GGG-40.3 (EN 0.7043) Ductile Cast Iron Casting Material

Introduction

GGG-40.3 is a ductile cast iron grade covered by DIN 1693-1, DIN 1693-2. Typical family applications include gear and transmission components, hubs, brackets, machine housings and pump-related castings.

Manufacturing Process

Sand Casting
Shell Molding Casting
Lost Foam Casting

Equivalent Materials

N/A

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
DIN 1693-1	Cast Iron with Nodular Graphite — Unalloyed and Low Alloy Grades	1973-10	GGG-40.3	—
DIN 1693-2	Cast Iron with Nodular Graphite — Unalloyed and Low Alloy Grades — Properties in Cast-on Test Piece	1977-10	GGG-40.3	—

Physical Properties

Property	Value / Unit	Note	Source
Density	7.2 kg/dm3	Approximate density for weight calculations, not a guaranteed density limit	DIN 1693-1

Chemical Composition

DIN 1693-1–1973-10

No specified chemical composition limits in DIN 1693-1

DIN 1693-2–1977-10

N/A

Heat Treatment

DIN 1693-1–1973-10

Supplied as cast or heat-treated; no mandatory numerical heat-treatment cycle specified.

DIN 1693-2–1977-10

N/A

Mechanical Properties

Core Mechanical Properties

DIN 1693-1 — 1973-10 · Table 2 — Normative

Property	Separately cast test piece
Tensile Strength	>= 400 N/mm2[1]
Yield Strength (Rp0.2)	>= 250 N/mm2[1]
Elongation	>= 18 %[1]
Impact Energy (DVM)	>= 16 J[2] >= 14 J[3]

DIN 1693-2 — 1977-10 · Table 1 — Normative

Property	Cast-on test piece
Tensile Strength	>= 390 N/mm2[4] >= 370 N/mm2[5]
Yield Strength (Rp0.2)	>= 250 N/mm2[4] >= 240 N/mm2[5]
Elongation	>= 15 %[4] >= 12 %[5]

Primarily casting weights >2000 kg and/or sections 50–200 mm; other sizes need separate agreement. Table 1 specifically lists 30–60 and >60–200 mm.

Additional Mechanical Properties

Low-Temperature Properties

DIN 1693-1 — 1973-10 · Table 2 — Normative

Property	Separately cast test piece
Impact Energy (DVM)	>= 14 J[6] >= 11 J[7]

DIN 1693-2 — 1977-10 · Table 1 — Normative

Property	Cast-on test piece
Impact Energy (DVM)	>= 14 J[8] >= 11 J[9] >= 12 J[10] >= 9 J[11]

Primarily casting weights >2000 kg and/or sections 50–200 mm; other sizes need separate agreement. Table 1 specifically lists 30–60 and >60–200 mm.

Notes

DIN 1693-1 · Edition 1973-10

[1] Tensile Strength/Yield Strength (Rp0.2)/Elongation: Separately cast U or Y test piece; tensile specimen per DIN 50125; A5 elongation

[2] Impact Energy (DVM): DVM notched-bar impact specimen per DIN 50115; room temperature; no numeric temperature invented; Condition: Separately cast test piece; DVM specimens; not a Charpy V-notch conversion. Mean of 3 DVM specimens; DIN 1693-1:1973-10, Table 2, PDF page 2; Mean of 3 DVM specimens

[3] Impact Energy (DVM): DVM notched-bar impact specimen per DIN 50115; room temperature; no numeric temperature invented; Condition: Separately cast test piece; DVM specimens; not a Charpy V-notch conversion. Individual DVM specimen; DIN 1693-1:1973-10, Table 2, PDF page 2; Individual DVM specimen

[6] Impact Energy (DVM): Test at -20 °C; DVM notched-bar impact specimen per DIN 50115; -20 °C; Condition: Separately cast test piece; DVM specimens; not a Charpy V-notch conversion. Mean of 3 DVM specimens; DIN 1693-1:1973-10, Table 2, PDF page 2; Mean of 3 DVM specimens

[7] Impact Energy (DVM): Test at -20 °C; DVM notched-bar impact specimen per DIN 50115; -20 °C; Condition: Separately cast test piece; DVM specimens; not a Charpy V-notch conversion. Individual DVM specimen; DIN 1693-1:1973-10, Table 2, PDF page 2; Individual DVM specimen

DIN 1693-2 · Edition 1977-10

[4] Tensile Strength/Yield Strength (Rp0.2)/Elongation: wall thickness <= 60 mm; Cast-on test piece 40 mm; DIN 50125 B14x70 tensile specimen; A5 elongation

[5] Tensile Strength/Yield Strength (Rp0.2)/Elongation: wall thickness <= 200 mm; Cast-on test piece 70 mm; DIN 50125 B14x70 tensile specimen; A5 elongation

[8] Impact Energy (DVM): wall thickness <= 60 mm; Test at -20 °C; DVM impact specimen per DIN 50115; Condition: Cast-on test piece; 30 <= t <= 60 mm; DVM impact energy at -20 °C; other temperatures require agreement.; DIN 1693-2:1977-10, Table 1, PDF page 7; Mean of 3 DVM specimens

[9] Impact Energy (DVM): wall thickness <= 60 mm; Test at -20 °C; DVM impact specimen per DIN 50115; Condition: Cast-on test piece; 30 <= t <= 60 mm; DVM impact energy at -20 °C; other temperatures require agreement.; DIN 1693-2:1977-10, Table 1, PDF page 7; Individual DVM specimen

[10] Impact Energy (DVM): wall thickness <= 200 mm; Test at -20 °C; DVM impact specimen per DIN 50115; Condition: Cast-on test piece; 60 < t <= 200 mm; DVM impact energy at -20 °C; other temperatures require agreement.; DIN 1693-2:1977-10, Table 1, PDF page 7; Mean of 3 DVM specimens

[11] Impact Energy (DVM): wall thickness <= 200 mm; Test at -20 °C; DVM impact specimen per DIN 50115; Condition: Cast-on test piece; 60 < t <= 200 mm; DVM impact energy at -20 °C; other temperatures require agreement.; DIN 1693-2:1977-10, Table 1, PDF page 7; Individual DVM specimen

Welding Conditions

N/A

Applications

Typical cast components in this material family include gear and transmission components, hubs, brackets, machine housings and pump-related castings. Applications include agricultural, construction and general industrial machinery. Lifting, low-temperature and pressure-retaining duties require the relevant component-specific requirements; ordinary family uses do not establish those capabilities.

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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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