

SOLDERING PROCESS QUALITY – CONTROL DEVICES



malcom PRODUCTS
CATALOG



MALCOMTECH
INTERNATIONAL

STA-2: SOLDER PASTE IMPURITY TESTER

Soldering has begun to turn lead-free. In the case of wave soldering, work is sequentially flown into molten solder. This is so that copper as a PCB pattern material and palladium, silver, lead, and other various components employed for the surface treatment of part leads, melt into solder pot during wave soldering. This causes the solder composition to change. Because of these changes in composition, it is imperative to constantly monitor the lead and copper content of the solder pot. Previous testing methods have been highly expensive and time consuming, taking up to several weeks for an accurate analysis report. Using a small solder sample, Malcom's STA-2 quickly and accurately measures lead and copper content in the solder pot at the soldering site. Testing is done within one hour, with an accuracy of $\pm 0.015\%$, making the STA-2 a highly cost and time efficient solution.

- Easy to test lead content(%) of solder pot at production site
- Quick testing (about 40 minutes)
- Small sample (0.5oz)
- Computer controlled, software data collection



TD-3V / VL: LASER PRINT INSPECTION

In recent years, there has been a rapid miniaturization of electronic devices and components, as well as an increase in the use of fine-pitch components. Soldering technology must now accommodate surface-mount device leads spaced closer together: 0.25 mm today vs. 0.50 mm previously. As a result, there is a greater potential for problems such as misregistration, smearing, clogging, and bridging. It is therefore vital that anyone who utilizes solder paste-printing technology be able to measure paste-print height, width, and volume. This is important in determining whether or not the quality of their printing meets their required standards.

For automatic paste-print height and width evaluation, the user selects a fiducial mark (up to 4 per board) as a point of origin, then teaches the system the points to be measured (up to 100 points). After measuring the paste-print height and width, the TD-3V indicates whether the printing meets the specified standards.

- Automated X/Y movement ensures accurate board-to-board comparisons of the same locations. After inspection, data can be viewed or printed as a table, graph, or color profile.
- Two(2) fiducial mark recognition - Used to measure the same print locations of multiple PCB modules.
- The system is capable of performing automatic 3-D volume calculations of a given location. You get true 2-D and 3-D test graph and data.
- TD-3V provides Statistic Process Control Data, "SPC". In the SPC, the operator will see graphs, histogram, and data. All of this information comes from raw data collected in Auto Inspection Setting. Our SPC is very clear and user friendly.
- Windows'98 operational program enables user to operate the system in step-by-step modes.
- Unlike other systems where guesswork is involved, the TD-3V ensures repeatable, accurate measurements.
- Simple PCB fixed holding bracket assures precision test positioning.
- TD-3VL allows for a larger board: Max board size - TD-3V <10x13"> TD-3VL <16x18">.



SPS: SOLDER PASTE SOFTENER

Unlike hand mixing, the Malcom SPS Solder Paste Mixer is a non contaminating mixer which utilizes pseudo-planetary motion to stir the solder paste. The SPS provides uniform paste consistency regardless of operator skill. The paste temperature rises due to friction, enabling control over the solder paste viscosity. Now a solder paste can be pulled from the refrigerator and ready on the stencil in less than 15 minutes!

The SPS employs a pseudo-planetary motion whereas the solder paste container rotates slowly at the end of an arm which spins rapidly. The resulting centrifuge force causes the solder paste within the container to repeatedly fold over itself, thereby mixing and softening itself.

- Uses airtight containers so oxidation and humidity are no longer a concern.
- Automated operation assures gentle softening, and unlike hand mixing, provides even consistency.
- From refrigerator to screen printer in less than 15 minutes.
- Centrifuge is self-balancing and has an off-balance safety detector.



There are three models available:

- SPS-1: Single paste jar softener
- SPS-2: Dual paste jar softener
- SPS-5: Dual paste cartridge softener

PCU-200: LABORATORY VISCOMETER

When speaking of solder paste, one parameter that is often discussed is viscosity. Viscosity is important as a paste that is too thick (high viscosity) may lead to a bad print in the form of an insufficient fillet. A paste that is too thin (low viscosity) may lead to the fillet slumping. In order to test that a paste has the proper thickness for optimal printing, the paste's viscosity should be checked with an accurate and repeatable viscometer.

- Patented spiral-pump sensor provides quick, easy, repeatable measurements.
- Elimination of misprints due to incorrect paste conditions.
- Continuous measurement of newtonian and non-newtonian fluids with constant shear rate and shear time.
- Automatic control of measurement according to JIS standards (PCU-203,205).
- Acquisition of viscosity data for rheological analysis.
- Built in dot matrix printer allows logging of acquired measurements.
- Fully automatic temperature control of sample.
- Satisfies international standards.
- Application includes solder pastes, thick film pastes, solder resists, liquid resists, inks, etc.



PC-1TL: TABLE TOP VISCOMETER

- Unique spiral-pump design for faster, easier, more accurate viscosity measurement.
- Fixed shear rate and shear time - No complicated calculations required.
- Eliminates multiple measurements and averaging.
- +/- 2% repeatability - Not user dependent.
- More consistent than conventional methods.
- Optional spiral cylinders allow a single unit to measure a wide range of viscosities, including solder paste, adhesives, solder masks, thick-film, etc.



TK-1: SOLDER PASTE TACKINESS TESTER

The Malcom TK-1 Tackiness Tester is widely used to help our customers predict solder paste tack force, limiting the potential for dropped components, using either the IPC, Depth Method, or JIS Standard Test. These three convenient testing methods for tackiness allow you to determine component drop time to loss of adhesion, and thus avoiding costly rework. Tackiness refers to combined force of the cohesion and adhesion. In many cases, chip parts are held on the board by the paste's tackiness during reflow. It is at this time that defects occur from chips falling off the board; or being displaced by the vibration of the chip mounter after some time has elapsed since printing, or when tackiness is reduced by reflow heat.



SP-2: WETTING TESTER

The Malcom SP-2 Wetting Tester helps to test the wettability of solder paste and components while actually simulating the SMT mounting and reflow process. The SP-2 simulates the actual temperature that solder paste undergoes during preheat and reflow, letting you easily identify any deficiencies in flux activity or component wettability, measurement of the solder paste wettability, printed board wettability, wettability on temperature rise, and wettability on preheating time. By actual simulation of the SMT mounting and reflow process with standard variables, it is possible to develop an accurate, repeatable evaluation method to determine a solder paste's solderability.

- Digital displays show load, depth, and temperature.
- Built-in heater can also be adjusted to find the optimum reflow profile for maximum wetting of a given solder paste.
- The system can also be used for testing the wettability of not only solder paste, but also components and PCB substrate pads.
- The system software allows the user to compare up to six wetting curves at a time.



RC-50: WAVE SOLDERING PROFILER

The Malcom RC-50 Solder Profiler provides excellent temperature profile and dip time analysis. The RC-50 is for single wave and dual wave soldering systems.

- Unit includes software (Computer not included).
- 50 ms sampling time for the ability to analyze dip time and temperatures.
- 6 channel measurement points.
- TAM-50 Program software to review test results.



RC-106: REFLOW CHECKER

The Malcom RC-106 Reflow Checker provides on-site data collection. The data can then be printed out and analyzed.

- High temperature measurement for lead-free applications.
- USB interface cable for data transfer.
- Adapter unit with forced cooling system
- Sampling data time of 0.05 seconds.
- New TAM-4 Data analysis software.
- 6 channel memory unit.
- Color printer prints out measurement data without a computer.
- Rapid cooling station to protect the memory unit from high temperature lead-free applications.
- Adjustable memory unit holder provided.



RCR-30: REAL-TIME WIRELESS REFLOW CHECKER

The Malcom RCR-30 Reflow Checker provides a wireless solution to real-time data collection. TAM-4 Data Analysis Software enables oven temperature profile setting.

- 6 Channel transmitter unit.
- Frequency: 315 MHz
- Sending Speed: 9600 bps.
- Transmitting range: 100~150 ft.
- Forced cooling station.
- Rechargeable Ni-NH battery.
- High temperature cover protects data memory unit for lead-free reflow ovens.



TD-4M: TABLE-TOP PASTE PRINT INSPECTION

The Malcom TD-4M 2-D and 3-D solder paste print inspection system provides a simple solution to measuring PCB paste prints. A color CCD camera allows the user to pick any desired location on the board for analysis.

- Slit Laser height and width measurement.
- Color CCD camera.
- Auto camera focus and laser head height adjustment
- PCB board movement guide.
- Data is saved to Flash Memory.
- Detailed SPC data analysis.



COMPANY PROFILE

Malcomtech International provides the latest SMT process technologies and products to improve your PCB quality. We currently sell and service Malcom products and Eightech Tectron Inline Convection Ovens. We also provide lead-free soldering techniques and consulting for printed assembly process technologies.



Malcom Company, Japan is a leading manufacturer of Electronics Printed Board Assembly Process Control Devices. Eightech Tectron is the largest manufacturer of inline reflow ovens in Asia. In partnering with Malcom and Eightech Tectron, Malcomtech International has created a worldwide distribution network.

Malcomtech International (formerly Malcom Instruments) was established in 1990. Our office, located in Northern California, has a show room complete with demo equipment for training, evaluation testing, repair service, and calibration. The Malcomtech staff is dedicated to providing the best product and customer support.



Malcomtech International is proud to be the recipient of the 2003 Vision Award in the Testing category for the **Malcom Solder Impurity Tester**. The Vision Award is awarded by *SMT Magazine* to the most innovative products every year.

MALCOMTECH INTERNATIONAL

26200 Industrial Blvd.
Hayward, CA 94545

tel: 510.293.0580
fax: 510.293.0940
info@malcomtech.com
<http://www.malcomtech.com>

MALCOMTECH
INTERNATIONAL