HYUNDAI WELDING

Rev. 00

SF-70W

FLUX CORED ARC WELDING CONSUMABLES
for WELDING of ATMOSPHERIC
CORROSION RESISTING STEEL

HYUNDAI WELDING CO., LTD.

❖ Specification

JIS Z3320 YFA-50W

❖ Applications

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

❖ Characteristics on Usage

SF-70W is the most widely used titania type flux cored wire for all position welding with CO_2 shielding gas. Arc stability is excellent, so spatter loss is low and slag covering is uniform with good removability. SF-70W is effective for use in insufficient in insufficient ventilation and/or space areas.

❖ 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.

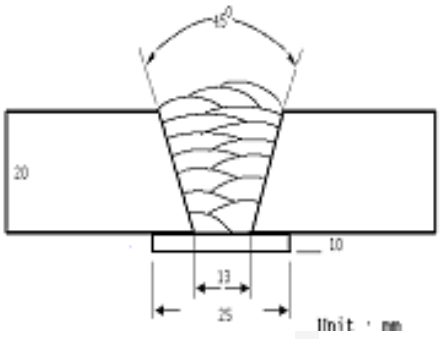
2. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.

3. Use 100% 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	:	100% CO_2
Flow Rate(ℓ /min.)	:	20~22
Amp./ Volt.	:	280 / 31
Stick-Out(mm)	:	20
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)
SF-70W	YS(MPa)	TS(MPa)	EL(%)	0℃
	518	580	28	66
JIS Z3320 YFA-50W	≥ 390	≥ 490	≥ 20	≥47J at 0℃

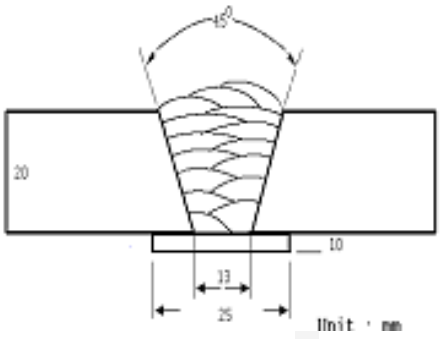
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Cu	Cr	Ni
SF-70W	0.04	0.45	1.09	0.014	0.009	0.40	0.52	0.35
JIS Z3320 YFA-50W	≤ 0.12	≤ 0.9	0.5~1.60	≤ 0.03	≤ 0.03	0.30~0.60	0.45~0.75	0.05~0.70

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	:	1.4mm
Shielding Gas	:	100% CO_2
Flow Rate(ℓ /min.)	:	20~22
Amp./ Volt.	:	300 / 32
Stick-Out(mm)	:	20
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)
SF-70W	YS(MPa)	TS(MPa)	EL(%)	0℃
	522	585	27.5	62
JIS Z3320 YFA-50W	≥ 390	≥ 490	≥ 20	≥47J at 0℃

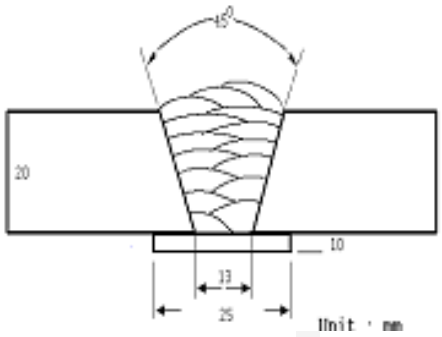
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Cu	Cr	Ni
SF-70W	0.04	0.43	1.05	0.014	0.008	0.42	0.50	0.35
JIS Z3320 YFA-50W	≤ 0.12	≤ 0.9	0.5~1.60	≤ 0.03	≤ 0.03	0.30~0.60	0.45~0.75	0.05~0.70

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_2
Flow Rate(ℓ /min.)	:	20~22
Amp./ Volt.	:	330 / 33
Stick-Out(mm)	:	20
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)
SF-70W	YS(MPa)	TS(MPa)	EL(%)	0℃
	520	578	28	76
JIS Z3320 YFA-50W	≥ 390	≥ 490	≥ 20	≥47J at 0℃

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Cu	Cr	Ni
SF-70W	0.04	0.42	1.05	0.014	0.008	0.38	0.50	0.34
JIS Z3320 YFA-50W	≤ 0.12	≤ 0.9	0.5~1.60	≤ 0.03	≤ 0.03	0.30~0.60	0.45~0.75	0.05~0.70

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
SF-70W 1.2mm	150	24	84~87	2.2
	200	26	84~88	3.2
	250	28	85~88	4.2
	300	33	85~88	5.1
SF-70W 1.4mm	250	28	84~87	3.8
	300	32	86~88	4.7
	350	36	86~89	6.2
SF-70W 1.6mm	280	31	86~88	4.3
	330	33	86~89	4.8
	350	34	86~89	5.4
	400	38	88~90	6.0
Remark			Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 100%CO_2

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	:	**1.2**	**Amps(A) / Volts(V)**	:	280 / 31
Shielding Gas	:	100% CO_2	**Stick-Out(mm)**	:	20
Flow Rate(ℓ /min.)	:	20	**Welding Speed**	:	45 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
6.4	**7.0**	**6.5**	**6.2**

Average Hydrogen Content 6.5 ㎖ / *100g Weld Metal*

Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)		
			1.2mm	1.4mm	1.6mm
SF-70W	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