

Welding Consumables in Industry

Pressure Vessel



TIENTAI

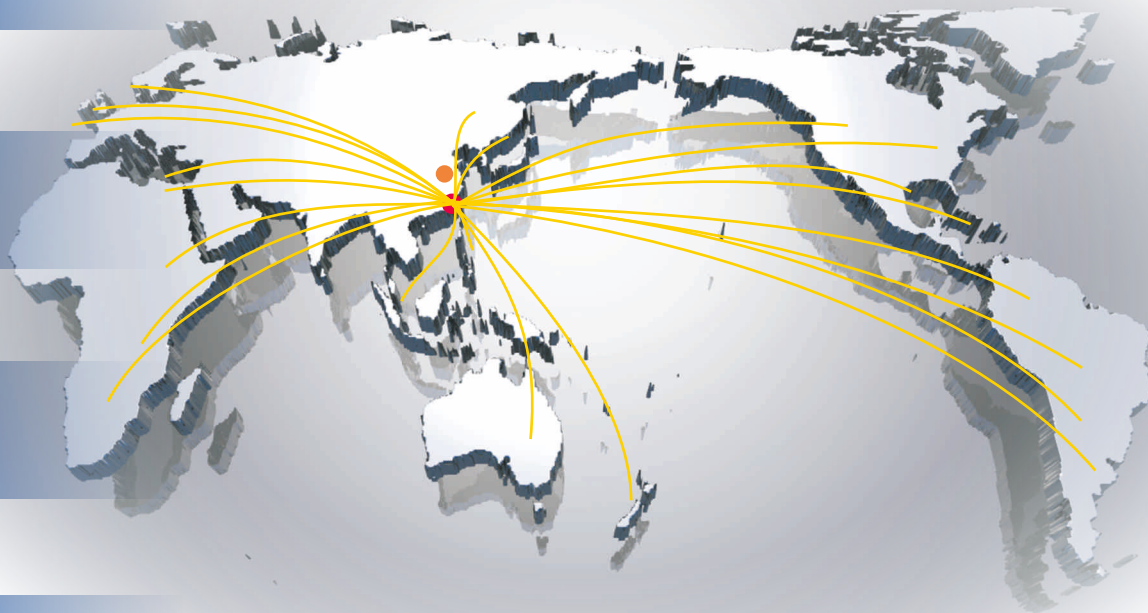
AN ILLINOIS TOOL WORKS COMPANY

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TIENTAI ELECTRODE CO., LTD.

ITW- Tradition of Excellence



Illinois Tool Works Inc. (NYSE:ITW) designs and produces an array of highly engineered fasteners and components, equipment and consumable systems, and specialty products and equipment for customers around the world. A Fortune 200 diversified manufacturing company with more than 100 years of history. ITW's 650 decentralized business units in 45 countries employ nearly 49,000 men and women who are focused on creating value-added products and innovative customer solutions.

"During its more than 100 years of existence, ITW's recipe for success has been focused on creating "value-added products for key customers around the world. We do this by growing our business and making acquisitions which provide additional product solutions to our customers.

Many of our best product innovations come from simple observation coupled with a keen understanding of our customers' needs. Most companies design products specifically to increase sales volume. ITW's main goal is not to create a best seller, but to enhance customers. To attain that goal, our product design engineers develop value-added, proprietary products. Our unique approach begins at our customers' plants or worksites. By working closely with our customers. We determine how an ITW product or process could provide a better solution. Proof of our highly innovative culture is seen in our patent activities. In 2004, we had more than 16,000 unexpired patents and pending patent applications worldwide, including 2,900 U.S. Patents and 1,116 pending U.S. Applications. We typically rank in the top 100 of patent issuers in the U.S.

Pressure Vessel



For global Pressure Vessel equipments and construction, TienTai provide consumables with top quality and specialized welding services.



Total Solutions for Pressure Vessel Welding

- ☆Saving cost of base materials in effect .
- ☆Conforming to the requirement of effective and high tensile welding.
- ☆Outstanding performance in welding.
- ☆Applying in stainless and carbon steel.
- ☆Effective strip cladding.

Your Perfect Welding Solutions

The limited page cannot afford whole specific contents of products and techniques. Please contact us if further information required.



Base Metal		SAW		
Steel Type	Steel Grade	Flux	Wire	AWS Spec.
C-Mn	ASME A516, G70	TF-250	TSW-12KH	F7A8/P8-EH12K
1.25Cr-0.5Mo	ASME A387 G11	TF-250	TSW-E22	F8P2-EB2-B2
2.25Cr-1Mo	ASME A387 G22	TF-250	TSW-E23	F9P4-EB3-B3
304	ASME SA240 TP304L	TFS-300	TW-308L	ER308L
Dissimilar-metal joint		TFS-300	TW-309L	ER309L
316L	ASME SA240 TP316L	TFS-300	TW-316L	ER316L
317L	ASME SA240 TP317L	TFS-300	TW-317L	ER317L
321	ASME SA240 TP321	TFS-330	TW-347	ER347
347	ASME SA240 TP347	TFS-330	TW-347	ER347
2205	ASTM S31803	TFS-330	TW-2209	ER2209
5Ni/9Ni	--	TFS-340	TW-61	ERNiCrMo-3

Type of Deposited Alloy	ESW				FCAW			
	Layer		Strip	Flux	Layer		Product Name	Shielding Gas
	Number	Sequence	--	--	Number	Sequence		
308L	1	1	TBD-309LNb	ML-305HS	--	--	--	--
	2	1	TBD-309LNb	ML-305	--	--	--	--
		2	TBD-308L		--	--	--	--
316L	1	1	TBD-21.13.3L	ML-305HS	--	--	--	--
	2	1	TBD-21.13.3L	ML-305	2	1	TFW-309LMo	CO2
		2	TBD-316L		2	2	TFW-316L	CO2
347	1	1	TBD-21.11LNb	ML-305	1	1	TFW-309LNb	CO2
	2	1	TBD-309L	ML-305	2	1	TFW-309L	CO2
		2	TBD-347		2	2	TFW-347L	CO2
	1	1	TBD-309LNb	ML-305HS (35~40cpm)	--	--	--	--
625	1	1	TBD-61	ML-306	--	--	--	--
	2	1	TBD-61	ML-306	--	--	--	--
		2	2	TBD-61	ML-306	--	--	--

Your Perfect Welding Solutions

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Pressure Vessel



Typical chemical composition of weld metal (wt%)

Product Name		C	Si	Mn	Ni	Mo	P	S	Other	
TFW-309LNb	All weld metal	0.027	0.50	1.9	12.7	-	0.025	0.007	Cr:23.5, Nb:0.77	
	2mm from the surface	0.04	0.40	1.32	9.95	-	0.022	0.009	Cr:19.0, Nb:0.58	
TFW-309LT		0.026	0.62	1.75	13.00	0.11	0.022	0.009	Cr:24.07, Cu:0.11	
TFW-309LMo		0.025	0.57	1.50	12.7	2.35	0.023	0.007	Cr:22.93	
TFW-347		0.058	0.54	1.48	10.5	0.10	0.029	0.009	Cr:19.56, Nb:0.54	
Product Name	Wire	C	Si	Mn	Ni	Mo	P	S	Other	
TF-250	TSW-12KH	0.08	0.36	1.53	-	0.015	0.015	0.002	Cu:0.026	
	TSW-E22	0.09	0.22	0.81	-	0.47	0.011	0.004	Cu:0.03, Cr:1.18	
	TSW-E23	0.07	0.24	0.63	-	0.93	0.009	0.004	Cu:0.04, Cr:2.25	
	SubCor B2	0.08	0.43	0.50	-	0.50	0.025	0.008	Cu:0.03, Cr:1.20	
	SubCor B3	0.08	0.42	0.60	-	0.91	0.025	0.007	Cu:0.04, Cr:2.25	
TFS-300	TW-308L	0.04	0.46	1.78	9.30	-	0.028	0.009	Cr:19.2	
	TW-309L	0.04	0.47	1.57	12.3	-	0.023	0.005	Cr:21.3	
	TW-316L	0.04	0.50	1.73	10.2	1.89	0.025	0.008	Cr:16.0	
	TW-317L	0.035	0.45	1.43	13.63	3.38	0.025	0.013	Cr:18.13	
TFS-330	TW-347	0.03	0.58	1.82	10.20	0.10	0.03	0.01	Nb:0.70, Cr:18.99	
	TW-2209	0.02	0.56	1.35	9.00	2.82	0.02	0.01	Cr:21.8	
	TW-308L	0.02	0.58	1.39	10.01	0.11	0.02	0.01	Cr:19.78	
	TW-309L	0.02	0.58	1.31	13.17	0.10	0.02	0.01	Cr:22.36	
	TW-316L	0.02	0.52	1.62	11.30	2.20	0.02	0.01	Cr:18.45	
	TW-317L	0.02	0.57	1.28	13.25	2.61	0.02	0.01	Cr:19.56	
ML-305	TBD-21.11LNb	Strip	0.01	0.38	2.07	12.2	0.12	-	-	Nb:0.81, Cr:23.7
		1st layer	0.04	0.53	1.51	10.1	0.12	-	-	Cu:0.06, Nb:0.63, Cr:19.2
ML-305HS	TBD-309LNb	Strip	0.01	0.35	2.07	12.19	0.16	-	-	Nb:0.87, Cr:23.48
		1st layer	0.045	0.56	1.60	9.79	0.11	-	-	Nb:0.56, Cr:18.2
ML-306	TBD-61	Strip	0.015	0.05	0.05	Bal.	9.0	-	-	Cu:0.015, Fe:0.25, Cr:22, Nb:3.5, Al:0.14, Ti:0.2
		1st layer	0.011	0.38	0.07	61.0	8.18	-	-	Cu:0.005, Fe:6.26, Cr:20.95, Nb:3.06, Al:0.04, Ti:0.03
		2st layer	0.006	0.52	0.025	65.4	8.52	-	-	Cu:0.005, Fe:1.01, Cr:21.23, Nb:3.16, Al:0.04, Ti:0.03
TFS-303	TW-61	0.018	0.65	0.05	62.8	8.70	0.006	0.003	Co:0.03, Fe:3.40, Ti:0.07, Al:0.017, Nb:2.73, Cr:21.4	
	TW-17	0.007	0.04	0.50	57.8	15.5	0.003	0.002	V:0.01, Co:0.05, Fe:3.40, W:3.40, Fe:5.70, Cr:16.1	
TFS-340	TW-61	0.02	0.36	0.07	63.0	8.85	0.004	0.007	V:0.02, Co:0.03, W:0.01, Fe:2.92, Ti:0.11, Al:0.06, Nb:3.18, Cr:21.3	
	TW-17	0.02	0.26	0.47	57.8	15.1	0.008	0.006	V:0.03, Co:0.07, W:3.78, Fe:7.23, Ti:0.03, Al:0.03, Nb:0.08, Cr:15.0	

Your Perfect Welding Solutions

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Typical mechanical properties of weld metal:

Product Name		Yield Stress (N/mm ²)	Tensile Strength (N/mm ²)	Elongation (%)	Charpy V-Notch (J)	Temperature (°C)	PWHT
TFW-309LNb		-	678	32	-	-	-
TFW-309LT		423	580	34	-	-	-
TFW-309LMo		-	685	33	-	-	-
TFW-347L		-	627	35	-	-	-
Product Name	Wire	Yield Stress (N/mm ²)	Tensile Strength (N/mm ²)	Elongation (%)	Charpy V-Notch (J)	Temperature (°C)	PWHT
TF-250	TSW-12KH	483	567	34	175	-50	-
					120	-60	
		415	526	34	209	-50	620°C * 1hr
					172	-60	
	TSW-E22	518	605	28	183	-29	690°C * 1hr
	TSW-E23	574	671	26	210	-29	690°C * 1hr
					110	-40	
SubCor B2	541	631	26	80	-30	690°C * 1hr	
SubCor B3	579	680	24	100	-30		
TFS-300	TW-308L	-	570	40	45	110	-
					40	-196	
	TW-309L	-	545	38	60	110	-
					35	-196	
	TW-316L	-	550	43	50	-110	-
					40	-196	
TW-317L	-	578	36	47	-100	-	
TFS-330	TW-347	460	620	36	50	-110	-
	TW-2209	591	780	31	74	-40	-
	TW-308L	377	545	43	40	-196	-
	TW-309L	386	541	39	56	-196	-
	TW-316L	375	560	40	40	-196	-
	TW-317L	443	576	24	67	-100	-
TFS-303	TW-61	470	700	35	70	-196	-
	TW-17	470	710	40	75	-196	-
TFS-340	TW-61	503	754	46	67	-196	AW
	TW-17	490	706	32	57	-196	AW

Your Perfect Welding Solutions

TIENTAI ELECTRODE CO., LTD.

The Portfolio of Brands





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TIENTAI ELECTRODE CO., LTD.

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