

Vertical Powder Coating System

Technical Data Sheet

MUSI Technology - Spray Coating Specialist

Document Reference: MUSI-TDS-VPS-001

Issue Date: 2026

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Product Description

Vertical Powder Coating System designed for long vertical workpieces such as aluminum profiles, fence panels, rebar, and architectural elements up to 8 meters in length. Workpieces hang vertically and pass through vertical-array powder booth with reciprocator-mounted electrostatic guns.

Operating Principle

Long workpieces loaded onto vertical hangers and transported through vertical conveyor. Pass through pretreatment, drying, vertical powder booth where reciprocator-mounted electrostatic guns apply powder uniformly along full length, and vertical curing oven. Powder overspray drops by gravity into collection trough and recovered via cyclone + cartridge filter ($\geq 98\%$ recovery).

Technical Specifications

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

Parameter	Value / Range
Conveyor height	4 - 7 m
Max workpiece length	Up to 8 m
Max workpiece weight	30 - 200 kg per hanger
Spray gun count	6 - 24 on vertical reciprocators
Spray gun type	Electrostatic, 60-100 kV
Reciprocator stroke	3 - 6 m vertical
Booth dimensions	8 x 3 x 6 m typical
Powder recovery rate	>=98% (vertical drop design)
Color change time	15 - 30 minutes
Curing oven height	5 - 8 m
Curing temperature	180-200 deg C polyester / 220 deg C fluorocarbon
Throughput	15 - 50 tons of profile per day
Total line length	60 - 200 m
Compatible powders	Epoxy, polyester, hybrid, fluorocarbon (PVDF)

Dimensions and Layout Requirements

Dimension	Value
Building clear height	Min 9 m, 10 m preferred
Building width	Min 8 m at booth area
Total footprint	60-200 m length x 8-12 m width
Pit depth (optional)	1.5 m for booth recovery hopper
Foundation	Reinforced concrete with hopper pit
Roof access	Required for reciprocator maintenance

Options and Accessories

Quick Color Change

Antistatic PTFE-lined booth for 15-30 min color change.

Vertical Pretreatment

3 to 7-stage spray pretreatment with chrome-free option.

Two-Coat System

Primer + topcoat booths for premium curtain wall projects.

Automatic Loader

Robotic profile loading from rack to conveyor.

Film Thickness Measurement

Inline coating thickness sensor with closed-loop control.

Heat Recovery on Oven

Exhaust-to-makeup air heat exchanger, 40-50% energy reuse.

Control System

PLC

Siemens S7-1500 with redundant I/O for vertical conveyor safety

HMI

Multiple HMI stations along the line

Reciprocator Control

Synchronized vertical motion with conveyor speed

Recipe

Up to 200 recipes (color + profile cross-section)

Safety

Light curtains, e-stops along conveyor path, anti-fall hangers

Production Tracking

Profile bundle tracking by barcode or RFID

Installation Requirements

Building Requirements

9 m clear height, fire-rated structural steel

Power

3-phase 380/415V at 200-500 kVA

Compressed Air

Dry oil-free 0.6 MPa, 8-20 m³/min

Natural Gas

For oven: 0.05 MPa, 400-1000 Nm³/h

Water

For pretreatment: 2-10 m³/h soft water

Wastewater

Drainage to onsite treatment

Installation Time

6-10 weeks including FAT and commissioning

Service and Maintenance

Daily

Visual check of conveyor, recovery cyclone, oven entry/exit

Weekly

Booth cleaning, gun voltage check, reciprocator lubrication

Monthly

Cartridge filter pressure check, oven temperature mapping

Quarterly

Conveyor chain tension, motor bearing greasing

Annually

Major reciprocator overhaul, cartridge replacement

Warranty

12 months MUSI standard, extendable

Typical Applications

- Aluminum window and door profiles
- Fence panels and gates
- Curtain wall profiles (PVDF fluorocarbon)
- Architectural rebar and structural members
- Heat sinks and radiator profiles
- Solar panel mounting frames

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.