HYUNDAI WELDING

Rev. 00

SC-81MC

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF 550MPa CLASS HIGH TENSILE STEEL

HYUNDAI WELDING CO., LTD.

SC-81MC

❖ Specification

AWS A5.29	E81T1-Ni2C-J/Ni2M -J H4
(AWS A5.29M	E551T1-Ni2C-J/Ni2M -J H4)
EN ISO 17632-A	T50 5 2Ni P C1/M21 1 H5

❖ Applications

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

❖ Characteristics on Usage

SC-81MC is a titania flux cored wire applicable for all-position welding by 100% CO2 shielding gas or Ar-20~25% CO2 shielding gas. You can get smooth arc, and low spatter, good weldability. The weld metal impact values at –51℃(-60℉) is excellent and has good bead appearance, slag covering is uniform and easy to remove.

❖ Note on Usage

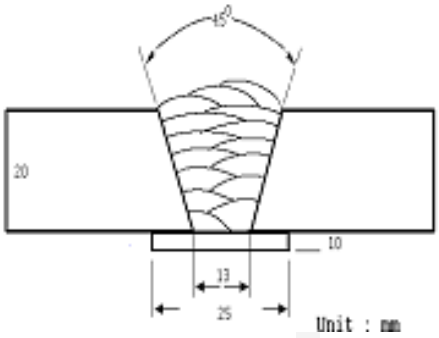
1. Proper preheating(50~150℃(150~302℉)) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates.

2. Use 100%CO_2 or 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(0.045 in)
Shielding Gas	:	100%CO_2, Ar+20%CO_2
Amp./ Volt.	:	280~300 /30~31
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	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS MPa(lbs/in²)	TS MPa((lbs/in²)	EL (%)	-40℃ (-40℉)	-51℃ (-60℉)
SC-81MC	100% CO_2	545(79,000)	590(86,000)	27.8	125(92)	94(69)
	Ar-20% CO_2	595(86,000)	655(95,000)	26.4	111(82)	85(63)
AWS A5.29 E81T1-Ni2C/M-J H4		≥470(68,000)	550~690 (80,000~100,000)	≥ 19	≥27J at -51℃ (≥20ft · lbs at 60℉)	

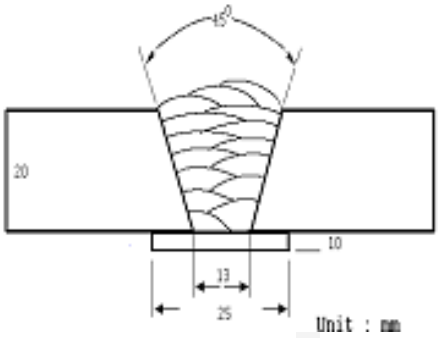
❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shielding gas	C	Si	Mn	P	S	Ni
SC-81MC	100%CO_2	0.026	0.22	1.02	0.008	0.004	1.95
	Ar-20%CO_2	0.036	0.27	1.13	0.007	0.003	1.99
AWS A5.29 E81T1-Ni2C/M-J H4		≤ 0.12	≤ 0.8	≤ 1.5	≤ 0.03	≤ 0.03	1.75~ 2.75

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	: 100%CO_2, 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	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS MPa(lbs/in²)	TS MPa((lbs/in²)	EL (%)	-40℃ (-40℉)	-51℃ (-60℉)
SC-81MC	100% CO_2	543(79,000)	599(87,000)	28.2	120(89)	90(66)
	Ar-20% CO_2	597(87,000)	648(94,000)	26.2	110(81)	80(59)
AWS A5.29 E81T1-Ni2C/M-J H4		≥470(68,000)	550~690 (80,000~100,000)	≥ 19	≥27J at -51℃ (≥20ft · lbs at 60℉)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shielding gas	C	Si	Mn	P	S	Ni
SC-81MC	100%CO_2	0.024	0.21	1.01	0.007	0.005	1.98
	Ar-20%CO_2	0.035	0.28	1.12	0.007	0.004	2.02
AWS A5.29 E81T1-Ni2C/M-J H4		≤ 0.12	≤ 0.8	≤ 1.5	≤ 0.03	≤ 0.03	1.75~ 2.75

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Shielding Gas	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
		Amp. (A)	Volt. (V)			
1.6mm (1/16 in)	100%CO_2	330	32	8.3(325)	86~88	5.3(12)
	Ar-20%CO_2	330	30	8.3(325)	87~89	5.5(12)
Remark					Deposition efficiency =(Deposited metal weight/Wire weight used)×100	Deposition rate =(Deposited metal weight/Welding time,min.)×60

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	:	**1.6mm(1/16in)**	**Amps(A) / Volts(V)**	:	310 / 30
Shielding Gas	:	100%CO_2 Ar+20%CO_2	**Stick-Out(mm)**	:	20mm(0.79in)
			Welding Speed	:	35 cm/min (13.8 in/min)
Flow Rate(ℓ /min.)	:	20			
Welding Position	:	1G(PA)	**Current Polarity**	:	DC(+)

❖ Diffusible Hydrogen Test 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
100% CO_2	3.4	3.5	3.5	3.7
Ar-20%CO_2	3.7	3.8	3.8	3.9

Average Hydrogen Content 3.6 *㎖ / 100g Weld Metal (100% CO_2)*

Average Hydrogen Content 3.8 *㎖ / 100g Weld Metal (Ar-20% CO_2)*

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Current
1.6mm (1/16 in)	100%CO_2 or Ar+20%CO_2	Flat	180~380 Amp
		V-up Overhead	160~320 Amp
		V-down	180~360 Amp

❖ F No. & A No.

F-No.	A-No.
6	10