

S-717 X M-12K (HD)

SUBMERGED ARC WELDING CONSUMABLES
FOR WELDING OF HIGH TENSILE STEEL



❖ Specification

Flux	JIS Z3352	EN ISO 14174	KS B ISO 14174
S-717	S A AB 1	S A AB 1	S A AB 1
Wire	AWS A5.17/A5.23		EN ISO 14171
M-12K (HD)	A5.17 F7A(P)6-EM12K		S2Si

❖ Applications

Multi-layer welding of structural steels, offshore structures and thick, windmill, pressure vessels.

❖ Characteristics on Usage

Good weldability for all range of thickness of plate. Excellent impact value and crack-resistibility of welded metal. Inactive type flux is not affected by welding parameter, especially suitable for multi-layer welding of thick plate.

❖ Note on Usage

1. Dry the flux at 300~350℃(572~662°F) for 60minutes before use.
2. For the first layer in groove, keep the current and speed low in the case of multi-layer welding.



Welding consumable for test

❖ Flux

Consumable	Chemical Composition, wt%			
	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaO+MgO	CaF ₂
S-717	10	30	35	10

Consumable	Particle Size (Mesh)	Type of Flux	B.I	H ₂ O _{1000℃} /CO ₂ (%)
S-717	10 × 48	Agglomerated	1.6	0.05/0.80

❖ Electrode

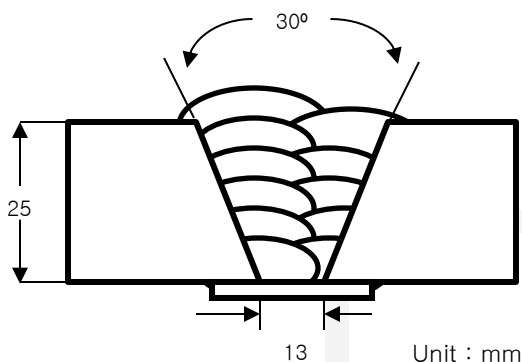
Consumables	Dia. (mm)	Chemical Composition, wt%					
		C	Si	Mn	P	S	Mo
M-12K (HD)	4.0	0.083	0.15	1.09	0.015	0.011	0.012
AWS A5.17 EM12K		0.05–0.15	0.10–0.35	0.80–1.25	≤0.030	≤0.030	–



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Base metal	: SS400
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	: AC

❖ Mechanical Properties of All weld metal

Consumables	PWHT Condition	Tensile Test			CVN Impact Test (Joule)	
		YS(MPa)	TS(MPa)	El(%)		
S-717 X M-12K (HD)	As-welded	498	582	31.6	-51℃	74
	620℃x1hr	459	562	32.8	-51℃	94
AWS A5.17 F7A(P)6-EM12K	-	≥ 400	490~660	≥ 22	≥ 27J at -51℃	

❖ Chemical Analysis of All weld metal(wt%)

Consumables	C	Si	Mn	P	S
S-717 X M-12K (HD)	0.09	0.32	1.52	0.025	0.007