HYUNDAI WELDING

Rev. 05

SC-81Ni2

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

2022.02

HYUNDAI WELDING CO., LTD.

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 CO_2 shielding gas. This wire provide excellent notch toughness at low temperature down to -60℃

❖ Note on Usage

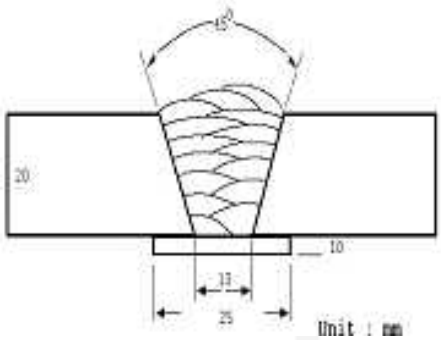
1. For preheating guidelines, please refer to your local standards and codes relative to your best practices.

2. Use 100% 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	:	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(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15℃ (302±59°F)
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS MPa (lbs/in²)	TS MPa (lbs/in²)	EL(%)	-40℃ (-40°F)	-62℃ (-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℃ (≥20ft · lbs at -40°F)**	

❖ Chemical Analysis of all weld metal(wt%)

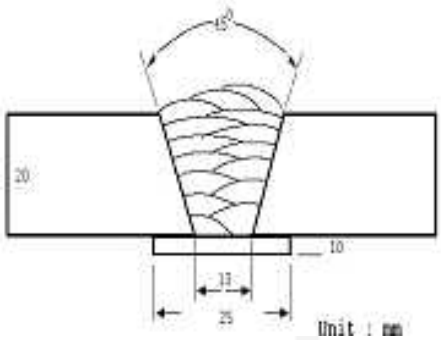
Consumable	C	Si	Mn	P	S	Ni
SC-81Ni2	0.05	0.27	1.35	0.012	0.011	2.20
AWS A5.29 E81T1-Ni2C	**≤0.12**	**≤0.80**	**≤1.50**	**≤0.03**	**≤0.03**	**1.75~2.75**

SC-81Ni2

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(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15℃ (302±59°F)
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS MPa (lbs/in²)	TS MPa (lbs/in²)	EL(%)	-40℃ (-40°F)	-62℃ (-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℃ (≥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**

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%CO_2

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	:	**1.2(0.045in)**	**Amps(A) / Volts(V)**	:	**280 / 31**
Shielding Gas	:	**100%CO_2**	**Stick-Out(mm)**	:	**20~25mm (0.79~0.98in)**
Flow Rate(ℓ /min.)	:	**20**			
Welding Position	:	**1G (PA)**	**Welding Speed**	:	**35 cm/min (13.8 in/min)**
			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
3.8	**3.9**	**3.7**	**3.8**

Average Hydrogen Content 3.8 ㎖ / *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	130~300 Amp
		V-up Over head	170~230 Amp
		V-down	150~300 Amp

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