

5083 aluminum plate for tank truck

1 . 5083 aluminum plate for tank truck Description

For commercial truck manufacturers, using 5083 aluminum provides a safe, lightweight solution that directly increases the vehicle's payload capacity, lowers fuel consumption, and meets strict international road transport safety regulations.

(1) Key advantages of using 5083 aluminum sheet in tank truck manufacturing

- **More Payload, Higher Profit:** Aluminum's density (2.66 g/cm³) is only one-third that of steel. A lighter empty vehicle means transport companies can carry more liquid cargo per trip while staying within legal highway weight limits.
- **Excellent Corrosion Resistance:** 5083 naturally resists corrosion from water, industrial atmospheres, and many chemicals. For many fuel and oil transport applications, the tank interior does not even require an anti-corrosion coating.
- **High Safety in Accidents:** Aluminum absorbs more impact energy than steel during a collision. It tends to deform rather than tear, which helps prevent massive liquid leaks during road accidents.
- **No Sparking:** Aluminum is a non-sparking metal. This is a critical safety requirement when transporting flammable liquids like gasoline or diesel.

(2) Recommended Tempers for Tank Parts

A tank truck is not made of a single temper of aluminum. Different parts of the vehicle experience different stresses and require different manufacturing processes. Here is the standard industry recommendation for 5083 aluminum tempers based on the specific tank part.

Tank Part	Alloy & Temper	Key Advantage for Manufacturing
Main Tank Body (Shell)	5083-H111	Provides the best balance. It is strong enough to handle liquid pressure but flexible enough to be rolled into cylindrical or elliptical shapes without cracking.
Tank Heads (End Caps) & Baffles	5083-O	The "O" temper is fully annealed and at its softest. It offers excellent performance for deep drawing, flanging, and bending to create the curved ends of the tank.
Structural & Load-bearing Parts	5083-H116 / H321	These tempers offer higher strength and enhanced resistance to exfoliation corrosion, making them ideal for the chassis mounts and external structural supports.

(3) Chemical Composition of 5083 aluminum plate

The high magnesium (Mg) content in 5083 aluminum is what gives the plate its high strength and superior resistance to rust and industrial chemicals.

Element	Content (%)
Magnesium (Mg)	4.00 - 4.90
Manganese (Mn)	0.40 - 1.00
Silicon (Si)	≤ 0.40
Iron (Fe)	≤ 0.40
Zinc (Zn)	≤ 0.25
Chromium (Cr)	0.05 - 0.25
Titanium (Ti)	≤ 0.15
Copper (Cu)	≤ 0.10
Others (each / total)	≤ 0.05 / ≤ 0.15
Aluminum (Al)	Remainder

(4) Mechanical Properties of 5083 aluminum plate

Safety is the top priority for road transport. The material must withstand internal liquid surge impacts and external road vibrations. Below are the mechanical property differences between the two most common tempers used in tank bodies.

Property	5083-O (Tank Heads)	5083-H111 (Tank Body)
Tensile Strength	275 - 350 MPa	305 - 380 MPa
Yield Strength	≥ 125 MPa	≥ 145 MPa
Elongation	≥ 12%	≥ 10%
Hardness (HB)	~65	~75

(5) Physical Properties of 5083 aluminum plate

Property	Value
Density	2.66 g/cm ³
Melting Range	570 - 640° C
Thermal Conductivity	~121 W/m • K
Electrical Conductivity	~29% IACS
Thermal Expansion	23.8 × 10 ⁻⁶ /° C

2 . 5083 aluminum plate for tank truck Specifications

When sourcing tank truck aluminum plates from GNEE, we provide a wide range of dimensions to fit your specific rolling and cutting equipment.

Alloy Grade	5083 Aluminum Plate / Sheet
Available Tempers	O, H12, H14, H16, H18, H19, H22, H24, H26, H28, H32, H34, H36, H38, H111, H112, H114, H116, H321
Thickness	0.15 mm - 500 mm (Common tank body thickness: 4mm to 8mm)
Width	20 mm - 2650 mm (Wide plates available to reduce weld seams)
Length	500 mm - 16000 mm

(Note: Custom cut-to-length and custom-width sizes are available to reduce scrap waste on your production line.)

As a direct manufacturer, GNEE can produce ultra-wide 5083 aluminum plates. **Contact Us Here** with your required thickness and dimensions, and we will send you a competitive wholesale price list within 24 hours.

(1) GNEE Services

- Bending and Rolling: The 5083 H111 aluminum plate can be smoothly rolled through three-roller or four-roller plate bending machines to form the long cylindrical shell of the tank.
- Deep Drawing: The 5083 O aluminum plate provides the high ductility needed to press the tank heads and internal anti-surge baffles without tearing the metal.
- Welding: 5083 has excellent weldability. It is fully compatible with standard MIG (Metal Inert Gas) and TIG (Tungsten Inert Gas) welding. The weld seams maintain high strength, ensuring a leak-proof structure for pressurized or non-pressurized tanks.

3 . Common Applications of 5083 aluminum plates for tank truck

- Fuel Tank Trucks: Transporting gasoline, diesel, and aviation fuel.
- Chemical Tank Trailers: Carrying mild industrial chemicals, solvents, and lubricants.
- Food-Grade Liquid Tankers: Transporting bulk drinking water, raw milk, and edible oils (ensuring no rust contamination).
- Pneumatic Dry Bulk Trailers: Used for transporting flour, cement, or plastic pellets.

4 . Quality Standards

As a professional manufacturer, GNEE strictly controls the quality of every plate. Defective plates cause weak points in tanks, which we prevent through rigorous testing.

Compliance: All materials are manufactured according to **ASTM B209**, **EN 573-3**, and **EN 485** standards.

Testing: Every batch undergoes strict chemical composition analysis, tensile testing, and surface defect inspection.

Certificates: We provide Mill Test Certificates (MTC) with every shipment.

5 . Packaging & Delivery

Large aluminum plates require careful handling to prevent scratches or bending during sea transport.

Packaging: Standard export seaworthy packaging. The plates are interleaved with paper or PVC film to prevent surface scratches.

Protection: Wrapped in moisture-proof plastic and kraft paper, then securely fastened to heavy-duty wooden pallets with steel bands.

Delivery Time: Typically 15–30 days, depending on custom dimensions and order volume.

6 . FAQ

Why is 5083 better than 5052 for tank trucks?

5083 has a higher magnesium content (around 4.5%) compared to 5052 (around 2.5%). This gives 5083 significantly higher tensile and yield strength. Because it is stronger, manufacturers can use thinner 5083 plates to build the tank, reducing the truck's overall weight while maintaining the same safety pressure ratings. 5052 is generally used for smaller fuel tanks, while 5083 is the standard for large-capacity commercial tank trailers.

What is the difference between 5083-O and H111?

The main difference is the hardness and flexibility. 5083-O is fully annealed, meaning it is in its softest state. It is used for making tank heads and baffles because it can be stretched and deep-drawn without breaking. 5083-H111 has undergone some work hardening. It is slightly harder and stronger than the O temper, making it the perfect material for the main straight cylinder body of the tank.

Is 5083 aluminum suitable for fuel tankers?

Yes, 5083 is highly suitable and is the global standard material for fuel tankers. It is lightweight (saving fuel for the truck itself), highly resistant to corrosion from petroleum products, and most importantly, it is non-sparking, which prevents static electricity explosions when loading and unloading flammable fuels like gasoline and diesel.

(1) Request a Quote

GNEE is ready to support your tank truck manufacturing business with stable quality and competitive pricing. To help us provide you with an accurate and fast quotation, please let us know:

- Thickness and Width (e.g., 5 mm x 2000mm)
- Alloy and Temper (e.g., 5083 H111)
- Estimated Quantity (e.g., 20 Tons)
- Application Details (e.g., Fuel tank body)

Our technical sales team will review your requirements and reply with a customized quotation and freight plan within 24 hours.