NON-FERROUS METAL
WELDING CONSUMABLES

SR-182

TYPE : Basic

AWS A5.11 SFA 5.11 ENiCrFe-3
JIS Z3224 DNiCrFe-3

Applications

SR-182 is designed for welding of Inconel 600 + 601 and dissimilar welding of stainless steels and low-alloyed steel & Nickl-alloyed steel. It can be used for welding of Ni-Cr-Fe alloyed clad steel as well.

Characteristics on Usage

SR-182 has an excellent crack resistibility due to high portion of Mn of weld metal. Arc & slag stability make good bead appearance as well. In practice welding, superior anti-heat feature enables better productivity.

Notes on Usage

① Remove rust, scales, oil, paint, slag of tack welds.
② Keep the arc as short as possible.
③ Dry the electrodes at 350~450℃(482~842℉) for 60 minutes before use.
④ Keep the welding current as low as possible.

Welding Position

1G 2F 3G 4G

Current

AC or DC +

Typical Chemical Composition of All-Weld Metal (%)

C	Si	Mn	P	S	Ni	Cr	Na+Ta	Fe
0.060	0.45	6.20	0.010	0.010	72.0	16.5	1.8	5.2

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)	Temp. ℃ (℉)	CVN-Impact Value J (ft · lbs)
640 (93,300)	40	-196 (-321)	76 (56)

Approval

I Packing

Packet 5 ㎏ (11 lbs)
Carton 5 ㎏ (11 lbs)×4 : 20㎏(44 lbs)

Sizes Available and Recommended Currents (Amp.)

Size mm (in)	3.2 (1/8)	4.0 (5/32)
Length mm(in)	350 (14)	350 (14)
F	70 - 115	95 - 150
V-up, OH	65 - 110	85 - 135

SR-625

TYPE : Basic

AWS A5.11 ENiCrMo-3
JIS Z3224 DNiCrMo-3
EN ISO 14172 Ni6625

Applications

SR-625 is designed for welding of Inconel 600 + 625 and Nickel alloys, 9% Nickel steels.
(LNG storage tank manufacture, desulfurization, Heat exchanger, Building of chemical carrier)

Characteristics on Usage

SR-625 has an Excellent corrosion resistance of Crevice and Pitting, SCC. it provides good tensile strength in high temperature

Notes on Usage

① Remove rust, scales, oil, paint, slag of tack welds.
② Keep the arc as short as possible.
③ Dry the electrodes at 300~350℃(572~662℉) for 60 minutes before use.
④ Keep the welding current as low as possible.

Welding Position

1G 2F 3G 4G

Current

AC or DC+

Typical Chemical Composition of All-Weld Metal (%)

C	Si	Mn	P	S	Ni	Cr	Mo	Nb	Fe
0.06	0.35	0.001	0.001	0.003	62.61	21.21	9.2	3.58	1.57

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)	CVN-Impact Value J (ft · lbs) -196℃
772 (111,000)	32	48

Approval

ABS

Packing

Packet 5Kg(11lbs)
Carton 5Kg(11lbs)x4: 20Kg(44lbs)

Sizes Available and Recommended Currents (Amp.)

Size mm(in)	2.6 (3/32)	3.2 (1/8)	4.0 (5/32)	5.0 (3/16)
Length mm(in)	300 (12)	350 (14)	350 (14)	350 (14)
F	90~95	100~105	120~140	140~180
V-up/OH	90~95	100~105	110~115	110~130

Superflux300 × SA-625

Inconel

Applications

Used for welding heat resisting alloys including Inconel 601, Incoloy 800/800H or combination of these with other alloys for furnace equipments, petrochemical plants and power generation plants.

Characteristics on Usage

① Superflux300 is a inert flux that composition of Si and Mn is hardly changed though welding condition is changed, and superflux300 is a bonded type flux and a high basicity flux.
(the basicity of superflux300 is 2.7)
② Excellent arc stability and slag release.
③ Both its bead appearance and weldability are good.

Notes on Usage

① Dry the flux at 300~350℃ (572~662℉) for 60 minutes before use.
② No preheat required and maximum interpass of 250℃. When welding superaustenitic alloys the interpass temperature should be controlled to a maximum of 100℃.

Welding Position

1G 2F 3G 4G

Current

AC or DC ±

Typical Chemical Composition of All-Weld Metal (%)

C	Si	Mn	P	S	Cr	Ni	Mo	Nb
0.023	0.44	0.40	0.003	0.002	21.0	61.8	9.0	3.5

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)	CVN-Impact Value J (ft · lbs)
715 (103,000)	37.7	-

Typical Welding Conditions (DC +)

Dia(mm)	Amp(A)	Vol(V)	Cpm(cm/min)	Remark
2.4	250~400			
3.2	300~450	28~36	30~60	
4.0	400~600			

SMT-625

AWS A5.14/ASME SFA5.14 ERNiCrMo-3
JIS Z3334 YNiCrMo-3

Applications

① Used for high-alloy steel, heat-resistant steel, 9%Ni steel and similar steel with high notch toughness at extra-low temperatures.
② Used for welding heat resisting alloys including Inconel 601, Incoloy 800/800H or combination of these with other alloys for furnace equipments, petrochemical plants and power generation plants.

Characteristics on Usage

① SMT-625 is a wire with about 68%Ni+22%Cr+9%Mo+3.5%Nb for strong tough corrosion and heat resistant deposit.
② No preheat required and maximum interpass of 250℃. When welding superaustenitic alloys the interpass temperature should be controlled to a maximum of 100℃.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar + He		DC+(Pulse)	DC -

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Cr	Ni	Mo	Nb
0.02	0.20	0.03	0.006	0.001	22.0	64.0	9.00	3.60

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)	Temp. ℃ (℉)	CVN-Impact Value J (ft · lbs)
770 (111,000)	40	-196 (-320)	100 (75)

Packing

SMT-625	Size(mm)	1.0	1.2	1.4	1.6
	Weight	Spool: 12.5kg			
	Size(mm)		2.0	2.4	3.2
	Weight	5kg*1,000mm			

Approval

ABS, GL, LR, DNV, NK, BV, KR

SMT-08

AWS A5.14 ERNiMo-8
JIS Z3331 YGT9Ni-2
EN ISO 18274 Ni 1008 (NiMo19WCr)

Applications

Used for welding of LNG storage tank. (welding for 9%Ni steel), FPSO

Characteristics on Usage

① Having good toughness at cryogenic temperature.
② Provide excellent strength in various temperature range.
③ stable arc and smooth bead appearance.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar+He		DC+(Pulse)	DC-

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Ni	Cr	Mo	Cu	W
0.014	0.012	0.010	0.002	0.001	70.20	2.0	19.4	0.01	2.62

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)	CVN-Impact Value J (ft · lbs) -196℃
725 (105,100)	38.0	176

Packing

SMT-08	Size(mm)	1.0	1.2	1.6
	Weight	Spool: 12.5kg		
	Size(mm)	2.0	2.4	3.2
	Weight	5kg*1,000mm		

NON-FERROUS

SM-455 / ST-455

AWS A5.14/ASME SFA5.14 ERNiCrMo-7
JIS Z3334 YNiCrMo-7

Applications

Ship engine, Heat exchanger, Sea plant, Chemical plant, FGD, etc.

Characteristics on Usage

① SM-455 and ST-455 has high level of corrosion resistance in multiple chemical environment(chlorine, formic acid, acetic acid, sea water).
② SM-455 and ST-455 have high level of stability, resistance of stress, corrosiveness and oxidation.
③ Avoid high level of heat treatment.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar+He		DC+(Pulse)	DC-

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Ni	Cr	Mo	Fe
0.013	0.05	0.01	0.004	0.003	65.0	17.5	15.0	2.5

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)
700 (101,000)	40.0

Packing

SM-455	Size(mm)	1.0	1.2	1.4	1.6
	Weight	Spool: 12.5kg			
ST-455	Size(mm)		2.0	2.4	3.2
	Weight	5kg*1,000mm			

SMT-22

AWS A5.9 ERNiCrMo-10
EN ISO 18274 SNi6022

Applications

FGD, Offshore structures and Petrochemical plants

Characteristics on Usage

① SMT-22 has a extreamly high resistance for corrosion of a limited part
② Welding for Inconel 625+601, Hastelloy C-22, and Overlay of Ni-Alloy metals

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar+He		DC+(Pulse)	DC -

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Ni	Cr	Mo	Co	V	W	Cu	Fe
0.009	0.06	0.38	0.001	0.001	55.52	22.30	14.10	0.04	0.04	2.85	0.01	4.13

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)
720 (104,000)	41.0

Packing

SMT-22	Size(mm)	1.0	1.2	1.6
	Weight	Spool: 12.5kg		
	Size(mm)	2.0	2.4	3.2
	Weight	5kg*1,000mm		

NON-FERROUS

SM-82 / ST-82

AWS A5.14/ASME SFA5.14 ERNiCr-3
JIS Z3334 YNiCr-3

Applications

LNG and LPG storage plant, boilers of thermal power station.

Characteristics on Usage

① SM-82(ST-82) is a Ni-based MIG(TIG) wire for welding a wide range of Ni based alloys and high temperature alloys.
② Used where good corrosion-resistance and heat-resistance for the GMAW(GTAW) of high-alloyed steel, heat-resistant steel, and corrosion-resistant steel.
③ Use for welding 9%Ni steels to give good strength and toughness.
④ Requirements for preheat and PWHT will be dependent on the base material being welded. For most nickel-base materials, no preheat is required.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar + He		DC+(Pulse)	DC -

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Cr	Ni	Fe	Nb+Ta
0.04	0.20	3.20	0.006	0.001	20.0	73.0	1.00	2.50

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)	Temp. ℃ (℉)	CVN-Impact Value J (ft · lbs)	Shielding Gas
660 (93,700)	35	-196 (-320)	80 (59)	70% Ar + 30% He

Packing

SM-82	Size(mm)	1.0	1.2	1.4	1.6
	Weight	Spool: 12.5kg			
ST-82	Size(mm)		2.0	2.4	3.2
	Weight	5kg*1,000mm			

SM-276 / ST-276

AWS A5.14/ASME SFA5.14 ERNiCrMo-4
JIS Z3334 YNiCrMo-4

Applications

Pumps, valves, pipework and vessels for use in aggressive environments in chemical process plants, also in equipment for flue gas desulphurisation and critical equipment in offshore oil and gas production.

Characteristics on Usage

① SM-276(ST-276) is a Ni-based MIG(TIG) wire with 60%Ni+17%Cr+16%Mo provide good corrosion resistance in a wide range of aggressive organic and inorganic acid media.
② Preheat is not required, interpass temperature should preferably be kept below 100℃ and heat input restricted to 1.5KJ/min.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar + He		DC+(Pulse)	DC -

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Cr	Ni	Mo	W
0.02	0.05	0.50	0.003	0.001	17.0	61.0	16.00	3.50

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)
750 (108,100)	33

Packing

SM-276	Size(mm)	1.0	1.2	1.4	1.6
	Weight	Spool: 12.5kg			
ST-276	Size(mm)		2.0	2.4	3.2
	Weight	5kg*1,000mm			

SM-400 / ST-400

AWS A5.14/ASME SFA5.14 ERNiCu-7
JIS Z3334 YNiCu-7

Applications

Used for welding of heat exchanger, piping, vessels and salt purification.

Characteristics on Usage

① SM-400(ST-400) is a MIG(TIG) wire with about 65%Ni+30%Cu+2%Ti+1%Fe and used for welding similar alloys and for mixed welds between them or Cupronickels and carbon steels.
② No preheat required, maximum interpass temperature 150℃ and no PWHT required.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar + He		DC+(Pulse)	DC -

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Ni	Cu	Ti	Fe
0.02	0.15	3.20	0.005	0.001	64.0	29.0	2.20	0.90

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)
530 (76,400)	45

Packing

SM-400	Size(mm)	1.0	1.2	1.4	1.6
	Weight	Spool: 12.5kg			
ST-400	Size(mm)		2.0	2.4	3.2
	Weight	5kg*1,000mm			

SM-718

AWSA5.14 ERNiFeCr-2

Applications

① Mainly used for welding high-strength aircraft components, liquid rocket components, jet engine parts and nuclear power plants involving cryogenic temperatures.
② Used for welding alloys 718, 706 and X-750`.

Characteristics on Usage

① This is a high-strength, high-temperature resistant and corrosion resistant nickel-chromium alloy.
It is suitable for use at cryogenic temperatures and also for use in air up to 1300℉.
The alloy is readily worked and can be age-hardened.
② Precautions should be taken with high heat input processes to avoid microfissuring.

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Cr	Ni	Mo	Fe	Nb	Ti
0.04	0.2	0.25	0.004	0.001	19.0	53	3.1	Rem.	5.05	1.0

Typical Mechanical Properties of All-Weld Metal (Shielding Gas: Ar+He)

YS MPa(lbs/in2)	TS MPa(lbs/in2)	EL (%)
630 (91,400)	860 (123,900)	27

Typical Welding Conditions (Pulse)

Dia (mm)	Amp (A)	Vol (V)	Cpm (cm/min)	Gas Flow (ℓ /min)	Shielding Gas
1.2	250	26	30	25	100% Ar or
1.6	300	29	35		Ar +30% He

SM-60 / ST-60

AWS A5.14/ASME SFA5.14 ERNi-1
JIS Z3334 YNi-1

Applications

Used for welding for food machine, magnetic machine, chemical facility, plant, etc.

Characteristics on Usage

① SM-60 and ST-60 has high level of mechanical properties and corrosion resistance especially in alkali case.
② SM-60 and ST-60 can be used for welding Ni 200 + 201, double welding of Ni alloy metal, hardfacing welding, etc.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar+He		DC+(Pulse)	DC -

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Ni	Ti
0.02	0.40	0.40	0.005	0.001	96.0	3.0

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in^2)	EL (%)
480 (69,700)	30.0

Packing

SM-60	Size(mm)	1.0	1.2	1.4	1.6
	Weight	Spool: 12.5kg			
ST-60	Size(mm)		2.0	2.4	3.2
	Weight	5kg*1,000mm			

Superflux300 × SA-82

Applications

① Boilers of thermal power station and Offshore structures
② Superflux300 X SA-82 is for welding of a wide range of Ni based alloys and high temperature alloys.

Characteristics on Usage

① Superflux300 is a inert flux that composition of Si and Mn is hardly changed though wedling condition in chagned, and is a bonded type flux and a high basicity flux(The basicity of superflux300 is 2.7)
② Stable Arc and Slag Release, both its bead appearance and weldability are good.

Notes on Usage

① Dry the flux at 300~350℃ for 60 minutes before use.
② Avoid using high current to prevent corrosion deterioration of HAZ and control Heat input as low as possible.
③ No preheat required and maxiumum interpass of 250℃. When welding super austenitic alloys, the interpass temperature should be controlled to maximum of 100℃.

Welding Position

1G

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Cr	Ni	Mo	Ti
0.067	0.220	3.33	0.0001	0.014	19.66	69.88	0	0.119

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)	CVN-Impact Value J (ft · lbs) -196℃
619 (89,000)	46.4	117

Approval

I Packing

SA-82(Wire) : 25Kg Coil
Superflux300(Flux) : 20Kg Can

SMT-7030

AWS A5.7/ASME SFA 5.7 ER CuNi
JIS Z3341 YCuNi-3

Applications

Used for welding desalination plant, evaporators, etc in salt and sea water processing system.

Characteristics on Usage

① SMT-7030 is a MIG(TIG) Wire used to weld different copper-nickel types Cu/Ni 70.30, 80.20 and 90.10.

② Preheating not normally required, maximum interpass temperature 150℃ and no PWHT. contamination of the weld zone with foreign material, particularly any source of lead, tin or zinc must be scrupulously avoided to prevent weld metal cracking.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar + He		DC+(Pulse)	DC -

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Ni	Ti	Cu
0.02	0.20	0.90	0.001	0.001	31.0	0.40	67.0

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)
500 (72,000)	30

Packing

SMT-7030	Size(mm)	1.0	1.2	1.4	1.6
	Weight	Spool: 12.5kg			
	Size(mm)		2.0	2.4	3.2
	Weight	5kg*1,000mm			

Approval

ABS

SM-9010 / ST-9010

JIS Z3341 YCuNi-1

Applications

Used for welding of offshore oil/gas, and petrochemical process industries.

Characteristics on Usage

① Used for welding 90%Cu-10%Ni copper-nickel alloys and dissimilar welding copper-nickel alloys.
② Provide good corrosion resistant in various corrosive environmental conditions.

Shielding Gas	Welding Currents	GMAW	GTAW
Ar, Ar+He		DC+(Pulse)	DC -

Typical Chemical Composition of Wire (%)

C	Si	Mn	P	S	Ni	Ti	Cu
0.005	0.04	0.85	0.006	0.001	10.5	0.27	Rem.

Typical Mechanical Properties of All-Weld Metal

TS MPa(lbs/in²)	EL (%)
380 (55,000)	36.0

Packing

SM-9010	Size(mm)	1.0	1.2	1.4	1.6
	Weight	Spool: 12.5kg			
ST-9010	Size(mm)		2.0	2.4	3.2
	Weight	5kg*1,000mm			

Approval

KR