



**HYUNDAI**  
W E L D I N G

Rev. 00

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# **SC-71MJ**

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

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**HYUNDAI WELDING CO., LTD.**



## ❖ Specification

**AWS A5.20**

**E71T-9M-J**

**EN ISO17632-A**

**T 46 4 P M 1 H5**

## ❖ Applications

Typical industrial applications include shipbuilding, machinery, bridge, structural fabrication and building

## ❖ Characteristics on Usage

SC-71MJ is a titania-type flux cored wire to be used with Ar+CO<sub>2</sub> gas mixture shielding. Provide an exceptionally smooth and stable arc with a fast freezing slag system, this wire is ideal for welding flat, vertical up, vertical down.

Bead shape and appearance are excellent in all position welding. It provide excellent notch toughness at low temperature.

## ❖ Note on Usage

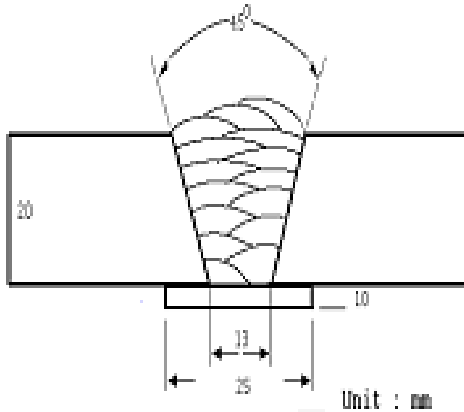
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. Use Ar+20~25% CO<sub>2</sub>



## Mechanical Properties & Chemical Composition of All Weld Metal

### ❖ Welding Conditions

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

<b>Diameter(mm)</b>	: 1.2mm
<b>Shielding Gas</b>	: Ar+20% CO <sub>2</sub>
<b>Welding Position</b>	: 1G
<b>Amp./ Volt.</b>	: 270-290 / 29~30
<b>Stick-Out(mm)</b>	: 20~25
<b>Pre-Heat(°C)</b>	: R.T.
<b>Interpass Temp.(°C)</b>	: 150±15

### ❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)								Remark
	YS (MPa)	TS (MPa)	EL (%)	-30 °C				-40 °C				
				x1	x2	x3	Avg.	X1	x2	X3	Avg.	
SC-71MJ	545	583	25.0	123	124	132	126	80	85	75	80	As welded
AWS A5.20 E71T-9M-J	≥ 390	490~670	≥ 22	≥ 27J at -40 °C								-

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

Consumable	C	Si	Mn	P	S	Ni
SC-71MJ	0.06	0.30	1.10	0.012	0.011	0.42
AWS A5.20 E71T-9M-J	≤ 0.12	≤ 0.9	≤ 1.60	≤ 0.03	≤ 0.03	≤ 0.50

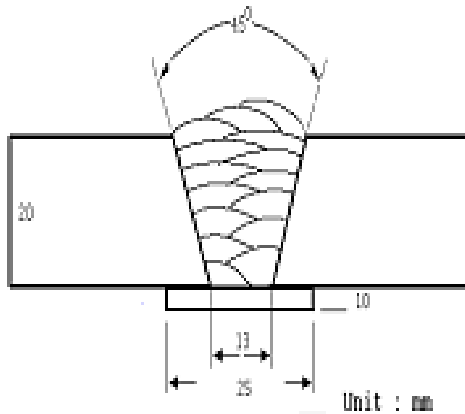
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## Mechanical Properties & Chemical Composition of All Weld Metal

### ❖ Welding Conditions

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

Diameter(mm)	: 1.4mm
Shielding Gas	: Ar+20% CO <sub>2</sub>
Welding Position	: 1G
Amp./ Volt.	: 300-315 / 29~30
Stick-Out(mm)	: 20~25
Pre-Heat(°C)	: R.T.
Interpass Temp.(°C)	: 150±15

### ❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)								Remark
	YS (MPa)	TS (MPa)	EL (%)	-30 °C				-40 °C				
				x1	x2	x3	Avg.	X1	x2	X3	Avg.	
SC-71MJ	540	580	25.0	120	124	128	124	75	80	84	80	As welded
AWS A5.20 E71T-9M-J	≥ 390	490~670	≥ 22	≥ 27J at -40 °C								-

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

Consumable	C	Si	Mn	P	S	Ni
SC-71MJ	0.06	0.32	1.12	0.012	0.011	0.43
AWS A5.20 E71T-9M-J	≤ 0.12	≤ 0.9	≤ 1.60	≤ 0.03	≤ 0.03	≤ 0.50

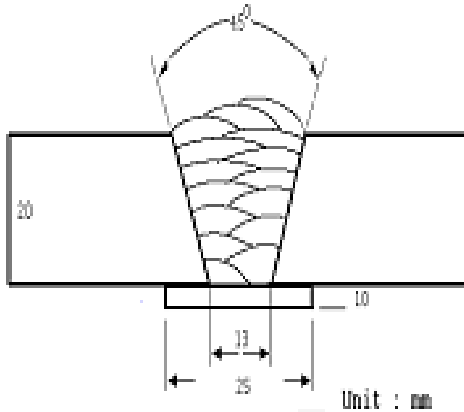
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## Mechanical Properties & Chemical Composition of All Weld Metal

### ❖ Welding Conditions

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

Diameter(mm)	: 1.6mm
Shielding Gas	: Ar+20% CO <sub>2</sub>
Welding Position	: 1G
Amp./ Volt.	: 320-330 / 29~30
Stick-Out(mm)	: 20~25
Pre-Heat(°C)	: R.T.
Interpass Temp.(°C)	: 150±15

### ❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)								Remark
	YS (MPa)	TS (MPa)	EL (%)	-30 °C				-40 °C				
				x1	x2	x3	Avg.	X1	x2	X3	Avg.	
SC-71MJ	545	585	25.5	115	124	122	120	70	85	80	78	As welded
AWS A5.20 E71T-9M-J	≥ 390	490~670	≥ 22	≥ 27J at -40 °C								-

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

Consumable	C	Si	Mn	P	S	Ni
SC-71MJ	0.06	0.30	1.15	0.012	0.010	0.40
AWS A5.20 E71T-9M-J	≤ 0.12	≤ 0.9	≤ 1.60	≤ 0.03	≤ 0.03	≤ 0.50

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## Welding Efficiency

### ❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
SC-71MJ 1.2 mm	200	26	87~89	3.1
	250	28	88~89	4.3
	300	31	88~90	5.8
SC-71MJ 1.4 mm	250	28	85~87	3.6
	300	32	86~88	4.7
	350	36	87~89	6.3
SC-71MJ 1.6 mm	280	31	86~88	4.0
	330	33	86~89	4.6
	350	34	87~89	5.6
	400	38	88~90	6.5
Remark			Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

\* Shielding Gas :Ar+20%CO<sub>2</sub>



# Diffusible Hydrogen Content

## ❖ Welding Conditions

Diameter(mm)	: 1.2	Amps(A) / Volts(V)	: 270 / 29
Shielding Gas	: Ar+20%CO <sub>2</sub>	Stick-Out(mm)	: 20
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)

구분	X1	X2	X3	X4	Avg.
1.2mm	3.05	3.11	2.98	2.91	3.01

**Average Hydrogen Content 3.01 ml / 100g Weld Metal**

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## ❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)		
			1.2mm	1.4mm	1.6mm
SC-71MJ	Ar + 20%CO <sub>2</sub>	Flat	120~300 Amp	160~350 Amp	180~380 Amp
		V-up Over head	120~260 Amp	140~270 Amp	160~320 Amp
		V-down	140~300 Amp	160~320 Amp	180~360 Amp

