

S-9016.G

COVERED ARC WELDING ELECTRODE
FOR 600MPa CLASS HIGH TENSILE STEEL

2020.12

HYUNDAI WELDING CO., LTD.



❖ Specification

<i>AWS A5.5</i>	E9016-G
<i>JIS Z 3211</i>	E5716
<i>EN ISO 2560-A</i>	E50 2 B 1 2

❖ Applications

Structures using 600MPa class high tensile steel, such as bridges, building, rolling stock and machines.

❖ Characteristics on Usage

S-9016.G is a low hydrogen type electrode for welding 600MPa class High tensile steel.

X-ray performance and mechanical properties of all weld metal are good. Its usability is good with direct current applications as well as alternating current applications and easy to weld in all position.

❖ Note on Usage

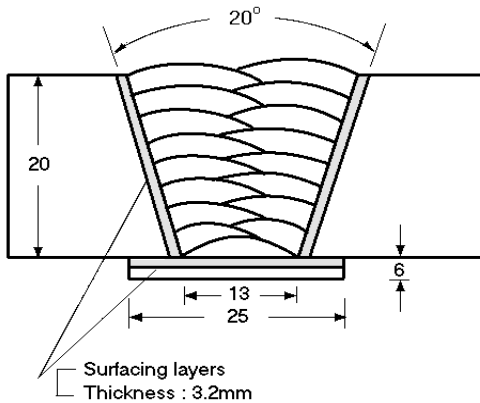
1. Dry the electrodes at 350°C ~ 400°C (662~752°F) for 60 minutes before use
2. Adopt back step method or strike the arc on a small steel plate prepared for this particular purpose because are striking on the base metal is danger of initiating cracking.
3. Preheat at 60~80°C (140~176°F) before use. The temperature to be applied varies in accordance with plate thickness and kind of steel.
4. If each pass welds becomes thicker than acceptable level by high amperage or low speed ratio application, the impact values and yield points will decrease.
5. Keep the arc as short as possible.



Mechanical Properties & Chemical Compositions of all-Weld Metal

❖ Welding Conditions

Method by AWS Rules



Diameter,	: 4.0 X 400mm(5/32 X 16in)
Amp./ Volt.	: 170 / 23~24
Pre-Heat,	: 95~110℃ (203~230°F)
Interpass Temp.	: 95~110℃ (203~230°F)
Polarity	: AC

[Joint Preparation & Layer Details]

❖ Mechanical Property of All Weld Metal

Consumable	Tensile test			CVN Impact Value J (ft·lbs)	
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-0℃ (-32°F)	-20℃ (-4°F)
S-9016.G	570(82,800)	655(95,100)	27.6	125(93)	78(58)
AWS Spec.	≥ 530(77,000)	≥ 620(90,000)	≥ 17	N.S	

❖ Chemical Composition of All Weld Metal(wt%)

Consumable	Chemical Composition (%)						
	C	Si	Mn	P	S	Ni	Mo
S-9016.G	0.06	0.52	1.09	0.016	0.010	0.56	0.23
AWS Spec.	N.S	≥0.80	≥1.00	≤0.03	≤0.03	≥0.50	≥0.20

In order to meet the alloy requirements of the "G" group, the undiluted weld metal shall have the minimum of at least one of the elements listed in this table.

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 Test****❖ Weldability**

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

❖ Test Conditions of Deposition Efficiency

Consumable	Base Metal		Welding conditions		
	Specification	Dimension, mm(in)	Amp. (A)	Welding speed (mm/min)	Position
S-9016.G (4.0 x 400 mm) (5/32 x 16 in)	ASTM A36	300 X 100 X12 (12 X 3.9 X 0.5)	180	200	Flat

❖ Results of Deposition Efficiency Test

Consumable	Deposition efficiency(%)	
	For electrode	For core wire
S-9016.G (4.0 x 400 mm) (5/32 x 16 in)	63 ~ 66	96 ~ 100

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Diffusible Hydrogen Content & Proper Welding conditions & Approval

❖ **Diffusible Hydrogen Contents of Weld Metal**

Consumable	Welding current	Diffusible hydrogen contents (ml/gr. Weld metal)					Test method
		X ₁	X ₂	X ₃	X ₄	Avg.	
S-9016.G (4.0 x 400 mm) (5/32 x 16 in)	AC 170 Amp.	4.7	5.2	5.9	6.0	5.5	Gas Chromatograph

Average Hydrogen Content 5.5 ml/100g Weld Metal

❖ **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)	55 ~90	90 ~130	130 ~180	180 ~240	250 ~310
	3G (PF) & 4G,5G (PE)	50 ~80	85 ~120	110 ~170	150 ~200	-

❖ **Authorized Approval Details**

Classification	Dia. mm(in)	Welding position	Grade					
			KR	ABS	LR	BV	DNV GL	NK
AWS A5.5								
E9016-G	2.6(3/32) ~5.0(3/16)	All		○				
	6.0(15/64)	Flat						

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