



宝鸡威尔钛业有限公司

BAOJI TITANIUM WIRE INDUSTRY CO., LTD.



American Welding Society

**TITANIUM
ZIRCONIUM
WELDING WIRES & RODS**





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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.

Zirconium often is chosen for its resistance to corrosion from most organic and inorganic acids, salt solutions, strong alkalis, and some molten salts. It is especially suitable in many sulfuric, nitric, hydrochloric, and acetic acid applications. Backup Shielding. Backup shielding protects the molten root of the weld on the first pass and blankets the solidified weld during subsequent passes until the root surface temperature stays below 600 degrees F. Backup shielding also should be used on the back surface of sheet or plate less than 1/4 in. thick to prevent oxidation. Gas Requirements. Welding-grade argon (99.999 percent purity) usually is chosen for primary, secondary, and backup shielding, as well as for purging. Argon provides excellent arc stability, and because it is heavier than air, it blankets the weld and provides protection. Helium or argon/helium mixtures sometimes are used for torch shielding if added penetration is desired. Argon and helium mixtures also are occasionally employed for backup shielding and purging, in which helium's low density can effectively purge blind spaces. Gas Purity. Argon usually is purchased to 99.998 percent purity with a guarantee of less than 5 parts per million (PPM) oxygen, moisture, or total hydrocarbons. The dew point at the gas supply should not be more than -60 degrees F (-51 degrees C).

AWS Classifications: Commercial Pure Ti: ERTi-1, ERTi-2, ERTi-3, ERTi-4
ERTi-5 Ti-6Al-4V ERTi-23 Ti-6Al-4V ELI
ERTi-7 Ti-0.2Pd ERTi-9 Ti-3Al-2.5V
ERTi-12 Ti-0.3Mo-0.8Ni
ERZr2 Zr-702 ERZr4 Zr-705



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.






TIG/MIG SOLID TITANIUM WELDING WIRES/RODS



ERTi-1

American Welding Society

Type:	Solid Titanium Welding Wire Grade 1 (purest grade)
Applications:	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.
Properties:	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.
Classification:	AWS A 5.16: ER Ti 1 UNS: R50100 EN ISO 24034: STi-0100 DIN 1737: SG Ti 1
Suitable for:	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	Mo	Ni
<0.03	0.03-0.10	<0.012	<0.005	<0.08	-	-	-	-	-

MECHANICAL PROPERTIES

Heat Treatment	RP 0.2 (N/mm ²)	Rm (N/mm ²)	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
1.2	1000		5
1.6	1000		5
2.0	1000		5
2.4	1000		5
3.0	1000		5

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




TIG/MIG SOLID TITANIUM WELDING WIRES/RODS



ERTi-2 Tig

American Welding Society

Type:	Solid Titanium Welding Wire Grade 2
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 strength and corrosion resistance makes the alloy a preferred choice in many applications to prefernd 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) DIN: W.Nr. 3.7036 DIN 1737: SG Ti 2
Suitable for:	Titanium grade 1, 2, 3 and 4.
Welding Positions:	

WELD DEPOSIT WEIGHT %

C	O	N	H	Fe	Al	V	Pd	Mo	Ni
<0.08	<0.18	<0.05	<0.013	<0.25	-	-	-	-	-

MECHANICAL PROPERTIES

Heat Treatment	RP 0.2 (N/mm ²)	Rm (N/mm ²)	A5 (%)	Impact Energy (J) ISO-V			Hardness HRC/HV
				-20°C	-40°C	-60°C	
as welded	275	395-540	20	-	-	-	-

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

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




TIG/MIG SOLID TITANIUM WELDING WIRES/RODS



ERTi-2

American Welding Society

Type:	Solid Titanium Welding Wire Grade 2
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 strength and corrosion resistance makes the alloy a preferred choice in many applications to prefernd 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) DIN: W.Nr. 3.7036 DIN 1737: SG Ti 2
Suitable for:	Titanium grade 1, 2, 3 and 4.
Welding Positions:	

WELD DEPOSIT WEIGHT %

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

MECHANICAL PROPERTIES

Heat Treatment	RP 0.2 (N/mm ²)	Rm (N/mm ²)	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

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




TIG/MIG SOLID TITANIUM WELDING WIRES/RODS



ERTi-5

American Welding Society

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:	<p>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.</p> <p>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.</p>
Classification:	AWS A 5.16: ER Ti 5 EN ISO 24034: STi-6402c DIN: W.Nr. 3.7165 DIN 1737:
Suitable for:	Titanium grade 5, UNS R56400, AMS 4954
Welding Positions:	

WELD DEPOSIT WEIGHT %

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

MECHANICAL PROPERTIES

Heat Treatment	RP 0.2 (N/mm ²)	Rm (N/mm ²)	A5 (%)	Impact Energy (J) ISO-V			Hardness
				-20°C	-40°C	-60°C	
as welded	>890	>810	--	-	-	-	-

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
3.2	1000		5

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




TIG/MIG SOLID TITANIUM WELDING WIRES/RODS



ERTi-7

American Welding Society

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 EN ISO 24034:STi-2401 DIN: W.Nr. 3.7235 DIN 1737:
Suitable for:	Titanium grade 7, grade 2, grade 16.
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	<0.12	-	-	0.12-0.25	-	-

MECHANICAL PROPERTIES

Heat Treatment	RP 0.2 (N/mm ²)	Rm (N/mm ²)	A5 (%)	Impact Energy (J) ISO-V			Hardness HRc/HV
				-20°C	-40°C	-60°C	
as welded	275	400	20	-	-	-	-

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

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




TIG/MIG SOLID TITANIUM WELDING WIRES/RODS



ERTi-12

American Welding Society

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++ and Mo++ 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 EN ISO 24034: STi-3401 DIN: W.Nr. 3.7105 DIN 1737:
Suitable for:	Titanium grade 12, grade 7, grade 2, 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	RP 0.2 (N/mm ²)	Rm (N/mm ²)	A5 (%)	Impact Energy (J) ISO-V			Hardness HRC/HV
				-20°C	-40°C	-60°C	
as welded	275	400	20	-	-	-	-

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

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



American Welding Society

ERZr2 Zirconium Zr-702 (UNS R60702)

Type:	Filler metal for Gas Tungsten Arc welding of Zirconium and Zirconium alloys
Applications:	Zirconium Zr 702 is used widely in many industries for process equipment. Major applications include pressure vessels, heat exchangers, piping, tanks, shafts, mixers, and other mechanical equipment; valves; pumps; spargers; trays; and tower packing
Properties:	Zirconium often is chosen for its resistance to corrosion from most organic and inorganic acids, salt solutions, strong alkalis, and some molten salts. It is especially suitable in many sulfuric, nitric, hydrochloric, and acetic acid applications. Backup Shielding. Backup shielding protects the molten root of the weld on the first pass and blankets the solidified weld during subsequent passes until the root surface temperature stays below 600 degrees F. Backup shielding also should be used on the back surface of sheet or plate less than 1/4 in. thick to prevent oxidation. Gas Requirements. Welding-grade argon (99.999 percent purity) usually is chosen for primary, secondary, and backup shielding, as well as for purging. Argon provides excellent arc stability, and because it is heavier than air, it blankets the weld and provides protection. Helium or argon/helium mixtures sometimes are used for torch shielding if added penetration is desired. Argon and helium mixtures also are occasionally employed for backup shielding and purging, in which helium's low density can effectively purge blind spaces. Gas Purity. Argon usually is purchased to 99.998 percent purity with a guarantee of less than 5 parts per million (PPM) oxygen, moisture, or total hydrocarbons. The dew point at the gas supply should not be more than -60 degrees F (-51 degrees C).
Classification:	AWS A5.24: ER Zr 2 UNS R60702
Suitable for:	Welding Zirconium alloys in general but also for successfully weld zirconium to titanium, tantalum, niobium (columbium) and vanadium however the weld metal will be stringer and less ductile than the base metals.
Welding Positions:	

WELD DEPOSIT WEIGHT %

C	O	N	H	Ha	Zr + Ha	Cr + Fe
< 0.03	0.11-0.15	< 0.015	< 0.005	< 4.50	> 99.0	< 0.20

MECHANICAL PROPERTIES

Heat Treatment	RP 0.2 (psi)	Rm (psi)	A5 (2")	Impact Energy (J) ISO-V			Hardness HRc/HV
				-20°C	-40°C	-60°C	
As welded	>30,000	>55,000	16	-	-	-	-

WELDING PARAMETERS/PACKING

Welding Parameters			Packing
Dia. (mm)	Length (mm)	Current (A)	kg/tube
1.6	1000	80-150	5
2.0	1000	100-175	5
2.4	1000	130-200	5
3.2	1000	180-225	5

Spool Wire: This alloy is also available as spooled wire on D-300 spools ranging from 0.8 mm till 1.6 mm.



American Welding Society

ERZr4 Zirconium Zr-705 (UNS R60705)

Type:	Filler metal for Gas Tungsten Arc welding of Zirconium alloys
Applications:	ERZr4-Zirconium Zr-705 is used widely in many industries for process equipment. Major applications include pressure vessels, heat exchangers, piping, tanks, shafts, mixers, and other mechanical equipment; valves; pumps; spargers; trays; and tower packing
Properties:	<p>Zirconium often is chosen for its resistance to corrosion from most organic and inorganic acids, salt solutions, strong alkalis, and some molten salts. It is especially suitable in many sulfuric, nitric, hydrochloric, and acetic acid applications. Backup Shielding. Backup shielding protects the molten root of the weld on the first pass and blankets the solidified weld during subsequent passes until the root surface temperature stays below 600 degrees F. Backup shielding also should be used on the back surface of sheet or plate less than 1/4 in. thick to prevent oxidation. Gas Requirements. Welding-grade argon (99.999 percent purity) usually is chosen for primary, secondary, and backup shielding, as well as for purging. Argon provides excellent arc stability, and because it is heavier than air, it blankets the weld and provides protection. Helium or argon/helium mixtures sometimes are used for torch shielding if added penetration is desired. Argon and helium mixtures also are occasionally employed for backup shielding and purging, in which helium's low density can effectively purge blind spaces. Gas Purity. Argon usually is purchased to 99.998 percent purity with a guarantee of less than 5 parts per million (PPM) oxygen, moisture, or total hydrocarbons. The dew point at the gas supply should not be more than -60 degrees F (-51 degrees C).</p> <p>Weld repair is performed but must be done in an inert gas atmosphere to prevent oxidation of the weld and heat affected zone. All welds are closely examined for evidence of serious contamination. Insufficient shielding can be readily detected by blue to purple or gray to white colors in the weld whereas silver-bright or straw-yellow colors are indicative of proper shielding during welding. Zirconium castings are not normally heat treated but Zr 702 castings are stress relieved after major weld repair and Zr 705 castings are stress relieved within 14 days of all welds.</p>
Classification:	AWS A5.24: ER Zr 4 UNS R60705
Suitable for:	Welding Zirconium alloys in general but also for successfully weld zirconium to titanium, tantalum, niobium (columbium) and vanadium however the weld metal will be stringer and less ductile than the base metals.
Welding Positions:	

WELD DEPOSIT WEIGHT %

C	O	N	H	Ha	Zr + Ha	Cr + Fe	NB
< 0.03	0.11-0.15	< 0.015	< 0.005	< 4.50	> 95.5	< 0.20	2.0-3.0

MECHANICAL PROPERTIES

Heat Treatment	RP 0.2 (psi)	Rm (psi)	A5 (2")	Impact Energy (J) ISO-V			Hardness HRc/HV
				-20°C	-40°C	-60°C	
As welded	>55,000	>80,000	16	-	-	-	-

WELDING PARAMETERS/PACKING

Welding Parameters			Packing
Dia. (mm)	Length (mm)	Current (A)	kg/tube
1.6	1000	80-150	5
2.0	1000	100-175	5
2.4	1000	130-200	5
3.2	1000	180-225	5

Spool Wire: This alloy is also available as spooled wire on D-300 spools ranging from 0.8 mm till 1.6 mm.



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TITANIUM/ZIRCONIUM WELDING WIRES & RODS

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 ZIRCONIUM WELDING WIRES & RODS

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