HYUNDAI WELDING

Rev. 06

SF-71LF

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF MILD & 490MPa CLASS
HIGH TENSILE STEEL

2022.02

HYUNDAI WELDING CO., LTD.

SF-71LF

❖ Specification

AWS A5.20	E71T-1C
(AWS A5.20M	E491T-1C)
JIS Z 3313	T49J 0 T1-1 C A-U

❖ Applications

All position welding of ship buildings, machinery, bridges, building, vehicles using mild and higher strength steels.

❖ Characteristics on Usage

SF-71LF is a titania type flux cored wire for all position welding with CO_2. Compared with solid wire, spatter loss is low, bead appearance is a beautiful and arc is soft with good stability. Slag covering is uniform with good removal. As fume generation is lower than conventional flux cored wire

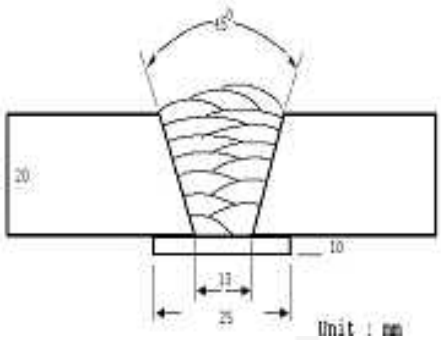
❖ Note on Usage

1. For preheating guidelines, please refer to your local standards and codes relative to your best practices.
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]

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 (lbs/in²)	TS MPa (lbs/in²)	EL (%)	-1℃ (30°F)	-18℃ (0°F)
SF-71LF	550 (80,000)	588 (85,000)	27.0	95(70)	55(41)
AWS A5.20 E71T-1C	≥ 390 (56,000)	490~670 (70,000~ 97,000)	≥ 22	≥27J at -18℃ (≥20ft · lbs at 0°F)	

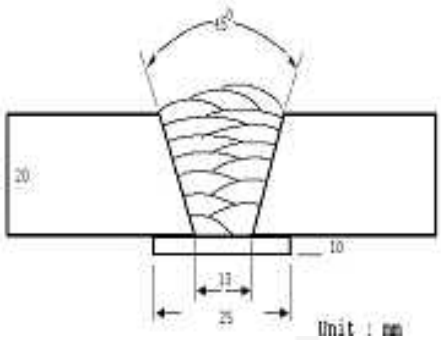
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71LF	0.04	0.50	1.45	0.010	0.008
AWS A5.20 E71T-1C	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

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 (lbs/in²)	TS MPa (lbs/in²)	EL (%)	-1℃ (30°F)	-18℃ (0°F)
SF-71LF	545 (79,000)	585 (85,000)	27.5	92(68)	49(36)
AWS A5.20 E71T-1C	≥ 390 (56,000)	490~670 (70,000~ 97,000)	≥ 22	≥27J at -18℃ (≥20ft · lbs at 0°F)	

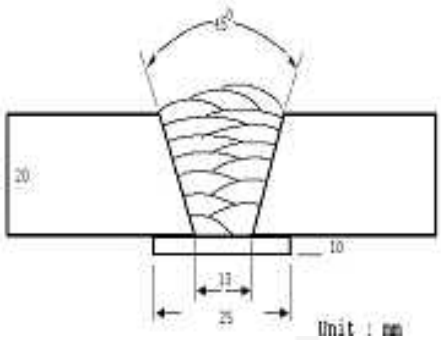
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71LF	0.04	0.53	1.46	0.010	0.008
AWS A5.20 E71T-1C	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

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 (lbs/in²)	TS MPa (lbs/in²)	EL (%)	-1℃ (30°F)	-18℃ (0°F)
SF-71LF	555 (80,000)	595 (86,000)	27.8	95(70)	52(38)
AWS A5.20 E71T-1C	≥ 390 (56,000)	490~670 (70,000~ 97,000)	≥ 22	≥27J at -18℃ (≥20ft · lbs at 0°F)	

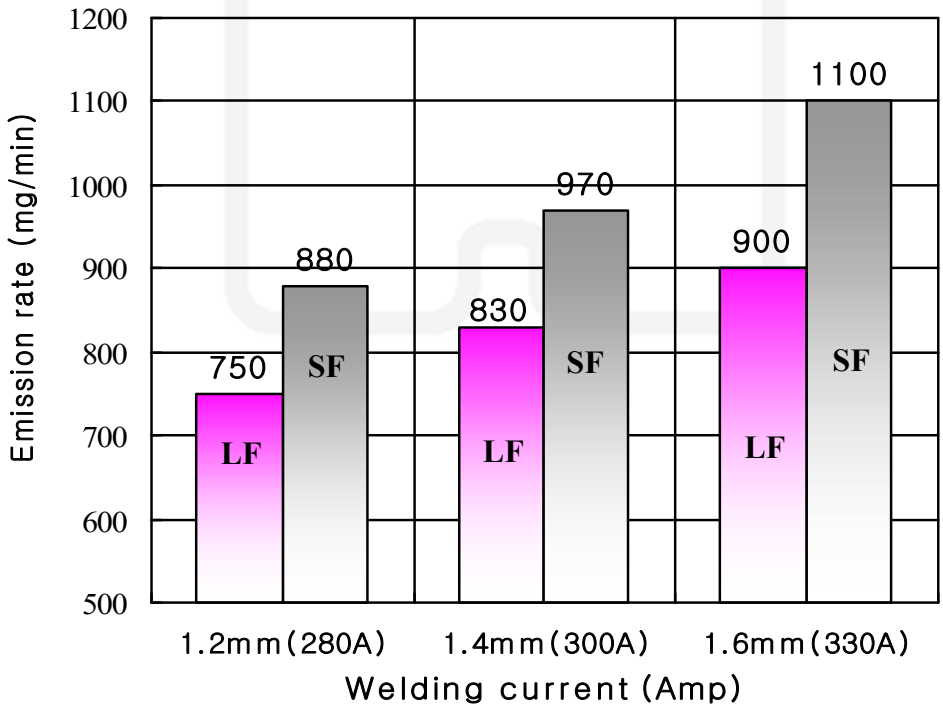
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71LF	0.04	0.52	1.44	0.011	0.008
AWS A5.20 E71T-1C	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

Fume Generation Rate

❖ Welding Conditions

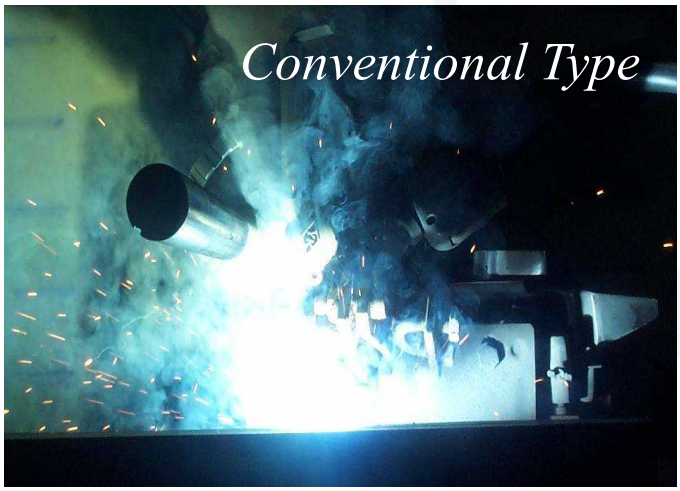
Diameter	:	1.2, 1.4, 1.6mm (0.045, 0.053, 1/16in)	**Amps**	:	280, 300, 330A
Shielding Gas	:	100% CO_2	**Stick-Out**	:	20mm ((0.79in)
Flow Rate	:	20 ℓ /min	**Welding Speed**	:	30 cm/min (12 in/min)
Welding Position	:	1G	**Current Type & Polarity**	:	DC(+)
Fume Suction time	:	Total 3min.	**Welding Time**	:	30sec.
Torch Angle	:	90 °(deg)			



Fume Generation Rate

❖ Welding Conditions

Diameter	:	1.2mm (0.045in)	**Amps / Volts**	:	280A / 31V
Shielding Gas	:	100% CO_2	**Stick-Out(mm)**	:	20mm ((0.79in)
Flow Rate	:	20 ℓ /min	**Welding Speed**	:	30 cm/min (12 in/min)
Welding Position	:	1G	**Current Type & Polarity**	:	DC(+)
Fume Suction time	:	Total 3min.	**Welding Time**	:	30sec.
Torch Angle	:	90 °(deg)			



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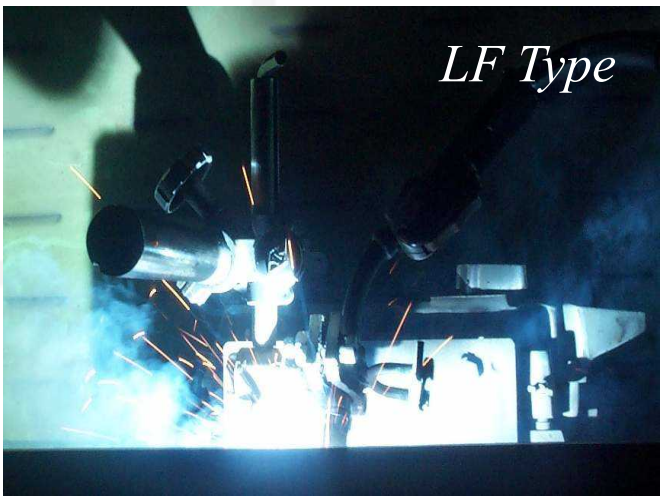

SF-71 LF

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	:	1.2mm (0.045in)	**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 Position	:	1G (PA)	**Welding Speed**	:	30 cm/min (12 in/min)
			Current Type & Polarity	:	DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

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

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
5.8	**5.4**	**5.9**	**5.2**

Average Hydrogen Content 5.6 ㎖ / *100g Weld Metal*

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-71LF	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

Approvals

❖ AUTHORIZED APPROVAL DETAILS

Welding Position	Register of shipping & Size			
	ABS	LR	DNV	NK
All V-Down	2YSAH10, 1.2~1.6mm (0.045~1/16in)	2YSH10 1.2~1.6mm (0.045~1/16in)	IIYMSH10 1.2~1.6mm (0.045~1/16in)	KSW52G(C)H10 KAW52MG(C) 1.2~1.6mm (0.045~1/16in)

❖ F No & A No

F No	A No
6	1