Class 415 Grey Cast Iron Casting Material

Introduction

Class 415 is a gray cast iron grade covered by ASTM A278/A278M. Typical applications include pressure-containing gray iron castings for service up to 650 F (350 C).

Manufacturing Process

Sand Casting
Shell Molding Casting
Lost Foam Casting

Equivalent Materials

N/A

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
ASTM A278/A278M	Standard Specification for Gray Iron Castings for Pressure-Containing Parts for Temperatures Up to 650 F (350 C)	01	Class 415	—

Physical Properties

N/A

Chemical Composition

Element	ASTM A278/A278M Edition 01 · wt.%[1]
P	<= 0.25
S	<= 0.12

Chemical requirements[2]

Notes

ASTM A278/A278M · Edition 01

[1] All properties in this column: Service above 230 C, up to 350 C

[2] Chemical composition: C + 0.3 * (Si + P) <= 3.8 wt.%

Heat Treatment

ASTM A278/A278M–01 · Stress relief for elevated-temperature service

Step	Operation	Temperature	Cooling
1	Stress relief at 565-650 C; Table 2	565–650 °C; Holding time: 2–12 h[1]	—

Notes

ASTM A278/A278M · Edition 01

[1] Stress relief for elevated-temperature service: Required for service above 230 C; up to standard service ceiling; Enter furnace not exceeding 400 F (200 C); heat/cool uniformly. For sections up to 1 in (25 mm), rates shall not exceed the printed 400 F/h (250 C/h); heavier-section rate per Holding time: and footnotes require section-dependent minimum 1 h/in or 1 h per 25 mm, not exceeding 12 h; retain independently printed unit-system rules.

Mechanical Properties

Core Mechanical Properties

ASTM A278/A278M — 01 · Table 4 — Normative

Property	Value
Tensile Strength	>= 415 MPa

Separately cast test bar A, B, C or S selected for controlling section per Tables 1 and 5; Pressure-containing parts; up to 650 F / 350 C; unit systems as separately printed, not converted grades; Test bars shall represent the same lot. If heat treated, bars and castings are treated in the same furnace. Bar dimensions follow Table 1; purchaser selects bar via Table 5, otherwise manufacturer selects. The standard gives separate inch-pound and SI class tables; no identity equivalence is inferred between classes.

Welding Conditions

N/A

Applications

Grey cast iron ASTM A278/A278M Class 415 is used for pressure-containing gray iron castings for service up to 650 F (350 C). Other cast components used in this material family include pump bodies, valve bodies, covers, flanges and fittings. Typical settings include water, heating and industrial piping systems.

Finished-component pressure, temperature and fluid limits remain separate from the material grade and its standard-specific restrictions.

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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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