

Medical Alloy

DESCRIPTION

Titanium resists corrosion, is biocompatible and has an innate ability to join with human bone, it has become a staple of the medical field, as well. From surgical titanium instruments to orthopedic titanium rods, pins and plates, medical and dental titanium has truly become the fundamental material used in medicine.

AVERAGE CHEMICAL COMPOSITION

AlLOY		Ti	N	C	H	Fe	O	Al	V	Nb	Ta
Grade 1	Min.	Bal									
	Max.		0.03	0.08	0.015	0.20	0.18	-	-	-	
Grade 2	Min.	Bal									
	Max.		0.03	0.08	0.015	0.30	0.25				
Grade 3	Min.	Bal									
	Max.		0.05	0.08	0.015	0.30	0.35				
Grade 4	Min.	Bal									
	Max.		0.05	0.08	0.015	0.50	0.40				
Grade 5 6Al-4V	Min.	Bal						5.50	3.50		
	Max.		0.03	0.08	0.015	0.40	0.20	6.75	4.50		
Grade 23 6Al-4V ELI	Min.	Bal						5.50	3.50		
	Max.		0.03	0.08	0.012	0.25	0.13	6.75	4.50		
6Al-7Nb	Min.	Bal						5.50		6.50	
	Max.		0.05	0.08	0.009	0.25	0.20	6.50		7.50	0.50

MECHANICAL PROPERTIES

	Tensile strength(N/mm ²)	0.2%Yield strength(N/mm ²)	Elongation (%)	Reduction of area(%)	Hardness (HB)
Grade 1	≥ 240	≥ 170	≥ 24	≥ 30	≥ 100
Grade 2	≥ 345	≥ 275	≥ 20	≥ 30	≥ 100
Grade 3	≥ 450	≥ 380	≥ 18	≥ 30	≥ 150
Grade 4	≥ 550	≥ 483	≥ 15	≥ 25	≥ 180
Grade 5 6Al-4V	≥ 895	≥ 828	≥ 10	≥ 25	-
Grade 23 6Al-4V ELI	≥ 825	≥ 760	≥ 8	≥ 25	-
6Al-7Nb	≥ 900	≥ 800	≥ 10	≥ 25	-

PHYSICAL PROPERTIES (Compared to other materials)

	Specific Gravity	Melting Point (°C)	Linear Expansion Coefficient (/°C)	Specific Heat (J/°C/g)	Thermal Conductivity (W/m/°C)	Electric Resistance (x10 ⁻⁸ Ωm)
Titanium	4.5	1668	8.4x10 ⁻⁶	0.52	17.1	55
Iron	7.9	1530	12x10 ⁻⁶	0.46	62.8	9.7
Stainless 304	7.9	1400~1420	17x10 ⁻⁶	0.50	16.3	72
Aluminum	2.7	660	23x10 ⁻⁶	0.88	205	2.7
Magnesium	1.7	650	25x10 ⁻⁶	0.961.00	159	4.3
Nickel	8.9	1453	15x10 ⁻⁶	0.46	92	9.5
Hastelloy C	8.9	1305	11.3x10 ⁻⁶	0.38	12.6	130
Copper	8.9	1083	17x10 ⁻⁶	0.38	385	1724