HYUNDAI WELDING

Rev. 00

S-777MXH X A-3

SUBMERGED ARC WELDING CONSUMABLES
FOR WELDING OF Mild & 550MPa CLASS
HIGH TENSILE STEEL

HYUNDAI WELDING CO., LTD.

S-777MXH X A-3

❖ Specification

AWS A5.23	F8A4-EA3-G
JIS Z3183	S584-H
EN 760	S A AB 1
EN 756	S4Mo

❖ Applications

Butt and flat welding of miniature LPG tanks, ships ,vehicles, agricultural implements, machinery, boilers, bridges, structural steels.

❖ Characteristics on Usage

Especially insensitive to oil, rust, scale, dirt and primers on the surface to be welded. Slag detachability in narrow groove and resistance to porosity are excellent. As the consumption of flux is low, it is very economical. Applicable to horizontal and flat fillet welding.

❖ Note on Usage

1. Dry the flux at 300~350℃(572~662°F) for 60minutes before use.
2. When the flux height is excessive, poor bead appearance may occur.
3. Remove rust, scales, oil, paint, water, dirt and slag of tack welds from the groove to obtain sound weld metal.
4. Use welding current and speed as low as possible at the first layer of groove to avoid cracking.

Welding Consumables for Test

❖ Flux

Consumable	Chemical Composition, wt%		
	$Al_2O_3+Fe_2O_3$	MgO+MnO	SiO_2+CaF_2
S-777MXH	35	35	30

Consumable	Particle Size (Mesh)	Type of Flux	B.I	H2O(1000℃)/ CO2(%)
S-777MXH	12 × 60	Agglomerated	0.9	0.01/0.10

❖ Electrode

Consumable	Dia. (mm)	Chemical Composition, wt%					
		C	Si	Mn	P	S	Mo
A-3	4.0	0.08	0.04	1.85	0.019	0.007	0.50
AWS A5.23 EA3		0.05-0.17	≤0.20	1.65-2.20	≤0.025	≤0.025	0.45-0.65

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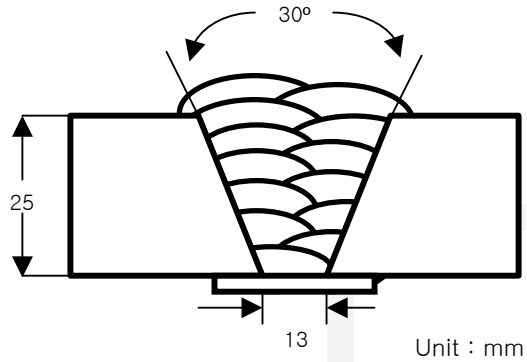
Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Base metal	:	SM 570
Particle size	:	12 X 60
Flux type	:	Agglomerated
Amp./ Volt./CPM	:	550 / 30 / 40
Stick-Out(mm)	:	30
Pre-Heat(℃)	:	R.T .
Interpass Temp.(℃)	:	<150
Polarity	:	DC+

❖ Mechanical Properties of All weld metal

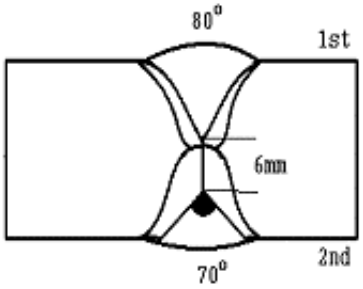
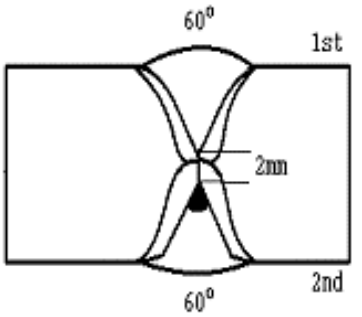
Consumables	PWHT Condition	Tensile Test			CVN Impact Test (Joule)
		YS(MPa)	TS(MPa)	El(%)	-40℃
S-777MXH X A-3	**As welded**	630	660	26	40
AWS A5.23 F8A4-EA3-G	**-**	**≥470**	**550~690**	**≥ 20**	**≥27J at -40℃**

❖ Chemical Analysis of All weld metal(wt%)

Consumables	C	Si	Mn	P	S	Mo
S-777MXH X A-3	0.04	0.28	1.30	0.025	0.015	0.50

Two-run Butt welding test

❖ Welding Conditions

Base Metal	Joint preparation and layer details	Wire dia. (mm)	Welding conditions							
			Side	Curr.		Amp. (A)	Volt (V)	Speed (cpm)	Heat input (KJ/cm)	Inter pass temp (℃)
API 5L X65 (16mm)		4.0	1st	AC		700	36	50	30.2	Max. 150
			2nd			700	40	45	37.3	
API 5L X65 (17.5mm)		4.0 ~ 4.8	1st	L	DC+	780	32	110	27.1	
				T	AC	650	38			
			2nd	L	DC+	1050	34	110	35.8	
				T	AC	750	40			

* Note) Sealing bead : GMAW 1 pass (1.2 f → 140A/23V/40CPM)

❖ Mechanical Properties of All weld metal

Consumables	Base Metal	Tensile Test		Bending test		CVN Impact Test (Joule)
		TS(MPa)	El(%)	Face	Root	-20℃
S-777MXH X A-3	API 5L X65 (16mm)	672	Rupture Of B.M.	Good	Good	7.5
	API 5L X65 (17.5mm)	639	Rupture Of B.M.	Good	Good	9.5

Diffusible Hydrogen Content

❖ Welding Conditions

Wire	:	**A-3**	**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**	:	AC

❖ Result(㎖/100g Weld Metal)

X1	X2	X3	X4
4.48	**4.92**	**4.86**	**4.31**

Average Hydrogen Content *4.64 ㎖* ***/ 100g Weld Metal***