

PV-360 Photovoltaic Coating System

In-line Thermal Diffusion and Selective Emitter Laser Doping Process

The PV-360 is a high-volume coating system for crystalline solar cell manufacturing applications. The PV-360 processes up to 4,300 wafers per hour, leveraging USI's proprietary nozzle-less ultrasonic spray head technology to apply a thin, uniform layer of dopant. *Ultra-Spray®* technology provides a superior coating deposition compared to other technologies.

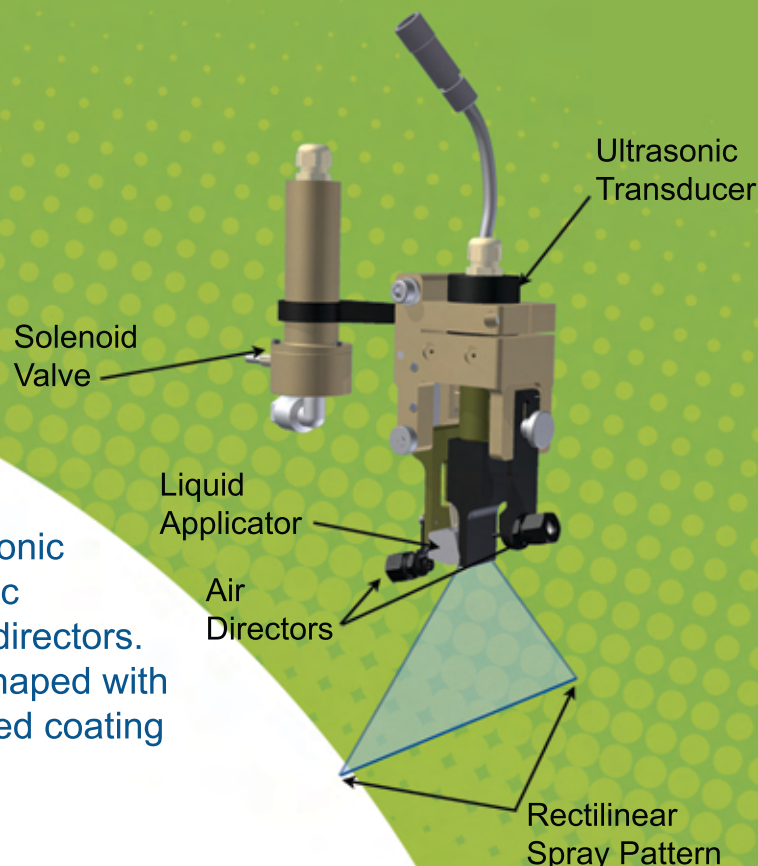
Features

- Proprietary ultrasonic spray technology
- Aqueous & solvent based dopants
- Non-contact coating deposition
- Up to 95% transfer efficiency
- Integrates with any diffusion furnace
- Water-based conveyor cleaning system
- Automatic spray head cleaning system
- Closed-loop metering pump liquid delivery
- 5 lanes for 156 mm wafers
- 6 lanes for 125 mm wafers



Nozzle-less Ultrasonic Spray Head Technology

USI's core technology consists of proprietary nozzle-less ultrasonic spray head technology for the thin, uniform application of a variety of low viscosity materials. The spray head consists of an ultrasonic transducer with a spray-forming tip, an ultrasonic generator, an external liquid applicator, and air directors. Spray is produced with ultrasonic energy and shaped with low pressure air for a more precise and controlled coating application.



PV360 Coating System Specifications

Coating Technology	Ultra-Spray Blade Head <ul style="list-style-type: none"> - Ultrasonic frequency - 45 kHz - Ultrasonic generator - Electronic controls for liquid flow - Electronic controls for air flow - Spray width up to 215 mm (8.5 inches) - Flow rate range 10 to 30 ml/min
Liquid Delivery	PMP-200 Precision Metering Pump <ul style="list-style-type: none"> - Dual 100 ml capacity metering pumps - Automatic pump refill for continuous operation - Servo motor drive
Conveyor	<ul style="list-style-type: none"> - Continuous mesh belt - Teflon coated Kevlar construction - Water-based cleaning system - IR drying system - Conveyor speed: up to 1.8 m/min (6 ft/min)
Process Width	914 mm (36 in)
Head Speed	<ul style="list-style-type: none"> - Spray stroke: up to 1,500 mm/sec (79 in/sec) - Return stroke: up to 1,500 mm/sec (79 in/sec)
Traversing Mechanism	<ul style="list-style-type: none"> - Servo motor/gear box - Synchronous belt drive actuator
Wafer Dryer	IR wafer drying system

Process	Spray Stroke <ul style="list-style-type: none"> - Head moves from home to conveyor width - Spray is activated Return Stroke <ul style="list-style-type: none"> - Head returns home - Spray is not activated Home Position <ul style="list-style-type: none"> - Head stays at home until conveyor travels distance equal to spray pattern width; up to 215 mm (78.5 in)
Control System	<ul style="list-style-type: none"> - Single Programmable Automation Controller (PAC) - Touch Panel Graphical User Interface (GUI) - Menus for process setup and recipe call up
Footprint	2,390 x 1,880 x 2,007 mm (94.1 x 74 x 79 in)
Weight	1,135 kg (2,500 lbs)
DI Water Supply	19 LPM (5 GPM) @0.7 bar (10 psi)
Power Requirements	<ul style="list-style-type: none"> - 480 VAC, 3-phase, 35 Amps (USA) - 380 VAC, 3-phase, 35 Amps (Europe/Asia)
Pneumatic Requirements	<ul style="list-style-type: none"> - Clean, dry compresses air at 5.5 bar (80 psi) @ 566 l/min (20 SCFM) - Compressed nitrogen at 5.5 bar (80 psi) @ 283 l/min (10 SCFM) - 8,500 l/min (300 SCFM) exhaust in a 167 mm (6.6 in) duct