HYUNDAI WELDING

Rev. 06

SC-80D2

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

2020.12

HYUNDAI WELDING CO., LTD.

SC-80D2

❖ Specification

AWS A5.28	**E80C-G**
(AWS A5.28M	**E55C-G)**
EN ISO 17632-A	**T 46 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_2 mixed gases and is ideal for single-pass multi-pass applications.

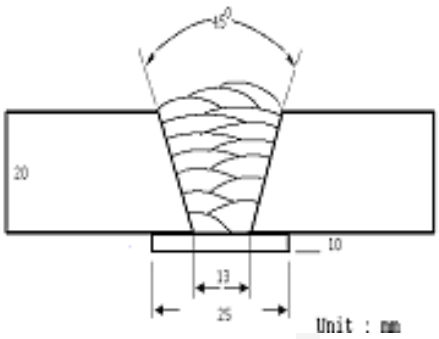
❖ Note on Usage

Use Ar + 20-25% CO2 gas.

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	:	1G(PA)
Diameter	:	1.2mm (0.045in)
Shielding Gas	:	80%Ar + 20%CO_2
Flow Rate	:	20 ℓ /min
Amp./ Volt.	:	280A / 30V
Stick-Out	:	20~25mm (0.79~0.98in)
Pre-Heat	:	R.T .
Interpass Temp.	:	150±15℃ (302±59°F)
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
SC-80D2	YS MPa (lbs/in²)	TS MPa (lbs/in²)	EL (%)	-18℃ (0°F)
	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%)

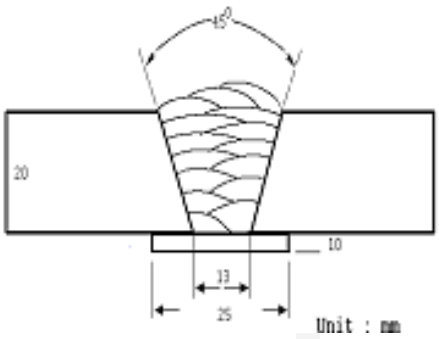
Brand Name	C	Si	Mn	P	S	Mo
SC-80D2	0.055	0.61	1.62	0.012	0.010	0.50
AWS A5.28 E80C-G	N/S (Not Specified) [h]					

* 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]

Welding Position	:	1G(PA)
Diameter	:	1.6mm (1/16in)
Shielding Gas	:	80%Ar + 20%CO_2
Flow Rate	:	20 ℓ /min
Amp./ Volt.	:	330A / 31V
Stick-Out	:	20~25mm (0.79~0.98in)
Pre-Heat	:	R.T .
Interpass Temp.	:	150±15℃ (302±59°F)
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
SC-80D2	YS MPa (lbs/in²)	TS MPa (lbs/in²)	EL (%)	-18℃ (0°F)
	590 (86,000)	660 (96,000)	28.0	70 (52)
AWS A5.28 E80C-G	Not Specified	≥ 550 (80,000)	Not Specified	Not Specified

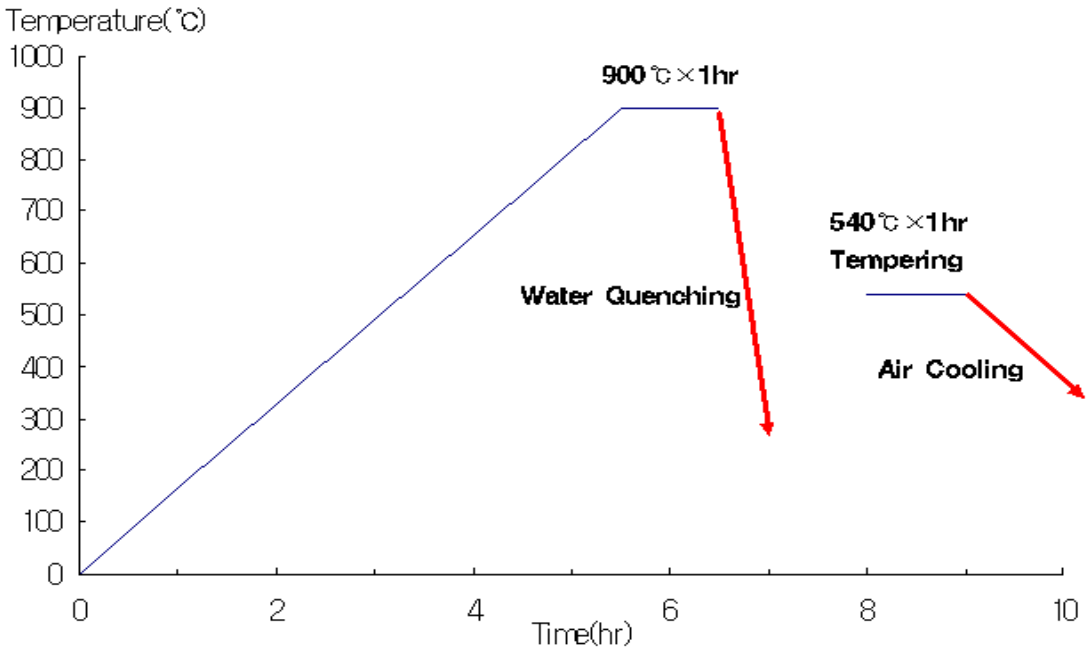
❖ Chemical Analysis of all weld metal(wt%)

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) [h]					

* 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℃(212°F)
1st Step	Heating Rate	163℃/hr(325°F/hr)
	Holding Temperature	900℃(1,625°F)
	Holding Time	1hr
	Cooling Method	Water Cooling
2nd Step	Holding Temperature	540℃(1,004°F)
	Holding Time	1hr
	Cooling Method	Air Cooling

Mechanical Properties after Heat Treatment

❖ Tensile Test of All Weld Metal

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

❖ Tensile Test of All Weld Metal

Impact Test Results				
Temperature	**J(ft · lbs)**			
	x1	***x2***	***x3***	***Avg.***
-18℃(0°F)	30(22)	28(21)	31(23)	**30(22)**

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	:	1.6mm (1/16in)	**Amps / Volts**	:	320A / 30V
Shielding Gas	:	80%Ar +20%CO_2	**Stick-Out**	:	20~25mm (0.79~0.98in)
Flow Rate	:	20 ℓ /min	**Welding Speed**	:	30 cm/min (12 in/min)
Welding Position	:	1G (PA)	**Current Type & Polarity**	:	DC(+)

❖ Hydrogen Analysis Using Gas Chromatograph Method

Hydrogen Evolution Time	:	72 hrs
Evolution Temp.	:	45 ℃ (113˚F)
Barometric Pressure	:	780 mm-Hg

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
3.2	**3.5**	**3.4**	**3.4**

Average Hydrogen Content 3.4 *㎖ / 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_2

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_2	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