

SC-81A1

FLUX CORED ARC WELDING CONSUMABLE
FOR 0.5%Mo TYPE



❖ Specification

<i>AWS A5.36</i>	E81T1-C1PZ-A1
<i>(AWS A5.36M)</i>	E551T1-C1PZ-A1)
<i>(AWS A5.29)</i>	E81T1-A1C)
<i>JIS Z3318</i>	YFM-C
<i>EN ISO 17632-B</i>	T55ZT1-1C1P-2M3

❖ Applications

SC-81A1 can be used welding of 0.5%Mo Steels used for high pressure vessel, steam pipes of boilers for electric power plants and Marine use, equipment for oil refining industries and high temperature synthetic chemical industries.

❖ Characteristics on Usage

SC-81A1 is a titania type flux cored wire for all position welding. Arc stability is excellent. covering is uniform with good removability.

❖ Note on Usage

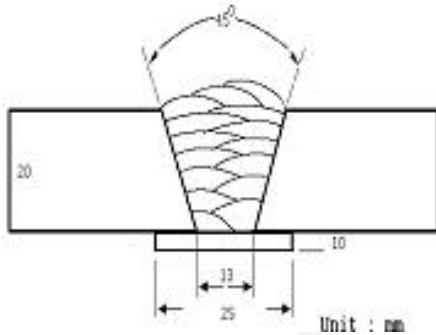
1. Used 100% CO₂ gas.
2. All position gas shielded flux cored wire.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.2mm (0.045in)
Shielding Gas	: 100%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 280A / 32V
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat	: R.T .
Interpass Temp.	: 150±15°C (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			PWHT
	YS Mpa (Ksi)	TS Mpa (Ksi)	EL (%)	
SC-81A1	571(83)	628(91)	24.6	620 ± 15°C x 1hr (1148±59°F x 1hr)
AWS A5.36 E81T1-C1PZ-A1	≥ 470 (68)	550~690 (80~100)	≥ 22.0	-

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Mo
SC-81A1	0.064	0.44	0.83	0.016	0.012	0.508
AWS A5.36 E81T1-C1PZ-A1	≤0.12	≤ 0.80	≤ 1.25	≤ 0.03	≤ 0.03	0.40~0.65

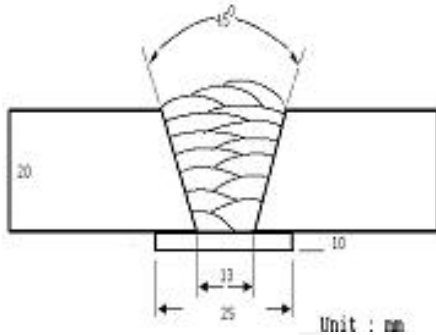
This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING 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** : 1.4mm (0.052in)
- Shielding Gas** : 100%CO₂
- Flow Rate** : 20 ℓ /min
- Amp./ Volt.** : 300A / 32V
- Stick-Out** : 20~25mm (0.79~0.98in)
- Pre-Heat** : R.T .
- Interpass Temp.** : 150±15°C (302±59°F)
- Polarity** : DC(+)

❖ **Mechanical Properties of all weld metal**

Consumable	Tensile Test			PWHT
	YS Mpa (Ksi)	TS Mpa (Ksi)	EL (%)	
SC-81A1	604(88)	664(96)	27.2	620 ± 15°C x 1hr (1148±59°F x 1hr)
AWS A5.36 E81T1-C1PZ-A1	≥ 470 (68)	550~690 (80~100)	≥ 22.0	-

❖ **Chemical Analysis of all weld metal(wt%)**

Consumable	C	Si	Mn	P	S	Mo
SC-81A1	0.069	0.48	0.90	0.017	0.012	0.538
AWS A5.36 E81T1-C1PZ-A1	≤0.12	≤ 0.80	≤ 1.25	≤ 0.03	≤ 0.03	0.40~0.65

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Welding Efficiency

❖ Deposition Efficiency

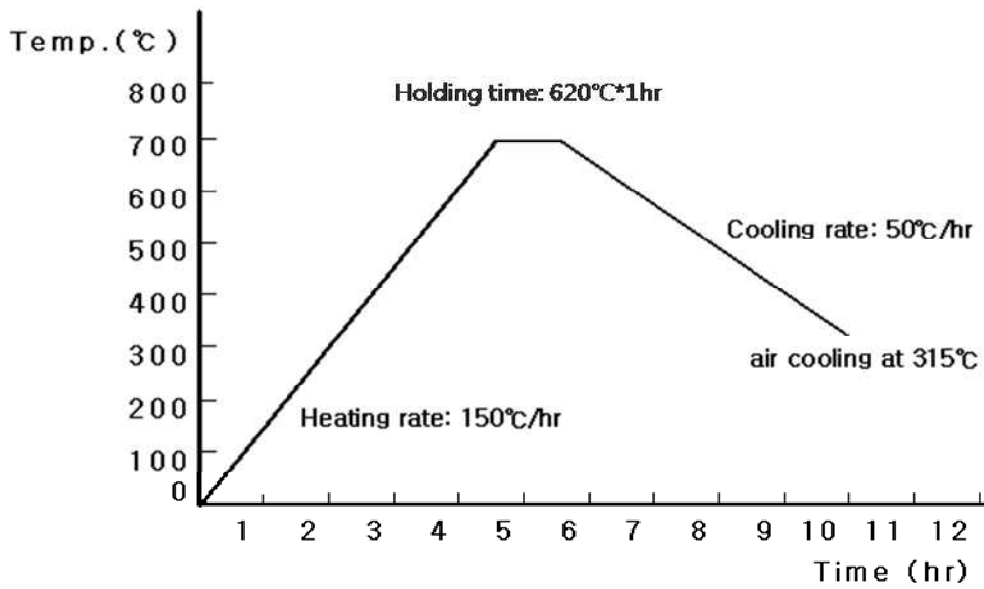
Consumable (size)	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency %	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
SC- 81A1 1.2mm (0.045in)	200	26	10.2 (400)	84~87	3.4 (7.5)
	250	28	11.5 (450)	85~88	4.5 (9.9)
	300	33	15.3 (600)	86~88	5.2 (11.4)
SC- 81A1 1.4mm (0.052in)	250	28	7.6 (300)	85~87	3.9 (8.6)
	300	32	10.2 (400)	85~88	4.8 (10.6)
	330	36	12.8 (500)	86~89	5.8 (12.8)
Remark				Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 100%CO₂



Postweld Heat Treatment

❖ PWHT



Division		Remark
Pre-heating Temperature(°C, °F)		150 (302)
PWHT Condition	Heating rate (°C/hr, °F/hr)	150 (302)
	Holding Temperature(°C, °F)	620 (1148)
	Holding time(hr)	1
	Cooling method (°C, °F)	air cooling at 315 (599)

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Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	: 1.4mm (0.052in)	Amps(A) / Volts(V)	: 240A / 27V
Shielding Gas	: 100%CO ₂	Stick-Out	: 20~25mm (0.79~0.98in)
Flow Rate	: 20 l /min	Welding Speed	: 30 cm/min (12 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
3.4	3.7	3.3	3.3

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



Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.	
			1.2mm (0.045in)	1.4mm (0.052in)
SC-81A1	100%CO ₂	F & HF	120~300Amp	200~350Amp
		V-Up & OH	120~260Amp	180~280Amp
		V-Down	200~300Amp	220~320Amp

❖ F No & A No

F No	A No
6	2

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