

Robotic Flexible Coating Line

Technical Data Sheet

MUSI Technology - Spray Coating Specialist

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Manufacturer	Changzhou MUSI Environmental Technology Co., Ltd.
Phone	+86 181 5173 1332
Email	lin@coating-spray.com
WhatsApp	+86 181 5173 1332
Address	Wujin Industrial Park, Changzhou City, Jiangsu, China
Website	https://coating-spray.com

Product Description

Robotic Flexible Coating Line is a 6-axis robotic spray coating cell designed for complex automotive parts (bumpers, body panels), large household appliances, and high-mix manufacturing where rigid reciprocator booths are inadequate. 3D vision-guided robots adapt spray paths to each part variant in real time.

Operating Principle

Workpieces enter on synchronized conveyor or rotary table. 3D scanner captures part geometry and orientation, generating real-time spray path for 6-axis robot. Robot atomizes paint via electrostatic bell, HVLP, or 2K mixing gun. Cycle time typically 30-90 seconds per part.

Technical Specifications

All values are typical for standard configuration. Custom specifications available on request.

Parameter	Value / Range
Robot type	6-axis articulated, ABB IRB / FANUC P / KUKA KR series
Reach	2.0 - 3.5 m
Payload	5 - 25 kg (spray gun + hose)
Repeatability	+/- 0.05 mm
Number of robots	1 - 6 per cell
Spray gun options	Bell (electrostatic), HVLP, 2K mixing, airless
Atomizer voltage	60 - 90 kV (electrostatic)
Vision system	3D structured light or laser scanner
Cycle time	30 - 90 seconds per part
Booth dimensions	5x4x3 to 12x8x4 m
Booth airflow	0.4 - 0.6 m/s face velocity
Compatible chemistries	Water-based, solvent-based, 2K, powder
Color change	Automatic, 30 seconds (rapid) to 5 minutes (full)
Transfer efficiency	>=80% electrostatic bell, >=70% HVLP

Dimensions and Layout Requirements

Dimension	Value
Booth interior	5x4x3 to 12x8x4 m
Robot mounting	Floor / wall / inverted (rail-mounted optional)
Conveyor opening	1.2 - 3 m wide
Required clear floor area	Booth footprint + 2 m perimeter clearance
Ceiling height	Min 4 m, 5 m preferred
Foundation	Standard concrete, no pit required

Options and Accessories

Multi-Robot Configuration

2-6 robots per cell for high throughput.

Rail-Mounted Robot

7th-axis linear rail for parts wider than robot reach.

Automatic Tool Change

Multiple guns on tool carousel for color or chemistry change.

Inline Quality Vision

Film thickness measurement and surface defect detection.

Robot Programming Suite

Offline programming with simulation in RobotStudio / Roboguide.

Climate Control

For water-based: 22-26 deg C, 60-75% RH controlled.

Control System

PLC

Siemens S7-1500

Robot Controller

Native ABB / FANUC / KUKA, integrated via Profinet

Vision System

3D scanner with proprietary path-generation software

HMI

15 inch touchscreen with recipe library

Safety

SIL 3 safety PLC, laser scanners at booth entry

Production Data

OPC UA to MES, traceability per part by RFID or barcode

Installation Requirements

Floor Load

Robot base + payload typically 2,000-5,000 kg static

Utilities

3-phase 380/415V at 80-150 kVA, dry compressed air 0.6 MPa, 3-8 m³/min

Paint Supply

Pressure pot, gear pump, or diaphragm pump (per chemistry)

Booth Ventilation

Make-up air unit sized for booth airflow + 10%

Safety Clearance

2 m clear perimeter around booth + emergency exit

Installation Time

4-8 weeks including robot programming and FAT

Operator Training

5-10 day on-site training program included

Service and Maintenance

Daily

Visual check of robot, gun, hose; cleaning of overspray

Weekly

Gun nozzle cleaning, pressure pot inspection, paint supply check

Monthly

Robot calibration, vision system alignment, booth filter check

Quarterly

Booth airflow measurement, robot gearbox oil check

Annually

Robot major overhaul (encoder, brake), gun rebuild

Warranty

Robot 24 months OEM warranty, cell 12 months MUSI warranty

Typical Applications

- Automotive bumpers, fenders, body panels
- Large home appliance casings
- EV battery pack housings
- Energy storage container coating
- Aerospace components (subject to certification)
- High-mix industrial parts requiring frequent geometry change

Standards and Compliance

Standard	Compliance
ISO 9001:2015	Quality Management - certified
ISO 14001:2015	Environmental Management - certified
ISO 45001:2018	Occupational Health and Safety - certified
CE Marking	EU compliance (LVD, EMC, MD)
ATEX	Zone 1/2 explosion-proof (where applicable)
China GB	Domestic safety and environmental compliance

Contact MUSI Technology

For inquiries, technical questions, or to request a custom quotation, please contact our sales engineering team:

Channel	Details
Sales Email	lin@coating-spray.com
Phone (Sales)	+86 181 5173 1332
WhatsApp	+86 181 5173 1332
Website	https://coating-spray.com
Headquarters	Wujin Industrial Park, Changzhou City, Jiangsu Province, China
Business Hours	Monday-Saturday 08:30-18:00 (GMT+8)
Response Time	Sales inquiries within 24 hours, technical proposals within 5-7 business days

How We Engage

Step 1 - Discovery

Share workpiece specifications, target throughput, color count, facility layout, and budget. Engineers respond with technical questions within 24 hours.

Step 2 - Process Simulation

We model your line in 3D, simulate cycle time and energy consumption, and provide a baseline ROI analysis.

Step 3 - Proposal and Quotation

Detailed technical proposal with layout drawings, equipment list, payment terms, and delivery schedule.

Step 4 - Manufacturing

Custom fabrication in our 28,000 sqm facility under ISO 9001 QMS. Progress photos shared via customer portal.

Step 5 - Factory Acceptance Test

You witness or remotely observe pre-shipment testing.

Step 6 - Site Installation

MUSI engineers travel to your site for installation, commissioning, and operator training.

Step 7 - Aftersales Support

Warranty support, remote diagnostics, preventive maintenance, and spare parts supply via our global network.