

# Metal-Asia

## Technical Requirements for LATP Line Procurement

### Serial Production of Thermoplastic Composite Components



*Industrial lines for serial production of thermoplastic composite components*

## Introduction

This document defines the comprehensive technical, commercial, and organizational data that the Buyer must provide to [Metal-Asia.pw](https://www.metal-asia.com) for the preparation of a complete quotation covering supply, installation, and commissioning of a production line for [serial manufacturing of thermoplastic composite components](#) based on [LATP technology](#). Without complete and accurate completion of all sections herein, calculation of final cost, delivery timelines, and scope of work is not possible.

[Metal-Asia.pw](https://www.metal-asia.com) delivers [comprehensive sourcing and procurement](#) of production [composite manufacturing lines](#) from China with full project lifecycle support.

### Pain Points in Direct Procurement from China

Key risks include: misalignment between stated and actual production performance, absence of regional service infrastructure, complexities in [customs clearance](#) for industrial lines, risk of shipment without [FAT acceptance](#), and lack of English-language documentation. [Metal-Asia.pw](https://www.metal-asia.com) eliminates these risks through [engineering audit](#) and [turnkey installation](#).

## Section 1. Buyer Credentials and Contracting Parties

The Buyer shall provide complete corporate credentials of the legal entity — the Payer: full and abbreviated company name, legal form, registration number, tax ID, legal and actual addresses, contact details of responsible personnel. Specify the Importer counterparty if the Payer and Consignee differ. Provide bank account details for settlements, contract currency, payment terms, and customs clearance requirements.

## Section 2. Equipment Purpose and Application Scope

The Buyer shall clearly articulate the technological purpose of the system: serial production, low-volume manufacturing, R&D development, laboratory testing, or educational objectives. Specify target industries: aerospace, automotive, energy, marine, medical, robotics, or general-purpose applications. Describe the

types of components to be manufactured. This determines the working envelope configuration, laser power requirements, and accuracy specifications.

## Serial Production Service Types

<b>Service</b>	<b>Description</b>
First article sample production	Manufacture of trial samples for validation
Low-volume production	Small-batch manufacturing for verification
Existing process optimization	Improvement of current production processes
Full production line optimization	Comprehensive line enhancement

## Technology Application Areas

<b>Industry</b>	<b>Component Types</b>
Aviation	Wing skins, stringers, fuselage panels, engine nacelles, interior components
Low-altitude economy	Integrated fuselages, rotor blades, landing gear beams, engine mounts
Space	Rocket cylinders, nozzle blocks, fuel tanks
Medical	Surgical instruments, medical equipment components
Robotics	Lightweight robot components, manipulators
New energy vehicles	Battery enclosures, structural body elements

## Section 3. Tape Feed System Technical Specifications

The Buyer shall specify the format and type of tape to be used: single-row UD tape width 1/4 inch (6.35 mm), 1/2 inch (12.7 mm), 1 inch (25.4 mm), or other custom dimensions. Thermoplastic matrix: PEEK, PEKK, PPS, PA, PP, or alternative polymer. Tape thickness, allowable tension range during feeding, reel requirements and capacity. Feed method: continuous, step-cut, or programmable step. Minimum course length, minimum cut step, feed accuracy, and cut repeatability.

## Section 4. Laser Heating System

The Buyer shall specify laser type: continuous-wave fiber laser with wavelength in the NIR range (1080 nm) or alternative spectrum. Laser power: 3–6 kW for industrial systems. Laser spot dimensions, required substrate and tape heating temperature range, temperature control accuracy (less than  $\pm 15^{\circ}\text{C}$ ), thermal control system response time. Water cooling requirements for the laser, optics, and compaction roller.

## Section 5. Robotic Positioning System and Working Envelope

The Buyer shall define the industrial robot type: KUKA KR70–KR210 or equivalent with KR C5 controller. Standard working envelope dimensions: 2x1 m, or custom configuration up to 15x2 m. Requirements for linear tracks, 1–3 axis positioners, additional robots for synchronized operation. Axis positioning accuracy, course-to-course placement accuracy ( $\pm 0.1$  mm), layup speed up to 1000 mm/s.

## Section 6. Compaction System and Layup Quality Control

Specify compaction force range: 100–1500 N for industrial systems. Compaction drive type: pneumatic control. Compaction roller requirements: material, diameter, coating, replaceability. Monitoring systems: IR pyrometer with response time  $\leq 5$  ms, IR thermal imager, optical camera for visual defect detection. High-precision tape tension sensors (5–50 N,  $\pm 0.5\%$ ). Data collection and process analytics system: real-time logging of temperature, speed, force, tension.

## Section 7. Control System and Software

Controller requirements: open architecture with user-configurable settings, PID temperature regulator. Operator interface: localization language (English, Chinese, or other), panel type (touchscreen, industrial PC). Software for offline layup trajectory programming, process simulation, CAD model import (STEP, IGES, CATIA, NX). MES/ERP system integration capability, data exchange protocols (OPC UA, Ethernet/IP). Requirements for program backup, software updates, technical support.

## Section 8. Electrical and Utility Requirements

Power supply: 380 V, 3-phase, 50/60 Hz for industrial systems. Maximum power consumption of the complete system. Grounding requirements, surge protection, UPS availability for critical nodes. Water cooling system: flow rate, pressure, coolant temperature, water preparation requirements (distilled, deionized). Pneumatic system: compressed air pressure, flow rate, air quality requirements (drying, filtration). Vacuum system: vacuum pump, receiver, regulator.

## Section 9. Safety and Certification Requirements

The Buyer shall specify required certifications: CE, ISO 9001, ISO 14001, AS9100 (for aerospace applications), EAC (for Customs Union). Safety systems: laser zone protective enclosure (laser safety Class 4), emergency stop buttons, operator presence sensors, door interlock. Fire suppression system for high-temperature thermoplastic processing. Electromagnetic interference protection, compliance with IEC 60204-1 electrical safety standards.

## Section 10. Delivery Terms, Shipping, and Customs Clearance

Specify Incoterms 2020 delivery basis: EXW, FCA, FOB, CIF, DAP, DDP. Port of departure in China and destination point. Packaging requirements: wooden crates, moisture barrier, fragile cargo labeling, shock and tilt indicators. Equipment manufacturing lead time. Customs clearance requirements: HS code, certificate of conformity necessity, Customs Union Technical Regulation compliance declaration. Cargo insurance terms during transit.

## Section 11. Installation, Commissioning, and Training

The Buyer shall define installation requirements: supplier specialist dispatch to the Buyer's facility, installation and commissioning timelines. Foundation preparation, utility routing, ventilation system completion prior to installation crew arrival. Personnel training: number of trainees, training program (operators, setup technicians, programmers), training language, certificate issuance. Number of working shifts for process parameter optimization on the Buyer's actual component.

## Section 12. Warranty Obligations and Service Support

Warranty period: standard 12 months from commissioning date, extendable to 24–36 months. List of warranty cases, claim submission procedure, supplier response time. Post-warranty service: annual service contract cost, scheduled maintenance frequency, remote diagnostics, spare parts warehouse availability in the delivery region. Critical spare parts: laser source, optics, robot, controller, sensors — delivery lead times and pricing.

## Section 13. Documentation and Technical Documentation

List of documents to be delivered with the equipment: technical passport, operation manual, programming manual, electrical and pneumatic schematics, component certificates, laser radiation safety passport, compliance declaration. Documentation language: English, Chinese, or bilingual. Format: printed and electronic (PDF). Process documentation requirements: tape selection recommendations, layup parameters for standard materials, material database.

## Section 14. Options, Configuration, and Future Upgrade Path

The Buyer shall list required options: IR thermal imager, machine vision optical system, data collection and analytics system, additional positioners, extended working envelope, automatic reel change system. Scalability requirements: laser power upgrade capability, working envelope expansion, integration with other technological cells. Request for consumables supply for trial operation: tapes, laser protective windows, filters.

## Section 15. Composite Component-Specific Requirements

Specify required properties of finished components: layup density (void content <1%), interlaminar shear strength (ILSS), tensile and flexural strength, thermal resistance, chemical resistance. Post-processing requirements: vacuum bagging necessity, thermoforming, machining, quality control (ultrasonic testing, X-ray, tomography). Productivity: target first-pass yield, cycle time per component, planned annual production volume.

## Section 16. Acceptance Conditions and Final Criteria

The Buyer shall define acceptance testing procedure: Factory Acceptance Test (FAT) at the manufacturer's facility in China, Site Acceptance Test (SAT) at the Buyer's facility. Acceptance criteria: geometric accuracy of test component layup, process repeatability on a series of N components, compliance with stated technical specifications, absence of layup defects. Penalty clauses for non-compliance with technical requirements, Buyer's right to reject acceptance. Property transfer conditions, risk of accidental loss during transit.

## Key LATP Technology Advantages

<b>Advantage</b>	<b>Description</b>
Laser heating	Precise heating to exact processing temperatures
High-precision positioning	Compaction and roller technology for dense lamination without voids
In-situ consolidation	Rapid consolidation with vacuum bagging
Control system	Multi-axis control with synchronized tape feed

Advantage	Description
Sustainability	Environmentally clean process with recyclable materials
Cost efficiency	Reduced costs compared to traditional methods

## Production Line Technical Specifications

Parameter	Value	Notes
Line type	LATP with laser heating	Automated layup
Laser power	3–6 kW	Depending on configuration
Wavelength	1080 nm	NIR range
Tape formats	1/4", 1/2", 1" UD tape	Multi-format system
Maximum layup speed	500–1000 mm/s	Industrial productivity
Compaction force	100–1500 N	Wide adjustable range
Layup accuracy	±0.1 mm	Industrial precision
Working envelope	2 × 1 m to 15 × 2 m	Modular configuration
Temperature control	PID, closed-loop	±10°C
Vacuum system	Vacuum bag	Additional consolidation
Quality control system	IR pyrometer, thermal imager, optical camera	Comprehensive monitoring
Data collection system	Real-time process analytics	Logging all parameters
Robot	KUKA KR70–KR210	Depending on dimensions
Positioners	1–3 axes	Synchronization with robot
Linear track	Up to 15 m	Extendable

## Control System Requirements

Parameter	Requirement
Architecture	Open, user-configurable
Temperature control	PID regulator with manual tuning
Interface	Industrial touchscreen display
Interface language	English / Chinese / Other
Data logging	Collection of all process parameters
Data export	CSV, XML, OPC UA
MES/ERP integration	OPC UA, Ethernet/IP, PROFINET

Parameter	Requirement
Offline programming	CAD model import (STEP, IGES, CATIA, NX)
Process simulation	Virtual trajectory verification
Machine vision system	Real-time defect detection

## Electrical and Utility Requirements

Parameter	Requirement
Power supply	380 V, 3-phase, 50/60 Hz
Maximum power consumption	20–50 kVA
Grounding	Mandatory, resistance $\leq 4$ Ohm
Surge protection	Class III
Water cooling	Flow rate $\geq 20$ L/min, pressure 3–5 bar
Pneumatic system	Pressure 6 bar, flow rate 600 L/min
Air quality	Drying, 5-micron filtration
Compressed air	ISO 8573-1 quality class: 1.4.1
Vacuum system	Vacuum pump, receiver, regulator

## Safety and Certification Requirements

Requirement	Details
CE Certificate	Mandatory for export to Europe
EAC Declaration	Mandatory for Customs Union
ISO 9001	Quality management system certificate
ISO 14001	Environmental management system
AS9100	For aerospace industry
Laser safety	IEC 60825-1, Class 4 protective enclosure
Electrical safety	IEC 60204-1
EMI protection	Compliance with EN 61000-6-2/4
Fire suppression	Automatic system for laser zone
Emergency stop	Buttons around working envelope perimeter
Presence sensors	Infrared barriers

## Delivery Terms and Shipping

Parameter	Requirement
Delivery basis	CIP / DAP Incoterms 2020
Port of departure	Shanghai, Ningbo, or Shenzhen
Destination point	Specified by Buyer
Packaging	Wooden crates, moisture barrier, labeling
Indicators	Shock, tilt, temperature
Manufacturing lead time	20–24 weeks made-to-order
HS customs code	8477 59 000 0
Additional code	8479 89 970 9

## Installation, Commissioning, and Training

Stage	Requirement
Turnkey installation	<a href="https://www.metal-asia.pl">Metal-Asia.pw</a> specialist dispatch to facility
Site preparation	Foundation, utilities, ventilation
Commissioning	Full parameter tuning on Buyer's materials
Personnel training	Up to 10 persons: operators, programmers, setup technicians, technicians, instrumentation engineers
Training language	English with technical translation
Process optimization	10 working shifts on actual component
Certificates	Issued upon training completion

## Warranty Obligations

Parameter	Terms
Warranty period	12 months from commissioning date
Extended warranty	Up to 24 months
Post-warranty service	Annual service contract
Response time	24 hours critical, 48 hours standard
Spare parts	Regional warehouse, delivery ≤ 14 days
Critical components	Laser, optics, robot — delivery ≤ 7 days
Remote diagnostics	VPN access, online monitoring

## Documentation

<b>Document</b>	<b>Format</b>	<b>Language</b>
Technical passport	Printed + PDF	English / Chinese
Operation manual	Printed + PDF	English / Chinese
Programming manual	Printed + PDF	English / Chinese
Electrical schematics	PDF + CAD	Universal
Pneumatic schematics	PDF + CAD	Universal
Laser safety passport	PDF	English / Chinese
Material recommendations	PDF	English / Chinese
Layup parameter database	Electronic	English / Chinese
FAT protocol	PDF	English / Chinese
SAT protocol	PDF	English / Chinese

## Supply Scope — Production Line

<b>No.</b>	<b>Item</b>	<b>Quantity</b>	<b>Notes</b>
1	Industrial LATP line, complete	1 set	Full system
2	Laser source 3–6 kW	1–2 pcs.	Depending on configuration
3	Focusing optics system	1–2 sets	Per laser
4	Multi-format tape feed system	1 set	1/4", 1/2", 1"
5	Pneumatic compaction system	1 set	Range 100–1500 N
6	Non-contact IR pyrometer	2 pcs.	Primary + backup
7	IR thermal imager	1 pc.	Upon request
8	Optical camera	1 pc.	Machine vision
9	Water cooling system	1 set	Closed-loop
10	KUKA KR C5 controller	1 pc.	Open architecture
11	Touchscreen operator panel	2 pcs.	Primary + backup
12	Laser zone protective enclosure	1 set	Class 4, full perimeter
13	Air filtration system	1 set	5-micron, drying
14	Emergency stop system	1 set	Buttons + barriers
15	Vacuum system	1 set	Pump, receiver, regulator
16	Linear track	1 set	Up to 15 m
17	1–3 axis positioners	2–4 pcs.	Synchronization with robot

No.	Item	Quantity	Notes
18	Data collection and analytics system	1 set	Logging and analysis
19	Spare parts kit	1 set	1-year operation
20	Consumables kit	1 set	Trial tape reels
21	Technical documentation	1 set	Complete package

## Customs Clearance and HS Codes

HS Code	Description	Notes
8477 59 000 0	Plastics processing machines	Primary code
8479 89 970 9	Other machinery and mechanical appliances	Secondary
8515 80 000 0	Laser welding apparatus	Laser source
8479 50 000 0	Industrial robots	KUKA manipulators
9031 80 000 0	Regulating and controlling instruments	Measurement system
8477 90 000 0	Parts of plastics processing machines	Spare parts
8414 10 000 0	Vacuum pumps	Vacuum system

## Metal-Asia.pw Procurement Support Services

[Metal-Asia.pw](#) delivers [comprehensive procurement from China](#), including tender bid support for public procurement frameworks, defense procurement compliance, and government contracting. Services encompass [quality control](#) (NDT, ultrasonic testing), chemical composition verification against international standards, and [turnkey customs clearance](#).

### Why Metal-Asia.pw vs. Direct Chinese Suppliers

Criterion	Direct Chinese Supplier	Metal-Asia.pw
Technical audit	Absent	<a href="#">Free engineering audit</a>
Quality control	At factory discretion	<a href="#">Independent control</a>
FAT acceptance	Not conducted	<a href="#">Mandatory FAT</a>
Customs clearance	Buyer handles independently	<a href="#">Full customs support</a>
Turnkey installation	Not provided	<a href="#">Turnkey with training</a>
Regional service	Absent	<a href="#">Regional service network</a>
Documentation	English only	<a href="#">Localized translation</a>
Warranty	12 months standard	Up to 24 months with service contract
Communication	Language barrier	<a href="#">English-speaking project managers</a>

## FAQ — Frequently Asked Questions

**Q1: What is the minimum batch volume for serial production startup?** A: Minimum volume depends on component complexity. For first article samples — from 1 pc., for low-volume production — from 10 pcs., for serial production — from 100 pcs. annually. [Metal-Asia.pw](https://www.metal-asia.pw) assists in optimizing the production line for specific volume requirements.

**Q2: What are the timelines from design to serial production startup?** A: Typical cycle: design — 4–6 weeks, first article sample production — 2–4 weeks, validation — 4–6 weeks, line commissioning — 2–4 weeks. Total timeline from technical requirements to serial production is 3–5 months.

**Q3: Is production of complex-geometry components possible?** A: Yes, LATP technology enables manufacturing of components with double curvature, variable cross-section, and integrated stiffeners. Multi-axis positioners and linear tracks provide access to complex surfaces.

**Q4: What are the facility requirements for production line placement?** A: Production facility with area  $\geq 200 \text{ m}^2$ , ceiling height  $\geq 4 \text{ m}$ , temperature 18–25°C, relative humidity  $\leq 70\%$ , ventilation and exhaust system, foundation for robot and positioners, utility routing.

**Q5: How is quality control of finished components organized?** A: Quality control includes: ultrasonic testing (UT) for void content, radiographic inspection for layup defects, mechanical testing (tensile, flexural, shear), thermal analysis (DSC, TGA) for crystallinity. All methods comply with aerospace industry requirements.

**Q6: Is integration with existing production possible?** A: Yes, the open controller architecture and support for industrial protocols enable integration with MES/ERP systems, CNC machines, and thermal treatment systems. Synchronization with automated warehouse systems is supported.

**Q7: Which materials are recommended for serial production?** A: For aerospace — CF/PEEK, CF/PEKK; for automotive — CF/PPS, CF/PA; for general engineering — CF/PP. Material selection is determined by strength, thermal resistance, and cost requirements. [Metal-Asia.pw](https://www.metal-asia.pw) provides material selection consultation.

**Q8: What is the investment payback period for an LATP production line?** A: Payback period depends on production volume and component type. For serial production of aerospace components, typical payback is 24–36 months through reduced material costs, labor intensity, and elimination of autoclave processing.

## Author

Prepared by: [Milosh Kovachevic](https://www.metal-asia.pw), Procurement Project Manager, [www.metal-asia.pw](https://www.metal-asia.pw)

For comprehensive service information, visit [Metal-Asia.pw](https://www.metal-asia.pw).

## Contact Information

For all inquiries, please contact our customer relations department:

- **Customer Relations Department:**
- WhatsApp: +86 132 50100874
- Telegram: @China\_metal\_supply

- Email: [zakaz@metal-asia.pw](mailto:zakaz@metal-asia.pw)
- Official Website: [www.metal-asia.pw](http://www.metal-asia.pw)



*Request design and delivery of turnkey LATP production line from China*