

# ULTRASONIC SPRAY SYSTEM

Uniform spray films by ultrasonically atomized liquids

## OVERVIEW

USS-40C ultrasonic spray system is capable of atomizing liquids with extremely fine droplets for applications which require high level of control. Liquid is injected into the ultrasonic gun with a pump syringe speed of typically 2 - 100 mm/min, atomized at the gun head, and conveyed to the substrate surface by a gas flow. This low speed of droplets towards the substrate is an important advantage of ultrasonic spray over conventional spray, in which there is high reflection loss of droplets. The spray gun is fabricated from corrosion-resistant stainless steel 316 providing long life and good acoustical properties. The gun is placed on an x-y stage in order to make uniform film deposition.

## FEATURES

- x-y scanning the spray gun for uniform deposition
- Variable ultrasonic power to optimize the droplet formation
- Control of liquid injection rate using syringe pump
- Low velocity, variable speed flow of droplets onto the surface
- LCD for easy control of process
- Closed deposition chamber ventilated using a fan
- Deposition of substrates as large as 25 cm x 25 cm



## SPECIFICATIONS

USS Technical Specifications	
Model	USS-40C
Frequency	42 KHz
Power output at nozzle	1-15 W
Spray nozzle diameter	0.5 mm
Mean particle diameter	5-50 $\mu\text{m}$ (depends on the frequency, surface tension and density of solution)
Ultrasonic actuator	PZT
Gun material	Stainless steel 316
Temperature range	0 – 40 °C
Syringe Pump Speed	2- 100 mm/min
Power Inlet	220 VAC, 80 W
Dimensions (W x H x D)	35 cm x 15 cm x 45 cm

## HOW IT WORKS

The main component of ultrasonic spray system is the ultrasonic gun which is acoustically designed for the highest vibration displacement at the nozzle. The liquid is pushed into the gun using a syringe pump. The liquid is atomized at the outlet nozzle, due to the intensely vibrating nozzle.

A variable air flow conveys the droplets onto the substrate and forms a uniform film. The main advantage of ultrasonic spray over conventional air pressure spray is the low speed of droplets which cause a very low reflection rate of droplets from the substrate surface. This considerably reduces the material loss in production units.

The whole system is controlled using an electronic system with an HMI display that provides graphical control. If needed, one can use a hot plate to heat the substrate during the deposition.

