DAIKOWM Ti 1

GMAW

TITANIUM ALLOYS
Gr. 1

DESCRIPTION

Titanium alloy solid wire 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

AWS A5.16	ERTi-1	**Shielding**	I1, I3
Positions	PA, PB, PC, PD, PE, PF	**Current**	DC+
Packaging Type	Drums, B300, D200 and D100 spools.		

ASME QUALIFICATIONS

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

CHEM. COMP. %	DEFAULT
C	0.1
N	0.01
P	0.003
Fe	0.05

MECHANICAL PROPERTIES	MIN. PER STANDARD	PRODUCT
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	1.0 mm	1.2 mm
Ampere	160A - 280A	240A - 300A
Voltage	18V - 27V	31V - 35V
Packaging	Ø 0,8÷1,6mm	Ø 0,8÷1,6mm
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APPLICATION

The high percentage of carbides gives this alloy extraordinary wear resistance, although it results in reduced impact and corrosion resistance. The alloy's superior hardness requires special attention, as it increases the tendency to crack during cooling. This risk can be minimized by strictly controlling preheat conditions, interpass temperature, and postheat techniques. Although cobalt-chrome deposits may soften slightly at high temperatures, they are generally considered immune to tempering. The weld metal obtained from ERCoCr-C electrodes and rods is ideal for fabricating components such as mixers and rotors, particularly in environments with high abrasion and low impact. This alloy is also suitable for uses such as pump sleeves, rotary seal rings, wear shoes, ejector screws, and bearing sleeves. The inclusion of tungsten helps to improve high-temperature hardness and matrix toughness, providing excellent wear resistance against both solid particle erosion and adhesion. The alloy maintains its hardness, ranging from 43-58 HRC, at temperatures up to 760 °C. A preheat of 300 °C or higher is generally recommended.

ALLOY TYPE

Gr. 1 titanium, commercially pure.

MICROSTRUCTURE

Primary hypereutectic carbides (approximately 19%) are found 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

Before welding, it is essential to thoroughly clean the joint surface and adjacent area, completely removing grease, oil, marker marks, sulfur compounds, and other impurities. Contact with copper or copper-containing materials in the joint area should be avoided. Although not strictly necessary, it is preferable for the alloy to be in the solution annealed state during the welding operation. Typically, preheating is not required as long as the base metal to be welded is above 0 °C. Generally, it is advisable to maintain low interpass temperatures. Post-welding, it is effective to perform post-heating at 600 °C and slow down cooling to prevent crack formation.