HONGCHEN METAL
INDUSTRIAL METAL MATERIALS

PRODUCT DATA SHEET
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PRODUCT SPECIFICATIONS · BAR

Inconel 690 Round Bar

Chemical composition, mechanical properties and material characteristics

Features

- Inconel 690 is a nickel-chromium alloy valued for high-temperature strength, resistance to oxidation, and performance in severe thermal and chemical environments.
- It is commonly supplied in plate, sheet, coil, pipe, tube, bar, and strip forms.

Typical Applications

- Applied in gas turbines, aerospace hot-section hardware, petrochemical heaters, reformer components and other elevated-temperature structures that must retain strength and resist oxidation or hot corrosion. Design stress should be checked against grade data at the intended temperature and hold time.

Product Parameters

Product Name	690 Bar
Type	High-Temperature Nickel / Specialty Alloy
Standard	UNS N06690; ASTM B166/B167/B168
Surface	Pickled, bright annealed, peeled / turned or polished; clean, low-contamination finish preferred for hot service.
Delivery Condition	Solution annealed and / or age-hardened to the ordered condition (e.g. AMS / ASTM temper).
Scope of Application	Applied in gas turbines, aerospace hot-section hardware, petrochemical heaters, reformer components and other elevated-temperature structures that must retain strength and resist oxidation or hot corrosion. Design stress should be checked against grade data at the intended temperature and hold time.
Certificate	EN 10204 3.1 MTC with chemistry and mechanical results; aerospace / oil-tool certifications and third-party inspection available when specified.
Production Technology	Produced by melting practices suited to nickel alloys, then hot worked / cold worked and heat treated to the specified condition. Machining and welding require nickel-alloy procedures. Hot-rolled, forged or cold-drawn routes depending on size; cut-to-length available.
Edge Processing	Cut ends as standard; chamfering, deburring, peeling or centerless grinding available on request.
Diameter	6-300 mm
Length	1-6 m

Chemical Composition

Ni	Cr	Fe	C	Mn	Si	Cu
≥58	27.0-31.0	7.0-11.0	≤0.05	≤0.50	≤0.50	≤0.50

Mechanical Properties

Tensile (MPa)	Yield (MPa)	Elongation (%)
≥580	≥240	≥30

Physical Performance

Density	Melting Range	Modulus
8.19 g/cm³	1343-1377°C	~211 GPa

Reference: UNS N06690 Inconel 690 datasheet

Related Properties

High-Temperature Strength	Retains useful tensile and yield strength at temperatures where ordinary stainless softens rapidly. Allowable stress still depends on grade, product form, hold time and whether the duty is continuous or cyclic—always check the design curve for the intended temperature.
Oxidation Resistance	Forms a protective scale in hot air and many furnace atmospheres within the recommended range. Aggressive sulfidizing, carburizing or salt-laden gases can attack the scale; atmosphere chemistry and peak temperature should be reviewed together.
Creep & Rupture	Selected nickel and iron-nickel grades provide useful creep and stress-rupture resistance for sustained hot service such as heaters, reformers and turbine-related hardware. Long-term life estimates require grade-specific rupture data at the design stress.
Fabricability	Can be formed, machined and welded with practices suited to nickel alloys. Expect rapid work hardening, higher cutting forces and the need for clean, low-contamination fabrication to protect later high-temperature performance.
Thermal Cycling	Repeated heat-up / cool-down can cause scale spalling or thermal-fatigue cracking at edges and welds. Design for expansion, avoid sharp thickness transitions, and follow any required solution or aging treatment after heavy fabrication.

Material guidance for your next project

Send your grade, size and application requirements to our team.

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