HYUNDAI WELDING

Rev. 05

Supercored 120

FLUX CORED ARC WELDING CONSUMABLES
for WELDING of MILD & 800Mpa
CLASS HIGH TENSILE STEEL

2020.12

HYUNDAI WELDING CO., LTD.

Supercored 120

❖ Specification

AWS A5.29 *E121T1-GC H4*

(AWS A5.29M *E831T1-GC)*

❖ Applications

Single and multi pass welding of high strength low alloy steel, such as HT-80 class steels.

❖ Characteristics on Usage

Supercored 120 is a titania type flux cored wire for all position welding with 100% CO_2. shielding gas

❖ Note on Usage

1. Proper preheating(50~180℃)(122~356°F) and inter pass 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.

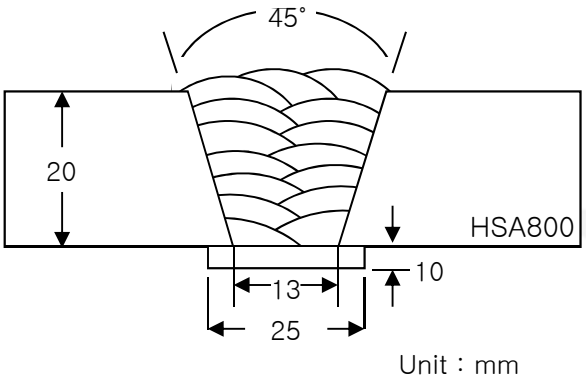
2. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.

3. Use 100% CO_2 gas.

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS A5.29



Unit : mm

[Joint Preparation & Layer Details]

Welding Position	**: 1G(PA)**
Diameter(mm)	**: 1.2mm(0.045 in)**
Shielding Gas	**: CO_2**
Flow Rate(ℓ /min.)	**: 20**
Amp./ Volt.	**: 280 / 30**
Stick-Out(mm)	**: 20~25mm (0.79~0.98in)**
Pre-Heating (℃)	**: 80℃(176℉)**
Interpass Temp.(℃)	**: 150±15℃ (302±59℉)**
Polarity	**: DC(+)**

❖ Mechanical Properties of the weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
Supercored 120	YS MPa (lbs/in²)	TS MPa (lbs/in²)	EL (%)	-18℃ (0℉)
	790 (115,000)	855 (124,000)	18.0	84 (62)
AWS A5.29 E121T1-GC	**≥ 745 (108,000)**	**830~970 (120,000~ 141,000)**	**≥ 14.0**	**No Specified**

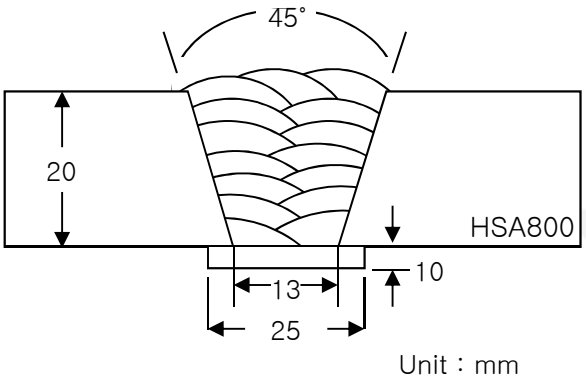
❖ Chemical Analysis of the weld metal(wt%)

	C	Si	Mn	P	S	Ni	Cr	Mo	V
Supercored 120	0.04	0.33	1.80	0.012	0.011	2.20	0.02	0.60	0.01
AWS A5.29 E121T1-GC	As agreed upon between supplier and purcahser								

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS A5.29



Unit : mm

[Joint Preparation & Layer Details]

Welding Position	**: 1G(PA)**
Diameter(mm)	**: 1.4mm (0.052in)**
Shielding Gas	**: CO_2**
Flow Rate(ℓ /min.)	**: 20**
Amp./ Volt.	**: 300 / 32**
Stick-Out(mm)	**: 20~25mm (0.79~0.98in)**
Pre-Heating (℃)	**: 80℃(176℉)**
Interpass Temp.(℃)	**: 150±15℃ (302±59℉)**
Polarity	**: DC(+)**

❖ Mechanical Properties of the weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
Supercored 120	YS MPa (lbs/in²)	TS MPa (lbs/in²)	EL (%)	-18℃ (0℉)
	800 (116,000)	860 (125,000)	18.0	81 (60)
AWS A5.29 E121T1-GC	**≥ 745 (108,000)**	**830~970 (120,000~ 141,000)**	**≥ 14.0**	**No Specified**

❖ Chemical Analysis of the weld metal(wt%)

	C	Si	Mn	P	S	Ni	Cr	Mo	V
Supercored 120	0.04	0.35	1.82	0.011	0.013	2.20	0.02	0.60	0.01
AWS A5.29 E121T1-GC	As agreed upon between supplier and purcahser								

Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	:	**1.4 (0.052in)**	**Amps(A) / Volts(V)**	:	**280 / 30**
Shielding Gas	:	**CO_2**	**Stick-Out(mm)**	:	**20~25mm (0.79~0.98in)**
Flow Rate(ℓ /min.)	:	**20**			
Welding Position	:	**1G (PA)**	**Welding Speed**	:	**30 cm/min (12 in/min)**
			Current Type & Polarity	:	**DC(+)**

❖ Hydrogen Analysis Using Gas Chromatograph Method

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

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
3.0	2.8	3.1	3.2

Average Hydrogen Content 3.0 ㎖ / *100g Weld Metal*

Welding Efficiency

❖ Deposition Rate & Efficiency

Consumables	Welding Conditions		Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)		
Supercored 120 1.2mm (0.045in)	180	23	86~88	2.2 (4.8)
	240	26	86~88	3.8 (8.4)
	280	30	87~89	4.7 (10.3)
Supercored 120 1.4mm (0.052in)	250	27	84~86	2.9 (6.4)
	300	31	84~86	3.8 (8.4)
	350	35	85~87	4.9 (10.8)
Remark			Deposition efficiency =(Deposited metal weight/ Used wire weight)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : CO_2

Proper Welding Condition

❖ Welding Conditions

Consumables	Shielding Gas	Welding Position	Amp.(A)	
			1.2mm(0.045in)	1.4mm(0.052in)
Supercored 120	CO_2	F & H-F	150~290	180~300
		V-up, OH	120~260	150~280
		V-down	180~290	180~300

Recommended Preheating & Inter pass Temp

Thickness of plate (mm)	Preheating Temp. ℃(℉)
< 10	> 20 (68
> 10 ~ 20 incl	> 65 (149)
> 20 ~ 40 incl	> 110 (230)
> 40	> 150 (302)

❖ The purpose of this guide is to avoid cold cracking (by AWS D 1.1/D1.1M:2010, ANNEX I)

❖ F No & A No

F No	A No
6	10