Alloy W is a solid solution strengthened nickel superalloy developed primarily as a filler metal for welding dissimilar alloys. Alloy W has excellent dissimilar welding characteristics, and is widely used for that purpose in the gas turbine, aerospace and chemical process industries. The properties of dissimilar weld joints made with alloy W are dependent upon the base metal being joined, but are generally acceptable for a wide range of combinations.

Specifications

UNS: N10004 **AMS:** 5786 **AWS:** A5.14, ERNiMo-3

Chemical Composition, %

	Cr	Ni+Co	Mo	Co*	V	C	Fe	Mn	Si	P	S
MIN	4.0	–	23.0	–	–	–	4.0	–	–	–	–
MAX	6.0	balance	26.0	2.5	0.6	0.12	7.0	1.0	1.0	0.04	0.03

** Determination not required for routine acceptance*

Features

- One of the best choices for dissimilar alloy weldments
- Resists weld cracking in restrained joints of precipitation hardenable alloys
- Oxidation resistant through 1400°F
- Low coefficient of thermal expansion

Applications

- Joining crack sensitive precipitation hardening alloys
- Rings in gas turbine engines

Physical Properties

Density: 0.325 lb/in^3 **Melting Range:** 2350-2510°F

Temperature, °F	800	1000	1200	1400	1600	1800
Coefficient* of Thermal Expansion, in/in°F x 10^{-6}	7.3	7.4	7.4	7.8	8.2	8.4

** 70°F to indicated temperature.*

Mechanical Properties

Representative Tensile Properties, Bar (AMS 5755)

Temperature, °F	70	1000	1200	1400	1600	1800
Ultimate Tensile Strength, ksi	140	121	104	89	61	32
0.2% Yield Strength, ksi	76	54	53	56	49	24
Elongation, %	51	52.5	27	20.3	31.8	47.5

Typical Rupture Strength, Bar (AMS 5755)

Temperature, °F	1300	1400	1500	1600	1700
100 Hours, ksi	35	26	18	12	8
1,000 Hours, ksi	28	19	12	8	5

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