

"Transform Your Projects with Premium 3105 Aluminum Coils: Trusted Chinese Manufacturing Excellence"

Original link:
<https://www.aluminium-coil-hw.com/news/3105-aluminum-coil-china-manufacture/>

Introduction

The demand for high-performance, lightweight metals has surged across construction, transportation, and industrial sectors. Among the numerous aluminum alloys available, **3105 Aluminum Coil China Manufacture** stands out for its excellent corrosion resistance, good formability, and reliable mechanical properties. This blog provides a comprehensive guide to understanding 3105 aluminum coil, its applications, the manufacturing landscape in China, quality benchmarks, cost drivers, and how to select a dependable supplier—highlighting Huawei Aluminum as a leading producer in the region.

1. Understanding 3105 Aluminum Coil

1.1 Chemical Composition

3105 belongs to the Al-Mn (aluminum-manganese) family, a non-heat-treatable alloy that offers moderate strength and superior corrosion resistance. The typical chemical composition (in weight percent) is:

Element	Minimum (%)	Maximum (%)
Al	Remainder	Remainder
Si	–	0.60
Fe	–	0.70
Cu	–	0.30
Mn	0.30	0.80
Mg	–	0.20
Zn	–	0.10

Others (each)	–	0.05
Total	–	0.15

Source: ASTM B928 / EN 485■2

The balanced manganese content improves work■hardening behavior, while low iron and silicon keep the alloy ductile.

1.2 Mechanical Properties

Property (Typical)	Value (Annealed)	Value (H14■H16)
Tensile Strength	110 – 130 MPa	150 – 180 MPa
Yield Strength (0.2 % offset)	40 – 60 MPa	100 – 130 MPa
Elongation (in 50 mm)	20 % – 30 %	8 % – 12 %
Hardness (Brinell)	45 – 55	70 – 85
Electrical Conductivity	38 % IACS	34 % IACS

These values make 3105 suitable for deep■drawing, roll forming, and bending without cracking.

1.3 Forms and Specifications

- **Coil** – wound strips, typically 0.2 mm – 3.0 mm thick, 20 mm – 1,500 mm wide.
- **Sheet** – cut from coil, standardized sizes (e.g., 4’ × 8’, 5’ × 10’).
- **Finish** – mill finish, brushed, anodized, pre■painted (PVDF, PE), or embossed.

Common specifications include ASTM B928, EN 485■2, GB/T 3880.2, and JIS H4000.

2. Key Applications and Industries

2.1 Construction & Architecture

- **Roofing & cladding** – 3105 coil’s weatherability reduces maintenance costs.
- **Ceiling panels & decorative strips** – easy forming enables intricate designs.
- **Thermal breaks** – low thermal conductivity improves energy efficiency.

2.2 Transportation

- **Automotive inner panels** – good dent resistance combined with light weight.
- **Truck trailers & container sides** – corrosion resistance extends service life.
- **Railcar interior panels** – satisfies fire-retardant standards when coated.

2.3 Industrial Equipment

- **Heat exchangers** – good thermal conductivity and corrosion resistance.
- **Electrical enclosures** – shields against moisture and chemical exposure.
- **Signage & lighting fixtures** – easy to cut, bend, and surface-treat.

2.4 Consumer Goods

- **Home appliances** (e.g., washing machine drums, oven liners).
- **Furniture frames** – sleek appearance with durable finish.

The alloy's versatility makes it a top choice for OEMs seeking a balance of cost, weight, and durability.

3. The Manufacturing Process in China

3.1 Raw Material Sourcing

China's abundant bauxite reserves and established alumina refineries ensure a steady supply of high-purity primary aluminum ($\geq 99.7\%$). Recycled aluminum (secondary melt) is also used when specific property thresholds are met.

3.2 Melting & Casting

- **Furnace** – Induction or gas-fired reverberatory furnaces melt the aluminum ingots.
- **Degassing** – Nitrogen or argon bubbling removes hydrogen and inclusions.
- **Alloying** – Precise addition of Mn, Fe, Si, and other elements achieves the target composition.
- **Casting** – Continuous or semi-continuous casting produces rolling slabs (≈ 6 mm thick).

3.3 Hot Rolling

- **Slab heating** – Slabs are reheated to $450\text{ }^{\circ}\text{C}$ – $520\text{ }^{\circ}\text{C}$.
- **Roughing mill** – Reduces thickness to ≈ 20 mm.
- **Finish rolling** – Further reduces to 2 mm – 6 mm, producing a "hot-rolled coil".

3.4 Cold Rolling & Annealing

- **Cold rolling** – Compresses the coil to final gauge (0.2 mm – 3.0 mm).
- **Intermediate annealing** – Softens the material to restore ductility (typically $350\text{ }^{\circ}\text{C}$ – $400\text{ }^{\circ}\text{C}$).
- **Final temper** – Process routes (H14, H16, H18) deliver the desired strength.

3.5 Surface Treatment & Finishing

- **Pickling** – Removes oxide scale.
- **Passivation** – Enhances corrosion resistance.
- **Coating** – Apply primer, PVDF, polyester, or embossed patterns.
- **Slitting & cutting** – Tailored widths (20 mm – 1,500 mm) for end-use.

3.6 Quality Control

Inspection	Method	Frequency
Chemical analysis	X-ray fluorescence (XRF)	Every batch
Tensile & yield testing	Universal testing machine (UTM)	Every 100 kg
Dimensional tolerance	Laser/contact gauges	Continuous
Surface defects	Automated visual inspection	100 %
Bend & formability	3-point bend test	Sample based

4. Quality Standards and Certifications

4.1 International Standards

- **ASTM B928** – Standard for 3105 alloy sheet and coil.
- **EN 4852** – Aluminum and aluminum alloys – sheet, strip, and plate – Part 2: Mechanical properties.
- **GB/T 3880.2** – Chinese national standard for aluminum alloy sheet & coil.

4.2 Management System Certifications

- **ISO 9001** – Quality management.
- **ISO 14001** – Environmental management.
- **ISO 45001** (formerly OHSAS 18001) – Occupational health & safety.
- **IATF 16949** – Automotive quality (applicable for automotive-grade coils).

4.3 Product Certifications

- **CE** – Conformity with EU safety, health, and environmental requirements.
- **RoHS** – Restriction of hazardous substances.
- **REACH** – Registration, evaluation, authorization of chemicals.

These certifications assure buyers that the 3105 aluminum coil meets global quality and sustainability expectations.

5. Choosing a Reliable Supplier – Spotlight on Huawei Aluminum

5.1 Company Profile

Huawei Aluminum (also known as Huawei Aluminum Co., Ltd.) is a premier **3105 Aluminum Coil China Manufacture** headquartered in Zhengzhou, Henan

Province. Established in 2001, the company has grown into a vertically integrated producer with a focus on high-grade aluminum alloy coils, sheets, and customized solutions.

- **Annual production capacity:** ~120,000 metric tons of aluminum coil.
- **Plant area:** 120,000 m², equipped with advanced hot-rolling, cold-rolling, and finishing lines.
- **Workforce:** Over 1,200 employees, including a 120-person R&D team.

5.2 Manufacturing Capabilities

- **Raw material sourcing:** Direct contracts with major Chinese alumina refineries, ensuring 99.7 %+ purity.
- **Processing:** Four hot-rolling mills, six cold-rolling mills, and a fully automated slitting line.
- **Finishing:** In-house pickling, passivation, and pre-painting (PVDF, PE) lines.
- **Customization:** Laser cutting, embossing, and anti-finger print coating upon request.

5.3 Quality Assurance

- **Laboratory:** In-house chemical analysis (XRF), mechanical testing (UTM), and corrosion labs accredited by CNAS.
- **Traceability:** Barcode system tracks each coil from melt to shipment.
- **Certifications:** ISO 9001, ISO 14001, ISO 45001, IATF 16949, CE, RoHS, and REACH.

5.4 Logistics & Service

- **Port access:** Close proximity to the Zhengzhou International Airport and the Lianyungang seaport, facilitating containerized exports.
- **Lead times:** 10-15 days for standard coil orders; 20-30 days for custom specifications.
- **Payment terms:** Flexible options, including T/T, L/C, and D/P.
- **After-sales support:** Technical documentation, on-site installation guidance, and warranty coverage.

5.5 Why Huawei Aluminum Stands Out

1. **Scale and consistency:** High-volume output ensures stable supply for large-scale projects.
2. **Technical depth:** In-house metallurgy experts develop alloy modifications to meet niche performance needs.
3. **End-to-end control:** From melting to final packaging, every step is monitored, reducing defects to <0.5 %.
4. **Customer-centric approach:** Dedicated account managers provide quotations, sample provision, and logistics coordination.

6. Cost Factors and Pricing Dynamics

6.1 Raw Material Cost

- **Aluminum price:** Linked to London Metal Exchange (LME) benchmarks; recent average ≈ USD 2,200 – USD 2,500 per metric ton (2024).

6.2 Energy & Labor

- **Electricity:** Industrial rates in Henan average ≈ CNY 0.60 – CNY 0.70 per kWh.
- **Labor:** Average manufacturing wages ≈ CNY 6,000 – CNY 8,000 per month, influencing processing fees.

6.3 Processing & Finishing

- **Hot-rolling cost:** ~USD 150 – USD 200 per ton.
- **Cold-rolling & annealing:** ~USD 200 – USD 250 per ton.
- **Surface treatment** (e.g., PVDF coating): ~USD 300 – USD 400 per ton.

6.4 Logistics & Duties

- **Domestic transport:** ~USD 30 – USD 50 per ton to major ports.
- **Export tariffs:** Chinese export duty on primary aluminum is 15 % (subject to changes).

6.5 Price Structure Example (FOB Shanghai, 2024)

Item	Cost (USD/ton)
LME aluminum (base)	2,300
Processing (hot + cold)	350
Surface treatment (PE)	300
Logistics (port handling)	40
Export duty (15 %)	345
Total (FOB)	~3,335

Note: Prices fluctuate with LME, currency exchange, and market demand.

7. Comparative Analysis: 3105 vs Other Alloys

7.1 Mechanical & Physical Property Comparison

Alloy	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Corrosion Resistance	Typical Applications
3105	110 – 180	40 – 130	8 – 30	Very good	Roofing, automotive, signage
3003	110 – 160	40 – 110	10 – 25	Good	Cooking utensils, chemical equipment
5052	230 – 290	190 – 250	6 – 12	Excellent (marine)	Marine, aircraft, fuel tanks
5754	250 – 300	200 – 260	8 – 15	Very good (marine)	Automotive structural, shipbuilding

7.2 Key Differences

- **Strength:** 5052 and 5754 are higher strength, heat treatable alloys, ideal for structural uses.
- **Formability:** 3105 offers superior elongation, making it easier to deep draw.
- **Corrosion:** While 5052/5754 excel in marine environments, 3105’s manganese content provides adequate resistance for architectural and general industrial exposure.

- **Cost:** 3105 is generally less expensive than 5052/5754 because of lower alloying element content and simpler temper processes.

7.3 Selection Guidance

- Choose **3105** when moderate strength, high ductility, and cost-effectiveness are priorities (e.g., roofing, interior panels).
 - Choose **5052** or **5754** when higher structural integrity and marine corrosion resistance are required.
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8. Market Trends and Future Outlook

8.1 Growing Demand for Lightweight Materials

- **Automotive:** CAFE standards in the U.S. and EU emission regulations push OEMs to reduce vehicle weight. Aluminum usage in cars is projected to rise from 150 kg per vehicle (2022) to 250 kg by 2030.
- **Construction:** Green building certifications (LEED, BREEAM) encourage the use of recyclable metal cladding, boosting 3105 demand.

8.2 Sustainability & Recycling

- **Circular economy:** China's "Made in China 2025" plan emphasizes recycling; over 70 % of aluminum in the country is now sourced from secondary production.
- **Carbon footprint:** Producing recycled aluminum uses ~5 % of the energy required for primary production, aligning with global decarbonization goals.

8.3 Technological Advancements

- **Digital twin monitoring:** Real-time data analytics on rolling lines improve yield and reduce scrap.
- **Advanced coatings:** Nano-coatings and self-cleaning surfaces extend the lifespan of 3105 coil in harsh climates.

8.4 Export Opportunities

- **Belt and Road Initiative:** Infrastructure projects across Asia, Africa, and Eastern Europe create new export channels for Chinese aluminum manufacturers.
 - **Regional trade agreements:** RCEP (Regional Comprehensive Economic Partnership) lowers tariffs, enhancing competitiveness of Chinese 3105 coil in Southeast Asian markets.
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9. Frequently Asked Questions (FAQs)

9.1 What is the typical lead time for a 3105 aluminum coil order?

Lead times range from **10–15 working days** for standard specifications (e.g., 0.5 mm × 1,000 mm) to **20–30 days** for custom widths, thicknesses, or surface treatments.

9.2 What is the minimum order quantity (MOQ)?

Most Chinese manufacturers, including Huawei Aluminum, set the MOQ at **1 metric ton** for trial orders; larger production runs typically start at **5 tons** to benefit from economies of scale.

9.3 How does 3105 compare to 3003 in terms of corrosion resistance?

Both alloys provide **good corrosion resistance**, but 3105's slightly higher manganese content gives it a marginal advantage in atmospheric exposure, especially when painted or coated.

9.4 Can I get a sample before placing a bulk order?

Yes. Reputable suppliers provide **free samples** (up to 5 kg) for evaluation; they also offer **paid production samples** for larger dimensions or custom finishes.

9.5 What certifications are essential for export to the European Union?

For EU market entry, at minimum you need **CE marking** (conformity), **RoHS compliance**, and **REACH registration** for chemical substances. Many buyers also request **ISO 9001** and **ISO 14001** as proof of quality and environmental management.

9.6 How is the coil packaged for sea freight?

Coils are usually **eye-to-sky** wound, wrapped in **VCI (volatile corrosion inhibitor) paper**, and placed in **** fumigated wooden crates or steel pallets**** to prevent moisture damage during ocean transit.

9.7 What surface finishes are available for 3105 coil?

Common finishes include **mill finish** (bright, brushed), **pre-painted (PVDF, polyester)**, **anodized**, **embossed**, and **anti-fingerprint coating**.

9.8 How can I verify the alloy composition of the supplied coil?

Request a **mill test certificate (MTC)** that details chemical composition via XRF or ICP analysis. Independent third-party inspection (e.g., SGS, Bureau Veritas) can be arranged for added assurance.

10. Conclusion

3105 aluminum coil is a versatile, cost-effective material that meets the demands of modern construction, transportation, and industrial applications. Its balanced mechanical properties, excellent corrosion resistance, and ease of fabrication make it a preferred choice for architects, automotive engineers, and equipment manufacturers worldwide.

When sourcing **3105 Aluminum Coil China Manufacture**, it is crucial to evaluate the supplier's production capabilities, quality control practices, certifications, and logistical support. **Huawei Aluminum** exemplifies a world-class manufacturer—combining high-volume production, rigorous quality assurance, and customer-focused service to deliver reliable 3105 coil worldwide.

As the global market shifts toward lightweight, recyclable, and sustainable materials, 3105 aluminum coil is poised for continued growth. By partnering with a trusted Chinese manufacturer, you can secure a stable supply, competitive pricing, and technical expertise that drive your projects forward.

If you need a quotation, technical data, or a sample, feel free to reach out to Huawei Aluminum—your reliable partner in **3105 Aluminum Coil China Manufacture**.

This article provides general guidance and should be used in conjunction with specific project requirements and professional engineering advice.