product specification

Dimensional Stability Tester

Description

The Dimensional Stability Testers are automated instruments for the optical evaluation of in-plane and out-of-plane deformations across a specimen surface. The concept enables detailed analysis of dynamic displacement across a specimen surface when exposed to changes in moisture, temperature or tension.

Models

Test systems
DST1200 – in-plane only
DST1230 – in-plane and out-of-plane

Climate chambers
DST1210 – single specimen
DST1250 – five specimens

Concept

A speckle pattern is applied onto the test specimen, which is then positioned under a pixel-synchronous CCD video camera to capture an image. The specimen is then exposed to a different level of humidity, temperature or tension. After the selected 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 under 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 of stereoscopic systems with angled cameras. The same 3D approach can also be used to describe the static shape of a cockled or curled surface as well as the dynamic deformation caused by moisture, temperature or tension.

Features

- Detects in-plane displacements to 1 µm across a 50 x 50 mm sample
- Enables dynamic visual and statistical evaluation
- 3D system measures out-of-plane shape as well as dynamic deformation
- Optional desktop climate chamber enables the automatic testing of in-plane hygro-expansion. After defining the test in the database, the climate chamber can then be operated automatically from a computer – a simple-to-use and time-saving addition

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Physical specifications

Dimensions (W x D x H)
DST1200/1210/1250 34 x 37 x 37 cm
DST1230 (3D) 33.5 x 28.5 x 115 cm

Net weight
All models ± 13 kg

Options

- Desktop climate chamber for the evaluation of hygro-expansion
- Speckle gun for the projection of speckles for out-of-plane measurements

Performance data

Humidity control
DST1210/1250 10–90 ± 2% rh

Drying response time
DST1210/1250 ← 3 min for 80–20% rh @ 50% rh

Moisturising response time
DST1210/1250 ← 3 min for 20–80% rh @ 50% rh

Field of view
DST1200/1210/1250 50 x 50 mm
DST1230 (3D) 125 x 125 mm

Image resolution
DST1200/1210/1250 1 µm in-plane
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

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