HYUNDAI WELDING

Rev. 00

S-11016.G

COVERED ARC WELDING ELECTRODE
FOR 780MPa CLASS HIGH TENSILE STEEL

2011. 02

HYUNDAI WELDING CO., LTD.

S-11016.G

❖ Specification

AWS A5.5	E11016-G
EN 757	E62 2 Mn2NiMo B 1 2

❖ Applications

S-11016.G can be used for welding of high tensile steel, such as pressure vessels, penstock and bridges.

❖ Characteristics on Usage

S-11016.G is a low hydrogen type electrode for welding 780MPa class high tensile steel.

The weld metal has a good crack resistibility.

X-ray performance and usability are good.

❖ Note on Usage

1.Dry the electrodes at 350℃～400℃ 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 150~200℃ before use, The temperature to be applied varies in accordance with plate thickness and kind of steel.

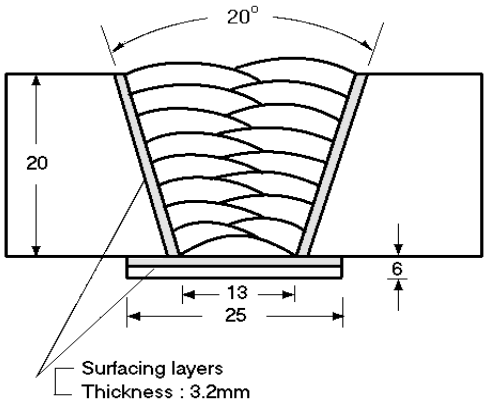
4. If each pass welds becomes thicker than acceptable level by high amperage or low speed ratio application, the impact values and yield points will decrease.

5. Keep the arc as short as possible.

Mechanical Properties & Chemical Compositions of all-Weld Metal

❖ Welding Conditions

Method by AWS Rules



[Joint Preparation & Layer Details]

Diameter(mm)	:	4.0 x 400
Amp./ Volt.	:	170 / 23~24
Pre-Heat(℃)	:	95 ~110
Interpass Temp.(℃)	:	95 ~110
Polarity	:	AC

❖ Mechanical Property of All Weld Metal

Consumable	Tensile test			CVN Impact Test (Joule)
	YS (MPa)	TS (MPa)	EL (%)	-20℃
S-11016.G	760	790	24.0	130
AWS Spec.	≥ 670	≥ 760	≥ 15	NS

❖ Chemical Composition of All Weld Metal(wt%)

Consumable	Chemical Composition							
	C	**Si**	**Mn**	**P**	**S**	**Ni**	**Cr**	**Mo**
S-11016.G	0.07	0.45	1.56	0.017	0.013	2.25	0.20	0.40
AWS Spec.	NS	≥0.80	≥1.00	≤0.03	≤0.03	≥0.50	≥0.30	≥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.

Weldability & Welding Efficiency Test

❖ Weldability

Item \ Division	Flat position	Vertical position
Arc stability	Excellent	Good
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)	Amp. (A)	Welding speed (mm/min)	Position
S-11016.G (4.0mm x 400)	ASTM A36	300 X 100 X12	180	200	Flat

❖ Results of Deposition Efficiency Test

Consumable	Deposition efficiency(%)	
	For electrode	For core wire
S-11016.G (4.0 mm x 400)	63 ~ 66	97 ~ 100

Diffusible Hydrogen Content

❖ Welding Conditions

consumable	:	**S-11016.G**	**Amp.(A) / Volts(V)**	:	170 / 23~24
Diameter(mm)	:	4.0 x 400	**Stick-Out(mm)**	:	20~25
Flow Rate(ℓ /min.)	:	-	**Welding Speed**	:	60 CPM
Welding Position	:	1G	**Current Type & Polarity**	:	AC

❖ Hydrogen Analysis Using Gas Chromatography Method

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

❖ Result (㎖/100g Weld Metal)

X1	X2	X3	X4
6.8	6.5	6.3	6.4

Average Hydrogen Content 6.5 ***㎖/100g Weld Metal***

Size Available and recommended Current & Approval

❖Sizes Available and Reconnended Current

Diameter (mm)		2.6	3.2	4.0	5.0	6.0
Length (mm)		350	350	400	400	450
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)	Welding position	Grade						
AWS A5.5			KR	ABS	LR	BV	DNV	GL	NK
E11016-G	2.6 ~5.0	All		○					
	6.0	Flat							