

Metal-Asia

Commercial Proposal for Supply

ATP Systems and LATW Lines for Composite Manufacturing

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Executive Summary

ATP (Automated Tape Placement) and LATW (Laser-Assisted Tape Winding) are complementary automated manufacturing technologies for composite components from wide prepreg tapes. ATP systems excel at laying flat and mildly contoured large-area panels (aerospace wing skins, fairings, nacelles), while LATW lines are purpose-built for winding tubes, cylinders, pressure vessels, and other axisymmetric parts. Metal-Asia.pw supplies both equipment types with full technical support, factory quality inspection, international logistics, and commissioning services worldwide through our **Global Procurement Solutions** platform.



Automated Tape Placement system with laser heating for flat panel production

Process Capabilities — ATP and LATW

ATP (Automated Tape Placement)

ATP systems deposit wide prepreg tapes (75-300 mm / 3-12 inches) onto flat or mildly contoured surfaces at high speed and accuracy. The technology is ideal for large aerospace panels where throughput is critical and geometry is relatively simple.

LATW (Laser-Assisted Tape Winding)

LATW lines wind narrow to medium tapes (12.7-50.8 mm) onto a rotating mandrel with laser heating and in-situ consolidation. Applications include pipeline production, high-pressure vessels (Type IV and V), hydrogen storage tanks, drive shafts, and geological drill columns.

Comparative Technical Specifications

Parameter	ATP System	LATW Line
Tape width	75-300 mm	12.7-50.8 mm
Tape thickness	0.13-0.36 mm	0.15-0.40 mm
Maximum layup/winding speed	up to 30 m/min	up to 60 m/min
Heating type	Laser NIR, IR lamps, hot gas	Laser NIR (primary), IR
Laser power	2-6 kW	2-4 kW
Positioning accuracy	+/- 0.1 mm	+/- 0.05 mm
Part geometry	Flat, mildly contoured panels	Axisymmetric, tubes, vessels
Maximum part diameter (LATW)	—	up to 4000 mm
Maximum part length (LATW)	—	up to 20000 mm
Maximum panel size (ATP)	6000x2000 mm	—
Robotic platform	Gantry or 6-axis robot	CNC machine with rotary axis
Control system	PLC + CAD/CAM	PLC + specialized software

Complete Equipment Scope of Supply — ATP System

Primary Equipment

Item	Description	Technical Specifications	Qty	Unit
1	Gantry layup system	Travel 3000-15000 mm (X), 2000-4000 mm (Y), 1000-2000 mm (Z), speed 30 m/min	1	set
2	Or: 6-axis robot on linear axis	Payload 150-500 kg, reach 3000-4000 mm, linear axis 3000-12000 mm	1	set
3	Tape placement head	Width 75-300 mm, roller feed system, angle cutting, compaction	1	pcs.
4	Tape feeding and tensioning system	Electric drives, tension sensors, elongation compensators, width up to 300 mm	1	set
5	Tape cutting and restart system	CNC knife system, 0-90 degree cutting, cycle time < 100 ms	1	set
6	Heating system	Laser NIR 2-6 kW or IR lamps, adjustable power, zonal heating	1	set
7	Thermal monitoring system	IR pyrometer, thermal imager, accuracy +/- 3 degC, closed-loop	1	set
8	Compaction roller	Width 100-350 mm, pneumatic drive, force 200-3000 N, silicone/steel coating	1	pcs.

Item	Description	Technical Specifications	Qty	Unit
9	Wide tape creel system	Capacity 2-4 spools at 50-150 kg each, adjustable brake, guides	1	set
10	Mandrels and tooling (optional)	Aluminum/steel, Teflon/chrome coating, per customer drawings	2-10	pcs.

Control System and Software

Item	Description	Technical Specifications	Qty	Unit
11	Control cabinet with PLC	Industrial PLC, analog I/O modules, 15" HMI	1	set
12	CNC system	3-5 axis interpolation, G-code support, manual mode	1	set
13	CAD/CAM for ATP	CATIA/Siemens NX import, automatic trajectory generation, simulation	1	lic.
14	Process monitoring system	Parameter logging, traceability, MES integration	1	lic.

Complete Equipment Scope of Supply – LATW Line

Primary Equipment

Item	Description	Technical Specifications	Qty	Unit
1	CNC laser winding machine	Longitudinal axis (X) 2000-20000 mm, transverse (Z) 500-2000 mm, speed 60 m/min	1	pcs.
2	Spindle group (mandrel rotation)	Power 15-75 kW, rotation speed 0.1-500 rpm, torque up to 50000 Nm	1	set
3	Tailstock (optional)	Morse/ISO taper, pneumatic clamp, height adjustment	1	pcs.
4	Tape winding head	Width 12.7-50.8 mm, layup angle +/- 90 degrees, cutting system	1	pcs.
5	NIR laser source	Power 2-4 kW, fiber, wavelength 980-1080 nm, water cooled	1	pcs.
6	Optical delivery system	Collimator, focusing optics, protective window, air purge	1	set
7	Thermal monitoring system	2-channel IR pyrometer, thermal imager, substrate and tape temperature control	1	set
8	Compaction assembly	Roller/pneumatic, force 100-1500 N, width 20-60 mm	1	pcs.

Item	Description	Technical Specifications	Qty	Unit
9	Tape feeding and tensioning system	Electric drives, tension sensors, accuracy +/- 0.5 N	1	set
10	Tape cutting system	Pneumatic knife, accuracy +/- 1 mm, response < 30 ms	1	set
11	Creel system	2-4 spools, capacity up to 15 kg each, adjustable brake	1	set
12	Long mandrel support system	Roller supports, pneumatic lift, height adjustment	2-4	pcs.

Auxiliary Equipment

Item	Description	Technical Specifications	Qty	Unit
13	Machine safety enclosure	Shaded panels, safety light curtains, interlock system	1	set
14	Laser safety (Class 4)	Shielding per IEC 60825, alarm, emergency stops	1	set
15	Laser chiller	5-10 kW cooling, temperature 18-22 degC, glycol circuit	1	pcs.
16	Exhaust system	Flow rate 1500-4000 m3/h, filtration, monitoring	1	set
17	Compressed air station	8-12 bar, 300-500 L receiver, dryer, filters	1	set
18	Fire suppression system	Detectors, gas-based extinguishing module	1	set

Control System

Item	Description	Technical Specifications	Qty	Unit
19	Control cabinet	PLC, analog I/O modules, 15" HMI, Ethernet	1	set
20	CNC system	2-4 axis interpolation, manual control, MDI	1	set
21	Specialized LATW software	Winding trajectory programming, CAD model import, simulation	1	lic.
22	Process monitoring system	Parameter logging, traceability, MES integration	1	lic.

Customs Classification and HS Codes

HS Code	Product Description
8458.11.00	CNC lathes (for LATW)
8459.61.00	CNC milling machines (for gantry ATP)

HS Code	Product Description
8479.71.00	Machines for working plastics materials
8477.10.00	Industrial robot manipulators
8515.11.00	Laser equipment for thermal processing
8479.89.97	Other machines with individual functions
8466.20.00	Parts and accessories for machine tools and robots
9031.49.00	Automatic control instruments
8419.39.80	Equipment for thermal processing
9027.80.00	Instruments for physical analysis

Engineering Audit and Project Design

Metal-Asia.pw engineers conduct an [engineering audit](#) of your production facility to determine the optimal ATP or LATW equipment configuration. The audit covers part geometry analysis, required working envelope calculation, infrastructure capacity assessment, and technical specification preparation.

Technical Documentation Package

- Technical specification for ATP system or LATW line
- Technical datasheets for all components
- Process layup/winding card
- Equipment layout referencing plant utilities
- Operation and maintenance manuals in English

Factory and Site Acceptance Testing

- FAT at manufacturer's facility
- Test layup/winding of sample parts
- Laminate geometry and thickness control
- Temperature profile verification
- SAT at your facility

Installation Supervision and Commissioning

[Installation supervision for ATP systems and LATW lines](#) includes mechanical and electrical installation, laser optics alignment, software-hardware integration, and personnel training.

Commissioning Sequence

1. Gantry system or robotic cell installation
2. Placement/winding head mounting and alignment
3. Laser source connection and calibration
4. Thermal monitoring system calibration

5. Feeding, tensioning, and cutting mechanism adjustment
6. Standard trajectory programming
7. Operator training (40-80 hours)
8. Trial production run and acceptance

Integrated Service Portfolio

Metal-Asia.pw provides comprehensive [procurement services from China](#), including quality control and worldwide logistics management.

- [Engineering audit](#) — requirements analysis, technical specification
- [Equipment sourcing](#) — optimal configuration
- [Customs and logistics](#) — global delivery and customs clearance
- [Manufacturer audit](#) — reliability verification
- [Integrated engineering systems](#) — auxiliary equipment
- [Installation and commissioning](#) — full handover
- [Composite production lines](#) — full catalog
- NDT quality control (UT, RT), chemical composition verification to ASTM/ISO/DIN
- Documentation for customs clearance and regulatory compliance

Why Metal-Asia.pw: Global Procurement with Full Transparency

Criteria	Direct Procurement from China	Metal-Asia.pw Turnkey Delivery
Factory verification	No on-site visit capability	In-person audit, certificate verification
FAT at factory	Difficult to organize	Full oversight, video reporting
Documentation	Chinese/English only	Complete English package
Customs clearance	Classification risks	Accurate HS codes, brokerage support
Installation	Separate contract	Included in scope
Service and spare parts	Long lead times	Regional inventory, 72-hour response
Training	Not provided	40-80 hours on-site
Compliance	No certification support	CE/UL support, ASTM/ISO documentation

Frequently Asked Questions (FAQ)

Q1: What is the fundamental difference between ATP and LATW technologies?

ATP (Automated Tape Placement) is designed for laying wide tapes (75-300 mm) onto flat or mildly contoured surfaces. LATW (Laser-Assisted Tape Winding) winds narrow tapes (12-50 mm) onto rotating

mandrels to produce axisymmetric parts. ATP is optimal for panels; LATW is optimal for tubes, vessels, and shafts.

Q2: What types of parts can be produced on LATW lines?

LATW lines are used for producing: oil and gas pipelines, high-pressure vessels (Type IV and V), hydrogen storage tanks (350/700 bar), geological drill columns, drive shafts and axles, sports tubes (bicycle frames, ski poles), fairings and rocket motor cases.

Q3: Is post-consolidation required after LATW processing?

With correct parameter settings (laser temperature, winding speed, compaction force), LATW achieves in-situ consolidation and no additional processing is required. For critical aerospace and energy applications, post-consolidation in an autoclave or hot press may be performed to achieve maximum density and interlaminar strength.

Q4: What fiber orientation accuracy does an ATP system provide?

Modern ATP systems achieve fiber orientation accuracy of +/- 0.5 degrees, meeting aerospace industry requirements. Tape positioning accuracy is +/- 0.1 mm, ensuring minimal gaps and overlaps between courses.

Q5: What staffing is required to operate ATP/LATW equipment?

ATP/LATW requires: a CNC machine operator (for LATW) or robotic cell operator (for ATP), a process technician with composite manufacturing experience, and a quality engineer with UT skills. Metal-Asia.pw provides comprehensive training as part of commissioning.

Q6: What are the delivery lead times for ATP systems and LATW lines?

Standard manufacturing lead time is 16-24 weeks. International shipping takes 4-6 weeks. Installation supervision and commissioning requires 3-5 weeks. Total project timeline from contract to production: 6-8 months.

Q7: Can ATP/LATW be integrated with existing production lines?

Yes, ATP systems and LATW lines integrate with existing systems via standard industrial protocols (OPC UA, Ethernet/IP, Profinet). Integration with MES and ERP systems is available for full production process traceability.

Q8: What warranty coverage is provided?

Warranty period is 12 months from commissioning or 18 months from shipment. Coverage includes: component replacement, engineer dispatch, remote support. Post-warranty service is available under a service agreement.

Contact Information

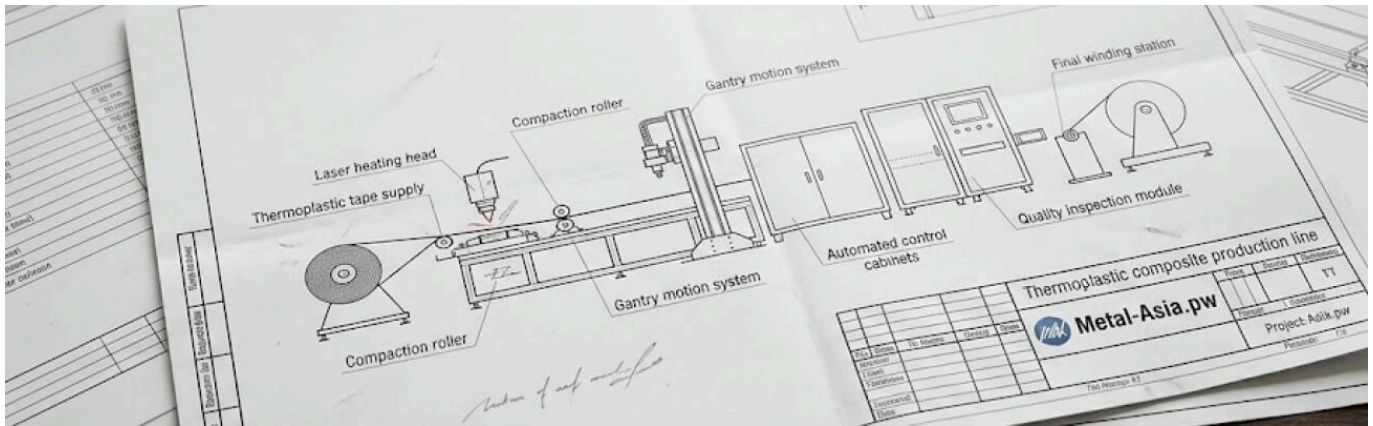
For ATP system and LATW line supply inquiries:

- **Official Website:** www.metal-asia.pw

- **Client Relations:**

- WhatsApp: +86 132 50100874
- Telegram: @China_metal_supply
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For our full service portfolio, visit Metal-Asia.pw.



Turnkey ATP systems and LATW lines from China with installation and training — worldwide delivery