

6-SIGMA

Automated Wetting Balance Tester

FEATURES

- Color Setup and Process Witness Camera
- Complete Control of All Process Steps
- Easy to Use Menu-Driven, Graphics-Based Software
- Integrated Analysis & Graphical Data Display
- Statistical Comparison Capabilities
- Data export in ASCII for easy Integration with Spreadsheets
- Meets ANSI-J-STD-002, -003, IEC-68-2-54, and MIL-STD-883
- 24-Pin Graphic Printer
- Globule Test Fixture

DESCRIPTION

The **RPS 6-Sigma** is a completely automated wetting balance test system that offers powerful tools for incoming inspection and process development. The system is bench-top in size and all parameters such as component fluxing, blotting, dross removal, and solder dipping are programmed and controlled via an embedded PC.

Specific tooling provided by RPS allows the 6-Sigma to accommodate all component types, including through-hole or surface mount. Tooling is designed for ease of use, cleanliness, and to enhance process repeatability.

Flux Pot: A static, overflow flux pot is integral to the system, providing a consistent flux level. Dip depth is user-programmable to precise requirements. The flux pot is easily interchangeable to allow testing with a variety of flux materials. An automated blotting station ensures removal of excess flux from component termination.

Solder Pot: A 2" x 4" 6 lb. non-contaminating solder pot with integral dross wiper is also standard with the system. Solder heating elements are disabled during the test cycle to prevent the effects of thermal currents on the test results.

System Software: System software is extremely user-friendly. It is menu-driven and graphics-based with windowing operation. On-line help steps the user through all operations. A library of procedure and component profiles containing all necessary test parameters may be maintained to reduce set up time. System software provides integrated analysis and graphical data display. Statistical utilities allow



the comparison of lots and processes. Results can be generated in a variety of summary and graphical formats. The system maintains a log of lots processed and a summary of results, allowing track lot testing.

Motion Control: Motion control is via a microprocessor controlled, closed loop servo mechanism for accuracy and repeatability. A wide range of speed control is available, allowing normal or scan mode testing. A stepper motor and slide are used to automatically zero the load cell before each test, making operator adjustments unnecessary.

SYSTEM SETUP AND OPERATION

The RPS 6-Sigma Wetting Balance Tester requires minimal setup time, particularly for repetitive testing common components, and pre-established test parameters. The required test is simply selected from the system library and the computer will automatically set all test parameters. For new applications, parameters are entered with a minimum of user time. Once parameters are selected or set, the operator only places the component(s) into the proper tooling fixture and activates the start button. The test may be stopped and

reset at any time during the process using an emergency stop button.

The system first lowers the component into a station which determines the distance to the end of the lead. This value is subsequently used to achieve proper positioning in the flux, blotting, and solder stations. The component then moves to the flux station where it is immersed to a specified depth. Following fluxing, the lead is automatically blotted to remove excess flux. After moving to the solder station, the load cell is automatically zeroed and the heater elements disabled prior to the wetting balance test. The solder pot is lifted until the component lead is submerged to the specified depth. At the end of the test, the solder pot is lowered to its original position and the tool-head returns to the loading position. The results of the test are then displayed on the system monitor.

Performance:

- Operation Computer controlled
- Load Cell Measurements
 - Autozero: Fully automatic auto tare and zero
- Force Measurement (Wetting Balance)
 - Capacity: Range 4 grams
 - Resolution: 54i G
 - Sample Rate: 1000 samples/sec
- Specimen Range
 - Max Tare Couterbalance: 64 grams
- Acquisition of Solder Contact Electrical contact or auto-cision reference
- Immersion Depth (Flux & Solder) 50 mm range in increments of 0.01 mm (0.0004 in.)
- Speed in/out (Flux & Solder) 0.1 mm to 50 mm in increments of 0.1 mm
- Immersion Time (Solder) 0.1 to 80 seconds in steps of 0.1 sec.
- Immersion Time (Flux) 0.1 to 999 seconds in steps of 0.1 sec.
- Exit Speed (Flux) 0.1 mm to 50 mm in increments of mm
- Flux Bath Utilizes a static flux bath with inter changeable flux containers allowing easy and rapid change of fluxes between tests.

Performance, Solder Pot:

- Temperature Controller Under computer

software control.
 Ranges 25 to 400°
 C ± 2°C
 6 lb.
 500 Watts

- Solder Capacity
- Power Consumption

Operational

- Electrical Input 110/VAC, 60 Hz @ 10 Amp
- Total Power Consumption 1000 Watts maximum
- Software Menu driven, graphics based, windowing with on-line help
- Results Displayed Force @ Time
 Time to force max
 Time to 2/3 max force
 Insertion force
 Extraction force
 Time to zero force
 Area under the curve
 Meniscus angle (optional)

Physical:

- Construction Base constructed of heavy gauge steel. All components are epoxy coted.
- Dimensions 44"W x 19"H x 25"D
- Net Weight 185 lb.
- Net Shipping Weight 210 lb.

APPLICATIONS

The wetting balance test is a superior method for quantitative evaluation of component solderability and is supported as a test method by MIL-STD 883C, Method 2022. In addition to testing the component solderability, it may be used to determine the optimum process parameters for subsequent soldering processes. This translates into shorter process development time in pre-tinning and assembly operations. The scanning feature of the system allows the user the option of continuous testing along the length of the component lead, not just at the tip. The system is provided with two RS232 ports for computer communication and data retrieval. Since SPC is embedded in the CPU software, it makes the RPS 6-Sigma the ideal system

Revised December 17, 2000