HYUNDAI WELDING

Rev. 01

SF-71

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

HYUNDAI WELDING CO., LTD.

❖ Specification

AWS A5.20	E71T-1C
EN ISO 17632-A	T 42 0 P C 1 H10

❖ Applications

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

❖ Characteristics on Usage

SF-71 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.

❖ 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.

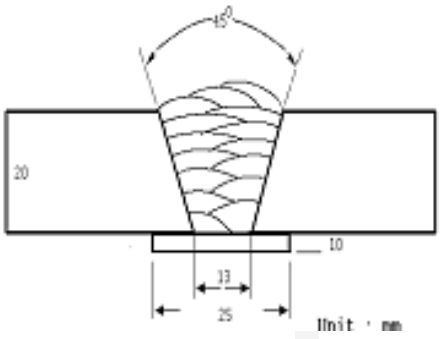
2. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.

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-71	YS(MPa)	TS(MPa)	EL(%)	20℃	0℃	-20℃
	548	582	28	120	86	50
AWS A5.20 E71T-1C	≥ 390	490~670	≥ 22	≥27J at -20℃		

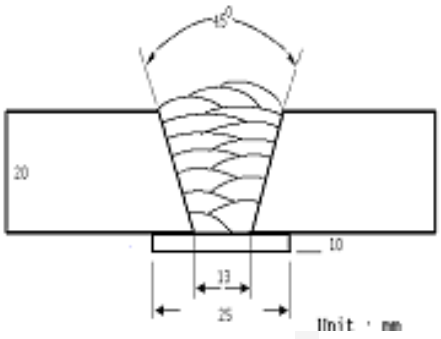
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71	0.04	0.49	1.29	0.010	0.009
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]

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-71	YS(MPa)	TS(MPa)	EL(%)	20℃	0℃	-20℃
	538	575	27.5	123	87	52
AWS A5.20 E71T-1C	≥ 390	490~670	≥ 22	≥27J at -20℃		

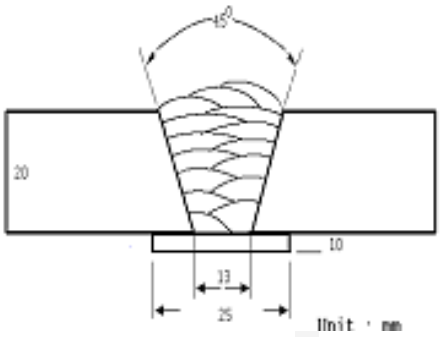
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71	0.041	0.52	1.29	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]

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-71	YS(MPa)	TS(MPa)	EL(%)	20℃	0℃	-20℃
	540	580	27.5	117	85	56
AWS A5.20 E71T-1C	≥ 390	490~670	≥ 22	≥27J at -20℃		

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SF-71	0.04	0.50	1.30	0.011	0.009
AWS A5.20 E71T-1C	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
SF-71 1.2mm	150	24	85~87	2.2
	200	26	85~87	3.3
	250	28	85~88	4.3
	300	33	85~88	5.2
SF-71 1.4mm	250	28	85~87	3.8
	300	32	86~88	4.8
	350	36	87~89	6.1
SF-71 1.6mm	280	31	86~88	4.2
	330	33	86~89	4.8
	350	34	87~89	5.3
	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)	:	**1.4**	**Amps(A) / Volts(V)**	:	300 / 32
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
6.0	**6.4**	**5.9**	**6.2**

Average Hydrogen Content 6.1 *㎖ / 100g Weld Metal*

Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)		
			1.2mm	1.4mm	1.6mm
SF-71	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(mm)						
	KR	ABS	LR	BV	DNV	GL	NK
All V-Down	2SMG, 2YSMG © H10 1.2~1.6	2SAH10, 2YSA 1.2~1.6	2S, 2YSH10 1.2~1.6	SA2M,2YMHH A2,2YMHH 1.2~1.6	IIYMSH15 1.2~1.6	2YH10S 1.2~1.6	KSW52Y40G © H10 1.2~ 1.6