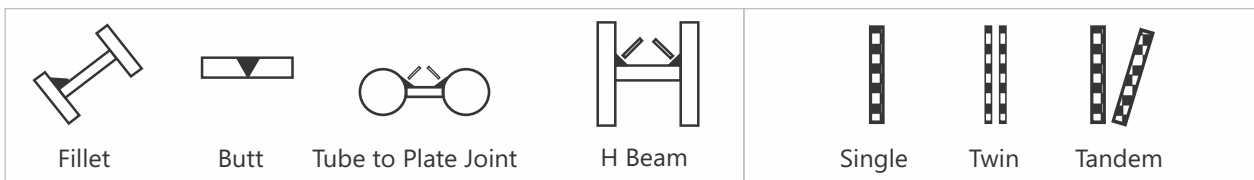
- Agglomerated Flux
- Aluminate- Rutile Type Flux
- Acidic Flux having Basicity Index of 0.6
- Active Flux with moderate Si and Mn pick-up
- For Single and Multi-pass Butt and fillet welding at high speeds
- For Low Alloy Steels
- Suitable for Single and Multi-Wire, twin and tandem wire system
- Suitable for Welding Speeds of 0.40-1.20 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / AC 1000A
- Wall Neutrality Number with EM12K Wire is 56

CLASSIFICATION :

With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EM12K	F7AZ-EM12K	Limited Multi-pass
AUTOMELT EA2	F8AZ-EA2-A2	Limited Multi-pass
AUTOMELT EA4	F8AZ-EA4-A4	Limited Multi-pass
AUTOMELT EB2	F9PZ-EB2-B2	Limited Multi-pass
AUTOMELT EB3	F9PZ-EB3-B3	Limited Multi-pass

TYPICAL APPLICATIONS :

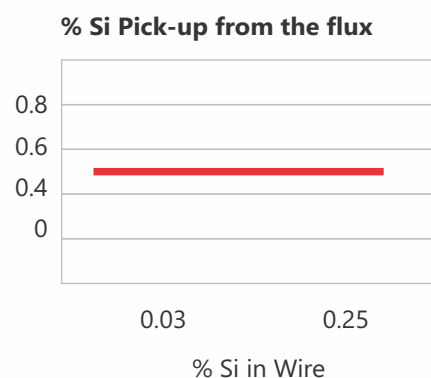
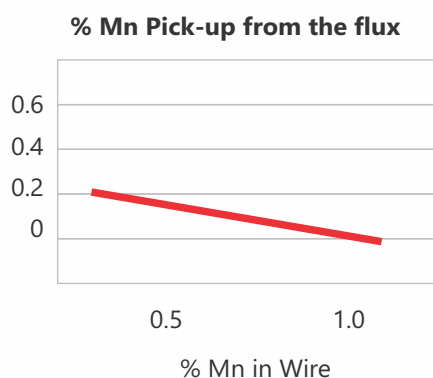
- High Speed Butt & Fillet Welding
- Tube to Plate Joint
- Fabrication of H & I Beams
- Fabrication of Boilers



APPROVALS:

IBR

ACTIVITY OF THE FLUX:





SAW Fluxes

AUTOMELT A81



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
25	10	50	10

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Cr	Mo
Automelt EM12K	0.07	1.20	0.70	--	--
Automelt EA2	0.06	1.20	0.70	--	0.50
Automelt EA4	0.06	1.50	0.70	--	0.50
Automelt EB2	0.06	1.15	0.70	1.10	0.50
Automelt EB3	0.06	1.15	0.70	2.10	1.00

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J) 0°C
Automelt EM12K	AW	540	430	26	40
Automelt EA2	AW	570	500	23	40
Automelt EA4	AW	600	520	23	40
Automelt EB2	PW	640	570	20	40
Automelt EB3	PW	700	600	19	40

AW – As Welded; PW – After Post weld heat treatment of 690°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes **AUTOMELT A82**



GENERAL DESCRIPTION:

- Agglomerated Flux
- Aluminate- Rutile Type Flux
- Acidic Flux having Basicity Index of 0.6
- Active Flux with moderate Si and Mn pick-up
- For Single and Multi-pass Butt and fillet welding at very high speeds
- For Low Alloy Steels
- Suitable for Single and twin Wire system
- Suitable for Welding Speeds of 0.40-2.0 m/min
- Grain Size – 0.25-1.20 mm
- Type of Current – DC / AC 1000A
- Wall Neutrality Number with EM12K Wire is 85

CLASSIFICATION :

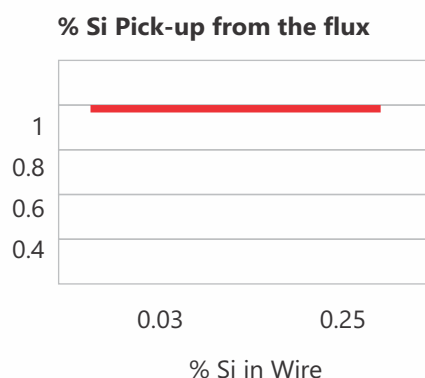
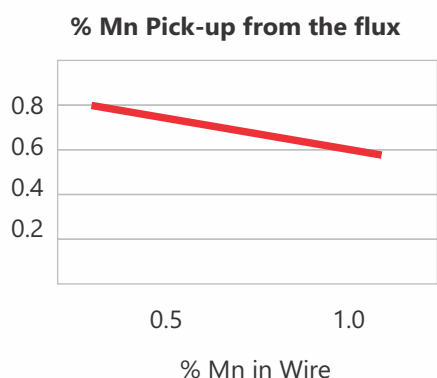
With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8	F7AZ-EL8	Limited Multi-pass
AUTOMELT EL12	F7AZ-EL12	Limited Multi-pass
AUTOMELT EM12K	F7AZ-EM12K	Limited Multi-pass

TYPICAL APPLICATIONS :

- Structural Welding
- High Speed Fillet Welding
- Fabrication of H & I Beams
- Fabrication of Boilers



ACTIVITY OF THE FLUX:



(continue...)



SAW Fluxes

AUTOMELT A82



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
25	10	50	10

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8	0.06	1.20	1.00
Automelt EL12	0.07	1.20	1.00
Automelt EM12K	0.06	1.60	1.30

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J) 0°C
Automelt EL8	AW	550	460	22	40
Automelt EL12	AW	560	460	23	40
Automelt EM12K	AW	560	470	23	40

AW – As Welded

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes **AUTOMELT A61**



GENERAL DESCRIPTION:

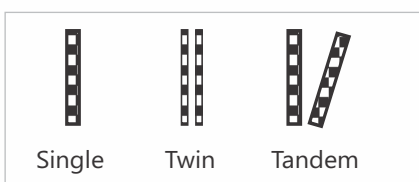
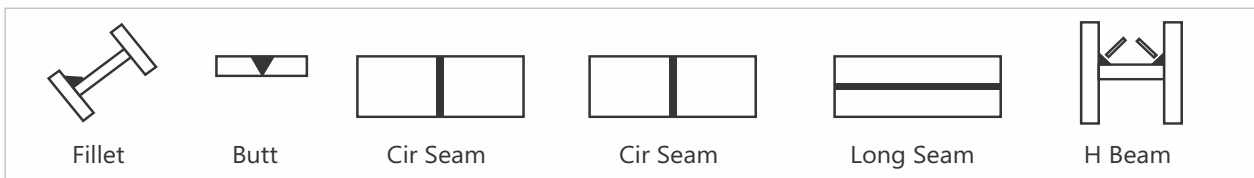
- Agglomerated Flux
- Manganese-Silicate Type Flux
- Neutral Flux having Basicity Index of 1.0
- Active Flux with high Si and Mn pick-up
- For Single and Multi-pass Butt and fillet welding at high speeds (With EM12K Wire restrict to 15 mm thickness for multi-pass)
- For Carbon Steels
- Suitable for Single and Multi-Wire, twin and tandem wire system
- Suitable for Welding Speeds of 0.40 – 2.00 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DC / AC 1200A
- Wall Neutrality Number with EM12K Wire is 85

CLASSIFICATION :

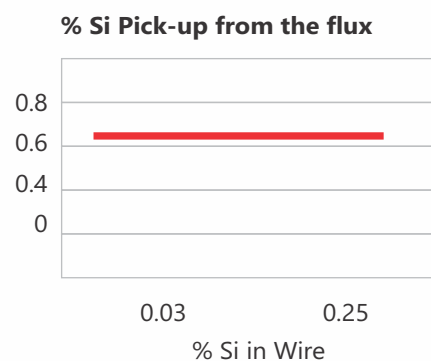
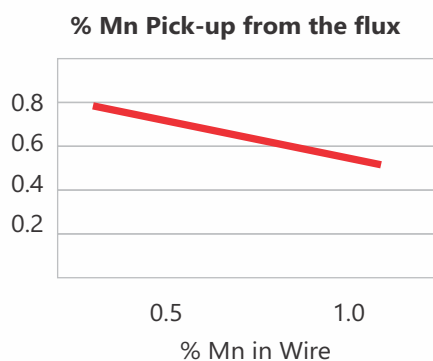
With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8	F7A0-EL8	Multi-pass
AUTOMELT EL12	F7A0-EL12	Multi-pass
AUTOMELT EM12K	F7A2/P2-EM12K	Limited Multi-pass

TYPICAL APPLICATIONS :

- High Speed Butt Welding
- Spiral, long Seam and Cir Seam Welding of Pipes
- Fabrication of H & I Beams (thickness above 6 mm)



ACTIVITY OF THE FLUX:





SAW Fluxes

AUTOMELT A61



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
35	15	40	5

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8	0.06	1.30	0.70
Automelt EL12	0.07	1.30	0.70
Automelt EM12K	0.06	1.50	0.90

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J)	
					-20°C	-30°C
Automelt EL8	AW	530	440	25	40	--
Automelt EL12	AW	540	450	26	40	--
Automelt EM12K	AW	510	430	28	50	40
Automelt EM12K	PW	540	450	28	50	40

AW – As Welded; PW - After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes

AUTOMELT A61S



GENERAL DESCRIPTION:

- Agglomerated Flux
- Calcium-Silicon Type Flux
- Neutral Flux having Basicity index of 1.0
- Active Flux with moderate Si and Mn pick-up
- For Single and Multi-pass Butt welding at high speeds (With EM12K Wire restrict to 15 mm thickness for multi-pass)
- For Carbon Steels
- Suitable for Single and Multi-Wire, twin and tandem wire system
- Suitable for Welding Speeds of 0.40 – 2.00 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DC / AC 1200A
- Wall Neutrality Number with EM12K Wire is 55

CLASSIFICATION :

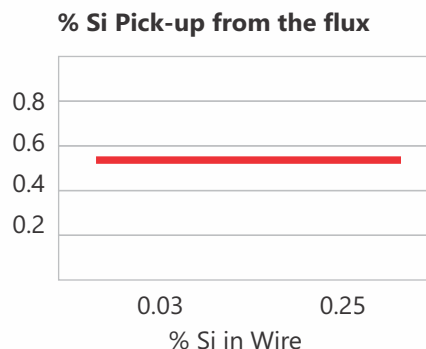
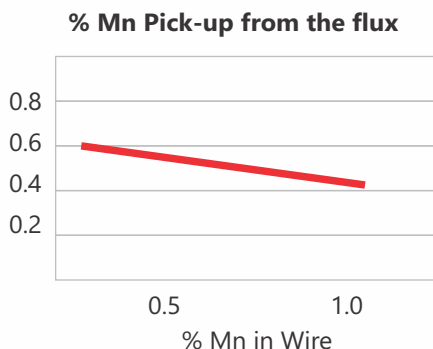
With Wire	AWS 5.17/5.23	Single/Multi-pass
AUTOMELT EL8	F7AZ-EL8	Multi-pass
AUTOMELT EL12	F7AZ-EL12	Multi-pass
AUTOMELT EM12K	F7A0/P0-EM12K	Limited Multi-pass

TYPICAL APPLICATIONS :

- High Speed Butt Welding
- Spiral, long Seam and Cir Seam Welding of Pipes



ACTIVITY OF THE FLUX:



CHEMICAL COMPOSITION OF FLUX:

SiO ₂ + TiO ₂	CaO + MgO	Al ₂ O ₃ + MnO	CaF ₂
35	25	30	10

(continue...)



SAW Fluxes

AUTOMELT A61S



CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8	0.06	0.80	0.50
Automelt EL12	0.07	0.80	0.50
Automelt EM12K	0.06	1.10	0.60

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J) -20°C
Automelt EL8	AW	530	440	25	-
Automelt EL12	AW	540	450	26	-
Automelt EM12K	AW	530	450	28	50
Automelt EM12K	PW	520	430	28	60

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes

AUTOMELT B31 (AUTOMELT Gr IV)



GENERAL DESCRIPTION:

- Agglomerated Flux
- Fluoride-Basic Type Flux
- Acidic Flux having Basicity Index of 1.5
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding
- For Carbon & Low Alloy Steels
- Suitable for Single Wire System
- Suitable for Welding Speeds of 0.40 – 0.60 m/min
- Grain Size – 0.25-2.00 mm
- Type of Current – DCEP
- Wall Neutrality Number with EH14 Wire is 7

CLASSIFICATION :

With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8 (AUTOMELT Gr.A)	F6A2-EL8	Multi-pass
AUTOMELT EL12	F6A2-EL12	Multi-pass
AUTOMELT EM12K	F7A2-EM12K	Multi-pass
AUTOMELT EH14	F7A4/P4-EH14	Multi-pass

TYPICAL APPLICATIONS :

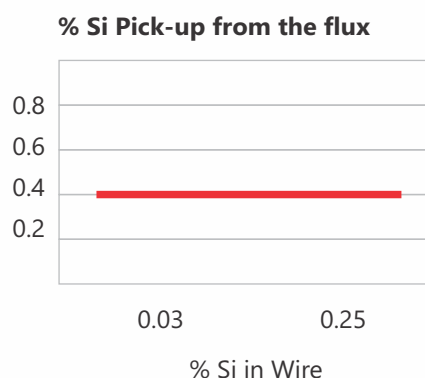
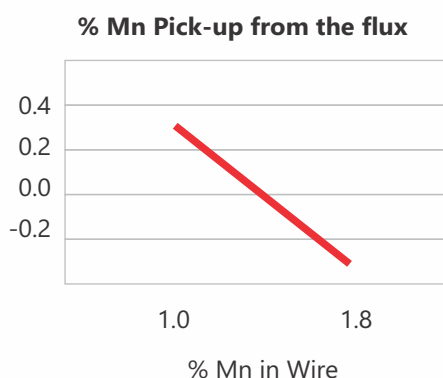
- General Structural Welding
- Boiler and Pressure Vessel Fabrication



APPROVALS:

RDSO, ABS, BV, DNV, IRS, LRA, MND, IBR

ACTIVITY OF THE FLUX:



(continue...)



SAW Fluxes

AUTOMELT B31 (AUTOMELT Gr IV)



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
15	20	30	35

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8 (Automelt Gr.A)	0.06	0.85	0.40
Automelt EL12	0.07	0.90	0.40
Automelt EM12K	0.07	1.20	0.50
Automelt EH14	0.07	1.50	0.40

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact		
					-20°C	-30°C	-40°C
AUTOMELT EL8 (Automelt Gr.A)	AW	470	390	28	50		
Automelt EL12	AW	480	390	27	50		
Automelt EM12K	AW	510	430	27		40	
Automelt EH14	AW	510	430	30			40
Automelt EH14	PW	510	430	30			50

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes

AUTOMELT B71



GENERAL DESCRIPTION:

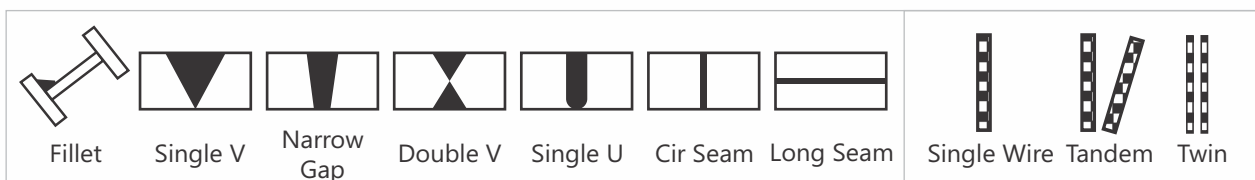
- Agglomerated Flux
- Fluoride-Basic Type Flux
- Basic Flux having Basicity Index of 1.6
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding including "two-run" technique
- For Carbon & Low Alloy Steels
- Suitable for Narrow Gap Welding
- Suitable for Single & Multi Wire twin and Tandem System
- Suitable for Welding Speeds of 0.35-0.70 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / AC
- Wall Neutrality Number with EM12K Wire is 23

CLASSIFICATION :

With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8	F7A2-EL8	Multi-pass
AUTOMELT EL12	F7A2-EL12	Multi-pass
AUTOMELT EM12K	F7A4/P4-EM12K	Multi-pass
AUTOMELT EH10K	F7A4/P4-EH10K	Multi-pass
AUTOMELT EH11K	F7TA0-EH11K	Two-Run
AUTOMELT EH12K	F7A4/P4-EH12K	Multi-pass
AUTOMELT EH14	F7A4/P4-EH14	Multi-pass
AUTOMELT EA2	F8A2/P2-EA2-A2	Multi-pass
AUTOMELT EA4	F8A2/P2-EA4-A4	Multi-pass
AUTOMELT EA3	F8A2/P2-EA3-A3	Multi-pass
AUTOMELT EA2TiB	F9TA4-EG-G	Two-Run
AUTOMELT EB2	F8PZ-EB2-B2	Multi-pass
AUTOMELT EB3	F8PZ-EB3-B3	Multi-pass
AUTOMELT ENi1	F8A5-ENi1-Ni1	Multi-pass
AUTOMELT ENi2	F8A6-ENi2-Ni2	Multi-pass
AUTOMELT ENi3	F8A8/P10-ENi3-Ni3	Multi-pass

TYPICAL APPLICATIONS :

- General Structural Welding
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Pressure Vessel and Boiler
- Heavy Equipment Fabrication



APPROVALS:

RDSO, ABS, IBR

(continue...)

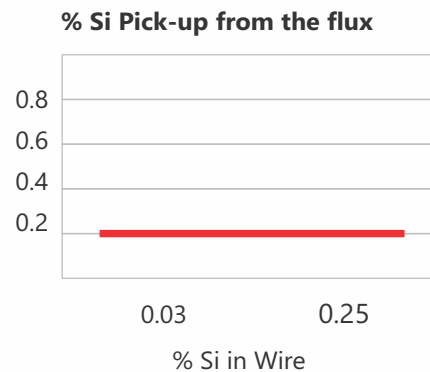
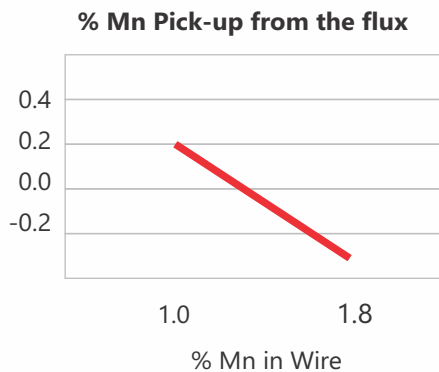


SAW Fluxes

AUTOMELT B71



ACTIVITY OF THE FLUX:



CHEMICAL COMPOSITION OF FLUX:

SiO ₂ + TiO ₂	CaO + MgO	Al ₂ O ₃ + MnO	CaF ₂
15	30	30	25

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Ni	Cr	Mo	Other Elements
AUTOMELT EL8	0.06	1.00	0.30	--	--	--	
AUTOMELT EL12	0.08	1.00	0.30	--	--	--	
AUTOMELT EM12K	0.08	1.35	0.45	--	--	--	
AUTOMELT EH10K	0.07	1.50	0.45	--	--	--	
AUTOMELT EH11K	0.07	1.70	1.00	--	--	--	
AUTOMELT EH12K	0.08	1.55	0.45	--	--	--	
AUTOMELT EH14	0.08	1.55	0.30	--	--	--	
AUTOMELT EA2	0.08	1.35	0.30	--	--	0.50	
AUTOMELT EA4	0.08	1.50	0.30	--	--	0.50	
AUTOMELT EA3	0.08	1.55	0.30	--	--	0.50	
AUTOMELT EA2TiB	0.07	1.35	0.30	--	--	0.50	Ti – 0.02; B – 0.003
AUTOMELT EB2	0.07	1.10	0.40	--	1.10	0.50	
AUTOMELT EB3	0.07	1.10	0.40	--	2.10	1.00	
AUTOMELT ENi1	0.08	1.40	0.40	0.90	--	--	
AUTOMELT ENi2	0.09	1.40	0.40	2.20	--	--	
AUTOMELT ENi3	0.09	1.40	0.40	3.00	--	--	

(continue...)



SAW Fluxes

AUTOMELT B71



MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J)				
					-30°C	-40°C	-50°C	-60°C	-70°C
Automelt EL8	AW	500	420	26	50				
Automelt EL12	AW	520	430	26	50				
Automelt EM12K	AW	530	430	26		50			
Automelt EM12K	PW1	500	420	28		60			
Automelt EH10K	AW	550	440	26		60			
Automelt EH10K	PW1	530	430	28		70			
Automelt EH11K	AW, TR	550	440	26	50J at -20°C	60			
Automelt EH12K	AW	560	450	25		70			
Automelt EH12K	PW1	540	430	27		60			
Automelt EH14	AW	550	440	26		70			
Automelt EH14	PW1	530	430	28					
Automelt EA2	AW	580	470	24	50				
Automelt EA2	PW1	560	460	25	60				
Automelt EA4	AW	600	490	24	50				
Automelt EA4	PW1	580	470	26	60				
Automelt EA3	AW	630	500	24	50				
Automelt EA3	PW1	610	480	25	60	40			
Automelt EA2TiB	AW, TR	630	580	18					
Automelt EB2	PW2	600	490	24					
Automelt EB3	PW2	630	510	24					
Automelt ENi1	AW	580	470	25			40		
Automelt ENi2	AW	600	490	25			50		
Automelt ENi3	AW	620	510	26				50	
Automelt ENi3	PW1	600	490	27					50

AW – As Welded; PW1 – After Post weld heat treatment of 620°C for 1 hour

PW2 – After Post Weld Heat treatment of 690°C for 1 hour

TW – Two Run

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes

AUTOMELT B22 PLUS



GENERAL DESCRIPTION:

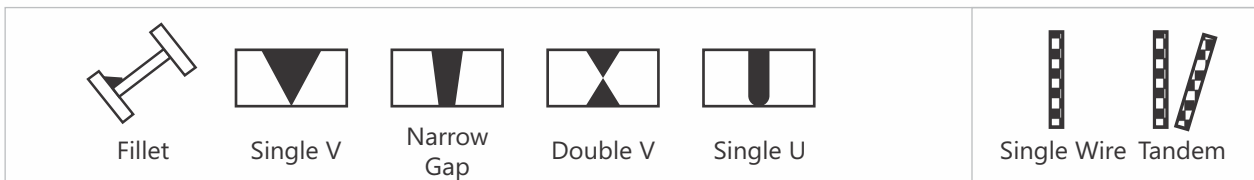
- Agglomerated Flux
- Fluoride-Basic Type Flux
- Basic Flux having Basicity Index of 1.8
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding
- For Carbon & Low Alloy Steels
- Suitable for Single Wire and Multiple wire tandem System
- Suitable for Welding Speeds of 0.40-0.60 m/min
- Grain Size - 0.25-1.60 mm
- Type of Current – DCEP / AC
- Wall Neutrality Number with EH12K Wire is 23

CLASSIFICATION :

With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EM12K	F7A5/F6P5-EM12K	Multi-pass
AUTOMELT EH10K	F7A4/P4-EH10K	Multi-pass
AUTOMELT EH12K	F7A4/P4-EH12K	Multi-pass

TYPICAL APPLICATIONS :

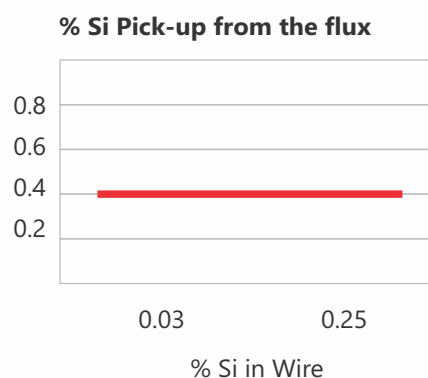
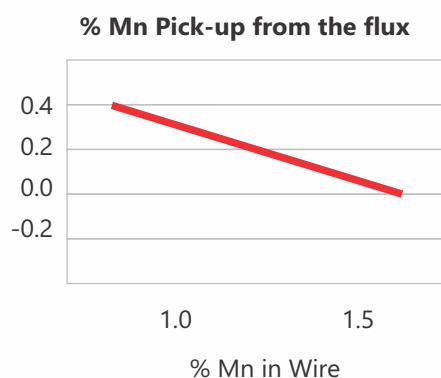
- Wind Mill Fabrication
- Boiler and Pressure Vessel Fabrication



APPROVALS:

CE

ACTIVITY OF THE FLUX:



(continue...)



SAW Fluxes

AUTOMELT B22 PLUS



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
30	20	25	20

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (WT%), TYPICAL:

With wire	C	Mn	Si
Automelt EM12K	0.06	1.40	0.30
Automelt EH10K	0.06	1.50	0.30
Automelt EH12K	0.07	1.50	0.30

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact	
					-40°C	-46°C
Automelt EM12K	AW	510	430	27	60	40
Automelt EM12K	PW	480	400	27	70	50
Automelt EH10K	AW	520	440	28	40	
Automelt EH10K	PW	510	430	28	50	
Automelt EH12K	AW	540	450	28	40	
Automelt EH12K	PW	520	440	28	50	

AW – As Welded; PW - After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes

AUTOMELT B20 PLUS



GENERAL DESCRIPTION:

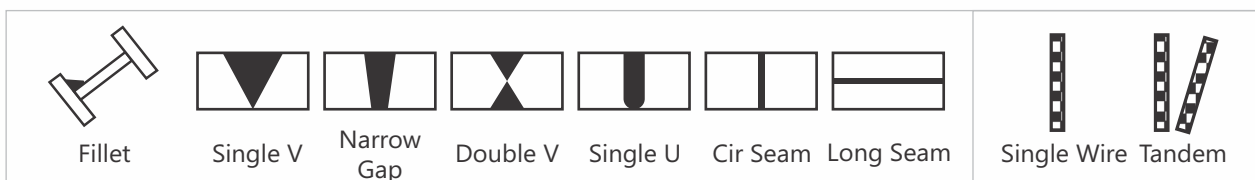
- Agglomerated Flux
- Fluoride-Basic Type Flux
- High Basic Flux having Basicity Index of 3.1
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding
- For Carbon & Low Alloy Steels
- Suitable for Narrow Gap Welding
- Suitable for Single & Multi Wire Tandem System
- Suitable for Welding Speeds of 0.40 – 0.60 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / AC
- Wall Neutrality Number with EM12K is 23

CLASSIFICATION :

With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EM12K	F7A8/F6P8-EM12K	Multi-pass
AUTOMELT EH10K	F7A8/P8-EH10K	Multi-pass
AUTOMELT EH12K	F7A8/P10-EH12K	Multi-pass
AUTOMELT EH14	F7A6/P6-EH14	Multi-pass
AUTOMELT EB2R	F8P2-EB2R-B2R	Multi-pass
AUTOMELT EB3R	F8P0-EB3R-B3R	Multi-pass
AUTOMELT EB91	F9PZ-EB91-B91	Multi-pass
AUTOMELT ENi1	F7A6-ENi1-Ni1	Multi-pass
AUTOMELT ENi2	F7A8-ENi2-Ni2	Multi-pass
AUTOMELT ENi3	F7A10-ENi3-Ni3	Multi-pass
AUTOMELT EF1	F8A6-EF1-F1	Multi-pass
AUTOMELT EF2	F8A6-EF2-F2	Multi-pass
AUTOMELT EF3	F9A8-EF3-F3	Multi-pass
AUTOMELT EF4	F8A6-EF4-F4	Multi-pass
AUTOMELT EF5	F11A10-EF5-F5	Multi-pass
AUTOMELT S3NiCrMo2.5	F12A8-EG-G	Multi-pass

TYPICAL APPLICATIONS :

- Fabrication of Reactors, steam generators
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Pressure Vessel and Boiler
- Heavy Equipment Fabrication



(continue...)

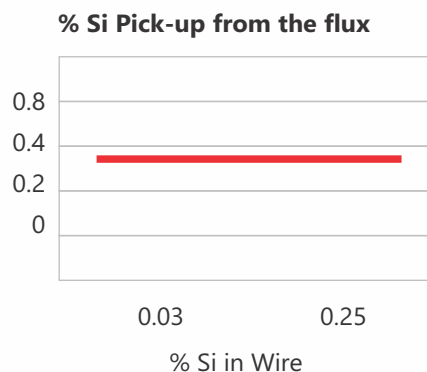
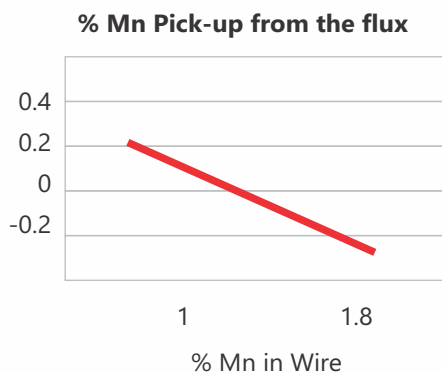


SAW Fluxes

AUTOMELT B20 PLUS



ACTIVITY OF THE FLUX:



CHEMICAL COMPOSITION OF FLUX:

SiO ₂ + TiO ₂	CaO + MgO	Al ₂ O ₃ + MnO	CaF ₂
20	15	30	30

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Ni	Cr	Mo	Other Elements
AUTOMELT EM12K	0.06	1.25	0.40	--	--	--	
AUTOMELT EH10K	0.07	1.45	0.40	--	--	--	
AUTOMELT EH12K	0.08	1.50	0.40	--	--	--	
AUTOMELT EH14	0.08	1.60	0.30	--	--	--	
AUTOMELT EB2R	0.06	0.90	0.30		1.10	0.50	S-0.007; P-0.009; Cu-0.05; As-0.003; Sn-0.003; Sb-0.003
AUTOMELT EB3R	0.07	0.90	0.30	--	2.10	1.00	S-0.007; P-0.009; Cu-0.05; As-0.003; Sn-0.003; Sb-0.003
AUTOMELT EB91	0.07	0.50	0.30	0.55	8.70	0.95	V-0.20; Nb-0.04; N-0.04; Mn+Ni<1.20
AUTOMELT ENi1	0.07	1.40	0.30	0.90	--	--	
AUTOMELT ENi2	0.08	1.40	0.30	2.20	--	--	
AUTOMELT ENi3	0.08	1.40	0.30	3.00	--	--	
AUTOMELT EF1	0.08	1.20	0.40	1.00	--	0.45	
AUTOMELT EF2	0.08	1.50	0.40	0.60	--	0.50	
AUTOMELT EF3	0.08	1.50	0.40	0.90	--	0.50	
AUTOMELT EF4	0.08	1.40	0.40	0.50	0.30	0.20	
AUTOMELT EF5	0.08	1.50	0.40	2.20	0.30	0.40	
AUTOMELT S3NiCrMo2.5	0.08	1.50	0.40	2.40	0.40	0.50	

(continue...)



SAW Fluxes

AUTOMELT B20 PLUS



MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J)				
					-30°C	-40°C	-50°C	-60°C	-70°C
Automelt EM12K	AW	510	430	28		80	50	30	
Automelt EM12K	PW1	490	400	29		80	60	40	
Automelt EH10K	AW	540	440	27			60	40	
Automelt EH10K	PW1	520	420	27			80	50	
Automelt EH12K	AW	540	450	27			70	50	50
Automelt EH12K	PW1	530	430	28			90	70	
Automelt EH14	AW	530	440	27			50		
Automelt EH14	PW1	520	430	28	40		60		
Automelt EB2R	PW2	600	490	24	30				
Automelt EB3R	PW2	630	500	24					
Automelt EB91	PW3	660	570	19					
Automelt ENi1	AW	520	430	29			50		
Automelt ENi2	AW	530	430	28			70	40	40
Automelt ENi3	AW	540	440	27			90	60	
Automelt EF1	AW	580	470	25			50		
Automelt EF2	AW	600	480	25			40		
Automelt EF3	AW	650	570	22			60	40	
Automelt EF4	AW	600	490	24			40		
Automelt EF5	AW	820	750	18				60	40
AUTOMELT S3NiCrMo2.5	AW	850	770	15			60	40	

AW – As Welded; PW1 – After Post weld heat treatment of 620°C for 1 hour

PW2 – After Post Weld Heat treatment of 690°C for 1 hour

PW2 – After Post Weld Heat treatment of 760°C for 2 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage

CREEP TEST DATA (Automelt B20 Plus+Automelt EB2R):

Condition	Temperature, °C	Stress, MPa	Duration, Hrs	Strain% after 1000 Hrs
PWHT: 690°C for 2 Hrs	500	254	1000	2.40
	550	160	1000	4.09



SAW Fluxes

AUTOMELT B41



GENERAL DESCRIPTION:

- Agglomerated Flux
- Fluoride-Basic Type Flux
- High Basic Flux having Basicity Index of 3.1
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding including two run technique
- For Carbon & Low Alloy Steels
- Suitable for Single & Multi Wire Tandem System
- Suitable for Welding Speeds of 0.40 – 0.60 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / AC
- Wall Neutrality Number with EH10K is 5

CLASSIFICATION :

With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EH11K	F7TA2-EH11K	Two Run
AUTOMELT EH10K	F7A8/P8-EH10K	Multi-pass
AUTOMELT EH12K	F7A8/P8-EH12K	Multi-pass
AUTOMELT EH14	F7A6/P6-EH14	Multi-pass
AUTOMELT EA2	F8A4-EA2-A2	Multi-pass
AUTOMELT EA4	F8A4/P4-EA4-A4	Multi-pass
AUTOMELT EA3	F8A4/P4-EA3-A3	Multi-pass
AUTOMELT ENi1	F7A6-ENi1-Ni1	Multi-pass
AUTOMELT ENi2	F7A8-ENi2-Ni2	Multi-pass
AUTOMELT ENi3	F7A10-ENi3-Ni3	Multi-pass
AUTOMELT EF1	F8A6-EF1-F1	Multi-pass
AUTOMELT EF2	F8A6-EF2-F2	Multi-pass
AUTOMELT EF3	F9A8-EF3-F3	Multi-pass

TYPICAL APPLICATIONS :

- Fabrication of Reactors, steam generators
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Pressure Vessel and Boiler
- Heavy Equipment Fabrication



APPROVALS:

IBR

(continue...)

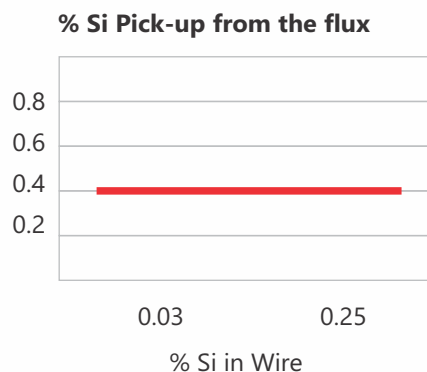
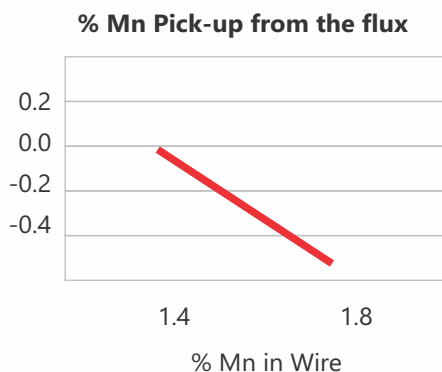


SAW Fluxes

AUTOMELT B41



ACTIVITY OF THE FLUX:



CHEMICAL COMPOSITION OF FLUX:

SiO ₂ + TiO ₂	CaO + MgO	Al ₂ O ₃ + MnO	CaF ₂
10	35	20	30

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Ni	Cr	Mo
AUTOMELT EH11K	0.08	1.35	0.45	--	--	--
AUTOMELT EH10K	0.07	1.50	0.45	--	--	--
AUTOMELT EH12K	0.08	1.55	0.45	--	--	--
AUTOMELT EH14	0.08	1.55	0.30	--	--	--
AUTOMELT EA2	0.08	1.35	0.30	--	--	0.50
AUTOMELT EA4	0.08	1.50	0.30	--	--	0.50
AUTOMELT EA3	0.08	1.55	0.30	--	--	0.50
AUTOMELT ENi1	0.07	1.40	0.30	0.90	--	--
AUTOMELT ENi2	0.08	1.40	0.30	2.20	--	--
AUTOMELT ENi3	0.08	1.40	0.30	3.00	--	--
AUTOMELT EF1	0.08	1.20	0.40	1.00	--	0.45
AUTOMELT EF2	0.08	1.50	0.40	0.60	--	0.50
AUTOMELT EF3	0.08	1.50	0.40	0.90	--	0.50

(continue...)



SAW Fluxes

AUTOMELT B41



MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact		
					-40°C	-50°C	-60°C
Automelt EH11K	AW, TR	540	440	24	(50J at -30°C)		
Automelt EH10K	AW	550	440	26		60	40
Automelt EH10K	PW	530	430	28		80	60
Automelt EH12K	AW	560	450	26		80	50
Automelt EH12K	PW	540	430	27		90	60
Automelt EH14	AW	550	440	26	60	50	
Automelt EH14	PW	530	430	28	80	60	
Automelt EA2	AW	580	470	24	40		
Automelt EA2	PW	560	460	25	50		
Automelt EA4	AW	600	490	24	40		
Automelt EA4	PW	580	470	26	50		
Automelt EA3	AW	630	500	24	40		
Automelt EA3	PW	610	480	25	50		
Automelt ENi1	AW	520	430	29		50	
Automelt ENi2	AW	530	430	28		70	40
Automelt ENi3	AW	540	440	27	(40J at -70°C)	90	60
Automelt EF1	AW	580	470	25		50	
Automelt EF2	AW	600	480	25		40	
Automelt EF3	AW	650	570	22		60	40

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes

AUTOMELT B43



GENERAL DESCRIPTION:

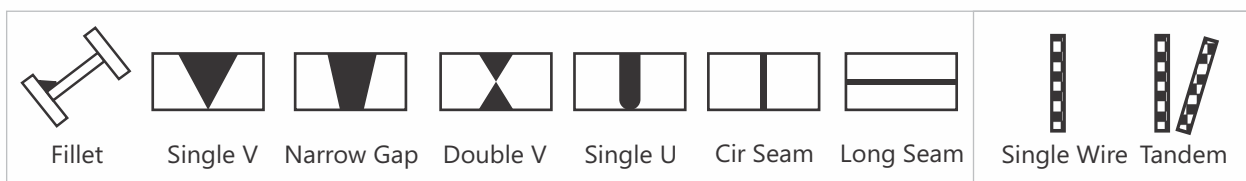
- Agglomerated Flux
- Fluoride-Basic Type Flux
- High Basic Flux having Basicity index of 3.1
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding
- For Low Alloy Steels
- Suitable for Narrow Gap Welding
- Suitable for Single & Multi Wire Tandem System
- Suitable for Welding Speeds of 0.40 – 0.60 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / AC
- Produces weld metal with low P

CLASSIFICATION :

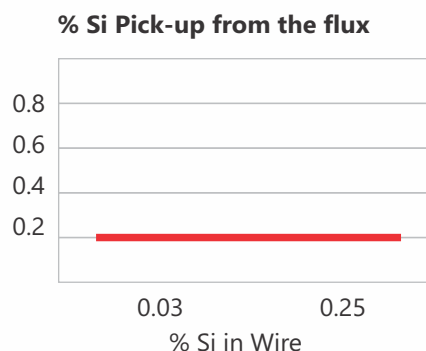
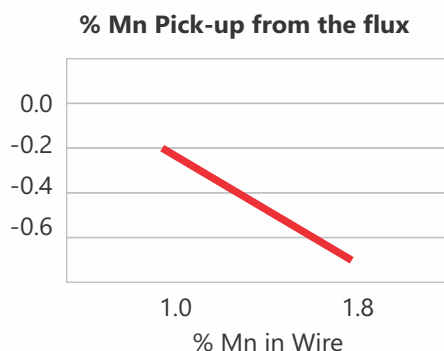
With Wire	AWS 5.17/5.23	Single/Multi-pass
AUTOMELT ENi1	F7A6-ENi1-Ni1	Multi-pass
AUTOMELT ENi2	F7A8-ENi2-Ni2	Multi-pass
AUTOMELT ENi3	F7A10/P10-ENi3-Ni3	Multi-pass
AUTOMELT ENi5	F9A4-ENi5-Ni5	Multi-pass

TYPICAL APPLICATIONS :

- Fabrication of Reactors, steam generators
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Pressure Vessel and Boiler
- Heavy Equipment Fabrication



ACTIVITY OF THE FLUX:



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
10	35	50

(continue...)



SAW Fluxes

AUTOMELT B43



CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Ni	Mo
AUTOMELT ENi1	0.05	0.80	0.30	0.90	
AUTOMELT ENi2	0.05	0.80	0.30	2.20	
AUTOMELT ENi3	0.05	0.80	0.30	3.20	
AUTOMELT ENi5	0.05	1.10	0.30	1.00	0.20

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J)		
					-50°C	-60°C	-70°C
Automelt ENi1	AW	520	430	29	50		
Automelt ENi2	AW	530	430	28	70	40	
Automelt ENi3	AW	590	500	28	90	60	30
Automelt ENi3	PW	560	480	30	100	70	40
Automelt ENi5	AW	650	570	20	40 (at -40°C)		

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes

AUTOMELT S33



GENERAL DESCRIPTION:

- Agglomerated Flux
- Fluoride-Basic Type Flux
- High Basic Flux having Basicity Index of 3.1
- Neutral Behaviour to Carbon, so Low C weld metal is produced with Low C Wire
- Non-Chromium Compensating
- Chromium Burnout is very less
- Multi-pass Butt and Fillet Welding
- For Stainless Steels
- Suitable for Welding Speeds of 0.40 – 0.60 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP

TYPICAL APPLICATIONS :

- Welding of High Alloy Stainless steels including Duplex and Superduplex Stainless Steels
- Most suitable for welding Cryogenic Vessels

 Fillet	 Single V	 Double V	 Single Wire
--	--	--	---

APPROVALS:

ABS

CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
10	35	50

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Cr	Ni	Mo	Other Elements
Subinox 308L	0.025	1.40	0.50	19.5	9.3	--	--
Subinox 308H	0.05	1.40	0.50	19.5	9.2	--	--
Subinox 316L	0.025	1.40	0.50	18.5	11.5	2.3	--
Subinox 347	0.050	1.40	0.50	19.5	9.5	--	Nb + Ta – 0.50
Subinox 309L	0.025	1.40	0.50	23.5	12.5	--	--
Subinox 309LMo	0.025	1.40	0.50	23.5	12.2	2.2	--
Subinox 410	0.07	0.50	0.30	12.5	--	--	--
Subinox 410NiMo	0.03	0.50	0.30	12.5	4.5	0.50	--
Subinox 430	0.05	0.50	0.30	16.5	--	3.0	--
Subinox 2209	0.025	1.30	0.50	22.0	9.0	3.5	N – 0.12
Subinox 2553	0.03	1.30	0.50	25.0	7.0	4.0	N – 0.15; Cu – 2.0
Subinox 2594	0.025	0.60	0.50	24.5	8.5		N-0.25, W-0.1

(continue...)



SAW Fluxes

AUTOMELT S33



MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	% El.	CVN Impact	
				-50°C	-196°C
Subinox 308L	AW	580	37	90	50
SUBINOX 308H	AW	600	37		
Subinox 316L	AW	580	37	90	40
Subinox 347	AW	600	35	90	
Subinox 309L	AW	600	35	90	
SUBINOX 309LMo	AW	620	35		
Subinox 410	AW	700	25	50	
Subinox 410NiMo	AW	750	23	50	
Subinox 430	AW	700	25	50	
Subinox 2209	AW	780	27	70	
Subinox 2553	AW	780	25	50	
Subinox 2594	AW	650	27	70	

AW – As Welded

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes **AUTOMELT S76**



GENERAL DESCRIPTION:

- Agglomerated Flux
- Fluoride-Basic Type Flux
- Neutral Flux having Basicity Index of 1.2
- It compensates Chromium to counteract arc loss
- For Cladding of Stainless Steels
- Suitable for Welding Speeds of 0.40-0.60 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / DCEN

TYPICAL APPLICATIONS :

- Cladding of Stainless Steels

APPROVALS:

BHEL

CHEMICAL COMPOSITION OF FLUX:

SiO ₂ + TiO ₂	CaO + MgO	Al ₂ O ₃ + MnO	CaF ₂
30%	20	20	50

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Cr	Ni	Mo	Other Elements
Subinox 308L	0.03	1.50	0.40	19.5	9.3	--	--
Subinox 316L	0.03	1.50	0.40	18.5	11.5	2.3	--
Subinox 347	0.03	1.20	0.50	19.5	9.5	--	Nb + Ta – 0.50
Subinox 309L	0.03	1.20	0.50	23.5	12.5	--	--
Subinox 410	0.03	0.50	0.30	12.5	--	--	--
Subinox 430	0.03	0.40	0.50	16.2	--	--	--

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	% E	CVN Impact (J) 20°C
Subinox 308L	AW	580	37	70
Subinox 316L	AW	580	37	70
Subinox 347	AW	600	35	70
Subinox 309L	AW	600	35	70
Subinox 410	AW	700	25	70
Subinox 430	AW	700	25	70

AW – As Welded

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



SAW Fluxes **AUTOMELT S79**



GENERAL DESCRIPTION :

- Agglomerated Flux
- Fluoride-Basic Type Flux
- High Basic Flux having Basicity index of 3.1
- Neutral Behaviour to Manganese and Silicon
- Non-Chromium Compensating
- Chromium Burnout is very less
- Multi-pass Butt and Fillet Welding
- For welding of 9% Ni Steels
- Suitable for Welding Speeds of 0.40 – 0.60 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / AC

TYPICAL APPLICATIONS :

- ASTM class 1, SA-353 class1. For welding of 9% Nickel steels for cryogenic applications, especially LNG storage systems
- Welding on stainless / heat resistant cryogenic steels and alloys for welding nickel base alloys.

			
Fillet	Single V	Double V	Single Wire

CHEMICAL COMPOSITION OF FLUX:

SiO ₂ + TiO ₂	Al ₂ O ₃ + MnO	CaF ₂
15	35	50

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Cr	Ni	Mo	Other Elements
Automelt NiCrMo3	0.03	0.30	0.30	22.0	Rem	8.6	Fe-4.0; Nb-3.5
Automelt NiCrMo4	0.01	0.55	0.15	14.6	Rem	16.0	Fe-5.0; W-3.6; Co-0.2; Cu-0.01

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	% E	CVN Impact (J) -196°C
Automelt NiCrMo3	AW	720	35	50
Automelt NiCrMo4	AW	750	35	50

AW – As Welded

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage



Strip Cladding Flux **AUTOMELT ES1**



GENERAL DESCRIPTION:

- Agglomerated Flux
- Fluoride-Basic Type Flux
- High Basic Flux having Basicity index of 4
- Excellent slag removal
- Good Wetting
- Very high deposition rates
- Cladding and Overlaying
- For Electroslag Strip Cladding
- Grain Size – 0.25-1.00 mm
- Type of Current – DCEP
- Low dilution

TYPICAL APPLICATIONS :

- For cladding and overlaying of Stainless Steel using Electroslag Strip Cladding process

 Cladding	 Cladding
--	--

CHEMICAL COMPOSITION OF FLUX:

Al₂O₃ + MnO	CaF₂	CaO + MgO
20	75	05

CHEMICAL COMPOSITION OF WELD METAL (Wt%), TYPICAL:

Base Metal – ASTM 516 Gr 70

Strip Dimensions – 60 mm (width) x 0.5mm (thickness)

With wire	Layer	C	Mn	Si	Cr	Ni	Mo	Nb
Subinox EQ309L	Strip	0.020	1.60	0.40	23.30	12.90	---	---
	1	0.020	1.40	0.45	21.30	12.30	--	--
Subinox EQ316L	Strip	0.020	1.60	0.40	19.00	12.50	2.50	--
	1	0.020	1.40	0.45	18.00	12.00	2.50	--
Subinox EQ347	Strip	0.020	1.65	0.40	19.50	10.70	--	0.50
	1	0.020	1.50	0.50	18.00	10.30	--	0.35
	2 (1 st layer with EQ309L)	0.020	1.50	0.50	19.50	11.00	--	0.35

The chemistry will depend on actual strip chemistry and welding parameters



Bare Brazing Rods **BRAS 3302**

COPPER-PHOSPHORUS BRAZING FILLER ROD CONTAINING SILVER



ALLOY BASIS :

Ag, Cu, P

KEY FEATURES :

- Cu-P brazing filler rod with Silver
- Very good gap filling properties
- Suitable for bridging broad gaps
- No flux is required for copper to copper brazing

TYPICAL APPLICATIONS :

- Construction of pipes and apparatus
- Refrigeration industries
- Brazing of Cu-Zn, Cu-Sn alloys in the construction of apparatus, electric motors
- In breweries, dairies and shop fittings



HEAT SOURCE :

Oxy-acetylene torch, Air-gas torch, Blow lamp

PROCEDURE :

Ensure parts to be welded are thoroughly cleaned. Adjust flame to neutral. For copper, heat parts to be joined to dull red and for copper alloy, heat until flux liquefies. Melt small amount of filler allow to flow along joint while removing flame. To avoid overheating use intermediate position in the flame, to give general heat. Do not use intense heat at top of the inner cone. Immersion in dilute sulphuric acid solution followed by water rinse will restore copper colour of the brazed area.

CLEANING :

Remove Flux residues by rising in hot water.

TECHNICAL DATA :

Solidus Temperature	Liquidus Temperature	Brazing Temperature Range
643°C	788°C	730-815°C

PACKING DATA :

Ø x L, mm	Kg/Plastic Tube
1.60 X 500	5
2.50 X 500	5
3.15 X 500	5



Bare Brazing Rods

BRAS 3305

COPPER-PHOSPHORUS BRAZING FILLER ROD WITH SILVER CONTENT



ALLOY BASIS : AWS A/SFA 5.8

BCuP-7

KEY FEATURES :

- Cu-P brazing filler rod with Silver
- Excellent flowing characteristics and high ductility
- No flux is required for copper to copper brazing

TYPICAL APPLICATIONS :

- Brazing of copper tubes, apparatus
- Refrigeration pipes
- Air conditioning pipes
- Motor windings



HEAT SOURCE :

Oxy-acetylene torch, Air-Gas Torch, Blow lamp, Furnace, High frequency induction furnace, TIG Process

PROCEDURE :

Remove all scale and oxide from the areas to be joined. Adjust flame to neutral and dip heated rod into the flux. Bring the base metal to melting point and then lower the filler rod into the puddle and allow to melt. When joint is completed, reheat to a dull red and allow to cool slowly.

CLEANING :

Remove Flux residues by rising in hot water.

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt% :

	Ag	P	Cu
Specification	4.8 - 5.2	6.5 - 7.0	Balance

TECHNICAL DATA :

Solidus Temperature	Liquidus Temperature	Brazing Temperature Range
643°C	771°C	705-815°C

PACKING DATA :

Ø x L, mm	Kg/Plastic Tube
1.60 X 500	5
2.50 X 500	5
3.15 X 500	5



Bare Brazing Rods **BRAS 3314**

COPPER-PHOSPHORUS ALLOY CONTAINING SILVER



ALLOY BASIS : Cu, Ag, P

KEY FEATURES :

- Cu-P brazing filler rod with 14% Silver
- Excellent flowing characteristics and high ductility
- No flux is required for copper to copper brazing
- For copper alloys use of flux is necessary

TYPICAL APPLICATIONS :

- Brazing of copper to copper for construction of apparatus
- Copper pipes, Heat exchangers
- Electric motors, Refrigeration pipes
- Joints subjected to very low temperatures



HEAT SOURCE :

Oxy-acetylene torch, Air-gas torch, Blow lamp, Furnace, High frequency induction furnace, TIG process

PROCEDURE :

Remove all scale and oxide from the areas to be joined. Adjust flame to neutral and dip heated rod into the flux. Bring the base metal to melting point and then lower the filler rod into the puddle and allow to melt. When joint is completed, reheat to a dull red and allow to cool slowly.

CLEANING :

Remove flux residues by rinsing in hot water.

TECHNICAL DATA :

Solidus Temperature	Liquidus Temperature	Brazing Temperature Range
607°C	618°C	620-760°C

PACKING DATA :

Ø x L, mm	Kg/Plastic Tube
1.60 X 500	5
2.50 X 500	5
3.15 X 500	5



Bare Brazing Rods **BRAS 3343**

HIGH SILVER CONTENT ALLOY FOR MULTIPURPOSE BRAZING



ALLOY BASIS : Ag, Cu, Zn, Cd

KEY FEATURES :

- Very low melting silver alloy
- High Silver content of 43%
- Excellent flowing characteristics and capillary action

TYPICAL APPLICATIONS :

- Carbon steel, low alloy steels, tool steels, stainless steels
- Carbide tips, Cu and its alloys, Ni and its alloys and their dissimilar combinations
- Construction of apparatus, precision jobs, novelty articles, kitchen ware, surgical instruments, repairs of delicate components
- Production of precision tools, pharmaceuticals industry



HEAT SOURCE :

Oxy-Acetylene torch, Air-Gas torch, Blow lamp, Furnace

PROCEDURE :

Clean the joint thoroughly. Use neutral flame. Spread the flux in paste form on the joint. Dip heated rod into flux. Joint clearance should be approximately 0.1 mm. Preheat a broad area and then heat locally until flux melts. Continue heating joint area until the flux melts. Melt filler metal and draw with flame along the joint. Do not over heat.

CLEANING :

Remove flux residues by rinsing in hot water.

TECHNICAL DATA :

Solidus Temperature	Liquidus Temperature	Brazing Temperature Range
643°C	802°C	705-815°C

PACKING DATA :

Ø x L, mm	Kg/Plastic Tube
1.60 X 500	5
2.50 X 500	5
3.15 X 500	5



Bare Brazing Rods **BRAS 3356**

CADMIUM FREE ALLOY WITH HIGH SILVER CONTENT



ALLOY BASIS : Ag, Cu, Zn, Sn

KEY FEATURES :

- Cadmium free brazing filler rod
- High Silver content of 56%
- Excellent flowing characteristics and capillary action

TYPICAL APPLICATIONS :

- Joining of steels, Stainless steels
- Malleable iron, Dissimilar steels
- Copper, Brass, Bronze, Nickel
- Recommended for joints in contact with food e.g. Dairies, Breweries, Canned food industries



HEAT SOURCE :

Oxy-Acetylene torch, Air-Gas torch, Blow lamp, Furnace

PROCEDURE :

Clean the joint thoroughly. Use neutral flame. Spread the flux in paste form on the joint. Dip heated rod into flux. Joint clearance should be approximately 0.1 mm. Preheat a broad area and then heat locally until flux melts. Continue heating joint area until the flux melts. Melt filler metal and draw with flame along the joint. Do not over heat.

CLEANING :

Remove flux residues by rinsing in hot water.

TECHNICAL DATA :

Solidus Temperature	Liquidus Temperature	Brazing Temperature Range
618°C	652°C	650-760°C

PACKING DATA :

Ø x L, mm	Kg/Plastic Tube
1.60 X 500	5
2.50 X 500	5
3.15 X 500	5



Coated Brazing Rods

BRACC 2211

FLUX COATED SPECIAL BRASS BRAZING ALLOY



ALLOY BASIS :

Cu, Zn, Additives

KEY FEATURES :

- Flux coated brazing rod
- Provide excellent wetting action
- No objectionable fuming
- Good machinability
- Very fast and economical operation
- Applied with a high quality coating to speed up brazing
- Flexible and thin flux coating does not peel off even after bending
- Flux coating has extended life span

TYPICAL APPLICATIONS :

- Brazing of steel, cast iron, copper, brass
- Galvanized iron
- Joins dissimilar metals like steel to cast iron, steel to copper and copper alloys, cast iron to copper and copper alloys
- Excellent for sheet metal assembly and repair
- Repair of car bodies and car silencer assembly in overhead position without dismantling



HEAT SOURCE :

Oxy-acetylene torch, Furnace, High frequency induction

PROCEDURE :

Clean the joint thoroughly. Use neutral flame. Preheat a broad area and then heat locally until flux melts. Then apply filler rod and melt it into the joint. For braze-welding, melt the rod drop by drop along the joint. For capillary joints melt the rod and draw with the flame along the joint. In case of cast iron, preheat the entire casting to 450°C and maintain this preheat until the operation is completed. In using Bracc 2211 melt the flux from the end of rod on the start of the weld area. Continue heating the weld area until the flux melts. Next melt a drop of filler metal by playing the flame on the rod end until it flows and bonds easily. Continue adding more of the filler metal drop by drop into the joint

CLEANING :

Remove flux residues mechanically or chemically (using 10% hydrochloric acid for ferrous metals and 10% sulphuric acid for copper and its alloys) followed by rinsing in running water.

TECHNICAL DATA :

Solidus Temperature	Liquidus Temperature	Brazing Temperature Range
888°C	899°C	910-954°C

PACKING DATA :

Ø x L, mm	Kg/Plastic Tube
2.50 x 500	5
3.15 x 500	5



Coated Brazing Rods **BRACS 3344**

FLUX COATED HIGH SILVER ALLOY FOR MULTI PURPOSE BRAZING



ALLOY BASIS :

Ag, Cu, Zn, Cd, Additives

KEY FEATURES :

- Flux coated brazing rod
- High silver content
- Lowest melting point
- Excellent flowing characteristics
- Excellent capillary action
- Strong, clean and smooth joints

TYPICAL APPLICATIONS :

- Brazing of CuZn20Al, CuNi10Fe, CuNi30Fe
- Capillary brazing on steels and stainless steels, malleable cast iron, copper and copper alloys, nickel, nickel alloys and hard metals and their dissimilar combinations
- Construction of apparatus, shipbuilding, precision tools, copper conductor joints
- Refrigeration plants, electrical industry, fittings manufacture, installation works, furniture, carbide tip brazing, drill bits brazing



HEAT SOURCE :

Oxy-acetylene torch, Air-gas torch, Blow-lamp, Furnace, High frequency induction

PROCEDURE :

Clean the joint thoroughly. Use neutral flame. Joint clearance approx. 0.1 mm. Preheat a broad area and then heat locally until flux melts. Melt filler metal and draw with flame along the joint. Do not overheat.

CLEANING :

Remove flux residues by rinsing in hot water.

TECHNICAL DATA :

Solidus Temperature	Liquidus Temperature
615°C	620°C

PACKING DATA :

Ø x L, mm	Kg/Plastic Tube
2.50 x 500	1
3.15 x 500	1



Coated Brazing Rods **BRACC 7700**

FLUX COATED SPECIAL BRONZE ALLOY FOR WEAR RESISTANCE



ALLOY BASIS :

Cu, Zn, Ni, Additives

KEY FEATURES :

- Flux coated rod
- Can be used directly on the job
- No external flux required
- Very fast and economical operation
- Tough and easily machinable alloy
- Deposit is free from porosity with resistance to corrosion and wear
- Flexible and thin flux coating does not peel off even after bending
- Flux coating has extended life span

TYPICAL APPLICATIONS :

- Surfacing of steel, grey cast iron, bronze
- Especially suitable for wear resistant surfacing
- Gear teeth, Bevel gear tracks, Shafts, Cams, Slide bars
- Bearings, Metal seals, Valve seats, Pistons



HEAT SOURCE :

Oxy-acetylene torch

PROCEDURE :

Clean the joint area. Prepare the edges especially for heavy section and cracked area. Preheat the job and melt off a drop of flux from the end of the rod onto the beginning of the joint area. Continue heating until flux liquefies and add the filler metal drop by drop making sure of a good bond.

TECHNICAL DATA :

Working temperature	Hardness of pure deposit, HRC
900°C	10-15

PACKING DATA :

Ø x L, mm	Kg/Plastic Tube
2.50 x 500	5
3.15 x 500	5



Brazing Fluxes

ALBRAZE A

ALUMINIUM BRAZING FLUX



CLASSIFICATION : AWS A/SFA 5.31 DIN 8511

FB1-A

F-LH 1

KEY FEATURES :

- Aluminium brazing flux
- Contains fluorides and chlorides
- Excellent cleaning action
- Flux residue is hygroscopic, hence easily soluble in water

TYPICAL APPLICATIONS :

- Brazing of Al and its alloys

DIRECTION :

Before Use : Remove oil, grease or other contaminants from the surface to be brazed. Check pH in case of over shelf life. Shake well to homogenize.

After Use : Clean flux residue from brazed joint using hot water 60°C for best results. If hot water unavailable, room temperature water may also be used. Remaining flux to be kept in closed container. Although fluxes are milder to human hygienic care is recommended.

PHYSICAL PROPERTIES :

Form	Filler Metal Type	Activity Temperature Range, °C
Powder	BAISi	580-615

PACKING DATA :

Packing Form	Wt/Bottle
Bottle	500 gms



Brazing Fluxes **SILBRAZE F**

SILVER BRAZING FLUX



CLASSIFICATION : AWS A/SFA 5.31 DIN 8511

FB3-F

F-SH 1

KEY FEATURES :

- Silver brazing flux
- Contains complex fluorides and boron components
- Excellent cleaning action and capillary flow
- Can be mixed with water and used in the paste form

TYPICAL APPLICATIONS :

- Brazing of steel, copper and silver

DIRECTION :

Before Use : Remove oil, grease or other contaminants from the surface to be brazed. Check pH in case of over shelf life. Shake well to homogenize.

After Use : Clean flux residue from brazed joint using hot water 60°C for best results. If hot water unavailable, room temperature water may also be used. Remaining flux to be kept in closed container. Although fluxes are milder to human hygienic care is recommended.

PHYSICAL PROPERTIES :

Form	Filler Metal Type	Activity Temperature Range, °C
Powder	BAG and BCuP	650-870

PACKING DATA :

Packing Form	Wt/Bottle
Bottle	500 gms



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