

DATA SHEET



**LATROBE SPECIALTY
STEEL COMPANY**

Latrobe, PA 15650-0031 USA

LSS™ A286

AGE-HARDENABLE, IRON-BASE SUPERALLOY
(UNS S66286)

Chemical Composition (weight %)		C	Mn	Si	Ni	Cr	Mo	V	Ti	Al	B	Fe
max		0.08	0.35	0.30	24.0	13.5	1.00	0.10	1.90	0.35	0.003	Bal
min		-	-	-	27.0	16.0	1.50	0.50	2.35	-	0.010	

GENERAL CHARACTERISTICS

LSS A286 is a precipitation hardening, austenitic stainless steel designed for use at temperatures up to 1300°F (704°C), where high tensile strength, excellent creep strength and good corrosion resistance are required. LSS A286 is available in a wide range of ingot, billet, bar, and coil rod sizes. Bar is available as either rounds or flats. Melt methods include: VIM-VAR and EAF-AOD-VAR.

APPLICATIONS

Typical applications include jet engine, gas turbine, and super-charger components such as turbine wheels, fasteners, nozzles, and exhaust parts. LSS A286 is also used in the oil and gas industry, and in high-strength non-magnetic and cryogenic applications. It is austenitic at all temperatures.

PHYSICAL PROPERTIES

Density

lb/in³: 0.286
g/cm³: 7.916

Melting Range

°F: 2500 - 2600
°C: 1371 - 1427

Specific Heat

Btu/lb .°F (104°F-1299°F): 0.110
kJ/kg .°C (40°C-704°C): 0.461

Magnetic Permeability

Solution treated: 1.010
Solution treated and aged: 1.007

Modulus of Elasticity

10⁶ psi: 29.1
GPa: 201

Poisson's Ratio

at 75°F (24°C): 0.306

Thermal and Electrical Properties

Temp	Coefficient of Expansion*	Thermal Conductivity	Electrical Resistivity
°F	10 ⁻⁶ in/in .°F	Btu.in/ft ² .h.°F	ohm.circ mil/ft
70	-	88	547
200	9.09	97	-
400	9.16	112	-
600	9.42	126	-
800	9.61	140	-
1000	9.74	155	695
1200	9.91	172	715
1350	-	-	422
1400	9.67	-	-
1500	-	-	736
°C	μm/m .°C	W/m .°C	μΩ .m
20	-	12.7	0.910
100	16.4	14.1	-
200	16.5	16.0	-
300	16.9	17.9	-
400	17.2	19.8	-
500	17.5	21.8	-
600	17.7	23.8	1.175
700	17.7	-	1.196
800	-	-	1.217

* Mean coefficient of linear expansion between 80°F (27°C) and temperature.

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WORKABILITY

Hot Working / Forging: Hot working at 1900 - 2100°F (1038 - 1149°C) is recommended using a short soak time. Do not hot work below 1700°F (927°C). Final reductions at temperatures below 1800°F (982°C) should be > 10% to avoid formation of large grains during subsequent solution treatment.

Machining: LSS A286 exhibits similar work hardening characteristics and machinability as other austenitic stainless steels. The alloy is easier to machine in the aged or cold worked condition compared to the solution treated condition.

Welding: LSS A286 is weldable using most fusion techniques. Because the alloy passes through a low-ductility region during cooling, conditions must be carefully controlled to avoid cracking the weld metal and heat affected zone, especially in large sections. The alloy should be welded in the solution

treated condition. Brazing in a vacuum or pure, dry, hydrogen atmosphere can be successfully accomplished.

HEAT TREATMENT

Two heat treatments are commonly used for this alloy.

For high stress rupture strength:

Solution treat at 1800°F (982°C) for 1 hr, rapid cool, age at 1325°F (718°C) for 16 hrs, air cool. (e.g., ASTM A638 Grade 660 Type 2; ASTM A453 Grade 660 Class B; ASTM A891 Type 2; AMS 5732)

For high room temperature tensile strength and stress rupture ductility:

Solution treat at 1650°F (899°C) for 2 hr, rapid cool, age at 1325°F (718°C) for 16 hrs, air cool. (e.g., ASTM A638 Grade 660 Type 1; ASTM A453 Grade 660 Class A, ASTM A891 Type 1; AMS 5737)

MECHANICAL PROPERTIES

Tensile (room temperature), typical

Product	UTS		0.2% YS		Elongation	RA	Grain size	Hardness	Specification
	ksi	MPa	ksi	MPa					
10" RCS	159	1096	112	772	26	44	5	35	AMS 5895
5" RND	160	1103	108	745	26	41	6	32	AMS 5732
1.5" RND	171	1179	112	772	25	46	7	34	AMS 5737
0.938" RND	167	1151	106	731	25	47	8	34	AMS 5737
0.625" RND	167	1151	111	765	25	49	7	35	AMS 5737
1.25" x 3" FLT	170	1172	108	745	28	49	6	32	AMS 5732

SPECIFICATIONS

Popular industry specifications for LSS A286 are given below.

AMS 5731	AMS 5853	NACE MR-0175	Cameron MS-003030
AMS 5732	AMS 5895	Fairchild MS 301, 314	ASTM A891 (Type 1, 2)
AMS 5734	EN 2399	Elliott Turbine MS 618	ASTM A638 (Grade 660 Type 1, 2)
AMS 5737	SPS M-118	Weatherford WS-881	ASTM A453 (Grade 660 Class A, B, C, D)
AMS 5726			



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The data presented herein are typical values, and do not warrant suitability for any specific application or use of this material. Normal variations in the chemical composition, the size of the product, and heat treatment parameters may result in different values for the various physical and mechanical properties.