

Solder Paste

Precise Measurement of Solder Paste Structures

Fast, automated surface measurements for process control of solder paste printing.

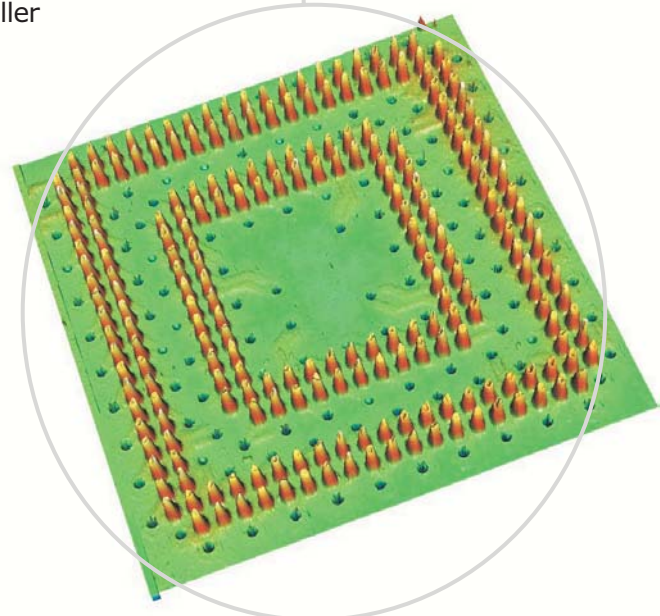
- **lateral resolution in the micron range**
- **automatic volume measurements**
- **Statistical Process Chart**

Statement of the problem

Today's electronics technology, particularly in consumer-focused applications such as mobile phones, personal computers and automotive controls and add-on features, are creating challenges for electronics manufacturers to produce modules in ever smaller forms at ever lower costs. This has stimulated component manufacturers to produce new, smaller components in outlines such as 0201 and 01005 for discrete chips and packages such as ultra-fine pitch BGAs. These tiny packages, in turn, are placing demanding strains on manufacturing processes such as solder paste printing, as well as the very handling of the components themselves to avoid damage to the fine connections. Human inspectors cannot see these errors, and AOI is reaching the limits of optical lens technology. New methods are therefore required to ensure that these parameters can be controlled at a sufficiently early stage in the manufacturing process..

The solution

Measurement of values of this nature has long been standard in the realm of tribology, using tactile sensors, but this is inappropriate in the electronics manufacturing environment. Now, the new non-tactile, optical laser technology introduced by NanoFocus AG for application in tribology can also be applied here. NanoFocus μ Scan versions CF2001 or CP1000 in association with the software tool SWT-Solder can provide electronics manufacturing with a focused, automated measuring system, feeding directly into SPC. Leading edge sensor technology is combined with modular, flexible software to enable fast, accurate measurement of solder volume, height, coplanarity, slump and other process parameters including the components and substrates themselves

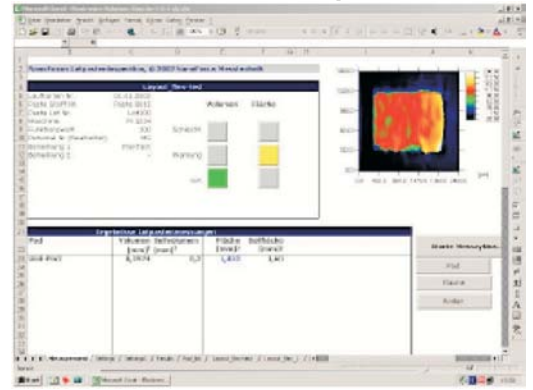


Fine pitch solder paste

Solder Paste

Software

The software tool SWT-Solder permits automated measurement of solder paste structures on desired substrates. In the "engineer" mode, measurement tasks such as volume, height and flatness are defined. For this, a side camera simplifies the learning of measurement positions. In the "operator" mode these pre-automated tasks can be invoked. The software automatically evaluates the desired values after the measurement is complete, delivers a go/no-go decision and saves the data in an SPC file. This enables an efficient and effective introduction of the measuring instrument.



Simple operator interface

Benefits

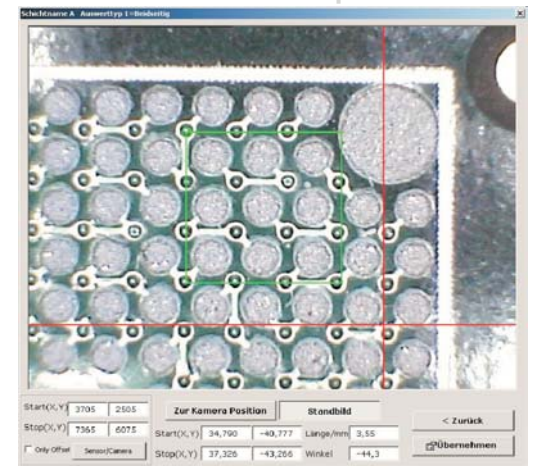
The following measurement tasks can be defined for solder paste structures :

- Volume
- Height and area
- Perpendicularity of the sides
- Position

Results

Captured results are saved with date, measurement details and further optional information, leading to SPC. Evaluation of the results against high and low limits follows. The form of the SPC is individually selectable. Amongst others, the following are produced :

- Single values and averages
- Maximum und minimum
- Upper and lower warning bounds
- Upper and lower limits

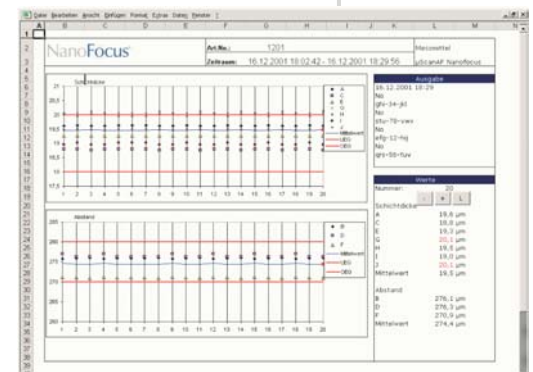


Position teaching

System

The "Hybridmaster" software runs on the Nanofocus laser profilometers µScan versions CF2001 or CP1000. The following modules are available:

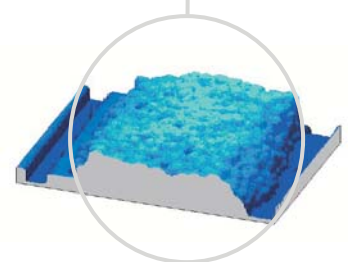
- SWT "Active X" basic module for programming
- SWT "Solder" software for automatic measurements and evaluation of solder paste
- SMV150c miniature overview microscope with 7 x 10 mm picture field
- SWT "SXS" SPC module
- SWT "SXG" module for reading CAD-files



SPC

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Details of freshly printed paste