

SC-81MC

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



❖ Specification

<i>AWS A5.29</i>	E81T1-Ni2C-J/Ni2M -J H4
<i>(AWS A5.29M)</i>	E551T1-Ni2C-J/Ni2M -J H4)
<i>EN ISO 17632-A</i>	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 °C (-60°F) is excellent and has good bead appearance, slag covering is uniform and easy to remove.

❖ Note on Usage

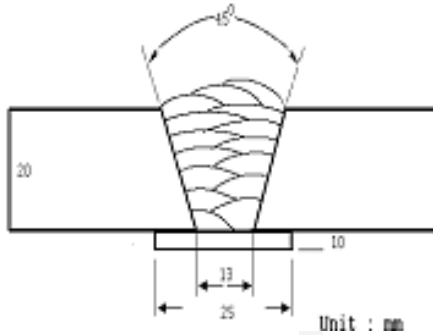
1. Proper preheating(50~150 °C (150~302°F)) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates.
2. Use 100%CO₂ or Ar+20~25% CO₂ gas.



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(°C)	: R.T.
Interpass Temp.(°C)	: 150±15 (302±59 °F)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS MPa(lbs/in ²)	TS MPa((lbs/in ²)	EL (%)	-40°C (-40°F)	-51°C (-60°F)
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°C (≥ 20ft · lbs at 60°F)	

❖ 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

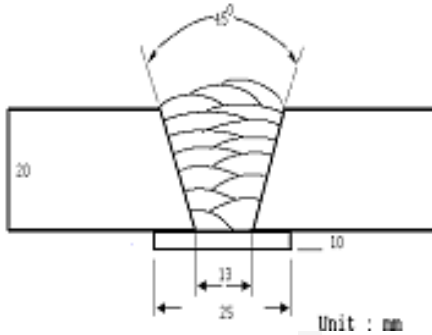
This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING CO., LTD. affect the results obtained in applying this type of information. These variables include, but are not limited to, welding procedure, shielding gas, plate chemistry and temperature, weldment design, fabrication methods and service requirements.



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%CO₂, Ar+20%CO₂
- Amp./ Volt.** : 320~330 /29~30
- Stick-Out(mm)** : 20~25 (0.79~0.98in)
- Pre-Heat(°C)** : R.T .
- Interpass Temp.(°C)** : 150±15 (302±59 °F)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS MPa(lbs/in ²)	TS MPa((lbs/in ²)	EL (%)	-40°C (-40°F)	-51°C (-60°F)
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°C (≥ 20ft · lbs at 60°F)	

❖ 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

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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)
Flow Rate(ℓ /min.)	: 20	Welding Speed	: 35 cm/min (13.8 in/min)
Welding Position	: 1G(PA)	Current Polarity	: DC(+)

❖ Diffusible Hydrogen Test Using Gas Chromatography Method

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

❖ Result(ml/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 ml / 100g Weld Metal (100% CO₂)

Average Hydrogen Content 3.8 ml / 100g Weld Metal (Ar-20% CO₂)



❖ 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