ISO1083/JS/400-18 Ductile Cast Iron Casting Material

Introduction

ISO1083/JS/400-18 is a spheroidal graphite iron casting material in ISO 1083. The standard reports ferrite as a typical matrix. The wider ductile-iron family is used for pump casings and machinery housings.

Manufacturing Process

Sand Casting
Shell Molding Casting
Lost Foam Casting

Equivalent Materials

Standard	Material Grade
SAE J434	D400
EN 1563	EN-GJS-400-18
ASTM A536	60-40-18
GB/T 1348	QT400-18

Approximate materials; not guaranteed interchangeable.

Reference Standards

Standard	Standard Title	Edition	Specification
ISO 1083	Spheroidal graphite cast irons — Classification	2018	ISO1083/JS/400-18

Physical Properties

Property	Value	Applicable Conditions
Density	7.1 kg/dm3	Room temperature unless otherwise specified
Elastic Modulus	169 GN/m2	Room temperature unless otherwise specified
Poisson Ratio	0.275	Room temperature unless otherwise specified
Thermal Conductivity	36.2 W/(m·K)	Test temperature: 300 °C
Specific Heat	515 J/(kg·K)	Temperature range: 20–500 °C
Thermal Expansion	12.5 um/(m·K)	Temperature range: 20–400 °C
Electrical Resistivity	0.50 uohm·m	Room temperature unless otherwise specified

Property	Value	Applicable Conditions
Hysteresis Loss	600 J/m3	Hysteresis loss at B = 1 T; Room temperature unless otherwise specified
Matrix Structure	ferrite	
Maximum Magnetic Permeability	2136 uH/m	Room temperature unless otherwise specified

Sources: ISO 1083:2018

Matrix Structure: Typical structure.

Informative values; not mandatory acceptance limits.

Chemical Composition

Not Available

Heat Treatment

ISO 1083–2018

Not Available

Mechanical Properties

Primary Mechanical Properties

ISO 1083 — 2018

Property	t <= 30 mm	30 < t <= 60 mm	60 < t <= 200 mm
Yield Strength (Rp0.2)	>= 250 MPa	>= 250 MPa	>= 240 MPa
Tensile Strength	>= 400 MPa	>= 390 MPa	>= 370 MPa
Elongation	>= 18 %	>= 15 %	>= 12 %

Separately cast, cast-on or side-by-side cast samples

Values apply to sand moulds or moulds of comparable thermal behaviour

alternative processes are subject to amendments agreed in the order.

Elongation: Elongation values determined from L0 = 5 d

Elongation: other gauge lengths see 9.1 and Annex B.

ISO 1083 — 2018

Informative

Property	t <= 30 mm	30 < t <= 60 mm	60 < t <= 200 mm
Yield Strength (Rp0.2)	>= 250 MPa	>= 240 MPa	>= 230 MPa
Tensile Strength	>= 390 MPa	>= 370 MPa	>= 350 MPa
Elongation	>= 15 %	>= 12 %	>= 10 %

test pieces machined from samples cut from castings

Informative reference value

not an acceptance requirement

Elongation: For elongation results, the reference gauge length is L0 = 5 d.

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Informative

Property	Value
Shear Strength	360 MPa
Compressive Strength	700 MPa

Room temperature unless otherwise specified.

Informative reference value

not an acceptance requirement

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Informative

Property	Value
Tensile Strength	400 MPa

specimens diameter <=25 mm from casting

relevant wall thickness <=30 mm

Informative reference value

not an acceptance requirement

Additional Mechanical Properties

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Other Mechanical Properties

Informative

Property	Value
Torsional Strength	360 MPa

Room temperature unless otherwise specified.

Informative reference value

not an acceptance requirement

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Fatigue Properties

Informative

Property	Value
Reversed Tension Compression Fatigue Strength	168 MPa

Property	Value
Reversed Tension Compression Fatigue Ratio	0.42
Pulsating Tension Fatigue Strength	235 MPa
Reversed Torsional Fatigue Strength	152 MPa
Reversed Torsional Fatigue Ratio	0.38
Rotating Bending Fatigue Strength	188 MPa
Rotating Bending Fatigue Ratio	0.47
Notched Rotating Bending Fatigue Strength	128 MPa
Notched Rotating Bending Fatigue Ratio	0.32

specimens diameter <=25 mm from casting

relevant wall thickness <=30 mm

Reversed Tension Compression Fatigue Strength; Reversed Tension Compression Fatigue Ratio; Pulsating Tension Fatigue Strength; Reversed Torsional Fatigue Strength; Reversed Torsional Fatigue Ratio; Rotating Bending Fatigue Strength; Rotating Bending Fatigue Ratio: Unnotched specimen

10 million cycles and 50% failure probability.

Informative reference value

not an acceptance requirement

Notched Rotating Bending Fatigue Strength; Notched Rotating Bending Fatigue Ratio: Notched specimen with stress concentration factor Kt <= 3

Welding Conditions

Not Available

Applications

Ductile iron ISO1083/JS/400-18 belongs to the spheroidal graphite iron casting family. Foundry applications for spheroidal graphite iron include gears, support brackets, wheel hubs and casings for industrial pumps. These types of components occur in agricultural machinery, construction equipment and industrial fluid-handling systems.

Last Updated: 2026-11-16

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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