



DAIKOWT Ti 1

GTAW

TITANIUM ALLOYS

Gr. 1

DESCRIPTION

Titanium alloy solid rod gr 1

Commercially pure titanium. It is the grade with the lowest resistance but which guarantees maximum ductility. This wire rod is suitable for welding titanium grades 1, 2, 3 and 4. As it is not alloyed, it has lower mechanical characteristics than other grades. The weld deposit is ductile and offers excellent corrosion resistance in oxidizing environments and excellent weldability. It is widely used for welding heat exchangers for sea water and for chemical processes, pressure vessels, pipes, chemical tanks and in the aerospace industry.

SPECIFICATIONS

ISO	-	AWS A5.16	ERTi-1
DIN	-	Werkstoff Number	-
Certifications	-	Shielding	11
Positions	PA, PB, PC, PD, PE, PF	Current	DC-

ASME QUALIFICATIONS

F-No (QW432)	51
A-No (QW442)	-

FERRITE

Ferrite	-
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PREN

PREN	-
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HARDNESS

Hardness	-
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CHEM. COMP. %

	DEFAULT
C	0.1
N	0.01
P	0.003
Fe	0.05

MECHANICAL PROPERTIES

	MIN	VARIANT
Tensile strength R _m MPa	-	240
Yield strength R _{p0.2} MPa	0	170
Elongation A (L ₀ =5d ₀) %	0	24
Impact Charpy ISO-V	-	-
Impact Charpy ISO-V	-	-

WELDING PARAMETERS

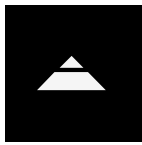
	1.6 mm	3.2 mm
Ampere	190A - 250A	220A - 280A
Voltage	-	-
Packaging	Ø 1,0÷2,4 mm	Ø 1,0÷2,4 mm
Packaging Type	5kg carton tube	5kg carton tube

V 01/2024



The information in this datasheet is the result of detailed research and is considered accurate as of the publication date. However, we cannot guarantee its complete accuracy, and it is subject to change without notice. Actual results may vary due to many factors like welding procedures, material composition, temperature conditions, bevel configuration, and specific manufacturing techniques. We accept no liability for any errors or omissions in this datasheet. For the most current information, please visit www.daikowelding.com.





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APPLICATION

Unalloyed Ti grade renowned for its peak ductility, cold formability, and impact toughness, coupled with exceptional resistance across a broad spectrum of media—from mildly reducing to highly oxidizing, with or without chlorides—and noteworthy weldability. As the lowest strength unalloyed commercially pure grade, it finds application in scenarios prioritizing ductility, including explosive cladding, loose linings, expanded metal, and deep drawing applications, with a key focus on the chemical industry. Tailored for applications like pump sleeves, rotary seal rings, wear pads, expeller screws, and bearing sleeves, it is also integral to electrolytic applications, serving as coated anode substrates for chlorine and sodium chlorate production. The resulting weld deposit, maintaining a hardness of 43-58 HRC even at temperatures up to 760°C, is ductile, ensuring excellent corrosion resistance and offering impressive weldability. Notably, it is suitable for hardfacing, delivering remarkable corrosion and abrasion resistance with minimal impact.

ALLOY TYPE

Gr. 1 titanium, commercially pure.

MICROSTRUCTURE

Primary hypereutectic carbides (approximately 19%) are found in in an austenitic type matrix.

MATERIALS

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

EN W.Nr.: 3.7025, 3.7035, 3.7055, 3.7065.

ASTM: Ti-Gr 1, Ti-Gr 2, Ti-Gr 3, Ti-Gr 4.

UNS: R504007, R50400, R50550, R50700.

WELDING & PWHT

Titanium, being a reactive metal, is susceptible to embrittlement by oxygen, nitrogen, and hydrogen at elevated temperatures. As a result, safeguarding the metal from atmospheric contamination becomes crucial. This protection is achieved by shielding the metal with welding-grade inert gas. Throughout arc welding, it is imperative to maintain this shielding until the titanium has cooled below about 430°C. To ensure optimal welding conditions, the titanium metal itself must be free of thick oxide and undergo thorough chemical cleaning Prior to welding initiation. Contamination from oxide, water, grease, or dirt can also lead to embrittlement. For titanium welding rods, ensure they're clean and free of heavy oxide, moisture, grease, and dirt. Cleaning between passes is usually unnecessary if the weld bead stays bright and silvery. Discoloration like straw or light blue can be removed with a stainless steel wire brush. However, contaminated weld beads with dark blue, gray, or white powdery discoloration must be completely ground off. The joint requires meticulous preparation and cleaning before proceeding with additional welding.

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