

SC-70ML

METAL CORED ARC WELDING CONSUMABLES
FOR WELDING OF Mild & 490MPa CLASS
HIGH TENSILE STEEL

HYUNDAI WELDING CO., LTD.



❖ **Specification**

AWS A5.18

E70C-6M

EN ISO 17632-A

T 46 4 M M 2 H5

❖ **Applications**

SC- 70ML can be used on mild and high tensile steel in single and multi- pass applications. It is ideally suited for high production and automatic applications where large amount of filler metal can be deposited with a minimum amount of slag & spatter. Typical industrial applications include shipbuilding, machinery, bridge, structural fabrication and building.

❖ **Characteristics on Usage**

SC- 70ML is a metal- cored gas shielded cored wire which combines the high deposition rates of a flux cored wire with the high efficiencies of a solid wire. SC- 70ML is recommended for welding of carbon steel having tensile strengths up to 490MPa Provide an exceptionally smooth and stable arc, low spatter and minimal slag coverage in welding

❖ **Note on Usage**

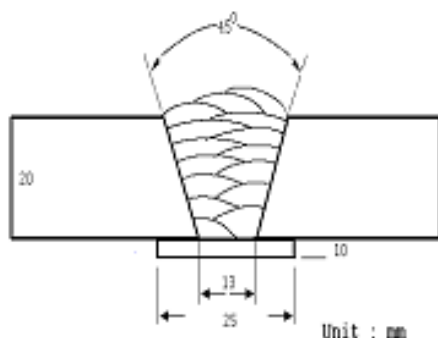
1. Proper preheating(50~ 150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. Use Ar + 20- 25% CO2 gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ **Welding Conditions**

Method by AWS Spec.

**[Joint Preparation & Layer Details]**

Diameter(mm)	: 1.2mm
Shielding Gas	: 80%Ar + 20%CO ₂
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 280 / 30
Stick-Out(mm)	: 20~ 25
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15
Polarity	: DC(+)

❖ **Mechanical Properties of all weld metal**

Consumable	Tensile Test			CVN Impact Test (Joule)	
SC-70ML	YS(MPa)	TS(MPa)	EL(%)	-30℃	-40℃
	490	545	27.5	101	78
AWS A5.18 E70C-6M	≥ 400	≥ 480	≥ 22	≥ 27J at -30℃	

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

Consumable	C	Si	Mn	P	S	Ni
SC-70ML	0.052	0.57	1.56	0.014	0.008	0.45
AWS A5.18 E70C-6M	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03	≤ 0.50

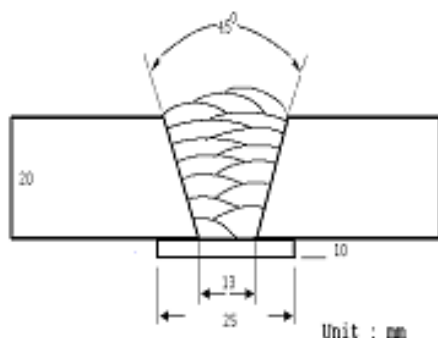
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ **Welding Conditions**

Method by AWS Spec.

**[Joint Preparation & Layer Details]**

Diameter(mm)	: 1.4mm
Shielding Gas	: 80%Ar + 20%CO ₂
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 280 / 30
Stick-Out(mm)	: 20~ 25
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15
Polarity	: DC(+)

❖ **Mechanical Properties of all weld metal**

Consumable	Tensile Test			CVN Impact Test (Joule)	
SC-70ML	YS(MPa)	TS(MPa)	EL(%)	-30℃	-40℃
	490	560	28.0	94	63
AWS A5.18 E70C-6M	≥ 400	≥ 480	≥ 22	≥ 27J at -30℃	

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

Consumable	C	Si	Mn	P	S	Ni
SC-70ML	0.054	0.56	1.54	0.015	0.006	0.46
AWS A5.18 E70C-6M	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03	≤ 0.50

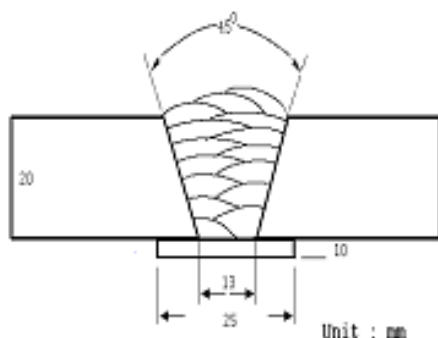
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**SC-70ML**

Mechanical Properties & Chemical Composition of All Weld Metal

❖ **Welding Conditions**

Method by AWS Spec.

**[Joint Preparation & Layer Details]**

Diameter(mm)	: 1.6mm
Shielding Gas	: 80%Ar + 20%CO ₂
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 300 / 30
Stick-Out(mm)	: 20~ 25
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: 150±15
Polarity	: DC(+)

❖ **Mechanical Properties of all weld metal**

Consumable	Tensile Test			CVN Impact Test (Joule)	
SC-70ML	Y.S.(MPa)	T.S.(MPa)	EL.(%)	-30℃	-40℃
	485	548	26.5	98	68
AWS A5.18 E70C-6M	≥ 400	≥ 480	≥ 22	≥ 27J at -30℃	

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

Consumable	C	Si	Mn	P	S	Ni
SC-70ML	0.050	0.55	1.50	0.014	0.008	0.43
AWS A5.18 E70C-6M	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03	≤ 0.50

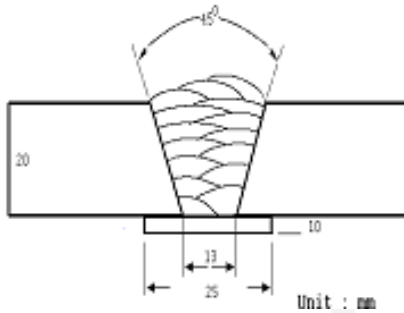
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Impact Toughness Test on Various Temp.

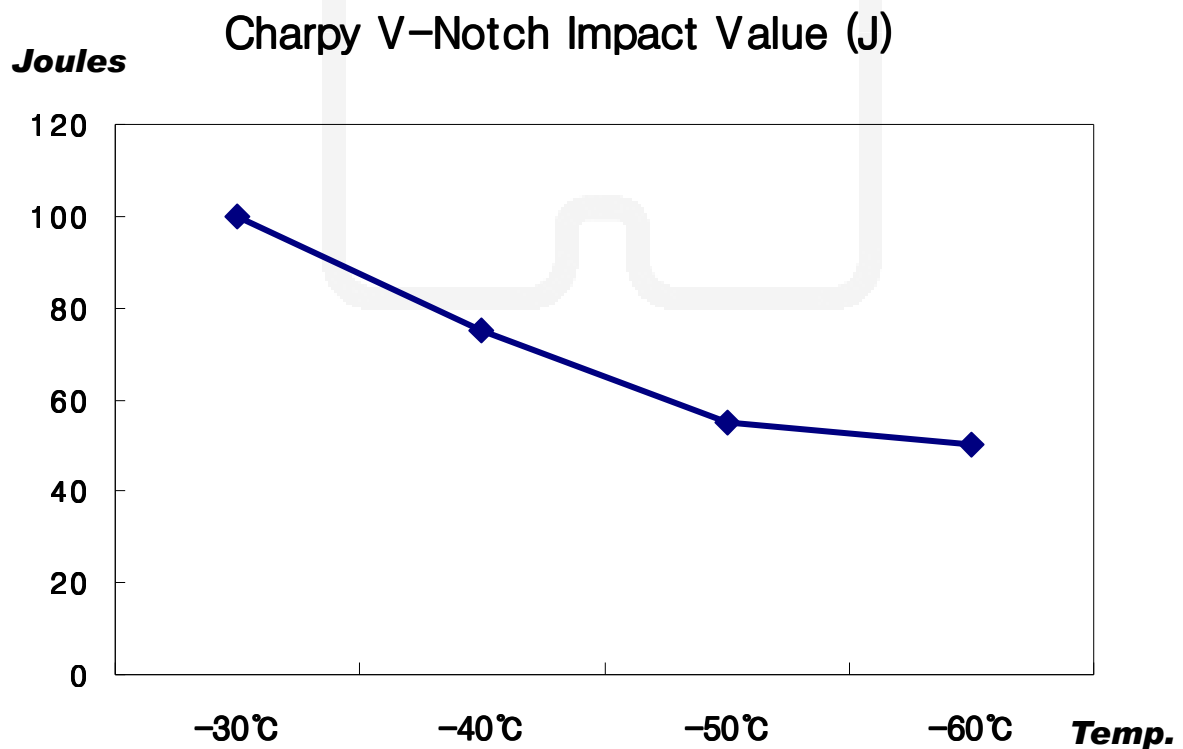
❖ Welding Conditions

Method by AWS Rules



[Joint Preparation & Layer Details]

Diameter(mm)	: 1.2
Shielding Gas	: 80%Ar + 20%CO ₂
Flow Rate(ℓ /min.)	: 20
Amps(A) / Volts(V)	: 280 / 30
Stick-Out(mm)	: 20~ 25
Pre-Heat(℃)	: Room Temp.
Inter-Pass Temp.℃)	: 150± 15
Current Type & Polarity	: DC(+)



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Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	:	1.2	Amps(A) / Volts(V)	:	280 / 30
Shielding Gas	:	80%Ar +20%CO2	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	Analysis Temp.	:	25 °C
Evolution Temp.	:	25 °C	Exposure Condition	:	80%RH- 25 °C
Barometric Pressure	:	780 mm- Hg			

❖ Result(ml/100g Weld Metal)

X1	X2	X3	X4
3.8	3.9	3.7	3.5

Average Hydrogen Content 3.7 ml / 100g Weld Metal

**SC-70ML**

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
SC-70ML 1.2mm	220	28	92~94	3.4
	280	30	94~96	5.0
	350	34	95~97	7.1
Remark			Deposition efficiency =(Deposited metal weight/ Wire weight used)× 100	Deposition rate =(Deposited metal weight/ Welding time,min.)× 60

* Shielding Gas : 80%Ar+20%CO2

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**SC-70ML**

Proper Welding Condition

❖ Welding Conditions

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)
			1.2mm
SC-70ML	80%Ar +20%CO ₂	F & HF	200~300Amp
		V-Up & OH	120~220Amp
		V-Down	200~300Amp

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Approvals

❖ Shipping Approvals

Welding Position	Resister of shipping & Size(mm)						
	KR	ABS	LR	BV	DNV	GL	NK
F, HF V- up	-	4Y400SA H5 1.2~ 1.6	4Y40SH5 1.2~ 1.6	SA4Y40M HHH 1.2~ 1.6	IV Y40MSH5 1.2~ 1.6	4Y40H5S 1.2~ 1.6	-

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