HYUNDAI WELDING

Rev. 02

S-10018.D2

COVERED ARC WELDING ELECTRODE
FOR CHROMIUM-MOLYBDENUM AND LOW ALLOY STEELS

HYUNDAI WELDING CO., LTD.

S-10018.D2

❖ Specification

AWS A5.5 E10018-D2 H4R

❖ Applications

S-10018.D2 can be used for welding of carbon-Manganese and Chromium-Molybdenum steels such as process piping (AISI 4130, 4140)

❖ Characteristics on Usage

S-10018.D2 is a low hydrogen type electrode for welding 690MPa class Low alloy 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℃(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.

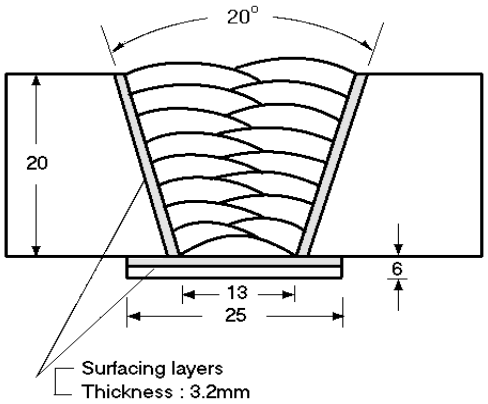
3. If each pass welds becomes thicker than acceptable level by high amperage or low speed ratio application, the impact values and yield points will decrease.

4. 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(in) : 4.0 X 400(5/32 X 16)

Amp./ Volt. : 170 / 23~25

Interpass Temp.℃(°F) : 95~110(203~230)

Polarity : DC+

❖ Mechanical Property of All Weld Metal

Consumable	Tensile test			CVN Impact Value J (ft·lbs)	PWHT
	YS MPa (ksi)	TS MPa (ksi)	EL (%)	-50℃ (-58°F)	
S-10018.D2	625(91)	705(102)	26.0	45(33)	620℃x1Hr (1148°Fx1Hr)
AWS Spec.	≥ 600(87)	≥ 690(100)	≥ 16	≥27(20)	

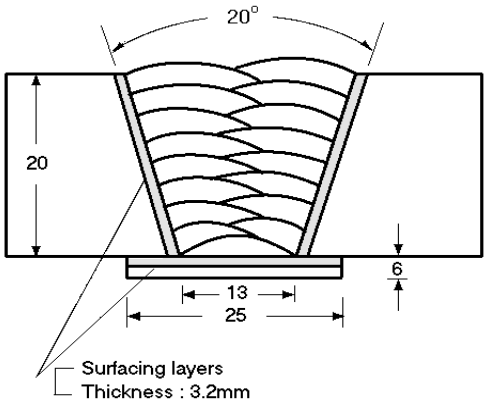
❖ Chemical Composition of All Weld Metal(wt%)

Consumable	Chemical Composition						
	C	Si	Mn	P	S	Ni	Mo
S-10018.D2	0.08	0.35	1.75	0.015	0.005	0.78	0.29
AWS Spec.	≤0.15	≤0.80	1.65 -2.00	≤0.03	≤0.03	≤0.90	0.25 -0.45

Mechanical Properties & Chemical Compositions of all-Weld Metal

❖ Welding Conditions

Method by AWS Rules



[Joint Preparation & Layer Details]

Diameter, mm(in) : 5.0 X 400(3/16 X 16)

Amp./ Volt. : 220 / 25~26

Interpass Temp.℃(°F) : 95~110(203~230)

Polarity : DC+

❖ Mechanical Property of All Weld Metal

Consumable	Tensile test			CVN Impact Value J (ft·lbs)	PWHT
	YS MPa (ksi)	TS MPa (ksi)	EL (%)	-50℃ (-58°F)	
S-10018.D2	630(91)	710(103)	26.5	45(33)	620℃x1Hr (1148°Fx1Hr)
AWS Spec.	≥ 600(87)	≥ 690(100)	≥ 16	≥27(20)	

❖ Chemical Composition of All Weld Metal(wt%)

Consumable	Chemical Composition						
	C	Si	Mn	P	S	Ni	Mo
S-10018.D2	0.08	0.40	1.70	0.015	0.007	0.80	0.28
AWS Spec.	≤0.15	≤0.80	1.65 -2.00	≤0.03	≤0.03	≤0.90	0.25 -0.45

Diffusible Hydrogen Content

❖ Welding Conditions

consumable	:	S-10018.D2	Welding Position	:	1G
Diameter mm(in)	:	4.0(5/32), 5.0(3/16)	Amp.(A) / Volts(V)	:	170~210Amp.
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 ℃(77°F)
Evolution Temp.	:	25 ℃(77°F)	Exposure Condition	:	80%RH-30℃(86°F)
Barometric Pressure	:	780 mm-Hg			

❖ Result (㎖/100g Weld Metal)

Size mm(in)	X1	X2	X3	X4	Avg
4.0 (5/32)	3.69	3.00	3.14	3.60	**3.36**
5.0 (3/16)	3.45	3.15	2.90	3.00	**3.16**

Absorbed Moisture contents

❖ Test Conditions

Measurement method : AWS A4.4

Diameter mm(in) : 4.0(5/32), 5.0(3/16)

Exposed environment : 80%RH-30℃(86°F)

Exposed Time : 3~9 hours **(* AWS requirement is period of not less then 9 hours)**

Analysis method : Infrared Detector

Limit of moisture content : As-Received or Reconditioned (≤0.15%) / As-Exposed (≤0.4%)

❖ Test result

Size mm(in)	Absorbed moisture contents (wt%)			
	As-received	3hr	6hr	9hr
4.0 (5/32)	0.05	0.10	0.12	0.18
5.0 (3/16)	0.04	0.08	0.16	0.20

Weldability & Welding Efficiency Test

❖ Weldability

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

Size Available and recommended Current & Approval

❖Sizes Available and Reconnended Current

Diameter, mm(in)		3.2 (1/8)	4.0 (5/32)	5.0 (3/16)
Length, mm(in)		350(14)	400(16)	400(16)
Recommended current range (AC or DC+ Amp.)	Flat position	90 ~130	130 ~180	180 ~240
	Vertical & Overhead position	85 ~120	110 ~170	

❖ Authorized Approval Details

Classification	Dia. mm(in)	Welding position	Grade		
AWS			ABS		
E10018-D2	3.2(1/8) ~ 5.0(3/16)	All	E10018-D2H4R		

Notice

This test report is made for giving general information, and it's not meaning guarantee.
Test results are changeable by several welding
- parameter including base materials