

# Standards of Titanium Products [Commercially-Pure Titanium/Corrosion-Resistant Titanium Alloys]

Classification	Standard	Chemical composition [mass%]										Tensile properties		
		C	H	O	N	Fe	Pd	Co	Ru	Ni	Ti	0.2%proof stress [MPa]	Tensile strength [MPa]	Elongation [%]
Commercially-Pure titanium	Well-formable grade	≤0.08	≤0.013	≤0.15	≤0.03	≤0.20					rem.	≥120	≥250	≥40
	JIS Class 1	≤0.08	≤0.013	≤0.15	≤0.03	≤0.20	–	–			rem.	≥165	270–410	≥27
	JIS Class 2	≤0.08	≤0.013	≤0.20	≤0.03	≤0.25	–	–			rem.	≥215	340–510	≥23
	JIS Class 3	≤0.08	≤0.013	≤0.30	≤0.05	≤0.30	–	–			rem.	≥345	480–620	≥18
	JIS Class 4	≤0.08	≤0.013	≤0.40	≤0.05	≤0.50	–	–			rem.	≥485	550–750	≥15
	ASTM/ASME Grade1	≤0.08	≤0.015	≤0.18	≤0.03	≤0.20	–	–			rem.	138–310	≥240	≥24
	ASTM/ASME Grade2	≤0.08	≤0.015	≤0.25	≤0.03	≤0.30	–	–			rem.	275–450	≥345	≥20
	ASTM/ASME Grade3	≤0.08	≤0.015	≤0.35	≤0.05	≤0.30	–	–			rem.	380–550	≥450	≥18
	ASTM/ASME Grade4	≤0.08	≤0.015	≤0.40	≤0.05	≤0.50	–	–			rem.	483–655	≥550	≥15
Corrosion-resistant titanium alloys	JIS Class 17	≤0.08	≤0.015	≤0.18	≤0.03	≤0.20	0.04–0.08	–			rem.	≥170	240–380	≥24
	JIS Class 19	≤0.08	≤0.015	≤0.25	≤0.03	≤0.30	0.04–0.08	0.20–0.80			rem.	≥275	345–515	≥20
	JIS Class 20	≤0.08	≤0.015	≤0.35	≤0.05	≤0.30	0.04–0.08	0.20–0.80			rem.	≥380	450–590	≥18
	ASTM/ASME Gr.17	≤0.08	≤0.015	≤0.18	≤0.03	≤0.20	0.04–0.08	–			rem.	138–310	≥240	≥24
	ASTM/ASME Gr.30	≤0.08	≤0.015	≤0.25	≤0.03	≤0.30	0.04–0.08	0.20–0.80			rem.	275–450	≥345	≥20
	ASTM/ASME Gr.31	≤0.08	≤0.015	≤0.35	≤0.05	≤0.30	0.04–0.08	0.20–0.80			rem.	380–550	≥450	≥18
	JIS Class 11	≤0.08	≤0.013	≤0.15	≤0.03	≤0.20	0.12–0.25	–			rem.	≥165	270–410	≥27
	JIS Class 12	≤0.08	≤0.013	≤0.20	≤0.03	≤0.25	0.12–0.25	–			rem.	≥215	340–510	≥23
	JIS Class 13	≤0.08	≤0.013	≤0.30	≤0.05	≤0.30	0.12–0.25	–			rem.	≥345	480–620	≥18
	ASTM/ASME Grade11	≤0.08	≤0.015	≤0.18	≤0.03	≤0.20	0.12–0.25	–			rem.	138–310	≥240	≥24
	ASTM/ASME Grade7	≤0.08	≤0.015	≤0.25	≤0.03	≤0.30	0.12–0.25	–			rem.	275–450	≥345	≥20
	JIS Class 21	≤0.08	≤0.015	≤0.10	≤0.03	≤0.20			0.04–0.06	0.40–0.60	rem.	≥170	275–450	≥24
	JIS Class 22	≤0.08	≤0.015	≤0.15	≤0.03	≤0.30			0.04–0.06	0.40–0.60	rem.	≥275	410–530	≥20
	ASTM/ASME Grade13	≤0.08	≤0.015	≤0.10	≤0.03	≤0.20			0.04–0.06	0.4–0.6	rem.	≥170	≥275	≥24
	ASTM/ASME Grade14	≤0.08	≤0.015	≤0.15	≤0.03	≤0.30			0.04–0.06	0.4–0.6	rem.	≥275	≥410	≥20