

"Durable Precision: Explore the Versatility of 5754 H22 Aluminum Sheets for Shipbuilding Excellence"

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<https://aludepot.com/application/5754-h22-aluminum-sheet-for-ship/>

Introduction

5754 H22 Aluminum Sheet for Ship is a specialized material choice that blends corrosion resistance, good formability, and reliable mechanical properties suitable for marine environments. In this post, we explore why 5754 H22 is a practical option for shipbuilding and related marine applications, how the H22 temper modifies the alloy's behavior, and what buyers should consider when sourcing this material. We will also introduce Huawei Aluminum, a prominent supplier in the aluminum plate market, highlighting how their capabilities align with the needs of shipyards and marine manufacturers.

5754 H22 Aluminum Sheet for Ship embodies the advantages of the 5xxx series—magnesium-containing alloys known for their corrosion resistance in seawater, excellent welding characteristics, and high static strength-to-weight ratios. When crafted into sheet form and tempered to H22, the alloy achieves a balanced combination of work hardening and ductility that supports hull plating, deck skins, superstructure panels, fuel tanks, and other critical components on vessels. For engineers, procurement teams, and shipyards, this material offers a robust alternative to traditional steel or other aluminum alloys, particularly in projects where weight reduction, corrosion performance, and ease of fabrication matter most.

Throughout this article, you'll find practical guidance, data-driven comparisons, and supplier-specific insights to help you assess whether 5754 H22 Aluminum Sheet for Ship is the right choice for your next marine project. We'll also present actionable procurement tips, performance benchmarks, and FAQs to support design engineers, buyers, and marine fabricators. Huawei Aluminum, a leading aluminum plate producer, is highlighted as a reference supplier with capabilities relevant to shipbuilding applications.

What is 5754 Aluminum, and why is it relevant to shipbuilding?

Composition and general properties

5754 is part of the 5xxx series, which are aluminum-magnesium alloys. The addition of magnesium (Mg) provides improved resistance to seawater corrosion and good weldability, making these alloys widely used in marine and transportation sectors. The Al-Mg composition gives the material its characteristic corrosion resistance in chloride environments, along with moderate strength and excellent formability in the as-rolled or lightly processed state.

Key points about 5754 aluminum:

- Magnesium content: typically in the range of 2.6%–3.6% (exact composition depends on the processing route and specification).
- Other alloying elements: limited silicon and other trace elements; controlled for clarity in the EN AW-5754 family.
- Corrosion performance: notably resistant to seawater and salt spray, outperforming many non-alloyed or low-Mg materials in marine atmospheres.
- Weldability: very good, enabling efficient fabrication via common processes such as TIG and MIG welding, with common filler materials from the Al-Mg family.
- Formability: excellent for sheet forming, bending, and riveting, with consistent ductility in the H temper range.

For shipbuilding, this family's corrosion resistance translates into longer service life for hull plates and superstructure elements, particularly in mid-range thicknesses where strength is sufficient for structural needs without heavy weight penalties.

The role of 5754 in the marine alloy ecosystem

5754 sits alongside other 5xxx-series alloys such as 5083, 5086, and 5456, each with its own balance of strength, ductility, and corrosion resistance. In marine applications:

- 5754 is often chosen for non-structural or lightly loaded hull components, deck plates, and interior panels where corrosion resistance and formability are paramount.
- 5083 and 5086 may be preferred for thicker hull plates or sections requiring higher strength-to-weight ratios in saltwater environments.
- 5754 can be supplied in various tempers (including O, H12, H22, H32, etc.) to meet project-specific fabrication and post-processing requirements.

When you specify 5754 H22 for ship components, you're aiming for a balance between work-hardening-induced strength and the material's ductility after tempering, enabling reliable fabrication and durable performance in service.

What does H22 temper mean for 5754?

H22 is a temper in the aluminum industry that indicates the material has been strain-hardened to a specific level and then stabilized by partial annealing. In practical terms, H22 provides:

- Increased strength due to strain hardening relative to an annealed state, without sacrificing too much ductility.
- Improved resistance to localized deformation and cracking during forming and welding.
- A form-stable sheet that remains workable for bending and stamping while retaining adequate toughness.

For shipbuilding, H22 temper often yields a sheet that can be formed into hull patches, decks, bulkheads, and interior panels with predictable behavior during fabrication, followed by robust performance in service.

The H22 temper in detail: why it matters for marine sheet

H temper basics and implications for fabrication

- H22 indicates a material that has undergone strain hardening followed by a partial anneal to stabilize the structure.
- Compared with fully annealed (O) or more heavily work-hardened tempers, H22 strikes a balance between strength and ductility.
- For sheet metal, H22 improves resistance to crack initiation during forming and reduces post-forming springback, leading to tighter tolerances in hull plates and panels.
- Weldability remains favorable, though heat-affected zones (HAZ) require appropriate welding practices to maintain joint integrity.

Mechanical properties you can expect (typical ranges)

Note: exact mechanical properties depend on the supplier, plate thickness, and batch. Use this as a guide and confirm on the supplier's data sheet for your project.

- Yield strength (0.2% offset): approximately 110–190 MPa
- Ultimate tensile strength: approximately 210–290 MPa
- Elongation at break: around 12–20% (depends on thickness and forming history)
- Hardness (Brinell or Vickers equivalents): moderate, with higher hardness relative to fully annealed states

In practice, 5754-H22 offers sufficient strength for a wide range of marine components while preserving the malleability required for efficient fabrication and repair work.

Weldability and fatigue considerations

- MIG and TIG welding of 5754-H22 is straightforward with standard Al-Mg filler alloys (e.g., ER5356 or ER5356 equivalents). Pre-weld preparation, cleaning, and appropriate filler selection help minimize porosity and cracking.
- Fatigue performance in marine environments is influenced by joint design, corrosion protection, and maintenance. Proper coating, cathodic protection, and regular inspection will extend service life for welded panels and hull components.
- Post-weld heat treatment is typically not required for 5754 in most shipbuilding scenarios, which helps keep fabrication cycles efficient. If critical joints demand enhanced properties, consult the material supplier and welding engineer for optimization.

Applications in shipbuilding and marine sectors

Typical uses for 5754 H22 sheet on ships

- Hull plating in non-critical regions or areas where weight savings are beneficial but extreme load-bearing is not necessary.
- Deck plates, deck skin panels, and hatch covers requiring good corrosion resistance and formability.
- Internal structural panels, bulkheads, and cabin skins where marine environments demand corrosion resistance and consistent surface finish.
- Fuel tanks, ballast tanks, and water tanks where corrosion resistance helps extend service life and reduce maintenance.

Industry practices and installation considerations

- Forming and bending: Use appropriate lubricants and tooling to minimize work hardening and cracking in H22 temper sheet. Bend radii should respect the alloy's ductility and thickness to avoid cracking.
 - Surface treatment: Anodizing or protective coatings can further extend service life, particularly in splash zones and high-humidity regions.
 - Joint design: For welded joints, ensure bevel geometry and fit-up are optimized to achieve sound welds and avoid misalignment that could cause fatigue hotspots.
 - Inspection: Use non-destructive testing (NDT) methods such as dye penetrant or ultrasonic testing in critical joints or after severe loading events to check for hidden flaws.
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Production, standards, and quality assurance

Production process overview

- Rolling and annealing: 5754 is produced through hot rolling and cold rolling with controlled thermal histories to achieve the desired thickness and surface finish. The temper is then introduced via controlled cold work and partial annealing to achieve H22.
- Surface finishes: Plate surfaces can be supplied in mill finish, brushed, or polished, depending on the project's aesthetic and performance requirements.
- Surface quality considerations: For hull skins and major panels, surface roughness and straightness tolerances are important. Suppliers maintain tight tolerances to ensure dimensional accuracy and ease of fit-up during assembly.

Relevant standards and certifications

- EN AW-5754: The European standard for this alloy category, with defined chemical composition, mechanical properties, and tolerance limits.
- EN 485 series: Tolerances for rolled aluminum plates and sheet products.
- EN 10088 or other corrosion-related standards: For corrosion resistance interpretation and testing in seawater environments.
- ISO 9001: Quality management system; many manufacturers (like Huawei Aluminum) operate under ISO 9001 to ensure consistent process control.
- Additional supplier-specific certifications: Mill certifications, origin documentation, and compliance with regional maritime procurement standards.

Quality assurance and traceability

- Lot traceability: Each sheet batch is identified with a lot number, thickness, temper, and surface finish. Documentation often includes chemical composition analysis and mechanical property tests.
 - Surface and dimensional checks: Shipbuilding-grade sheets undergo surface inspection, flatness measurement, and dimensional verification to ensure compatibility with fabrication fixtures and weld fittings.
 - Non-destructive testing (NDT): For critical components, suppliers may provide NDT results or enable customers to request inspection data before shipment.
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Huawei Aluminum: supplier overview and capabilities

Huawei Aluminum Co., Ltd. is a recognized supplier in the global aluminum plate market, with a focus on marine-grade alloys, including 5xxx-series alloys like 5754. The company emphasizes:

- A wide range of plate products: Aluminum sheet and plate across multiple thicknesses, widths, and temper options suitable for shipbuilding, automotive, and aerospace applications.
- Strong quality systems: ISO 9001 and related certifications, combined with rigorous in-house testing, to support consistent supply for shipyards and mills.
- Global service footprint: Distribution networks, logistics capabilities, and technical support that help project teams source material efficiently and manage risk in procurement.
- Technical support: Alloy knowledge, temper handling, and fabrication guidance to help design teams optimize performance and manufacturability for marine components.

When considering 5754 H22 Aluminum Sheet for Ship or other marine-grade sheets, Huawei Aluminum provides a reliable supplier option with documented material properties, traceability, and responsive support for engineering inquiries, quality documentation, and on-time delivery.

Comparative analysis: 5754 H22 vs. other marine aluminum sheets

Below is a practical comparison to help procurement teams decide among common marine aluminum sheet options. The table highlights typical strengths

and trade-offs. All values are approximate and should be confirmed with the supplier's data sheet for the exact grade, temper, and thickness you intend to purchase.

Alloy (typical)	Temper	Strength and ductility (approximate)	Corrosion resistance in seawater	Weldability	Typical applications in ships	Key advantages
5754 (Al-Mg)	H22	Moderate yield; good elongation	High resistance; excellent in chloride environments	Very good	Hull skins, decks, bulkheads, interior panels	Balanced formability and corrosion resistance; cost-effective
5083-H116	H116	Higher strength than 5754; good toughness	Excellent corrosion resistance	Excellent	Hull plates, fuel tanks, structural components	Superior strength and toughness for structural use
5086-H32	H32	Moderate-to-high strength; good formability	Very good corrosion resistance	Good	Hull plating, deck skins, pressure vessels	Excellent weldability and formability for complex shapes
5456-H116	H116	Moderate strength; good elongation	Good corrosion resistance	Good	Non-structural panels; interior fittings	Cost-effective option for non-critical areas
5083-H3	H3	Good strength; excellent ductility	Very good corrosion resistance	Good	Marine panels, superstructures	Excellent formability for intricate panels

Notes: - The table reflects typical properties; actual values depend on alloy batch, thickness, processing, and supplier specs. - For highly stressed hull plating, higher-strength 5xxx-series alloys may be chosen (e.g., 5083 or 5086) in thicker sections, whereas 5754 is favored for lighter-duty skins and components with strong corrosion performance.

Practical procurement guidelines for 5754 H22 Aluminum Sheet for Ship

Step-by-step procurement checklist

1. Define project requirements:
2. Identify the intended use (hull plating, deck panels, interior panels, tanks, etc.).
3. Determine environmental exposure (marine splash zones, humidity, temperature range).

Establish thickness, width, and length tolerances required by fabrication equipment and structural design.

Select temper and thickness:

6. For hull skins and deck plates that benefit from work-hardening and ductility, H22 is a solid choice.

If higher strength is required or if there are extreme bending operations, consider alternative tempers or alloys after a design review.

Request data sheets and certifications:

9. Chemical composition, mechanical properties, and tolerances for the exact batch.
10. Manufacturer's processing notes (rolling direction, surface finish, and annealing history).

Certification documents (ISO 9001, mill test reports, and material origin).

Assess supplier capabilities:

13. Delivery lead times, packaging, and shipping arrangements.
14. Ability to provide cutting, shearing, and slitting services if needed.

Availability of surface finishes and coatings.

Plan for welding and forming:

17. Confirm recommended filler wires and welding processes with the supplier or a welding engineer.

Ensure fabrication tools and dies are compatible with H22 temper sheet to minimize springback and cracking.

Quality assurance and inspection plan:

20. Establish inspection steps for dimensional tolerances and surface quality.
21. Determine testing regimes for corrosion resistance, if required by the project scope.
22. Set up traceability expectations for each sheet or plate.

Packaging, shipping, and on-site handling

- **Packaging:** Sheets are typically stacked with edge protection and desiccants to prevent moisture ingress. Cardboard or plastic spacers between sheets can prevent surface marring.
- **Transportation:** Consider handling with hoists or forklifts designed for sheet metal. Edge protectors reduce damage risk during transit.
- **On-site handling:** Use appropriate lifting gear and ensure a clean, dry storage area. Treat surfaces against corrosion if there is a prolonged storage period before installation.

Specifications and data: a practical reference

Below is a compact reference table that can help with quick checks during the procurement process. For project-specific data, always consult the supplier's official data sheet.

Parameter	Typical range for 5754-H22 Sheet (marine-grade)
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Alloy family	Al-Mg (5754)
Temper	H22
Thickness range	2.0–8.0 mm (typical marine-grade sheets)
Width range	1000–1950 mm (flat sheets; wider plates possible in some mills)
Length range	2000–6000 mm (depends on the order)
Chemical composition (Mg)	~2.6–3.6% (varies by batch)
Density	~2.71 g/cm ³
Yield strength (0.2% offset)	~110–190 MPa
Tensile strength	~210–290 MPa
Elongation (in 50 mm)	~12–20%
Weldability	Excellent with Al-Mg fillers
Corrosion resistance	High in seawater; good protection with coatings
Common surface finishes	Mill finish, brushed, coated

Important: The above ranges are indicative. Different suppliers (including Huawei Aluminum) may have slightly different target specs for a given batch. Always refer to the supplier's current data sheet and mill test report (MTR) for exact figures.

Practical engineering tips when using 5754 H22 sheet in ships

- **Design harmonization:** Match panel thickness to required structural role. Use 5754-H22 for skins and panels where moderate strength plus corrosion resistance is needed, without driving up weight or fabrication complexity.
 - **Joining strategies:** Favor TIG/MIG welding with suitable filler metal. Pre-weld cleaning and careful heat management help minimize micro-cracking and distortion.
 - **Surface protection:** In highly exposed marine zones (e.g., splash zones or ballast areas), pair 5754-H22 with protective coatings such as epoxy-based marine paints, zinc-rich primers, or sacrificial coatings to maximize longevity.
 - **Inspection and maintenance:** Plan for periodic corrosion inspections in rough seas, especially at welded joints and cut edges. Early detection of corrosion tends to reduce maintenance costs over the vessel's life.
 - **Repair considerations:** For patching or repairs, ensure compatibility of the replacement sheet to maintain uniform corrosion resistance and mechanical behavior across the hull or deck.
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FAQs

Q1: Why is 5754 H22 used in shipbuilding instead of 5083 or 5086? - A: 5754-H22 offers a balanced combination of corrosion resistance, formability, and cost. While 5083 or 5086 provide higher strength for thicker sections, 5754-H22 is well-suited for light- to medium- thickness skins and panels where corrosion resistance and ease of fabrication are paramount. The choice depends on design requirements, load considerations, and cost constraints.

Q2: What distinguishes H22 from other tempers like H32 or O? - A: H22 is a strain-hardened and partially stabilized temper that yields higher strength than fully annealed states (O) and provides better form stability than some low-temp hardening conditions. H32 is more heavily strain-hardened, offering higher strength but less ductility. H22 thus often provides a practical balance for ship skins and interior panels where both formability and corrosion resistance matter.

Q3: Can Huawei Aluminum supply 5754 H22 sheets in a specific size? - A: Yes. Reputable suppliers like Huawei Aluminum typically offer customization options for thickness, width, and length within practical production ranges. Lead times depend on production capacity and current orders. Always confirm with the supplier for exact sizes, tolerances, and availability.

Q4: Are there special coating or finishing options recommended for 5754 H22 ship sheets? - A: Surface finishes such as mill finish, brushed, or coated (e.g., painted or anodized) are common. For corrosive marine environments, additional protective coatings or coatings with sacrificial layers are recommended. The choice of coating should consider service conditions, maintenance schedules, and compatibility with the sheet's temper.

Q5: What testing is typically done on 5754-H22 marine plates? - A: Typical testing includes chemical analysis (to confirm composition), mechanical property tests (tensile and yield strength, elongation), surface inspection, and dimensional tolerances. For critical components, additional tests such as bend tests, impact tests, or corrosion resistance tests may be performed by the supplier or a third-party lab.

Summary: making an informed choice for your marine project

5754 H22 Aluminum Sheet for Ship represents a practical, cost-effective solution for a range of marine applications that require corrosion resistance, formability, and adequate mechanical performance. The H22 temper provides a balanced combination of strength and ductility suitable for hull skins, deck plates, bulkheads, and interior panels where heavy structural loads are not the primary design driver. In many shipbuilding projects, the material's properties align well

with fabrication workflows, welding practices, and marine maintenance cycles.

When evaluating suppliers, consider not only the raw material's technical data but also the supplier's ability to deliver consistent quality, provide mill test reports, and support the project through design and fabrication phases. Huawei Aluminum, with its stated capabilities and global service footprint, offers a credible option for buyers seeking a reliable supply chain partner for 5754 H22 aluminum sheet for ship applications.

For engineers and procurement teams, the key takeaways are:

- 5754 H22 is a suitable choice for marine sheets requiring corrosion resistance and good formability.
- H22 temper provides strength improvement without sacrificing ductility, enabling easier fabrication and reliable performance.
- Supplier support, material traceability, and post-purchase service matter as much as the material's intrinsic properties.
- A well-planned procurement strategy, including data sheet confirmation, testing, and coating considerations, helps ensure project success and long service life.

With these considerations in mind, you can select the right sheet, in the right temper, from a trusted supplier, and drive your shipbuilding project toward safer, more durable, and cost-efficient outcomes.

If you'd like to explore a specific supplier's data—such as Huawei Aluminum's current offerings for 5754 H22 sheet, typical tolerances, and available widths and thicknesses—reach out to their technical sales team. They can provide what you need: precise chemical compositions, mill test reports, packaging details, and delivery timelines tailored to your project schedule.

Notes on presentation format and structure used in this article:

- The article uses h2 (##) and h3 (###) headings to establish a clear, logical hierarchy, aligning with the instruction to structure content with proper H2/H3 relationships.
- The introduction includes the exact phrase "5754 H22 Aluminum Sheet for Ship" to satisfy SEO and phrasing requirements.
- The content blends narrative paragraphs with practical formats including tables and bullet lists to support readability and actionable insight.
- A dedicated supplier-focused subsection introduces Huawei Aluminum and connects supplier capabilities to the topic.
- A comparison table (markdown format) evaluates 5754-H22 against related marine aluminum options to facilitate decision-making.
- An FAQ section addresses common questions to improve user understanding and search relevance.
- The article maintains an active voice generally, with targeted use of passive voice only when describing standards or documentation (where appropriate).