

Supercored 81-K2MAG

FLUX CORED ARC WELDING CONSUMABLE
FOR LOW TEMPERATURE SERVICE STEEL

2022.02

HYUNDAI WELDING CO., LTD.



Supercored 81-K2MAG

❖ Specification

<i>AWS A5.29</i>	E81T1-K2M
<i>(AWS A5.29M)</i>	E551T1-K2M)
<i>JIS Z3313</i>	T55 6 T1-1 M A-N3
<i>EN ISO 17632-A</i>	T50 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%CO₂ 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. For preheating guidelines, please refer to your local standards and codes relative to your best practices.
2. Use Ar+20%CO₂ gas.

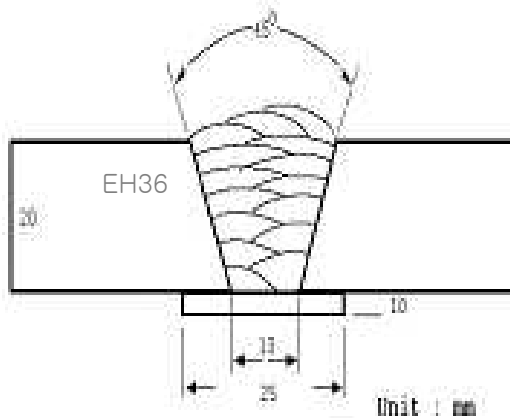


Supercored 81-K2MAG

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 °C (302±59 °F)
Polarity	: DC(+)

❖ Typical Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft·lbs)	
	YS Mpa(lbs/in ²)	TS Mpa((lbs/in ²)	EL(%)	-29 °C (-20 °F)	-60 °C (-76 °F)
Supercored 81-K2MAG	590(86,000)	610(88,000)	27.0	110(81)	70(52)
AWS A5.29 E81T1-K2M	≥ 470 (68,000)	550~690 (80,000~100,000)	≥ 19	≥ 27(20) at -29 °C (-20 °F)	

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

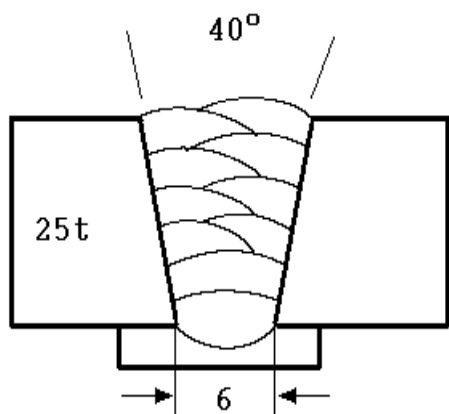
Consumable	C	Si	Mn	P	S	Ni	Mo	Ti	B	Nb
Supercored 81-K2MAG	0.03	0.35	1.25	0.012	0.010	1.55	0.003	0.045	0.004	0.017
AWS A5.29 E81T1-K2M	≤ 0.15	≤ 0.80	0.50-1.75	≤ 0.03	≤ 0.03	1.00-2.00	≤ 0.35	-	-	-

This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING CO., LTD. affect the results obtained in applying this type of information. These variables include, but are not limited to, welding procedure, shielding gas, plate chemistry and temperature, weldment design, fabrication methods and service requirements.



Typical Mechanical Properties of weld metal

❖ Welding Conditions



unit : mm

[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% CO₂

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

❖ Typical Mechanical Properties of weld metal

Consumable (size)	Direction	CVN Impact test J(ft·lbs)				
		Temp. °C (°F)	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)	110(81)	99(73)
	Root 2mm (0.08in)	-40(-40)	78(58)	82(60)	80(59)	80(59)
		-60(-76)	42(31)	55(41)	53(39)	50(37)

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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%CO₂

❖ AUTHORIZED APPROVAL DETAILS

Consumable	Welding position	Register of shipping & Size(mm)			
		ABS	LR	BV	DNV
Supercored 81-K2MAG	All V-down	5Y400SA H5 1.2 (0.045in)	5Y40S H5 1.2 (0.045in)	SA5Y40M HHH 1.2 (0.045in)	VY40MS(H5) 1.2 (0.045in)

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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 °C(113°F)
Barometric Pressure	: 780 mm-Hg

❖ Result(ml/100g Weld Metal)

X1	X2	X3	X4
3.5	3.6	3.4	3.5

Average Hydrogen Content **3.5 ml / 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