



**宝鸡威尔钛业有限公司**

**BAOJI TITANIUM WIRE INDUSTRY CO., LTD.**



American Welding Society

**TITANIUM  
TITANIUM ALLOY  
WELDING WIRE**





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## TITANIUM TITANIUM ALLOY WELDING WIRE

Titanium offers similar strength of steel but is two times lighter and offers a amazing corrosion resistance. Grade 1 is the most pure type and is mostly welded with Grade 2 filler metal. The weld ability of Titanium is excellent for most grades but extra care have to be taken for the gas protection on the weld pool, the weld pool needs to stay protected until it cooled down to at least 470°C. Often Titanium is welded in a gas chamber with pure argon gas to make sure that the weld pool gets proper protection.

Material: Titanium or Titanium Alloy.

Grade: Commercial Pure Ti: ERTi-1, ERTi-2, ERTi-3, ERTi-4

ERTi-5 Ti-6Al-4V

ERTi-7 Ti-0.2Pb

ERTi-9 Ti-3Al-2.5V

ERTi-12 Ti-0.3Mo-0.8Ni

ERTi-23 Ti-6Al-4V ELI

Standards: AWS A5.16, ASTM B863, ASTM F67, ASTM F136

Shape: Straight, in spool or coil.

- Spool Dia.: 100mm - 300mm (3.9" - 12")

- Straight Length: 300mm - 3000mm (12" - 118")

- Coil Weight: 50kgs - 55kgs (110.23 - 121.45 lbs)



American Welding Society



## TITANIUM/TITANIUM ALLOY WELDING WIRE

GRADE	SPECIFICATIONS		
	AWS A5.16	ASTM B863	AMS
Commercial Pure Titanium	ERTi-1,2,3,4	ASTM B863 Gr1,2,3,4 ASTM F67 Gr1,2,3,4	AMS 4951 AMS 4921
Ti 6Al-4V	ERTi-5	ASTM B863 Gr5	AMS 4954
Ti 6Al-4V Eli	ERTi-5 Eli	ASTM B863 Gr23 ASTM F136 Eli	AMS 4956
Ti (0.12~0.25)Pd	ERTi-7	ASTM B863 Gr7	----
Ti 3Al-2.5V	ERTi-9	ASTM B863 Gr9	----
Ti 0.3Mo-0.8Ni	ERTi-12	ASTM B863 Gr12	----
Al5.5-6.5, V3.5-5.5	ERTi-23	ASTM B863 Gr23	----

### Product Specification:

**Diameter:** 0.15-6.0mm

**Shape:** Straight, in coil or spool

**Surface Treatment:** Polished, Pickled, Peeled

**Grade Status:** ERTi-1, ERTi-2, ERTi-3, ERTi-4, ERTi-5 (Ti-6Al-4V), ERTi-7(Ti-0.2Pb),  
ERTi-9(Ti-3Al-2.5V), ERTi-12(Ti-0.3Mo-0.8Ni), ERTi-23(Ti-6Al-4V ELI)

**Standard:** AWS A5.16, ASTM B863, AMS 4951H

**Product Status:** Heat processing(R)

┆ Cold processing(Y)

┆ Annealed(M)

**Application:** Electrode materials, fasteners, welding materials, medical field, surgical implants, chemical industry, structural parts, glasses, jewelry, aerospace and marine, consumer and architectural, nuclear waste storage, etc.



## TITANIUM/TITANIUM ALLOY WELDING WIRE

### Mechanical Property

AWS Classification	Tensile Strength(min)		Yield Strength(min)		Elongation(%)
	ksi	MPa	ksi	MPa	
ERTi-1	35	240	20	138	20
ERTi-2	50	345	40	275	18
ERTi-3	65	450	55	380	18
ERTi-4	80	550	70	483	15
ERTi-5	130	895	120	828	10
ERTi-7	50	345	40	275	18
ERTi-9	90	620	70	483	15
ERTi-12	70	483	50	345	18
ERTi-23	120	828	110	759	10

### Chemical Composition

AWS A5.16	N	C	H	Fe	O	Al	V	Pd	Mo	Ni	Ti
ERTi-1	0.012	0.03	0.005	0.08	0.03-0.10	/	/	/	/	/	Bal
ERTi-2	0.015	0.03	0.008	0.12	0.08-0.16	/	/	/	/	/	Bal
ERTi-3	0.02	0.03	0.008	0.16	0.13-0.20	/	/	/	/	/	Bal
ERTi-4	0.025	0.03	0.008	0.25	0.18-0.32	/	/	/	/	/	Bal
ERTi-5	0.03	0.05	0.015	0.22	0.12-0.20	5.5-6.75	3.5-4.5	/	/	/	Bal
ERTi-7	0.015	0.03	0.008	0.12	0.08-0.16	/	/	0.12-0.25	/	/	Bal
ERTi-9	0.012	0.03	0.005	0.20	0.06-0.12	2.5-3.5	2.0-3.0	/	/	/	Bal
ERTi-12	0.015	0.03	0.008	0.15	0.08-0.16	/	/	/	0.2-0.4	0.6-0.9	Bal
ERTi-23	0.012	0.03	0.005	0.20	0.03-0.11	5.5-6.50	3.5-4.5	/	/	/	Bal



# TITANIUM WELDING WIRE

## ER Ti-1

<b>Category</b>	BTWI-BPTW Solid wires
<b>Type</b>	Solid Titanium welding wire Grade 1 (purest grade)
<b>Applications</b>	ERTi-1. Grade 1 is the lowest strength unalloyed (or Commercially Pure — CP) grade. Grade 1 is used in applications where ductility is paramount, such as explosive cladding, loose linings, expanded metal, and deep drawing applications. It is also used in electrolytic applications like coated anode substrates for production of chlorine and sodium chlorate.
<b>Properties</b>	The weld deposit is ductile and offers excellent corrosion resistance in oxidizing environments. The purity and corrosion resistance makes the alloy a preferred choice in many applications to prevent or solve problems. The wire is cleaned in a very special way to obtain porosity free and a ductile weld deposits.
<b>Classification</b>	AWS A 5.16: ER Ti 1 UNS: R50100
<b>Suitable for</b>	ER Ti-1 is the purest grade and is suitable for welding Titanium grade 1, 2, 3 and 4. With the restriction that the mechanical properties are much less than Grade 2, 3 and 4. The weld deposit is ductile and offers excellent corrosion resistance in oxidizing environments. This alloy finds his applications in chemical industry and offers excellent Weldability.

**Welding positions:**



### Weld deposit weight %

C	O	N	H	Fe	Al	V	Pd
< 0.03	0.03 - 0.10	< 0.012	< 0.005	< 0.08	--	--	--

### Mechanical properties

Heat Treatment	RPO,2 (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A5 (%)	Impact Energy (J) ISO-V			Hardness HRc / HV
				-20°C	-40°C	-60°C	
as welded	250	320	--	--	--	--	--

### welding parameters / packing

Welding Parameters			Packing
Dia. (mm)	Length (mm)	Current (A)	kg / tube
1.0	1000		5
1.2	1000		5
1.6	1000		5
2.0	1000		5
2.4	1000		5
3.0	1000		5
3.2	1000		5
3.5	1000		5
4.0	1000		5
4.5	1000		5
5.0	1000		5
6.0	1000		5

Note: Also available as spooled wire :0.8 mm, 1.0 mm and 1.2 mm (D-100 / D-200 / D-300)

## TITANIUM WELDING WIRE

### ER Ti-2

**Category** BTWI-BPTW Solid wires

**Type** Solid Titanium welding wire

**Applications** ER Ti-2 is developed for welding Titanium grade 1, 2, 3 and 4. This alloy finds his applications in chemical industry and offers excellent Weldability.

**Properties** The weld deposit is ductile and offers excellent corrosion resistance in oxidizing environments. The unique combination of mechanical strenght and corrosion resistance makes the alloy a preferred choice in many applications to preferend or solve problems. The wire is cleaned in a very special way to obtain porosity free and a ductile weld deposit.

**Classification** AWS A 5.16: ER Ti 2

EN ISO 24034: S Ti 0120 (Ti 99,6)

**Suitable for** Titanium grade 1, 2, 3 and 4.

**Welding positions:**



**Weld deposit weight %**

C	O	N	H	Fe	Ti
< 0.08	< 0.25	< 0.18	< 0.013	< 0.05	rem

**Mechanical properties**

Heat Treatment	RPO,2 (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A5 (%)	Impact Energy (J) ISO-V			Hardness HRC / HV
				-20°C	-40°C	-60°C	
AW	275	395-540	20	--	--	--	--

**Welding parameters / packing**

Welding Parameters			Packing
Dia. (mm)	Length (mm)	Current (A)	kg / tube
1.0	914-1000mm		5kgs
1.2	914-2000mm		5-10kgs
1.6	914-2000mm		5-10kgs
2.0	914-2000mm		5-10kgs
2.4	914-2000mm		5-15kgs
3.0	914-2000mm		5-15kgs
3.2	914-2000mm		5-15kgs
3.5	914-2000mm		5-15kgs
4.0	914-2000mm		5-15kgs
4.5	914-2000mm		5-15kgs
5.0	914-2000mm		5-15kgs
6.0	914-2000mm		5-15kgs

Note: Also available as spooled wire :0.8 mm, 1.0 mm and 1.2 mm (D-100 / D-200 / D-300)

## TITANIUM ALLOY WELDING WIRE

### ER Ti-5

**Category** BTWI-BPTW Solid wires

**Type** Solid Titanium based welding wire (Grade 5) with extreme high strength.

**Applications** Aerospace, marine, chemical plants, process plants, power generation, oil and gas extraction, medical and sports.

**Properties** Excellent weldability, and can be heat treated to a higher strength or toughness. Grade 5 is used in aircraft components such as landing gear, wing spars, and compressor blades. Its corrosion resistance is generally comparable to Grade 2 and it is often used in corrosion service where higher strength is required, particularly in shafts, high strength bolting, and keys.

The weld deposit is ductile and offers excellent corrosion resistance in oxidizing environments. The unique combination of mechanical strength and corrosion resistance makes the alloy a preferred choice in many applications to prevent or solve problems. The wire is cleaned in a very special way to obtain porosity free and a ductile weld deposit.

**Classification** AWS A 5.16: ER Ti 5

UNS: R56400

**Suitable for** Titanium grade 5, UNS R56400, AMS 4954

**Welding positions:**



### Weld deposit weight %

C	O	N	H	Fe	Al	V	Pd
< 0.05	0.12 - 0.20	< 0.03	< 0.015	< 0.22	5.5 - 6.7	3.5 - 4.5	--

### Mechanical properties

Heat Treatment	RPO,2 (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A5 (%)	Impact Energy (J) ISO-V			Hardness HRc / HV
				-20°C	-40°C	-60°C	
	>890	>810	--	--	--	--	--

### Welding parameters / packing

Welding Parameters			Packing
Dia. (mm)	Length (mm)	Current (A)	kg / tube
1.6	914 -1000mm		5
2.0	914 -1000mm		5
2.4	914 -1000mm		5
3.0	914 -1000mm		5
3.2	914 -1000mm		5
3.5	914 -1000mm		5
4.0	914 -1000mm		5

Note: Also available as spooled wire :0.8 mm, 1.0 mm and 1.2 mm (D-100 / D-200 / D-300)

## TITANIUM ALLOY WELDING WIRE

### ER Ti-7

**Category** BTWI-BPTW Solid wires

**Type** Solid drawn Titanium Grade 7 welding wire

**Applications** Grade 7 has the same mechanical properties as Grade 2. The 0.12 wt% palladium addition improves corrosion performance under mildly reducing conditions or where crevice or under-deposit corrosion is a problem. ERTi-7 can be considered for welding Grade 2 or 16 where improved corrosion performance is desired.

**Properties** The weld deposit is ductile and offers excellent corrosion resistance in oxidizing environments. The unique combination of mechanical strength and corrosion resistance makes the alloy a preferred choice in many applications to prevent or solve problems. The wire is cleaned in a very special way to obtain porosity free and a ductile weld deposit.

**Classification** AWS A 5.16: ER Ti 7

UNS: R52401

**Suitable for** Titanium grade 7, Grade 2, Grade 16

**Welding positions:**



### Weld deposit weight %

C	O	N	H	Fe	Al	V	Pd
< 0.03	0.08 - 0.16	< 0.015	< 0.008	< 0.12	-	-	0.12 - 0.25

### Mechanical properties

Heat Treatment	RPO,2 (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A5 (%)	Impact Energy (J) ISO-V			Hardness HRc / HV
				-20°C	-40°C	-60°C	
as welded	275	400	20	--	--	--	--

Redrying temperature not required

### Welding parameters / packing

Welding Parameters			Packing
Dia. (mm)	Length (mm)	Current (A)	kg / tube
1.0	914 -1000mm		5
1.2	914 -1000mm		5
1.6	914 -1000mm		5
2.0	914 -1000mm		5
2.4	914 -1000mm		5
3.2	914 -1000mm		5
4.0	914 -1000mm		5

Note: Also available as spooled wire :0.8 mm, 1.0 mm and 1.2 mm (D-100 / D-200 / D-300)



## TITANIUM ALLOY WELDING WIRE

### ER Ti-12

**Category** BTWI-BPTW Solid wires

**Type** Solid drawn Titanium Grade 12 welding wire

**Applications** This alloy finds his applications in chemical industry and offers excellent Weldability. Often recommended for pressure vessels and piping for its superior strength alone.

**Properties** ER Ti-12. Grade 12 (Ti 0.8Ni0.3Mo) is an intermediate strength grade originally developed to provide enhanced crevice-corrosion resistance in high temperature brines, but at lower cost than Grade 7. The improved performance is believed to be the result of Ni<sup>++</sup> and Mo<sup>++</sup> ions that alter the surface electrochemistry of the material in the crevice or under a surface deposit. Grade 12 has better elevated temperature properties than Grade 2 or 3 and is sometimes specified for pressure vessels or piping for its superior strength alone.

**Classification** AWS A 5.16: ER Ti - 12

UNS: R53401

**Suitable for** Titanium grade 12, Grade 7, Grade 2 and Grade 3

**Welding positions:**



### Weld deposit weight %

C	O	N	H	Fe	Al	V	Pd	Mo	Ni
< 0.03	0.08 - 0.16	< 0.015	< 0.008	< 0.15	--	--	--	0.2 - 0.4	0.6 - 0.9

### Mechanical properties

Heat Treatment	RP0,2 (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A5 (%)	Impact Energy (J) ISO-V			Hardness HRc / HV
				-20°C	-40°C	-60°C	
as welded	345	483	--	--	--	--	--

Redrying temperature not required

### welding parameters / packing

Welding Parameters			Packing
Dia. (mm)	Length (mm)	Current (A)	kg / tube
1.2	914 - 1000mm		5
1.6	914 - 1000mm		5
2.0	914 - 1000mm		5
2.4	914 - 1000mm		5
3.2	914 - 1000mm		5
4.0	914 - 1000mm		5

Note: Also available as spooled wire :0.8 mm, 1.0 mm and 1.2 mm (D-100 / D-200 / D-300)



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## TITANIUM/TITANIUM ALLOY WELDING WIRE

**Annual Capability:** 600 Metric Tons

**Packing:**

- ┌ **Straight:** sealed with plastic bag in plastic box + plywood case
- ┌ **In Coil:** protected by foam paper+ plywood case
- ┌ **In spool:** carton box + plywood case
- ┌ As per customer's requirement

**Delivery Time:** 5-15 days

**Shipping:** By International Express(TNT, FEDEX, DHL, UPS, etc.)  
By Air, By Sea

**Trade Terms:** FOB China, C&F, CIF

**Payment Terms:** T/T, L/C, PayPal, Western Union





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# **TITANIUM WELDING WIRES & RODS**

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