

SF-80W

FLUX CORED ARC WELDING CONSUMABLES
FOR ATMOSPHERIC CORROSION RESISTING STEEL



❖ Specification

<i>AWS A5.36</i>	E81T1-C1A2-W2
<i>(AWS A5.36M)</i>	E551T1-C1A3-W2)
<i>(AWS A5.29)</i>	E81T1-W2C)
<i>JIS Z3320</i>	T55 3 T1-1 C A-NCC1 H10

❖ Applications

All position welding of bridges, building using atmospheric corrosion resisting steels.

❖ Characteristics on Usage

SF-80W is the most widely used titania type flux cored wire for all position welding with CO₂ shielding gas. Arc stability is excellent, so spatter loss is low and slag covering is uniform with good removability. SF-80W is effective for use in insufficient ventilation and/or space areas.

❖ Note on Usage

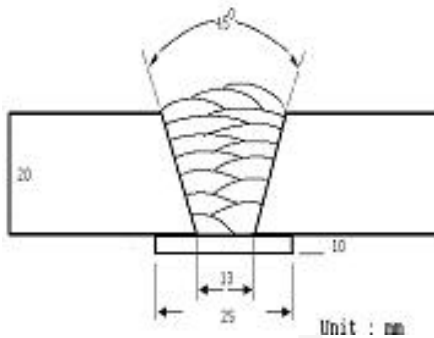
1. Proper preheating(50~150℃, 122~302°F) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates.
2. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.
3. Use 100% 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	: 100%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 280A / 32V
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)	
	YS (Mpa / Ksi)	TS (Mpa / Ksi)	EL (%)	-20℃ (-4°F)	-30℃ (-22°F)
SF-80W	540 (75)	615 (84)	28.0	66 (49)	46 (34)
AWS A5.36 E81T1-C1A2-W2	≥ 470 (68)	550~690 (80~100)	≥ 22.0	≥ 27J at -30℃ (≥ 20ft · lbs at -20°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Cu	Cr	Ni
SF-80W	0.04	0.40	0.92	0.016	0.009	0.40	0.52	0.50
AWS A5.36 E81T1-C1A2-W2	≤ 0.12	0.35~0.80	0.50~1.30	≤ 0.03	≤ 0.03	0.30~0.75	0.45~0.70	0.40~0.80

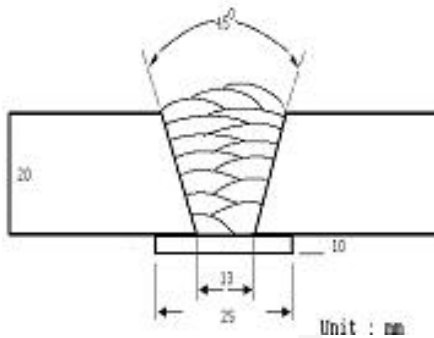
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.4mm (0.052in)
Shielding Gas	: 100%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 300A / 32V
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)	
	YS (Mpa / Ksi)	TS (Mpa / Ksi)	EL (%)	-20℃ (-4°F)	-30℃ (-22°F)
SF-80W	550 (80)	620 (90)	26.5	82 (61)	40 (30)
AWS A5.36 E81T1-C1A2-W2	≥ 470 (68)	550~690 (80~100)	≥ 22.0	≥ 27J at -30℃ (≥ 20ft · lbs at -20°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Cu	Cr	Ni
SF-80W	0.04	0.42	0.95	0.016	0.009	0.41	0.50	0.52
AWS A5.36 E81T1-C1A2-W2	≤ 0.12	0.35~0.80	0.50~1.30	≤ 0.03	≤ 0.03	0.30~0.75	0.45~0.70	0.40~0.80

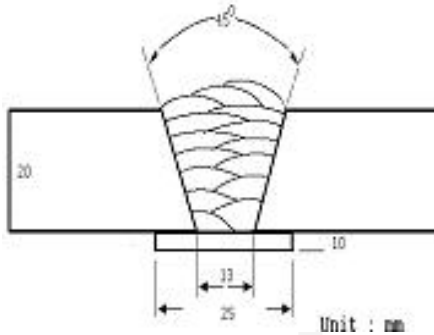
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Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.6mm (1/16in)
Shielding Gas	: 100%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 320~330A / 29~30V
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)	
	YS (Mpa / Ksi)	TS (Mpa / Ksi)	EL (%)	-20℃ (-4°F)	-30℃ (-22°F)
SF-80W	545 (79)	618 (90)	26.0	76 (56)	40 (30)
AWS A5.36 E81T1-C1A2-W2	≥ 470 (68)	550~690 (80~100)	≥ 22.0	≥ 27J at -30℃ (≥ 20ft · lbs at -20°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Cu	Cr	Ni
SF-80W	0.04	0.39	0.92	0.016	0.009	0.42	0.50	0.48
AWS A5.36 E81T1-C1A2-W2	≤ 0.12	0.35~0.80	0.50~1.30	≤ 0.03	≤ 0.03	0.30~0.75	0.45~0.70	0.40~0.80

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Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency %	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Vol.t.(V)			
SF- 80W 1.2mm (0.045in)	200	26	10.2 (400)	84~87	3.4 (7.5)
	250	28	11.5 (450)	85~88	4.5 (9.9)
	300	33	15.3 (600)	86~88	5.2 (11.4)
SF- 80W 1.4mm (0.052in)	250	28	7.6 (300)	85~87	3.9 (8.6)
	300	32	10.2 (400)	85~88	4.8 (10.6)
	330	36	12.8 (500)	86~89	5.8 (12.8)
SF- 80W 1.6mm (1/16in)	280	31	6.4 (250)	85~88	4.2 (9.2)
	330	33	7.6 (300)	86~88	4.8 (10.6)
	350	34	8.1 (320)	87~89	5.3 (11.7)
	400	38	9.2 (360)	87~90	5.7 (12.5)
Remark				Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 100%CO₂

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Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	: 1.4mm (0.052in)	Amps(A) / Volts(V)	: 240A / 27V
Shielding Gas	: 100%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 Chromatography Method

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

❖ Result(ml/100g Weld Metal)

X1	X2	X3	X4
6.5	6.3	6.2	6.6

Average Hydrogen Content 6.4 ml / 100g Weld Metal

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Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.		
			1.2mm (0.045in)	1.4mm (0.052in)	1.6mm (1/16in)
SF-80W	100%CO ₂	F & HF	120~300Amp	200~350Amp	200~400Amp
		V-Up & OH	120~260Amp	180~280Amp	180~280mp
		V-Down	200~300Amp	220~320Amp	250~320Amp

❖ F No & A No

F No	A No
6	1

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