STAVIAN®
INDUSTRIAL METAL

SOLAR PV ALUMINIUM SOLUTIONS



SHAPING LIFE

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INTEGRATING GLOBAL MANUFACTURING CAPABILITIES – OPTIMIZING THE ALUMINUM SUPPLY CHAIN

Stavian Industrial Metal integrates and coordinates a multinational manufacturing network to deliver end-to-end aluminum solutions, from raw materials to finished products, tailored to the solar PV industry's requirements for technical specifications, production volumes, quality standards, and delivery schedules.

I. INDUSTRY OVERVIEW

Rapid solar PV industry growth raising the bar for aluminum supply chains

Solar PV is becoming one of the key drivers of the global energy transition, driving demand for materials and components that are lightweight, durable, corrosion-resistant, and suitable for large-scale production. Aluminum therefore plays an important role across a wide range of solar PV system applications, from module frames, rails, and mounting structures to specialized engineered components.

According to the International Energy Agency Photovoltaic Power Systems Program (IEA-PVPS), global installed solar PV capacity approached 3 TW by the end of 2025, with approximately 698 GW of new capacity added in 2025 alone, representing an estimated 14 million tons of aluminum demand.



As project scales continue to grow and supply chains become increasingly global, solar PV module manufacturers, project developers, and value chain partners require more than aluminum products that meet technical specifications. They demand capabilities in drawing-based product development, multi-source manufacturing coordination, quality control, traceability, and reliable supply continuity.

II. WHO WE ARE



About Stavian Group

Stavian Industrial Metal Joint Stock Company ("Stavian Industrial Metal") is a proud member of Stavian Group, a large-scale multinational industrial, technology, and trading group with a strong track record of achievements:

Founded in
2009

Revenue 2025
~2,8 Billion USD

Number of employees
> 5,000 Worldwide

Market
> 100 Countries & Territories

Facilities
> 30 International offices
> 10 Manufacturing factories
> 40 Worldwide logistics hubs
> 5 Industrial parks & Digital parks
> 10 Gas supply stations (LNG, LPG, CNG)

Extensive global network
> 20,000 Partners & Customers Worldwide

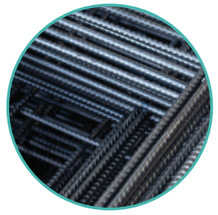


About Stavian Industrial Metal

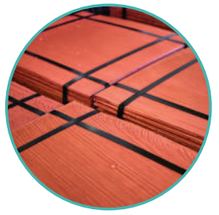
Stavian Industrial Metal – A member of Stavian Group

As a member of Stavian Group, Stavian Industrial Metal builds on the Group's global ecosystem across business, trading, and logistics, with a strategic focus on becoming a comprehensive solutions provider for the industrial metal sector and bringing Vietnamese industrial metals to global markets.

Building on its trading foundation, the Company has progressively expanded its capabilities in processing, manufacturing investment, and international partnerships, developing a diversified product portfolio across four core metal categories: Steel, Aluminum, Copper, and Zinc.


1. Steel


2. Aluminum


3. Copper


4. Zinc

Beyond product supply, Stavian Industrial Metal progressively organizes and connects the value chain across raw material sourcing, manufacturing and processing, trade finance, logistics, and end markets. On this foundation, the Company has developed 05 business models and a portfolio of 25 business solutions, exclusively designed to respond to the specific requirements of different customers, products, and markets. These solutions span multiple stages of the supply chain, from procurement and supply, trade finance and payment solutions, to manufacturing and investment partnerships, commercial and logistics services, risk management, and sustainable development – helping customers optimize resources, costs, cash flow, and operational efficiency.

Alongside its expansion in scale and market reach, Stavian Industrial Metal has identified green metals and decarbonization solutions as key long-term strategic priorities. By 2030, the Company aims to rank among the Top 10 global companies in industrial metal processing, manufacturing investment, and trading, while targeting a Top 1 position in Southeast Asia in green metal trading and carbon credit services.



Global agents
200+

Domestic branches
06

Transportation trips/month
10,000+

Warehouses nationwide
26+

Trucks & container vehicles
2,500+

III. WHY CHOOSE US



STAVIAN INDUSTRIAL METAL – INTEGRATING MANUFACTURING CAPABILITIES ACROSS THE SUPPLY CHAIN

1. Integrated Aluminium Supply Chain

Through strategic partnerships with large-scale aluminum raw material producers (annual production capacities exceeding 1 million tons), integrated production lines, and advanced technologies, Stavian Industrial Metal has access to diverse and reliable sources of aluminum ingots and billets that meet requirements for quality, origin, and commercial competitiveness.

Building on its raw material sourcing capabilities and network of partners specializing in extrusion, surface treatment, machining, and assembly, Stavian Industrial Metal aims to serve as a comprehensive supply partner for the Solar PV industry, acting as a central coordinator across the supply chain. The Company manages product development, manufacturing partner selection, and quality control to meet the technical specifications, volume, delivery schedules, and target-market requirements of each project. This enables flexible support for large-scale, long-term supply programs as well as market-specific requirements.

Rather than relying on a single manufacturing source, Stavian Industrial Metal develops a Global OEM Manufacturing Network across Vietnam, the UAE, Malaysia, Indonesia, and other suitable markets. Manufacturing sources are evaluated and selected based on equipment capabilities, technology, product expertise, quality systems, capacity, lead times, geographical location, origin, and commercial terms.

2. Engineering & Quality Control

Stavian Industrial Metal works closely with manufacturing partners throughout the product development process, including drawing review, alloy and temper selection, tooling development, prototyping, surface treatment, machining, and assembly.

The Company also establishes project-specific quality control parameters covering input materials, chemical composition, mechanical properties, dimensions and tolerances, surface quality, machining accuracy, assembly performance, packaging, and production batch traceability.

Based on product requirements, target markets, and technical standards, Stavian Industrial Metal selects manufacturing facilities with the appropriate management systems, testing capabilities, certifications, and compliance capacity.

The applicable scope is validated for each manufacturing source and individual order. Requirements may include management systems for quality, environmental, energy, and occupational health and safety; laboratory testing capabilities; standards for aluminum extrusion and surface treatment; sustainable aluminum management programs; as well as industry- or market-specific standards.



3. Supply Chain & Commercial Solutions

Beyond manufacturing coordination, Stavian Industrial Metal has developed a system of 05 business models and 25 exclusive solutions spanning procurement and supply, finance and payment, manufacturing and investment partnerships, commercial and logistics services, risk management, and sustainable development.

These solutions are tailored flexibly around the scale and specific requirements of each project, helping customers optimize resources, cash flow, costs, inventory, and overall operational efficiency.





IV. PRODUCT DETAILS

Stavian Industrial Metal supplies aluminum profiles and fabricated components for PV modules, mounting structures and tracker applications through an integrated route from metal sourcing and financing to qualified production and international delivery.

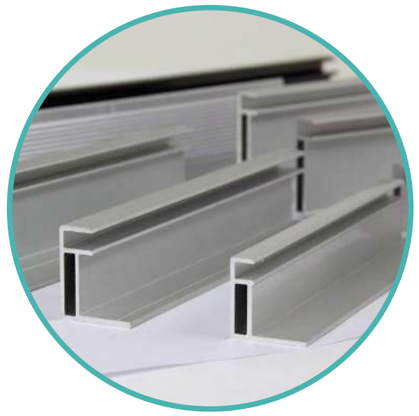
- **SOLAR PV MODULE FRAMES**
- **MOUNTING & RACKING PROFILES**
- **ALUMINUM COMPONENTS FOR SOLAR TRACKER SYSTEMS**
- **ENGINEERED & CUSTOM ALUMINUM PROFILES**

Solar PV Module Frames

Aluminum solar panel frames are a key product category within Stavian Industrial Metal's aluminum solutions for PV module manufacturing. We provide frame configurations tailored to customer-specific drawings and technical requirements, including:

- Long-side frames
- Short-side frames
- Corner keys
- Complete frame sets





Product group	Typical components & supply formats	Engineering & fabrication scope	Materials, finishing & quality
PV module frames	• Long-side frames • Short-side frames • Corner keys • Complete frame sets	• Common frame-height classes: 30, 35 and 40 mm • Typical finished frame lengths: approximately 1,700–2,400 mm for long-side frames and 1,100–1,300 mm for short-side frames, subject to module dimensions and approved drawings • Cross-sectional geometry and local wall thickness: according to approved drawings • Fabrication: 45° miter cutting; drainage, mounting, grounding and corner-key features according to approved drawings	• 6063-T5/T6 is typical; 6005/6005A may be used where the design requires higher structural performance • Silver or black anodizing is common; coating thickness and color are specified by the customer • Inspection may cover alloy and temper, dimensions, surface, fabrication, assembly fit and batch traceability



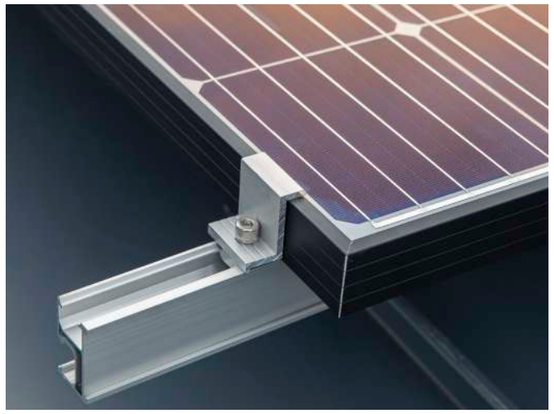


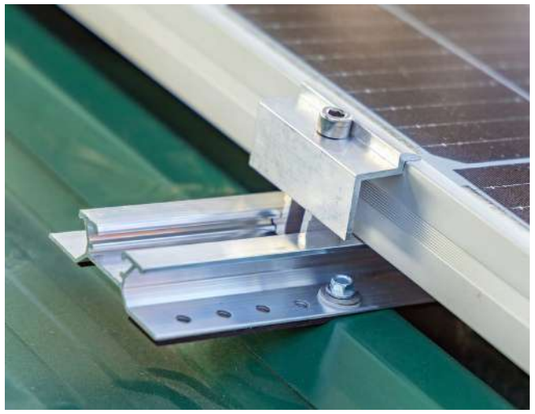
Mounting & Racking Profiles

Stavian Industrial Metal supplies aluminum extrusions and fabricated components for solar PV mounting and support structures. The portfolio includes:

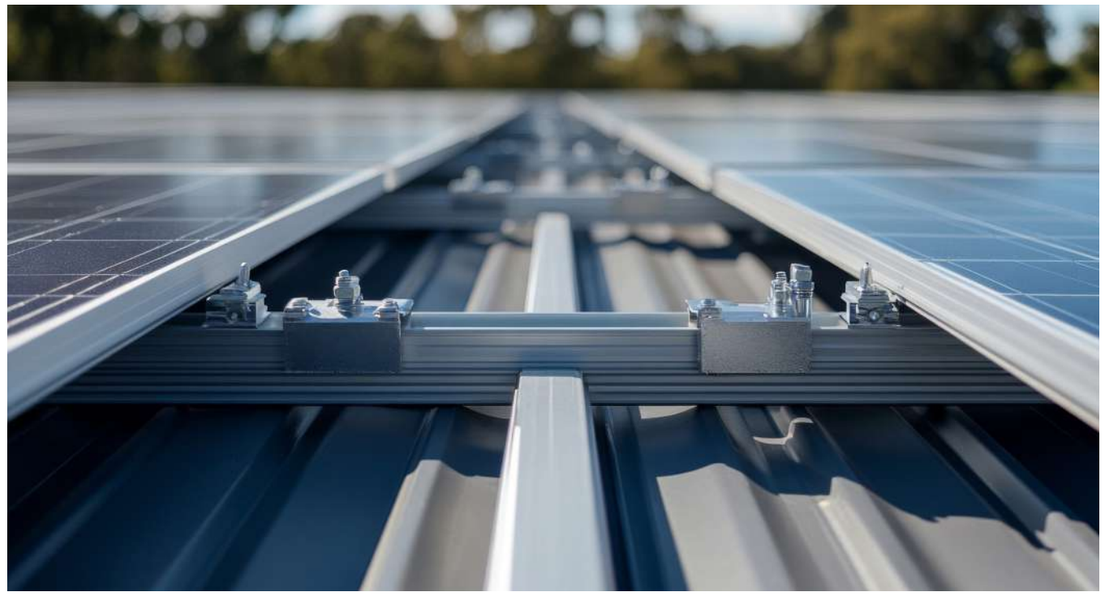
- Rails and support profiles: main rails, mini-rails and purlins
- Connection and mounting accessories: rail splices, mid/end clamps, L-feet and brackets
- Structural mounting profiles: carport and fixed-tilt profiles

Key technical considerations include structural performance, weight optimization, dimensional accuracy, straightness, precise hole and slot positioning, corrosion resistance, and compatibility with the overall mounting and assembly system.

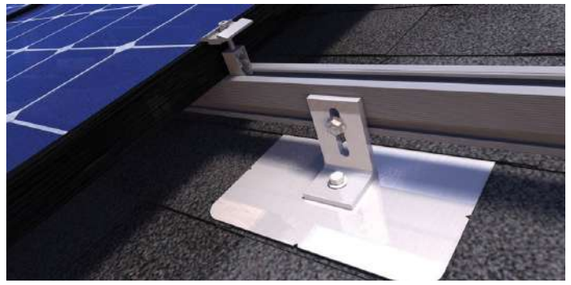




Product group	Typical components & supply formats	Engineering & fabrication scope	Materials, finishing & quality
PV mounting and racking components	• Rails and support profiles: main rails, mini-rails and purlins • Connection and mounting accessories: rail splices, mid/end clamps, L-feet and brackets • Structural mounting profiles: carport and fixed-tilt profiles	• Typical rail lengths of approximately 3,300–4,400 mm; custom cut lengths, profile weight and sectional properties according to approved drawings • Clamp interfaces commonly designed for module-frame heights of approximately 30–50 mm; dimensions, straightness, bow and twist controlled to EN 755-9 or agreed specifications • Cutting, drilling, punching and CNC machining, with hole/slot positions and connection interfaces controlled to project-specific tolerances	• 6005/6005A, 6061 or 6082 for structural applications; 6063 for suitable lighter sections • Mill finish, silver/black anodizing or powder coating according to project requirements • Inspection of alloy and temper, dimensions, surface finish, fabrication accuracy and batch traceability









Aluminum Components for Solar Tracker Systems

Stavian Industrial Metal supplies high-strength aluminum extrusions and fabricated components for solar tracker systems, including module-support rails and purlins, clamps, brackets, joining profiles and tracker-specific interface components. Products can be supplied in mill lengths, cut-to-length or fully fabricated according to customer-approved drawings.



Product group	Typical components & supply formats	Engineering & fabrication scope	Materials, finishing & quality
Solar tracker aluminum components	• Module-support profiles: rails and purlins • Connection components: clamps, brackets and joining profiles • Tracker-specific components: extruded bearing housings and steel-aluminum interface profiles where specified	• Section properties and interfaces matched to customer-defined static, cyclic and torsional load requirements • Control of dimensions, straightness, bow, twist, hole pitch and positional accuracy • Cutting, drilling, punching and CNC machining according to approved drawings • Steel-aluminum interfaces and isolation measures defined by the customer or tracker-system designer	• Typically 6005A-T6, 6061-T6 or 6082-T6, subject to engineering requirements • Mill finish, anodizing or protective coating according to project and exposure conditions • Material certificates, dimensional reports, fabrication inspection and batch traceability available according to the agreed quality plan





Engineered and Custom Aluminum Profiles

Beyond solar applications, Stavian Industrial Metal works with qualified OEM manufacturers to develop and supply custom aluminum extrusions and fabricated components for a broad range of industrial applications. Products are manufactured to customer-approved drawings and can be supplied as mill-length profiles, cut-to-length components or fully fabricated assemblies.

Key application areas include:

- Industrial automation
- Electric vehicles and battery systems
- Equipment enclosures, frames and heat sinks

Product group	Typical components & supply formats	Engineering & fabrication scope	Materials, finishing & quality
Custom & industrial aluminum extrusions	• Customer-designed solid, semi-hollow and hollow profiles • Channels, housings, heat sinks and structural sections • Supplied in mill lengths, cut-to-length or fully fabricated formats	• Design-for-manufacturing review, die development and sample qualification • Control of profile dimensions, weight per meter, local wall thickness and dimensional tolerances • Cutting, drilling, punching, CNC machining, bending, welding, riveting and assembly where technically suitable	• 6060/6063 for surface finish and extrudability; 6005A/6061/6082 for higher structural requirements • Mill finish, anodizing, powder coating or mechanical finishing • Alloy, temper, surface treatment, inspection and traceability matched to the approved specification

PRODUCTION PROCESS

Stavian Industrial Metal establishes and coordinates quality control points throughout the production process at qualified manufacturing facilities. At each stage, Stavian Industrial Metal inspects and verifies materials and products, confirms compliance, and maintains records in accordance with project-specific technical requirements, approved drawings, and applicable standards.

Step 1
INCOMING MATERIAL INSPECTION

Material documentation is received and checked against the order requirements, including alloy grade, chemical composition, aluminium billet lot number, and material certificates. The physical condition of the billets is inspected, lot information is confirmed, and traceability identification is established before the material enters production.



Step 2
TOOLING & EXTRUSION CONTROL

The approved drawing is reviewed against the die design before production. Profile cross-section, wall thickness, weight per unit length, and dimensional tolerances are confirmed. The extrusion process is monitored, and the first-off profile is sampled and measured against the approved drawing before proceeding with mass production.



Step 3
STRETCHING & HEAT TREATMENT

After extrusion, the aluminium profiles are checked and adjusted for straightness, curvature, and profile shape through the stretching process. Heat treatment and aging are carried out as required, followed by sample testing of mechanical properties to confirm the required T5 or T6 temper before the product moves to the next stage.



Step 4
SURFACE TREATMENT

The appropriate surface finishing method is selected according to the requirements of each product. After treatment, colour, surface uniformity, surface condition, and coating thickness are inspected. The results are compared with the specified technical requirements before the product is approved.



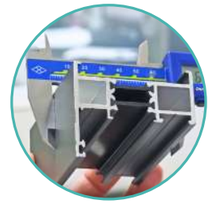
Step 5
FABRICATION & ASSEMBLY

Fabrication drawings are reviewed before cutting, punching, drilling, CNC machining, bending, welding, and riveting. Cut lengths, cutting angles, hole positions and dimensions, and post-machining dimensions are measured. Trial assembly or fit checks are performed to ensure that the components conform to the approved design.



Step 6
FINAL INSPECTION & LOT RELEASE

Samples are taken from each production lot to inspect dimensions, weight, appearance, mechanical properties, surface condition, fabrication accuracy, and assembly accuracy. Inspection results are compared with project requirements, quality records are completed, and only conforming lots are approved for packaging and shipment.



Step 7
PACKAGING & PRE-SHIPMENT INSPECTION

Actual quantities are checked against the order. Surface protection, separators, bundling, pallets, identification markings, and packaging condition are inspected. The condition of the products is checked again before loading to ensure that the packaging method meets customer requirements and the selected international transportation method.



Step 8
DELIVERY & TRACEABILITY

Quality records, production lot information, quantities, packing documents, and shipping documents are completed and linked to each shipment. This enables each product lot to be traced back to its raw materials, production process, and inspection records when required.



V. OEM PROJECT DEVELOPMENT PROCESS

Stavian Industrial Metal manages solar PV aluminium profile and component projects through an end-to-end process covering requirement assessment, engineering development, OEM source selection, prototyping, mass production, quality control, and international delivery, with a single point of coordination throughout the entire process.

1 REQUIREMENT INTAKE & ASSESSMENT

Receive and review product, technical, volume, quality, packaging, and delivery requirements to determine the most suitable supply solution.

2 TECHNICAL ASSESSMENT & OEM SOURCE SELECTION

Assess technical requirements and select suitable OEM sources based on manufacturing capabilities, technology, quality systems, capacity, lead times, and commercial terms. For custom-designed products, specific requirements are aligned and confirmed before prototype development.

3 QUOTATION & ORDER CONFIRMATION WITH EXECUTION PLAN

Confirm tooling costs, product pricing, MOQ, development lead time, testing costs, payment terms, delivery terms, packaging requirements, and other key conditions before project execution.

4 TOOLING DEVELOPMENT & PROTOTYPING

Work closely with the selected OEM to develop tooling and produce prototypes in accordance with customer's design and technical requirements, with lead times potentially optimized to approximately 7 days depending on the project.

5 SAMPLE APPROVAL & SPECIFICATION CONFIRMATION

Coordinate with the customer to inspect and finalize prototypes against agreed requirements for dimensions, materials, mechanical properties, surface finish, and applicable technical standards before mass production.

6 MASS PRODUCTION & QUALITY CONTROL

Coordinate production planning and implement quality control throughout the process, from incoming raw materials to finished products, in accordance with agreed specifications, ensuring production volumes and delivery schedules as required.

7 PACKAGING

Products are packed according to customer requirements and international standards, ensuring safe handling and suitability for international sea transport. Stavian Industrial Metal coordinates freight forwarding and international transportation in line with the delivery plan for each order.

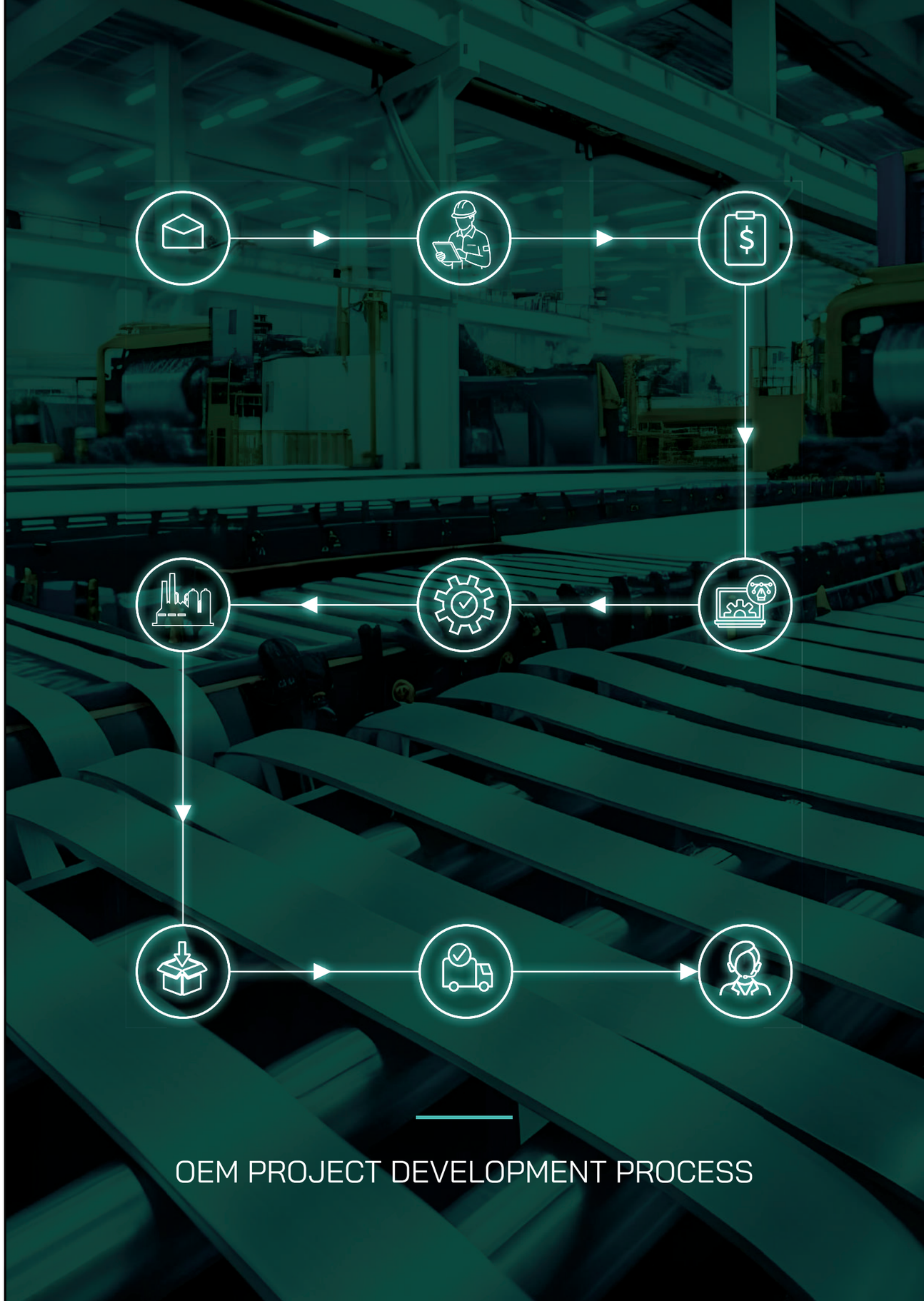
8 DELIVERY

Coordinate shipment, monitor transport milestones, and provide commercial, shipping, and agreed quality documents in accordance with the contractual delivery terms.

9 POST-DELIVERY SUPPORT & SUPPLY CONTINUITY

Monitor delivery performance, product quality, and user feedback; coordinate root-cause investigations and complaint resolution where required.

Raw material planning, production capacity, and subsequent delivery schedules are proactively coordinated to maintain supply continuity and support volume expansion in line with customer requirements.



OEM PROJECT DEVELOPMENT PROCESS

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