Dimensional stability tester DST

Our dimensional stability testers are automated testing instruments for optical evaluation of in-plane as well as out-of-plane deformations across a specimen surface.

The DST concept enables detailed analysis of dyna-mic displacement across a specimen surface exposed to changes in moisture, temperature or tension.

Concept

A speckle pattern is applied on the test specimen, which is then positioned under a pixel-synchronous CCD video camera capturing an image. The specimen is then exposed to a different level of humidity, temperature or tension.

After the requested conditioning time, a second image is captured and the two images are compared to calculate the dynamic in-plane displacements across the specimen surface. A full test involves the comparison of a sequence of two or more captured images at different conditions.

For evaluation of out-of-plane displacements, two pixel-synchronous CCD cameras are used to view the same specimen area from a perpendicular angle. This eliminates the distortion characteristic for stereoscopic systems with angled camera. The 3D approach can be used to describe the static shape of a cockled or curled surface as well as the dynamic deformation caused by moisture, tempera-ture or tension.

Models

Test systems

DST1200: in-plane only

DST1230: in-plane and out-of-plane

Climate chambers

DST1210: single specimen

DST1250: five specimens

Features

- Optical non-contact evaluation of in-plane as well as out-of-plane displacements
- Detects in-plane displacements down to one micron across a 50 x 50 mm large sample
- Allows dynamic visual and statistical evaluation
- 3D-system measures out-of-plane shape as well as dynamic deformation
- Automatic testing of in-plane hygroexpansion with optional desktop climate chamber

Options

- Desktop climate chamber: for evaluation of hygroexpan-sion. Once the test is defined in the database, the climate chamber is operated automatically from the computer. Neat, clean and simple to use, the chamber runs time-con-suming experiments by itself.
- Speckle gun: projects speckles for out-of-plane measure-ments.

Technical specifications

Humidity control

For DST1210/1250: 10-90 ± 2% rh

Drying response time

For DST1210/1250: < 3 min for 80-20 % rh @ 50 % rh

Moisturizing response time

For DST1210/1250: < 3 min for 20-80 % rh @ 50 % rh

Field of view

For DST1200/1210/1250: 50 x 50 mm

For DST1230(3D): 125 x 125 mm

Image resolution

For DST1200/1210/1250: 1 µm in-plane

For DST1230(3D): 2 µm in-plane 8 µm out-of-plane

Pixel size

11 x 11 µm

Power supply

100-120 / 220-240 V, 50/60 Hz

Physical specifications

Dimensions

DST1200/1210/1250: 34 x 37 x 37 cm (W x D x H)

DST1230(3D): 33.5 x 28.5 x 115 cm

Net Weight

All models +/- 13 kg