HYUNDAI WELDING

Rev. 07

Supercored 81-K2

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF LOW-TEMPERATURE
SERVICE STEEL

2022.02

HYUNDAI WELDING CO., LTD.

Supercored 81-K2

❖ Specification

AWS A5.29	E81T1-K2C H4
(AWS A5.29M	E551T1-K2C H4)
EN ISO 17632-A	T46 6 1.5Ni P C1 1 H5
JiS Z3313	T55 6 T1-1 C A-N3
KS D 7104	YFL-C506R

AWS D1.8

Wire Dia. mm(in)		
1.2(0.045)	1.4(0.052)	1.6(1/16)

* AWS D1.8 is available upon request

❖ Applications

Supercored 81-K2 is a titania type flux cored wire for welding of low-temperature service steel used LPG, LNG tanks.

❖ Characteristics on Usage

Supercored 81-K2 is titania type flux cored wire for all position welding with CO_2 shielding gas. This wire provide excellent notch toughness at low temperature

❖ Note on Usage

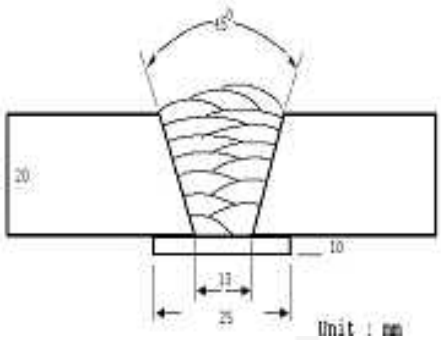
1. For preheating guidelines, please refer to your local standards and codes relative to your best practices.

2. Use 100% 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	:	100%CO_2
Flow Rate	:	20 ℓ /min
Amp./ Volt.	:	280A / 32V
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)	
Supercored 81-K2	YS MPa (lbs/in²)	TS MPa (lbs/in²)	EL(%)	-29℃ (-20°F	-62℃ (-80°F)
	540 (78,000)	620 (90,000)	28.0	110 (81)	60 (44)
AWS A5.29 E81T1-K2C H4	**≥ 470 (68,000)**	**550~690 (80,000~ 100,000)**	**≥ 19**	**≥27J at -29℃ (≥20ft · lbs at -20°F)**	

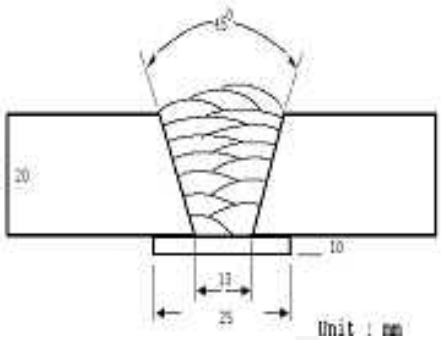
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
Supercored 81-K2	0.04	0.35	1.35	0.012	0.011	1.50
AWS A5.29 E81T1-K2C H4	**≤0.15**	**≤0.80**	**0.5~1.75**	**≤0.03**	**≤0.03**	**1.0~2.0**

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	:	100%CO_2
Flow Rate	:	20 ℓ /min
Amp./ Volt.	:	300A / 32V
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 (lbs/in²)	TS MPa (lbs/in²)	EL(%)	-29℃ (-20°F	-62℃ (-80°F)
Supercored 81-K2	545 (79,000)	625 (91,000)	27.5	100 (74)	58 (44)
AWS A5.29 E81T1-K2C H4	**≥ 470 (68,000)**	**550~690 (80,000~ 100,000)**	**≥ 19**	**≥27J at -29℃ (≥20ft · lbs at -20°F)**	

❖ Chemical Analysis of all weld metal(wt%)

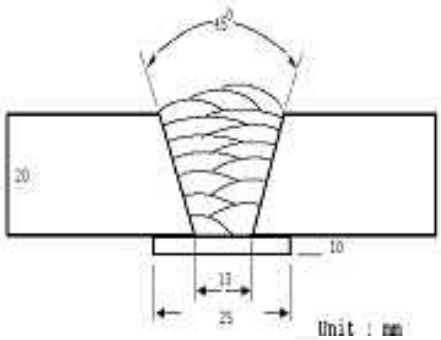
Consumable	C	Si	Mn	P	S	Ni
Supercored 81-K2	0.04	0.34	1.30	0.011	0.011	1.50
AWS A5.29 E81T1-K2C H4	**≤0.15**	**≤0.80**	**0.5~1.75**	**≤0.03**	**≤0.03**	**1.0~2.0**

Supercored 81-K2

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
Flow Rate	:	20 ℓ /min
Amp./ Volt.	:	320~330A / 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 (lbs/in²)	TS MPa (lbs/in²)	EL(%)	-29℃ (-20°F)	-62℃ (-80°F)
Supercored 81-K2	550 (80,000)	630 (91,000)	27.5	95 (70)	55 (41)
AWS A5.29 E81T1-K2C H4	**≥ 470 (68,000)**	**550~690 (80,000~ 100,000)**	**≥ 19**	**≥27J at -29℃ (≥20ft · lbs at -20°F)**	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
Supercored 81-K2	0.04	0.34	1.30	0.012	0.011	1.50
AWS A5.29 E81T1-K2C H4	**≤0.15**	**≤0.80**	**0.5~1.75**	**≤0.03**	**≤0.03**	**1.0~2.0**

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)			
Supercored 81-K2 1.2mm (0.045in)	200	26	10.2 (400)	84~86	2.4 (5.3)
	250	28	11.5 (450)	84~86	3.5 (7.7)
	300	33	15.3 (600)	85~87	4.5 (9.9)
Supercored 81-K2 1.4mm (0.052in)	250	28	7.6 (300)	84~86	2.4 (5.3)
	300	32	10.2 (400)	84~86	3.2 (7.0)
	330	36	12.8 (500)	85~87	4.4 (9.7)
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)	:	1.4 (0.052in)	**Amps(A) / Volts(V)**	:	300 / 32
Shielding Gas	:	100%CO_2	**Stick-Out**	:	20~25mm (0.79~0.98in)
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°F)
Barometric Pressure	:	780 mm-Hg

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
3.8	**3.9**	**3.7**	**3.8**

Average Hydrogen Content 3.8 ㎖ / *100g Weld Metal*

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)		
			1.2mm (0.045in)	1.4mm (0.052in)	1.6mm (1/16in)
Supercored 81-K2	100% CO_2	Flat	150~300 Amp	150~330Amp	150~360 Amp
		V-up Over head	150~230 Amp	150~240Amp	150~250Amp
		V-down	150~300 Amp	150~330Amp	150~350 Amp

❖ AUTHORIZED APPROVAL DETAILS

Welding position	Register of shipping & size(mm)				
	KR	ABS	LR	BV	DNV
All V-down	4Y40SG©H5 (-60℃) 1.2~1.6 (0.045~1/16in)	5Y400SA H5 1.2~1.6 (0.045~1/16in)	5Y40S H5 1.2~1.6 (0.045~1/16in)	SA5Y40HHH 1.2~1.6 (0.045~1/16in)	VY40MS H5 NV4-4L 1.2~1.6 (0.045~1/16in)

Welding position	Register of shipping & size(mm)	
	NK	CWB
All V-down	KSW54Y40G©H5(-60℃) 1.2~1.6 (0.045~1/16in)	A5.29/A5.29M:2010 E551T1-K2C- H4 (E81T1-K2C- H4) 1.2~1.6 (0.045~1/16in)

❖ F No & A No

F No	A No
6	10