

Alloy L-605 (also referenced as HAYNES® 25) is the strongest of the fabricable cobalt alloys, useful for continuous service to 1800°F. Because of its long and widespread use, this alloy has been the subject of many investigations to determine its properties over a wide range of conditions, thus making it an unusually well characterized material. When exposed for prolonged periods at intermediate temperatures, alloy L-605 exhibits a loss of room temperature ductility in much the same fashion as other superalloys, such as alloy X or alloy 625.

L-605 is welded using gas tungsten arc, gas metal arc, shielded metal arc, electron beam and resistance welding. Submerged arc welding is not recommended. Use good joint fit-up, minimum restraint, low interpass temperature and cool rapidly from welding. For maximum ductility, fabricated components should be annealed 2150-2250°F, rapid cool.

Specifications

UNS: R30605 W. Nr./EN: 2.4964 AMS: 5537, 5796 GE: B50A460

Chemical Composition, %

	Cr	Ni	Co	W	C	Fe	Mn	Si	P	S
MIN	19.0	9.0	—	14.0	0.05	—	1.0	—	—	—
MAX	21.0	11.0	balance	16.0	0.15	3.0	2.0	0.4	0.04	0.03

Features

- Outstanding high temperature strength
- Oxidation resistant to 1800°F
- Galling resistant
- Resistant to marine environments, acids and bodily fluids

Applications

- Gas turbine engine components such as combustion chambers and afterburners
- High temperature ball bearings and bearing races
- Springs
- Heart valves

Density: 0.330 lb/in³ Melting Range: 2425-2570°F

Temperature, °F	70	800	1000	1200	1400	1600	1800
Coefficient* of Thermal Expansion, in/in°F x 10 ⁻⁶	—	7.8	8.0	8.2	8.6	9.1	9.4
Thermal Conductivity Btu • ft/ft ² • hr • °F	—	10.0	11.2	12.5	13.7	15.2	16.7
Modulus of Elasticity Dynamic, psi x 10 ⁶	33	28	27	26	24	23	21

* 70°F to indicated temperature.

Mechanical Properties

Representative Tensile Properties, Sheet

Temperature, °F	70	1200	1400	1600	1800
Ultimate Tensile Strength, ksi	146	108	93	60	34
0.2% Yield Strength, ksi	69	48	41	36	18
Elongation, %	51	60	42	45	32

Typical Stress-Rupture Strength

Temperature, °F	1200	1400	1500	1600	1700	1800
100 Hours, ksi	69	36	25	18	12	7
1,000 Hours, ksi	57	26	18	12	7	4



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