HYUNDAI WELDING

SC-80M

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

HYUNDAI WELDING CO., LTD.

SC-80M

❖ Specification

AWS A5.28	E80C-G
EN ISO 17632-A	T 46 4 M M 3 H5

❖ Applications

SC-80M is used for welding in bridge construction, structural fabrication automated or robotic welding

❖ Characteristics on Usage

SC-80M is a metal cored wire designed for single or multipass welding on high-tensile steel and weathering grade steels. SC-80M was designed specifically to meet the demand for weld deposits that color match the low alloy, high strength weathering grade steels, such as Corten steel.

❖ Note on Usage

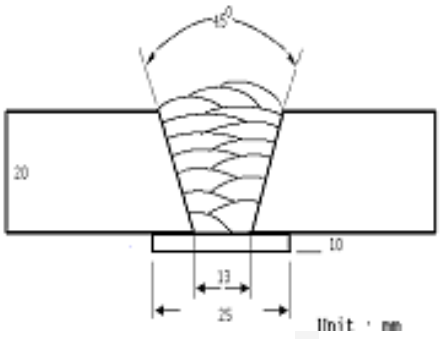
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates

2. Use Ar + 20-25% CO_2 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-80M	YS(MPa)	TS(MPa)	EL(%)	-20℃	-40℃
	610	664	24.2	115	76
AWS A5.28 E80C-G	N/S	≥ 550	N/S	N/S	

❖ Chemical Analysis of all weld metal(wt%)

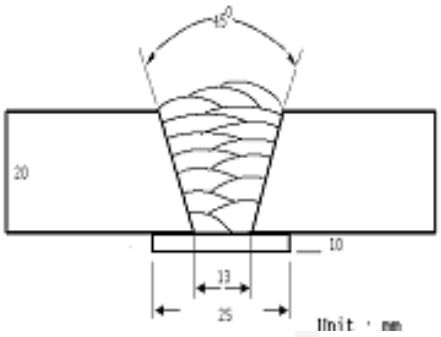
consumable	C	Si	Mn	P	S	Ti	Ni	Cr	Mo	Cu
SC-80M	0.077	0.63	1.65	0.014	0.007	0.007	0.72	0.25	0.012	0.34
AWS A5.28 E80C-G	N/S (Not Specified) [h]									

* 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]

Diameter(mm)	:	1.6mm
Shielding Gas	:	80%Ar + 20%CO_2
Flow Rate(ℓ /min.)	:	20
Amp./ Volt.	:	350 / 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-80M	YS(MPa)	TS(MPa)	EL(%)	-20℃	-40℃
	602	658	24.6	92	72
AWS A5.28 E80C-G	N/S	≥ 550	N/S	N/S	

❖ Chemical Analysis of all weld metal(wt%)

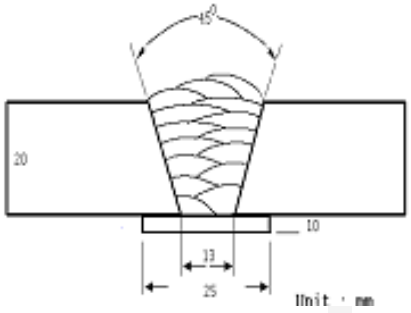
Consumable	C	Si	Mn	P	S	Ti	Ni	Cr	Mo	Cu
SC-80M	0.075	0.61	1.62	0.014	0.009	0.006	0.75	0.26	0.015	0.34
AWS A5.28 E80C-G	N/S (Not Specified) [h]									

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

Impact Toughness Test on Various Temp.

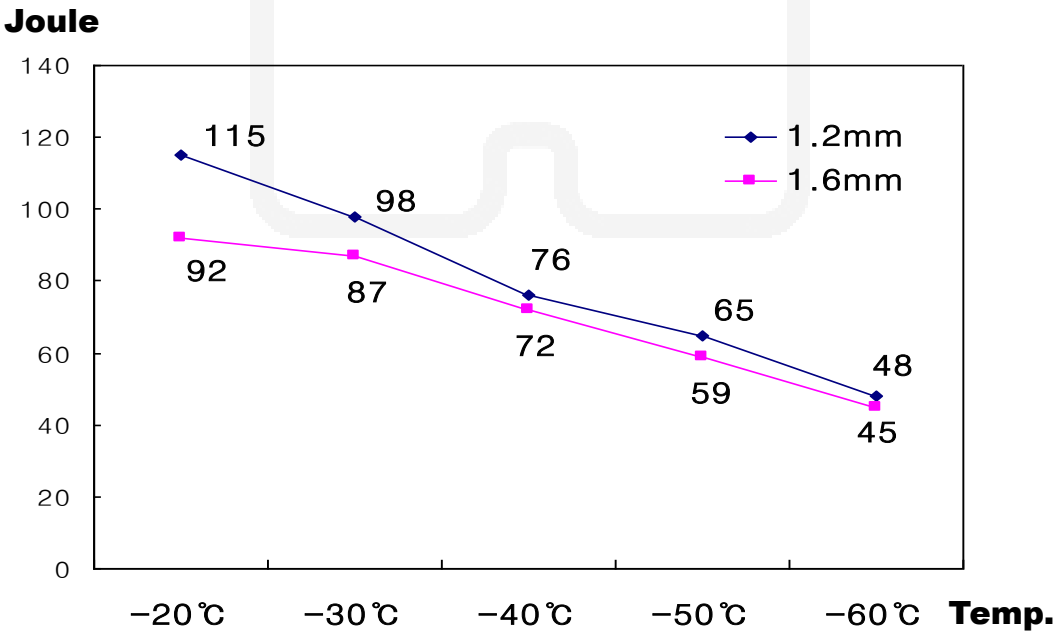
❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	:	**1.2**	**1.6**
Shielding Gas	:	80%Ar + 20%CO_2	80%Ar + 20%CO_2
Flow Rate(ℓ /min.)	:	20	20
Amps(A) / Volts(V)	:	280 / 32	350 / 30
Stick-Out(mm)	:	20~25	20~25
Pre-Heat(℃)	:	Room Temp.	Room Temp.
Inter-Pass Temp.℃)	:	150±15	150±15
Current Type & Polarity	:	DC(+)	DC(+)



Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	:	**1.6**	**Amps(A) / Volts(V)**	:	320 / 30
Shielding Gas	:	80%Ar +20%CO_2	**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 ℃
Evolution Temp.	:	25 ℃	**Exposure Condition**	:	80%RH-25℃
Barometric Pressure	:	780 mm-Hg			

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
4.3	**4.2**	**4.4**	**4.3**

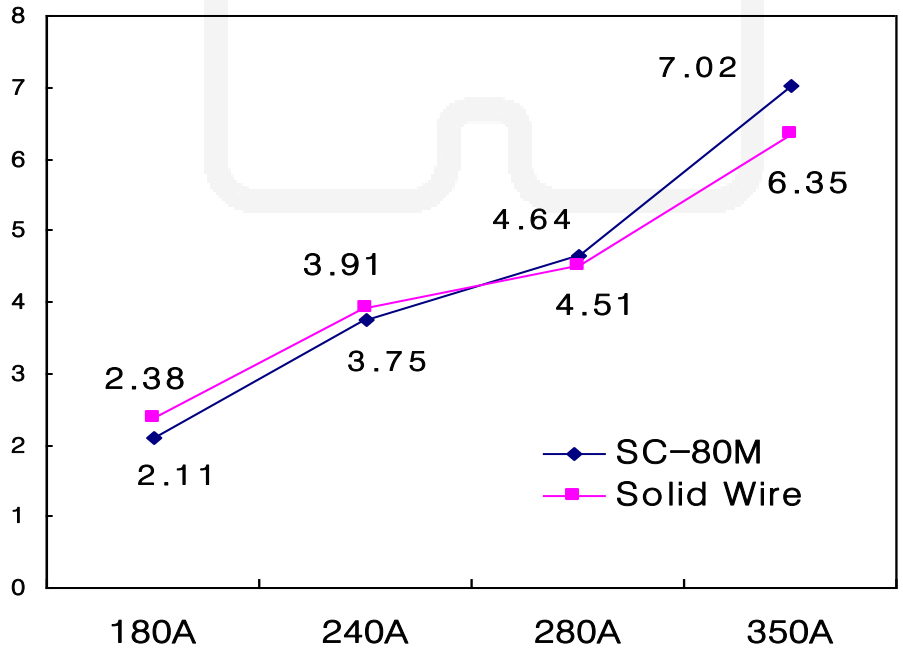
Average Hydrogen Content ***4.4 ㎖ / 100g Weld Metal***

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
SC-80M 1.2mm	180	23	92~94	2.11
	240	26	93~95	3.75
	280	30	95~97	4.64
	350	34	97~98	7.02
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



Fume Test

❖ Welding Conditions

Diameter(mm)	:	**1.2**	**Amps(A) / Volts(V)**	:	280 / 30
Shielding Gas	:	80%Ar +20%CO_2	**Stick-Out(mm)**	:	20~25
Flow Rate(ℓ /min.)	:	20	**Welding Speed**	:	30 cpm
Welding Position	:	1G	**Current Type & Polarity**	:	DC(+)

❖ Result(mg/min.)

X1	X2	X3	X4
692	685	705	695

Average Fume Emission **695 *mg/min.***

Proper Welding Condition

❖ Welding Conditions

Consumable	Shielding Gas	Welding Position	Amp.(A) / Volt.(V)	
			1.2mm	1.6mm
SC-80M	80%Ar +20%CO_2	F & H-F	180 ~200A / 23~24V	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