HYUNDAI WELDING

Rev. 00

S-707 X L-8

SUBMERGED ARC WELDING CONSUMABLES
FOR WELDING OF Mild & 490MPa CLASS
HIGH TENSILE STEEL

HYUNDAI WELDING CO., LTD.

S-707 X L-8

❖ Specification

WIRE	AWS A5.17/A5.17	EN 760
L-8	F7A4-EL8	S A AB 1

❖ Applications

Single and multi-layer welding of shipbuilding.

❖ Characteristics on Usage

As the penetration is deep, it is suitable for welding of thick plate in both side single-layer welding.

Impact Value (or mechanical properties) of weld metal and crack resistibility are excellent.

Also applicable to one-side welding. As the consumption of flux is low, it is economical.

❖ Note on Usage

1. Dry the flux at 300~350℃ for 60 minutes before use.

2. Pay attention to welding voltage. Excessive welding voltage causes deterioration of joint properties.

3. Add new flux periodically to prevent the weld defects and bad bead appearance which occurs when continuously reusing the flux.

4. Weld pass should be limited to 3 or 4 passes. (please inquire of the manufactures when welding more than 5 passes)

Welding Consumables for Test

❖ Flux

Consumable	Chemical Composition, wt%			
	SiO2+TiO2	CaO+MgO	Al2O3+MnO	CaF2
S-707	15	30	40	15

Consumable	Particle Size (Mesh)	Type of Flux	B.I	$H2O_{1000℃}$/ CO2(%)
S-707	12 × 60	Agglomerated	1.6	0.03 / 0.63

❖ Electrode

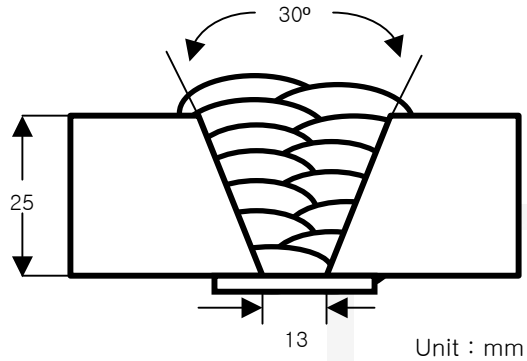
Consumable	Dia. (mm)	Chemical Composition, wt%				
		C	Si	Mn	P	S
L-8	4.0	0.05	0.02	0.52	0.017	0.012
AWS A5.17 EL8		≤0.10	≤0.07	0.25-0.60	≤0.030	≤0.030

S-707 X L-8

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Base metal	: SS 400
Particle size	: 12 X 60 (ASME)
Flux type	: Agglomerated
Amp./ Volt./cpm	: 550 / 30 / 40
Stick-Out(mm)	: 30
Pre-Heat(℃)	: R.T .
Interpass Temp.(℃)	: <150
Polarity	: AC

❖ Mechanical Properties of All weld metal

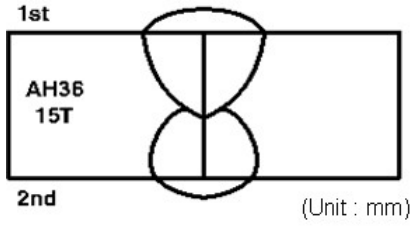
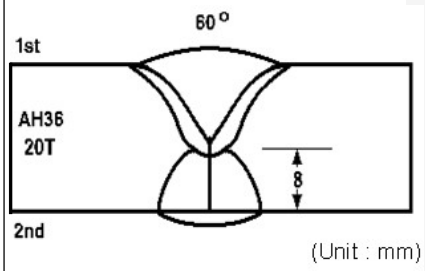
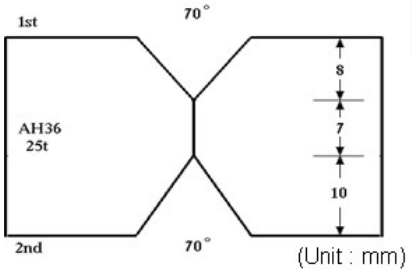
Consumables	PWHT Condition	Tensile Test			CVN Impact Test (Joule)
		YS(MPa)	TS(MPa)	El(%)	-40℃
S-707/L-8	**As welded**	490	560	31	54
AWS A5.17	**-**	**≥400**	**490~660**	**≥ 22**	**≥27J at -40℃**

❖ Chemical Analysis of All weld metal(wt%)

Consumables	C	Si	Mn	P	S
S-707/L-8	0.07	0.40	1.40	0.028	0.015

Two-run Butt welding test

❖ Welding Conditions

Joint preparation and layer details (B.M. AH36)	Wire dia. (mm)	Welding conditions						
		Side	Polarity	Amp. (A)	Volt (V)	Speed (CPM)	Heat input (kJ/cm)	Inter pass temp. (℃)
	4.8	1st	AC	850	34	48	36.1	≤250
		2nd		950	35	48	41.6	
	4.0	1st	AC	850	35	25	71.4	
		2nd		880	36	45	42.2	
	4.8	1st	AC	950	36	40	51.3	
		2nd		1050	36	35	64.8	

Two-run Butt welding test

❖ Mechanical Properties of All weld metal

Consumables	Test Plate (mm)	Tensile Test		Bending test		CVN Impact Test (Joule)
		TS(MPa)	El(%)	Face	Root	-20℃
S-707 X L-8	AH36 (15)	554	Rupture Of B.M.	Good	Good	47
	AH36 (20)	545	Rupture Of B.M.	Good	Good	43
	AH36 (25)	566	Rupture Of B.M.	Good	Good	48

Diffusible Hydrogen Content

❖ Welding Conditions

Wire	:	**L-8**	**Amp.(A) / Volts(V)**	:	625/30
Diameter(mm)	:	4.0	**Stick-Out(mm)**	:	30
Flow Rate(ℓ /min.)	:	–	**Welding Speed**	:	60 CPM
Welding Position	:	1G	**Current Type & Polarity**	:	DC(+)

❖ Result (㎖/100g Weld Metal)

X1	X2	X3	X4
9.44	**9.33**	**9.57**	**8.24**

Average Hydrogen Content *9.15 ㎖* ***/ 100g Weld Metal***

Approvals

❖ Authorized Approval Details

Consumables	KR	ABS	LR	BV	DNV	GL	NK	RINA	MRS
S-707 X L-8	3TM 3YTM 1.6~6.4	3TM 3YTM 1.6~6.4	3TM 3YTM 1.6~6.4	A3TM A3YTM 2.4~6.4	IIIYTM 2.4~6.4	3YTM 2.4~6.4	KAW2M KAW52M 2.4~6.4	3YM 3YT 1.2~6.4	3YTM 1.2~6.4
S-707 X L-8 (2Pole)	-	-	3TM 3YTM 1.6~6.4	-	-	-	-	3YM 3YT 1.2~6.4	-