

SC-81Ni2

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF LOW-TEMPERATURE
SERVICE STEEL

2024.12



SC-81Ni2

❖ Specification

AWS A5.29

E81T1-Ni2C

(AWS A5.29M

E551T1-Ni2C)

EN ISO 17632-A

T46 6 2Ni P C1 1 H5

❖ Applications

SC-81Ni2 is a titania type flux cored wire for welding of low-temperature service steel

❖ Characteristics on Usage

SC-81Ni2 is titania type flux cored wire for all position welding with CO₂ shielding gas. This wire provide excellent notch toughness at low temperature down to -60°C

❖ Note on Usage

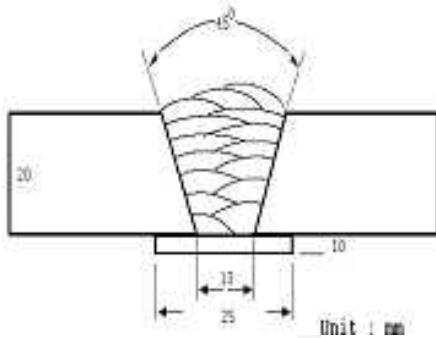
1. For preheating guidelines, please refer to your local standards and codes relative to your best practices.
2. Use 100% CO₂ gas.



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 (0.045in)
Shielding Gas	: 100%CO ₂
Flow Rate(ℓ /min.)	: 20 ℓ /min
Amp./ Volt.	: 280A / 32V
Stick-Out(mm)	: 20~25mm (0.79~0.98in)
Pre-Heat(°C)	: R.T.
Interpass Temp.(°C)	: 150±15°C (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL(%)	-40°C (-40°F)	-62°C (-80°F)
SC-81Ni2	590 (86,000)	630 (91,000)	25.0	100 (74)	80 (59)
AWS A5.29 E81T1-Ni2C	≥ 470 (68,000)	550~690 (80,000~ 100,000)	≥ 19	≥ 27J at -40°C (≥ 20ft · lbs at -40°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-81Ni2	0.05	0.27	1.35	0.012	0.011	2.20
AWS A5.29 E81T1-Ni2C	≤ 0.12	≤ 0.80	≤ 1.50	≤ 0.03	≤ 0.03	1.75~2.75

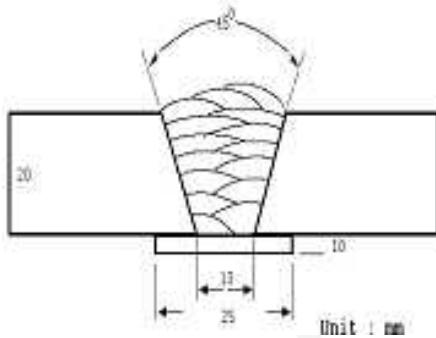
This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING 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)	: 1.4mm (0.052in)
Shielding Gas	: 100%CO ₂
Flow Rate(ℓ /min.)	: 20 ℓ /min
Amp./ Volt.	: 300A / 32V
Stick-Out(mm)	: 20~25mm (0.79~0.98in)
Pre-Heat(°C)	: R.T.
Interpass Temp.(°C)	: 150±15°C (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL(%)	-40°C (-40°F)	-62°C (-80°F)
SC-81Ni2	605 (88,000)	635 (92,000)	26.0	95 (70)	75 (55)
AWS A5.29 E81T1-Ni2C	≥ 470 (68,000)	550~690 (80,000~ 100,000)	≥ 19	≥ 27J at -40°C (≥ 20ft · lbs at -40°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-81Ni2	0.05	0.28	1.36	0.012	0.011	2.25
AWS A5.29 E81T1-Ni2C	≤ 0.12	≤ 0.80	≤ 1.50	≤ 0.03	≤ 0.03	1.75~2.75

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Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr) kg/hr(lb/hr)
	Amp.(A)	Volt.(V)		
SC-81Ni2 1.2mm (0.045in)	200	26	84~86	2.6 (5.7)
	250	30	84~86	3.6 (7.9)
	300	33	85~87	4.7 (10.3)
SC-81Ni2 1.4mm (0.052mm)	250	27	84~86	2.5 (5.5)
	300	31	84~86	3.4 (7.5)
	350	35	85~87	4.5 (9.9)
Remark			Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	* Shielding Gas : 100%CO ₂ Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 100%CO₂



Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	: 1.2(0.045in)	Amps(A) / Volts(V)	: 230 / 24
Shielding Gas	: 100%CO ₂	Stick-Out(mm)	: 20~25mm (0.79~0.98in)
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 °C (113°F)
Barometric Pressure	: 780 mm-Hg

❖ Result(ml/100g Weld Metal)

X1	X2	X3	X4
4.1	4.2	4.1	4.1

Average Hydrogen Content 4.1 ml / 100g Weld Metal



Proper Welding Condition

❖ Welding Conditions

Consumable	Shielding Gas	Welding Position	Wire Dia.
			1.2mm(0.045in)
SC-81Ni2	100% CO ₂	Flat	110~280 Amp
		V-up Over head	110~240 Amp
		V-down	110~280 Amp

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Approvals

❖ AUTHORIZED APPROVAL DETAILS

Welding Position	Register of shipping & Size				
	ABS	LR	BV	DNV	NK
All V-Down	5YQ460SA H5 1.2~1.4mm (0.045~0.052in)	3Y47S H5 1.2~1.4mm (0.045~0.052in)	SA5Y46 HHH 1.2~1.4mm (0.045~0.052in)	V Y46MS(H5) 1.2~1.4mm (0.045~0.052in)	KSW63Y47G(C) H5 1.2~1.4mm (0.045~0.052in)

❖ F No & A No

F No	A No
6	10