CF3 Austenitic Stainless Steel Casting Material

Introduction

CF3 is a austenitic stainless steel grade specified in ASTM A351, ASTM A743, ASTM A744 for pressure-containing cast components. 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

GX2CrNi19-11 (1.4309) — EN 10213 / EN 10283 / EN 10340 / ISO 11972[1]

Notes

[1] Source: ISO 11972:2023, Table A.1 (similar grade reference); Chemical comparison (similar grade reference).

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
ASTM A351	Standard Specification for Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts	03	CF3	UNS J92700
ASTM A743	Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application	03	CF3	UNS J92500
ASTM A744	Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service	00e1	CF3	UNS J92500

Physical Properties

N/A

Chemical Composition

Element	ASTM A351 Edition 03	ASTM A743 Edition 03	ASTM A744 Edition 00e1
C	<= 0.03 %	<= 0.03 %	<= 0.03 %[1]
Si	<= 2.00 %	<= 2.00 %	<= 2.0 %
Mn	<= 1.50 %	<= 1.50 %	<= 1.50 %
P	<= 0.040 %	<= 0.04 %	<= 0.04 %
S	<= 0.040 %	<= 0.04 %	<= 0.04 %

Element	ASTM A351 Edition 03	ASTM A743 Edition 03	ASTM A744 Edition 00e1
Cr	17.0–21.0 %	17.0–21.0 %	17.0–21.0 %
Ni	8.0–12.0 %	8.0–12.0 %	8.0–12.0 %
Mo	<= 0.50 %	— / Not specified	— / Not specified

Notes

ASTM A744 · Edition 00e1

[1] C: B For purposes of determining conformance with this specification, the observed or calculated value for carbon content shall be rounded to the nearest 0.01 % in accordance with the rounding method of Practice E 29.

Heat Treatment

ASTM A351–03 · Heat treatment

Step	Operation	Temperature	Cooling
1	Heat treat	>= 1900 °F / >= 1040 °C	—
2	Quench or rapid cool	—	water quench or rapid cooling by other means

ASTM A743–03 · As cast if corrosion resistance is acceptable

Step	Operation	Temperature
1	As cast	—[1]

ASTM A743–03 · Heat treatment and rapid cooling

Step	Operation	Temperature	Cooling
1	Heat	>= 1900 °F / >= 1040 °C[2]	—
2	Cool rapidly	—	rapid; medium not specified

ASTM A744–00e1 · Heat treatment

Step	Operation	Temperature	Cooling
1	Heat	>= 1900 °F / >= 1040 °C[3]	—
2	Quench or rapid cool	—	water quench or rapid cooling by other means

Notes

ASTM A743 · Edition 03

[1] As cast if corrosion resistance is acceptable: Only if corrosion resistance is acceptable

[2] Heat treatment, Heat treatment and rapid cooling: sufficient time to heat casting to temperature

ASTM A744 · Edition 00e1

[3] Heat treatment: sufficient time to heat casting to temperature

Mechanical Properties

Property	ASTM A351 Edition 03	ASTM A743 Edition 03	ASTM A744 Edition 00e1
Tensile Strength	>= 70 ksi >= 485 MPa	>= 70 ksi[1] >= 485 MPa[1]	>= 70 ksi[2] >= 485 MPa[2]
Yield Strength (Rp0.2)	>= 30 ksi >= 205 MPa	— / Not specified	— / Not specified
Elongation	>= 35.0 %	>= 35 %[1]	>= 35 %[2]
Yield Strength	— / Not specified	>= 30 ksi[1] >= 205 MPa[1]	>= 30 ksi[2] >= 205 MPa[2]

Notes

ASTM A743 · Edition 03

[1] Tensile Strength/Elongation/Yield Strength: Applies only when Supplementary Requirement S12 is specified; Condition: heat treatment per; separately cast keel block per S12.2 unless S12.3 agreement applies

ASTM A744 · Edition 00e1

[2] Tensile Strength/Elongation/Yield Strength: Applies only when Supplementary Requirement S22 is specified; Condition: heat treated to the same production procedure as the casting; separately cast keel block per S22.2

Welding Conditions

N/A

Applications

Typical casting applications include pressure-containing cast components such as valve bodies, flanges and fittings, subject to grade-specific service requirements.

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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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