

Welding Consumables in Industry

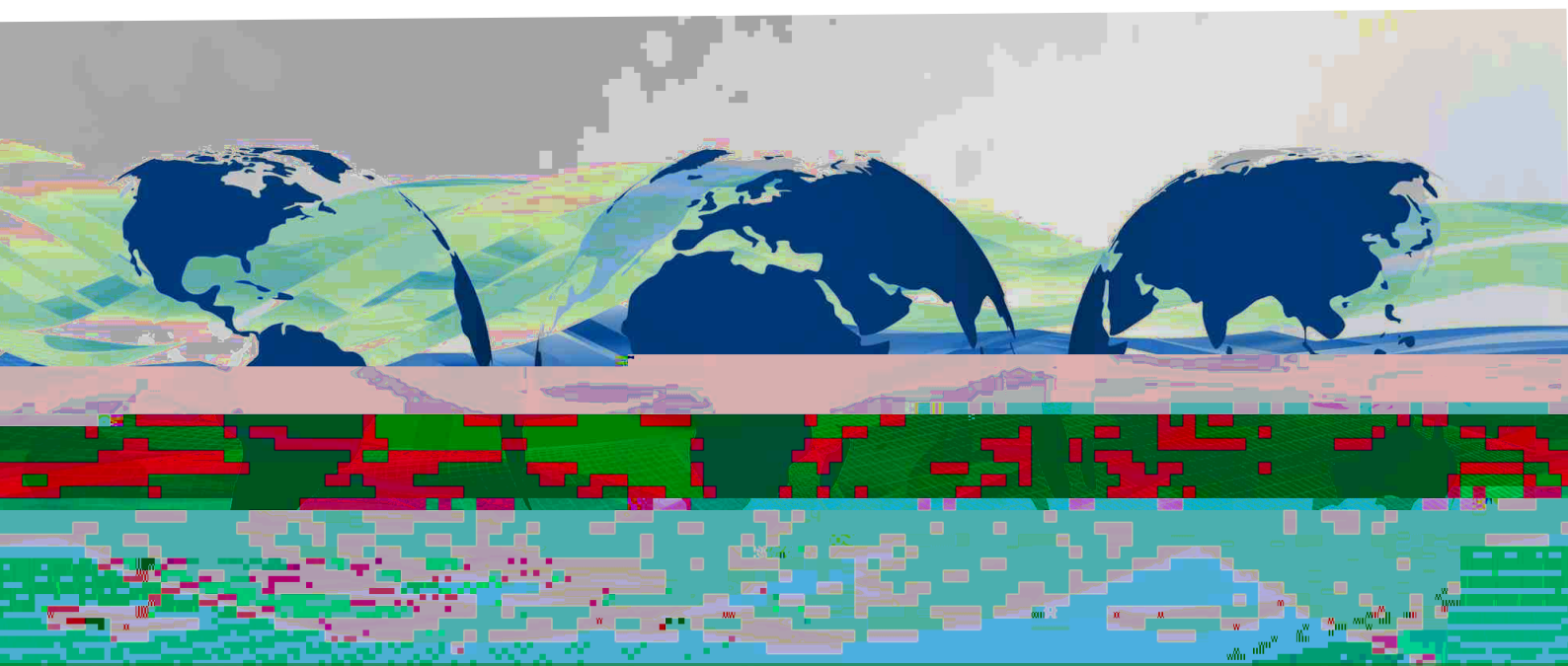
Offshore



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.

Offshore



List of welding consumables for offshore construction

- This list helps readers select the welding consumables for offshore construction. The consumers, however, must confirm if the product meet all their working requirements, which include related regulations and others, before using. The impact value is mean index form three test pieces, and yielding strength contains yielding point and 0.2% ranges.
- The selection of DC polarity should obey the instruction.

Base Metal	Welding process	TienTai Brand	AWS spec.
AH32, DH32, EH32 AH36, DH36, EH36 API 2H Gr.50 API 5LX52 ASTMA572 Gr.50 ASTMA537 CI 1	SMAW	TL-508 TL-581	E7018 E7018-1
	FCAW	TWE-711 TWE-711Ni	E71T-1C E71T-1CJ/9CJ
	GTAW	TGA-50	ER70S-G
	SAW	TF-210/TSW-12KH TF-565/TSW-12KM	F7A8/P8-EH12K F7A4-EM12K
ASTMA537 C12 WEL-TEN60 NVE 40S HT-60	SMAW	TL-60	E8016-G
	FCAW	TWE-81K2 TWE-811Ni2	E81T1-K2 E81T1-Ni2
	GTAW	TGA-80	ER80S-G
	SAW	TF-210/TSW-E12 TF-210/TSW-E40 TF-585/TSW-60G	F8A6-EA2-A2 F8A8/P8-EG-G F8A4-EG-G

- 40<t≤63.5mm AW, -10℃ δ ≥0.35mm; t>63.5mm, PWHT, -10℃ δ ≥0.25mm (δ c indicate CTODvalue) .
- Primary structure t≥40mm, Secondary structure t≥50mm PWHT required, and Hardness at HAZ should be less Hv280.
- Diffusion hydrogen less 10ml/100g.
- We got CTOD approvals for these two grades.
- 48/34 indicates average value minimum 48J, each can less 48J, but not less 34J.
- This product we can get average value minimum 34J, each can less 34J, but not less 27J at -40℃.
- The leg of jack-up rig has heavy section, for racks uses HT-80 steels.

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AH32, DH32, EH32 AH36, DH36, EH36 API 2H Gr.50 API 5LX52 ASTMA572 Gr.50 ASTMA537 CI 1	SMAW	TL-508 TL-581	E7018 E7018-1
	FCAW	TWE-711 TWE-711Ni	E71T-1 E71T-1MJ
A106Gr. B	GTAW	TGA-52	ER70S-2
	SMAW	TL-501 TL-581	E7016-1 E7018-1
A333 Gr. 6	GTAW	TGA-56	ER70S-6
	SMAW	TL-60	E8016-G
Duplex stainless steel	22%Cr	GTAW	TGA-2209
		SMAW	TS-2209
Inconel 625 Incoloy 825 254 SMO	GTAW	TGS-61	ERNiCrMo-3
	SMAW	TNM-10	ENiCrMo-3

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Typical chemical composition of weld metal (wt%)

TWE-711	0.05	0.55	1.45	-	-	0.015	0.008	-
ArcStar T9	0.05	0.51	1.35	-	-	0.015	0.005	-
TWE-711Ni	0.05	0.43	1.35	0.45	-	0.018	0.009	-
TWE-811Ni1	0.05	0.55	1.25	1.00	0.28	0.018	0.006	-
TWE-811Ni2	0.05	0.40	1.10	2.55	-	0.016	0.008	-
TWE-81K2	0.04	0.45	1.35	1.60	-	0.016	0.008	-
TLH-581	0.06	0.50	1.40	-	-	0.02	0.004	-
TLH-581R	0.06	0.45	1.20	-	-	0.02	0.005	-

Typical mechanical properties of weld metal:

TWE-711	530	580	29	100	-20	-	
ArcStar T9	565	615	28	70	-40	-	
TWE-711Ni	515	575	29	80	-40	-	
TWE-811Ni1	540	620	26	50	-30	-	
TWE-811Ni2	540	630	26	50	-40	-	
TWE-81K2	580	640	27	50	-60	-	
TLH-581	500	580	30	98	-45	-	
TLH-581R	470	580	29	90	-45	-	
TF-210	TSW-12KH	463	557	34	181	-50	-
					115	-60	-
		407	517	34	158	-50	620°C*8hr
					148	-60	
	TSW-12KM	414	493	38	190	-50	-
	TSW-E12	498	573	28	167	-40	-
					130	-50	
	TSW-E13	656	670	25	90	-40	-
	TSW-E40	549	628	26	90	-60	-
	TSW-E32	484	563	32	63	-70	-
	TSW-E41	655	716	26	59	-50	AW
571		644	29	76	-40	620°C*1hr	
SubCor M13K mod.	476	556	28	126	-60	AW	
TF-565	TSW-12KM	460	530	33	40	-40	-
					65	-30	-
	TSW-12KH	508	600	31	32	-50	AW
	TSW-E12	546	614	26	60	-30	AW

The Portfolio of Brands



