

SC-81Ni2M

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

2024.12



SC-81Ni2M

❖ Specification

<i>AWS A5.29</i>	E81T1-Ni2M
<i>(AWS A5.29M)</i>	E551T1-Ni2M
<i>EN ISO 17632-A</i>	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+CO₂ gas mixture shielding. 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 Ar+20~25% CO₂ 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.

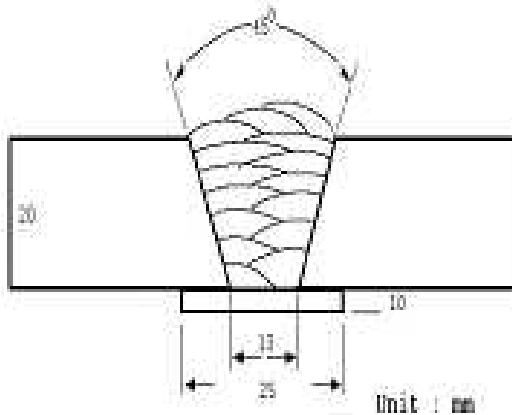


SC-81Ni2M

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 °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-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°C (-40°F)	

❖ 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

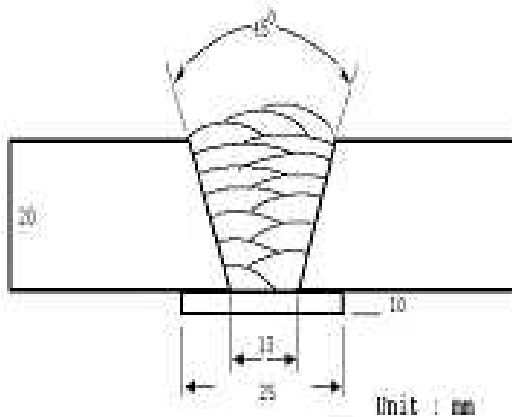
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ 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 °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-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°C (-40°F)	

❖ 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

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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%CO₂



Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	: 1.2mm(0.045in)	Amps(A) / Volts(V)	: 230A / 24V
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 °C(113°F)
Barometric Pressure	: 780 mm-Hg

❖ Result(ml/100g Weld Metal)

X1	X2	X3	X4
4.1	4.3	4.2	4.2

Average Hydrogen Content 4.2 ml / 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	110~280 Amp	110~280 Amp
		V-up Over head	110~240 Amp	110~260 Amp
		V-down	110~280 Amp	110~280 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

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