

Supercored 81

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF 550MPa CLASS
HIGH TENSILE STEEL



❖ Specification

AWS A5.29 E81T1-Ni1C

EN ISO 17632-A T 46 2 1Ni P C 1

❖ Applications

All position welding for construction machinery, bridge structures and storage tanks.

❖ Characteristics on Usage

Supercored 81 is an all position flux cored wire designed for 100% CO₂ shielding. You can get smooth arc, and low spatter, good weldability. The weld metal impact values at -30°C is excellent and has good bead appearance, slag covering is uniform and easy to remove.

❖ Note on Usage

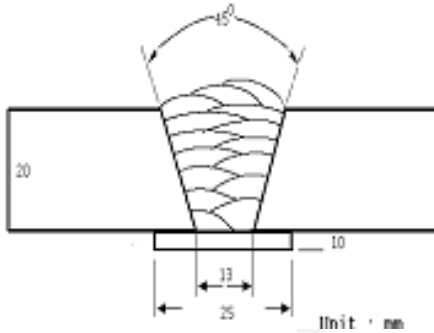
1. Proper preheating(50~150°C) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates.
2. One-side welding defects such as hot cracking may occur with wrong welding parameter such as high welding speed.
3. Use 100% CO₂ gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	: 1.2mm
Shielding Gas	: 100% CO ₂
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 260~280 / 29~31
Stick-Out(mm)	: 20~25
Pre-Heat(°C)	: R.T.
Interpass Temp.(°C)	: 150±15
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS(MPa)	TS(MPa)	EL(%)	-20°C	-30°C
Supercored 81	570	640	25	114	90
AWS A5.29 E81T1-Ni1C	≥ 470	550~690	≥ 19	≥ 27J at -30°C	

❖ Chemical Analysis of all weld metal(wt%)

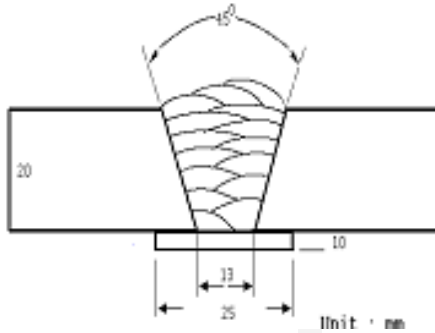
Consumable	C	Si	Mn	P	S	Ni
Supercored 81	0.03	0.35	1.25	0.011	0.012	0.95
AWS A5.29 E81T1-Ni1C	≤ 0.12	≤ 0.8	≤ 1.5	≤ 0.03	≤ 0.03	0.8~1.1



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	: 1.4mm
Shielding Gas	: 100% CO ₂
Flow Rate(l /min.)	: 20
Amp./ Volt.	: 290~310/ 29~32
Stick-Out(mm)	: 20~25
Pre-Heat(°C)	: R.T .
Interpass Temp.(°C)	: 150±15
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS(MPa)	TS(Mpa)	EL(%)	-20°C	-30°C
Supercored 81	571	642	25.1	111	92
AWS A5.29 E81T1-Ni1C	≥ 470	550~690	≥ 19	≥ 27J at -30°C	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
Supercored 81	0.03	0.35	1.26	0.011	0.012	0.95
AWS A5.29 E81T1-Ni1C	≤ 0.12	≤ 0.8	≤ 1.5	≤ 0.03	≤ 0.03	0.8~1.1

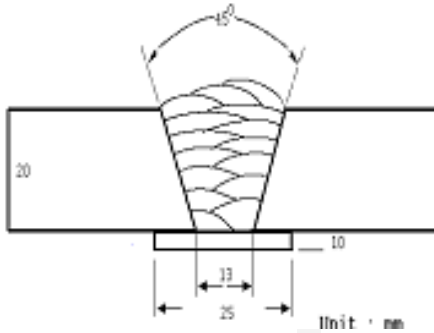
This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING 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.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	: 1.6mm
Shielding Gas	: 100% CO ₂
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 310~330 / 31~33
Stick-Out(mm)	: 20~25
Pre-Heat(°C)	: R.T .
Interpass Temp.(°C)	: 150±15
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test (Joule)	
	YS(MPa)	TS(MPa)	EL(%)	-20°C	-30°C
Supercored 81	573	640	25.2	113	91
AWS A5.29 E81T1-Ni1C	≥ 470	550~690	≥ 19	≥ 27J at -30°C	

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
Supercored 81	0.03	0.35	1.26	0.0114	0.012	0.96
AWS A5.29 E81T1-Ni1C	≤ 0.12	≤ 0.8	≤ 1.5	≤ 0.03	≤ 0.03	0.8~1.1



Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable (size)	Welding Conditions		Deposition Efficiency(%)	Deposition Rate(kg/hr)
	Amp.(A)	Volt.(V)		
Supercored 81 1.2mm	200	26	84~86	3.2
	250	30	84~86	4.5
	300	33	85~87	5.3
Supercored 81 1.4mm	250	27	84~86	3.2
	300	31	84~86	4.4
	350	35	85~87	5.2
Supercored 81 1.6mm	280	31	85~87	3.9
	330	33	85~87	4.6
	350	34	86~88	5.2
	400	38	86~88	5.6
Remark			Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 100%CO₂



Diffusible Hydrogen Content

❖ Welding Conditions

Diameter(mm)	: 1.4	Amps(A) / Volts(V)	: 300 / 32
Shielding Gas	: 100% CO ₂	Stick-Out(mm)	: 20
Flow Rate(ℓ /min.)	: 20	Welding Speed	: 45 cpm
Welding Position	: 1G	Current Type & Polarity	: DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	: 72 hrs	Analysis Temp.	: 25 °C
Evolution Temp.	: 25 °C	Exposure Condition	: 80%RH-25°C
Barometric Pressure	: 780 mm-Hg		

❖ Result(ml/100g Weld Metal)

X1	X2	X3	X4
5.31	5.66	6.10	5.88

Average Hydrogen Content 5.73 ml / 100g Weld Metal



Proper Welding Condition

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia. (mm)		
			1.2mm	1.4mm	1.6mm
Supercored 81	100%CO ₂	F & HF	250~300Amp	260~320Amp	290~350Amp
		V-Up & OH	180~230Amp	200~260Amp	220~280mp
		V-Down	250~310Amp	260~320Amp	280~340Amp