



ATI Ti-8Al-1Mo-1V Alloy

(UNS R54810)

INTRODUCTION

ATI 8-1-1™ alloy (UNS R54810) is a near alpha alloy with aluminum being the alpha stabilizer, and the additions of Mo, V and Fe resulting in small amounts of beta. The alloy is intended primarily for use at elevated temperatures, has good creep strength and good weldability, and possesses the lowest density of any titanium-base alloy. ATI 8-1-1™ alloy is used in the annealed condition, and special duplex annealing procedures have been developed for thick sections, such as bars and forgings. Typical applications are airframe and jet engine parts requiring high strength, superior creep strength a good stiffness-to-density ratio, and toughness.

SPECIFICATIONS & CERTIFICATES

- AMS 4972 - Bars (Solution Treated and Stabilized or Duplex Annealed)

FORMABILITY

Although a limited amount of cold forming can be done at room temperature, ATI 8-1-1™ alloy is generally hot-formed in the temperature range of 1,200 - 1,450°F (649 - 788°C) when severe forming is required, and below 1,100°F (593°C) for moderate deformations. Short heating times above 1,100°F (593°C) should be utilized, and any contaminated layer must be removed by machining or proper pickling.

FORGEABILITY

ATI 8-1-1™ alloy is finish-forged from 1,850°F (1,010°C) with a minimum finishing temperature of 1,650°F (899°C). Minimum reductions of about 35% in the alpha - beta range are recommended to obtain specification properties.

MACHINEABILITY

See comments in the Technical Data Sheet for CP Titanium. The machinability of ATI 8-1-1™ alloy is similar to that of ATI 8-1-1™ alloy. After machining, a stress relief anneal at 1,350 - 1,450°F (649 - 732°C) is recommended.

WELDABILITY

ATI 8-1-1™ alloy can be successfully welded by the inert gas shielded fusion and resistance-welding processes. Any subsequent stress relief annealing should avoid the temperature range of 1,000 - 1,200°F (538 - 649°C), which would result in a loss of fracture toughness.

SPECIAL PRECAUTIONS

See comments in the Technical Data Sheet for CP Titanium.



Technical Data Sheet

PHYSICAL PROPERTIES

Melting Range: 3,100°F (1,704°C)
Density: 0.158 lbs/in³ (4.37 gms/cc)
Beta Transus Temperature: 1,900°F (1,038°C)

OXIDATION RESISTANCE

See comments in the Technical Data Sheet for CP Titanium.

HARDNESS

The hardness is approximately Rockwell C 36.

HEAT TREATMENT

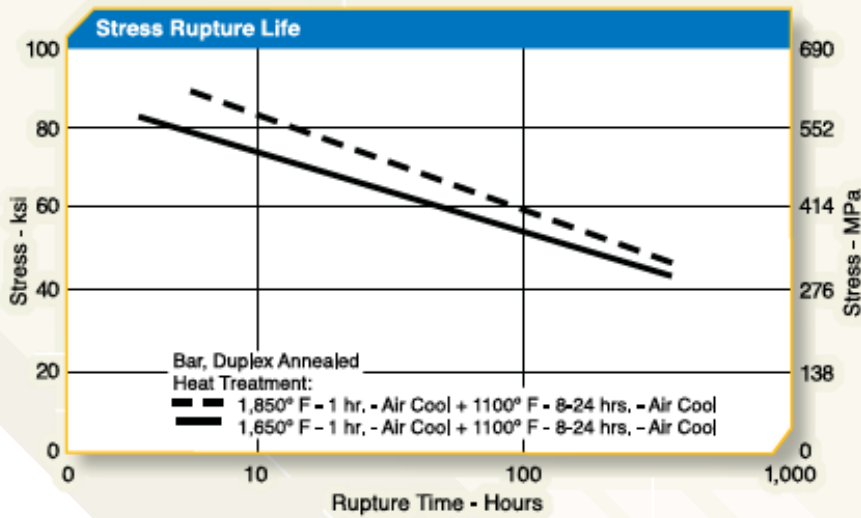
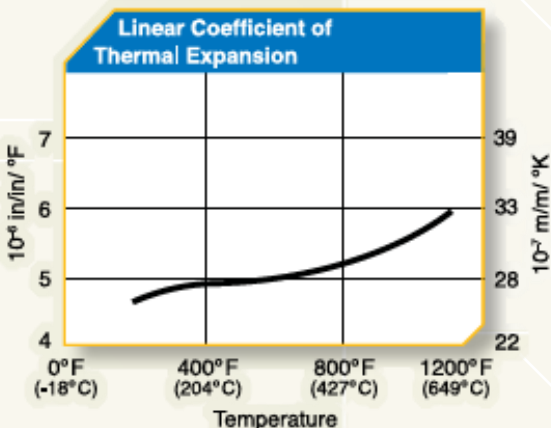
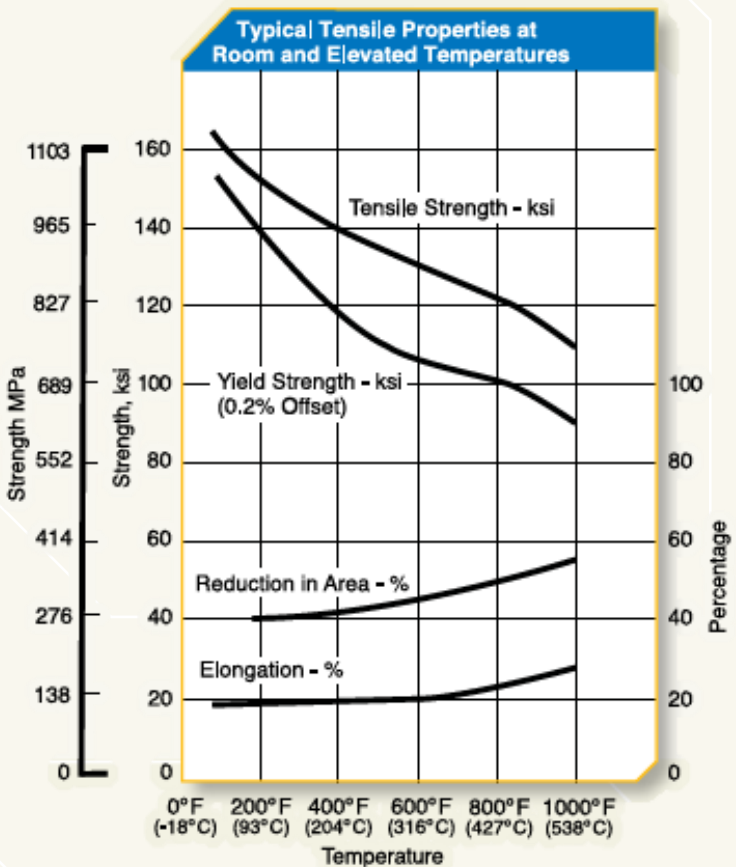
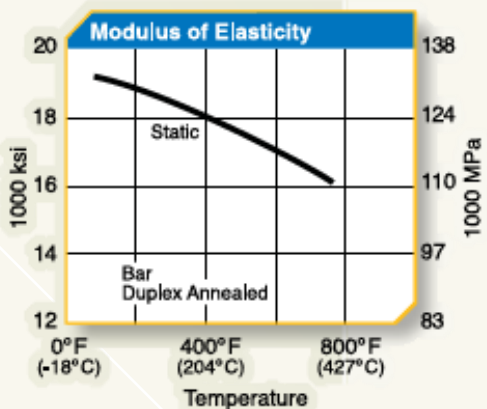
The various recommended treatments for bars and forgings are:

1. Solution Treatment: 1,650 - 1,700°F (899 - 927°C) or 1,800 - 1,850°F (982 - 1,010°C) - 1 hour - Air Cool followed by:
2. Stabilizing Treatment: 1,000 - 1,100°F (538 - 593°C) - 8 hours - Air Cool For maximum creep strength, the solution treating is performed at 1,850°F (1,010°C). However, when minimum distortion is desired (at a sacrifice in creep strength), the lower end of the solution treating range, i.e. 1,650°F (927°C) is used.



Technical Data Sheet

Chemical Composition									
	N	C	H	O	Fe	Al	V	MO	Ti
wt %, min.	-	-	-	-	-	7.50	0.75	0.75	-
wt %, max.	0,05	0,08	0,015	0,12	0,30	8,50	1,25	1,25	Bal.



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