KST-2209

COVERED ELECTRODE

FOR STAINLESS STEEL

KISWEL

KST-2209

■ Description

- **Covering is lime titania type for welding of 22%Cr-9%Ni-3%Mo duplex stainless steel, the principal application are chemical plant and shipbuilding as well as nuclear plant industries**
- **Please perform welding with selecting proper heat input according to the required mechanical properties**
- **Redry the electrode at 250~350℃ for 30~60 minutes prior to use**

■ Classification

- **AWS A5.4 : E2209-16**
- **JIS Z 3221 : ES2209-16**
- **EN ISO 3581-A : E 22 9 3 N L R 12**
- **EN ISO 3581-B : ES2209-16**

■ Welding Position



■ Base Materials

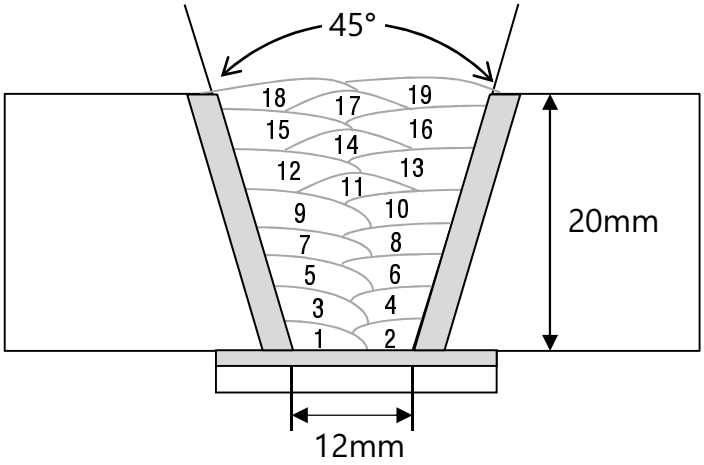
1.4462 X2CrNiMoN22-5-3, 1.4460 X3CrNiMoN27-5-2
1.4352 X2CrNiN23-4, 1.4162 X2CrMnNi21-5-1

UNS S31803, S31500, S31200, S32304, S32101

Dissimilar joints such as un- and low alloy steel to duplex stainless steel

KST-2209

■ All Weld Metal Test Specimen



Base metal	A36 (Buttering)
Size	4.0*350mm
Polarity / Current	DC+ / 150~155A
Welding Position	PA / 1G
Heat Input	7.8~11.3 kJ/cm

■ Typical Mechanical Properties of Weld Metal

	Y.S (MPa)	T.S (MPa)	El. (%)	I.V (J) (J @ Temp.)	PWHT	Remark
AWS Spec.	-	≥690	≥20	-	A.W	1G
KST-2209	590	770	33	35 @ -45℃	A.W	

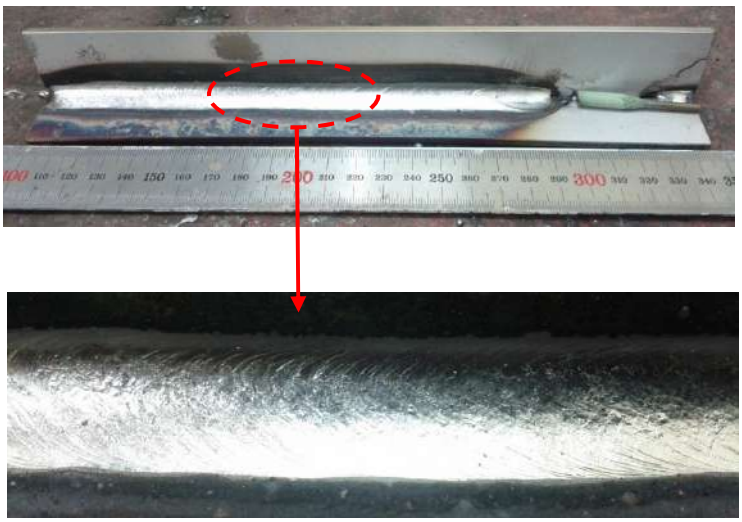
■ Typical Chemical Composition of Weld Metal (%)

	C	Si	Mn	P	S
AWS Spec.	≤0.04	≤0.90	0.5~ 2.5	≤0.04	≤0.03
KST-2209	0.03	0.74	0.75	0.020	0.009
	Cr	**Ni**	**Mo**	**Cu**	**N**
AWS Spec.	21.5~23.5	8.5~10.5	2.5~3.5	≤0.75	0.08~0.20
KST-2209	22.32	9.33	3.26	0.04	0.18

■ 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



1G, 4.0*350mm, DC+ 150~155A

■ Welding Efficiency

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

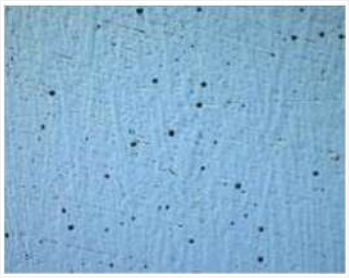
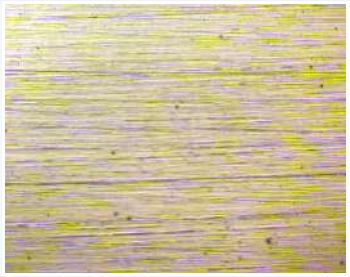
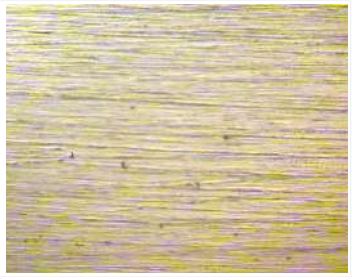
1) Size : 3.2*350mm

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

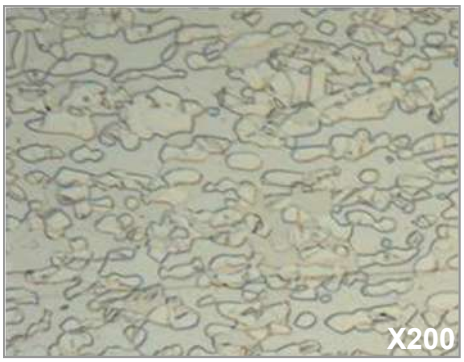
3) Deposition efficiency (%) : $M_D/(M_E-M_S)$*100

* 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

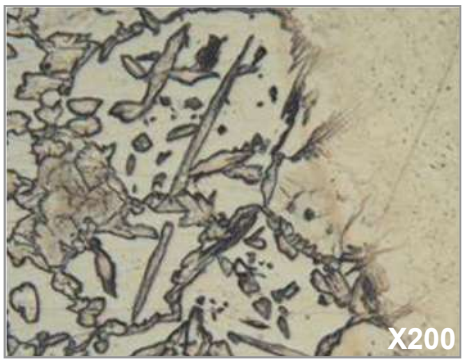
■ Corrosion test (ASTM G48 Method A)

Base materials (UNS S31803)		Weld metals	
Before	After	Before	After
			

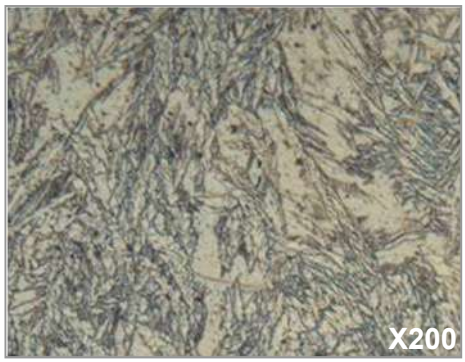
■ Microstructure at Multiple weld metals



Base Material



Heat Affected Zone



Weld Metal

KST-2209

■ Packaging and Available sizes



Diameter (mm)		2.0	2.5 / 2.6	3.2	4.0	5.0
Length (mm)		300	300	350	350	350
Plastic tube	Inner	2, 5Kg				
	Out	20Kg (2Kg x 10EA, 5Kg x 4EA)				
Vacuum	Inner	2Kg				
	Out	10Kg (2Kg x 5EA)				

* Identification Imprint : E2209-16 KISWEL

* Tip Color : None

■ Recommended Welding Parameter (AC or DC+)

Diameter (mm)	2.0	2.5 / 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	-

■ 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
E2209-16	Not recommended	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

