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We can provide client designed instruments on special order. For more details, please contact us

Spray Pyrolysis Equipment
Larger version
Model : HO-TH-04A

This is the latest model in Holmarc's line of Spray Pyrolysis Units. This model is the larger version of the standard model that provides expanded capacity and increased travel area for the spray head. This also provides a larger heating platform to spray coat substrates that are larger than standard application. This model uses a fresh new design that enables the user to carry out the spray coating process in a more convenient and efficient manner. This model can also be separated from the bottom shelf section for use as a table top unit. This unit also provides for Nitrogen purging of the enclosure.

Holmarc's Spray Pyrolysis system has been designed for research laboratories in thin films, especially for solar cell development. The system automates various fatigue and error creating processes involved in the technique when performed manually. Moreover, ergonomically designed chamber provides clean and healthy atmosphere suitable for modern lab conditions.

Parameters like dispensing rate of the solution and speed of spray head movement which are difficult to control manually are controlled precisely by PC based automation. A positive displacement pump controlled by stepper motor and microprocessor is used to dispense solution as per requirement. The spray head movement is also controlled by stepper motor driven linear stages in X and Y direction. The temperature of the substrate heater plate is controlled independently through a dedicated controller.

Factors affecting bonding & subsequent build up of the coating:

- Cleanliness
- Larger Surface area
- Surface topography or profile
- Temperature (thermal energy)
- Speed
- Time (reaction rates, cooling rates etc.)
- Physical & chemical properties
- Physical & chemical reactions

A desktop computer with windows OS is used to control the operations through serial port. Our dedicated software for spray pyrolysis system can as well be used for documenting the relevant parameters used for sample preparation like temperature, air pressure, duration, etc.

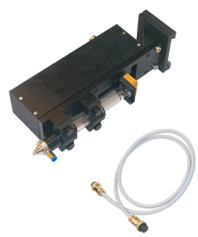
Spray pyrolysis is a process in which a thin film is deposited by spraying a solution on a heated surface, where the constituents react to form a chemical compound. The chemical reactants are selected such that the products other than the desired compound are volatile at the temperature of deposition. The process is particularly useful for the deposition of oxides and has long been a production method for applying a transparent electrical conductor of Tin oxide (SnO_2) or Stannic oxide to glass.

Specifications

Actuator	Stepper motor
Dispensing unit capacity	50ml & 250ml
Dispensing rate	1 - 10ml / min.
Sprayer	
Drive speed X axis (min-max)	10 - 800mm / sec
Drive speed Y axis (min-max)	1 - 12mm / sec
Sprayer traverse	X - Y 250mm max.
Substrate base plate	
Dimension	250 x 250mm
Max. temperature	500° C
Power input	230V, 50Hz
PC connectivity	Serial port (RS 232)

Optional Accessories :

Syringe Pump : Syringe pump is preferable to the glass dispenser for solutions which should be sprayed at lower flow rates (<1ml / min). It works with very low volume of solution as the syringe is directly connected to the spray nozzle, avoiding the use of lengthy tubes which should be filled first before the solution can reach the nozzle.



Ultrasonic Spray Head : The standard spray head which uses a compressed air atomization nozzle can be replaced with the ultrasonic spray head which uses an ultrasonic atomizer nozzle. It breaks the solution by vibrating its nozzle at an ultrasonic frequency (Typically 40 kHz), producing a fine spray of droplets of 50 micron average size.

Standard Accessories :

Glass Container : Glass container holds the solution to be sprayed during the coating process. Containers of two volumes (250ml & 50ml) are available as standard accessories.

Nylon Tube : This tube carries the solution from the glass dispenser to the spray head. Nylon is resistant to most of the chemicals which has applications in spray pyrolysis.

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