HYUNDAI WELDING

Rev. 06

SC-81M

FLUX CORED ARC WELDING CONSUMABLE
FOR LOW-TEMPERATURE SERVICE STEEL

2022.02

HYUNDAI WELDING CO., LTD.

SC-81M

❖ Specification

AWS A5.29	E81T1-Ni1M-J H4
(AWS A5.29M	E551T1-Ni1M-J H4)
EN ISO 17632-A	T 50 6 1Ni P M21 1 H5

❖ Applications

All position welding for construction machinery, bridge structures and storage tanks

❖ Characteristics on Usage

SC-81M is an all position flux cored wire designed for Ar+20~25% CO2 shielding. You can get smooth arc, and low spatter, good weldability. The weld metal impact values at –60℃(-76°F) is excellent and has good bead appearance, slag covering is uniform and easy to remove.

❖ Note on Usage

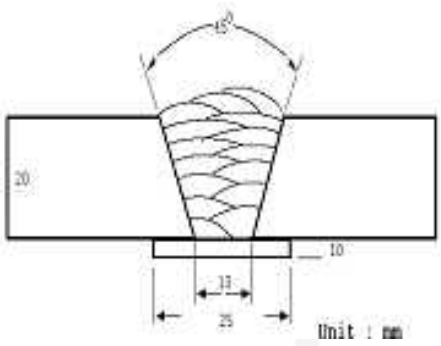
1. For preheating guidelines, please refer to your local standards and codes relative to your best practices.

2. Use Ar+20~25% CO_2 gas.

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	**: 1G(PA)**
Diameter(mm)	: 1.2mm(0.045in)
Shielding Gas	: Ar+20%CO_2
Amp./ Volt.	: 270~280 /29~30
Stick-Out(mm)	: 20~25 (0.79~0.98in)
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15 (302±59 ℉)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft·lbs)	
SC-81M	YS Mpa(lbs/in²)	TS Mpa((lbs/in²	EL(%)	-40℃ (-40℉)	-60℃ (-76℉)
	540(78,000)	580(84,000)	25.0	105(77)	73(54)
AWS A5.29 E81T1-Ni1M-J H4	**≥470 (68,000)**	**550~690 (80,000~100,000)**	**≥ 19**	**≥27(20) at -40℃(-40℉)**	

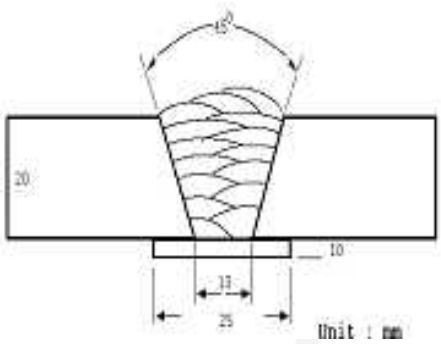
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-81M	0.04	0.32	1.15	0.008	0.008	0.90
AWS A5.29 E81T1-Ni1M-J H4	**≤0.12**	**≤0.80**	**≤1.75**	**≤0.03**	**≤0.03**	**0.8~1.1**

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	:	**1G(PA)**
Diameter(mm)	:	1.4mm(0.052in)
Shielding Gas	:	Ar+20%CO_2
Amp./ Volt.	:	300~315 /29~30
Stick-Out(mm)	:	20~25 (0.79~0.98in)
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15 (302±59 ℉)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft·lbs)	
SC-81M	YS Mpa(lbs/in²)	TS Mpa((lbs/in²)	EL(%)	-40℃ (-40℉)	-60℃ (-76℉)
	545(79,000)	585(85,000)	26.2	102(75)	70(52)
AWS A5.29 E81T1-Ni1M-J H4	**≥470 (68,000)**	**550~690 (80,000~100,000)**	**≥ 19**	**≥27(20) at –40℃(-40℉)**	

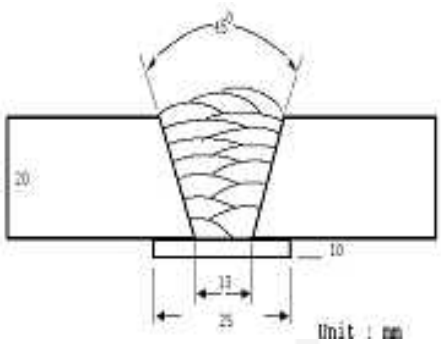
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-81M	0.04	0.33	1.16	0.008	0.008	0.90
AWS A5.29 E81T1-Ni1M-J H4	**≤0.12**	**≤0.80**	**≤1.75**	**≤0.03**	**≤0.03**	**0.8~1.1**

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	**: 1G(PA)**
Diameter(mm)	: 1.6mm(1/16 in)
Shielding Gas	: Ar+20%CO_2
Amp./ Volt.	: 320~330 /29~30
Stick-Out(mm)	: 20~25 (0.79~0.98in)
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15 (302±59 ℉)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft·lbs)	
	YS Mpa(lbs/in²)	TS Mpa((lbs/in²)	EL(%)	-40℃ (-40℉)	-60℃ (-76℉)
SC-81M	550(80,000)	590(86,000)	26.0	96(71)	67(49)
AWS A5.29 E81T1-Ni1M-J H4	**≥470 (68,000)**	**550~690 (80,000~100,000)**	**≥ 19**	**≥27(20) at -40℃(-40℉)**	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-81M	0.04	0.34	1.15	0.008	0.008	0.91
AWS A5.29 E81T1-Ni1M-J H4	**≤0.12**	**≤0.80**	**≤1.75**	**≤0.03**	**≤0.03**	**0.8~1.1**

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
1.2mm (0.045in)	200	26	10.2(400)	87~89	3.1(6.8)
	250	28	13.3(525)	88~89	4.3(9.5)
	300	32	15.3(600)	88~90	5.8(12.8)
1.4mm (0.052in)	250	28	7.6 (300)	85~87	3.6(7.9)
	300	32	10.2 (400)	86~88	4.7(10.4)
	330	36	12.8 (500)	87~89	6.3(13.9)
1.6mm (1/16 in)	280	31	6.4 (250)	86~88	4.0(8.8)
	330	33	7.6 (300)	86~89	4.6(10.1)
	350	34	8.1 (320)	87~89	5.6(12.3)
	400	38	9.2 (360)	88~90	6.5(14.3)
Remark				Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time, min.)×60

* Shielding Gas : Ar+20%CO_2

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	:	**1.6(1/16in)**	**Amps(A) / Volts(V)**	:	310 / 32
Shielding Gas	:	Ar+20%CO_2	**Stick-Out(mm)**	:	20mm(0.79in)
Flow Rate(ℓ /min.)	:	20	**Welding Speed**	:	35 cm/min (13.8 in/min)
Welding Position	:	1G(PA)	**Current Type & Polarity**	:	DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	:	**72 hrs**
Evolution Temp.	:	45 ℃(113°F)
Barometric Pressure	:	780 mm-Hg

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
3.4	**3.5**	**3.3**	**3.4**

Average Hydrogen Content 3.4 ㎖ / *100g Weld Metal*

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Current
1.2mm (0.045in)	Ar+20%CO_2	Flat	120~300 Amp
		V-up Over head	120~260 Amp
		V-down	140~300 Amp
1.4mm (0.052in)	Ar+20%CO_2	Flat	160~350 Amp
		V-up Over head	140~270 Amp
		V-down	160~320 Amp
1.6mm (1/16 in)	Ar+20%CO_2	Flat	180~380 Amp
		V-up Over head	160~320 Amp
		V-down	180~360 Amp

❖ F No. & A No.

F No	A No
6	10