

ChipFlo 4

Solder Ball Reflow Attachment System



ChipFlo 4 is designed to attach solder balls to chip scale package substrates manufactured on strips, magazines or boat assembly processes. **ChipFlo 4** uses our exclusive Low Velocity Nitrogen Convection (LVNC) heat transfer method – which delivers heat to the product without blowing solder balls off substrates. **ChipFlo** series ovens provide the smallest possible footprint for high-volume backend semiconductor assembly. Our patented no-clean convection method prevents heater cavity flux build-up, eliminating maintenance downtime.

Standard System Features

- No-Clean Heater Cavities
- Low Velocity Nitrogen Convection (LVNC)
- Wire Belt Conveyor
- Built-in Closed Loop Liquid Cooling
- Pentium-Compatible Computer
- Multi-Language StarWin™ Oven Operating Software (32 bit - Windows 95™)
- Modular Electronics Design Fully Contained in Sliding Drawer
- SMEMA Interface
- Zone Independent Nitrogen Control
- 72 x 36 Inch (183 x 36 cm) Machine Footprint
- Uninterrupted Power Supply (UPS) Solders Remaining Chips in Oven
- Upper and Lower Product Exhaust
- Direct Connect Machine Exhaust with High Temperature Exhaust Hose Kit
- Class 1000 Clean Room Compatible
- Nitrogen Purity < 10 PPM
- Nitrogen Consumption < 650 SCFH

Safety and Quality Features

- Key Activated Motorized Clamshell Cavity Opening
- 4 Color Signal Light Tower
- Redundant Overtemperature Protection
- Emergency Stop Buttons (4)
- CE Certified

Options (Customized Features Also Available)

- **External Fan Cooling** – 12-inch conveyor extension with fans for additional product cooling.
- **Custom Panel Color** – Customer specified to match assembly line.
- **Oxygen Analyzer** – Monitors PPM levels.
- **Casters** – Allows lift-free transport.
- **Flow Meter Covers** – Key lock protection of nitrogen settings. Prevents unauthorized adjustment.

NOTE: SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Model	ChipFlo 4
Dimensions	
Overall Length	72 Inches (183 cm)
Overall Width	36 Inches (91 cm)
Overall Height	56 Inches (133 cm)
On-Load Length	3 Inches (7.6 cm)
Off-Load Length	3 Inches (7.6 cm)
Net Weight	1530 Pounds (694 kg)
Shipping Weight	1750 Pounds (794 kg)
Crate Dimensions (L x W x H)	80 x 45 x 70 Inches (203 x 114 x 178 cm)
Power Requirements	
Voltage	220V – 3 phase – 50/60 Hz.; 400V ±10% – 3 phase – 50/60 Hz.; 480V – 3 phase – 50/60 Hz.
Maximum Startup Current	12 kVa
Typical Operating Current	6 kVa
Lockable Safety Disconnect	Standard
4 Color Light Tower	Red=Alarm/Yellow=NotReady/Green=Ready/White=Interrupted Power (top to bottom)
Industrial Dimension Controllers	CPU card, 2 analog I/O cards, oven interface board
Current Protection	Circuit Breakers
SMEMA Transport Communications	Connectors entrance and exit end meets standard specifications, entrance sensor indicates product presence
Electric Clamshell Lift	Key Activated; Opens heater cavity 12 Inches (31 cm), < 12 seconds
Redundant Overtemperature	Temperature monitoring separate from controller to prevent any machine damage
Oven Interface	
Interface Computer	Laptop 133 MHz Pentium (min) Processor, 8 meg RAM, 1.2 gig hard drive, serial port, 3.5" floppy drive
StarWin™ Interface Software	32 bit, true Windows 95™ interface package
Modem Communications	28.8 modem (minimum) that allows remote control of oven
Starlog™ SPC Software	SPC application to track and record all critical reflow parameters
Thermal Process Chamber Performance	
Heat Transfer Method	LVNC, Low Velocity Nitrogen Convection
Heated Length	48 Inches (122 cm)
Top Temperature Control Zones	4 closed loop zones, 12 inches (31 cm) each
Bottom Temperature Control Zones	4 closed loop zones, 12 inches (31 cm) each
Maximum Setpoint Temperature	325°C
Heating Uniformity	±2.0°C across usable belt width
Heating Repeatability	±2.5°C across usable belt width
Mass Loading Rates	0% to 90%
Inert Atmosphere	
PPM level above source	<25 PPM (5-10 PPM typical)
Nitrogen Consumption	1100 SCFH Maximum (<650 SCFH typical)
Nitrogen Monitoring Ports	Preheat and Reflow
Exhaust Specifications	
Entrance Exhaust Output	~ 25 cfm
Exit Exhaust Output	~ 25 cfm
Direct connect with High Temperature Hose Kit (Included)	100 cfm draw required, surplus draw required for machine cooling and complete insert atmosphere control
Exhaust above and below conveyor	Standard
Flux Exhaust Collectors	Disposable exhaust hose; Replacement time < ½ hour
Conveyor Specifications	
Conveyor Type	Stainless steel wire belt conveyor, 20 Inches (51 cm) wide, 0.125 inch (.32 cm) pitch, 0.050 (.127 cm) wire, entrance and exit sprockets diameter is .75 inch (1.9 cm).
Conveyor Speed Accuracy	±0.5%
Conveyor Height Above Floor	34 – 37 Inches (86 – 94 cm)
Usable Conveyor Width	20 Inches (51 cm)
Product Clearance Above Conveyor	3/8 Inch (0.95 cm) 1 Inch (2.5 cm) Optional [Nitrogen consumption will vary for 1 inch version]
Product Clearance Below Primary Conveyor	N/A
Cooling System Specifications	
No-Clean Flux Removal System	CoolClean: Closed loop, water cooled, nitrogen cooling
Cooling System	Built-in Closed Loop Liquid Cooling
Inert Atmosphere Cooling	12 Inches (31 cm) Nitrogen Cooling Zone; Extended Fan Cooling [Optional]
Flux Condensation Collectors	150°C Maximum temperature; Replacement time < 20 minutes

1860 Smithtown Ave
Ronkonkoma, NY USA 11779
Phone: (631) 981-7081 Fax: (631) 981-7095

www.research-intl.com
Email: sales@research-intl.com
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