

A36 Carbon Steel Coil, Properties, Standards, Applications & More

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A36 Carbon Steel Coil: Properties, Standards, Applications & More



A36 carbon steel coil is one of the most widely used carbon steel products in the world. Known for its affordability, excellent weldability, machinability, and structural strength, A36 is a staple material across construction, manufacturing, automotive, shipbuilding, and more. In coil form, A36 steel is ideal for sheet metal fabrication, cold-forming applications, and automated processing lines.

What is A36 Carbon Steel?

A36 is a low-carbon structural steel grade defined by ASTM International (formerly American Society for Testing and Materials) under specification ASTM A36/A36M. The "A36" designation signifies:

- **A:** Ferrous material
- **36:** Minimum yield strength of 36 ksi (250 MPa)

It's known as a mild steel due to its low carbon content, which makes it easy to weld, cut, form, and machine.

When produced in coil form, A36 carbon steel offers flexibility in stocking, transportation, and processing. Steel coils are rolled strips or sheets wound into continuous spools for ease of storage and uncoiling.

Advantages of A36 Carbon Steel Coil

- ✓ Cost-effective
- ✓ Easy to work with
- ✓ Readily available
- ✓ Strong and ductile
- ✓ Customizable
- ✓ Versatile

1. Introduction

A36 carbon steel coil is one of the most widely used carbon steel products in the world. Known for its **affordability**, **excellent weldability**, **machinability**, and **structural strength**, A36 is a staple material across construction, manufacturing, automotive, shipbuilding, and more. In coil form, A36 steel is ideal for **sheet metal fabrication**, **cold-forming applications**, and **automated processing lines**.

2. What is A36 Carbon Steel?

A36 is a low-carbon structural steel grade defined by **ASTM International (formerly American Society for Testing and Materials)** under specification **ASTM A36/A36M**. The "A36" designation signifies:

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Related Read: [A36 Equivalent Material Grade](#)

3. A36 Steel Coil Overview

When produced in **coil form**, A36 carbon steel offers flexibility in **stocking, transportation, and processing**. Steel coils are **rolled strips or sheets wound into continuous spools** for ease of storage and uncoiling.

Key Features of A36 Carbon Steel Coil:

- [Hot-rolled](#) or [cold-rolled](#) options
 - Available in pickled & oiled or black finish
 - Thickness from 0.5 mm to 25 mm
 - Widths up to 2000 mm or more
 - Length per coil depending on weight and thickness
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4. Chemical Composition

Below is the typical **chemical composition** of A36 carbon steel as per ASTM A36 standards:

Element	Content (%)
Carbon (C)	≤ 0.26
Manganese (Mn)	0.60 – 0.90
Phosphorus (P)	≤ 0.04
Sulfur (S)	≤ 0.05
Silicon (Si)	≤ 0.40 (optional)
Copper (Cu)	≥ 0.20 (if specified for atmospheric corrosion resistance)

Note: The actual content may vary slightly depending on the mill and production method.

5. Mechanical Properties

Property	Value
Yield Strength	≥ 36 ksi (250 MPa)
Tensile Strength	58 – 80 ksi (400 – 550 MPa)
Elongation (200 mm)	≥ 20%
Elongation (50 mm)	≥ 21%
Modulus of Elasticity	~200 GPa
Hardness (Brinell)	~119 – 162 HBW

A36's combination of strength and ductility makes it suitable for load-bearing applications.

6. Standards and Specifications

- **ASTM A36 / A36M** – Standard specification for carbon structural steel
- **EN 10025 (S275JR)** – Equivalent European grade
- **JIS SS400** – Japanese standard equivalent
- **GB Q235** – Chinese equivalent
- **AS/NZS 3678** – Australian standards

Always confirm dimensional and mechanical tolerances with suppliers or mill certifications.

7. Manufacturing Process of A36 Steel Coil

1. Melting & Casting

- Steel is melted in a **basic oxygen furnace** or **electric arc furnace**
- Cast into slabs for rolling

2. Hot Rolling

- Slabs are heated to ~1200°C and rolled into thin sheets
- Rolled to final thickness and coiled while hot

3. Optional Cold Rolling

- For improved surface finish and tighter tolerance
- Further processed via pickling and oiling

4. Finishing

- Coils may be trimmed, slit, or surface treated
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8. Surface Finishes and Coil Types

Coil Type	Description
Hot Rolled Coil (HRC)	Coiled directly from hot rolling
Pickled & Oiled (P&O)	Oxide layer removed, oiled for storage
Cold Rolled Coil (CRC)	Thinner, smoother finish, tighter tolerances
Galvanized A36 Coil	Coated with zinc for corrosion resistance
Black Coil	Untreated hot-rolled surface

9. Common Sizes and Tolerances

Parameter	Range
Thickness	0.5 mm – 25 mm
Width	600 mm – 2000 mm
Coil Weight	3 – 25 tons (varies)
Tolerance	Per ASTM A6/A6M standards

Custom slit coils or cut-to-length sheets are also available.

10. Welding, Machining, and Formability

Welding

- Excellent weldability with **MIG, TIG, SMAW, or FCAW**
- No preheating needed under normal thickness
- Good for structural connections and fabrication

Machining

- Easily machinable using conventional tools
- Drilling, milling, tapping possible without special prep

Forming

- High ductility allows bending, rolling, stamping
 - Ideal for press brakes and roll forming equipment
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11. Advantages of A36 Carbon Steel Coil

- ✓ **Cost-effective:** One of the cheapest structural steel options
 - ✓ **Easy to work with:** Excellent machinability and weldability
 - ✓ **Readily available:** Global availability from most steel mills
 - ✓ **Strong and ductile:** Good balance for structural applications
 - ✓ **Customizable:** Can be galvanized or surface-treated
 - ✓ **Versatile:** Compatible with different fabrication processes
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12. Limitations and Considerations

- ⚠ **Corrosion-prone:** Needs painting or galvanizing for outdoor use
 - ⚠ **Limited strength:** Not suitable for high-performance applications
 - ⚠ **Non-alloyed:** Lacks added strength/hardness from alloying elements
 - ⚠ **Not heat-treatable:** Limited to cold-working for hardening
 - ⚠ **Tensile variation:** Mechanical properties may vary slightly between batches
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13. Applications

Construction & Infrastructure

- Beams, columns, plates, and channels
- Bridges, steel buildings, and sheds
- Road barriers and guardrails

Manufacturing

- Chassis frames and brackets
- Equipment bases and supports
- Industrial racks and enclosures

Automotive

- Trailers and truck bodies
- Toolboxes and mounting panels

Shipbuilding

- Inner structures and flooring
- Reinforcements and bulkheads

Miscellaneous

- Storage tanks
- Steel furniture
- Agricultural equipment

14. Comparison with Other Carbon Steel Grades

Grade	Yield Strength	Weldability	Cost	Application Focus
A36	250 MPa	Excellent	Low	General structural
S275JR (EN)	275 MPa	Good	Moderate	EU construction
A572 Grade 50	345 MPa	Excellent	Medium	High strength structures
Q235 (GB)	235 MPa	Good	Low	General fabrication
1018	~370 MPa	Excellent	Higher	Precision machining

15. Packaging, Storage, and Handling

- Coils are strapped and wrapped in plastic or waterproof paper
 - Edge protection to prevent damage during transport
 - Stored in dry, well-ventilated warehouses
 - Avoid long-term exposure to moisture (prevents rust)
 - Use forklifts or coil lifters with care
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16. Quality Testing and Certification

Suppliers typically provide:

- **Mill test certificates (MTC)**
- **Dimensional inspection reports**
- **Ultrasonic or magnetic particle testing (if needed)**
- **Tensile and hardness test results**

Look for compliance with ASTM, ISO, or customer-specific requirements.

17. Frequently Asked Questions (FAQs)

Q1: What is the difference between A36 steel plate and coil?

Coils are continuous strips rolled into rolls for mass processing. Plates are flat, discrete, and often thicker than coil products.

Q2: Can A36 coil be galvanized?

Yes, A36 steel coil can be hot-dip galvanized or electro-galvanized for improved corrosion resistance.

Q3: Is A36 good for outdoor use?

Not in raw form. It needs painting, galvanizing, or coating to prevent rust in outdoor environments.

Q4: Does A36 steel coil rust easily?

Yes, it's prone to corrosion without protective treatment due to its low alloy content.

Q5: Can I laser cut A36 coil?

Yes, A36 is suitable for **laser cutting**, as well as plasma and waterjet cutting.

18. Conclusion

A36 carbon steel coil is a **versatile, affordable, and widely-used** material ideal for countless structural and manufacturing applications. Its **formability, weldability, and mechanical strength** make it a go-to choice for engineers, fabricators, and builders around the world.

From **construction beams** to **equipment housings**, from **automotive parts** to **bridge components**, A36 steel in coil form provides **efficient processing and excellent performance** — especially when paired with proper surface protection and modern fabrication technologies.