G42CrMo4 (EN 1.7231) Low-Alloy Steel Casting Material

Introduction

G42CrMo4 (EN 1.7231) is a low-alloy steel casting grade specified in EN 10293. The standard covers steel castings for general engineering uses and defines the applicable delivery conditions and engineering requirements. Casting process options include Investment Casting, Shell Molding Casting and Sand Casting, subject to the applicable specification and component requirements.

Manufacturing Process

Investment Casting
Shell Molding Casting
Sand Casting

Equivalent Grades

N/A

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
EN 10293	Steel castings — Steel castings for general engineering uses	2015	G42CrMo4	—

Physical Properties

N/A

Chemical Composition

Element	EN 10293 Edition 2015 · wt.% Cast analysis
C	0.38–0.45
Si	<= 0.60
Mn	0.60–1.00
P	<= 0.025
S	<= 0.020[1]
Cr	0.80–1.20
Ni	<= 0.40[2]
Mo	0.15–0.30
Cu	<= 0.30[2]
V	<= 0.05[2]

Notes

EN 10293 · Edition 2015

[1] S: For castings of ruling thickness <28 mm, sulfur up to 0.030 wt.% is permitted.

[2] Ni/Cu/V: Applies only where unspecified in unless otherwise agreed; no intentional addition except for finishing the heat.

Heat Treatment

EN 10293–2015 · +QT1

Step	Operation	Temperature	Cooling
1	: quenching	880–950 °C	liquid
2	: tempering	600–650 °C	—

EN 10293–2015 · +QT2

Step	Operation	Temperature	Cooling
1	: quenching	880–950 °C	liquid
2	: tempering	550–600 °C	—

Mechanical Properties

Conditions are not identical. Compare each stated condition and applicability separately.

Property	EN 10293 Edition 2015 +QT1[1]	EN 10293 Edition 2015 +QT2[2]
Yield Strength (Rp0.2)	>= 600 MPa[3] >= 550 MPa[4] >= 350 MPa[5]	>= 700 MPa
Tensile Strength	800–950 MPa[3] 700–850 MPa[4] 650–800 MPa[5]	850–1000 MPa
Elongation	>= 12 %[3] >= 10 %[4] >= 10 %[5]	>= 10 %
Impact Energy	>= 31 J[3] >= 27 J[4] >= 16 J[5]	>= 27 J

Notes

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[1] All properties in this column; +QT1: Test block of relevant thickness; maximum test-block wall thickness 150 mm; Room temperature; Properties apply to the casting up to the specified maximum wall thickness; above this, foreseeable lowering shall be agreed.

[2] All properties in this column; +QT2: wall thickness <= 100 mm; Test block of relevant thickness; maximum test-block wall thickness 150 mm; Room temperature; Properties apply to the casting up to the specified maximum wall thickness; above this, foreseeable lowering shall be agreed.

[3] Yield Strength (Rp0.2)/Tensile Strength/Elongation/Impact Energy; +QT1: wall thickness <= 100 mm

[4] Yield Strength (Rp0.2)/Tensile Strength/Elongation/Impact Energy; +QT1: wall thickness <= 150 mm

[5] Yield Strength (Rp0.2)/Tensile Strength/Elongation/Impact Energy; +QT1: wall thickness <= 250 mm

Welding Conditions

EN 10293–2015

Requirement	Value
Preheat	200–350 °C[1]
Interpass Temperature	<= 400 °C
Post-weld Heat Treatment	Post-weld temperature 20–50 °C below the base-material tempering temperature

Notes

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[1] Preheat: Preheat depends on casting geometry, thickness and climatic conditions.

Applications

At the casting-family level, typical applications include machinery, automotive and railway components, agricultural equipment and mining equipment.

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Casting Quality Industrial

As a professional manufacturer in China, We Casting Quality focus on Metal Parts OEM industry, and provide solutions and services in Metal Casting field as following:

Sand Casting

Investment Casting, Lost Wax process

Shell Casting

Lost Form Casting

Permanent Mold Casting

CNC Machining

CAD Design

Tools/Mold Design

Material Supplied

Cast Iron Castings (Grey Iron, Malleable Iron, Ductile Iron)

Carbon Steel and Alloy Steel Castings

Stainless Steel and Duplex Stainless Steel Castings

Aluminum Castings

Bronze and Brass Castings

Titanium and Cobalt Alloy Castings

What We Can Do

Design Ability

Our engineers will help you to improve the designs based on casting technology, then The simulation software will be processed to verify the casting pouring system. Pro/E, Solidworks, AutoCAD and ProCast are available in Casting Quality Industrial.

Saving Cost

Some manufacture processes may lead high cost. We will analyses the designs and advise the suitable methods to our customers. The best solution will be adopted.

Quality Control

From the raw material selecting to bulk production processing, all procedures will follow PPAP program if necessary. The certificates will be provided including chemistry, hardness, mechanical property or NDT testing.

Production Capacity

The max iron/steel castings can reach 30tons in weight, meanwhile the minus casting is around 1gram only.

We also have prototyping and 3D scanning ability for sample plan.

Logistic Service

The products will be delivered directly to customer’s workshop, which will save plenty of work for clients.

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