WCB Low Carbon Steel Casting Material

Introduction

ASTM A216/A216M Grade WCB is a cast carbon steel for pressure-containing components in high-temperature service. The specification limits composition and tensile properties and defines heat-treated delivery options.

Manufacturing Process

Investment Casting
Shell Molding Casting
Sand Casting

Equivalent Materials

Not Available

Reference Standards

Standard	Standard Title	Edition	Specification
ASTM A216/A216M	Steel Castings, Carbon, Suitable for High-Temperature Service	93(2003)	WCB

Physical Properties

Not Available

Chemical Composition

Element	Requirement
C	<= 0.30 %
Si	<= 0.60 %
Mn	<= 1.00 %
P	<= 0.04 %
S	<= 0.045 %
Cr	<= 0.50 %
Ni	<= 0.50 %
Mo	<= 0.20 %
Cu	<= 0.30 %
V	<= 0.03 %
Combined requirement	Cu + Ni + Cr + Mo + V <= 1.00 % unless S11 is specified CEV <= 0.50 % [Applies only when ordered under S11. CE = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15.]

Mn: An additional 0.04 % Mn is permitted for each 0.01 % C below its maximum, up to 1.28 % Mn.

Heat Treatment

Delivery condition — Anneal, normalize, or normalize and temper. Perform heat treatment after cooling below the transformation range. Use quench-and-temper delivery when S15 is ordered.

Sources: ASTM A216/A216M:93(2003)

Mechanical Properties

Primary Mechanical Properties

ASTM A216/A216M — 93(2003)

Property	Requirement
Tensile Strength	70–95 ksi [485–655 MPa]
Yield Strength	>= 36 ksi [250 MPa]
Elongation	>= 22 %
Reduction of Area	>= 35 %

Yield Strength: Determine yield strength by 0.2% offset or 0.5% extension under load.

Elongation: When ICI test bars are used, the gauge length to reduced section diameter ratio shall be 4 to 1.

Elongation gauge length: 2 in. [50 mm]

Welding Conditions

Not Available

Applications

Carbon steel ASTM A216/A216M Grade WCB is covered for cast valves, flanges, fittings and other pressure-containing parts in high-temperature service. Grade selection depends on applicable design and service conditions.

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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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