



GX5CrNi19-10 (EN 1.4308) Austenitic Stainless Steel Casting Material

Introduction

GX5CrNi19-10 is a austenitic stainless steel casting grade covered by EN 10213, EN 10283. Casting process options include Investment Casting, Shell Molding Casting, Sand Casting, subject to the applicable specification and component requirements.

Manufacturing Process

Investment Casting
Shell Molding Casting
Sand Casting

Equivalent Grades

CF8 — ASTM A351 / ASTM A743 / ASTM A744^[1]

Notes

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

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
EN 10213	Steel castings for pressure purposes	2007+A1:2016	GX5CrNi19-10	EN 1.4308
EN 10283	Corrosion resistant steel castings	2019	GX5CrNi19-10	EN 1.4308
ISO 11972	Corrosion-resistant cast steels for general applications	2023	GX5CrNi19-10	EN 1.4308

Physical Properties

EN 10213–2007+A1:2016

Property	Value	Note
Density	7.88 kg/dm ³	Test at 20 °C
Thermal Expansion	16.8 ×10 ⁻⁶ /K	Temperature range: 20–100 °C
Thermal Expansion	17.9 ×10 ⁻⁶ /K	Temperature range: 20–300 °C
Thermal Expansion	18.6 ×10 ⁻⁶ /K	Temperature range: 20–500 °C
Thermal Conductivity	15.2 W/(m·K)	Test at 50 °C
Thermal Conductivity	16.5 W/(m·K)	Test at 100 °C
Specific Heat	530 J/(kg·K)	Test at 20 °C



Property	Value	Note
Magnetic Property	Not or slightly magnetic	

EN 10283–2019

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Density	7.88 kg/dm ³	Test at 20 °C
Specific Heat	530 J/(kg·K)	Test at 20 °C
Thermal Conductivity	15.2 W/(m·K)	Test at 50 °C
Thermal Conductivity	16.5 W/(m·K)	Test at 100 °C
Thermal Expansion	16.8 ×10 ⁻⁶ /K	Temperature range: 20–100 °C
Thermal Expansion	17.9 ×10 ⁻⁶ /K	Temperature range: 20–300 °C
Thermal Expansion	18.6 ×10 ⁻⁶ /K	Temperature range: 20–500 °C

Chemical Composition

Element	EN 10213 Edition 2007+A1:2016 · wt.% Cast analysis	EN 10283 Edition 2019 · wt.% Cast analysis	ISO 11972 Edition 2023 · wt.%
C	≤ 0.07	≤ 0.07	≤ 0.07
Si	≤ 1.50	≤ 1.50	≤ 1.5
Mn	≤ 1.50	≤ 1.50	≤ 1.5
P	≤ 0.040	≤ 0.040	≤ 0.040
S	≤ 0.030	≤ 0.030	≤ 0.030
Cr	18.00–20.00	18.00–20.00	18.0–20.0
Ni	8.00–11.00	8.00–11.00	8.0–11.0
Cu	≤ 0.50	≤ 0.50 ^[1]	— / Not specified

Notes**EN 10283 · Edition 2019**

^[1] Cu: Applies unless otherwise agreed; unspecified elements shall not be intentionally added without purchaser agreement except for finishing the heat.

Heat Treatment**EN 10213–2007+A1:2016 · +AT**



Step	Operation	Temperature	Cooling
1	: solution annealing	1050–1150 °C ^[1]	water quench

EN 10283–2019 · +AT

Step	Operation	Temperature	Cooling
1	solution annealing	1050–1150 °C	water

ISO 11972–2023 · Solution treated

Step	Operation	Temperature	Cooling
1	solution treatment	1050–1150 °C ^[2]	quench

Notes**EN 10213 · Edition 2007+A1:2016**

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

ISO 11972 · Edition 2023

^[2] Solution treated: Depending on thickness, accelerated air cooling.

Mechanical Properties

Property	EN 10213 Edition 2007+A1:2016	EN 10283 Edition 2019 ^[1]	ISO 11972 Edition 2023 ^[2]
Yield Strength (Rp1.0)	>= 200 MPa ^[3] >= 160 MPa ^[4] >= 125 MPa ^[5] >= 110 MPa ^[6]	>= 200 MPa	>= 200 MPa
Tensile Strength	440–640 MPa ^[3]	>= 440 MPa	>= 440 MPa
Elongation	>= 30 % ^[3]	>= 30 %	>= 30 %
Impact Energy	>= 60 J ^[3] >= 60 J ^[7]	>= 60 J ^[8]	>= 60 J ^[9]
Yield Strength (Rp0.2)	— / Not specified	>= 175 MPa	>= 175 MPa

Notes**EN 10283 · Edition 2019**

^[1] All properties in this column: wall thickness <= 150 mm; Test block; maximum thickness 150 mm; Room temperature; Yield and tensile strength also apply to the casting up to the maximum specified wall thickness.

^[8] Impact Energy: KV2 as specified in

ISO 11972 · Edition 2023

^[2] All properties in this column: wall thickness <= 150 mm; Room temperature; Test blocks used to verify mechanical properties shall not exceed 150 mm thickness. Properties for samples removed from castings shall be agreed between manufacturer and purchaser.

^[9] Impact Energy: Verification of impact tests is required only when indicated by the customer.

**EN 10213 · Edition 2007+A1:2016**

[3] Yield Strength (Rp1.0)/Tensile Strength/Elongation/Impact Energy: wall thickness ≤ 150 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] Yield Strength (Rp1.0): Test at 100 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

[5] Yield Strength (Rp1.0): Test at 200 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

[6] Yield Strength (Rp1.0): Test at 300 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

[7] Impact Energy: Test at -196 °C; Test block; maximum thickness 150 mm; Optional by agreement at enquiry and order

Welding Conditions**EN 10213–2007+A1:2016**

Requirement	Value
Preheat	No preheat ^[1]
Interpass Temperature	At manufacturer discretion unless otherwise agreed ^[2]
Post-weld Heat Treatment	+AT (solution annealing), normally liquid quenching; air quenching may be agreed for very small, thin castings. May be omitted for high-temperature use. ^[3]

EN 10283–2019

Requirement	Value
Preheat	No preheat ^[4]
Interpass Temperature	At manufacturer discretion unless otherwise agreed
Post-weld Heat Treatment	Solution annealing followed by water quenching ^[5]
Post-weld Heat Treatment	Solution annealing followed by water quenching ^[6]

Notes**EN 10213 · Edition 2007+A1:2016**

[1] Preheat: Production welding by the foundry; requirements for austenitic/austenitic-ferritic grades are normative.; Preheat temperature depends on casting geometry, thickness and climatic conditions.

[2] Interpass Temperature: Production welding by the foundry; requirements for austenitic/austenitic-ferritic grades are normative.

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

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

[5] Post-weld Heat Treatment: minor welds; Air quenching may be agreed for very small, thin castings according to corrosion conditions.



[6] Post-weld Heat Treatment: major welds; Air quenching may be agreed for very small, thin castings according to corrosion conditions.

Applications

Typical casting applications include pumps, valves and pipe fittings; machinery parts; automotive components; food-processing equipment; and construction components.

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Investment Casting, Lost Wax process

Shell Casting

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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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