

CoCrMo ASTM F75

UNS R30075

Cast Co–Cr–Mo implant alloy

Medical-grade cobalt alloy for wear-resistant orthopedic and dental cast components.

01 PRODUCT INTRODUCTION

ASTM F75 CoCrMo is a cast cobalt-chromium-molybdenum alloy used for surgical implants and precision medical components. Chromium provides a stable passive film, molybdenum contributes solid-solution and carbide strengthening, and the cobalt matrix supplies strength and wear resistance. Applications include orthopedic joint components and dental structures. Chemical composition, casting quality, microstructure, mechanical properties, cleanliness and biocompatibility are controlled by ASTM F75; wrought ASTM F1537 material is a different product and should not be represented by F75 cast data. Final selection should consider product form, manufacturing route, heat treatment, wear mechanism, temperature, stress and governing specification.

02 ENGINEERING POSITION

Core advantage	Biocompatibility, wear, corrosion resistance and cast mechanical integrity
Applications	Orthopedic implants · femoral components · dental castings · surgical and precision medical parts
Material class	Cast Co–Cr–Mo implant alloy

03 COMMON INDUSTRY USE

Industry focus	Orthopedic implants · femoral components · dental castings · surgical and precision medical parts
Design note	Separate cast, wrought, overlay and medical-grade product data.

Composition & Physical Data

04 CHEMICAL COMPOSITION

Co	Balance	Cr	27–30%
Mo	5–7%	Ni	≤ 0.50%
Fe	≤ 0.75%	C	≤ 0.35%
Mn	≤ 1%	Si	≤ 1%

05 PHYSICAL PROPERTIES

Density	Approx. 8.29 g/cm ³
Product route	Wrought / cast / deposited as identified
Data status	Typical reference; specification controls acceptance

06 MATERIAL IDENTITY

Common name	CoCrMo ASTM F75
UNS	R30075
Alloy family	Cast Co–Cr–Mo implant alloy
Reference specs	ASTM F75 · ISO 5832-4 where applicable · medical quality-system requirements

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	Biocompatibility, wear, corrosion resistance and cast mechanical integrity
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	Orthopedic implants · femoral components · dental castings · surgical and precision medical parts
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

Casting, hot isostatic pressing and heat treatment must follow the validated implant manufacturing route.

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

13 REFERENCE STANDARDS

Standards	ASTM F75 · ISO 5832-4 where applicable · medical quality-system requirements
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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	CoCrMo ASTM F75 · UNS R30075 · 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.

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