

SC-70A

METAL CORED ARC WELDING CONSUMABLE
FOR MILD & 490MPa CLASS HIGH TENSILE STEEL

2021.09



❖ Specification

AWS A5.18	E70C-3C/-6M
(AWS A5.18M)	E48C-3C/-6M)
EN ISO 17632-A	T 42 3 M C1 1 H5, T 46 3 M M21 1 H5 T 42 2 M C1 1 H5, T 42 2 M M21 1 H5

❖ Applications

SC-70A is used for welding in shipbuilding, machinery, bridge Construction, structural fabrication, automated or robotic welding.

❖ Characteristics on Usage

SC-70A is a metal-cored wire which combines the high deposition rates of a flux cored wire with the high efficiencies of a solid wire. It provides minimized slag coverage so it can be performed multi-pass welding without slag removal

❖ Note on Usage

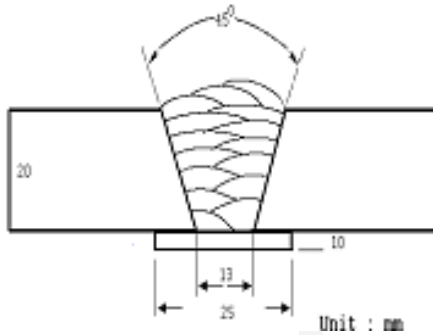
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. Use 100% CO₂ or Ar + 20-25% CO₂ gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

- Diameter(mm)** : 1.2mm(0.045in)
- Shielding Gas** : 100%CO₂
- Flow Rate(ℓ /min.)** : 20
- Amp./ Volt.** : 280 / 32
- 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 the weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-18°C (0°F)	-29°C (-20°F)
SC-70A	500(73,000)	560(81,000)	27.0	70(52)	50(37)
AWS A5.18 E70C-3C/-6M	≥ 400 (58,000)	≥ 480 (70,000)	≥ 22	≥ 27J at -18°C (≥ 20ft · lbs at -0°F)	

❖ Chemical Analysis of the weld metal(wt%)

Consumable	C	Si	Mn	P	S
SC-70A	0.06	0.40	1.40	0.011	0.008
AWS A5.18 E70C-3C/-6M	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

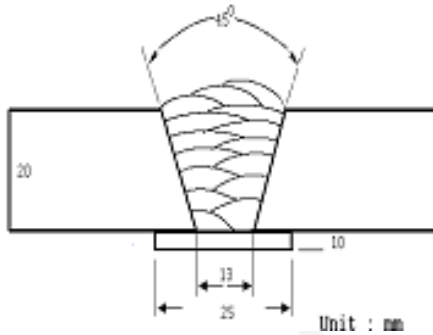
This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING 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]

Diameter(mm)	: 1.2mm(0.045in)
Shielding Gas	: 80%Ar + 20%CO ₂
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 280 / 30
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 the weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-18°C (0°F)	-29°C (-20°F)
SC-70A	540(78,000)	610(88,000)	26.4	84(62)	70(52)
AWS A5.18 E70C-3C/-6M	≥ 400 (58,000)	≥ 480 (70,000)	≥ 22	≥ 27J at -29°C (≥ 20ft · lbs at -20°F)	

❖ Chemical Analysis of the weld metal(wt%)

Consumable	C	Si	Mn	P	S
SC-70A	0.06	0.55	1.55	0.010	0.009
AWS A5.18 E70C-3C/-6M	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

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Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	: 1.2(0.045in)	Amps(A) / Volts(V)	: 280 / 30
Shielding Gas	: 80%Ar +20%CO ₂	Stick-Out(mm)	: 20~25
Flow Rate(ℓ /min.)	: 20	Welding Speed	: 30 cpm
Welding Position	: 1G	Current Type & Polarity	: DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	: 72 hrs	Evolution Temp.	: 45 °C
Barometric Pressure	: 780 mm-Hg		

❖ Result(ml/100g Weld Metal)

X1	X2	X3	X4
3.8	4.0	4.2	4.3

Average Hydrogen Content **4.1 ml / 100g Weld Metal**



Welding Efficiency

❖ Deposition Rate & Efficiency

Shielding Gas	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
100% CO ₂	200	25	91~93	2.6
	250	29	92~94	4.0
	300	32	93~95	5.4
	350	34	94~96	6.8
80%Ar+20% CO ₂	200	24	92~94	2.7
	250	28	93~95	4.2
	300	31	95~97	5.7
	350	33	95~98	7.2
Remark			Deposition efficiency =(Deposited metal weight/ Wire weight used) × 100	Deposition rate =(Deposited metal weight/ Welding time,min.) × 60

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Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.(mm)		
			1.2mm	1.4mm	1.6mm
SC-70A	100%CO ₂ or 80%Ar+20%CO ₂	F & HF	230~300Amp	260~330Amp	290~360Amp
		V-Up	160~200Amp	170~210Amp	180~220Amp
		O.H.	160~200Amp	170~210Amp	180~220Amp



Approvals

❖ Shipping Approvals

Shielding Gas	Resister of shipping & Size(mm)							
	ABS	BV	DNV.GL	LR	RINA	TUV	DB	CE
100% C O ₂	3YSAH5	SA3MYH 5	IIIYSH5	3YSH5	3YSH5	12079.01	42.115.05	HWK- 300-00
80% Ar +20% C O ₂	1.2~1.6	1.2~1.6	1.2~1.6	1.2~1.6	1.2~1.6	1.2~1.6	1.2~1.6	1.2~1.6