HYUNDAI WELDING

Rev. 05

SC-81Ni2M

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

2022.12

HYUNDAI WELDING CO., LTD.

SC-81Ni2M

❖ Specification

AWS A5.29	E81T1-Ni2M
(AWS A5.29M	E551T1-Ni2M
EN ISO 17632-A	T46 6 2Ni P M21 2 H5

❖ Applications

SC-81Ni2M is a titania type flux cored wire for welding of low-temperature service steel.

❖ Characteristics on Usage

SC-81Ni2M is titania type flux cored wire for all position welding with Ar+CO_2 gas mixture shielding. 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 Ar+20~25% CO_2 gas

3. Original packaging until ready for use should remain.

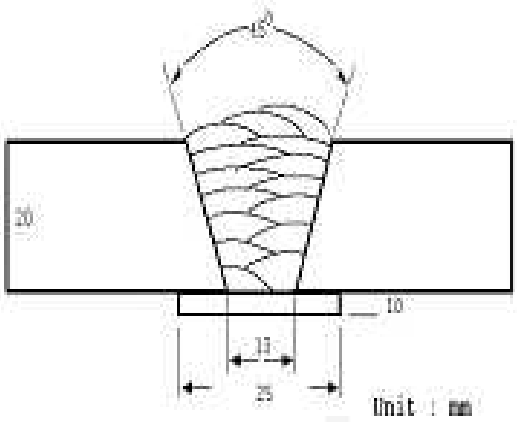
4. Remaining after use so that you can be protected from moisture and re-packaging plastic, etc. should be kept in the room and as soon as possible should be used.

SC-81Ni2M

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
Flow Rate(ℓ /min.)	:	20
Amp./ Volt.	:	280 / 30
Stick-Out	:	20~25mm (0.79~0.98in)
Welding position	:	1G
Interpass Temp.	:	150±15 ℃ (302±59 ℉)
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℉)	-62℃ (-80℉)
SC-81Ni2M	580(84,000)	620(90,000)	24.8	120(89)	90(66)
AWS A5.29 E81T1-Ni2M	**≥470 (68,000)**	**550~690 (80,000~100,000)**	**≥ 19**	**≥ 27(20) at –40℃(-40℉)**	

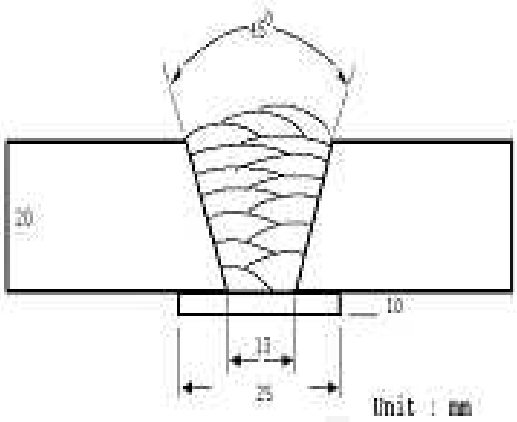
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-81Ni2M	0.05	0.24	1.15	0.010	0.010	2.25
AWS A5.29 E81T1-Ni2M	**≤0.12**	**≤0.80**	≤1.50	**≤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)	:	1.4mm(0.052in)
Shielding Gas	:	Ar+20%CO_2
Flow Rate(ℓ /min.)	:	20
Amp./ Volt.	:	300 / 30
Stick-Out	:	20~25mm (0.79~0.98in)
Welding position	:	1G
Interpass Temp.	:	150±15 ℃ (302±59 ℉)
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℉)	-62℃ (-80℉)
SC-81Ni2M	585(85,000)	640(93,000)	25.4	115(85)	85(63)
AWS A5.29 E81T1-Ni2M	**≥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-81Ni2M	0.06	0.22	1.17	0.010	0.010	2.22
AWS A5.29 E81T1-Ni2M	**≤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(lb/hr)
	Amp.(A)	Volt.(V)		
SC-81Ni2M 1.2mm(0.045in)	230	26	84~86	3.2(7.0)
	280	30	85~87	4.4(9.7)
	330	33	86~88	5.1(11.2)
SC-81Ni2M 1.4mm(0.052in)	250	27	83~85	3.0(6.6)
	300	31	84~86	4.2(9.2)
	350	35	85~87	4.9(10.8)
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	:	1.2mm(0.045in)	**Amps(A) / Volts(V)**	:	280A / 30V
Shielding Gas	:	80%Ar+20%CO_2	**Stick-Out**	:	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℉)
Barometric Pressure	:	780 mm-Hg

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
3.3	**3.5**	**3.2**	**3.4**

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

Proper Welding Condition

❖ Welding Conditions

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)	
			1.2mm(0.045in)	1.4mm(0.052in)
SC-81Ni2M	100% CO_2	Flat	130~300 Amp	270~330 Amp
		V-up Over head	170~230 Amp	180~240 Amp
		V-down	150~300 Amp	170~320 Amp

❖ AUTHORIZED APPROVAL DETAILS

Welding position	Register of shipping & size(mm)		
	DNV	LR	BV
All	VY46MS(H5) 1.2~1.4	SA5Y46 HHH 1.2~1.4	Pending

❖ F No & A No

F No	A No
6	10