



GX10NiCrSiNb32-20 (EN 1.4859) Austenitic Stainless Steel Casting Material

Introduction

GX10NiCrSiNb32-20 (EN 1.4859) is an austenitic 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

CT15C — ASTM A351^[1]

Notes

^[1] Historical manual confirmation (similar grade reference).

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
EN 10213	Steel castings for pressure purposes	2007+A1:2016	GX10NiCrSiNb 32-20	EN 1.4859
EN 10295	Heat resistant steel castings	2002	GX10NiCrSiNb 32-20	EN 1.4859

Physical Properties

EN 10213–2007+A1:2016

Property	Value	Note
Density	8.0 kg/dm ³	Test at 20 °C
Thermal Expansion	15 ×10 ⁻⁶ /K	Temperature range: 20–300 °C
Thermal Expansion	16.3 ×10 ⁻⁶ /K	Temperature range: 20–500 °C
Thermal Conductivity	12.1 W/(m·K)	Test at 50 °C
Thermal Conductivity	13.1 W/(m·K)	Test at 100 °C
Specific Heat	500 J/(kg·K)	Test at 20 °C
Magnetic Property	Not or slightly magnetic	



Chemical Composition

Element	EN 10213 Edition 2007+A1:2016 · wt.% Cast analysis	EN 10295 Edition 2002 · wt.% Cast analysis
C	0.05–0.15	0.05–0.15
Si	0.50–1.50	0.50–1.50
Mn	≤ 2.00	≤ 2.00
P	≤ 0.040	≤ 0.040
S	≤ 0.030	≤ 0.030
Cr	19.00–21.00	19.00–21.00
Ni	31.00–33.00	31.00–33.00
Mo	≤ 0.50	≤ 0.50
Cu	≤ 0.50	≤ 0.25 ^[1]
Nb	0.50–1.50	0.50–1.50
V	— / Not specified	≤ 0.12 ^[1]
W	— / Not specified	≤ 0.60 ^[1]
Co	— / Not specified	≤ 1.00 ^[1]

Notes

EN 10295 · Edition 2002

^[1] Cu/V/W/Co: Unless otherwise agreed: limit for element unspecified in; no intentional addition except for finishing the heat.

Heat Treatment

NO HEAT TREATMENT

Mechanical Properties

Property	EN 10213 Edition 2007+A1:2016	EN 10295 Edition 2002 ^[1]
Yield Strength (Rp0.2)	≥ 180 MPa ^[2] ≥ 180 MPa ^[3] ≥ 155 MPa ^[4] ≥ 135 MPa ^[5] ≥ 125 MPa ^[6] ≥ 120 MPa ^[7] ≥ 110 MPa ^[8] ≥ 107 MPa ^[9]	— / Not specified
Tensile Strength	440–640 MPa ^[2] 400–600 MPa ^[10]	≥ 440 MPa



Property	EN 10213 Edition 2007+A1:2016	EN 10295 Edition 2002 ^[1]
Elongation	$\geq 25\%$ ^[2] $\geq 20\%$ ^[10]	$\geq 20\%$
Impact Energy	$\geq 27\text{ J}$ ^[2] $\geq 27\text{ J}$ ^[3]	— / Not specified
Yield Strength	— / Not specified	$\geq 180\text{ MPa}$

Notes

EN 10295 · Edition 2002

^[1] All properties in this column: Room temperature

EN 10213 · Edition 2007+A1:2016

^[2] Yield Strength (Rp0.2)/Tensile Strength/Elongation/Impact Energy: wall thickness $\leq 50\text{ mm}$; 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

^[3] Yield Strength (Rp0.2)/Impact Energy: wall thickness $\leq 150\text{ mm}$; 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] Yield Strength (Rp0.2): Test at 100 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

^[5] Yield Strength (Rp0.2): Test at 200 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

^[6] Yield Strength (Rp0.2): Test at 300 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

^[7] Yield Strength (Rp0.2): Test at 400 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

^[8] Yield Strength (Rp0.2): Test at 500 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

^[9] Yield Strength (Rp0.2): Test at 550 °C; Verification of elevated-temperature yield values is subject to agreement at enquiry and order.

^[10] Tensile Strength/Elongation: wall thickness $\leq 150\text{ mm}$; 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; For centrifugal castings in this thickness range: Rm 440–640 MPa; elongation 25%.

Welding Conditions

EN 10213–2007+A1:2016

Requirement	Value
Preheat	No preheat ^[1]
Interpass Temperature	$\leq 200\text{ °C}$ ^[2]
Post-weld Heat Treatment	For wall thickness $> 80\text{ mm}$, annealing at $\geq 850\text{ °C}$ is necessary to reduce residual stresses. ^[3]



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.

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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Investment Casting, Lost Wax process

Shell Casting

Lost Form Casting

Permanent Mold Casting

CNC Machining

CAD Design

Tools/Mold Design

Material Supplied

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Carbon Steel and Alloy Steel Castings

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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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