

## Titanium and Titanium alloy product

### Titanium sheet

Material	Production	Condition	Specification
			Thickness×Width×Length mm
- Grade 1,2,3,4,7 - 6AL 4V - 6-6-2 - 6,2,4,2 - 5AL 2,5Sn - 8-1-1 - TA6 Z D - Ti 17 - 10-2-3 - TU2	Hot rolled	Hot rolled Condition(R) Anneal (M)	(4.1~60.0) × (400~3000) × (1000~4000)
	Cold rolled	Cold rolled Condition(Y) Anneal (M)	(0.3~4.0) × (400~1000) × (1000~3000)
TB2	Hot rolled	Quench (C)	(4.1~10.0) × (400~3000) × (1000~4000)
	Cold rolled	Quench (C)	(1.0~4.0) × (400~1000) × (1000~3000)

### Titanium foil and strip

Material	Name	Condition	Thickness×Width×Length mm
Grade 1,2,3,4,7 - 6AL 4V	Foil	Cold rolled (Y)  Anneal (M)	(0.01~0.02) × (30~100) × (>=500) (0.03~0.09) × (50~300) × (>=500)
	Strip		(0.10~0.30) × (50~300) × (>=500) (0.40~0.90) × (50~500) × (>=1000) (1.0~2.0) × (50~500) × (>=2000)

### Titanium bar

Material	Production	Condition	Diameter or length, mm
- Grade 1,2,3,4,7 - 6AL 4V - 6-6-2 - 6,2,4,2 - 5AL 2,5Sn - 8-1-1 - TA6 Z D - Ti 17 - 10-2-3 - TU2	(1) Hot forged, hot extrusion, hot rolled  (2) Hot forged +machined/grinded, hot extrusion+ machined/grinded, hot rolled + machined/grinded  (3) Cold rolled, hard-drawn	(1) Hot rolled (R)  (2) Cold rolled (Y)  (3) Anneal (M)	(1) Hot forged 8~200  (2) hot extrusion 15~80  (3) hot rolled 8~120  (4) Cold rolled, hard-drawn 8~20

### Titanium tube

Material	Condition	Condition	OD mm	Thickness, mm														
				0.2	0.3	0.5	0.6	0.8	1.0	1.25	1.5	2.0	2.5	3.0	3.5	4.0	4.5	
Grade 1,2,3,4,7  - 6AL 4V - 3AL2.5V	Anneal Condition (M)	Cold rolled 、hard-drawn	3~5	○	○	○	○	—	—	—	—	—	—	—	—	—	—	—
			>5~10	—	○	○	○	○	○	○	—	—	—	—	—	—	—	—
			>10~15	—	—	○	○	○	○	○	○	○	—	—	—	—	—	—
			>15~20	—	—	—	○	○	○	○	○	○	○	—	—	—	—	—
			>20~30	—	—	—	○	○	○	○	○	○	○	○	—	—	—	—
			>30~40	—	—	—	—	—	○	○	○	○	○	○	○	—	—	—
			>40~50	—	—	—	—	—	—	○	○	○	○	○	○	○	—	—
			>50~60	—	—	—	—	—	—	—	○	○	○	○	○	○	○	—
			>60~80	—	—	—	—	—	—	—	—	○	○	○	○	○	○	○
			>80~110	—	—	—	—	—	—	—	—	—	—	○	○	○	○	○
	Welding	Welding	16	—	—	○	○	○	○	—	—	—	—	—	—	—	—	
			19	—	—	○	○	○	○	○	—	—	—	—	—	—	—	
			25、27	—	—	○	○	○	○	○	○	—	—	—	—	—	—	
			31、32、33	—	—	—	—	○	○	○	○	○	—	—	—	—	—	
			38	—	—	—	—	—	—	—	○	○	○	—	—	—	—	
			50	—	—	—	—	—	—	—	—	○	○	—	—	—	—	
			63	—	—	—	—	—	—	—	—	—	○	○	—	—	—	
			Welding rolled	Welding rolled	6~10	—	—	○	○	○	○	○	—	—	—	—	—	—
					>10~15	—	—	○	○	○	○	○	○	—	—	—	—	—
					>15~20	—	—	○	○	○	○	○	○	○	—	—	—	—
>20~30	—	—			○	○	○	○	○	○	○	○	—	—	—			

**Titanium disk and ring**

Material	Condition	Name	Specification, mm			
			OD	ID	Height	Thickness
Grade 1,2,3,4,7  - 6AL4V  3AL2.5V	Hot rolled (R)	Disk	150~300	---	35~140	---
			>300~500	---	35~150	---
			>500~600	---	40~110	---
	Anneal (M)	Ring	200~400	100~300	35~120	40~150
			>400~700	150~500	40~160	40~250
			>700~900	300~700	50~180	40~300
			>900~1300	400~900	70~250	40~400

**Titanium wire**

Material	Condition	Dia mm
ERTi 1 ERTi 2 ERTi 3 ERTi 4	Anneal (M)	0.1~7.0
ERTi 5 ERTi 5 Eli ERTi-0.2 Pd ERTi-9	Process Condition (Y or R)	1.6~7.0

**Titanium casting**

Material	Condition
ZTi1、ZTi2、ZTi3	Casting (C)
ZTiAl4、ZTiAl5Sn2.5、ZTiAl6Sn4.5Nb2Mo1.5	relaxation of residual stress Anneal (M)
ZTiAl6V4、ZTiMo32	Hipping Condition (HIP)

Standards:

AWS A5.16, ASTM B 348,AMS 4928,ASTM B265,AMS 4911,ASTM F136,ASTM F67,ASTM B337,ASTM B338,etc.

## Ti Anodes







Adopting advanced coating technique, this Ti anode has the advantages of lower gas potential and longer passivation. Products as metal anodes coated with active layer, dissepimental metal anode electrolytic tank and Ti lining tank bottom to meet customers' demands.

Mash Anodes				
Coat			Applications	Service Time (year)
Model	Exhausting Potential (v)	Passivation Lifetime (minute)		
Ru-Ti	1.13	1000	Chloric Alkali	4-5
Ru-Ti-Sn	1.11	1400	Chloric Alkali,Potassium Chlorate	>7.3
Ru-Ti-Ir	1.11	4000	Water Processing	

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Plate Anodes				
Coat			Applications	Service Time (year)
Coat	Exhausting Potential (v)	Passivation Lifetime (minute)		
Ru-Ti-Sn	1.11	1400	Potassium Chlorate	3
Ru-Ti-Ir	1.11	4000	Potassium Chlorate	>3

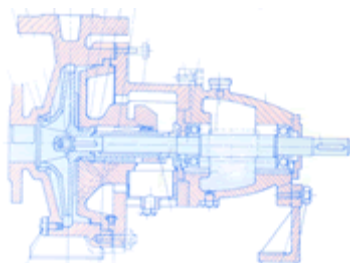
**Titanium fasteners**

D	L	Standard	picture
M4-M24	10-20	GB5785-86/GB5782-86/GB5783-86/ GB5784-86/GB21-76/GB30-76/	
M5-M10	10-100	GB65-85 »ðGB65-76	
M5-M10	10-100	GB65-85 »ðGB65-76	
M4-M24	10-120	GB5780-86 GB5781-86»ðGB5-76	
D	M	Standard	picture
M5-M24	4.4-22.3	GB41-86 »ðGB41-76	
D	M	Standard	picture
M5-M24	4.4-21.5	GB6170-86 GB6171-86»ðGB52-76	

We can also supply many kinds of other screws and bolts,including DIN933,DIN931,DIN934,DIN125,DIN912,DIN7991,DIN7992,etc.

**Ti Pumps**

Contacting liquid parts use Ti and Ti alloys,which is small proportion,high intensity and good comprehensive mechanical function as well as good corrosion resistance function.When the scope of temperature ranges is 6.3-400 m3/hour,the scope of head is 5-125.



**Technological Properties**

1. Corresponding to ISO2858, ISO30069 and ISO3661;
2. Transporting strongly corrosive liquid;
3. Rate of flow can reach 400 m<sup>3</sup>/hour;
4. Temperature ranges from "-45°C to -180°C;
5. Head can reach 125 m;
6. Outlet pressure not higher than 1.57 MPa;

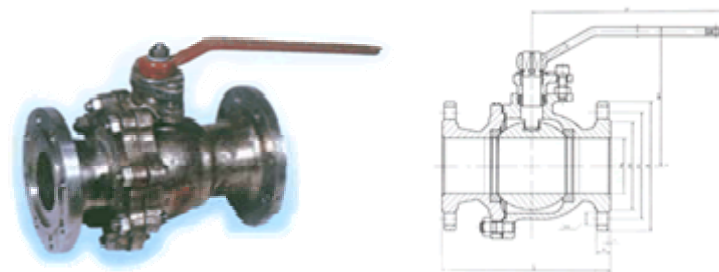
### Structure

**ITi Pumps:** single-stage-single-suction, horizontal centrifugal pumps, corresponding to ISO2858, ISO30069 and ISO3661, of which the main components include pump shell, pump casing, impeller, axis, etc. Making use of the structure of "back opening", makes it possible for a pump to be repaired without disassembling tube system and motors. Impeller is "closed" or "half-open", having auxiliary vanes, so as to balance axial force. Bearings are rolling ones, lubricated by olefine polymer oil. While transporting medium of high temperature and easy to crystallize, we can put steam into the empty heat exchanging cavity in the filling case and the back of the pump casing for the medium to maintain a certain temperature or put in water for the fillings to be cooled.

## Ti Valves

### Q41F series of Ti ball valves:

As on-off devices for controlling flow of medium, they apply to tubes of oxidative corrosive medium with working temperature ranging from -180°C to 150°C.



### Functions and Specifications

Nominal Pressure PN (MPa)	Seal Test Pressure P (MPa)	Strength Test Pressure Ps (MPa)
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1.6	1.6	2.4
2.5	2.5	3.75
4.0	4.0	6.0

**Structure**

- The valve is mainly made up of body, ball, stem, etc. Turn the handle, which moves the stem, to make the ball rotate by 90°, thus opening or closing the valve rapidly.
- Limit is designed for a valve to be correctly opened or closed.
- The ball valve is float type.
- This series of valves has bore DN15-DN100  
Ti globe valves J41F and J45F, with bore DN40-DN200.

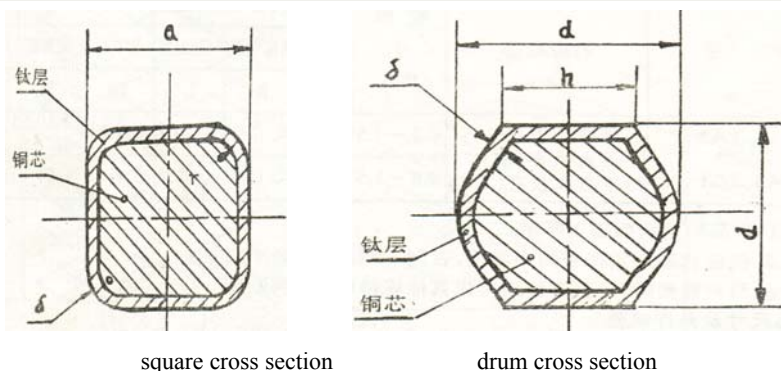
## Titanium-clad copper bar

**Types**

Designation, state and specification of products.

Designation		Supply state	Shape of cross section	specification,mm
Ti	Cu			$a \times a \times \delta$ or $d \times h \times \delta$
ZTA1	T1	Heat processing state(R)	Square	$24 \times 24 \times 2 \sim 5$
				$27 \times 27 \times 2 \sim 6.5$
				$29 \times 29 \times 2 \sim 7.5$
				$32 \times 32 \times 2 \sim 9$
ZTA2	T2	Cool processing state(Y)	Drum	$27 \times 14 \times 1.5$
				$29 \times 14 \times 1.5$
				$32 \times 14 \times 1.5$

- Sketch maps of square and drum cross sections are shown in fig.1 and fig.2
- Clad bars can meet the needs of other shapes and specifications by consent of both parties.



square cross section

drum cross section

**Dimension and deviation allowance of products**

1.Dimension and deviation allowance of products should agree with the specifications below.

Shape of cross section	specification: $a \times a \times \delta$ -r or $d \times h \times \delta$	deviation allowance					
		length of edge a or diameter d		thickness of Ti tier $\delta$ round and sharp angle not included		plane width h	
		heat processing	cool processing	heat processing	cool processing	heat processing	cool processing
Square	$24 \times 24 \times 2^{-5}$						
	$27 \times 27 \times 2^{-6.5}$						
	$29 \times 29 \times 2^{-7.5}$	$\pm 0.7$	$\pm 0.3$	$\pm 0.7$	$\pm 0.5$	-	-
	$32 \times 32 \times 2^{-9}$						
Drum	$27 \times 14 \times 1.5$	+0.9	+0.3	+0.9	$\pm 0.5$	+1.5	+1.0
	$29 \times 14 \times 1.5$	-0.5		-0.5		-1.0	0
	$32 \times 14 \times 1.5$						

2.The thickness of round and sharp angle of Ti tier must not be less than the minimum size specified above.

2.Cutting length tolerance of clad bars is +8mm.

3.Curvature of clad bars must not be more than 1.3mm/m; curl must not be more than 1mm/m.

**Technical specifications**

1. Chemical component of Cu must agree with the request of GB5231, while Ti must agree with the request of GB6614.
2. Clad bars must be tightly compounded, Ti and Cu must not be separated after the turning test.
3. Ultrasonic tests can be used to check clad bars if customers request and indicate in the contract, and the test must agree with the specifications of the standard appendix A.
4. Clad bars must have a clean surface and have no defects like cracks. Partial, tolerable nicks and raised or sunken dots are allowed. Partial defects on the surface are allowed to be cleaned up, as a result the bar must accord with the minimum size allowed.

Other non-ferrous metal products

牌号 Designation	钨 (Tungsten): W1, W2
	钼 (Molybdenum): Mo1, Mo2, Mo3G, TZM, MoW等
	钛 (Titanium): TA1, TA2, Ti-1023, Ti-15-3, Ti-15-5-3, TC4等
	钽 (Tantalum): Ta1, Ta2, FTa1, FTa2, Ta-10W, Ta-5W
	铌 (Niobium): Nb1, Nb2
	锆 (Zirconium): Zr, Zr0, Zr2
	镍 (Nickel): N2, N4, N6, NCu28-2.5-1.5, NS331, NS322, NS312等
规格 Size	δ (0.1~30)×(50~610)×L mm
供货标准 Delivery standard	钨板 (Tungsten sheets): GB 3875-83
	钼板 (Molybdenum sheets): GB 3876-83 Q/BS 2531-91
	钛板 (Titanium sheets): GB/T 3621-1994 钽板 (Tantalum sheets): GB 3629-83
	铌板 (Niobium sheets): GB 3630-83 镍板 (Nickel sheets): GB 2054-80

Simple version for above catalogue

<b>Ti Bars</b>	<p><b>SIZE</b> : TA0 ~ TA21 TC1 ~ TC20 TB1 ~ TB16 Gr1 ~ Gr12</p> <p><b>SIZE</b>: Drum, Round, Square, Hollow <math>\varnothing</math> (□) 8~350×≤2700</p> <p><b>STANDARD</b> : ASTM AMS ASME MIL JIS GB/T2965-96 GB/T13810-1997</p>
<b>Ti Tubes</b>	<p><b>SPEC</b>: TA0 ~ TA10 TA16 TA18 TA21 TC1 TC2</p> <p><b>SIZE</b>: <math>\varnothing</math> 3~15×0.2~2.0×≤11000 <math>\varnothing</math> 16 ~ 110×0.6 ~ 5.0×≤15000 <math>\varnothing</math> 25 ~ 210×4 ~ 30×≤15000</p> <p><b>STANDARD</b>: GB/T 3624-95 GB/T3625-95 ASTM B337 ASTM B338 (ASTM) GB2882-8 Q/BS5631-95</p>
<b>Ti -Cu clad material/base</b>	<p><b>SPEC</b>: ZTA1/T1 ZTA1/T2 ZTA2/T1 ZTA2/T2 ZTGr2/T1 ZTGr2/T2</p> <p><b>SIZE</b>: 24 ~ 40×24 ~ 102) ~ (10 ~ 32×13 ~</p>

	32)×1.0 9.0×L  <b>STANDARD:</b> GB/T12769-91	
<b>Ti Plates</b>	<b>SPEC:</b> TA0 ~ TA21 TC1 ~ TC20 TA1-A TB1 ~ TB9Ti-4Zr Gr1 ~ Gr12 Ti-4322  <b>SIZE:</b> $\varnothing$ 0.3 ~ 0.4×400 ~ 1200×1000 ~ 3000 ≥4.0×400 ~ 3000×1000 ~ 6000  <b>STANDARD :</b> ASTM AMS ASME MIL DMS JIS GB/T3621-94 GB/T14845-93 GB/T13810-1997	
<b>Ti Wires</b>	<b>SPEC:</b> TA0 ~ TA21 TB1 ~ TB6 TC1 ~ TC20 Gr1 ~ Gr12  <b>SIZE:</b> $\varnothing$ 1.0 ~ 10.0  <b>STANDARD :</b> GB/T3623-98 AWSA5.16 AMS  GB/T13810-1997	
<b>Ti Nets</b>	<b>SPEC:</b> TA1 TA2 TA3 TC1 Gr2  <b>SIZE:</b> 0.5 ~ 1.5×(12.5×40)×(4.5×14)×≤1200×≤1200×1.7  <b>STANDARD:</b> Q/BS5932-91	
<b>Ingots</b>	<b>Size</b>	Nominal dia.(mm) $\varnothing$ 290-800Weight (kg) 260-6000+-5%
	<b>Standard</b>	ASTM, AMS, DMS, JIS

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