CSS450

Optical Rheology System

Heating and Freezing
Temperature range from –50°C up to 450°C

Choice of Shear Modes
Choose between oscillary, steady and step

Real Time Imaging
Better understand your sample by correlating visual changes and rheological data

Linkam Scientific Instruments

www.linkam.co.uk

+44 (0)1737 363476

info@linkam.co.uk

Introducing the CCS450

The Linkam Optical Shearing System (CSS450) allows structural dynamics of complex fluids to be directly observed via standard optical microscope while they are under precisely controlled temperature and various shear modes.

Using the CSS450, it is possible to study the microstructure evolution of complex fluids in great detail for many physical processes, for example to investigate the coarsening of binary fluids during their phase separations, flow-induced mixing and de-mixing of polymer blends, defects dynamics of liquid crystals, and the aggregation of red blood cells and their deformation in flows. We are then in a good position to correlate micro-structural dynamics with rheological data for gaining insight into the rheology of complex fluids.

To facilitate various textures or particle sizes in different samples, the gap between the two plates can be precisely set from 5 to 2500um; in addition, the speed of this change in gap setting can also be varied. The CSS450 can be modified to be used with X-Ray techniques and also with a liquid nitrogen cooling option thereby further extending the temperature range to -50°C which enables work on the effects of shear on ice crystals.

It is also provided with a T96 controller which is available with either LINK software or LinkPad touch screen controller.

Features

WIDE RANGE TEMPERATURES
The temperature capabilities range from ambient to 450°C, and –50°C to 450°C with the addition of a LNP96-D Liquid Nitrogen Pump and Dewar.

HIGH DEGREE OF ACCURACY & STABILITY
The embedded high quality Pt100 platinum sensor guarantees high accuracy and stability throughout the temperature range.

SHEAR CONTROL
Choice of shear modes including: oscillatory, steady and step to study the microstructure evolution of complex fluids. Velocity, amplitude and frequency are all controllable and can be changed on a ramp by ramp basis.

VARIABLE GAP SETTINGS
The gap between the top and bottom plate can be varied between 5µm - 2500µm, for different sample sizes and textures.

HEATED STAGE BODY AND LID
The stage body and stage lid are each fitted independently with heaters allowing uniform temperature between body and lid.

X-RAY TECHNIQUES
Many CSS450 users have used SAXS equipment to characterize their samples with shearing stress. Linkam can supply Kapton or Mica windows in place of the standard quartz.

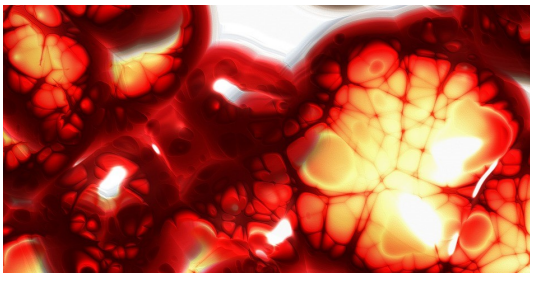
Application Examples

The CSS450 stage was developed in collaboration with Cambridge University. It is a unique instrument enabling high resolution imaging of samples under various shearing conditions and temperatures and can be used for a variety of applications including:

Biological Research

The CSS450 is used by many leading universities and institutes to aid the pioneering research of biological material in a wide variety of applications:

Tissue Stress | Coagulation | Cell Stretching



Food Research

Many well known food and drink manufacturers and food scientists are currently using the CSS450 in a variety of different applications:

Storage | Mastication | Thermal Analysis

Materials Science

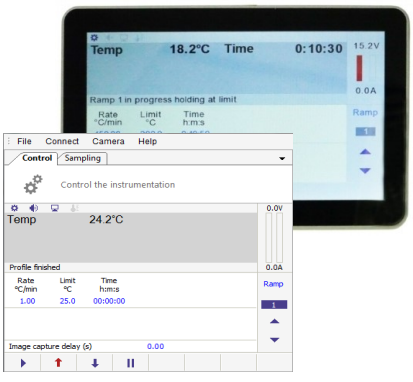
Within the materials testing field, the CSS450 is ideal for testing shear applications such as:

Self-healing | Nucleation Rate | Elasticity

Technical Specification

Temperature Range	Ambient to 450°C (-50°C to 450°C with LNP)
Heating Rates	0.01°C to 30°C/min
Temperature Stability	+/-0.2°C
Gap Setting	Between 5µm and 2500µm
Objective Lens Working Distance	7.4mm
Observation radius	7.5mm (viewing area 2.5mm diameter)
Shear Rate	0.003 s^{-1} to 7500 s^{-1}
Strain	0.1% to 40,000%
Velocity	0.001 s^{-1} to 10 s^{-1}

Discover More...

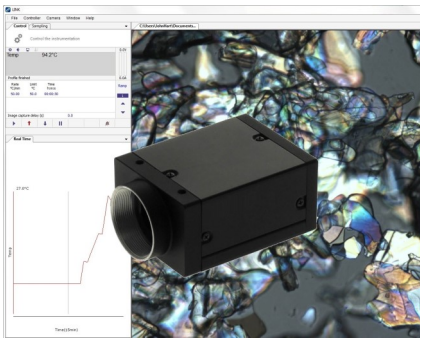


Control Options

Take control of your experiment with LINK software for Windows, or the stand alone LinkPad touch screen.

Both share a unified user interface for ease of use and in addition to temperature can control or monitor many of the other stage parameters such as vacuum, humidity, tensile force and shear force (dependent of stage type and sensors). A profile with up to 100 ramps can be entered, allowing simulation of complex real world processes.

In addition, LINK provides logging functions and real time graphical feedback. It also supports a number of modules to further enhance your system, including LINK Imaging Module for synchronised image capture, LINK Extended Measurements module for recording the measurement of key features in your images, LINK 21CFR11 Module for data regulatory compliance and LINK TASC providing image analysis based thermal analysis.



LINK Imaging Systems

Get more out of your Linkam stage, recording the temperature is only half the story. Seeing how your sample changes with changing environment such as temperature, humidity, vacuum, tensile or shear force can provide important information about your sample. Changes to the physical characteristics of your material such as surface structure, colour, opacity, size and shape can be analysed from the images. Add one of the LINK Imaging Systems to record images of your sample automatically during your experiment. There are a range of LINK Imaging Systems available optimised for use with Linkam stages.

Imaging Station

The Imaging Station is compatible with all Linkam heating and cooling stages. It has been specially designed with a pivoted mechanism to allow greater access to your samples. There are reflected and transmitted light options available and it is compatible with a range of long working distance objective lenses.

Contact Details

Linkam Scientific Instruments
Unit 8
Epsom Downs Metro Centre
Tadworth
KT20 5LR
United Kingdom

We make scientific instruments that help characterise materials from polymers to biological tissue and metals to composites. Our instruments are used for research by the world's most advanced scientific organisations and companies. Each of our instruments are designed and manufactured in-house by our team of highly experienced electronics, software and mechanical design engineers. We design and develop solutions for sample characterisation by collaborating with the best scientists in the world. Will you be next?

Linkam Scientific Instruments

www.linkam.co.uk | +44 (0)1737 363476 | info@linkam.co.uk