BH DÖVME METAL SANAYİ ve TİCARET LTD. ŞTİ.
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Grade	W.Nr.	UNS	Nickel Alloys
Nimonic 90 / Alloy 90	2.4632 / 2.4969	N07090	

Nickel Alloy Properties

Nimonic 90 / Alloy 90 is an age-hardenable nickel superalloy that develops high strength through precipitation hardening and is especially noted for creep resistance, stress-rupture strength and mechanical stability at elevated temperatures. Its ability to retain shape and strength under long-term thermal exposure makes this grade more performance-oriented than standard nickel alloys. Machining requires controlled process conditions; welding and forming operations should also take heat treatment condition and section thickness into account.

Chemical Analysis (Nimonic 90 / Alloy 90)

Ni %	Cr %	C %	S %	Mn %	Si %	Ti %	Al %	Co %	Cu %	Fe %
Balance	18.00 - 21.00	0.13 max.	0.015 max.	1.00 max.	1.00 max.	2.00 - 3.00	1.00 - 2.00	15.00 - 21.00	0.20 max.	1.50 max.

Note: Limits for minor elements such as B, Zr, Pb and residual elements should be checked against the relevant producer datasheet, customer specification or order standard. The table above gives the principal alloying elements and common commercial analysis limits.

Mechanical Properties (Aged Condition / Age Hardened)

Product Form	Rp0.2, MPa	Rm, MPa	Elongation [%]	Hardness [HB]	Density [g/cm³]
Round Bar	752	1175	30	≈ 240–335 HB*	8.18
Plate	≥ 685	≥ 1200	≥ 16.5	≈ 240–335 HB*	
Sheet	831	1180	23	≈ 240–335 HB*	

** Note: For Nimonic 90, hardness values in aged condition are not always specified directly in HB; they are often given as HV. Therefore, the HB range shown is an approximate conversion. Round bar and sheet values are typical values; plate values are general datasheet minimum values. For ordering and inspection, the applicable AMS, BS, EN/AECMA standard or producer certificate should be checked.*

Applications

Sector	Products	Why Nimonic 90 Is Used in These Products
Aerospace and aircraft engines	Turbine blades, turbine discs, hot-section jet engine components	It provides creep resistance, stress-rupture strength and mechanical stability at high temperature, giving reliable performance under long-term load in hot engine sections.
Gas turbines and power generation	Gas turbine discs, ring sections, high-temperature forged parts	Rotating components exposed to high temperature must retain their shape; Nimonic 90 maintains strength and dimensional stability well under these conditions.
Hot-working tools and die sector	Hot-forming tools, furnace carriers/fixture parts, high-temperature fixtures	It is preferred where thermal cycling, hot contact and mechanical pressure require surface and core strength. It is more resistant to softening in hot environments.

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Automotive, motorsport and special exhaust systems	Exhaust reheater parts, high-temperature engine fasteners, turbo/exhaust-line components	It can retain strength under high exhaust temperature, vibration and thermal fatigue, so it is used in performance-oriented hot-section components.
Springs and fasteners	High-temperature springs, spring wire, high-temperature fasteners	Spring force and mechanical elasticity must be retained at elevated temperature; Nimonic 90 provides resistance to relaxation and deformation.
Industrial furnace and heat-treatment equipment	Furnace hangers/fixture parts, thermal-cycle-resistant fixtures, hot-environment carrier parts	It reduces deformation risk under long-term high temperature, oxidation and load-bearing conditions, increasing the service life of furnace equipment.

Technical Description

Nimonic 90 / Alloy 90 is an age-hardenable, creep-resistant nickel superalloy developed for service temperatures up to approximately **920°C**. After solution treatment, the grade gains high strength through **precipitation hardening / ageing**; for example, round bar can reach approximately **Rp0.2 752 MPa and Rm 1175 MPa** at 20°C. The alloy is weldable; resistance welding, TIG and MIG can be applied particularly in sheet form. However, for sections above approximately 5 mm, the risk of microfissuring in the weld metal and heat-affected zone increases; welding should therefore be performed under controlled conditions, preferably on solution-treated material, and suitable post-weld heat treatment should be considered for optimum properties.

Specifications
Nimonic 90, Alloy 90, W.Nr. 2.4632, W.Nr. 2.4969, NiCr20Co18Ti

Standards

Product Form	ASTM / ASME	AMS / SAE	Most Common Other Spec
Round Bar	ASTM B637 / ASME SB-637	SAE AMS 5829	BS HR2, BS HR501, BS HR502, BS HR503, AECMA PrEN 2295 / 2296 / 2297 / 2400 / 2401 / 2669 / 2670
Plate	—	—	BS HR202 / AECMA PrEN 2298
Sheet	—	—	BS HR202 / AECMA PrEN 2298

Alternative Grades

1. Nimonic 80A
2. Inconel X-750

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