

Welding Consumables for LNG Storage Tanks

Steel type	Welding method	Welding consumables	ASME/AWS	Polarity	Flux grain size (mesh) Diameter(mmφ)	Example of application section
9%Ni steel JIS G3127 SL9N590 ASTM A553 Type 1	SAW (Flux/Wire)	PREMIARC PF-N4/ PREMIARC US-709S	SFA/A 5.14 ERNiMo-8 (US-709S)	DCEP	Flux:12×65 2.4	Side plate (Horizontal)
	SMAW	PREMIARC NI-C70S PREMIARC NI-C1S	SFA/A 5.11 ENiCrFe-9 SFA/A 5.11 ENiMo-8	AC	3.2, 4.0, 5.0	Side plate (Vertical,Horizontal) Bottom plate Tack and Repair welding
Mild steel JIS G3106 SM490 ASTM A36	SMAW	FAMILIARC LB-52A	SFA/A 5.1 E7016	AC/ DCEP	2.6, 3.2, 4.0 5.0, 6.0	Outer tank
	GTAW	FAMILIARC TG-S50	SFA/A 5.18 ER70S-G	DCEN	1.2, 1.6, 2.0 2.4, 3.2	Outer tank
304type stainless steel JIS G4304 SUS304L ASTM A167 Type 304L	SMAW	PREMIARC NC-38LT	SFA/A 5.4 E308L-16	AC/ DCEP	2.6, 3.2, 4.0	Pipe
	GTAW	PREMIARC TG-S308L	SFA/A 5.9 ER308L	DCEN	1.0, 1.2, 1.6 2.0, 2.4, 3.2	Pipe
	FCAW	PREMIARC DW-308LTP	SFA/A 5.22 E308LT1-1/4	DCEP	1.2	Pipe

Example of chemical composition of weld metal (mass%)

Welding consumables	C	Si	Mn	P	S	Ni	Cr	Mo	Fe	Nb	W
PREMIARC PF-N4/ PREMIARC US-709S	0.02	0.61	0.30	0.002	0.001	67.1	1.8	18.6	8.3	—	2.9
PREMIARC NI-C70S ※	0.09	0.23	2.20	0.003	0.002	65.0	16.5	4.9	9.8	1.2	0.6
PREMIARC NI-C1S ※	0.03	0.49	0.30	0.003	0.002	68.6	1.9	18.6	6.8	—	2.9
FAMILIARC LB-52A※	0.08	0.57	1.12	0.012	0.005	—	—	—	—	—	—
FAMILIARC TG-S50	0.09	0.73	1.35	0.009	0.010	—	—	—	—	—	—
PREMIARC NC-38LT※	0.03	0.38	2.12	0.022	0.002	10.9	18.4	—	—	—	—
PREMIARC TG-S308L	0.02	0.48	1.98	0.023	0.003	9.7	19.9	—	—	—	—
PREMIARC DW-308LTP	0.03	0.71	1.18	0.023	0.009	9.5	20.4	—	—	—	—

※AC

Example of mechanical properties of weld metal

Welding consumables	0.2%Y.S. (MPa)	T.S. (MPa)	El. (%)	vE-196°C (J)
PREMIARC PF-N4/ PREMIARC US-709S	435	716	48	88
PREMIARC NI-C70S ※	450	710	41	67
PREMIARC NI-C1S ※	440	730	48	83
FAMILIARC LB-52A ※	500	580	31	230 (0°C)
FAMILIARC TG-S50	480	580	31	180 (-30°C)
PREMIARC NC-38LT ※	370	540	51	51
PREMIARC TG-S308L	420	590	45	78
PREMIARC DW-308LTP	420	630	40	35

※AC

