242.0 Aluminum-Copper Alloy Casting Material

Introduction

242.0 is a casting grade in the Aluminum-Copper Alloy family, specified in ASTM B26/B26M. The specification defines its chemical composition and mechanical requirements for the applicable sand-casting tempers. Casting process options include Sand Casting, subject to the applicable specification and component requirements.

Manufacturing Process

Sand Casting

Equivalent Grades

N/A

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
ASTM B26/B26M	Standard Specification for Aluminum-Alloy Sand Castings	05	242.0	UNS A02420

Physical Properties

N/A

Chemical Composition

Element	ASTM B26/B26M Edition 05 · wt.%
Si	<= 0.7
Fe	<= 1.0
Cu	3.7–4.5
Mn	<= 0.35
Mg	1.2–1.8
Cr	<= 0.25
Ni	1.7–2.3
Zn	<= 0.35
Ti	<= 0.25
Al	remainder

Chemical requirements[1][2]

Notes

ASTM B26/B26M · Edition 05

[1] Chemical composition: Other elements, each: <= 0.05 wt.%

[2] Chemical composition: Other elements, total: <= 0.15 wt.%

Heat Treatment

ASTM B26/B26M–05 · Sand Casting · O · Recommended heat treatment

Step	Operation	Temperature / holding time	Cooling
1	Recommended: Annealing	650 °F / 345 °C; Holding time: 3 h[1]	Still air outside furnace

ASTM B26/B26M–05 · Sand Casting · T61 · Recommended heat treatment

Step	Operation	Temperature / holding time	Cooling
1	Recommended: Solution heat treatment	960 °F / 515 °C; Holding time: 2–6 h[2]	Air blast
2	Recommended: Precipitation heat treatment	450 °F / 230 °C; Holding time: 1–3 h[3]	Still air outside furnace

Notes

ASTM B26/B26M · Edition 05

[1] O, O · Recommended heat treatment: Source: ASTM B917/B917M–25 (Recommended; when specified by the material specification or purchase order).; ±10°F; Use suitable metal-temperature measurement; sections/microstructure affect soak time selection (7.2).; No quenching required. Cool in still air outside the furnace.; Footnote H (footnotes), O — inch-pound: Solution treatment temperature of 1010°F may be used (to obtain higher solubility) provided no portion of the heat treat oven exceeds 1020°F.; ±5°C; Footnote H (footnotes), O — SI: Solution treatment temperature of 545°C may be used (to obtain higher solubility) provided no portion of the heat treat oven exceeds 550°C.

[2] T61, T61 · Recommended heat treatment: Source: ASTM B917/B917M–25 (Recommended; when specified by the material specification or purchase order).; ±10°F; Use suitable metal-temperature measurement; sections/microstructure affect soak time selection (7.2).; Quench in water at 150 to 212°F except as noted.; Time at solution temperature may be increased for section thickness over 1 in.; Quenching is accomplished by air blast.; ±5°C; Quench in water at 65 to 100°C except as noted.; Time at solution temperature may be increased for section thickness over 25 mm.

[3] T61, T61 · Recommended heat treatment: Source: ASTM B917/B917M–25 (Recommended; when specified by the material specification or purchase order).; ±10°F; Use suitable metal-temperature measurement; sections/microstructure affect soak time selection (7.2).; No quenching required. Cool in still air outside the furnace.; ±5°C

Mechanical Properties

Conditions are not identical. Compare each stated condition and applicability separately.

Property	ASTM B26/B26M Edition 05 O	ASTM B26/B26M Edition 05 T61
Yield Strength (Rp0.2)	Not Applicable Not Applicable	>= 20.0 ksi / >= 140 MPa[1]
Elongation	Not Applicable Not Applicable	Not Applicable Not Applicable

Property	ASTM B26/B26M Edition 05 O	ASTM B26/B26M Edition 05 T61
Tensile Strength	>= 23.0 ksi / >= 160 MPa[2]	>= 32.0 ksi / >= 220 MPa[1]
Brinell Hardness	70 HB[3]	105 HB[4]

Notes

ASTM B26/B26M · Edition 05

[1] Yield Strength (Rp0.2)/Tensile Strength; T61: inch-pound; 2 in. or 4 x diameter / SI; 5 x diameter

[2] Tensile Strength; O: inch-pound; 2 in. or 4 x diameter / SI; 5 x diameter

[3] Brinell Hardness; O: inch-pound; 2 in. or 4 x diameter; 500 kgf; 10 mm; Typical hardness is for information only, not required for acceptance / SI; 5 x diameter; Typical hardness is for information only, not required for acceptance

[4] Brinell Hardness; T61: inch-pound; 2 in. or 4 x diameter; 500 kgf; 10 mm; Typical hardness is for information only, not required for acceptance / SI; 5 x diameter; Typical hardness is for information only, not required for acceptance

Welding Conditions

N/A

Applications

At the material-family level, typical applications include custom, shaped aluminum sand-cast components for non-aerospace use. ASTM B26/B26M excludes aerospace applications; suitability of this grade must be checked against the component requirements and specified temper.

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CASTING QUALITY

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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