

SPECIFICATIONS

○ Available
— Not available

* Only materials not registered with official standards

No.	Classification	Features	Official standards	Corresponding KOBE STEEL standard	Nominal composition	Applications	Products shapes				Official standard or KOBE STEEL standard						Final annealing etc.	Chemical composition, mass%							
							Coils Sheets Heavy plates	Welded tubes	Wires Rods	Forgings	Tensile properties			Bend properties				Main elements (min/max)	N (max)	C (max)	H (max)	Fe (max)	O (max)		
											Tensile strength, Mpa (min)	0.2% proof strength, Mpa	Elongation, % (min)	Reduction of area, % (min)	Bend angle, degree	Internal radius, mm (min)									
1	Commercially pure titanium	Excellent formability Excellent corrosion resistance	ASTM Gr.1	KS40S KS40	Ti-Fe-O	PHE Press formed parts Roofs Walls	○	○	○	○	240	170-310	24	30	105	1.5T	2T	Annealing	bal.Ti	0.03	0.08	0.015	0.20	0.18	
2		Relatively high strength Excellent corrosion resistance	ASTM Gr.2	KS60		Condensator tubes Heat transfer tubes Pipings, Linings Electrolysis vessels Chemical use	○	○	○	○	345	275-450	20	30	105	2T	2.5T	Annealing	bal.Ti	0.03	0.08	0.015	0.30	0.25	
3		Scratch resistance Easy to polish High strength	ASTM Gr.3	KS70		Tube sheets	○	○	○	○	450	380-550	18	30	105	2T	2.5T	Annealing	bal.Ti	0.05	0.08	0.015	0.30	0.35	
4			ASTM Gr.4	KS85		Airplane parts	○	○	○	○	550	483-655	15	25	105	2.5T	3T	Annealing	bal.Ti	0.05	0.08	0.015	0.50	0.40	
5			—	KS100		—	○	○	○	○	650	min550	15	—	180	T≤5, 3T		Annealing	bal.Ti	0.07	0.08	0.013	0.45	0.50	
6	Titanium alloy with low alloy elements	Scratch resistance Easy to polish High strength	—	KS120SI	Ti-Fe-O-Si	Wrist watches Cutlery Golf club heads	○	—	○	○	750	min650	10	—	180	T≤5, 3T		Annealing	Si 0.50/0.70, bal.Ti	0.07	0.08	0.013	0.60	0.37	
7		Super-corrosion resistance	ASTM Gr.7	—	Ti-0.15Pd	Condensator tubes Heat transfer tubes Pipings Linings Electrolysis vessels	○	○	○	○	345	275-450	20	30	105	2T	2.5T	Annealing	Pd 0.12/0.25, bal.Ti	0.03	0.08	0.015	0.30	0.25	
8			ASTM Gr.11	KS40PDA			○	○	○	○	240	170-310	24	30	105	1.5T	2T	Annealing	Pd 0.12/0.25, bal.Ti	0.03	0.08	0.015	0.20	0.18	
9			ASTM Gr.12	KSG12	Ti0.3Mo-0.8Ni	○	○	○	○	483	min345	18	25	105	2T	2.5T	Annealing	Mo0.2/0.4, Ni0.6/0.9, bal.Ti	0.03	0.08	0.015	0.30	0.25		
10			ASTM Gr.33	KS60AKOT	Ti-0.4Ni-0.015Pd-0.025Ru-0.14Cr	○	○	○	○	345	275-450	20	30	105	2T	2.5T	Annealing	Ru 0.02/0.04, Pd 0.01/0.02, Cr 0.1/0.2, Ni 0.35/0.55, bal.Ti	0.03	0.08	0.015	0.30	0.25		
11	Titanium alloy	Heat resistance	—	KSTI-1.5AL	Ti-1.5Al	Exhaust systems	○	○	○	○	345	215-450	20	30	105	2T	2.5T	Annealing	Al 1.0/2.0, bal.Ti	0.03	0.08	0.015	0.30	0.25	
12			AMS4976	KS6-2-4-2	Ti-6Al-2Sn-4Zr-2Mo	Jet engine parts Engine Valves	—	—	○	○	896	min827	10	25	—	—	—	STA	Al5.5/6.5, Zr3.6/4.4, Mo1.8/2.2, Sn1.8/2.2, Si0.06/0.10, bal.Ti	0.05	0.05	0.015	0.10	0.15	
13		High strength balance between strength and toughness	Heat resistance	ASTM Gr.9	KS3-2.5	Ti-3Al-2.5V	Exhaust systems Bicycle frames Eye glass frames	○	○	○	○	620	min483	15	25	105	2.5T	3T	Annealing	Al 2.5/3.5, V 2.0/3.0, bal.Ti	0.03	0.08	0.015	0.25	0.15
14				ASTM Gr.5	KS6-4	Ti-6Al-4V	Aircraft parts Connecting rods Valve spring retainers Structural parts Golf club heads	○	—	○	○	895	min828	10	25	105	4.5T	5T	Annealing	Al 5.5/6.75, V 3.5/4.5, bal.Ti	0.05	0.08	0.015	0.40	0.20
15			ASTM Gr.35	KSTI-9	Ti-4.5Al-2Mo-1.6V-0.5Fe-0.3Si-0.03C	○	—	○	○	895	min828	5	20	105	5T	5T	Annealing (Coils, Sheets)	Al 4.0/5.0, Mo 1.5/2.5, V 1.1/2.1, Si 0.2/0.4, bal.Ti	0.05	0.08	0.015	0.20/0.80	0.25		
16			—	KS EL-F	Ti-4.5Al-4Cr-0.5Fe-0.2C	—	—	○	○	895	min828	10	20	—	—	—	—	Annealing	Al 4.0/5.0, Cr 3.5/4.5, bal.Ti	0.05	0.08/0.25	0.015	0.20/0.80	0.25	
17			AMS4981	KS-6-2-4-6	Ti-6Al-2Sn-4Zr-6Mo	Jet engine parts	—	—	○	○	1172	min1103	L direction 10 T direction 8	L direction 20 T direction 15	—	—	—	—	STA Thickness ≤ 3in	Al 5.5/6.5, Zr 3.5/4.5, Sn 1.75/2.25, Mo 5.5/6.5	0.04	0.04	0.015	0.15	0.15
18		Cold workable (ST) Super high strength (STA)	Heat resistance	AMS4914	KS15-3-3-3	Ti-15V-3Cr-3Sn-3Al	Aircraft parts Bicycle gears Golf club heads Foil	○	—	○	○	703-945	689-869	12	—	105	T≤1.78 2T	1.78<T≤3.18 2.5T	ST	V 14.0/16.0, Cr 2.5/3.5, Sn 2.5/3.5, Al 2.5/3.5	0.05	0.05	0.015	0.25	0.13
19				—	KS15-5-3	Ti-15Mo-5Zr-3Al	Implant materials for orthopaedics Erosion shields Golf club heads	○	—	○	○	min1250	min1103	5	10	—	—	—	—	STA 482°C, 16hr →AC	Al 2.5/3.5, Zr 4.5/5.5, Mo 14.0/16.0, bal.Ti	0.05	0.08	0.020	0.35

No.	Standards	Nominal composition	Notes	No.	Standards	Nominal composition	Notes
20	ASTM Gr.34	Ti-0.4Ni-0.015Pd-0.025Ru-0.14Cr	KS70AKOT, Super-corrosion resistance, High strength	27	AMS4959	Ti-13V-11Cr-3Al	KS13-11-3, Super-high strength
21	ASTM Gr.6	Ti-5Al-2.5Sn	AMS4926, KS5-2.5, Heat resistance	28	JIS T 7401-3	Ti-6Al-2Nb-1Ta	KS6-2-1, Implant materials for orthopaedics
22	AMS4924	Ti-5Al-2.5Sn ELI	KS5-2.5ELI, Heat resistance, Cryogenic property	29	KS50PDA	Ti-0.15Pd	Super-corrosion resistance
23	AMS4972	Ti-8Al-1Mo-1V	KS8-1-1, Heat resistance	30	KS70PDA	Ti-0.15Pd	Super-corrosion resistance, High strength
24	AMS4918	Ti-6Al-6V-2Sn	AMS4971, 4978, KS6-6-2	31	KS50TA	Ti-5Ta	Condensed nitric acid resistance
25	AMS4995 (Ti-17)	Ti-5Al-2Sn-2Zr-4Cr-4Mo	KS5-2-2-4-4, High strength at high temperature, Creep resistance	32	KS6-4-4-1-1TA	Ti-5.8Al-4Sn-3.5Zn-0.5Mo-0.35Si-0.06C-1Ta	Heat resistance
26	AMS4983	Ti-10V-2Fe-3Al	KS10-2-3, High strength, High toughness, High fatigue strength	33	KS16-4-3-3	Ti-16V-4Sn-3Al-3Nb	Cold formability

ELI : Extra low interstitial
ST : Solution treatment
STA : Solution treatment & aging

* Drawing specifications apply to rod and forged products; bending specifications apply to plate products; values of reduction of area are applied to bars and forgings.

* The letters "KS" (corresponding KOBE STEEL standard) are the initial letters of "KOBE" and "STEEL," and the numbers 40, 50, and 70 which follow list minimum tensile strengths of 40 ksi, 50 ksi, and 70 ksi respectively. 1 ksi is equal to 6.9 MPa.

* The specification values listed above do not necessarily correspond to all products manufactured by KOBE STEEL.

* The specification values of titanium alloys may be different according to the form or dimensions of the finished product.

* We can produce materials other than those listed above.

* Please contact us for details.