



Mission Critical Metallics®

ATI A-286 Alloy

GENERAL

ATI A-286 alloy (UNS-S66286) is a Ni-Cr austenitic precipitation-hardened steel that is one of the original superalloys. It has been used for applications requiring high strength and corrosion resistance up to 1,300° F (704° C), and for cryogenic applications. Its relatively low alloy content and low-cost formulation make it an excellent choice for many applications. ATI A-286 alloy is produced by vacuum induction melting (VIM), followed by vacuum arc (VAR) or electroslag (ESR) remelting.

Applications include jet engine, supercharger, and missile components including: wheels and blades, casings, afterburner and sound suppressor parts, fuel nozzles, fasteners, extrusion tooling, miscellaneous hardware.

SPECIFICATIONS - AMS

- AMS 5525 - Sheet, Strip, and Plate
- AMS 5731 - Bars, Rings, Forgings, and Tubing (1,800° F Solution Treatment)
- AMS 5732 - Bars, Rings, Forgings, and Tubing (1,800° F Solution Treatment + Age)
- AMS 5734 - Bars, Rings, Forgings, and Tubing (1,650° F Solution Treatment)
- AMS 5737 - Bars, Rings, Forgings, and Tubing (1,650° F Solution Treatment + Age)

PHYSICAL PROPERTIES

Melting Range: 2,500-2,600° F (1,371 - 1,427° C)

Density: 0.287 lbs/cu. in. (7.94 gm/cc)

HEAT TREATMENT

Two solution treatments are used. 1,650° F (899° C) for 2 hours with water or oil quench is used where higher tensile and yield strengths are desired. 1,800° F (982° C) for 1 hour with water or oil quench is used where optimum creep and stress-rupture strengths are desired. Aging is 1,300-1,400° F (704 - 760° C) for 16 hours - air cool.

HARDNESS

In the solution treated condition, hardness is 140 - 180 Brinell. After aging the hardness increases to 248 - 321 Brinell. The hardness is affected by the titanium content and the aging temperature.

OXIDATION AND CORROSION RESISTANCE

ATI A-286 alloy has excellent oxidation resistance up to 1,800° F (982° C). Its corrosion resistance is similar to austenitic stainless steels in many environments. It has superior corrosion resistance to nickel-base alloys when exposed to sulfurous atmospheres at elevated temperatures.

FORGEABILITY/ FORMABILITY

ATI A-286 alloy has forgeability similar to many austenitic stainless steels. Initial forging is usually performed from 2,000-2,150° F (1,093 - 1,177° C) with finishing temperatures from 1,650-1,700° F (899 - 927° C). A minimum of 15 to 20 percent reduction should be combined with a low finishing temperature to produce a fine, uniform grain size.

The formability of ATI A-286 alloy in the solution annealed condition is similar to 319 stainless steel.

MACHINABILITY

The machinability of ATI A-286 alloy is similar to that of the austenitic stainless steels. It is usually machined in the full aged or partially aged condition.

WELDABILITY

ATI A-286 alloy can be welded in the solution treated condition in thin sections, and in large sections under conditions of low restraint. However, the alloy is subject to hot cracking, particularly in the aged condition. Sound welds can be produced by inert gas shielded arc, spot, resistance seam, flash butt, and electron beam welding techniques.

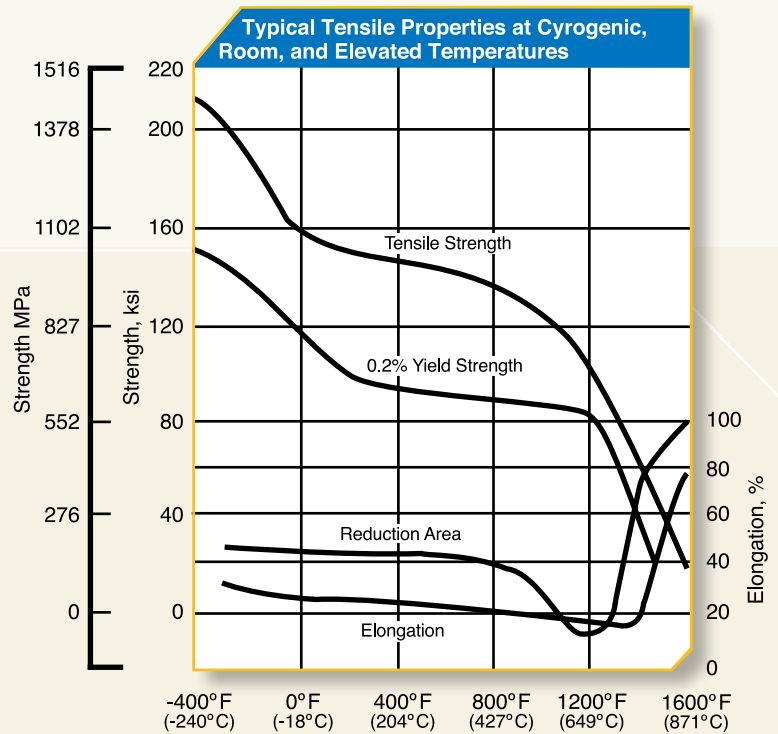
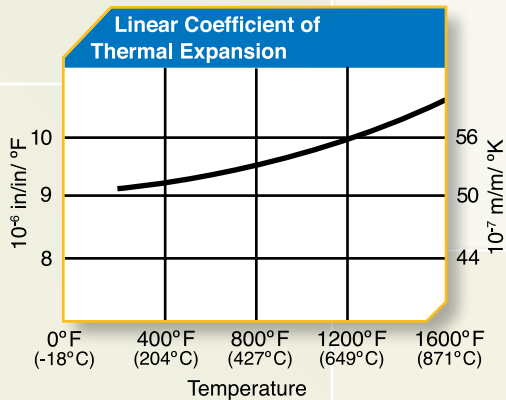
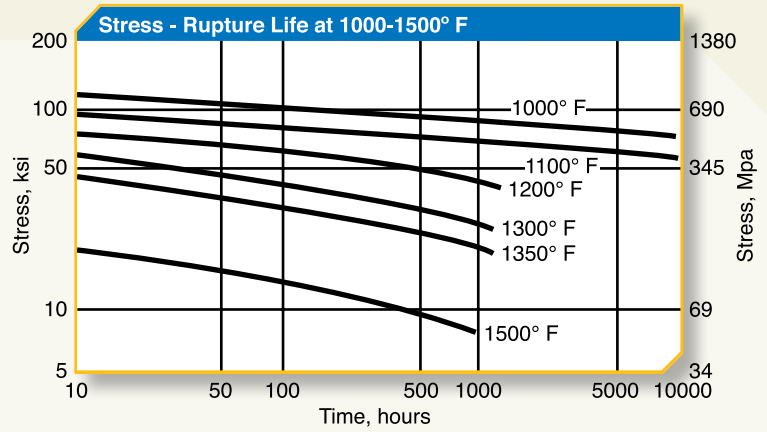
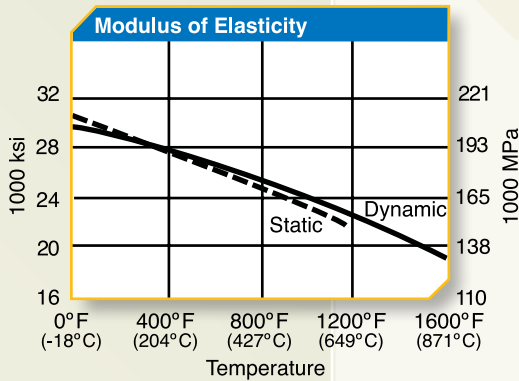
SPECIAL PRECAUTIONS

All lubricants and coolants, particularly those containing sulfur, should be removed prior to heat treating and pickling.



ATI A-286 Alloy

Chemical Composition													
	C	Mn	Si	S	P	Cr	Ni	Fe	Mo	Ti	Al	B	V
% w/w, min.	-	1.0	-	-	-	13.5	24.0	Bal.	1.0	1.90	-	0.003	0.10
% w/w, max.	0.08	2.0	1.0	0.015	0.025	16.0	27.0	-	1.5	2.35	0.35	0.010	0.50



Heat Treatment

Solution Treat: 1800° F (982° C) for 1 Hour. Oil Quench.
Age: 1325° F (718° C) for 16 hours. Air cool.

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