ISO1083/JS/500-7 Ductile Cast Iron Casting Material

Introduction

ISO1083/JS/500-7 is a spheroidal graphite iron casting material in ISO 1083. The standard reports ferrite-pearlite as a typical matrix. Family applications include hubs and gears in agricultural and industrial machinery.

Manufacturing Process

Sand Casting
Shell Molding Casting
Lost Foam Casting

Equivalent Materials

Standard	Material Grade
NBN 830-02	FNG50-7
NS11 301	SJK-500
NF A32-201	FGS500-7
EN 1563	EN-GJS-500-7
JIS G5502	FCD500
UNI 4544	GS500-7
AS 1831	500-7
SAE J434	D500
SS 14 07	0727-02
BS 2789	500/7
IS 1865	SG500/7
UNE 36-118	FGE50-7
ASTM A536	70-50-05
DIN 1693-1 DIN 1693-2	GGG-50
GB/T 1348	QT500-7

Approximate materials; not guaranteed interchangeable.

Reference Standards

Standard	Standard Title	Edition	Specification
ISO 1083	Spheroidal graphite cast irons — Classification	2018	ISO1083/JS/500-7

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	35.2 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	0.51 uohm·m	Room temperature unless otherwise specified
Hysteresis Loss	1345 J/m3	Hysteresis loss at B = 1 T; Room temperature unless otherwise specified
Matrix Structure	ferrite-pearlite	
Maximum Magnetic Permeability	1596 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)	>= 320 MPa	>= 300 MPa	>= 290 MPa
Tensile Strength	>= 500 MPa	>= 450 MPa	>= 420 MPa
Elongation	>= 7 %	>= 7 %	>= 5 %

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.

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Informative

Property	t <= 30 mm	30 < t <= 60 mm	60 < t <= 200 mm
Yield Strength (Rp0.2)	>= 300 MPa	>= 280 MPa	>= 260 MPa
Tensile Strength	>= 480 MPa	>= 450 MPa	>= 400 MPa
Elongation	>= 6 %	>= 5 %	>= 3 %

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	450 MPa
Compressive Strength	800 MPa

Room temperature unless otherwise specified.
Informative reference value
not an acceptance requirement

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Informative

Property	Value
Tensile Strength	500 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	450 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	200 MPa
Reversed Tension Compression Fatigue Ratio	0.40
Pulsating Tension Fatigue Strength	280 MPa
Reversed Torsional Fatigue Strength	180 MPa
Reversed Torsional Fatigue Ratio	0.36
Rotating Bending Fatigue Strength	225 MPa
Rotating Bending Fatigue Ratio	0.45
Notched Rotating Bending Fatigue Strength	150 MPa
Notched Rotating Bending Fatigue Ratio	0.30

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/500-7 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. Manufacturers supply such castings for agricultural equipment, vehicle assemblies and flow-control machinery.

CASTING QUALITY

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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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