70-40 [485-275] Carbon Steel Casting Material

Introduction

ASTM A27/A27M Grade 70-40 [485-275] is a heat-treated carbon steel for castings. The standard specifies a minimum yield point as well as tensile strength, elongation and reduction of area.

Manufacturing Process

Investment Casting
Shell Molding Casting
Sand Casting

Equivalent Materials

Not Available

Reference Standards

Standard	Standard Title	Edition	Specification	Identifier
ASTM A27/A27M	Steel Castings, Carbon, for General Application	13	70-40 [485-275]	UNS J02501

Physical Properties

Not Available

Chemical Composition

Element	Requirement
C	<= 0.25 %
Si	<= 0.80 %
Mn	<= 1.20 %
P	<= 0.035 %
S	<= 0.035 %

Mn: For every 0.01 % below the maximum carbon, 0.04 % above the manganese limit is permitted, up to 1.40 % Mn.

Element	ASTM A27/A27M — 13 — Conditional requirements
Cr	<= 0.50 %
Ni	<= 0.50 %
Mo	<= 0.25 %
Cu	<= 0.50 %

Cu: Applies only when Supplementary Requirement S54 is specified; When S54 applies, combined Cu + Ni + Mo + Cr shall not exceed 1.00 %.

Ni; Mo; Cr: Applies only when Supplementary Requirement S54 is specified

Heat Treatment

Required heat treatment — Full annealing, normalizing, normalizing and tempering, or quenching and tempering. Unless otherwise specified, one or a combination may be selected by the manufacturer. Cool below the transformation range from pouring temperature before heat treatment. Furnace temperature is regulated using pyrometers. If castings are retreated after a failed mechanical test, no more than three reaustenitizations are allowed without purchaser approval.

Sources: ASTM A27/A27M:13

Mechanical Properties

Primary Mechanical Properties

ASTM A27/A27M — 13

Property	Inch-pound 70-40 (ksi)	SI 485-275 (MPa)
Tensile Strength	>= 70 ksi	>= 485 MPa
Yield Strength	>= 40 ksi	>= 275 MPa
Elongation	>= 22 %	>= 22 %
Reduction of Area	>= 30 %	>= 30 %

Same heat as the represented casting

Elongation [Inch-pound 70-40 (ksi)]: Minimum elongation measured over 2 in. For ICI test bars the gauge length to reduced section diameter ratio is 4:1.

Elongation [SI 485-275 (MPa)]: Minimum elongation measured over 50 mm. For ICI test bars the gauge length to reduced section diameter ratio is 4:1.

Welding Conditions

ASTM A27/A27M — 13 · Clause 9.2 (continues on PDF p.3) / normative

Property	Requirement
Post-weld Heat Treatment	Class 1 when postweld heat treatment is required; identify the welds to be treated. Class 2 when it is not required.

Applications

Carbon steel ASTM A27/A27M Grade 70-40 [485-275] is one of the carbon steel casting grades for general application. The broader material family is used in pump and valve parts and in construction equipment. The cited uses have no grade-specific service rating.

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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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