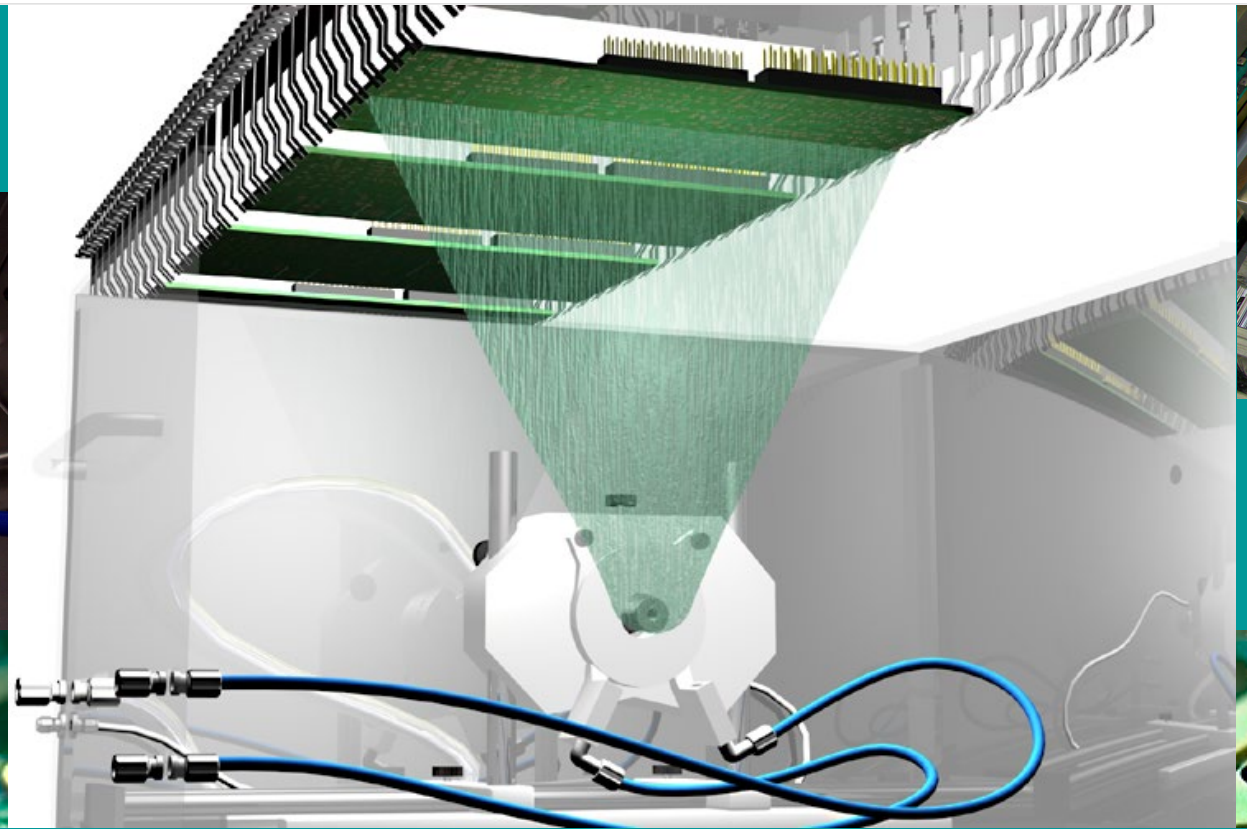
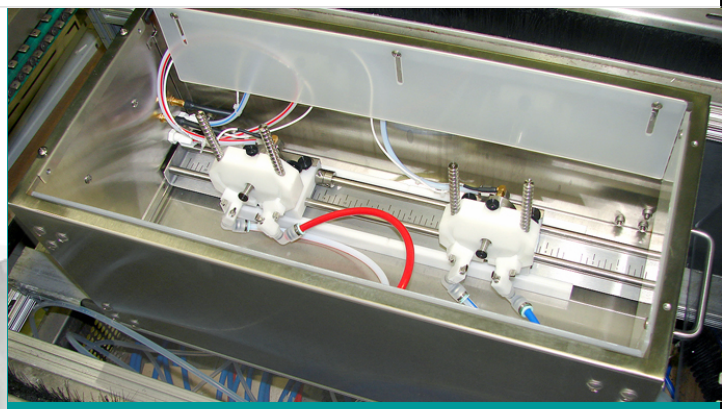
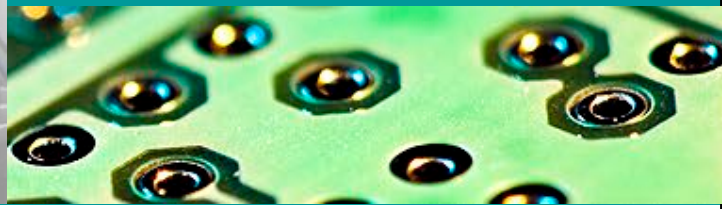
SONO•TEK

Stationary Ultrasonic Spray Fluxing System

SONOFLUX 2000F





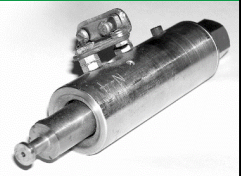


ISO CERTIFIED

SONO•TEK Corporation

SONOFLUX 2000F

Who We Are



Sono-Tek was founded in 1975 by **Dr. Harvey L. Berger, Ph.D.**
Inventor of the ultrasonic nozzle

All of our products are designed and manufactured at Sono-Tek's corporate headquarters in Milton, New York. This facility houses our factory as well as a full staff, including engineering, sales, accounting, manufacturing, quality control, technical support and shipping departments.

Sono-Tek became ISO certified in August 1998 and is presently ISO 9001:2018 certified. We are committed to the highest standards for manufacturing in our Milton, New York facility.

TÜV SÜD ISO 9001: 2015 CERTIFIED

Sono-Tek became a publicly traded company in 1987 and currently trades on the OTC Bulletin Board under the symbol **SOTK**.

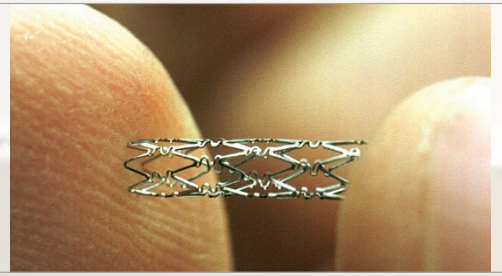
Sono-Tek has 60+ employees working in our corporate headquarters location, in addition to worldwide distributors and support personnel in dozens of countries.

SONOFLUX 2000F

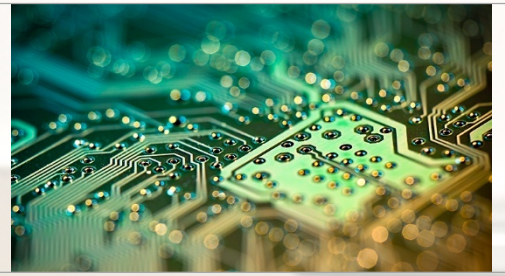
Industry Knowledge

Alternative Energy & Nanomaterials

Glass & Industrial



Medical Devices

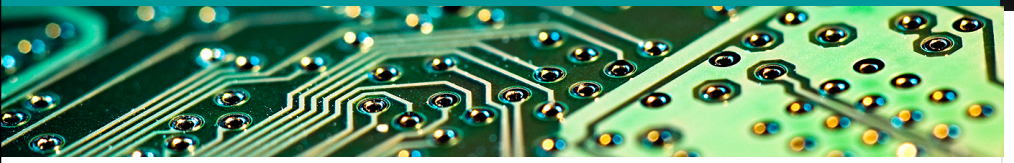


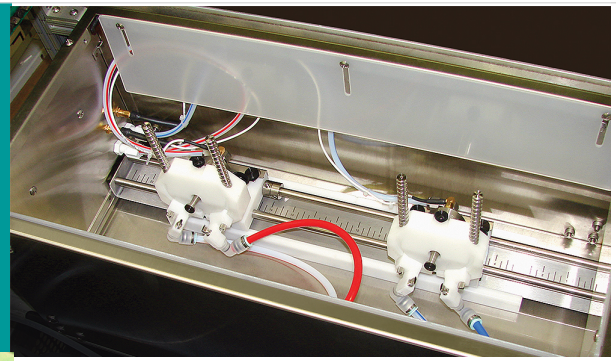
Printed Circuit Boards

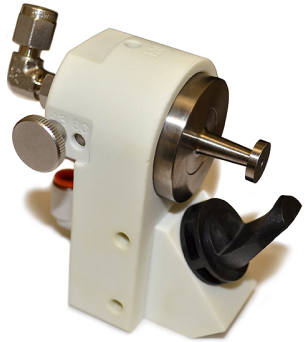
Semiconductor

COMPANY

Introduction to Spray Fluxing







SONOFLUX 2000F

Today, ultrasonic spray is the preferred method of flux application. SonoFlux spray fluxing systems are compatible with Rosin Flux (even up to 35% solids), no-clean, VOC-free, and water soluble with minimal maintenance.

Benefits

ENHANCED PROCESS AND CONTROL

- Superior top side fill
- Uniform and repeatable deposition
- Specific gravity remains constant (closed liquid delivery system)

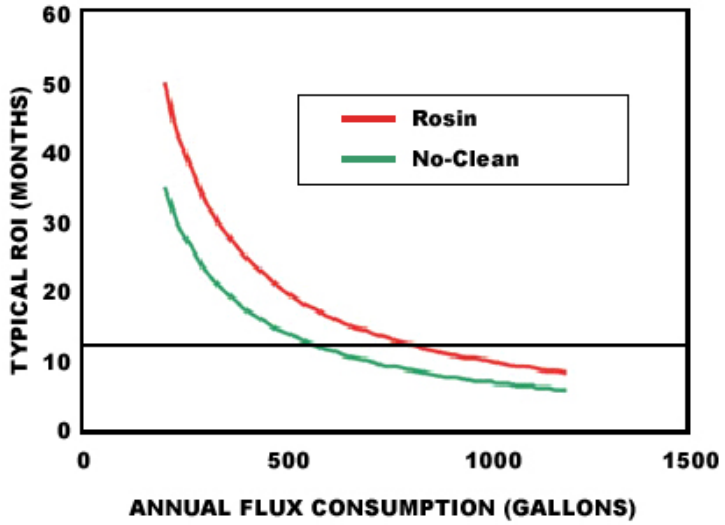
COST SAVINGS

- Reduced flux consumption
- Elimination of thinner
- Reduced maintenance
- Solder defect reduction

COMPATIBLE WITH ALL TYPES OF FLUX

Comparison of Spray Fluxing Methods

- Typical *ROI is less than one year* (for Retrofit Model 2000F)
- Works with *all fluxes* using the same ultrasonic nozzle
- *Pressure-free* ultrasonic atomization eliminates the need for nitrogen required in pressurized liquid delivery systems
- Large diameter ultrasonic nozzle orifice *eliminates any possibility of clogging*
- *No moving parts* translates into high reliability
- *Low maintenance*

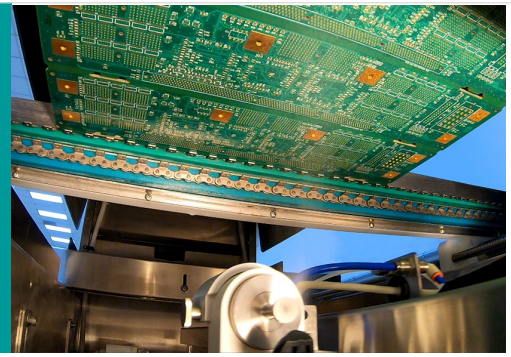


SONOFLUX 2000F

The versatile SonoFlux system offers many advantages over other spray fluxing equipment.

	Ultrasonic Nozzles		Pressure Nozzles	
	SONO-TEK Stationary	Reciprocating	Stationary	Reciprocating
Maintenance *even with rosin	**Monthly**	Daily	Daily	Daily
Mechanical Complexity	**Simple**	Complex	Simple	Complex
Reliability	**High**	Low	High	Moderate
Overspray	**Low**	Moderate	Moderate	High
Deposition Uniformity	**Good**	Fair (but with overlap)	Fair	Fair (but with overlap)
Clogging Susceptibility	**None**	Moderate	Low	High

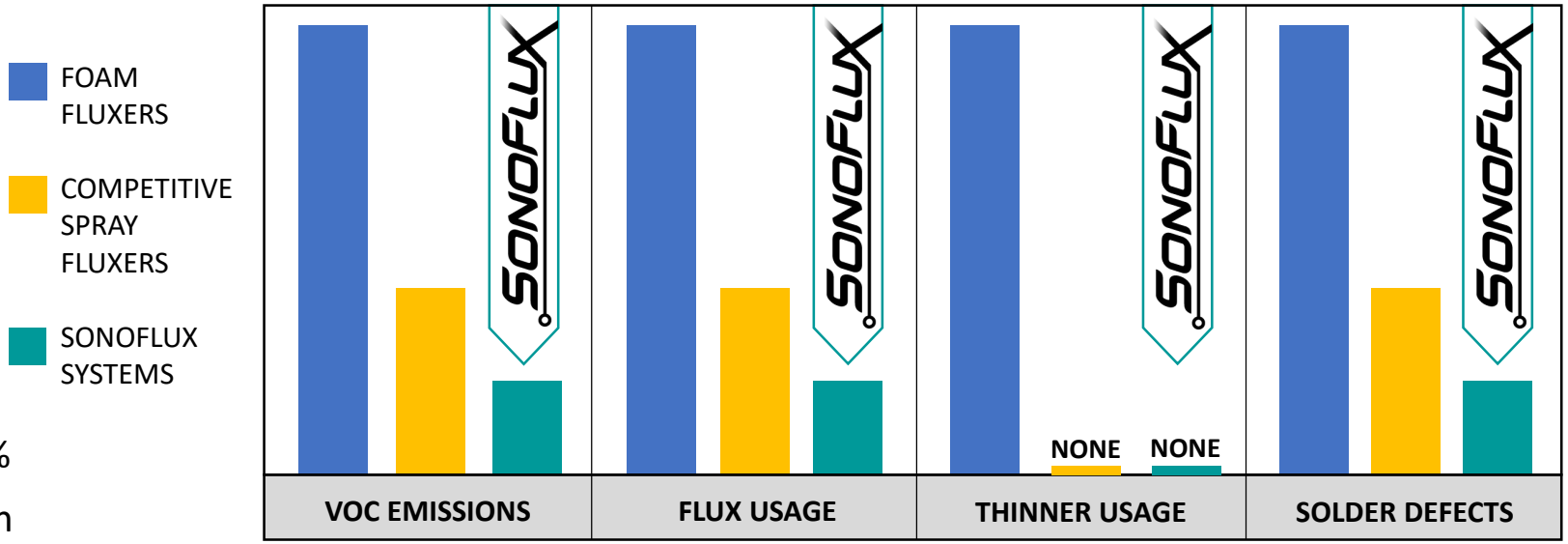
Benefits of Spray Fluxing



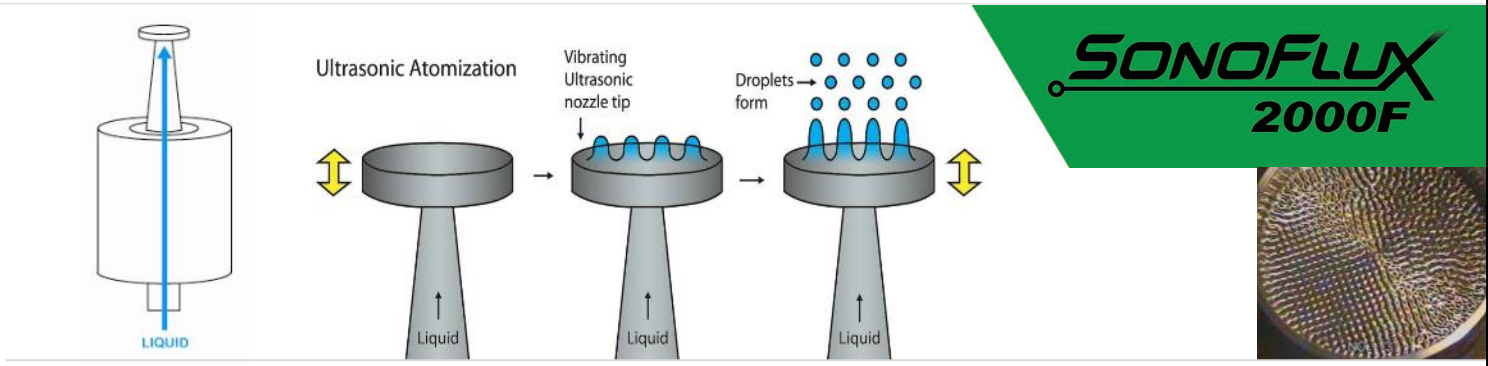
SONOFLUX 2000F

Factors contributing to a rapid payback include:

- Reduction in flux usage by up to 80% compared to foam fluxing, 50% reduction when compared to competitive spray fluxers
- Reduction in VOC Emissions by up to 80% compared to foam fluxing, 50% reduction when compared to competitive spray fluxers
- Reduction in solder defects by up to 80%
- Total elimination of thinner consumption and elimination of specific gravity checks

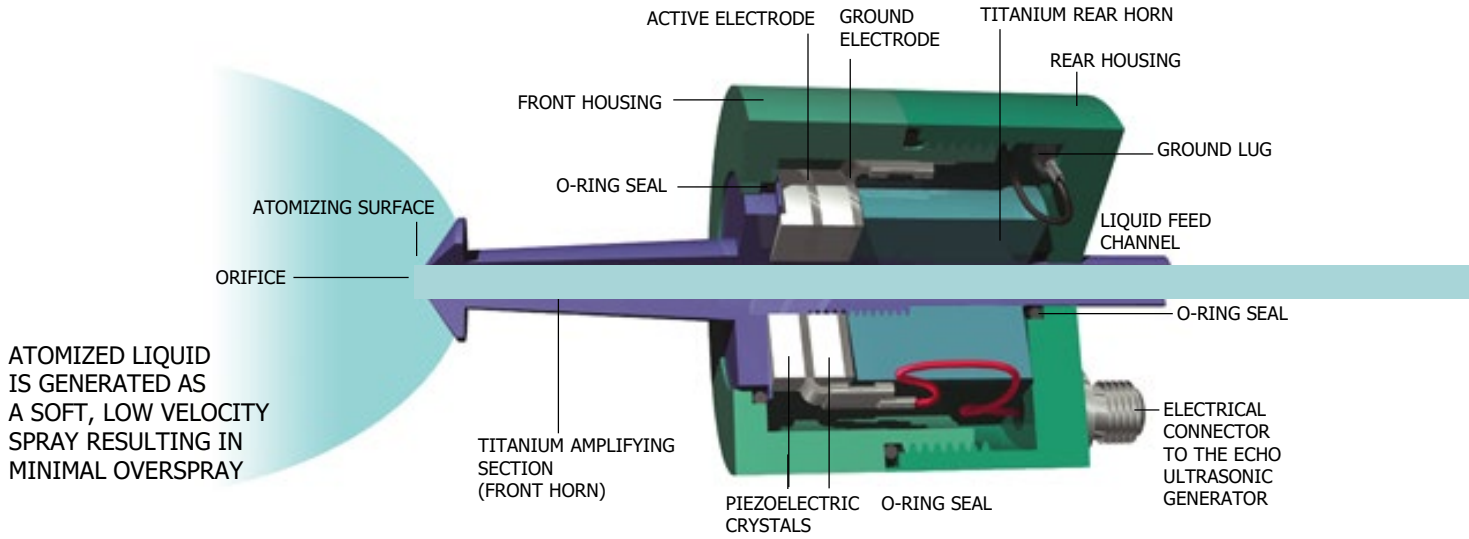


How Ultrasonic Nozzles Work



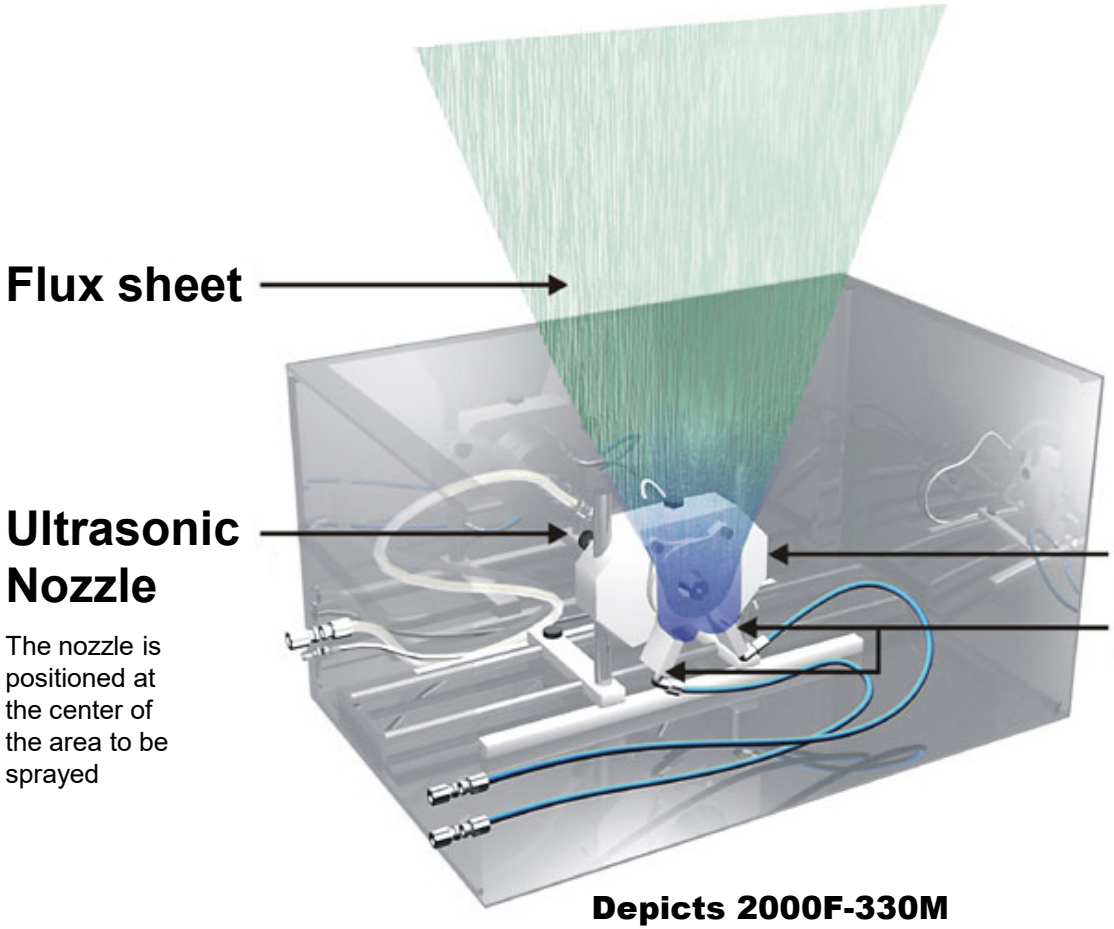
Ultrasonic Spray	Pressure Spray
• Liquid flows through a relatively large orifice using no pressure, and is atomized at the nozzle tip using ultrasonic vibrations. Spray variables are easy to control.	• Liquid is forced through a very small orifice using high pressure to shear the liquid. Spray variables cannot be controlled independently (flow rate, deposition).
• Drop distribution is dictated by the frequency of the nozzle with very tight drop distribution.	• Wide range of unpredictable drop sizes. Difficult to predict and control drop size.
• Very little bounceback (droplets bouncing off PCB) or overspray due to the soft “mist” ultrasonic spray	• Large amount of overspray and satellite drops due to high velocity spray, as well as a large amount of bounceback.

Cross section of Sono-Tek ultrasonic nozzle



SONOFLUX 2000F

Spray Assembly



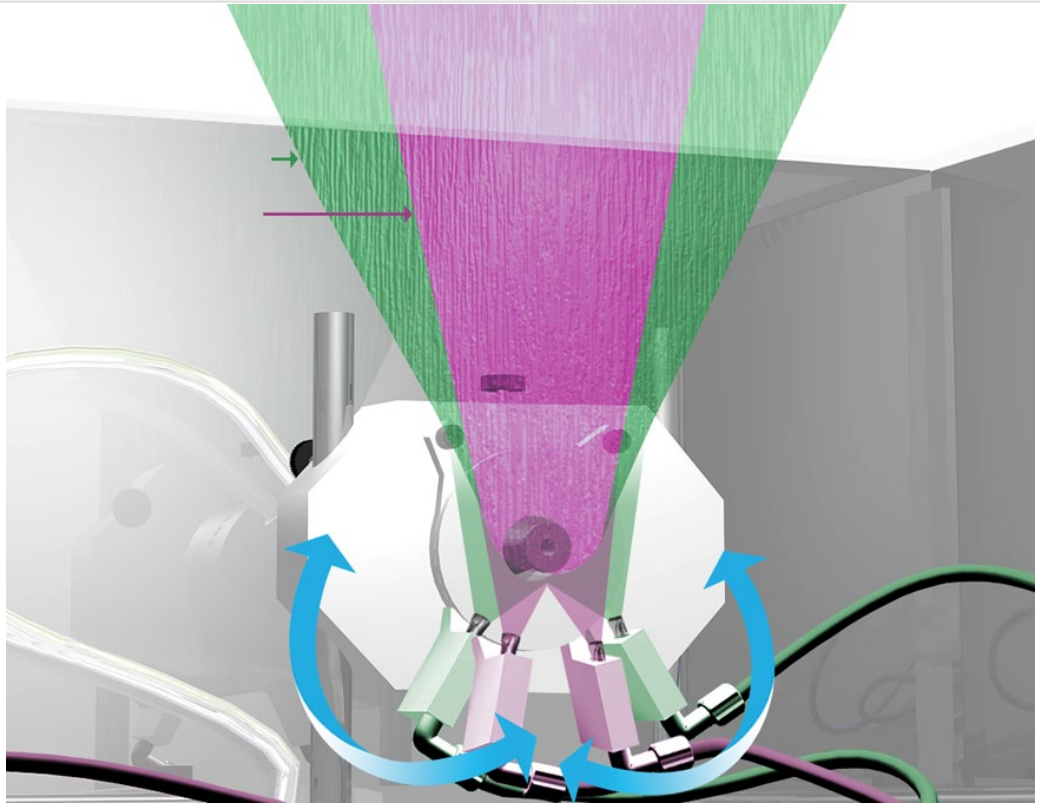
The nozzle is positioned at the center of the area to be sprayed

Depicts 2000F-330M

System Components

SONOFLUX 2000F

2-13” (50-330mm) or
2-24” (50-610mm)
PCB Width Adjustment



Your fluxer is great. It has exceeded all expectations.

Bose *– New England*

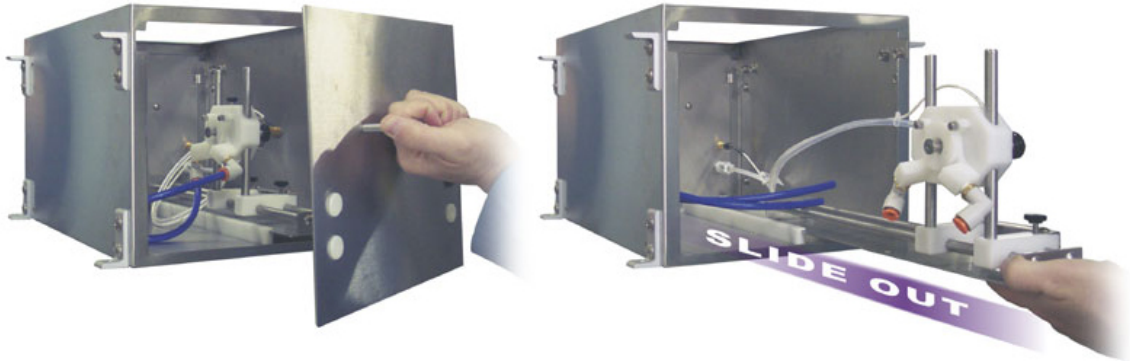
System Components

SONOFLUX 2000F

Spray assembly attributes include:

- High velocity flux transfer system for maximum topside fillets
- High efficiency flux transfer to the bottom of the PCB
- Compact design (fits inside all major wave solder machines)
- Low maintenance
- Sharp edge definition
- Flux vapor containment chamber

Depicts 2000F-330M



- ✓ ***Recommended monthly cleaning of spray assembly (with rosin flux)***
- ✓ ***Simple slide out design allows for easy access to core components***

System Components

SONOFLUX 2000F

The display and control module is designed for ease of operation. It incorporates a backlit 4 x 40 character LCD display and dedicated 18-function keypad. System functions are easily changed on screen. These include:

- Power to ultrasonic nozzle
- Flux flow rate
- Conveyor speed
- Spray Force
- Deposition Density Control

The display and control module includes facilities for setup, calibration, and storing up to 1,500 process recipes (programmable systems only.) It also displays a range of system alarms. Alarms include:

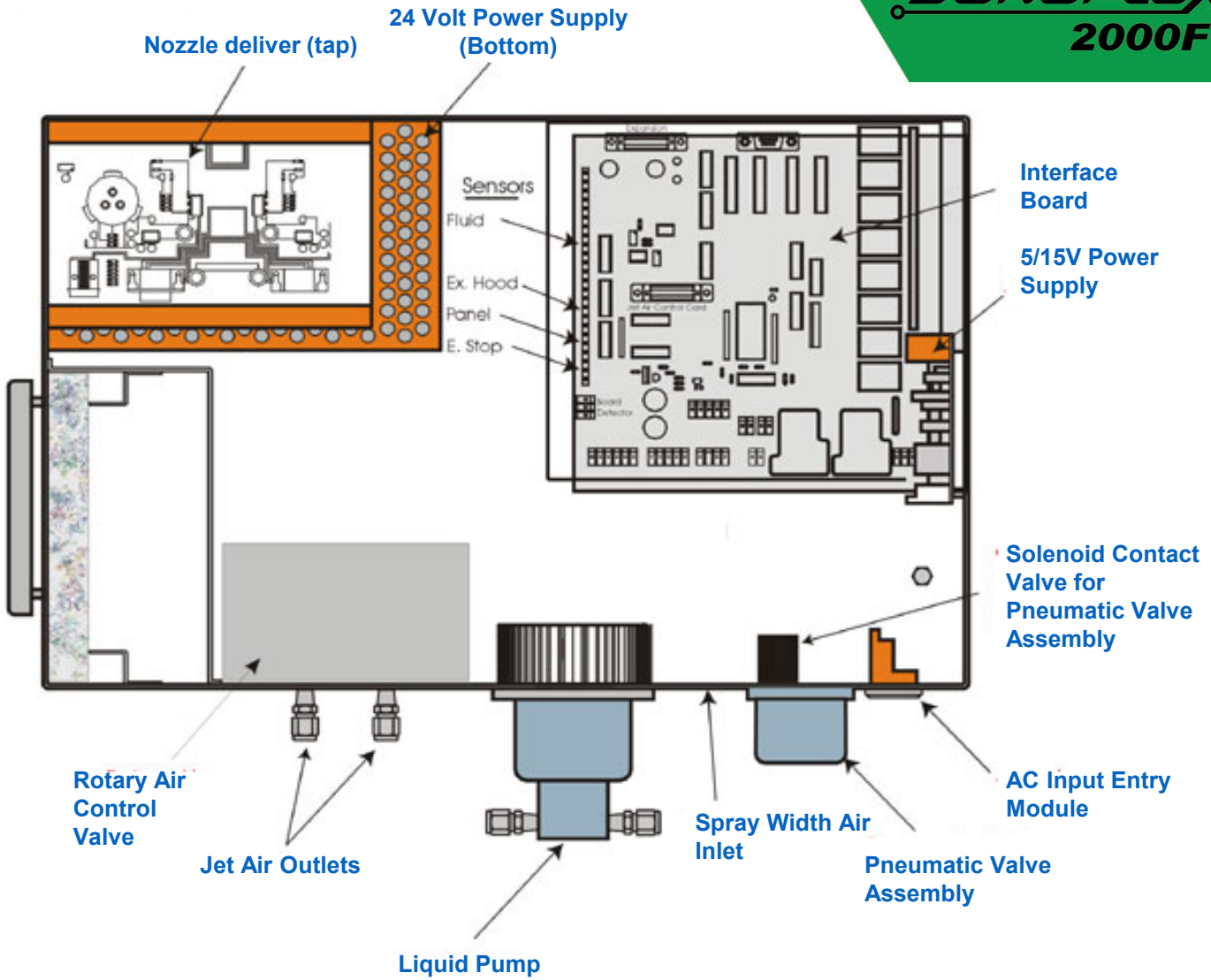
- ✓ Emergency off
- ✓ Exhaust failure
- ✓ Low flux level warning
- ✓ Spray force air supply failure
- ✓ Pump failure
- ✓ Nozzle malfunction
- ✓ Fire alarm (for optional fire detection equipment)

SONOFLUX 2000F

Electronics Module

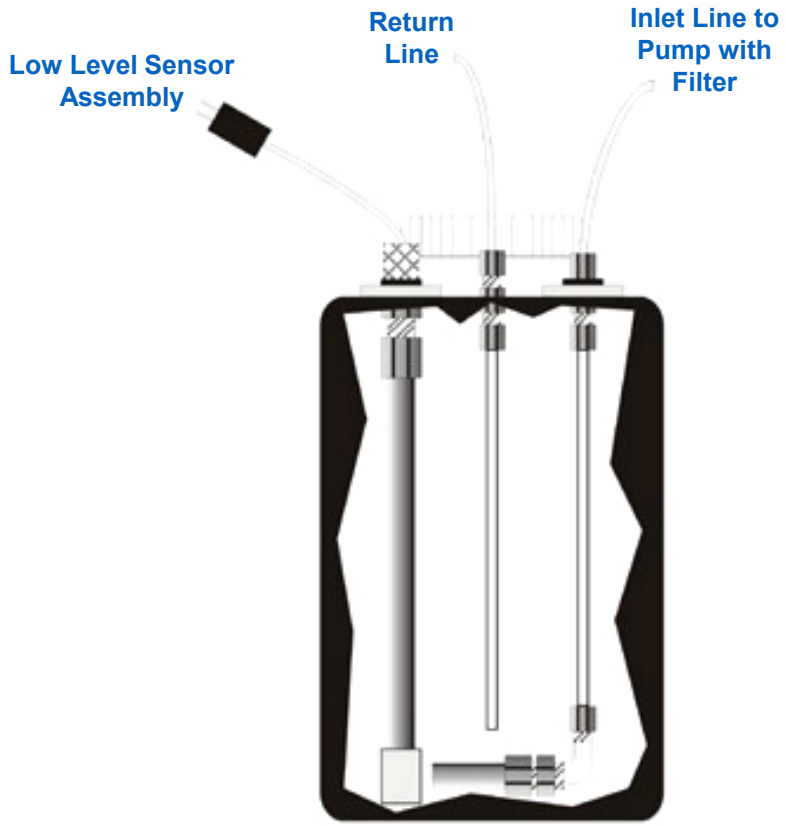
The electronics cabinet contains all the components and circuitry required to drive the spray fluxer – all major components are modular in design.

- Ultrasonic nozzle power supply
- DC power supplies
- Liquid delivery system
- Spray force controller
- Interface electronics
- Pulsed jet drive assembly



Polypropylene Flux Reservoir

SONOFLUX 2000F



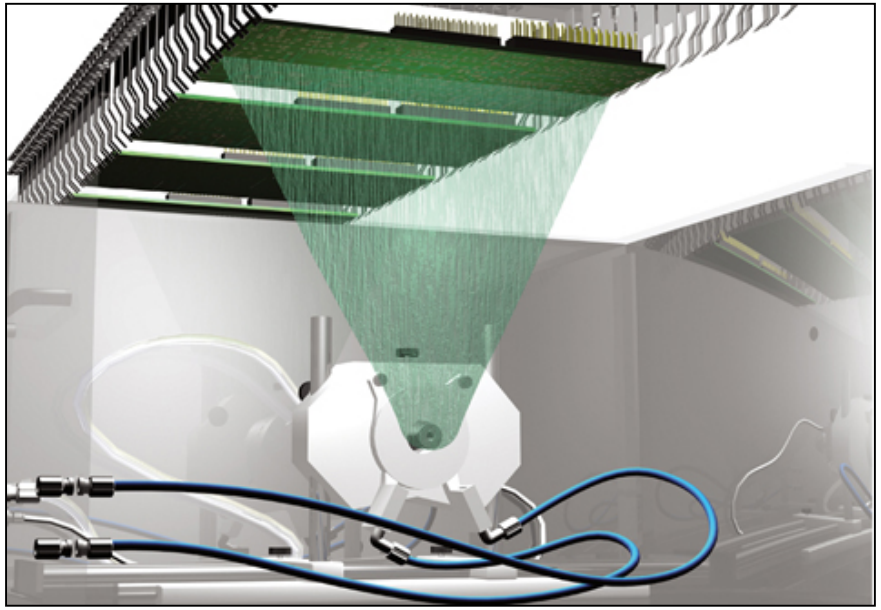
The 5 gallon (19 liter) flux reservoir has been engineered to provide maximum protection for the liquid delivery system and for easy use and service.

- The polypropylene filter assembly on the input line to the gear pump prevents any debris from entering and assures that the flux applied is free from contamination.
- The low level sensor assembly signals the control system when flux in the reservoir drops to an unacceptable low level. This condition results in an audible warning and prompts a message on the display and control module panel.
- A nitrogen atmosphere is not required for alcohol-based fluxes since the system is unpressurized.
- The 4-inch (101mm) diameter vented screw cap permits refilling the tank while the system is on-line, thereby *avoiding the downtime* that accompanies refilling a pressurized flux reservoir.

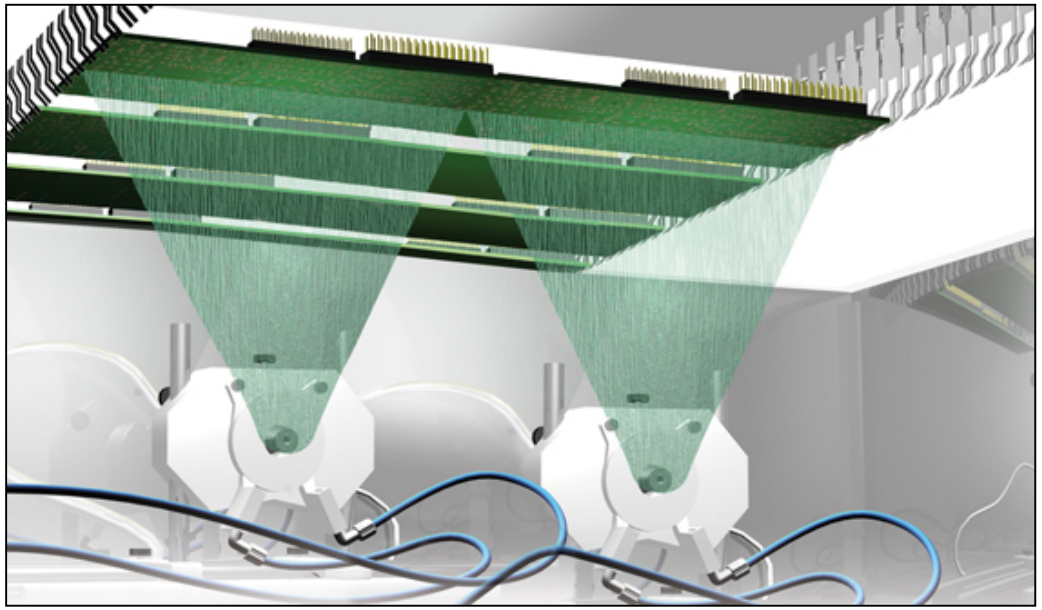
SONOFLUX 2000F

Dual Head Option

SonoFlux 2000F systems can be configured with 1 or 2 ultrasonic nozzles*



SonoFlux 2000F-330M for 2-13” width boards



SonoFlux 2000F-610M for 2 – 24” width boards

Configurations, Enhancements & Options

Accessories and other option are available include conveyors for standalones, fire detection systems, emergency stop hardware and circuitry, exhaust failure sensors, light towers, Windows-based PC control, and a calibration kit containing complete instrumentation for periodic calibration of the system.

SONOFLUX 2000F

SonoFlux 2000F systems are produced in two basic forms:

- ✓ *For installation inside a wave soldering machine (internal)*
- ✓ *As stand-alone systems positioned at the input to a wave soldering machine*

The following options are also available:

- ✓ *316 stainless steel or titanium alloy spray assembly construction*
- ✓ *Self-cleaning jet*

Standard Features:

- High velocity flux transfer for optimum top-side fill
- PLC-based functionality to control flux flow rate, nozzle power, and conveyor speed
- Complete monitoring of system functions—audible and visual alarms
- Stainless steel flux chamber
- Stainless steel exhaust hood
- 110/120 and 220/240 VAC, 50/60 Hz input power
- Compact design
- Low maintenance (recommended monthly)
- User-friendly control panel
- Fully modularized electronics cabinet
- Unpressurized polypropylene flux reservoir
- Retrofits into all wave solder machines

Standalone System Installation

SONOFLUX 2000F

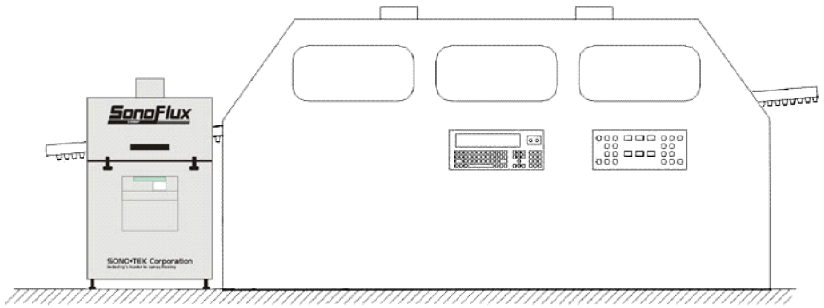
SonoFlux stand-alone systems are available with or without an *integrated tab-and-chain conveyor.* If used without the integrated conveyor, the system requires a wave soldering machine conveyor with *extended rails* that fits through the frame.

- Engineered for installation in-line with the inlet to the wave soldering machine
- Includes a dedicated exhaust hood for the removal of flux vapor
- Spray assembly is slide-mounted for easy accessibility and removal
- Hinged top provides easy access to the interior and the exhaust hood

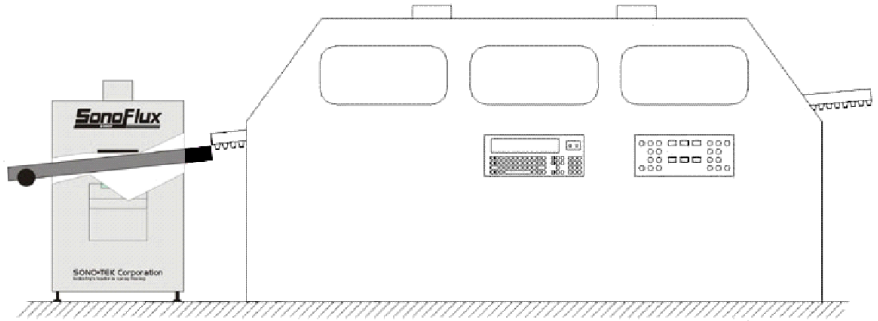
SONOFLUX 2000F

Installation Options

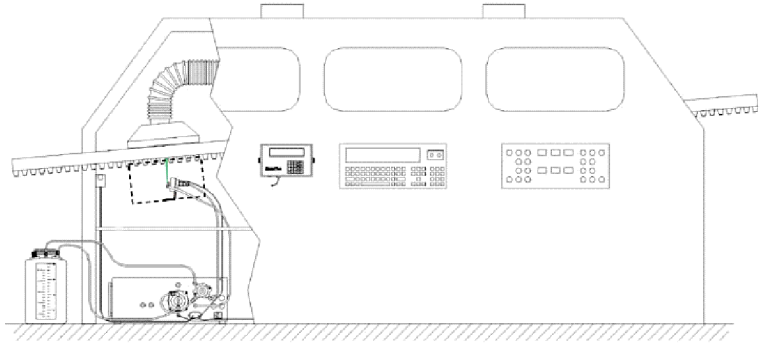
Shown is one method for installing a stand alone SonoFlux 2000F system. Extended rails on the wave soldering machine conveyor (available from the manufacturer) pass through the SonoFlux system enclosure.)



Shown is another method for installing a stand alone SonoFlux 2000F system. The optional tab-and-chain conveyor supplied by Sono-Tek is mated to the rails of the wave soldering machine conveyor to provide a smooth transition from one conveyor to the other.



The SonoFlux 2000F retrofit system installs conveniently in the space formerly occupied by a foam, wave or other spray fluxing system.

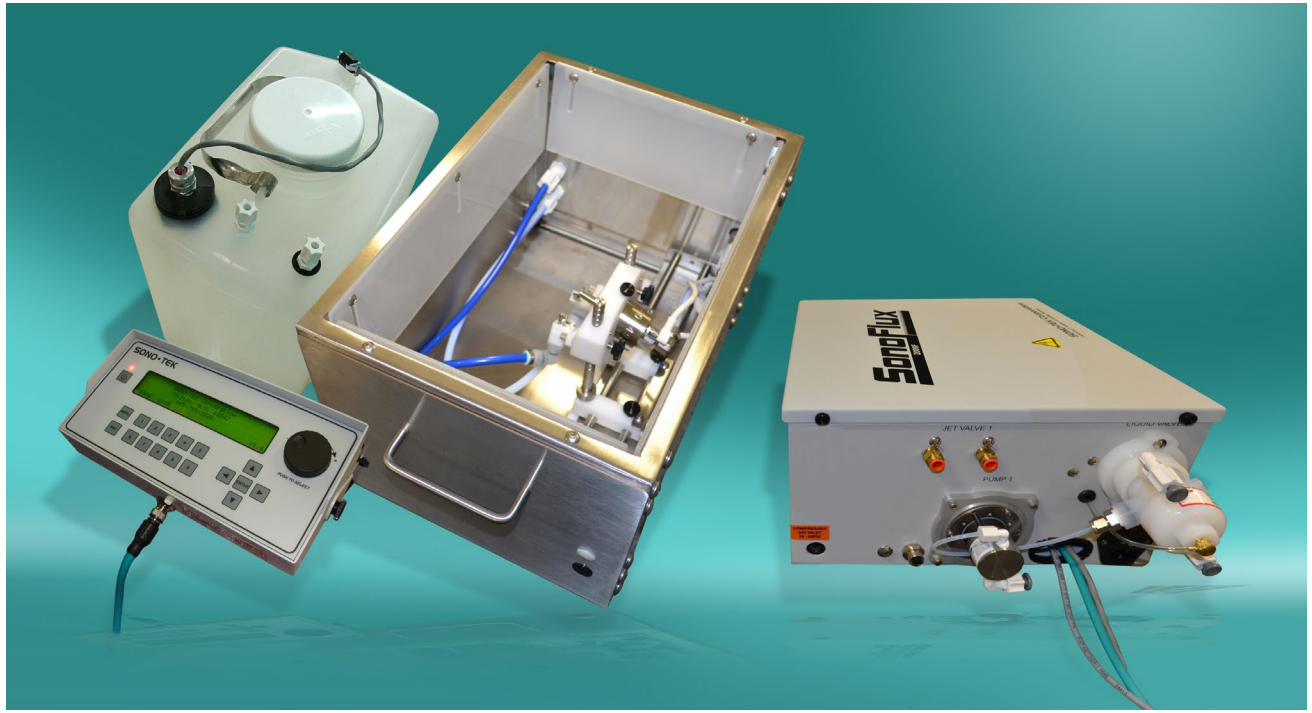


SONOFLUX 2000F

Basic System Components

Every 2000F Internal system consists of the following components:

- Spray assembly and chamber
- Ultrasonic nozzle
- Control module with PLC, backlit LCD display, and keypad
- Electronics module
  - Ultrasonic nozzle power supply
  - DC power supplies
  - Liquid delivery system
  - Spray force controller
  - Interface electronics
- Flux reservoir
- Exhaust hood
- Internal installation kit for all major solder machines



Depicts 2000F-330M

Retrofit System Installation

SONOFLUX 2000F

Retrofit Kits Available For All Leading Wave Soldering Equipment

MANUFACTURER	EQUIPMENT			
Asahi	MW 3000			
Dee Electric				
Electrovert	Vectra	Electra	UltraPak 650C	UltraPak 328
	Ultrapak 337	UltraPak 337-24F	UltraPak 445	UltraPak 229
	Ultrapak 600	UltraPak 600C	UltraPak 640	EconoPak Plus
	EconoPak I LV	EconoPak I SMT	EconoPak II	EconoPak II SMT
	EconoPak II 15F SMT	EconoPak II 16F	EconoPak II 16F N2	EconoPak 400F
	AstraPak 400	Atmos 2000	Century 2000	MiniPak 300
	Ultra 2000			
Ersa	EMS series	ETS series		
Hollis	Astra	Future 1	GMB II	GBS Mark II
	GBS Mark III			
Huang Dyi				
Lemme	IM315	Aries 300	Titan 400	
Koki	330VN	UCT 353		
Komatsu				
Novastar				
Pastec				
Pillarhouse				
Seho	Inert			
Sensbey	Gemini	HQC/X21000	LD-400FG	LE-300EM
	300 EB	300 EV	300 NM	300 FM
SKS				
Specnor Technic	Fusion 1600-N	Fusion 1800		
Streckfuss				
Tamura	CF	HC-25	HC-30UD	
Technical Devices	Nu/Era 16	Nu/Era 18	Nu/Era 24	TD junior
Treiber	700B	700CCS	7300	
Unit Design				
Vitronics Soltec (Dover)	Delta	Prisma	Galaxy 1	Soltec 6521
	Soltec 6522	Maxi	SWS-400-2	
Yokota	S450	YSM 90C		

Documented Results from the field

The data presented below represents analyses performed by three different customers who have installed SonoFlux systems to replace foam fluxing equipment. In each case, the data represent the results from a single wave soldering line.

SONOFLUX 2000F

Customer A Contract manufacturer with four (4) lines; 1200 boards/day per line

Customer B Security system manufacturer with one (1) line; 300 boards/day

Customer C Control device manufacturer with three (3) lines; 1500 boards day per line

	Customer A				Customer B				Customer C			
	Foam		SonoFlux		Foam		SonoFlux		Foam		SonoFlux	
	Liter/Yr	$/Yr	Liter/Yr	$/Yr	Liter/Yr	$/Yr	Liter/Yr	$/Yr	Liter/Yr	$/Yr	Liter/Yr	$/yr
Flux Consumption	3463	12,800	832	3,080	794	5,460	208	1,090	2755	12,280	613	2,720
Thinner Consumption	1037	1,920	0	0	454	2,400	0	0	2203	4,980	0	0
Disposal Cost		1,830	0	0		1,080	0	0		5,040	0	0
TOTAL OPERATING COST		16,560		3,080		8,940		1,090		22,300		2,720
Cost Savings over Foaming	81%				88%				88%			
Reduction in Defects	0%				85%				42%			

Summary of Benefits

- ✓ *We invented ultrasonic coating technology.*
- ✓ *Over 40 years expertise in the development and application of ultrasonic spray technology.*
- ✓ *Numerous patents and intellectual property.*
- ✓ *Provide customized coating solutions.*
- ✓ *Worldwide distribution and support network.*

SONOFLUX 2000F

The SonoFlux 2000F system offers many advantages over other spray fluxing equipment

- Typical ***ROI is less than one year***
- Low maintenance (monthly)
- Works with all fluxes using the same spray head(s)
- Pressure-free ultrasonic atomization eliminates the need for nitrogen required in pressurized liquid delivery systems
- Large diameter ultrasonic nozzle orifice eliminates any possibility of clogging
- No moving parts translates into high reliability
- Flexible configurations for every manufacturing need

SONOFLUX 2000F

Calibration Kit

The Calibration Kit is designed to enable users of SonoFlux spray fluxing equipment to comply with ISO 9000 and other quality assurance and management standards.

The kit contains all the tools and procedures needed to calibrate the following functions associated with equipment operation:

- Flux flow rate
- Spray force jet flow
- Exhaust measurement
- Ultrasonic nozzle power level

The Sono-Tek Advantage

SMTC MANUFACTURING INNOVATORS

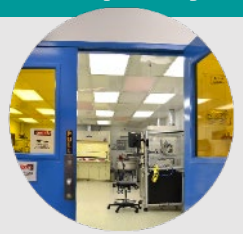
SONOFLUX 2000F

The reliability of this equipment is excellent.
***SMTC DE CHIHUAHUA S.A. DE C.V**. - Mexico*

People

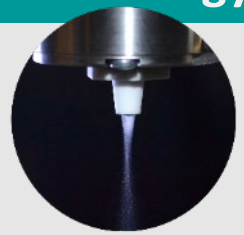
- ✓ Applications engineering team of 6 professionals
- ✓ Highly knowledgeable and experienced technical staff
- ✓ Lifetime process support
- ✓ Worldwide distributors and support.

Company



- ✓ The leader in ultrasonic coating technology since 1975
- ✓ Publicly traded since 1987
- ✓ 7 worldwide applications testing labs
- ✓ ISO 9001: 2018 Certified
- ✓ Systems built in-house.

Technology



- ✓ Highly reliable components for max up time
- ✓ Non-clogging nozzle with consistent results
- ✓ Ultrasonics create small, uniform drops
- ✓ Unmatched control and repeatability.

SONOFLUX 2000F

Laboratory Testing

VARITRON

Very professional. A pleasure to deal with Sono-Tek

Varitron *– QC, Canada*

Sono-Tek's extensive global support and distribution network provides factory-trained personnel with local language support in dozens of countries worldwide.

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Industry Expertise

Thousands of spray fluxing systems installed worldwide…

We pride ourselves on building strong relationships with our customers to ensure the equipment they receive meets their fluxing needs.

Visteon®
invensys®
TRW Automotive
IBM
JABIL
flex
TOSHIBA
tyco
DELPHI
Driving Tomorrow's Technology
ADTRAN
SONY
Benchmark
Kimball International
SANMINA-SCI®