

# **S-10016.G**

COVERED ARC WELDING ELECTRODE  
FOR 700MPa CLASS HIGH TENSILE STEEL

2020.12

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**HYUNDAI WELDING CO., LTD.**



## ❖ Specification

AWS A5.5	E10016-G
JIS Z 3211	E6916-N4CM1 U
ISO 18275-A	E55 0 Z 1.5NiMo B 1 2

## ❖ Applications

S-10016.G electrodes are recommended for applications requiring stress relieved weldments that meet MIL-10016 high strength tensile and relatively low (2.8kg-m at -18°C) charpy V-notch impact requirements. In fact impact tests are not required to meet MIL quality conformance inspection unless they are specifically requested by the customer. S-10016.G electrodes can be used to join armor plate and high strength steel such as WES HW63, ASTM A514 and Hy-80 where high X-ray quality welds are required.

## ❖ Characteristics on Usage

S-10016.G is heavy coated low alloy, low hydrogen type electrode for all position welding. Its usability and X-ray performance are very good. Extremely good crack resistibility is obtained owing to very low hydrogen content of the weld metal.

## ❖ Note on Usage

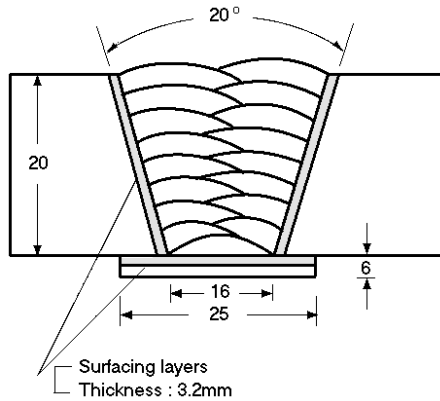
1. Dry the electrodes at 350°C ~ 400°C (662~752°F) for about one hour before use and store the electrodes at 100~150°C (212~302°F) after drying them with attention to keep away from moisture.
2. Adopt back step method or strike the arc on a small steel plate prepared for this particular purpose, because arc striking on base metal is in danger of initiation cracking.
3. Keep the arc as short as possible and avoid large with weaving.
4. Preheat at 100 ~ 120°C (212~248°F) The temperature to be applied varies in accordance with plate thickness and kind of steel to be welded.



**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 / 23~25  
 Interpass Temp. : 160~190°C (320~374°F)  
 Polarity : AC or DC+

**[ Joint Preparation & Layer Details ]**

❖ **Mechanical Properties of The Weld Metal**

Consumable	Tensile test			CVN Impact Value J (ft·lbs)
	YS MPa (lbs/in <sup>2</sup> )	TS MPa (lbs/in <sup>2</sup> )	EL (%)	-0°C (322°F)
S-10016.G	710(103,000)	762(111,000)	24.0	110(81)
AWS Spec.	≥ 600(87,000)	≥ 690(100,000)	≥ 16	NS

❖ **Chemical Analysis of The Weld Metal(wt%)**

Consumable	Chemical Composition (%)								
	C	Si	Mn	P	S	Ni	Cr	Mo	V
S-10016.G	0.07	0.69	1.41	0.013	0.012	1.49	0.007	0.12	0.11
AWS Spec.	NS	≥0.80	≥1.00	≤0.03	≤0.03	≥0.50	≥0.30	≥0.20	≥0.10

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.

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**Weldability  
& Welding Efficiency Test****❖ Weldability**

Item	Division	Flat position	Vertical position
	Arc stability		Excellent
Melting rate		Good	Excellent
Deposition rate		Good	Excellent
Resistance of spatter occurrence		Good	Good
Bead appearance		Excellent	Good
Slag detachability		Excellent	Excellent
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-10016.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-10016.G (4.0 x 400 mm) (5/32 x 16 in)	63 ~ 66	97 ~ 100

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**Diffusible Hydrogen Content****❖ Diffusible Hydrogen Contents of Weld Metal**

Consumable	Welding current	Diffusible hydrogen contents (ml/gr. Weld metal)					Test method
		X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	Avg.	
S-10016.G (4.0 x 400 mm) (5/32 x 16 in)	AC 170 Amp.	7.2	6.7	6.8	7.3	7.0	Gas Chromatograph

**Average Hydrogen Content 7.0 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 position	60 ~90	90 ~130	130 ~180	180 ~240	250 ~310
	Vertical & Overhead position	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								
E10016-G	2.6(3/32) ~5.0(3/16)	All		○				
	6.0(15/64)	Flat						

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