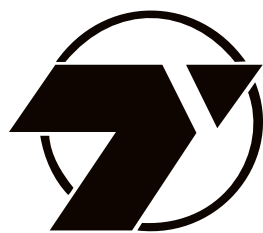


# Welding Consumables in Industry

Power Plant



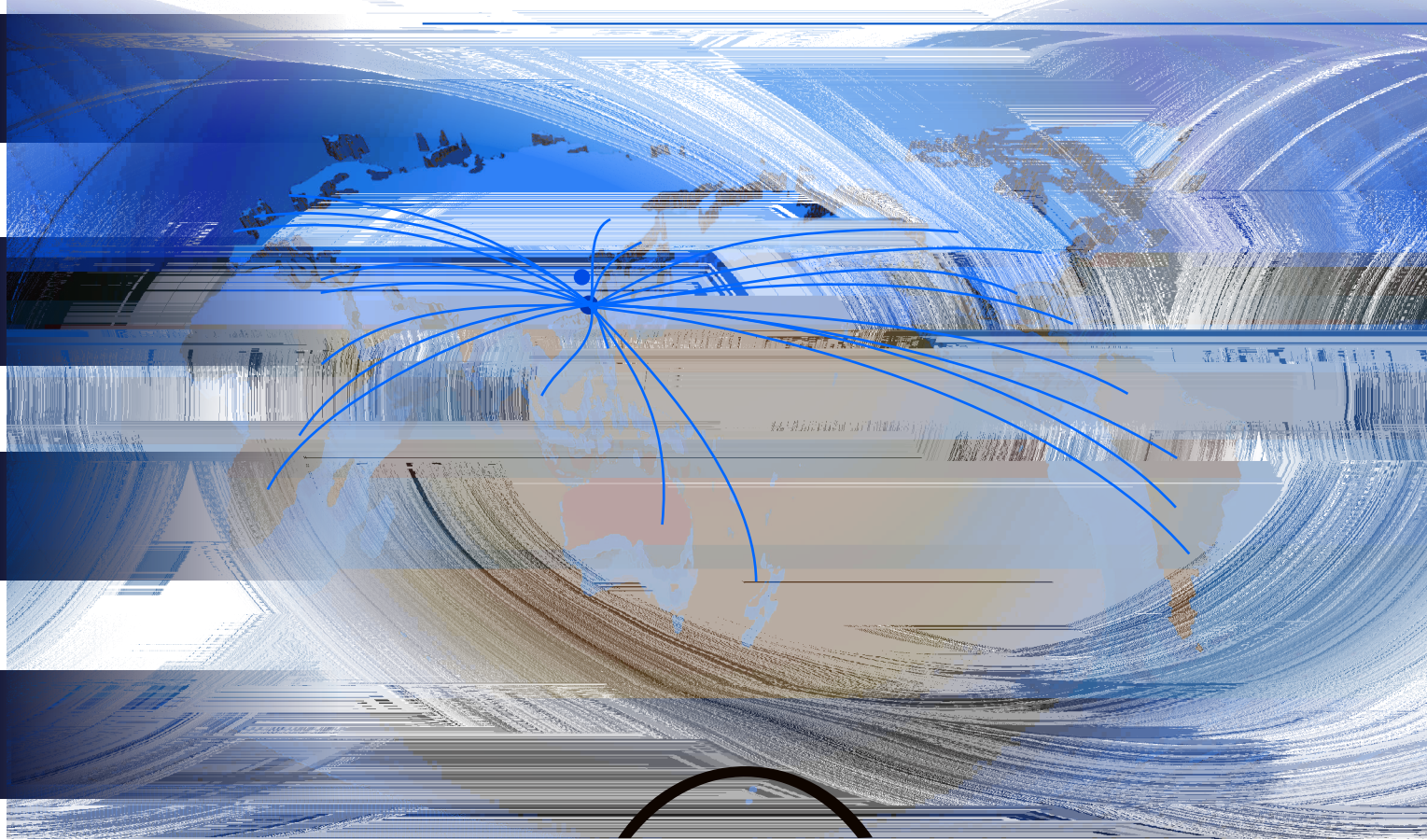
**TIENTAI**

AN ILLINOIS TOOL WORKS COMPANY

[http : // www.tientai.com](http://www.tientai.com)

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.

# Power Plant



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



## **Welding consumables for thermal power plant & nuclear power plant**

The consumables include heat-resistant steel, stainless steel, carbon steel, nickel alloy....etc, which are adopted for factory building, boiler, chemney, flue. F.G.D, high-pressure pipeline, general pipeline, and liner manufacture.

## **Your Perfect Welding Solutions**

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



## Pressure vessel for nuclear power plant

Equipment name	Materials ASTM	Welding Processes				Remark
		SMAW	GTAW	GMAW	FCAW	
Pressure Vessel	A533B C1.1 A508 C1.2	TL-80	-	-	-	to adopt A533B C1.2 for PWR pressure vessel
Pressurizer & steam generator	Inside liner inside material	TS-308/308L TS-316/316L TNC-70B	TGA-82	MIG-82	-	-
RCCV	A36 A516 Gr.60 A516 Gr.70	TL-508	TGA-52	-	TWE-711	※ to adopt without the limitation of (ultra low carbon requirement) ULC (C≤0.02%)
	A516 Gr.70 and A240 Type 304L	TS-309/309L	TGA-309/309L TGFA-309L	MIG-309/309L	※TFW-309L	
	A240 Type 304L	TS-308/308L	TGA-308/308L TGFA-308L	MIG-308/308L	※TFW-308L	
BWR	A240 Type 304 or Type 304L	TS-308/308L	TGA-308/308L	MIG-308/308L	※TFW-308L	
Plumbing	A312 Type 304L or Type 316L (C≤0.02%)	TS-308/308L TS-316/316L	TGA-308/308L TGA-316/316L TGFA-308L TGFA-316L	MIG-308/308L MIG-316/316L	-	To adopt the ultra low carbon materials for SCC strategy

1、A533 B C1.2 is adopted for PEDESTAL, A572 Gr50 (TL-60) and A572 Gr65 (TL-80) are adopted for material of construction.

2、For pipe P1×P8, E309 (L) is adopted with the temperature below 150℃, ENiCrMo-3 or ENiCrFe-3 (TNM-10, TGS-61 or TNC-70C, TGS-82) is adopted with the temperature above 150℃.

Your Perfect Welding Solutions

TIENTAI ELECTRODE CO., LTD.



Application	Steel	Weld method	TIENTAI Products	AWS SPEC.
	SA213 TP304 TP304H SA312 TP304 TP304L			
	SA213 TP316/316L SA312 TP316/316L			A5.9 ER-316/316L A5.22 R-316LT1-5
	SA213 TP321 , 347 SA312 TP321 , 347			A5.9 ER-347 A5.22 R-347T1-5
	P1×P8 (			A5.9 ER-309/309L A5.22 R-309LT1-5

Your Perfect Welding Solutions

TIENTAI ELECTRODE CO., LTD.

Application		Base Metal	Weld Method	TIENTAI Products	Application
Chimney	Outer	SA36			hr.A8
	Inner	SA588	tEhi hsAG	5A176AG1A3hPi -Ay	
Flux Duct F.G.D		SA36 SA516 Gr.70			
		C276			
By pass		SA240 Type 321	hSAG1-ghS8	SA61-gh884G5-gh884 5	
Steel Fabrication		SA36, A572 Gr.50			
Pipeline		SA178C, SA106 B, C SA105 SA515Gr.70 SA234WPB, WPC SA210A-1,C SA672 B60, B70			
		SA209T1			
High-pressure Steam Pipe		SA213T1A 1/2			
		SA213T1A 1/2			
Boiler		SA213T1A 1/2			
		SA213T1A 1/2			

Your Perfect Welding Solutions

TIENTAI ELECTRODE CO., LTD.

# Power Plant

## Typical chemical composition of weld metal (wt%)

Product Name		C	Si	Mn	Cr	Mo	P	S	Other
TL-50		0.08	0.50	1.1	-	-	0.020	0.006	-
TL-78A1		0.06	0.40	0.75	-	0.55	0.02	0.007	-
TLH-88B2		0.074	0.18	0.55	1.2	0.50	0.010	0.005	-
TLH-98B3		0.092	0.25	0.74	2.20	1.00	0.011	0.007	-
TLH-88B2P		0.085	0.17	0.61	1.22	0.53	0.009	0.005	-
TLH-98B3P		0.092	0.27	0.73	2.22	0.98	0.009	0.007	-
TL-96B9		0.085	0.25	0.7	9.0	1.00	0.01	0.009	Nb:0.4,V:0.20,N:0.05
TWE-711		0.05	0.55	1.45	-	-	0.015	0.008	-
TWE-811B2		0.06	0.42	0.85	1.17	0.55	0.014	0.008	-
TWE-911B3		0.06	0.45	0.78	2.27	1.10	0.016	0.011	-
TWE-81W2		0.03	0.57	1.15	0.60	-	0.015	0.007	Cu:0.45
TGA-50		0.085	0.85	1.50	-	-	0.015	0.005	Ti: Bal.
TGA-52		0.040	0.46	1.21	0.022	0.001	0.01	0.008	Ni:0.032,V:0.003, Al:0.083,Ti:0.101, Zr:0.039
Product Name	Wire	C	Si	Mn	Ni	Mo	P	S	Other
TF-385	TSW-12KM	0.06	0.6	1.4	-	-	<0.035	<0.02	-
	TSW-12KH	0.06	0.7	1.8	-	-	<0.03	<0.02	-
	TSW-E12	0.05	0.7	1.5	-	0.43	<0.03	<0.02	-
TF-565	TSW-12KM	0.06	0.4	1.7	-	-	0.03	<0.02	-
	TSW-12KH	0.05	0.4	2.0	-	-	<0.03	<0.02	-
	TSW-E12	0.06	0.29	1.6	-	0.45	<0.03	<0.02	-
TFS-340	TW-61	0.02	0.36	0.07	63.0	8.85	0.004	0.007	Co:0.03,Fe:2.9,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	Co:0.07,Fe:7.23 W:3.78,Fe:7.23,Cr:15.0
Product Name		C	Si	Mn	Cr	Mo	P	S	Other
TGFA-308L		0.02	0.4	1.40	20.20	-	0.022	0.008	Ni:10.30
TGFA-309L		0.022	0.35	1.45	23.26	-	0.024	0.009	-
TGFA-316L		0.027	0.52	1.35	18.56	2.30	0.023	0.007	Ni:12.50
TGFA-347		0.024	0.5	1.53	20.00	-	0.024	0.006	Nb:0.63,Ni:10.22

Your Perfect Welding Solutions

**TIENTAI ELECTRODE CO., LTD.**

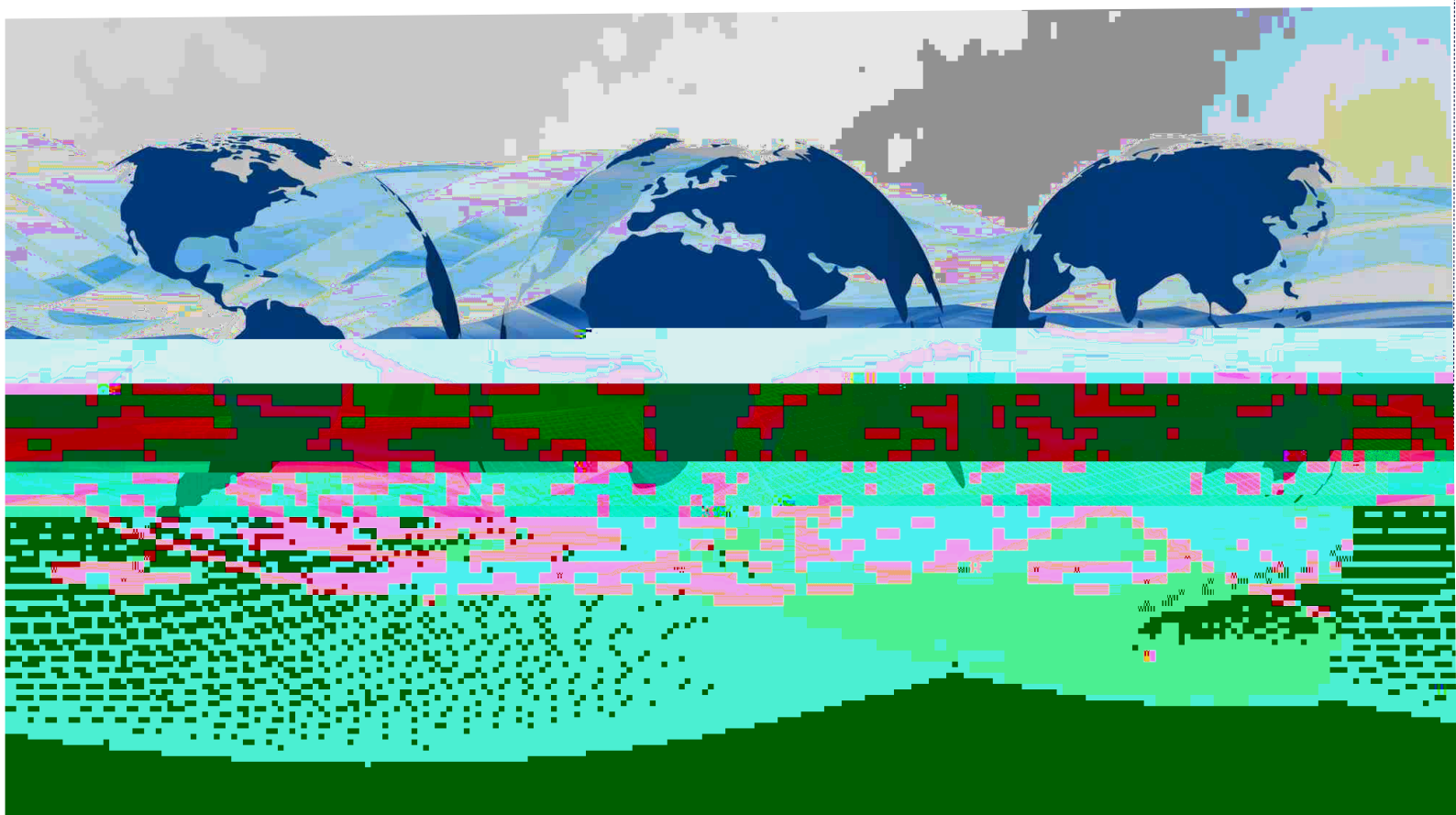




///TW



ANVILLO 2015 Xcel 1000



## Head Office

TienTai Electrode Co., Ltd.

No.6, Kaifa 4th Rd., Rende Township,  
Tainan County 717, Taiwan.

Tel: 886-6-2663721 / Fax: 886-6-2664301

<http://www.tientai.com>

E Mail: [ttrad@mail.tientai.com.tw](mailto:ttrad@mail.tientai.com.tw)

Business Contact 

TIENTAI ELECTRODE CO., LTD.

*All data of our products in this brochure are upon careful investigation and intensive research. However, we do not assume any liability for their correctness, please contact our staff before adoption.*

PRINTED: 08.2012