

# **SC-80MR**

METAL CORED ARC WELDING CONSUMABLE  
FOR 550MPa CLASS HIGH TENSILE STEEL

2022.02

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**HYUNDAI WELDING CO., LTD.**



## ❖ Specification

*AWS A5.28*                    **E80C-G**  
*(AWS A5.28M*                **E55C-G)**  
*EN ISO 17632-A*            **T50 6 1.5Ni M M21 2 H5**

## ❖ Applications

SC-80MR is used for welding in offshore structure and heavy equipment and general structural fabrication

## ❖ Characteristics on Usage

SC-80MR is a metal cored wire designed for single-side welding and is also suitable for multi-pass welding in thick plate. SC-80MR provides an exceptionally smooth and stable arc, low spatter and minimal slag coverage and achieves good impact value to low temperature(-62°C).

## ❖ Note on Usage

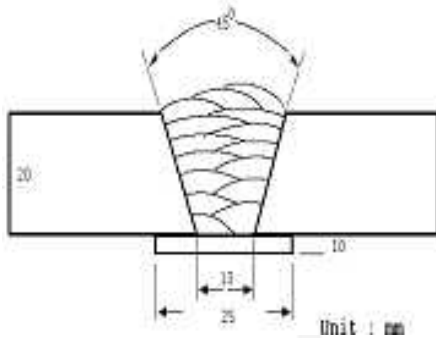
1. For preheating guidelines, please refer to your local standards and codes relative to your best practices
2. Use Ar + 20-25% CO<sub>2</sub> gas.



**Mechanical Properties & Chemical Composition of All Weld Metal**

❖ **Welding Conditions**

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

<b>Welding Position</b>	: 1G(PA)
<b>Diameter</b>	: 1.2mm (0.045in)
<b>Shielding Gas</b>	: 80%Ar + 20%CO <sub>2</sub>
<b>Flow Rate</b>	: 20 ℓ /min
<b>Amp./ Volt.</b>	: 280A/ 30V
<b>Stick-Out</b>	: 20~25mm (0.79~0.98in)
<b>Pre-Heat</b>	: R.T .
<b>Interpass Temp.</b>	: 150±15℃ (302±59°F)
<b>Polarity</b>	: DC(+)

❖ **Mechanical Properties of all weld metal**

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
	YS MPa (lbs/in <sup>2</sup> )	TS MPa (lbs/in <sup>2</sup> )	EL (%)	-60℃ (-76°F)
SC-80MR	612 (89,000)	658 (95,000)	25.5	88 (65)
AWS A5.18 E80C-G	-	≥ 550 (80,000)	-	-

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

Consumable	C	Si	Mn	P	S	Ni
SC-80MR	0.072	0.35	1.55	0.014	0.007	1.55
AWS A5.18 E80C-G	N/S (Not Specified) <sup>h</sup>					

\* h : The electrode must have a minimum of one or more of the following: ≥0.5%Ni, ≥0.3%Cr, ≥0.2%Mo

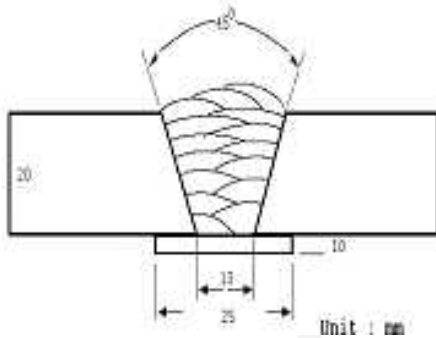
This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING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

<b>Welding Position</b>	: 1G(PA)
<b>Diameter</b>	: 1.4mm (0.052in)
<b>Shielding Gas</b>	: 80%Ar + 20%CO <sub>2</sub>
<b>Flow Rate</b>	: 20 ℓ /min
<b>Amp./ Volt.</b>	: 300 A/ 30V
<b>Stick-Out</b>	: 20~25mm (0.79~0.98in)
<b>Pre-Heat</b>	: R.T .
<b>Interpass Temp.</b>	: 150±15℃ (302±59°F)
<b>Polarity</b>	: DC(+)

❖ **Mechanical Properties of all weld metal**

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
	YS MPa (lbs/in <sup>2</sup> )	TS MPa (lbs/in <sup>2</sup> )	EL (%)	-60℃ (-76°F)
SC-80MR	608 (88,000)	652 (95,000)	25.0	81 (60)
AWS A5.18 E80C-G	-	≥ 550 (80,000)	-	-

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

Consumable	C	Si	Mn	P	S	Ni
SC-80MR	0.070	0.32	1.54	0.013	0.008	1.57
AWS A5.18 E80C-G	N/S (Not Specified) <sup>h</sup>					

\* h : The electrode must have a minimum of one or more of the following: ≥0.5%Ni, ≥0.3%Cr, ≥0.2%Mo

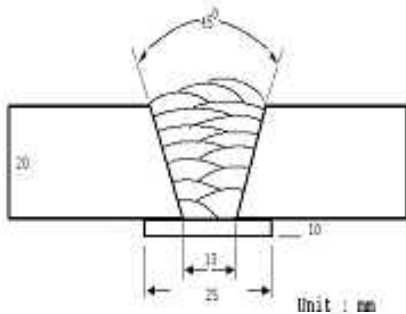
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## Impact Toughness Test on Various Temp.

### ❖ Welding Conditions

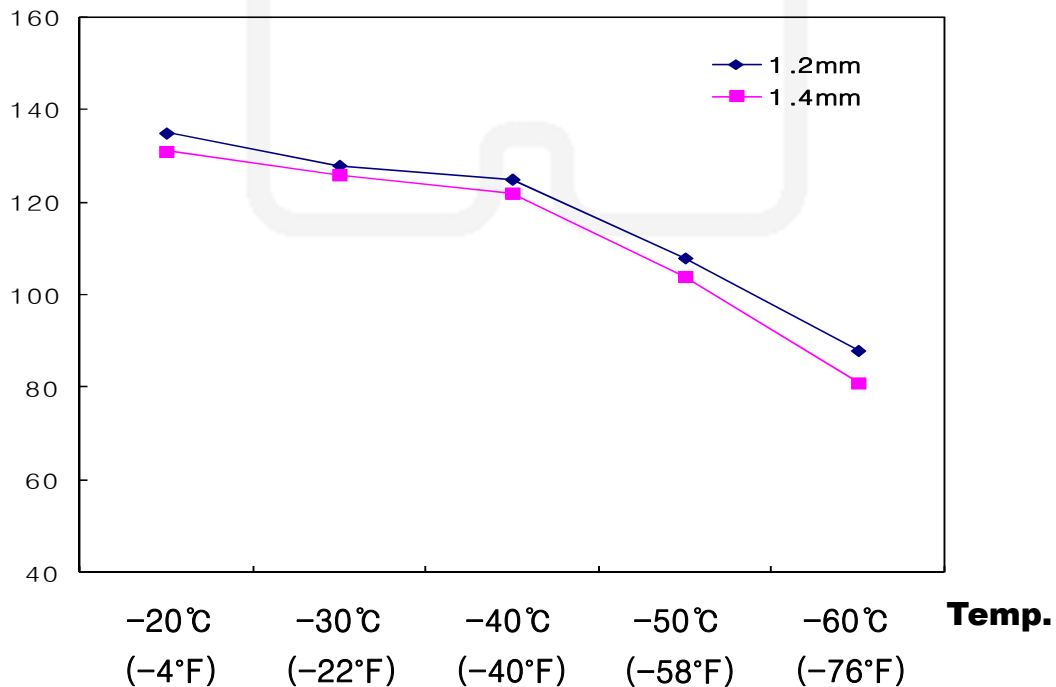
Method by AWS Spec.



[ Joint Preparation & Layer Details ]

<b>Diameter</b>	:	1.2mm (0.045in)	1.4mm (0.052in)
<b>Shielding Gas</b>	:	80%Ar + 20%CO <sub>2</sub>	
<b>Flow Rate</b>	:	20 l /min	
<b>Amps / Volts</b>	:	280A / 30V	300A / 30V
<b>Stick-Out</b>	:	20~25mm (0.79~0.98in)	
<b>Pre-Heat(°C)</b>	:	Room Temp.	
<b>Inter-Pass Temp.</b>	:	150±15°C (302±59°F)	
<b>Current Type &amp; Polarity</b>	:	DC(+)	

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## Diffusible Hydrogen Content

### ❖ Welding Conditions

<b>Diameter</b>	: 1.4mm (0.052in)	<b>Amps / Volts</b>	: 300A / 30V
<b>Shielding Gas</b>	: 80%Ar +20%CO <sub>2</sub>	<b>Stick-Out(mm)</b>	: 20~25mm (0.79~0.98in)
<b>Flow Rate</b>	: 20 ℓ /min	<b>Welding Speed</b>	: 30 cm/min (12 in/min)
<b>Welding Position</b>	: 1G (PA)	<b>Current Type &amp; Polarity</b>	: DC(+)

### ❖ Hydrogen Analysis Using Gas Chromatography Method

<b>Hydrogen Evolution Time</b>	: 72 hrs
<b>Evolution Temp.</b>	: 45 °C (113°F)
<b>Barometric Pressure</b>	: 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**



## Welding Efficiency

### ❖ Deposition Rate & Efficiency

Consumable	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency (%)	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
SC-80MR  1.2mm (0.045in)	180	23	6.1(240)	92~94	2.12(4.7)
	240	26	8.9(350)	93~95	3.76(8.3)
	280	30	11.0(430)	95~97	4.65(10.2)
Remark				Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

\* Shielding Gas : 80%Ar+20%CO<sub>2</sub>



# Proper Welding Condition

## ❖ Welding Conditions

Consumable	Shielding Gas	Welding Position	Amp.(A) / Volt.(V)	
			1.2mm (0.045in)	1.4mm (0.052in)
SC-80MR	80%Ar +20%CO <sub>2</sub>	F & HF	200~300Amp	220~350Amp
		V-Up & OH	120~220Amp	140~240Amp
		V-Down	200~300Amp	220~300Amp

## ❖ F No & A No

F No	A No
6	10

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