

# What Is Carbon Steel and How Is It Classified?

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Carbon steel is an iron-carbon alloy with up to 2.1% carbon by weight. It is known for its strength, affordability, and wide use in construction and manufacturing.

How Is Carbon Steel Made?

Carbon steel is typically produced through the Basic Oxygen Furnace (BOF) or Electric Arc Furnace (EAF) processes, which combine molten iron with controlled amounts of carbon and other elements.

Classification of Carbon Steel

Carbon steel is commonly classified based on carbon content:

- Low Carbon Steel (Mild Steel):

  - Carbon content:  $<0.25\%$

  - Soft, ductile, excellent weldability

  - Common in pipes, wire, car bodies

- Medium Carbon Steel:

  - Carbon content:  $0.25\%-0.60\%$

  - Higher strength and hardness

  - Used in axles, gears, rails

- High Carbon Steel:

## What Is Carbon Steel and How Is It Classified?

Carbon content: 0.60%-1.0%

Very strong and hard

Ideal for tools, blades, springs

- Ultra-High Carbon Steel:

Carbon content: >1.0%

Hardest form, brittle, used in specialty knives and dies

### Comparison Table of Carbon Steel Types

| Type              | Carbon %    | Strength  | Ductility | Common Uses                |
|-------------------|-------------|-----------|-----------|----------------------------|
| Low Carbon Steel  | <0.25%      | Low       | High      | Tubes, wires, construction |
| Medium Carbon     | 0.25%-0.60% | Medium    | Medium    | Axles, shafts, gears       |
| High Carbon       | 0.60%-1.0%  | High      | Low       | Cutting tools, springs     |
| Ultra High Carbon | >1.0%       | Very High | Very Low  | Tool steels, dies          |

### Other Ways to Classify Carbon Steel

- Based on manufacturing method: hot rolled, cold rolled
- Surface finish: black steel, pickled, oiled
- Use case: structural, pressure vessel, etc.

### Applications of Carbon Steel

- Infrastructure and construction (beams, rebar)
- Automotive and transportation (frames, axles)

## **What Is Carbon Steel and How Is It Classified?**

- Oil and gas (pipes, line pipes)
- Machinery parts and tools

### **FAQs**

Q: Is carbon steel the same as mild steel?

A: Mild steel is a type of low carbon steel. All mild steels are carbon steels, but not all carbon steels are mild.

Q: Can carbon steel rust?

A: Yes. Carbon steel is not corrosion resistant and needs surface treatment or coating to avoid rusting.

Q: What is the difference between carbon steel and alloy steel?

A: Carbon steel mainly relies on carbon for its properties. Alloy steel includes other alloying elements like chromium, nickel, or molybdenum to enhance performance.

Q: Is carbon steel stronger than stainless steel?

A: Carbon steel often has higher strength, but stainless steel offers better corrosion resistance.

### **Contact Us**

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