

# **SF-80MX**

FLUX CORED ARC WELDING CONSUMABLE  
FOR WELDING OF 590MPa CLASS  
HIGH TENSILE STEEL



## ❖ Specification

**AWS A5.28** E80T1-G

**EN ISO 17632-A** T 46 2 1Ni R C 3 H10

## ❖ Applications

As a metal type flux cored wire, Butt and fillet welding of steel structures using 590N/mm<sup>2</sup> class high tensile steel such as Construction machinery, building and bridges.

## ❖ Characteristics on Usage

SF-80MX is a metal type flux cored wire which produces smooth arc characteristics. It is used for joining from mild tensile steels to 590N/mm<sup>2</sup> class high tensile steels. and is suitable for both fillet and but welds, providing high deposition rates, combined with minimal spatter and excellent slag release. Especially it has good anti-porosity to zinc-primer plate and mill scale plate in fillet welding.

## ❖ Note on Usage

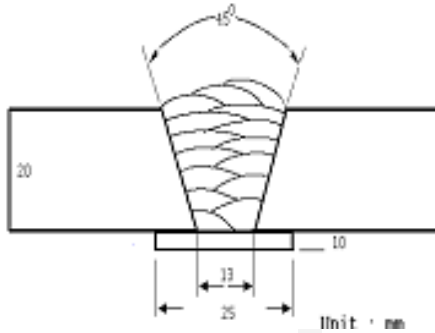
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. Use 100% CO<sub>2</sub> gas.



## Mechanical Properties & Chemical Composition of All Weld Metal

### ❖ Welding Conditions

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

Diameter(mm)	: 1.2mm
Shielding Gas	: 100% CO <sub>2</sub>
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 280 / 32
Stick-Out(mm)	: 20~25
Pre-Heat(°C)	: R.T .
Interpass Temp.(°C)	: 150±15
Polarity	: DC(+)

### ❖ Mechanical Properties of the weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS(MPa)	TS(MPa)	EL(%)	0°C	-20°C
SF-80MX	590	630	24	60	53
AWS A5.28 E80T1-G	≥ 470	550~690	≥ 19	As agreed upon between the supplier and purchaser	

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

Consumable	C	Si	Mn	P	S	Ni
SF-80MX	0.06	0.55	1.42	0.015	0.010	1.00
AWS A5.28 E80T1-G	-	≤ 1.00	≥ 0.50 <sup>f</sup>	≤ 0.03	≤ 0.03	≥ 0.50 <sup>f</sup>

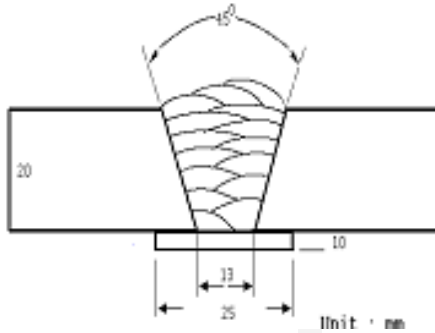
\* f : the undiluted weld metal shall have not less than minimum specified for one or more of the following alloys  
Mn, Ni, Cr, Mo or V



## Mechanical Properties & Chemical Composition of All Weld Metal

### ❖ Welding Conditions

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

<b>Diameter(mm)</b>	: 1.4mm
<b>Shielding Gas</b>	: 100% CO <sub>2</sub>
<b>Flow Rate(ℓ /min.)</b>	: 20
<b>Amp./ Volt.</b>	: 300 / 32
<b>Stick-Out(mm)</b>	: 20~25
<b>Pre-Heat(°C)</b>	: R.T .
<b>Interpass Temp.(°C)</b>	: 150±15
<b>Polarity</b>	: DC(+)

### ❖ Mechanical Properties of the weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS(MPa)	TS(MPa)	EL(%)	0°C	-20°C
SF-80MX	565	620	25.5	62	52
AWS A5.28 E80T1-G	≥ 470	550~690	≥ 19	As agreed upon between the supplier and purchaser	

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

Consumable	C	Si	Mn	P	S	Ni
SF-80MX	0.06	0.54	1.40	0.014	0.010	0.98
AWS A5.28 E80T1-G	-	≤ 1.00	≥ 0.50 <sup>f</sup>	≤ 0.03	≤ 0.03	≥ 0.50 <sup>f</sup>

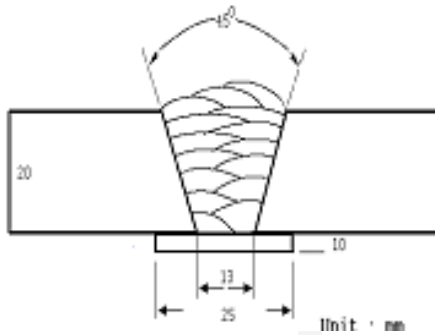
\* f : the undiluted weld metal shall have not less than minimum specified for one or more of the following alloys  
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## Mechanical Properties & Chemical Composition of All Weld Metal

### ❖ Welding Conditions

Method by AWS Spec.



[ Joint Preparation & Layer Details ]

Diameter(mm)	: 1.6mm
Shielding Gas	: 100% CO <sub>2</sub>
Flow Rate(l /min.)	: 20
Amp./ Volt.	: 330 / 32
Stick-Out(mm)	: 20~25
Pre-Heat(°C)	: R.T .
Interpass Temp.(°C)	: 150±15
Polarity	: DC(+)

### ❖ Mechanical Properties of the weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS(MPa)	TS(MPa)	EL(%)	0°C	-20°C
SF-80MX	570	610	26.0	64	50
AWS A5.28 E80T1-G	≥ 470	550~690	≥ 19	As agreed upon between the supplier and purchaser	

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

Consumable	C	Si	Mn	P	S	Ni
SF-80MX	0.06	0.52	1.40	0.012	0.010	0.97
AWS A5.28 E80T1-G	-	≤ 1.00	≥ 0.50 <sup>f</sup>	≤ 0.03	≤ 0.03	≥ 0.50 <sup>f</sup>

\* f : the undiluted weld metal shall have not less than minimum specified for one or more of the following alloys  
Mn, Ni, Cr, Mo or V



# Welding Efficiency

## ❖ Deposition Rate & Efficiency

Consumable (Size)	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
SF-80MX 1.2mm	200	26	85~87	3.4
	250	30	87~89	4.6
	300	33	91~93	6.2
	350	38	91~93	7.0
SF-80MX 1.4mm	300	31	90~92	5.2
	350	36	91~93	5.7
	400	38	91~93	6.4
SF-80MX 1.6mm	300	33	87~89	4.9
	350	36	90~91	5.7
	400	38	91~93	6.4
<b>Remark</b>			Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

\* Shielding Gas : 100% CO<sub>2</sub>



## Diffusible Hydrogen Content

### ❖ Welding Conditions

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Diameter(mm)	: 1.6	Amps(A) / Volts(V)	: 300 / 32
Shielding Gas	: 100% CO <sub>2</sub>	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

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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)

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X1	X2	X3	X4
6.5	6.2	6.0	6.4

**Average Hydrogen Content 6.3 ml / 100g Weld Metal**



## Proper Welding Condition

### ❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)		
			1.2mm	1.4mm	1.6mm
SF-80MX	100%CO <sub>2</sub>	F & HF	250~300Amp	300~350Amp	300~380Amp