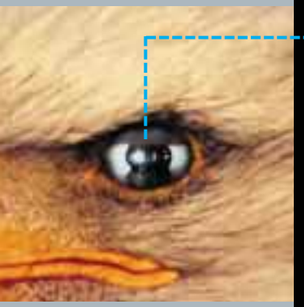
ERSCOPE

INSPECTION SYSTEMS

for the 21st Century



To See is to Survive !

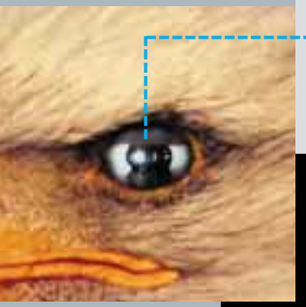
In today's highly competitive manufacturing environment, the ability to see and react to hidden production deficiencies, in order to guarantee a quality process, can mean the difference between life and death!

Visual examination of a solder joint is a vital step in evaluating the quality of a soldering process. It can make the difference between questionable results and total quality assurance.

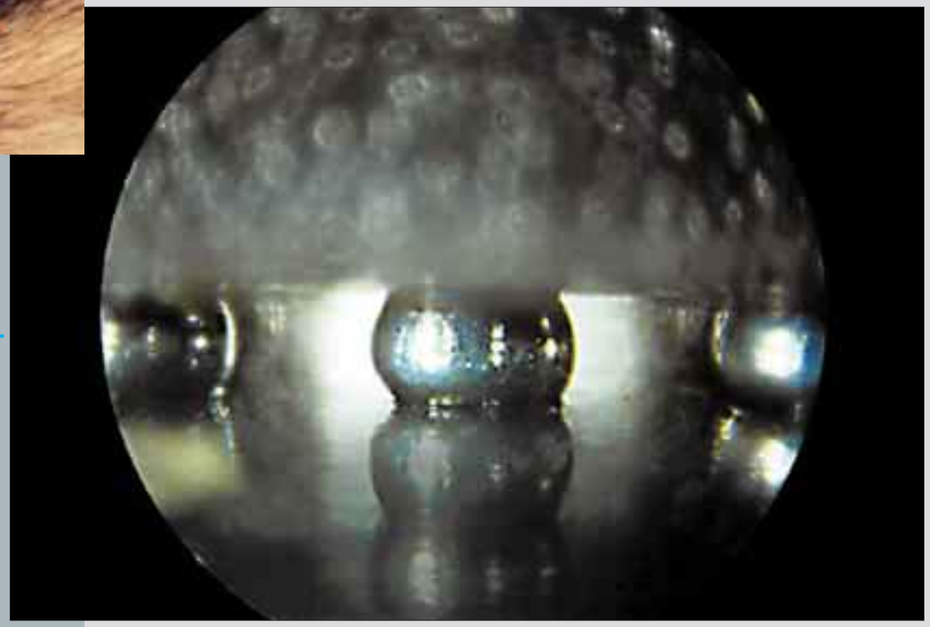
ERSA recognized this need and engineered the first optical system to visually inspect BGA and other hidden solder joints under the component.

ERSA GLOBAL CONNECTIONS

ERSASCOPE

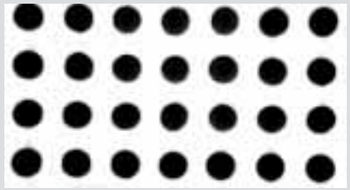


Expand Your Inspection Capabilities: Seeing is Believing!



ERSASCOPE image of CSP 180; pitch = 0.8 mm; ø = 0.45 mm; stand-off height = 0.25 mm

The revolutionary ERSASCOPE Inspection System 3000 offers a cross-sectional, non-destructive visual image of hidden solder joints by looking under the BGA. At a fraction of the cost of an X-ray system, the ERSASCOPE is a bench-top, user-friendly, safe, and cost effective method for quickly inspecting all types of BGA, MicroBGA, and Flip-Chip components, in addition to many other applications, e.g. interior fillets of PQFP and PLCC components, where a microscope or X-ray fails.



X-ray image of PBGA after soldering

X-ray inspection has established itself as the state-of-the-art for non-destructive inspection of hidden solder joints, particularly those of BGA, CSP and Flip-Chip components. While revealing many of the possible defects, e.g. bridges, misalignment and voids, other critical defects, e.g. excess flux residue, surface structure, and micro cracking, are more difficult or impossible to detect.

Cross-section of PBGA after soldering

Making a cross-section of the hidden solder joint and evaluating the solderability by examining the intermetallic under a high power microscope will provide a great deal more information about the process. Both this method and a common pull test to evaluate the intermetallic bond or mechanical stability of a joint, are destructive and can be used only on a limited basis.

A proper temperature profile will ensure the production of an intermetallic compound, which is the key to the soldering process.

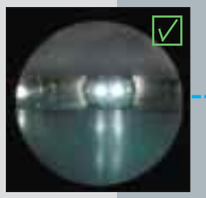
A visual examination of the solder joint after soldering can provide an indication of the temperature reached during the process.

A cold solder joint did not receive enough heat to produce the intermetallic compound and will appear matt or dull. A good solder joint has reached proper peak temperature to produce an intermetallic bond and will appear shiny. The presence of the intermetallic is the key to lasting mechanical stability in a solder joint.

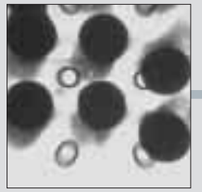
The ability to determine whether the reflow process delivers quality results, must be a part of the total quality control system!

The ERSASCOPE inspection system can expand current inspection methods by providing the only known non-destructive method to visually examine hidden solder joints.

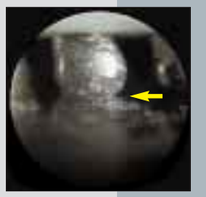
ERSASCOPE image of cold solder joint: surface is rough and dull. This cold joint can prematurely fail!



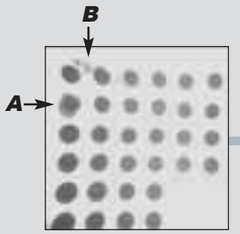
ERSASCOPE image of good solder joint: surface is smooth and shiny. This joint is the goal and will last!



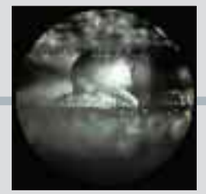
3D-X-ray image of CBGA after soldering.



ERSASCOPE image of same CBGA reveals cracking zone.

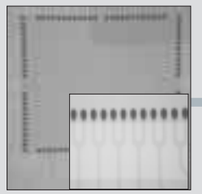


X-ray image of PBGA; areas A and B show mistakes but are unclear of source.



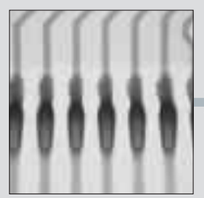
***A.** ERSASCOPE shows incomplete melt of solder paste; temperature too low.*

***B.** ERSASCOPE reveals excess flux residue bridge with conductive particles.*

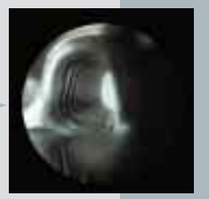


X-ray image of Flip-Chip 96 after soldering, before under-fill; stand-off height = 0.05 mm

ERSASCOPE image of same Flip-Chip 96; quality of joints clearly visible.



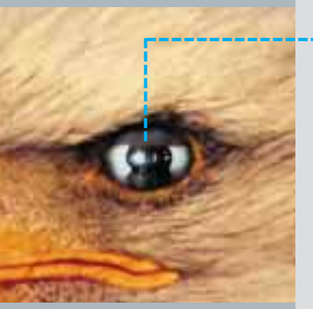
X-ray image of TQFP 120, pitch = 0.4 mm; dark shadow depicts heel fillet.

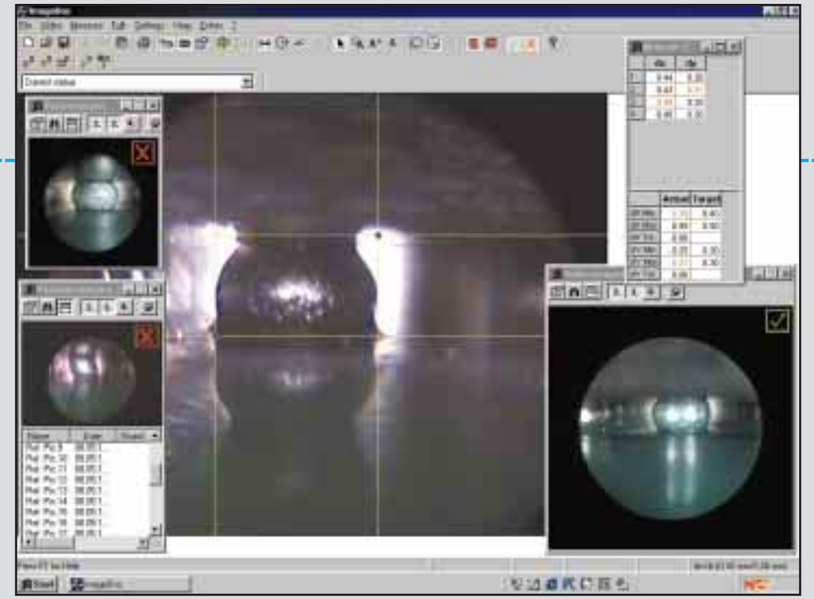


ERSASCOPE image of same TQFP 120; all heel fillets are visible.

ERSASCOPE

No Limits! - Multifunctional Concept for Maximum Flexibility.





ERSASCOPE image: good solder paste print

ERSASCOPE image: bad solder paste print

MAGNISCOPE image: solder paste alignment

MAGNISCOPE image: stencil

- **BGA, SMT and PTH solder joints**
- **Component co-planarity before soldering**
- **Solder paste deposition**
- **Stencil thickness**
- **Via-hole diameter and cleanliness**
- **Adhesive dots**
- **Thick film deposition**
- **Conformal coating thickness**
- **Wire bonding ...**

With images from practically any angle, and with an enormous magnification range, the ERSASCOPE Inspection System 3000 was designed to meet every benchtop visual inspection need. The ERSASCOPE cross-sectional scope (90° angle) is complemented by the MAGNISCOPE look-down scope (0° angle) with up to 350 x magnification.

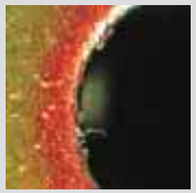
ImageDoc Image Processing & Measurement Software

The ERSASCOPE Inspection System 3000 with the ImageDoc software was designed to set new standards for quality assurance management. This user-friendly system and software takes the subjectivity out of the quality control and inspection process.
The representation of a real-time video image on the monitor can be complemented by numerous pop-up reference images chosen from the image databank revealing examples of both good and bad inspection criteria. A multiple criteria search function makes selection quick and easy for any operator. With the system optically calibrated, height, width, radius, and angle measurements are as easy as a click of the mouse, and as accurate as ± 0.01 mm. Exact solder paste print shape, height, and volume measurements extend the capability of the system to cover other critical application areas.
The Automatic Measure Control function displays and stores measurements which exceed established tolerances set specifically by QC, for each type of component and PCB.
Whether creating a report, sending it via e-mail, or inserting images, text, and measurement data into the image databank, the ImageDoc software is the perfect tool to guarantee and document Total Quality Control.

MAGNISCOPE image: Conformal coating

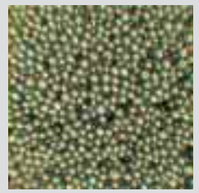
MAGNISCOPE image: wire bonding

MAGNISCOPE image: Via-hole inspection



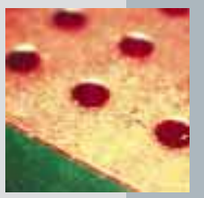
MAGNISCOPE image: Macro (350 x) of via-hole

MAGNISCOPE image: PCB low magnification



MAGNISCOPE image: Macro (350 x) solder paste

MAGNISCOPE image: Component PTH top-side



MAGNISCOPE image: gold TAB carrier

ERSASCOPE

For further detailed information on the ERSASCOPE Inspection Systems product line, please contact your local official ERSASCOPE distributor.

ERSA is a leading manufacturer with the world's largest range of tools, machines and solutions for the soldering industry. Please visit our website or contact your local distributor for detailed information on:

- ERSA Hand Soldering Tools
- ERSA SMD and BGA Rework Equipment
- ERSA Solder Fume Extraction Systems
- ERSA Wave Soldering Machines
- ERSA Reflow Soldering Machines
- ERSA Selective Soldering Machines
- ERSA Accessories & Know-How Transfer

ERSA®
GLOBAL CONNECTIONS

ERSA Löttechnik GmbH
Leonhard-Karl-Str. 24
97877 Wertheim/Germany
Tel. +49 (0)9342/800-0
Fax. +49 (0)9342/800-100
e-mail: info@ersa.de
http://www.ersa.de/

ERSA Inc.
Soldering Tools
6 Vista Drive, Old Lyme,
CT 06371-1539, USA
Phone 860.434.8091/6224
Fax 860.434.5448
www.ersasoldertools.com

A Kurtz Company

5PE1099_SCOPE • subject to change •