High-temperature alloy

Alloy 80A

Description

Alloy 80A is a wrought precipitation-hardening nickel-chromium superalloy originally developed for early jet engines and industrial gas turbines. Its design intent was to deliver reliable strength and oxidation resistance under sustained high-temperature loading up to around 815°C.

It features excellent high-temperature tensile and creep strength, good oxidation resistance, and fatigue performance. Precipitation of gamma prime phase provides its main strengthening effect.

Grade: UNS N07080| Nimonic® 80A | W.Nr.2.4952 / 2.4631 | NiCr20TiAl

Chemical Composition (wt%)

	Ni	Fe	Mn	C	Si	S	Cr	Al	Ti
Min	Balance						18.00	0.50	1.80
Max	Balance	3.00	1.00	0.10	1.00	0.015	21.00	1.80	2.70

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Physical Properties

Oxidation resistance

θ/℃	700	750	800
Oxidation Rate/(g/(m2.h))	0.037	0.041	0.047

Thermal conductivity

θ/℃	100	200	300	400	500	600	700	800	900
W/(m·℃)	12.11	13.83	15.48	16.75	18.39	20.93	23.48	25.57	27.66

Coefficient of thermal expansion

θ/℃	16-100	16-200	16-300	16-400	16-500	16-600	16-700
α	12.18	12.86	13.69	14.08	14.5	14.94	15.36

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Modulus of elasticity

θ/℃	18	100	200	300	400	500	600	700
E/GPa	222	218	214	206	200	194	189	179

Applicable standards

Technical Standards	Product Form
ASTM B637	Bars, Forgings and Forging stock

Disclaimer

Data is typical for reference only; actual values based on actual application.