KST-309L

COVEREDE ELECTRODE
FOR STAINLESS STEEL

KISWEL

Rev.0

■ Description

- **Covering is lime titania type for welding of 22%Cr-12%Ni stainless steel and heat-resisting castings, clad side of type 304 clad steels, welding of dissimilar steels such as Cr-Mo steel or carbon steel to stainless steel**
- **As its deposited weld metal has austenitic structure, with suitable ferrite, crack resistance is good and inter granular corrosion resistance is superior to that of E309 type**
- **Redry the electrode at 250~350℃ for 30~60 minutes prior to use**

■ Classification

- **AWS A5.4 : E309L-16**
- **JIS Z 3221 : ES309L-16**
- **EN ISO 3581-A : E 23 12 L R 12**
- **EN ISO 3581-B : ES309L-16**

■ Welding Position

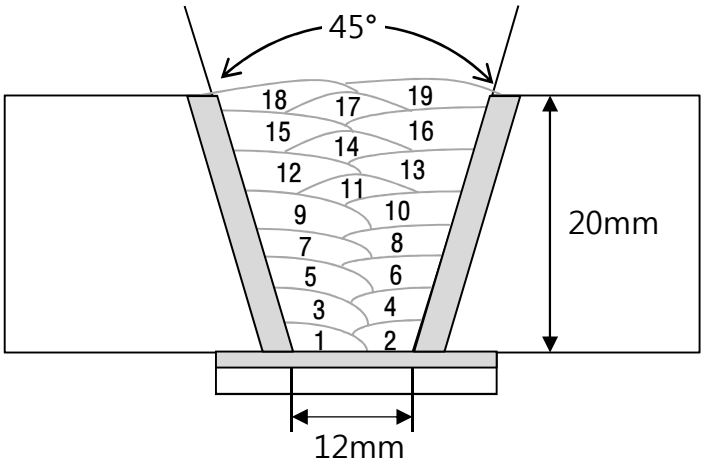


■ Base Materials

Dissimilar joint welds between high strength, mild steels, low alloyed steels and stainless steel, manganese steels

Cladding, Surfacing for the first layer of corrosion resistant weld surfacing On ferriric-perlitic steels in boiler and pressure vessel parts up to fine-Grained steel

■ All Weld Metal Test Specimen



Base metal	A36 (Buttering)
Size	4.0*350mm
Polarity / Current	DC+ / 135~140A
Welding Position	PA / 1G
Heat Input	8.7~12.4 kJ/cm

■ Typical Mechanical Properties of Weld Metal

	Y.S (MPa)	T.S (MPa)	El. (%)	I.V (J) (J @ Temp)	PWHT	Remark
AWS Spec.	-	≥520	≥30	-	A.W	1G
KST-309L	480	610	40	60 @ -20℃	A.W	

■ Typical Chemical Composition of Weld Metal (%)

	C	Si	Mn	P	S	Ni	Cr	Mo
AWS Spec.	≤0.04	≤1.00	0.5~ 2.5	≤0.04	≤0.03	12.0~ 14.0	22.0~ 25.0	≤0.75
KST-309L	0.03	0.84	0.76	0.027	0.013	12.97	23.04	0.08

■ Weldability

		Flat, H-Fillet	V-Up
Arc	Stability	Excellent	Good
	Concentration	Good	Excellent
	Force	Good	Good
Slag	Fluidity	Excellent	Good
	Removability	Good	Good
Spatter	Quantity	Excellent	Excellent
Fume	Quantity	Good	Good
Porosity	Occurrence	Good	Good

■ Bead Appearance



H-Fillet, 3.2*350mm, DC+ 110~115A

■ Welding Efficiency

Nominal electrode efficiency (%)	Deposition efficiency (%)
85~90	55~60

1) Size : 3.2*350mm

2) Nominal electrode efficiency (%) : M_D/M_{CN} *100

3) Deposition efficiency (%) : $M_D/(M_E-M_S)$*100

* M_D : mass of deposited weld metal
* M_{CN} : nominal mass of consumed core wire
* M_E : total mass of electrodes tested
* M_S : total mass of the stub ends

■ IGC Test Result & Ferrite Number

ASTM A262 Practice E	FN (WRC 1992)
-	10~15

■ Recommended Welding Parameter (AC or DC+)

Diameter (mm)	2.0	2.6	3.2	4.0	5.0
Length (mm)	300	300	350	350	350
Flat, Fillet	40~50	55~80	90~130	110~150	140~180
V-Up	35~45	40~60	70~90	90~130	-

KST-309L

■ Packaging and Available sizes



Diameter (mm)		2.0	2.6	3.2	4.0	5.0
Length (mm)		300	300	350	350	350
Carton	Inner	2, 5Kg				
	Out	20Kg (2Kg x 10EA, 5Kg x 4EA)				
Vacuum	Inner	2Kg				
	Out	10Kg (2Kg x 5EA)				

* Identification Imprint : E309L-16 KISWEL

* Tip Color : Green

■ Approval

ABS	BV	DNV • GL	LR
E309L-16	-	-	-

* Remark : CWB, CE

■ Control Instruction

1. Storage

1) On principle covered electrodes should be in their original packaging until used. If possible the packs of electrodes should be taken out of storage in the sequence in which they were received in warehouse.
2) The covered electrodes must be stored in dry rooms to protect them against damage caused by moisture. The room must be fitted out with pallets or shelves since storage directly on the floor or against the walls is not recommended.
3) Opened packs of electrodes should also be stored in dry and, if necessary, heated rooms so that there is no likelihood of the temperature dropping below the dew point.

AWS Classification	Store Condition (Opened packs of electrode)	
	Ambient Air	Holding Oven
E309L-16	30±10℃ Humidity max. 50%	High 30~140℃ than room temperature

2. Re-drying

1) Where electrodes have become damp it is recommended that re-drying is carried out immediately prior to welding in accordance with the temperature details specified in the following table.
2) Electrodes that have been in direct contact with water, grease or oil should not be used for welding fabrication.

Type of coating	Re-drying temp. (℃)	Re-Drying time (min)
Lime titania	250~350	30~60

KISWEL

The Management System of KISWEL LTD, 704, Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongnam 51544, Republic of Korea, 70, Saebyeok-ro 63beon-gil, Sasang-gu, Busan 47018, Republic of Korea has been approved by Lloyd's Register Quality Assurance to : IATF 16949:2016, ISO 14001:2015, applicable to : Manufacture of solid welding wires & rods, flux cored wires, submerged arc welding wires & fluxes, stainless steel welding wires & rods and covered electrodes.
More information : www.kiswel.com

