HYUNDAI WELDING

Rev. 00

SF-71MC

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

HYUNDAI WELDING CO., LTD.

SF-71MC

❖ Specification

AWS A5.20	***E71T-1C/-1M/-9C/-9M/-12C/-12M***
EN ISO 17632-A	***T 42 2 P C 1 H10*** ***T 42 2 P M 1 H10***

❖ Applications

All position welding of ship hulls, vehicles, bridges, chemical plant machinery and other metal fabrication

❖ Characteristics on Usage

SF-71MC is a titania flux cored wire applicable for all-position welding by 100% CO_2 shielding gas or Ar + 20~25% CO_2 shielding gas.

Less spattering and good slag detachability shorten the time of bead grinding operation.

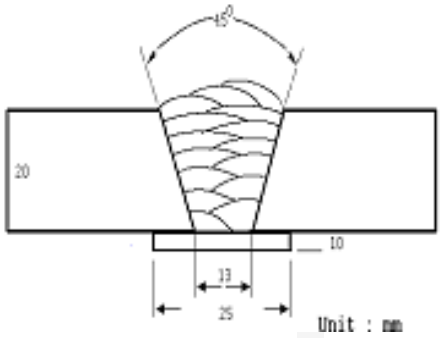
❖ Note on Usage

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_2 or Ar + 20~25% CO_2 shielding 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 Ar+25%CO_2
Flow Rate(ℓ/min.)	:	20
Amp./ Volt.	:	280 / 32
Stick-Out(mm)	:	20~25
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test (Joule)	
		YS (MPa)	TS (MPa)	EL (%)	-20℃	-30℃
SF-71MC	100% CO_2	510	550	28.0	95	75
	Ar+25% CO_2	540	605	28.0	110	90
AWS A5.20 E71T-1C/-1M/-9C/-9M/-12C/-12M		≥ 390	490 ~620	≥ 22	≥27J at –30℃	

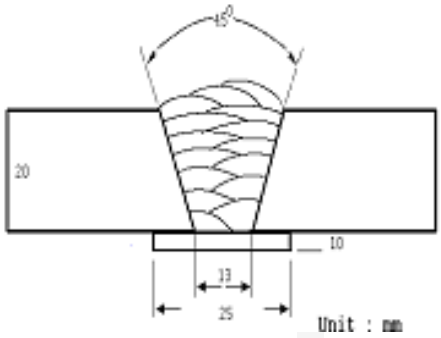
❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shielding gas	C	Si	Mn	P	S
SF-71MC	100%CO_2	0.040	0.40	1.20	0.010	0.012
	Ar+25%CO_2	0.040	0.50	1.41	0.010	0.014
AWS A5.20 E71T-1C/-1M/-9C/-9M/-12C/-12M		***≤ 0.12***	***≤ 0.9***	***≤ 1.60***	***≤ 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 Ar+25%CO_2
Flow Rate(ℓ/min.)	:	20
Amp./ Volt.	:	320 / 32
Stick-Out(mm)	:	20~25
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	150±15
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test (Joule)	
		YS (MPa)	TS (MPa)	EL (%)	-20℃	-30℃
SF-71MC	100% CO_2	500	540	28.5	90	70
	Ar+25% CO_2	545	600	28.5	100	85
AWS A5.20 E71T-1C/-1M/-9C/-9M/-12C/-12M		≥ 390	490 ~620	≥ 22	≥27J at –30℃	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	Shielding gas	C	Si	Mn	P	S
SF-71MC	100% CO_2	0.040	0.41	1.23	0.011	0.012
	Ar+25% CO_2	0.040	0.55	1.42	0.010	0.012
AWS A5.20 E71T-1C/-1M/-9C/-9M/-12C/-12M		***≤ 0.12***	***≤ 0.9***	***≤ 1.60***	***≤ 0.03***	***≤ 0.03***

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Shielding Gas	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
		Amp.(A)	Volt.(V)		
SF-71MC 1.2mm	100%CO_2	280	32	86~88	4.8
	Ar+25%CO_2	280	30	87~89	5.0
SF-71MC 1.6mm	100%CO_2	320	32	86~88	4.6
	Ar+25%CO_2	320	30	87~89	4.5
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)	:	**1.6**	**Amps(A) / Volts(V)**	:	320 / 32
Shielding Gas	:	100%CO_2	**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

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
6.8	**6.9**	**6.5**	**6.8**

Average Hydrogen Content 6.8 ㎖ / *100g Weld Metal*

Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)		
			1.2mm	1.4mm	1.6mm
SF-71MC	100%CO_2 or Ar+20~25%CO_2	F	120~300Amp	150~350Amp	180~400Amp
		HF	120~300Amp	150~350Amp	180~340Amp
		V-Up & OH	120~260Amp	150~270Amp	180~280mp
		V-Down	200~300Amp	220~320Amp	250~300Amp

Approvals

❖ Shipping Approvals

Welding Position	Shielding gas	Register of shipping & Size(mm)	
		ABS	LR
All V-Down	100%CO_2	3YSA H10 1.2~1.6	3YS H10 1.2~1.6
All V-Down	Ar+25%CO_2	3YSA H10 1.2~1.6	3YS H10 1.2~1.6