HYUNDAI WELDING

Rev. 05

Supercored 81-K2MAG

FLUX CORED ARC WELDING CONSUMABLE
FOR LOW TEMPERATURE SERVICE STEEL

HYUNDAI WELDING CO., LTD.

Supercored 81-K2MAG

❖ Specification

AWS A5.36	E81T1-M21A8-K2
(AWS A5.36M	E551T1-M21A6-K2)
(AWS A5.29	E81T1-K2M)
EN ISO 17632-A	T 50 6 1.5Ni P M21 2 H5

❖ Applications

Single or multi pass welding for low temperature service steel, for example offshore sector LPG storage tank etc.

❖ Characteristics on Usage

Supercored 81-K2MAG is a titania-type flux cored wire to be used with Ar+20%CO_2 gas mixture shielding.

Provide an exceptionally smooth and stable arc with a fast freezing slag system and bead shape and appearance are excellent in all position welding.

❖ Note on Usage

1. Proper preheating(50~150℃(150~302℉)) 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

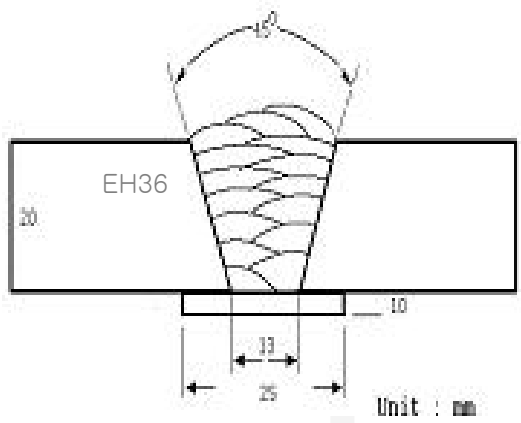
2. Use Ar+20%CO_2 gas.

Supercored 81-K2MAG

Typical Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS spec.



[Joint Preparation & Layer Details]

Welding Position	:	1G(PA)
Diameter(mm)	:	1.2mm(0.045in)
Shielding Gas	:	Ar+20%CO_2
Flow Rate(ℓ /min.)	:	20
Amp./ Volt.	:	280 / 30
Stick-Out	:	20~25mm (0.79~0.98in)
Welding position	:	1G
Interpass Temp.	:	150±15 ℃ (302±59 ℉)
Polarity	:	DC(+)

❖ Typical Mechanical Properties of all weld metal

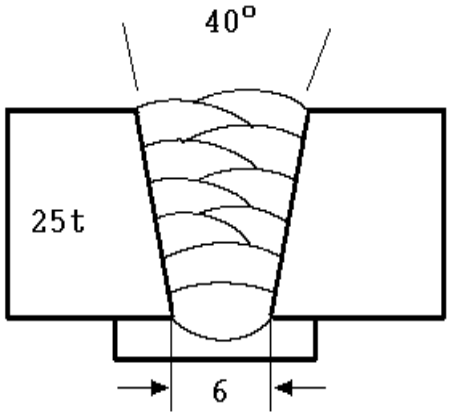
Consumable	Tensile Test			CVN Impact Test J(ft·lbs)	
	YS MPa(ksi)	TS MPa(ksi)	EL(%)	-30℃ (-22℉)	-60℃ (-76℉)
Supercored 81-K2MAG	590(86)	610(88)	27.0	110(81)	70(52)
AWS A5.36 E81T1-M21A8-K2	**≥470(68)**	**550~690 (80~100)**	**≥ 19**	**-**	**≥ 27(20)**

❖ Typical Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni	Mo	Ti	B	Nb
Supercored 81-K2MAG	0.05	0.35	1.25	0.013	0.010	1.50	0.003	0.045	0.004	0.017
AWS A5.36 E81T1-M21A8-K2	≤ 0.15	≤ 0.80	0.50-1.75	≤ 0.03	≤ 0.03	1.00-2.00	≤ 0.35	-	-	-

Typical Mechanical Properties of weld metal

❖ Welding Conditions



[Joint Preparation & Layer Details]

•Wire Diameter : 1.2mm (0.045in)

* Welding Parameter

- 1pass : 180A/ 23V
- 3~Top : 210~220A/24~25V

* Shielding Gas : Ar+20% CO_2

* Welding Position : 3G (Vertical-up, PF)

❖ Typical Mechanical Properties of weld metal

Consumable (size)	Direction	CVN Impact test J(ft·lbs)				
		Temp. ℃(℉)	x1	x2	x3	Avg.
Supercored 81-K2MAG 1.2mm (0.045in)	Face 2mm (0.08in)	-40(-40)	101(74)	104(77)	114(84)	106(78)
		-60(-76)	91(67)	95(70)	11081)	9973)
	Root 2mm (0.08in)	-40(-40)	78(58)	82(60)	80(59)	80(59)
		-60(-76)	42(31)	55(41)	53(39)	50(37)

Welding Efficiency

❖ Deposition Rate & Efficiency

Wire Size	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
1.2mm (0.045in)	200	26	10.2(400)	85~87	3.3(7.3)
	250	28	13.3(525)	85~87	4.4(9.7)
	300	32	15.3(600)	86~88	5.8(12.8)
Remark				Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 80%Ar+20%CO_2

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	:	1.2mm(0.045in)	**Amps(A) / Volts(V)**	:	280A / 30V
Shielding Gas	:	80%Ar+20%CO_2	**Stick-Out**	:	20mm(0.79in)
Flow Rate(ℓ /min.)	:	20	**Welding Speed**	:	35 cm/min (13.8 in/min)
Welding Position	:	1G(PA)	**Current Type & Polarity**	:	DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

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

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
3.5	**3.6**	**3.4**	**3.5**

Average Hydrogen Content 3.5 ㎖ / *100g Weld Metal*

Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia	
			1.2mm (0.045in)	1.4mm (0.052in)
Supercored 81-K2MAG	80%Ar +20%CO_2	F & HF	220~290Amp	240~320Amp
		V-Up & OH	180~250Amp	200~260Amp
		V-Down	210~290Amp	250~320Amp

❖ F No & A No

F No	A No
6	10