

Stellite 6B

UNS R30006

Wrought Co–Cr–W–C wear alloy

The best-known wrought cobalt wear alloy for galling, erosion and hot sliding contact.

01 PRODUCT INTRODUCTION

Stellite 6B is a wrought cobalt-chromium-tungsten-carbon alloy developed for severe wear and galling service. Chromium-rich carbides and tungsten strengthening provide abrasion, erosion and hot-hardness capability, while the cobalt matrix retains toughness and corrosion resistance. It is used for valve trim, bushings, sleeves, wear plates, guide surfaces and high-temperature sliding components. Stellite 6B data must not be confused with cast Stellite 6 or weld-overlay deposits because processing route and carbide distribution change the properties. Final selection should consider product form, manufacturing route, heat treatment, wear mechanism, temperature, stress and governing specification.

02 ENGINEERING POSITION

Core advantage	Galling, abrasion, erosion, cavitation and hot sliding wear
Applications	Valve trim · bushings · sleeves · wear plates · guide surfaces · high-temperature bearings
Material class	Wrought Co–Cr–W–C wear alloy

03 COMMON INDUSTRY USE

Industry focus	Valve trim · bushings · sleeves · wear plates · guide surfaces · high-temperature bearings
Design note	Separate cast, wrought, overlay and medical-grade product data.

Composition & Physical Data

04 CHEMICAL COMPOSITION

Co	Balance	Cr	28–32%
W	3.5–5.5%	C	0.9–1.4%
Ni	≤ 3%	Fe	≤ 3%
Mo	≤ 1.5%	Si	≤ 2%

05 PHYSICAL PROPERTIES

Density	8.44 g/cm ³
Product route	Wrought / cast / deposited as identified
Data status	Typical reference; specification controls acceptance

06 MATERIAL IDENTITY

Common name	Stellite 6B
UNS	R30006
Alloy family	Wrought Co–Cr–W–C wear alloy
Reference specs	UNS R30006 · wrought Stellite 6B supplier and customer specifications

Mechanical, Wear & Service Performance

07 MECHANICAL PROPERTIES

Strength basis	Product form, cold work, microstructure and heat treatment determine properties.
Acceptance	Use specification minimums for tensile, yield, elongation and hardness.

08 SERVICE PERFORMANCE

Primary service	Galling, abrasion, erosion, cavitation and hot sliding wear
Wear mode	Identify galling, abrasion, erosion, cavitation or fretting separately.
Corrosion	Review chlorides, sour media, hot gases and galvanic coupling.
Temperature	Use grade-specific hot hardness, creep and oxidation data.

09 APPLICATIONS

Typical use	Valve trim · bushings · sleeves · wear plates · guide surfaces · high-temperature bearings
Critical review	Confirm section size, surface finish, manufacturing route and inspection plan.

Fabrication, Joining & Heat Treatment

10 MACHINING & FORMING

Machining	Use rigid carbide-alloy practice; wear grades may require grinding.
Forming	Wrought grades require superalloy forming practice and work-hardening control.

11 JOINING GUIDANCE

Welding	Use qualified cobalt-alloy procedures and compatible filler metal.
Overlay	Control dilution, cracking, preheat and deposit thickness.
Cleanliness	Remove sulfur, grease, oxides and iron contamination.
Inspection	Use NDE and hardness checks appropriate to the product route.

12 HEAT TREATMENT

Normally supplied as wrought and heat-treated product; machining and finishing require carbide-alloy practice.

Quality control	Confirm procedure qualification, hardness, NDE and full traceability.
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Product Forms, Standards & Procurement

13 REFERENCE STANDARDS

Standards	UNS R30006 · wrought Stellite 6B supplier and customer specifications
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14 PRODUCT FORMS

Forms	Sheet · plate · bar · wire · castings · wear plate · overlay · custom parts
Route	Specify wrought, cast, HIP, deposited or medical-grade product

15 RFQ INFORMATION

Material	Stellite 6B · UNS R30006 · governing specification
Dimensions	Form, thickness, tolerances, length and quantity
Testing	Chemistry, tensile, hardness, NDE, microstructure and special tests
Documents	MTR, heat/lot traceability and compliance certificates

16 TECHNICAL DISCLAIMER

Values shown are nominal or typical references and may vary by product form, manufacturing route and heat treatment. They do not replace design calculations, wear testing, medical validation, applicable codes or the certified material test report.

Contact	sales@nickelalloy.net · www.nickelalloy.net
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