Welding Consumables for Stainless Steel Overlay Welding

KOBELCO
KOBE STEEL GROUP

Stainless steel overlay welding with strip electrode

Welding method	Type of alloy	Application	Welding consumables (flux/strip)	Remarks
ESW	347L	Single-layer	PREMIARC PF-B7/US-BQ347LD	–––
			PREMIARC PF-B7FK/US-B309LCb	–––
		Multi-layer	PREMIARC PF-B7FK/US-BQ347LD	1st layer : PREMIARC PF–B7FK/US–BQ309L (ESW)
				1st layer : PREMIARC PF–B1/US–BQ309L (SAW)
	316L	Single-layer	PREMIARC PF-B7/US-BQ316EL	–––
		Multi-layer	PREMIARC PF-B7FK/US-BQ316EL	1st layer : PREMIARC PF–B7FK/US–BQ309L (ESW)
				1st layer : PREMIARC PF–B1/US–BQ309L (SAW)
	317L	Multi-layer	PREMIARC PF-B7FK/US-B317L	1st layer : PREMIARC PF–B7FK/US–BQ309L (ESW)
				1st layer : PREMIARC PF–B1/US–BQ309L (SAW)
SAW	347	Single-layer	PREMIARC PF-B1FP/US-B347LP	–––
	347L	Multi-layer	PREMIARC PF-B1FK/US-BQ347LD	1st layer : PREMIARC PF–B1/US–BQ309L

Stainless steel overlay welding with metal cored wire

Welding method	Type of alloy	Application	Welding consumables (flux/wire)	Remarks
SAW	347L	Multi-layer	PREMIARC PF-S2/US-C347L	Buffer layer PF-S2/US-C309L
	316L	Multi-layer	PREMIARC PF-S2/US-C316LM	Buffer layer PF-S2/US-C309L

Example of chemical composition of weld metal (mass%)

Welding method	Welding consumables (flux/strip, wire)	C	Ni	Cr	Mo	Nb	N	FN※1	FNW※2
Single-layer	PREMIARC PF–B7/US–BQ347LD	0.032	9.7	18.8	–––	0.53	0.04	6	5
	PREMIARC PF–B7FK/US–B309LCb	0.027	10.5	18.7	–––	0.48	0.03	7	6
Multi-layer	PREMIARC PF–B7FK/US–BQ347LD	0.028	10.3	19.1	–––	0.55	0.04	7	6
Single-layer	PREMIARC PF–B7/US–BQ316EL	0.033	12.2	18.2	2.2	–––	0.02	8	7
Multi-layer	PREMIARC PF–B7FK/US–BQ316EL	0.019	12.5	18.4	2.3	–––	0.02	8	7
Multi-layer	PREMIARC PF–B7FK/US–B317L	0.022	13.4	19.0	3.2	–––	0.06	7	6
Single-layer	PREMIARC PF–B1FP/US–B347LP	0.045	10.5	18.9	–––	0.64	0.03	7	6
Multi-layer	PREMIARC PF–B1FK/US–BQ347LD	0.035	10.2	19.1	–––	0.53	0.04	6	5
Multi-layer	PREMIARC PF–S2/US–C347L	0.024	10.4	18.9	–––	0.35	0.03	8	7
Multi-layer	PREMIARC PF–S2/US–C316LM	0.030	12.9	18.8	2.8	–––	0.04	8	5

※1 Ferrite number (Delong)
※2 Ferrite number(WRC)

Recommended welding parameters

Welding method	Strip width (mm)	Polarity	Welding current (A)	Welding speed (cm/min)	Thickness of the overlay (mm)
ESW	25	DCEP	400–500	14–20	3.5～4.5
	50	DCEP	800–900	14–20	
	75	DCEP	1200–1300	14–20	
SAW	25	DCEP	350–450	18–20	4.0～4.5
	50	DCEP	750–850	18–20	
	75	DCEP	1100–1200	18–20	
	1.6 Dia. (mmϕ)	DCEP	250–300	25–35	3.0～4.0

※1 Electro-magnetically controrolling welding head is recommendable.
※2 Lap of weld : around 7 mm
※3 Welding position : flat or 0.5-1.0 degrees upwardly inclined.
※4 Flux burden height : 20-30 mm
※5 Electrode extension : 35-40 mm

KOBE STEEL, LTD.