HYUNDAI WELDING

Rev. 02

SF-71MC

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

HYUNDAI WELDING CO., LTD.

SF-71MC

❖ Specification

AWS A5.36	E71T1-C1A2-CS2 E71T1-M21A2-CS2
AWS A5.36M	E491T1-C1A3-CS2 E491T1-M21A3-CS2
(AWS A5.20	E71T-1C/-1M/-9C/-9M/-12C/-12M)
EN ISO 17632-A	T 46 2 P C1 1 H10 T 46 3 P M21 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

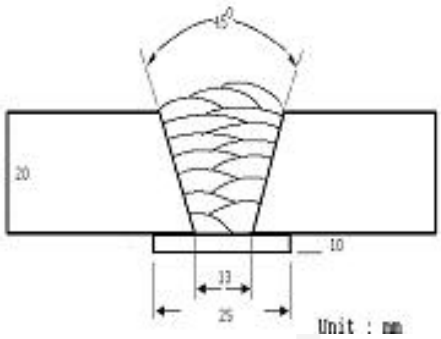
1. Proper preheating(50~150℃, 122~302°F) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates

2. 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]

Welding Position	:	1G(PA)
Diameter	:	1.2mm (0.045in)
Shielding Gas	:	100% CO_2 Ar-20%CO_2
Flow Rate	:	20 ℓ /min
Amp./ Volt.	:	280A / 32V (100% CO_2) 280A / 30V (Ar-20%CO_2)
Stick-Out	:	20~25mm (0.79~0.98in)
Pre-Heat	:	R.T (℃,°F)
Interpass Temp	:	150±15℃ (302±59°F)
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS Mpa(Ksi)	TS Mpa(Ksi)	EL (%)	-20℃ (-4°F)	-30℃ (-22°F)
SF-71MC	100% CO_2	510(74)	550(80)	28.0	95(70)	75(55)
	Ar-20% CO_2	540(78)	605(88)	28.0	110(81)	90(66)
AWS A5.36 E71T1-C1(M21)A2-CS2		≥ 400 (58)	490~660 (70~95)	≥ 22	≥27J at -30℃ (≥20ft · lbs at -20°F)	

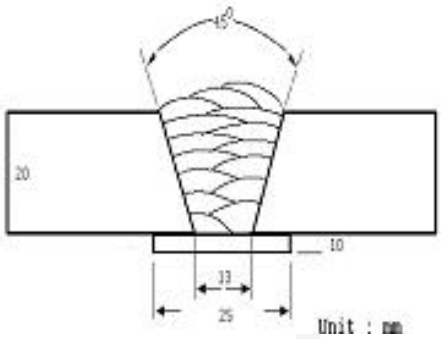
❖ Chemical Analysis of all weld metal(wt%)

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 A5.36 E71T1-C1A2(M21A3)-CS2		≤ 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]

Welding Position	:	1G(PA)
Diameter	:	1.6mm (1/16in)
Shielding Gas	:	100% CO_2 Ar-20%CO_2
Flow Rate	:	20 ℓ /min
Amp./ Volt.	:	320A / 32V (100% CO_2) 320A / 30V (Ar-20%CO_2)
Stick-Out	:	20~25mm (0.79~0.98in)
Pre-Heat	:	R.T (℃,°F)
Interpass Temp	:	150±15℃ (302±59°F)
Polarity	:	DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Shielding gas	Tensile Test			CVN Impact Test J(ft · lbs)	
		YS Mpa(Ksi)	TS Mpa(Ksi)	EL (%)	-20℃ (-4°F)	-30℃ (-22°F)
SF-71MC	100% CO_2	500(73)	540(78)	28.5	90(66)	70(52)
	Ar-20% CO_2	545(79)	600(87)	28.5	100(74)	85(63)
AWS A5.36 E71T1-C1(M21)A2-CS2		≥ 400 (58)	490~660 (70~95)	≥ 22	≥27J at -30℃ (≥20ft · lbs at -20°F)	

❖ 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 A5.36 E71T1-C1A2(M21A3)-CS2		≤ 0.12	≤ 0.9	≤ 1.60	≤ 0.03	≤ 0.03

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Shielding Gas	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
		Amp. (A)	Volt. (V)			
1.2mm (0.045 in)	100%CO_2	280	32	12.7(500)	86~88	4.8(11)
	Ar-20%CO_2	280	30	12.7(500)	87~89	5.0(11)
1.6mm (1/16 in)	100%CO_2	330	32	8.3(325)	86~88	5.3(12)
	Ar-20%CO_2	330	30	8.3(325)	87~89	5.5(12)
Remark					Deposition efficiency =(Deposited metal weight/Wire weight used)×100	Deposition rate =(Deposited metal weight/Welding time,min.)×60

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	:	1.6mm (1/16 in)	**Amps / Volts**	:	260A / 28V
Shielding Gas	:	100%CO_2, Ar-20%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
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.	
			1.2mm (0.045 in)	1.6mm (1/16 in)
SF-71MC	100%CO_2 or Ar-20~25%CO_2	F	100~280Amp	150~360Amp
		HF	100~280Amp	150~360Amp
		V-Up & OH	140~260Amp	180~300Amp
		V-Down	100~280Amp	150~360Amp

Approvals

❖ Shipping Approvals

Welding Position	Shielding gas	Register of shipping & Size	
		ABS	LR
All V-Down	100%CO_2	3YSA H10 1.2~1.6mm (0.045~1/16in)	3YS H10 1.2~1.6mm (0.045~1/16in)
All V-Down	Ar-25%CO_2	3YSA H10 1.2~1.6mm (0.045~1/16in)	3YS H10 1.2~1.6mm (0.045~1/16in)

❖ F No & A No

F No	A No
6	1