

S-7018.1

COVERED ARC WELDING ELECTRODE
FOR HIGHLY EFFICIENT WELDING
OF 490MPa CLASS HIGH TENSILE STEEL

2021.05

HYUNDAI WELDING CO., LTD.



❖ Specification

AWS A5.1	E7018-1
JIS Z 3211	E4918
EN ISO 2560-A	E42 4 B 3 2

❖ Applications

Structures using 490MPa class high tensile steel, such as bridges, building, rolling stock and low temperature used for structures.

❖ Characteristics on Usage

S-7018.1 is an iron powder low hydrogen type electrode of high efficiency used for welding 490MPa class high tensile steel. Its usability is good with direct current applications as well as alternating current applications and easy to weld in all position.

❖ Note on Usage

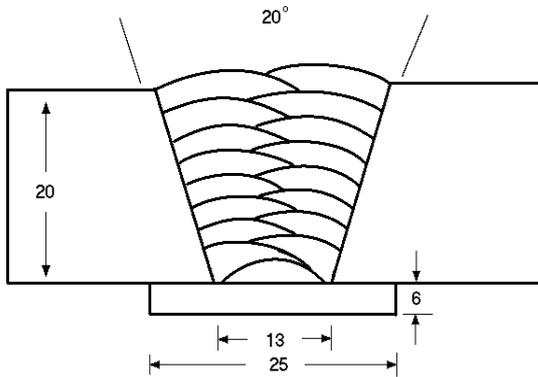
1. Dry the electrodes at 350~400°C (662~752°F) for 30~60 minutes before use.
2. Keep the arc as short as possible, and avoid large width weaving.
3. Adopt back step method or strike the arc on a small steel plate prepared for this particular purpose to prevent blowholes at the arc starting.
4. Use the wind screen against strong wind.



Mechanical Properties & Chemical Compositions of All Weld Metal

❖ **Welding Conditions**

Method by AWS Spec.



- Diameter. : 4.0 X 400mm(5/32 X 16in)
- Amp./ Volt. : 160 / 23~24
- Interpass Temp. : 80 ~ 130°C (176~266°F)
- Polarity : DC+

[Joint Preparation & Layer Details]

❖ **Mechanical Property of All Weld Metal**

Consumable	Tensile Test Results			CVN Impact Test J (ft·lbs)
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-45°C(-49°F)
S-7018.1	480(69,700)	550(79,800)	30.2	94(70)
AWS Spec.	≥ 400(58,000)	≥ 490(71,000)	≥ 22	≥ 27(20)

❖ **Chemical Composition of All Weld Metal(wt%)**

Consumable	Chemical Composition				
	C	Si	Mn	P	S
S-7018.1	0.08	0.25	1.10	0.017	0.012
AWS Spec.	≤0.15	≤0.75	≤1.60	≤0.035	≤0.035

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.



Weldability & Welding Efficiency

❖ Weldability

Item	Division	Flat position	Vertical position
Arc stability		Good	Good
Melting rate		Excellent	Excellent
Deposition rate		Excellent	Excellent
Resistance of spatter occurrence		Excellent	Excellent
Bead appearance		Excellent	Excellent
Slag detachability		Good	Good

❖ Test Conditions of Deposition Efficiency

Consumable	Base Metal		Welding conditions		
	Specification	Dimension (mm)	Amp. (A)	Welding speed (mm/min)	Position
S-7018.1 (4.0 x 400 mm) (5/32 x 16 in)	ASTM A36	300 X 100 X12 (12 X 3.9 X 0.5)	170 (DC+)	200	1G-PA

❖ Results of Deposition Efficiency Test

Consumable	Deposition efficiency(%)	
	For electrode	For core wire
S-7018.1H 4.0 x 400 mm (5/32 x 16 in)	65 ~ 70	120 ~ 125

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Diffusible Hydrogen Content

❖ Welding Conditions

consumable	: S-7018.1	Welding Position	: 1G
Diameter	: 4.0 x 400mm(5/32 x 16in)	Amp.(A) / Volts(V)	: 160~170Amp.
Re-drying conditions	: 350℃ X 1hr (662°F X 1hr)	Current Type & Polarity	: AC/DC+

❖ Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	: 72 hrs	Analysis Temp.	: 25 °C(77°F)
Evolution Temp.	: 25 °C(77°F)	Exposure Condition	: 80%RH-30°C(86°F)
Barometric Pressure	: 780 mm-Hg		

❖ Result (ml/100g Weld Metal)

X1	X2	X3	X4
7.5	8.5	8.1	7.4

Average Hydrogen Content 7.9 ml/100g Weld Metal



Size Available and recommended Current & Approval

❖ Sizes Available and Recommended Current

Diameter, mm(in)		2.6 (3/32)	3.2 (1/8)	4.0 (5/32)	5.0 (3/16)	6.0 (15/64)
Length, mm(in)		350(14)	350(14)	400(16)	400(16)	450(18)
Recommended current range (AC or DC+ Amp.)	Flat (1G-PA)	60 ~90	90 ~140	130 ~190	180 ~240	250 ~300
	3G (PF) & 4G,5G (PE)	50 ~80	80 ~120	120 ~170	150 ~200	-

❖ Authorized Approval Details

Classification	Dia. mm(in)	Welding position	Grade				
			ABS	LR	BV	DNV	GL
E7018-1	2.6(3/32) ~ 5.0(3/16)	All	3H10, 3Y	3, 3YH15	3YHH	3YH10	3YH10

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