

# **SC-80D2**

METAL CORED ARC WELDING CONSUMABLE  
FOR 0.5% Mo TYPE LOW ALLOY STEEL.

2025.01



## ❖ Specification

**AWS A5.28**                    **E80C-G**  
**(AWS A5.28M**                **E55C-G)**  
**EN ISO 17632-A**        **T 50 0 MnMo M M21 3**

## ❖ Applications

SC-80D2 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-80D2 is equivalent to ER80S-D2 solid wire. Provide an exceptionally smooth and stable arc, low spatter and minimal slag coverage in welding.

## ❖ Characteristics on Usage

SC-80D2 can be used on high strength steel, low alloy steels in heavy industry and structural part. SC-80D2 is design for use Ar+20~25%CO<sub>2</sub> mixed gases and is ideal for single-pass & multi-pass applications.

## ❖ Note on Usage

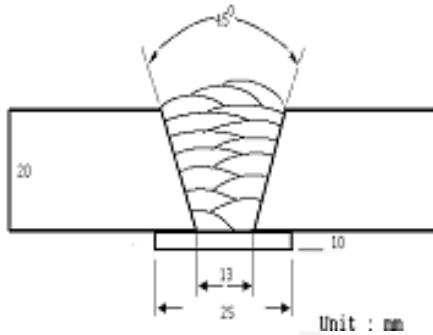
Use Ar + 20-25% CO<sub>2</sub> gas.



## 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 (%)	-18℃ (0°F)
SC-80D2	604 (88,000)	675 (98,000)	27.5	60 (44)
AWS A5.28 E80C-G	Not Specified	≥ 550 (80,000)	Not Specified	Not Specified

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

Brand Name	C	Si	Mn	P	S	Mo
SC-80D2	0.055	0.61	1.62	0.012	0.010	0.50
AWS A5.28 E80C-G	N/S (Not Specified) <sup>h</sup>					

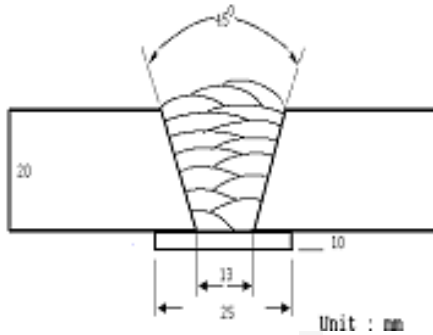
\* h : The electrode must have a minimum of one or more of the following: ≥0.5%Ni, ≥0.3%Cr, ≥0.2%Mo



## 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>	: 1.6mm (1/16in)
<b>Shielding Gas</b>	: 80%Ar + 20%CO <sub>2</sub>
<b>Flow Rate</b>	: 20 ℓ /min
<b>Amp./ Volt.</b>	: 330A / 31V
<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 (%)	-18℃ (0°F)
SC-80D2	590 (86,000)	660 (96,000)	28.0	70 (52)
AWS A5.28 E80C-G	Not Specified	≥ 550 (80,000)	Not Specified	Not Specified

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

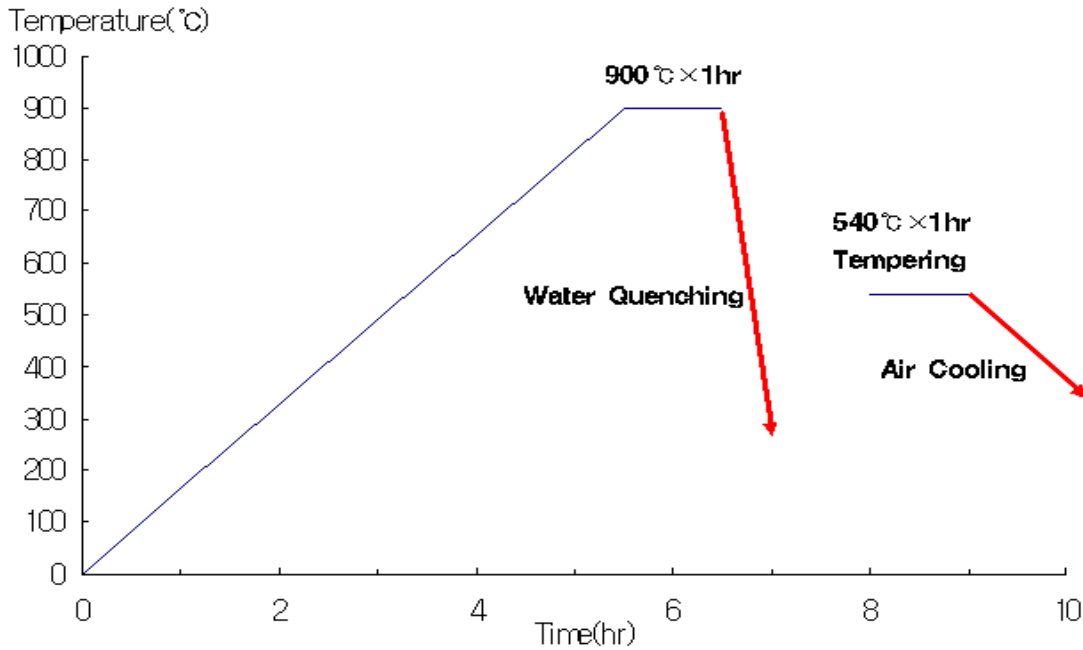
Brand Name	C	Si	Mn	P	S	Mo
SC-80D2	0.050	0.60	1.65	0.012	0.010	0.51
AWS A5.28 E80C-G	N/S (Not Specified) <sup>h</sup>					

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



# Mechanical Properties after Heat Treatment

## ❖ Heat Treatment Schedule



Items		Remarks
Preheat Temperature		100°C(212°F)
1 <sup>st</sup> Step	Heating Rate	163°C/hr(325°F/hr)
	Holding Temperature	900°C(1,625°F)
	Holding Time	1 hr
	Cooling Method	Water Cooling
2 <sup>nd</sup> Step	Holding Temperature	540°C(1,004°F)
	Holding Time	1 hr
	Cooling Method	Air Cooling

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 after Heat Treatment

## ❖ Tensile Test of All Weld Metal

Tension Test	Result	Instrument
YS	565 MPa(82,000 lbs/in <sup>2</sup> )	UH-F50A (Shimadzu)
TS	667 MPa(97,000 lbs/in <sup>2</sup> )	
EL	26.0 %	
RA	64.0 %	

## ❖ Tensile Test of All Weld Metal

Impact Test Results				
Temperature	J(ft · lbs)			
	x1	x2	x3	Avg.
-18°C (0°F)	30(22)	28(21)	31(23)	<b>30(22)</b>

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## Diffusible Hydrogen Content

### ❖ Welding Conditions

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<b>Diameter</b>	: 1.6mm (1/16in)	<b>Amps / Volts</b>	: 240A / 25V
<b>Shielding Gas</b>	: 80%Ar +20%CO <sub>2</sub>	<b>Stick-Out</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 Chromatograph Method

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<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)

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X1	X2	X3	X4
4.5	4.2	4.4	4.6

**Average Hydrogen Content** 4.4 ml / 100g Weld Metal



# Welding Efficiency

## ❖ Deposition Rate & Efficiency

Wire Size	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
1.2mm (0.045in)	200	24	6.7(260)	90~92	2.6(5.7)
	250	28	9.8(390)	93~95	4.1(9.0)
	300	30	12.7(500)	95~96	5.4(11.9)
	350	33	15.7(620)	95~96	7.1(15.6)
1.6mm (1/16in)	350	32	8.1(320)	93~95	6.3(13.9)
	400	34	9.8(390)	94~96	7.3(16.1)
	450	36	11.0(430)	95~96	8.0(17.6)
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)	1.6mm(1/16in)
SC-80D2	80%Ar +20%CO <sub>2</sub>	F & H-F	180 ~200A / 23~24V	-
			220~240A / 26~27V	220~240A / 23~24V
			280~300A / 29~30V	280~300A /27~28V
			350~370A / 34~35V	350~370A/ 30~31V
			-	400~420A/ 36~37V

### ❖ F No & A No

F No	A No
6	11