HYUNDAI WELDING

Rev. 05

SC-460

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

2022.02

HYUNDAI WELDING CO., LTD.

SC-460

❖ Specification

AWS A5.29	E81T1-K2C
(AWS A5.29M	E551T1-K2C)
EN ISO 17632-A	T46 6 1.5Ni P C1 1 H5
JIS Z3313	T55 6 T1-1 C A-N3

❖ Applications

SC-460 is suitable for single or multipass welding for low temperature Service steel . Oil and gas construction, pipe and offshore stations.

❖ Characteristics on Usage

SC-460 is titania type of flux cored wire for all position welding. It provides excellent impact values at low temperature.

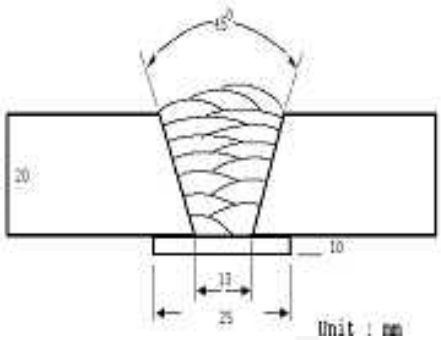
❖ Note on Usage

1. For preheating guidelines, please refer to your local standards and codes relative to your best practices.
2. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.
3. 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)	
	YS MPa (lbs/in²)	TS MPa (lbs/in²)	EL(%)	-29℃ (-20°F)	-60℃ (-76°F)
SC-460	580 (84,000)	630 (91,000)	26.0	125 (92)	60 (44)
AWS A5.29 E81T1-K2C	**≥ 470 (68,000)**	**550~690 (80,000~ 100,000)**	**≥ 19**	**≥27J at -29℃ (≥20ft · lbs at -20°F)**	

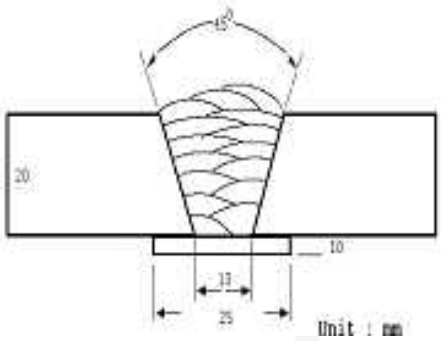
❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-460	0.06	0.35	1.20	0.008	0. 011	1.50
AWS A5.29 E81T1-K2C	**≤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)	-60℃ (-76°F)
SC-460	581 (84,000)	632 (92,000)	26.1	124 (92)	62 (46)
AWS A5.29 E81T1-K2C	**≥ 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
SC-460	0.06	0.35	1.21	0.008	0.011	1.51
AWS A5.29 E81T1-K2C	**≤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)			
SC-460 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	32	15.3 (600)	85~87	4.5 (9.9)
SC-460 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)	:	1.2 (0.045in)	**Amps(A) / Volts(V)**	:	280 / 31
Shielding Gas	:	100%CO_2	**Stick-Out(mm)**	:	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
4.7	**4.1**	**4.2**	**4.3**

Average Hydrogen Content 4.3 ㎖ / *100g Weld Metal*

Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)	
			1.2mm (0.045in)	1.4mm (0.052in)
SC-460	100%CO_2	F & HF	120~290 Amp	150~350Amp
		V-UP & OH	120~260 Amp	140~270Amp
		V-Down	200~300 Amp	220~350Amp

Approvals

❖ Shipping Approvals

Welding Position	Register of shipping & Size(mm)					
	KR	ABS	LR	BV	DNV	NK
All V-Down	5Y46SG(C1) H5 1.2~1.4 (0.045~0.052)	5YQ460SA H5 1.2~1.4 (0.045~0.052)	5Y46 H5 1.2~1.4 (0.045~0.052)	SA5Y46 HHH 1.2~1.4(0.045~0.052)	VY46MS (H5) 1.2~1.4(0.045~0.052)	KSW5Y46G© H5 KSW63Y47G ©H5(-20℃≧53J) 1.2~1.4

❖ F No & A No

F No	A No
6	10