



GX3CrNi13-4 (EN 1.6982) Stainless Steel Casting Material

Introduction

GX3CrNi13-4 (EN 1.6982) is a stainless steel casting grade specified in EN 10213. The standard defines delivery conditions and engineering requirements for pressure-containing 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

N/A

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
EN 10213	Steel castings for pressure purposes	2007+A1:2016	GX3CrNi13-4	EN 1.6982
EN 10293	Steel castings — Steel castings for general engineering uses	2015	GX3CrNi13-4	EN 1.6982

Physical Properties

EN 10213–2007+A1:2016

Property	Value	Note
Density	7.7 kg/dm ³	Test at 20 °C
Thermal Expansion	10.5 ×10 ⁻⁶ /K	Temperature range: 20–100 °C
Thermal Expansion	11 ×10 ⁻⁶ /K	Temperature range: 20–300 °C
Thermal Expansion	12 ×10 ⁻⁶ /K	Temperature range: 20–500 °C
Thermal Conductivity	26 W/(m·K)	Test at 50 °C
Thermal Conductivity	27 W/(m·K)	Test at 100 °C
Specific Heat	460 J/(kg·K)	Test at 20 °C
Magnetic Property	Magnetic	

Chemical Composition



Element	EN 10213 Edition 2007+A1:2016 · wt.% Cast analysis	EN 10293 Edition 2015 · wt.% Cast analysis
C	≤ 0.05	≤ 0.05
Si	≤ 1.00	≤ 1.00
Mn	≤ 1.00	≤ 1.00
P	≤ 0.035	≤ 0.035
S	≤ 0.015	≤ 0.015
Cr	12.00–13.50	12.00–13.50
Ni	3.50–5.00	3.50–5.00
Mo	≤ 0.70	≤ 0.70
Cu	≤ 0.30	≤ 0.30 ^[1]
V	≤ 0.08	≤ 0.08 ^[1]

Notes

EN 10293 · Edition 2015

^[1] Cu/V: Applies only where unspecified in unless otherwise agreed; no intentional addition except for finishing the heat.

Heat Treatment

EN 10213–2007+A1:2016 · +QT

Step	Operation	Temperature	Cooling
1	: quenching	1000–1050 °C ^[1]	air quench
2	: tempering	670–690 °C ^[1]	—
3	: tempering	590–620 °C ^[1]	—

EN 10293–2015 · +QT

Step	Operation	Temperature	Cooling
1	: quenching	1000–1050 °C	air
2	: tempering	670–690 °C	—
3	: tempering	590–620 °C	—

Notes

EN 10213 · Edition 2007+A1:2016

^[1] +QT: Treatment temperatures are given for information; required delivery condition is specified separately.



Mechanical Properties

Property	EN 10213 Edition 2007+A1:2016	EN 10293 Edition 2015 ^[1]
Yield Strength (Rp0.2)	$\geq 500 \text{ MPa}^{[2]}$	$\geq 500 \text{ MPa}^{[3]}$
Tensile Strength	700–900 MPa ^[2]	700–900 MPa ^[3]
Elongation	$\geq 15 \%^{[2]}$	$\geq 15 \%^{[3]}$
Impact Energy	$\geq 50 \text{ J}^{[2]}$ $\geq 27 \text{ J}^{[4]}$	$\geq 27 \text{ J}^{[5]}$

Notes

EN 10293 · Edition 2015

^[1] All properties in this column: wall thickness $\leq 300 \text{ mm}$; Test block of relevant thickness; maximum test-block wall thickness 150 mm; Properties apply to the casting up to the specified maximum wall thickness; above this, foreseeable lowering shall be agreed.

^[3] Yield Strength (Rp0.2)/Tensile Strength/Elongation: Room temperature

^[5] Impact Energy: Test at $-120 \text{ }^{\circ}\text{C}$

EN 10213 · Edition 2007+A1:2016

^[2] Yield Strength (Rp0.2)/Tensile Strength/Elongation/Impact Energy: wall thickness $\leq 300 \text{ mm}$; Properties verified on test blocks of thickness up to 150 mm; applicability to casting wall thickness as stated. Larger governing thickness requires agreement.; Room temperature

^[4] Impact Energy: Test at $-120 \text{ }^{\circ}\text{C}$; Test block; maximum thickness 150 mm; Specified low-temperature impact requirement

Welding Conditions

EN 10213–2007+A1:2016

Requirement	Value
Preheat	20–200 $^{\circ}\text{C}^{[1]}$
Interpass Temperature	manufacturer ^[2]
Post-weld Heat Treatment	Post-weld heat treatment at the discretion of the manufacturer unless otherwise agreed. ^[3]

EN 10293–2015

Requirement	Value
Preheat	20–200 $^{\circ}\text{C}^{[4]}$
Interpass Temperature	At manufacturer discretion unless otherwise agreed
Post-weld Heat Treatment	At manufacturer discretion unless otherwise agreed



Notes

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^[1] Preheat: Production welding by the foundry; ferritic/martensitic guidance is informative.; Preheat temperature depends on casting geometry, thickness and climatic conditions.

^[2] Interpass Temperature: Production welding by the foundry; ferritic/martensitic guidance is informative.

^[3] Post-weld Heat Treatment: Production welding by the foundry; ferritic/martensitic guidance is informative.; In general, production welds are major when prepared cavity depth exceeds 40% of the wall thickness; minor weld corrosion conditions may require special agreement.

EN 10293 · Edition 2015

^[4] Preheat: Preheat depends on casting geometry, thickness and climatic conditions.

Applications

At the casting-family level, typical applications include valve bodies, pump casings and other pressure-containing components. Material selection should account for service temperature, loading and the specified delivery condition.

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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.

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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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