HYUNDAI WELDING

Rev. 04

SW-309MoL Cored

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF 22% Cr-12% Ni -2.5% Mo STAINLESS STEEL
MILD STEELS, LOW- ALLOY STEELS

2021.02

HYUNDAI WELDING CO., LTD.

SW-309MoL Cored

❖ Specification

AWS A5.22	E309LMoT1-1/-4
JIS Z 3323	TS309LMo-FB1
EN ISO 17633-A	T 23 12 2 L P M21/C1 2

❖ Applications

SW-309MoL Cored is designed for welding of 22%Cr-12%Ni-2.5% Mo stainless steels, cladding of Mild steels,

❖ Characteristics on Usage

1. SW-309MoL Cored is suitable for all position welding makes easier re-arcing, beautiful bead appearance and better slag removability.
2. SW-309MoL Cored is for the applications of resistance to heat and corrosion and the joining of stainless steels to mild or low alloy steels

❖ Note on Usage

Use 100% CO_2 gas or Ar+20~25% CO2 gas

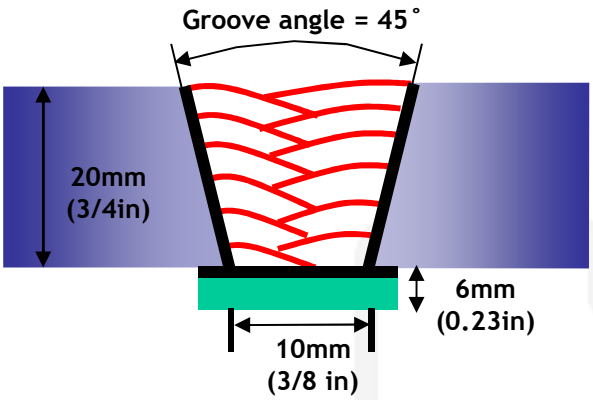
❖ Packing

Diameter	1.2mm (0.045in)	1.4 (0.052in)	1.6 (1/16in)	
Spool *including ball pac	5kg (11lbs)	12.5kg (28lbs)	15kg (33lbs)	20kg (44lbs)

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	:	1.2mm(0.045in)
Shielding Gas	:	100% CO2
Flow Rate(ℓ /min.)	:	20~22
Amp./ Volt.	:	210/30
Stick-Out(mm)	:	20(3/4 in)
Pre-Heat(℃)	:	R.T . ℃(°F)
Interpass Temp.(℃)	:	≤150℃(302°F)
Polarity	:	DC(+)

❖ Mechanical Properties of All weld metal

Consumable	**Tensile Test**		**CVN Impact Test J(ft · lbs)**	
SW-309MoL Cored	**TS (Mpa/lbs/in²)**	**EL (%)**	**-20℃ (-4°F)**	**-60℃ (-76°F)**
	693(100,485)	32.4	47(34.6)	44(32.4)
AWS A5.22 E309LMoTX-X	**≥520**	**≥ 25**	**Not Specified**	

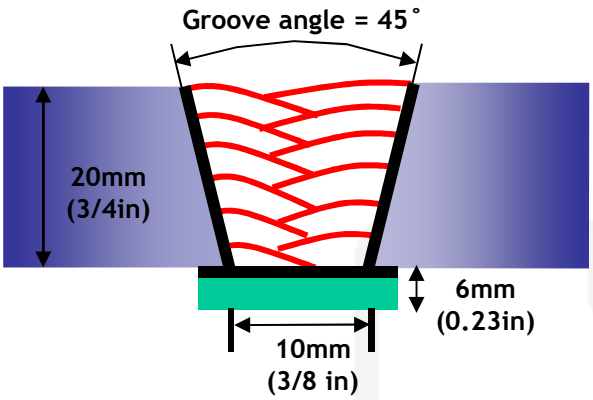
❖ Chemical Analysis of All weld metal(wt%)

Consumable	Shielding Gas	Chemical Composition (%)								
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu
SW-309MoL Cored	100%CO2	0.031	0.64	1.39	0.021	0.010	12.42	22.24	2.37	0.08
AWS A5.22 E309MoLTX-X		≤0.04	≤1.0	0.5 ~2.5	≤0.04	≤0.03	12.0 ~16.0	21.0 ~25.0	2.0~3.0	≤ 0.5

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	:	1.2mm(0.045in)
Shielding Gas	:	Ar+200% CO2
Flow Rate(ℓ /min.)	:	20~22
Amp./ Volt.	:	210/29
Stick-Out(mm)	:	20(3/4 in)
Pre-Heat(℃)	:	R.T . ℃(°F)
Interpass Temp.(℃)	:	≤150℃(302°F)
Polarity	:	DC(+)

❖ Mechanical Properties of All weld metal

Consumable	**Tensile Test**		**CVN Impact Test J(ft · lbs)**	
SW-309MoL Cored	**TS (Mpa/lbs/in²)**	**EL (%)**	**-20℃ (-4°F)**	**-60℃ (-76°F)**
	661(96,845)	29.6	47(34.6)	44(32.4)
AWS A5.22 E309LMoTX-X	**≥520**	**≥ 25**	**Not Specified**	

❖ Chemical Analysis of All weld metal(wt%)

Consumable	Shielding Gas	Chemical Composition (%)								
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu
SW-309MoL Cored	Ar+ 20% CO2	0.035	0.75	1.35	0.021	0.015	12.47	22.34	2.20	0.12
AWS A5.22 E309LMoTX-X		≤0.04	≤1.0	0.5 ~2.5	≤0.04	≤0.03	12.0 ~16.0	21.0 ~25.0	2.0~3.0	≤ 0.5

Mechanical Properties & Chemical Composition of All Weld Metal

❖Bead Appearance

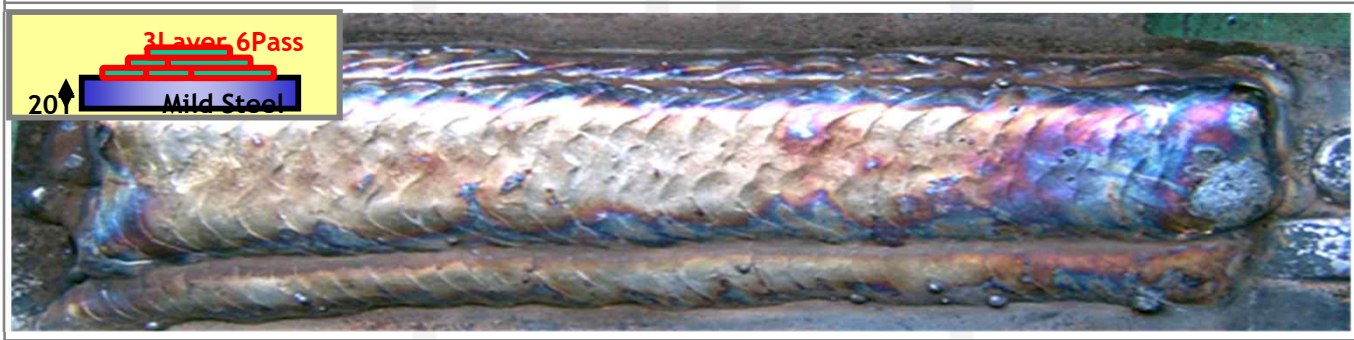
Horizontal Fillet(2F, PB) , Base : STS 304L(6mm,0.23in)		Fillet Vertcal up(3F, PF) , Base : STS 304L(6mm,0.23in)	
			
100% CO2(220A/30V)			
			
Ar+20% CO2(220A/28V)		100% CO2(160A/25V)	Ar+20% CO2(160A/24V)

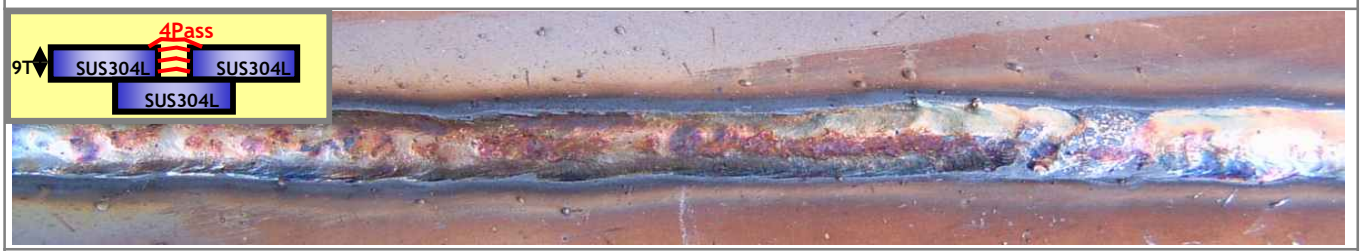
❖ δ – Ferrite No.

Consumable	Shielding Gas	Diagram			FERITSCOPE MP-30 * (FISCHER)
		Schaeffler	Delong	WRC(1992)	
SW-309MoL Cored	100% CO2	15.4	25.4	21.8	18.0~19.0
	Ar+20% CO2	14.3	25.0	20.9	17.0~18.0

Bead Appearance

❖ Over-lay

Bead Appearance (High Heat Input Welding Parameter)

300A/36V(100% CO2)

300A/36V(100% CO2)

260A/34V 40CPM(100% CO2)

Welding Efficiency & Proper Welding Condition

❖ Deposition Rate & Efficiency

Consumable (size)	Shielding Gas	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
		Amp. (A)	Volt. (V)			
1.2mm (0.045 in)	100%CO_2	210	30	12(472)	86~88	4.6(10.1)
	Ar-20%CO_2	210	29	12(472)	87~89	4.8(10.6)
1.6mm (1/16 in)	100%CO_2	290	33	8.9(350)	86~88	5.5(12.1)
	Ar-20%CO_2	290	32	8.9(350)	87~89	5.(12.6)
Remark					Deposition efficiency =(Deposited metal weight/Wire weight used)×100	Deposition rate =(Deposited metal weight/Welding time,min.)×60

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.	
			1.2mm (0.045 in)	1.6mm (1/16 in)
SW-309MoL Cored	100%CO_2 or Ar-20~25%CO_2	F	160~220Amp	250~290Amp
		HF	160~220Amp	250~290Amp
		V-Up & OH	140~180Amp	-

Appovals

Consumable	Shielding Gas	DNV	NK	CWB
SW-309MoL Cored	C1	309MoL(-20℃) 1.2~1.6	KW309MoLG(C) 1..2~1.6	AWS A5.22-95 E309LMoT1-1 0.9~1.6

Consumable	Shielding Gas	DNV	CWB	-
SW-309MoL Cored	M21	309MoL(-20℃) 1.2~1.6	AWS A5.22-95 E309LMoT1-4 0.9~1.6	