HYUNDAI WELDING

Rev. 00

SM-718

AWS A5.14/ ASME SFA5.14 ERNiFeCr-2
JIS Z3334 SNi7718 (NiCr19Fe19Nb5Mo3)

HYUNDAI WELDING CO., LTD.

SM-718

❖ Specification

AWS A5.14/ ASME SFA5.14 ERNiFeCr-2
JIS Z3334 SNi7717 (NiCr19Fe19Nb5Mo3)

❖ Applications

Mainly used for welding high-strength aircraft components, liquid rocket components, jet engine parts and nuclear power plants involving cryogenic temperatures.

❖ 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°F
   The alloy is readily worked and can be age-hardened.
2. Precautions Should be taken with high heat input processes to avoid microfissuring.

❖ Shielding gas

100% Ar or Ar+30%He

❖ Polarity

GMAW: DC+

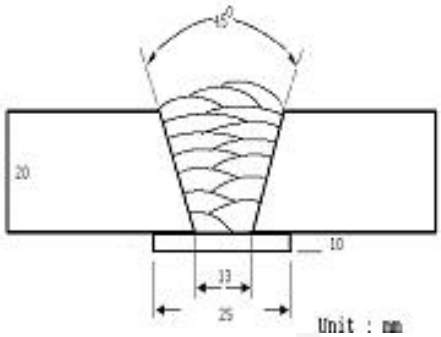
❖ Packing

Dia.	1.2mm (0.045in)	1.6mm (1/16in)
Spool	12.5kg (28lbs)	

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Rules



[Joint Preparation & Layer Details]

Diameter(mm)	:	1.2mm
Shielding Gas	:	CO2 0.06% + H2 2.0% + He 15% + Bal Ar
Flow Rate(ℓ /min.)	:	20~22
Amp./ Volt.	:	230 / 24
Stick-Out(mm)	:	20
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Chemical composition of the wire (wt%)

Consumables	C	Si	Mn	P	S	Ni	Cr
SM-718	0.055	0.05	0.02	0.001	0.001	52.05	18.00
AWS A5.14 ERNiCrFe-2	≤0.08	≤0.35	≤0.35	≤0.015	≤0.015	50.0 ~55.0	17.0 ~21.0

Consumables	Mo	Ti	Cu	Nb	Fe	Al	B
SM-718	3.17	0.92	0.009	5.29	20.10	0.512	0.001
AWS A5.14 ERNiCrFe-2	2.80 ~3.30	0.65 ~1.15	≤0.30	4.75 ~5.50	Rem	0.20 ~0.80	≤0.006

❖ Chemical Analysis of the weld metal(wt%)

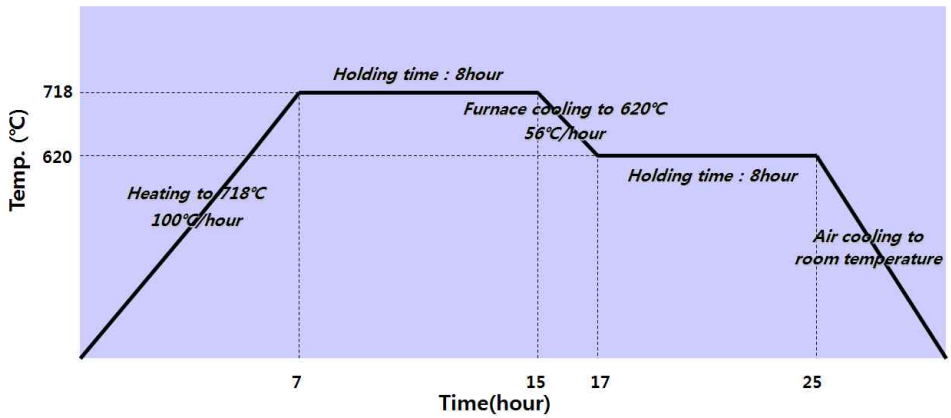
Consumables	C	Si	Mn	P	S	Ni	Cr
SM-718	0.059	0.09	0.08	0.002	0.001	51.45	18.12

Consumables	Mo	Ti	Cu	Nb	Fe	Al	B
SM-718	3.29	1.05	0.021	5.09	19.19	0.510	0.001

Mechanical Properties of All Weld Metal(GMAW)

❖ Post Weld Heat Treatment condition(AWS A5.14 ERNiFeCr-2)

Age-hardened condition: Heat treated at 718℃ for 8 hours, then furnace cooled to 620℃ at 56℃ per hour, held for 8hours, then air cooled.



❖ Mechanical Properties of the weld metal

Consumables	Tensile Test		CVN Impact test Joule (ft·lbs)					
SM-718	T.S. MPA (ksi)	EL. (%)	Temp.	x1	x2	x3	x4	x5
	1,221 (177)	6.9	**-196**℃ **(-320.8**°F**)**	37 (27)	39 (29)	39 (29)	41 (30)	30 (22)
AWS A5.14 ERNiCrFe-2	≥ 1,140	-	Not Specified					

Consumables	Hardness											
SM-718	Temp.	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	Avg.
	HRc	43	42	40	43	42	42	42	43	41	43	42.1
	Hv20	420	420	427	429	409	416	425	406	419	420	418.9

Bead Appearance (GMAW)

❖ Bead Appearance (H-Fillet Welding Position

Shielding gas	Bead Appearance (220A/27V)
15%He + Bal Ar	
CO2 0.05% + H2 2.0% + He 15% + Bal Ar	

Notice

This test report is made for giving general information, and it's not meaning guarantee.
Test results are changeable by several welding
- parameter including base materials