



## G34CrMo4 (EN 1.7230) Low-Alloy Steel Casting Material

### Introduction

G34CrMo4 (EN 1.7230) 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    | G34CrMo4      | —          |

### Physical Properties

N/A

### Chemical Composition

| Element | EN 10293<br>Edition 2015 · wt.%<br>Cast analysis |
|---------|--------------------------------------------------|
| C       | 0.30–0.37                                        |
| Si      | ≤ 0.60                                           |
| Mn      | 0.50–0.80                                        |
| P       | ≤ 0.025                                          |
| S       | ≤ 0.020 <sup>[1]</sup>                           |
| Cr      | 0.80–1.20                                        |
| Ni      | ≤ 0.40 <sup>[2]</sup>                            |
| Mo      | 0.15–0.30                                        |
| Cu      | ≤ 0.30 <sup>[2]</sup>                            |
| V       | ≤ 0.05 <sup>[2]</sup>                            |



## Notes

## EN 10293 · Edition 2015

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

<sup>[2]</sup> 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<br>Edition 2015<br>+QT1 <sup>[1]</sup>                                        | EN 10293<br>Edition 2015<br>+QT2 <sup>[2]</sup> |
|------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------|
| Yield Strength (Rp0.2) | >= 540 MPa <sup>[3]</sup><br>>= 480 MPa <sup>[4]</sup><br>>= 330 MPa <sup>[5]</sup>    | >= 650 MPa                                      |
| Tensile Strength       | 700–850 MPa <sup>[3]</sup><br>620–770 MPa <sup>[4]</sup><br>620–770 MPa <sup>[5]</sup> | 830–980 MPa                                     |
| Elongation             | >= 12 % <sup>[3]</sup><br>>= 10 % <sup>[4]</sup><br>>= 10 % <sup>[5]</sup>             | >= 10 %                                         |
| Impact Energy          | >= 35 J <sup>[3]</sup><br>>= 27 J <sup>[4]</sup><br>>= 16 J <sup>[5]</sup>             | >= 27 J                                         |

## Notes

## EN 10293 · Edition 2015

<sup>[1]</sup> 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.



<sup>[2]</sup> All properties in this column; +QT2: wall thickness  $\leq 100$  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.

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

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

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

## Welding Conditions

### EN 10293–2015

| Requirement              | Value                                                                        |
|--------------------------|------------------------------------------------------------------------------|
| Preheat                  | 200–350 °C <sup>[1]</sup>                                                    |
| Interpass Temperature    | $\leq 400$ °C                                                                |
| Post-weld Heat Treatment | Post-weld temperature 20–50 °C below the base-material tempering temperature |

### Notes

#### EN 10293 · Edition 2015

<sup>[1]</sup> 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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