



Q-400 μDIC - Optical, non-contact measurement system for microscopic shape, displacement and strain measurement.

Q-400 μDIC™ Microscopic Shape, Displacement & Strain Measurement

Applications

- Warpage measurement
- CTE determination
- FEA Validation
- Best for micro-electronic components

Features

- 3D shape, deformation and strain measurement
- Optical, non-contact measurement method
- Fast, accurate online visualization of results
- Small, microscopic samples < 17 x 17 mm²
- All-in-one system with thermal load

Solution

The Q-400 μDIC system is specially designed for measurement of warpage and thermal expansion within the micro-electronics/components industry working with electronic miniaturization and high-density package design.

The solution helps to measure the precise deformation in cases where simulations are not possible or simply just a necessity. The solution comes as a complete system with stereo microscope, illumination, heating/cooling stage, 5 megapixel cameras and user friendly measurement software.

Benefits

Easy and fast FEM validation and CTE determination thru real-time image correlation of shape, deformation and strain with sub-micron accuracy. Both setup, focusing and calibration are easy and smooth allowing you to focus on what really matters: 3D warpage measurements that have never been easier.

Results

The system provide easy and fast full-field, 3D deformation and strain analysis. The results include complete shape, deformation and strain data, temporal and spatial plots, data of virtual strain gauges, STL data for CAD processing as well as images and movies for presentation purposes.

General Specifications μ DIC

Measurement area	Typical measurement areas 17 x 17 mm ² and smaller
Measuring results	Full-field surface contour, 3D displacements and strains.
Measuring range	Up to several 100% strain
Precision calibration plates	Range of sizes from 0.5 x 0.5 mm ² up to 2 x 2 mm ²
Control Electronics	Desktop or Notebook Options, Windows 7, Integrated analogue data acquisition and recording input: 8 independent configurable analogue Data Acquisition Channels, 16 Bit resolution, ± 0.05 V to ± 10 V Synchronized to camera triggering 2 analogue voltage outputs for data extraction ± 10 V
Stereoscopic Microscope	Magnification range: 8 x 100x (1.0x objective, 10x eyepieces) Apochromatic corrected optics, integrated iris diaphragm for adjustable depth of field, click stop zoom settings, for parfocal planapochromat objectives: 0.63x, 1x, 1.6x, 2x, integrated LED ring light, gliding stage etc.
Sensor chip	Different Sensor types up to 16MP are possible; Standard 5MP
Sensor details	Shutter speed: 47 μ s – 67 s, Frame rate: up to 60 Hz (Adjustable Region of Interest)
Measuring sensitivity: Displacement Strain	Up to 0.01 pixel accuracy depending on measuring conditions Up to 0.01% local

Software Features

- Real-Time Correlation up to 2 Hz
- Unrestricted, open data format for measurement data
- Fast and easy automated calibration procedure with accuracy feedback
- Results displayed on 3D model or 2D overlay
- Confidence Margin for every data point
- Selectable filtering of measurement data and free definition of reference step
- Enhanced external and internal triggering functions
- Convenient GUI follows Universal Guideline of Dialog and Window Frame
- Different axis systems available - additionally a user definable axis system can be used
- Extended export and import functionality – e.g. STL, AVI, ASCII
- Easy post processing of data
- Comfortable visualization and analysis of dynamics processes

Options

Different sensors	Resolution and focal length adapted to your individual application
Heating / Cooling Stage	For microscopic CTE measurement, warpage of electronic parts etc
Analogue Output	Extract measured data as a live voltage
Remote Support Functionality	System maintenance and Remote User Support via Internet connection

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