HYUNDAI WELDING

Rev. 02

SC-71LHM Cored

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

HYUNDAI WELDING CO., LTD.

SC-71LHM Cored

❖ Specification

AWS A5.36	E71T1-M21A2-CS1
(AWS A5.36M	E491T1-M21A3-CS1)
(AWS A5.20	E71T-1M /-9M)
EN ISO 17632-A	T 46 3 P M21 1 H5

❖ Applications

Typical industrial application include shipbuilding, machinery. Bridges and structural fabrications.

❖ Characteristics on Usage

SC-71LHM Cored is extra low hydrogen(H5) type flux cored wire for all position welding. Provide an exceptionally smooth and stable arc With a fast freezing slag system.

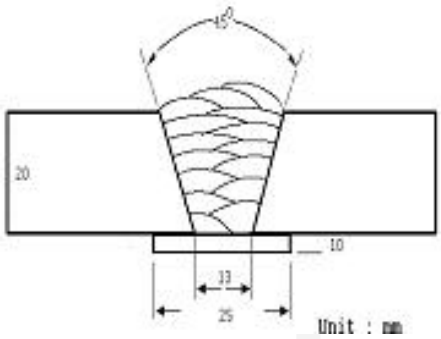
❖ Note on Usage

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. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.
3. Use Ar-20~25%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	:	Ar-20%CO_2
Flow Rate	:	20 ℓ /min
Amp / Volt	:	270~280A / 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 (Ksi)	TS Mpa (Ksi)	EL (%)	-20℃ (-4°F)	-30℃ (-22°F)
SC-71LHM Cored	580 (84)	600 (87)	28.0	95 (70)	80 (59)
AWS A5.36 E71T1-M21A2-CS1	≥ 400 (58)	490~660 (70~95)	≥ 22	≥27J at -30℃ (≥20ft · lbs at -20°F)	

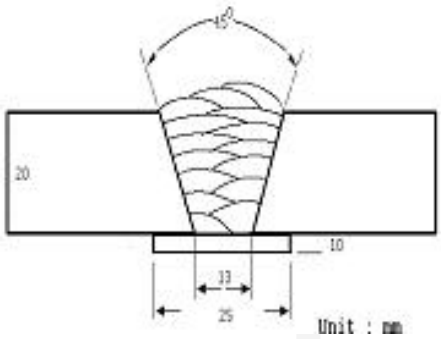
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SC-71LHM Cored	0.05	0.50	1.20	0.012	0.015
AWS A5.36 E71T1-M21A2-CS1	≤ 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	:	Ar-20%CO_2
Flow Rate	:	20 ℓ /min
Amp / Volt	:	290~300A / 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 (Ksi)	TS Mpa (Ksi)	EL (%)	-20℃ (-4°F)	-30℃ (-22°F)
SC-71LHM Cored	580 (84)	603 (87)	28.3	97 (72)	82 (61)
AWS A5.36 E71T1-M21A2-CS1	≥ 400 (58)	490~660 (70~95)	≥ 22	≥27J at -30℃ (≥20ft · lbs at -20°F)	

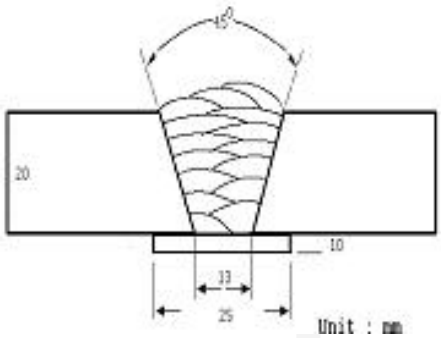
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SC-71LHM Cored	0.05	0.50	1.21	0.012	0.015
AWS A5.36 E71T1-M21A2-CS1	≤ 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]

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Diameter	:	1.4mm (0.052in)
Shielding Gas	:	Ar-20%CO_2
Flow Rate	:	20 ℓ /min
Amp / Volt	:	290~300A / 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 (Ksi)	TS Mpa (Ksi)	EL (%)	-20℃ (-4°F)	-30℃ (-22°F)
SC-71LHM Cored	582 (84)	604 (88)	28.1	98 (72)	85 (63)
AWS A5.36 E71T1-M21A2-CS1	≥ 400 (58)	490~660 (70~95)	≥ 22	≥27J at -30℃ (≥20ft · lbs at -20°F)	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S
SC-71LHM Cored	0.05	0.50	1.22	0.011	0.015
AWS A5.36 E71T1-M21A2-CS1	≤ 0.12	≤ 0.9	≤ 1.75	≤ 0.03	≤ 0.03

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency %	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
SC-71LHM Cored 1.2 mm (0.045in)	200	26	10.2 (400)	87~89	3.1 (6.8)
	250	28	11.5 (450)	88~89	4.3 (9.5)
	300	32	15.3 (600)	88~90	5.8 (12.8)
SC-71LHM Cored 1.4 mm (0.052in)	250	28	7.6 (300)	85~87	3.6 (7.9)
	300	32	10.2 (400)	86~88	4.7 (10.3)
	330	36	12.8 (500)	87~89	6.3 (13.9)
SC-71LHM Cored 1.6 mm (1/16in)	280	31	6.4 (250)	86~88	4.0 (8.8)
	330	33	7.6 (300)	86~89	4.6 (10.1)
	350	34	8.1 (320)	87~89	5.6 (12.3)
	400	38	9.2 (360)	88~90	6.5 (14.3)
Remark				Deposition efficiency =(Deposited metal weight / Wire weight used)×100	Deposition rate =(Deposited metal weight / Welding time,min.)×60

* Shielding Gas : Ar-20%CO_2

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	:	1.2mm (0.045in)	**Amps / Volts**	:	230A / 25V
Shielding Gas	:	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
3.5	**3.4**	**3.7**	**3.6**

Average Hydrogen Content 3.6 *㎖ / 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)
SC-71LHM Cored	Ar -20%CO_2	F & HF	120~300 Amp	160~350 Amp	180~380 Amp
		V-Up & OH	120~260 Amp	140~270 Amp	160~320 Amp
		V-Down	140~300 Amp	160~320 Amp	180~360 Amp

Approvals

❖ AUTHORIZED APPROVAL DETAILS

Welding Position	Register of shipping & Size						
	KR	ABS	LR	BV	DNV	GL	NK
All V-Down	–	3YSA H5 1.2~1.6mm (0.045~1/16in)	3YS H5 1.2~1.6mm (0.045~1/16in	SA3Y HHH 1.2~1.6mm (0.045~1/16in	3YMS H5 1.2~1.6mm (0.045~1/16in	3YH5S 1.2~1.6mm (0.045~1/16in	–

❖ F No & A No

F No	A No
6	1