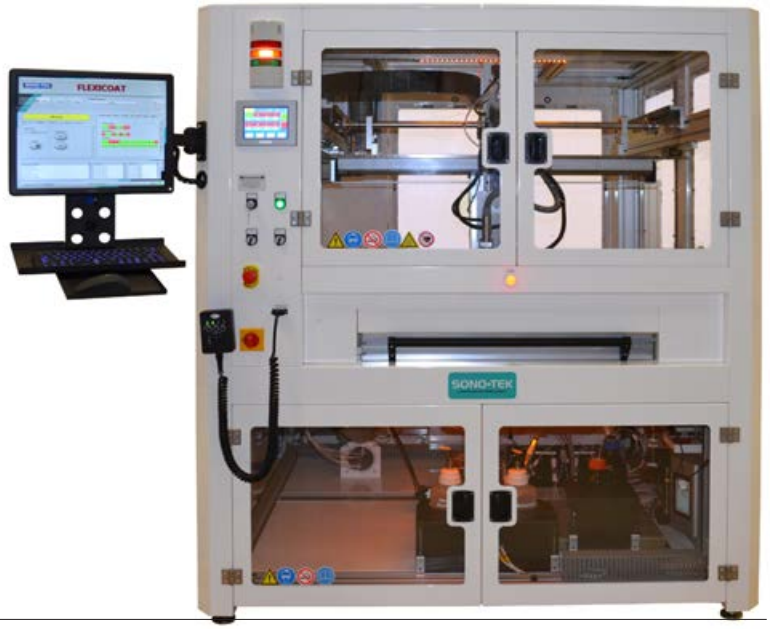
Ultrasonic Coating Systems

Options

Exacta•Coat

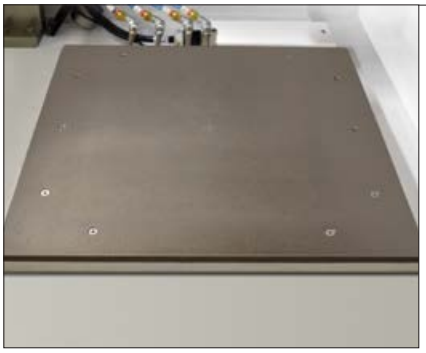


Flexi•Coat

www.sono-tek.com
ISO CERTIFIED

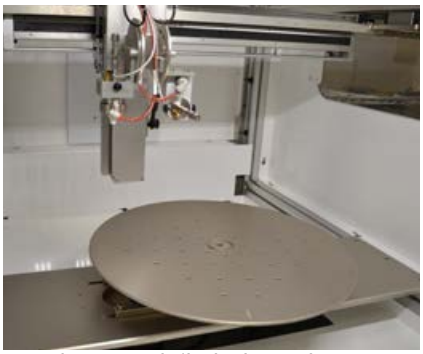
SONO•TEK Corporation

Vacuum Plate

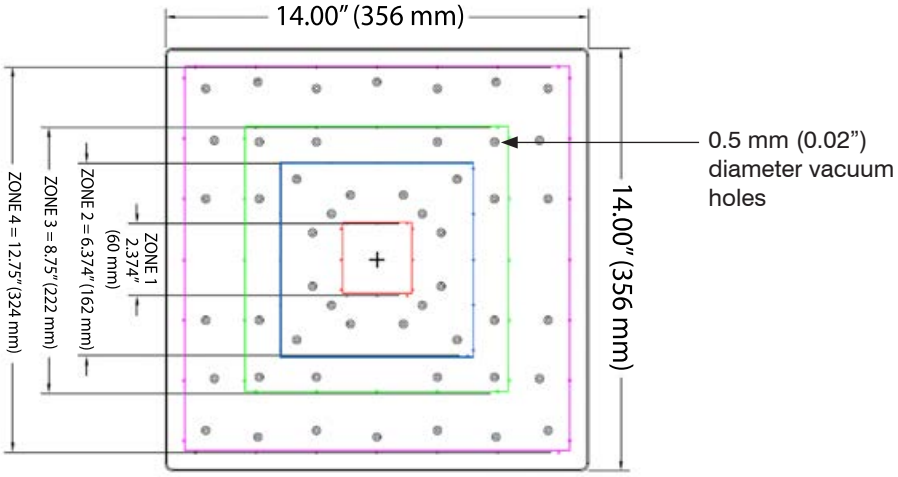


- Up to 4 zones - user controlled
- Only requires house air connection - increase air input pressure for stronger vacuum
- Aluminum construction (SS316 available)
- Max vacuum pressure - 84kPa (12 psi)
- Air consumption - 63 l/min (ANR), per zone
- Supply pressure range: 0.2 - 0.5 MPa

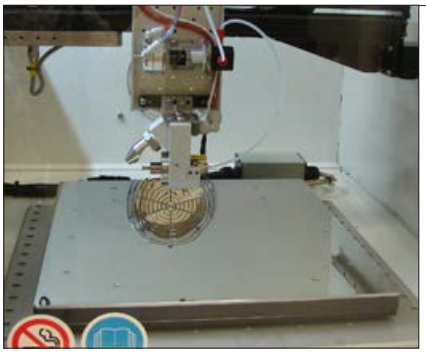
(4) Vacuum Generators - Integrated vacuum pressure gauges allow individual zone pressures to be set.



360 degree spin/indexing spin vacuum plate also available



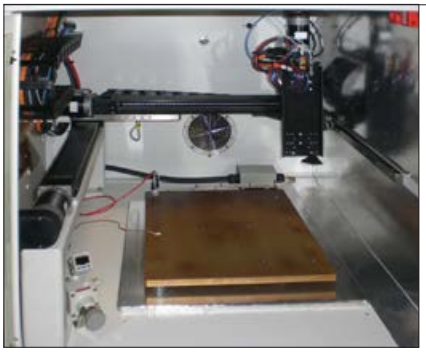
Heat Plate



- Precision temperature controller
- Dimensions: 14" x 14" (356mm x 356mm) or 19.7" x 19.7" (500mm x 500mm) - FlexiCoat
- Redundant safety overtemp thermal switch shutoff
- Max 150°C
- Controller alarm output does not allow AUTO cycle when heat plate is not at PV temp
- Contact heat
- Corrosion resistant SS316 construction with mirror finish (shown in picture) or anodized aluminum with tooling holes

Microprocessor-based, user programmable
1/16 DIN size form factor
Easily accessible for changes during process
Dual 4-digit LED displays
P.I.D. process control

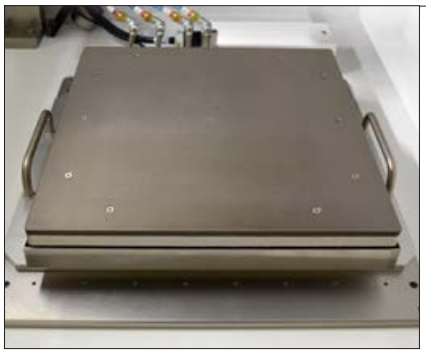
High Temp Heat Plate



- Precision temperature controller
- Dimensions: 14" x 14" (356mm x 356mm) or 19.7" x 19.7" (500mm x 500mm) - FlexiCoat
- Redundant safety overtemp thermal switch shutoff
- Max 250°C
- Controller alarm output does not allow AUTO cycle when heat plate is not at PV temp
- Contact heat
- Corrosion resistant SS316 construction

High temperature enclosure configuration protects components
Ventilation ports at top of spray chamber
Fan cooled electronics enclosure
Air cooling of servo motors
Reflective paneling directs heat away from electronics enclosure

Combination Heat/Vacuum Plate



Vacuum:

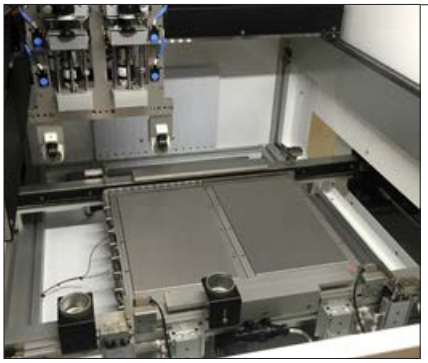
- 4 zones - user controlled
- Only requires house air connection - increase air input pressure for stronger vacuum
- Max vacuum pressure - 84kPa (12 psi)
- Uses 63 l/min (ANR) air per zone
- Supply pressure range: 0.2 - 0.5 MPa
- Aluminum construction (SS316 option)*

**Porous Aluminum option available, vacuum generator uincluded*

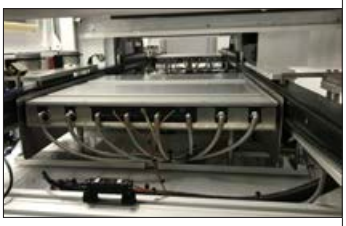
Heat:

- Precision temperature controller
- Dimensions: 14 x 14" (356 x 356mm) or 19.7 x 19.7" (500 x 500mm) - FlexiCoat
- Redundant safety overtemp thermal switch shutoff
- Max 150°C (hi temp option - max 250°C)
- Controller alarm does not allow AUTO cycle when heat plate is not at PV temp
- Contact heat
- Aluminum construction (SS316 option)*

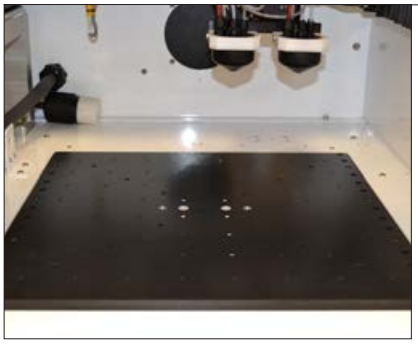
Automatic Heat Plate Lift



- Optional equipment for conveyorized FlexiCoat systems that require a contact heat plate during spray process.
- Conveyor brings part to spray position. Sensors detect part in place and raise heat plate when programmed temperature is reached.
- Programmed spray cycle is performed - heat plate is lowered upon completion.
- Coated part travels out of spray area via conveyor.

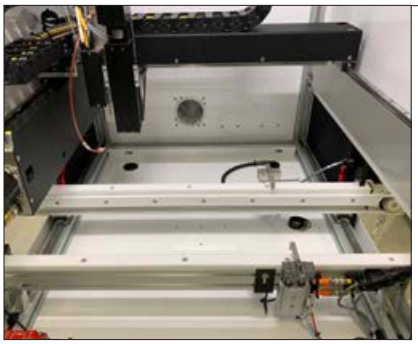


Teflon Coated Spray Surface

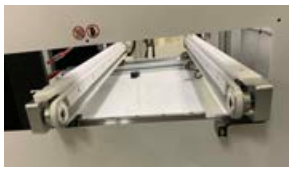


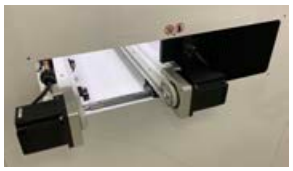
- Available on
  - » Heat
  - » Vacuum
  - » Heat/vacuum
- Rated for 250°C
- Easier cleaning of polymer and high adhesion coatings
- Chemical resistance for corrosive materials

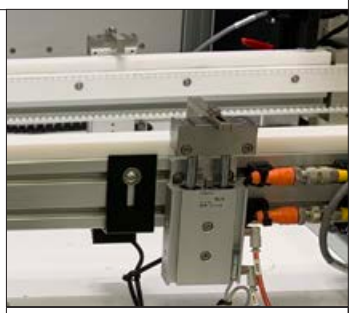
Conveyorized System (SMEMA)



- Left to right or right to left programmable
- Speed adjustable
- Manual or automatic conveyor width adjust
- Pneumatic board stops
- Available pallet locator pins
- Multiple part-in-place sensors
- SMEMA compatible
- Not available on ExactaCoat models

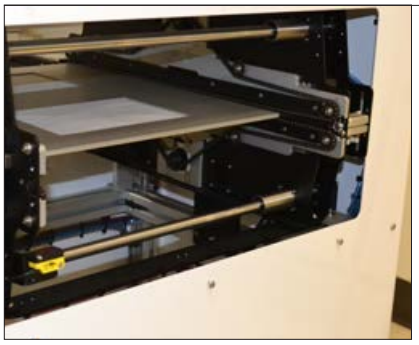






Board stops engaged

Automated Substrate Flip Station



- High throughput production volume
- Automated 2-sided coatings
- Can be configured for inline conveyorized applications
- Max substrate size 450x450mm (standard)
  - *Custom sizes quoted upon request*

LEL Sensor

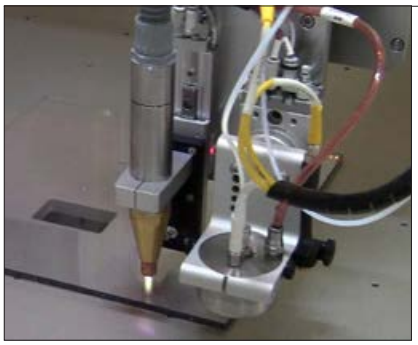
- Solvent detection safety option for monitoring dangerous vapor levels to prevent unsafe combustion conditions
- Alarm condition alerts unsafe levels
- Power is removed until safe operating parameters have been re-established
- Lower Explosion Limit (LEL) sensors can be located in multiple areas (i.e. spray chamber, exhaust ducting, liquid delivery chamber, etc.) for maximum detection capability

Low Oxygen/High Nitrogen Environment

Operating Principle:

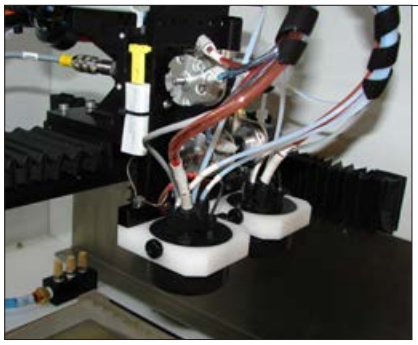
- When the Cycle Start button is pressed in Auto cycle mode the machine is flooded with inert gas from one regulator until a set point percentage of O_2 is reached and maintained for a period of time (approx. 10 seconds).
- Exhaust is baffled and a secondary purge regulator is used to maintain gas level.
- If the O_2 level goes above a set point for a given amount of time (parameters programmed by the end user), then the system will stop the process and display an alert message to the user.
- The inert gas is filtered and enters the chamber at the base of the machine on both sides of the tooling/heat plate.
- Both the high and low inert gas regulators are set by the user and can be adjusted for more or less gas usage.
- Typical gas consumption: *Initial purge - 250 LPM, Maintain - 20 LPM*

Plasma Pre-Treatment



- Enhanced wettability/coating receptiveness of substrates
- Atmospheric plasma head - no need for special gases or vacuum chamber
- Requires 5-6 bar (72-87 psi) clean, dry air
- Can be used with Nitrogen
- Plasma head cleans surface and increases surface energy for improved wettability
- Allows treatment of both conductive and non-conductive surfaces

Aggressive Materials Upgrade

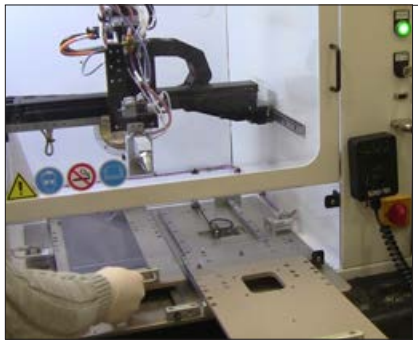


- Replacement of standard titanium nozzle with Cobalt series nozzle
- Protective bellows on gantry slides
- Teflon Impact/AccuMist air shaping (where applicable)
- Teflon coated tooling plate
- Protective motor covers

Slide Out Load Door

- Convenient pull out tray for large area systems
- Enables precise positioning and easy load/unload of large size substrates
- Process lock prevents door from moving during process

2-Drawer Production Volume Configuration

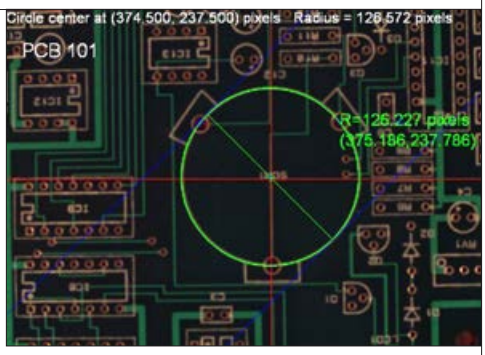


- User friendly low-to-mid volume production in a compact tabletop configuration
- Sensor driven drawer lock prevents plate movement during processing
- Fully integrated software control allows seamless loading/unloading of substrates
- Spray area is 13.8 x 7.9” (350 x 200mm) for each plate
- Load one drawer while the other drawer is being coated

Camera

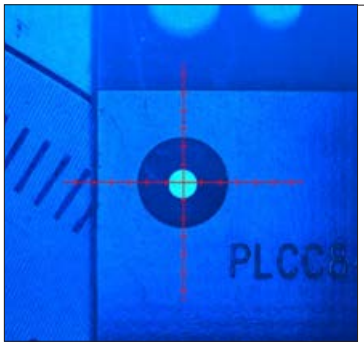
- Passive vision*
- Crosshair software package
- Adjustable focus
- Resolution: 752 x 480, 87 FPS
- Settings programmed via crosshair software
- USB connection
- Capabilities include:
  - » Measurement
  - » Image capture with text
  - » Video capture

**Active vision camera available upon request*

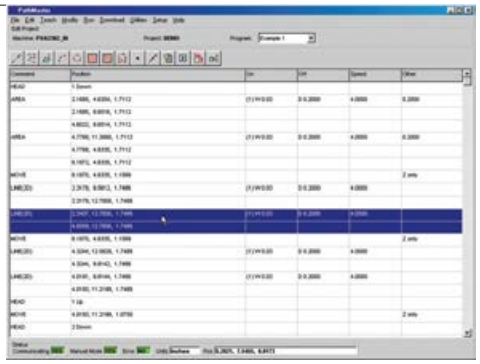


Software screen

Active Vision with XY Correct



- Fiducial function corrects translational X and Y substrate alignment errors
- Skew correction for increased process control
- Wet, dry and camera program playback mode
- Three-dimensional path previews



Substrate Holder*

- SS316 construction
- Mounts directly to standard tooling plate
- 3 standard opening sizes available for substrates*
  - » 5cm x 5cm
  - » 2cm x 2cm
  - » 20cm x 20cm

** Custom sizes available upon request*

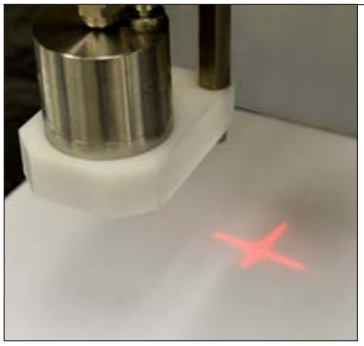
(Fuel cell membrane holder shown)

Light tower*

- Indicates ready state, machine in operation state and alarm state
- Unique shock and vibration isolation mechanism helps prolong bulb life
- Lenses are heat and shock resistant
- polycarbonate resin
- IP20 rated (dust resistant)
- CE compliant

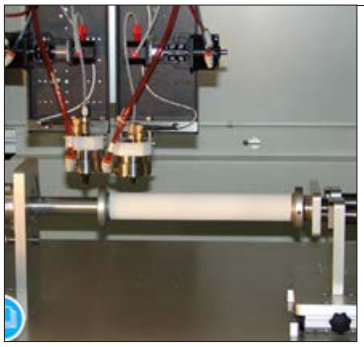
**Standard on conveyorized systems*

Laser Pointer

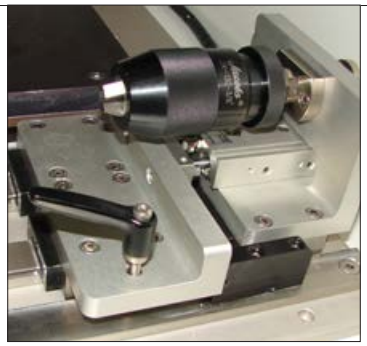


- Allows for simplified programming using PathMaster offset function
- Wavelength: 650 nm
- Class II laser
- Crosshair

Rotational Rod & Wire Coating Removable Fixtures



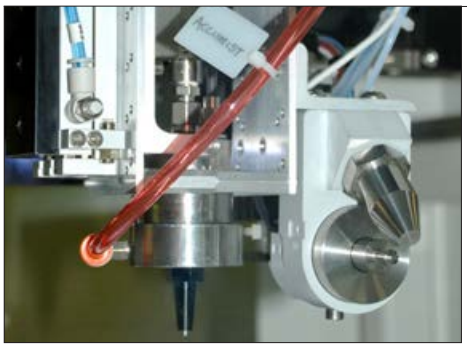
Hollow rod coating configuration



Wire coating configuration with quick release sliding width adjust

- Removable secure spring loaded attachment for hollow rods or wires up to 1m in length
- Coating area is customized to substrate size, up to max 1m x 400mm (39 x 15.7”) spray area
- Programmable X and Y axes motion and speed of rotation (manual Z adjust)
- Large spray chamber (FlexiCoat model) has multiple coating areas, with flexibility to coat flat substrates
- Dual nozzle configuration for layering of chemistries
- Single motor removable fixture available for small solid rods

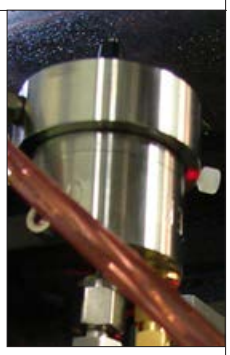
Nozzle Mounting Options



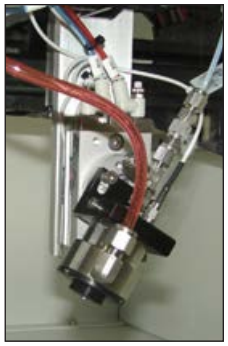
Dual nozzle configuration

- Dual nozzle configurations allow different spray patterns or reduced cycle time
- Allows layering of different liquids in the same coating cycle

- AccuMist or Impact nozzle systems can be configured in FlexiCoat models for spray up applications



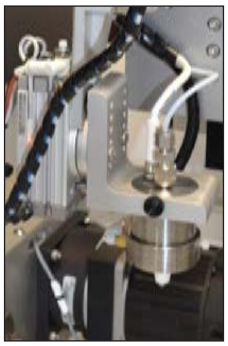
Spray up configuration



Nozzle two-position pneumatic tilt option

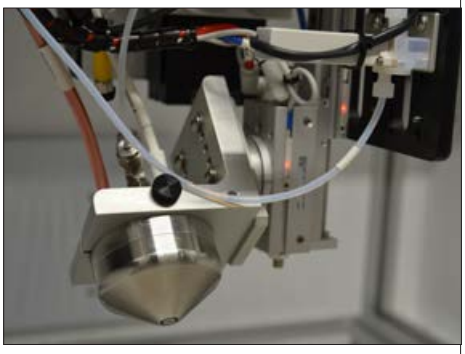
- Automated tilt with variable Z position angle adjust
- Two-position programming (vertical + one angle) per recipe
- 0 - 45° angle position adjust (either direction)
- Angled position is beneficial when coating substrate side walls

Nozzle two-position rotate option



Combined nozzle tilt and rotate option

- Compact tilt and/or rotate combination
- Two-position (0 - 45° angle) programmable rotate with 360° servo driven tilt

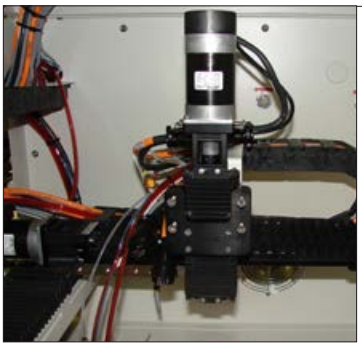


Nozzle 360° tilt - servo motor controlled

Accessories, Shelving & Side Mount Enclosures

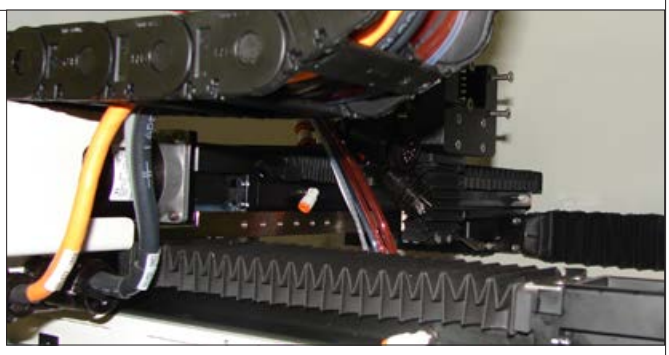
Hinged Enclosure

- Robust hinged cabinet swings open 90 degrees
- Convenient, easy access to spray chamber
- Accommodates multiple liquid delivery systems and/or nozzle generators
- Separate enclosure from the main spray chamber

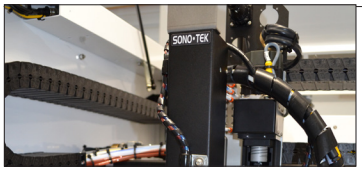


Protective Bellows

- Protects slides from corrosive liquids
- Does not interfere with axes motion

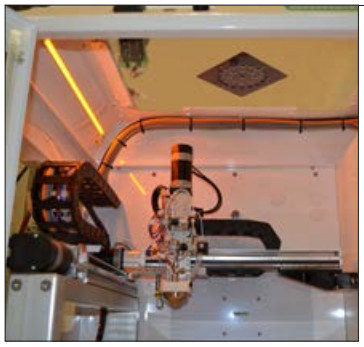


Cleanroom Upgrade



- Cleanroom rated grease on all slides
- Enclosed energy track for all cables and tubing
- Cleanroom packaging
- Cleanroom rated keyboard

Special Lighting



- Photosensitive yellow lighting for light sensitive applications

Barcode Reader

- Integrated barcode reader can be used for:
  - Data Collection
  - Program Selection
  - Operator Login
- Optional data output to Manufacturing Executon Systems (MES)

Flexible, customizable system options...

We are committed to providing coating systems tailored to customer's individual needs. Contact a sales representative for further information regarding these options, or if you have a specific requirement not listed here.

Option	FlexiCoat with Conveyor	FlexiCoat without Conveyor	ExactaCoat
Vacuum Plate **Spin plate not available w/conveyor*	√*	√	√
Heat Plate (150ºC Max.)	√	√	√
High Temp Heat (250ºC Max.)**		√	√
Combined Vacuum/Heat Plate	√	√	√
Porous Heat/Vacuum Plate	√	√	√
Automatic Heat Plate Lift	√		
Teflon Coated Spray Surface	√	√	√
Substrate Flip	√		
LEL Sensor		√	√
Low O_2/High N_2 Environment (>5 % Oxygen)		√	√
Plasma Pre-Treatment	√	√	√
Camera	√	√	√
Substrate Holder	√	√	√
Light Tower (Standard)	*Included*	*Included*	√
Laser Pointer	√	√	√
Aggressive Materials Upgrade	√	√	√
Slide Out Load Drawer		√	
2-Drawer Production Volume Configuration		√	√
Rotational Axis	√	√	√
Rod Coating Option		√	√
Spray Up Configuration	√		
Dual Nozzle Configuration	√	√	√
Nozzle Tilt	√	√	√
Nozzle Rotate	√	√	√
Protective Bellows	√	√	√
Cleanroom Upgrade	√	√	√
Photosensitive Yellow Lighting	√	√	√
Barcode Reader	√	√	√

√ = Option available

***Not available on machines with low O_2/High N_2 environment*

Note: Depending upon individual configurations, there may be limitations on the number of options that can be integrated together on a single machine.

Liquid Delivery Options

Syringe Pump TI

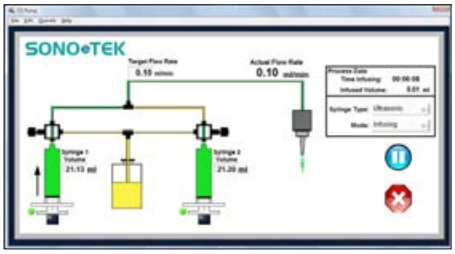
- Fully integrated with XYZ platform software for on-the-fly flow control (optional in FlexiCoat)
- Easy to use intuitive touch screen interface
- Wide flow rate range - 0.01 - 50 ml/min
- 1.8° precision stepper motor
- 25 ml syringe standard (100 ml syringe max)
- Single shot or continuous operation

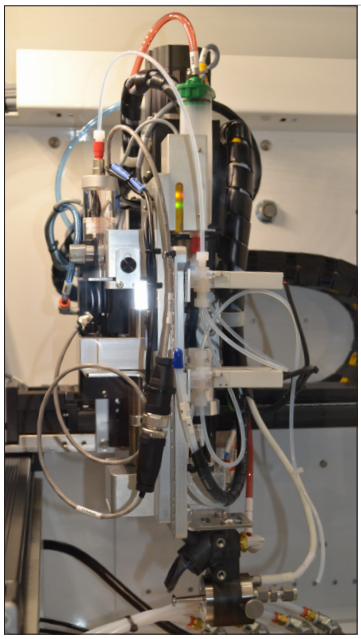
MicroFlow Pump

- Wide range of flow rates - 1 µl/min - 25 ml/min
- High accuracy dispense +/- 0.5%
- Continuous flow capability
- Ceramic (ZrO_2) pump rotor for superior chemical resistance and liquid compatibility

SonoFlow Fusion Continuous Syringe Pump

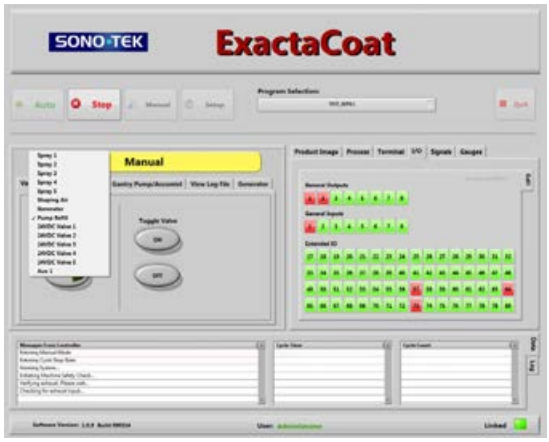
- Uninterrupted continuous flow dual syringe dispersion pump
- Available with SonicSyringes or magnetic stirring syringes for dispensing suspensions that agglomerate easily.
- (2) 25 ml glass syringes standard
- Capable of flow rates down to 0.5 ml/min
- All system functions controlled with Windows®-based software

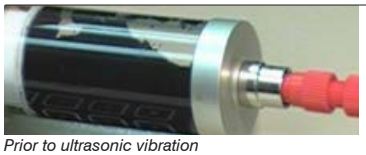




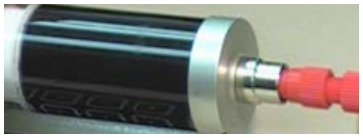
Gantry Mounted Syringe

- Servo controlled precision dispensing syringe automatically refills from a separate reservoir, when necessary
- Automated dispense routine and refill using PathMaster software
- Works in conjunction with SonicSyringe or magnetic stirring syringe where required





Prior to ultrasonic vibration



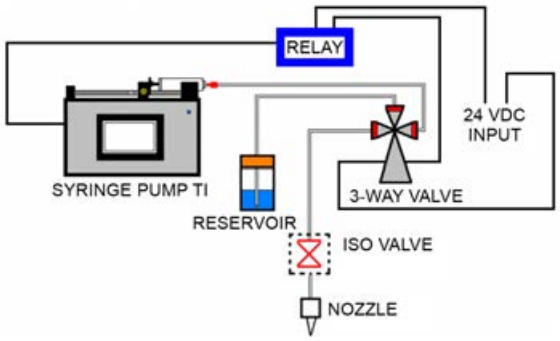
Particles uniformly mixed after ultrasonic vibration

SonicSyringe Ultrasonic Dispersion Syringe Pump

- Disperses and holds particles evenly suspended in solution for up to several hours
- Ideal for catalyst inks or slurries
- Control module delivers electrical impulses to generate ultrasonic vibrations inside of syringe body
- Duration and intensity of ultrasonic vibrations is user controlled
- 25 ml glass syringe standard
- Available as a gantry mounted configuration

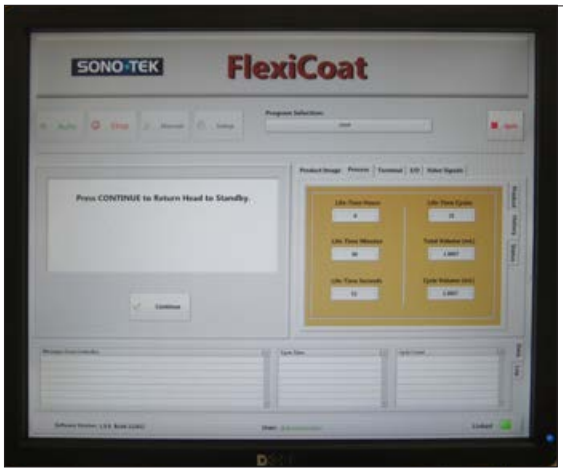
Magnetic Stirring Syringe Pump

- Effective mixing of catalysts or slurries
- 25 ml glass syringe standard
- Control module displays alarm conditions
- 2 stir pills provided
- Commonly used for liquids with higher solids concentration such as ceramic slurries such as SOFCs
- Can be configured with SonoFlow Fusion Continuous Dispersion Pump



Syringe Pump Auto Refill

- Designed for hands off and automated filling of syringe
- Syringe pump infuses and fills from separate reservoir
- Allows user to program syringe refill set points in the recipe



Flow Rate Monitoring

- Programming will output both the Volume Dispense in the spray cycle and the Total Volume Dispense*

**Total Volume Dispense can be reset to zero*

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