SUNEAST SUNFLOW SF/450

HIGH-CAPACITY IN-LINE MODULAR SELECTIVE SOLDERING SYSTEM

PRODUCT DATA SHEET

Large-Format PCBA Assembly Lines • Model: SunFlow SF/450

The **Suneast SunFlow SF/450** (SunFlow 3/450 Series) is an advanced, large-format in-line selective soldering system engineered for heavy-payload, high-reliability lead-free electronics manufacturing. Designed to handle board dimensions up to 510 × 450 mm, it combines Suneast's pioneering electromagnetic induction pump technology, ultra-precise German-grade drop-jet micro-fluxing, high-efficiency top convection with 17 kW bottom IR preheating, and servo-driven multi-axis motion to deliver zero-defect solder joints across complex automotive, aerospace, and industrial assemblies.

510×450 mm	±0.05 mm	≤ 8.0 kg	< 30 kW
MAX PCB DIMENSIONS	SERVO POSITION ACCURACY	MAX PAYLOAD WITH PALLET	MAX POWER CONSUMPTION

Key Technological Advantages of the SunFlow SF/450

Electromagnetic Solder Pump Engine

Pioneering impeller-free electromagnetic pump operates without mechanical friction or shaft seals. Generates an ultra-steady, laminar wave up to 5 mm high with near-zero dross formation, extending maintenance intervals significantly.

High-Precision Drop-Jet Flux Module

High-frequency drop-jet nozzle applies micro-droplets with target wetting widths down to 2.0 mm. Features automated self-cleaning cycles, zero solvent overspray onto adjacent SMT passives, and an integrated 2-liter pressurized reservoir.

High-Capacity Dual Thermal Soak

Configured with 17 kW of bottom IR heating tubes segmented into independently controlled zones alongside continuous top-side forced-convection hot air. Prevents board warping and guarantees proper barrel fill on multi-layer copper planes.

Hybrid Transport & Dual-Pump Upgradability

Heavy-duty motorized chain transport in flux/preheat stages coupled with vibration-isolated roller drive in the soldering chamber. Modular architecture supports in-field expansion to dual independent electromagnetic solder pots (DS/450Z).

Selective Soldering Process Flow & Module Alignment

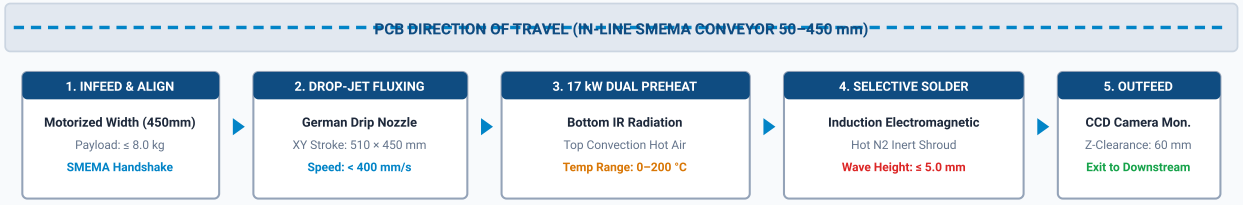


Fig. 1: Functional module configuration and inline processing stages of the Suneast SunFlow SF/450 selective soldering platform.

Technical Specifications & Engineering Parameters

1. SOLDER POT & ELECTROMAGNETIC WAVE GENERATION (LEAD-FREE / ROHS CERTIFIED)	
Solder Pump Mechanism	Proprietary induction electromagnetic pump (zero moving parts, zero impeller wear)
Solder Pot Capacity & Weight	Approx. 12 kg (Lead-free alloy) / Approx. 13 kg (Sn63Pb) per pot
Max. Solder Temp & Pot Power	Max. 330 – 350 °C (PID closed loop, ±2 °C accuracy) / Heating power: 1.15 kW
Nozzle Diameters (Inner / Outer)	Inner: 2.4, 3, 4, 5, 6, 8, 10 mm / Outer: 5, 6, 8, 9, 10, 12, 14 mm (wettable alloy)
Max. Solder Wave Height	Up to 5.0 mm with real-time automatic wave height calibration and tin level sensing
Soldering Axis Stroke (X / Y / Z)	X-axis: 510 mm / Y-axis: 450 mm / Z-axis: 60 mm (Dual-pot option extensible)
2. PRECISION FLUX APPLICATION & MULTI-STAGE PREHEATING SYSTEM	
Flux Applicator & Positioning Speed	High-precision German drip / drop-jet nozzle; Positioning velocity: < 400 mm/s
Flux Dispensing Modes & Accuracy	Point-by-point micro-dot and linear vector trajectory; minimum spray spot: 2.0 mm
Flux Stroke & Storage Tank	X-axis: 510 mm / Y-axis: 450 mm / Z-height: 60 mm; Stainless tank capacity: 2.0 L
Preheating Configuration & Power	Bottom IR quartz emitter tubes (17 kW) + Top forced-convection hot air circulation
Preheat Temperature Range	Ambient to 200 °C (Closed-loop thermocouple feedback, ±2 °C control accuracy)
3. CONVEYOR TRANSPORT & MOTION CONTROL ARCHITECTURE	
Applicable PCB Dimensions	Min. 120 mm (L) × 50 mm (W) — Max. 510 mm (L) × 450 mm (W)
PCB Thickness & Max. Load	1.0 – 6.0 mm (including pallet/carrier) / Maximum board weight: ≤ 8.0 kg
Component Clearances & Edge Margin	Top side clearance: 120 mm / Bottom side: 60 mm / PCB edge margin: ≥ 3.0 mm
Conveyor Type, Speed & Height	Hybrid chain & roller drive; Speed: 0.2 – 10.0 m/min; Rail height: 900 ± 20 mm
Motion Drive & Repeatability	Panasonic AC Servo motors + precision ground ball screws; Repeatability: ±0.05 mm
4. UTILITY FACILITIES, NITROGEN & PHYSICAL SPECIFICATIONS	
Power Supply Requirements	AC 380V (±10%), 3-phase 5-wire, 50/60 Hz; Max power: < 30 kW (Max current: < 56 A)
Nitrogen (N_2) Supply Requirements	Input pressure: 0.6 MPa; Flow rate: ~1.5 m³/h (per pot); Required purity: > 99.999%
Compressed Air Supply	Input pressure: 0.6 MPa (operating 0.5–0.8 MPa); Max consumption: ~5.0 m³/h
Communication Protocol & Noise	Standard SMEMA interface (infeed/outfeed); Permanent noise level: < 65 dB
Machine Dimensions & Net Weight	2710 mm (L) × 1930 mm (W) × 1630 mm (H) / Net weight: Approx. 1550 kg

High-Purity N_2 Shroud & Anti-Dross Performance

- **Zero-Oxidation Inert Blanket:** Heated nitrogen micro-nozzle shrouds the laminar wave, eliminating oxide film formation and solder icicles.
- **Extended Nozzle Longevity:** Specialized surface metallurgy allows nozzles to run up to 2 continuous months without de-wetting.
- **Low Maintenance Electromagnetic Core:** Free of impeller shafts and dynamic seals, virtually reducing dross generation to trace levels.

Dual-Monitor Vision, Traceability & Gerber Programming

- **Color CCD Process Monitoring:** Live high-resolution camera continuously streams wave immersion and pin wetting to the operator console.
- **Multi-Source Fast Programming:** Direct CAD/Gerber file import, optical high-resolution board image teaching, or live coordinate jogging.
- **Per-Joint Soldering Recipe:** Independent Z-height, dwell time, nozzle traverse speed, and N2 temperature assignable to each pad.