

Welding Consumables in Industry

Storage Tank



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.

Storage Tank



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



Steels which have been used under ambient temperature are usually called low temperature service steel. Main applications are storage and transportation vessel for liquefied gases. To maintain gases at the liquefied state, the easy way is to decrease temperature. It is understandable that storage vessel as well as the other auxiliary machinery should be ready for low temperature service.

Other applications including chemical plants, ships, pipelines and offshore structures match with different low temperature service steels per service requirement.

The quality requirement of weld joints for low temperature service steels is higher than ambient temperature weld joints, especially in the low temperature toughness.

The graph below shows different boiling point of liquefied gases and their applicable steels.

Your Perfect Welding Solutions

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



Typical chemical composition of weld metal (wt%)

Product Name		C	Si	Mn	Ni	Mo	P	S	Other
TNM-9		0.03	0.43	2.50	69.9	7.0	-	-	Cr:13.43,Nb:1.30, Fe:4.0,Mo:7.0,W:1.50
FabStar 721		0.05	0.43	2.50	-	0.18	0.015	0.007	-
FabStar 80G		0.06	0.35	1.60	-	0.22	0.017	0.006	-
Product Name	Wire	C	Si	Mn	Ni	Mo	P	S	Other
TF-565	SubCor M13K	0.05	0.27	1.60	-	-	0.025	0.008	-
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-303	TW-61	0.018	0.65	0.05	62.8	8.70	0.006	0.003	Fe:3.40,Ti:0.07 Al:0.017,Nb:2.73 Co:0.03
	TW-17	0.007	0.04	0.50	57.8	15.5	0.003	0.002	Fe:5.70,V:0.01 W:3.4, Co:0.05
TFS-340	TW-61	0.02	0.36	0.07	63.0	8.85	0.004	0.007	Cr:21.3,V:0.02,Co:0.03, W:0.01,Fe:2.92, Ti:0.11,Al:0.06,Nb:3.18
	TW-17	0.02	0.26	0.47	57.8	15.1	0.008	0.006	Cr:15.0,V:0.03,Co:0.07, W:3.78,Fe:7.23, Ti:0.03,Al:0.03,Nb:0.08

Typical mechanical properties of weld metal:

Product Name		Yield Stress (N/mm ²)	Tensile Strength (kgf/mm ²)	Elongation (%)	Charpy V-Nothch (J)	Temperature (°C)	PWHT
TNM-9		-	700	43	70	-196	-
FabStar 721		470	575	25	50	-30	-
FabStar 80G		480	630	24	55	-20	-
Product Name	Wire	Yield Stress (N/mm ²)	Tensile Strength (kgf/mm ²)	Elongation (%)	Charpy V-Nothch (J)	Temperature (°C)	PWHT
TF-565	SubCor M13K	450	515	34	60	-50	-
TF-565	TSW-12KM	460	530	30	65	-30	-
	TSW-12KH	508	600	31	32	-50	AW
	TSW-E12	546	614	26	60	-30	AW
TFS-303	TW-61	470	700	35	70	-196	AW
	TW-17	470	710	40	75	-196	AW
TFS-340	TW-61	503	754	46	67	-196	AW
	TW-17	490	706	32	57	-196	AW

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Base materials / suggested welding consumables guide for tank construction						
	Name	Typical		Elong %	ISO-V J	°C
		Tensile N/mm2	Yield N/mm2			
1	12Ni19	540	420	25	47	-110
2	X8Ni9	700	490	22	47	-110/ -196
3	TEST-620	750	620	15	27	-40
4	P355 QL1	490-630	355	22	27	-40
	P355 QL2					-60
5	TEST-690	770	700	14	35	-40
6	P500 QL1	500-700	500	17	27	-40
7	A 537 C12	550	415	22	47	-50
8	A 738 GrB	585-705	420	20	27	-20
9	A 333 Gr6	415	240	17	27	-40
10	X6CrNiTi18 9	500	205	35	55	-100
11	13Mn Ni6-3	540	360	22	27	-60
12	NV 4-4L	490 min	355	21	27	-60
13	NV-2-4L	400 min	265	24	27	-55
14	A316LN	550 min	280	35	47	-110
15	A240 Type 304L mod	550 min	240	--	27	-196
16	304N	630	290	--	47	-196
17	3.5%Ni	540	420	25	47	-110

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Base materials / suggested welding consumables guide for tank construction

Welding processes

GTAW	SMAW	FCAW	SAW
TGA-61 (ERNiCrMo-3) TGA-17 (ERNiCrMo-4)	TNM-9 (ENiCrMo-6)	--	TFS-303*TW-17 TFS-340*TW-17 (ERNiCrMo-4)
TGA-61 (ERNiCrMo-3) TGA-17 (ERNiCrMo-4)	TNM-9 (ENiCrMo-6)	--	TFS-303*TW-17 TFS-340*TW-17 (ERNiCrMo-4)
--	TL-118G (E11018-G)	TWE-111K3 (E111T1-K3)	TF-210*TSW-E5G (F11A6-EG-G)
--	TL-508 (E7018)	TWE-711Ni (E71T-9C)	TF-565*TSW-12KM (F7A4-EM12K)
--	TN-28 (E8018-C1)	TWE-81K2 (E81T1-K2)	TF-210*TSW-12KH (F7A8-EH12K)
--	TL-118G (E11018-G)	TWE-111K3 (E111T1-K3)	TF-210*TSW-E5G (F11A6-EG-G)
--	TN-18 (E7018-G)	TWE-81K2 (E81T1-K2)	TF-210*TSW-E12 (F8A6-EA2-A2)
--	TN-28 (E8018-C1)	TWE-81K2 (E81T1-K2)	TF-210*TSW-E40 (F8A8-EG-G)
--	TL-108G (E10018-G)	TWE-101K3 (E101T1-K3)	TF-210*TSW-E41 (F9A6-EF3-F3)
TGA-50 (ER-70S-G)	--	--	--
TGA-347(ER347) TGA-318(ER318)	--	--	--
--	TN-28 (E8018-C1)	TWE-81K2 (E81T1-K2)	TF-210*TSW-E32 (F8A10-ENi21-Ni2)
--	TN-28 (E8018-C1)	TWE-81K2 (E81T1-K2)	TF-210*TSW-E31 (F7A8-ENi1-Ni1)
--	TN-28 (E8018-C1)	TWE-81K2 (E81T1-K2)	TF-210*TSW-E31 (F7A8-ENi1-Ni1)
--	TS-316LMn (E316LMn-15)	--	--
--	TS-308LB (E308L-15)	TFW-308L (E308LT1-1)	TFS-300*TW-308L (ER308L)
--	TS-316LMn (E316LMn-15)	--	--
--	TNM-9	--	TFS-340*TW-17 (ERNiCrMo-4)

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The Portfolio of Brands





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