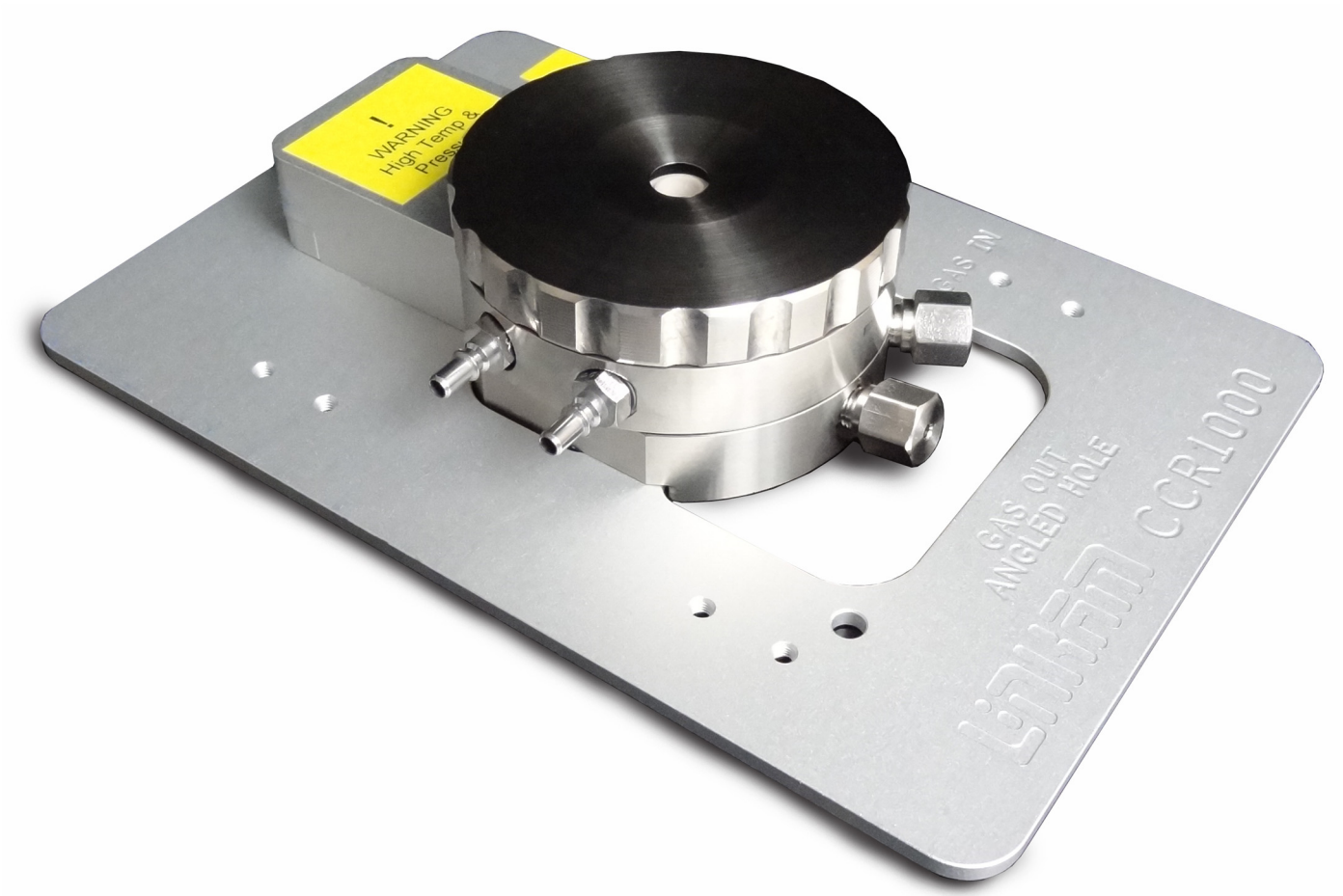
CCR1000

Catalyst Cell Reactor Stage



Temperature Range
From ambient up to 1000°C with heating rates from 0.1°C to 200°C/min

Compatibility
Reflected light upright and Raman microscopes

Catalyst Cell
Study and image in situ catalytic reactions

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Introducing the CCR1000

The CCR1000 Catalyst Cell Reactor is a versatile stage that has been designed to study catalytic reactions at high temperature and pressure. It enables the user to carry out small scale tests on catalyst formulations and evaluate the results using a number of gas analysis techniques.

Samples are mounted on a virtually unreactive disposable ceramic fabric filter which is placed inside the ceramic heating chamber. The carrier gas is introduced into the stage via a high pressure 1/16 gas line. The gas is then partially pre-heated and passed through the sample and ceramic fabric filter. The tube of the heater is very narrow to prevent dead space and to ensure that it remains hot enough to prevent any condensation before it is available for gas analysis.

All parts of the cell in contact with the sample and gas are selected for their unreactive properties; the majority of the parts in contact with the sample and carrier gas are either ceramic or stainless steel. The stage is designed with optical access to the reaction chamber making it ideal for use with reflected light microscopy and spectroscopic techniques including Raman and FT-IR microscopy such as Operando.

Temperature is accurately controlled by the Linkam T96-S controller (via the S-type platinum/rhodium thermocouple) which can heat samples at a rate of up to an impressive 200°C/min. Thermocouple linearization (linearized to 0.1°C and displayed to 0.1°C) and cold junction compensation are performed inside the T96-S controller.

A system requires the CCR1000, ECP water circulation pump and a T96-S controller, which is available with either LINK software for computer control, or a LinkPad touch screen for stand-alone control.

Features

Temperature range
From ambient to 1000°C.

Heating Rate
From 0.1°C to 200°C/min.

High Degree of Accuracy
The T96-S controller accurately controls the temperature via the S-type platinum/rhodium thermocouple.

Various Optical Techniques
Compatible with reflected light upright microscopes and other spectroscopic techniques including Raman and FT-IR microscopy such as Operando.

Water-cooled
Water-cooled stage body for safe work above 300°C.

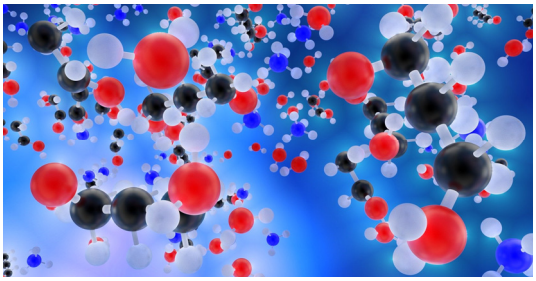
Custom Options
Please contact us with details of your requirements.

Application Examples

The CCR1000 is extremely versatile with many options and configurations, and can be easily tailored to suit a variety of fields from academic research to commercial and industrial applications including the following:

Catalysis

The CCR1000 is used for high precision thermal analysis of catalytic reactions, from organic catalysts and metallic ions to biocatalysts and photocatalytic materials.



Synthetic Chemistry | Thermal Dehydration | Composite Materials

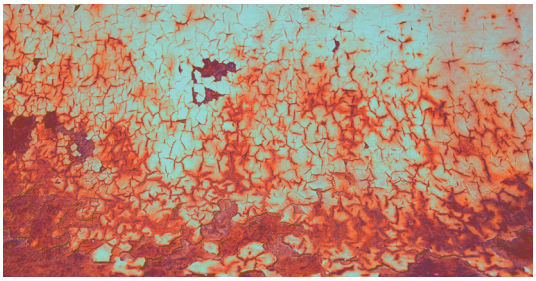
Semiconductor and Electrical

There is significant academic research and commercial interest in new materials for energy storage and electrocatalysis. The CCR1000 can be used to study their properties in conjunction with Raman Spectroscopy and other microscopic and spectroscopic techniques.

Hydrogen Fuel Cells | Electrochemical Storage | Battery Materials

Materials and Metallurgy

The critical CCR1000 components are manufactured with stainless steel to enable use with some corrosive materials, including studies of the metallic corrosion process, alloys, or galvanisation.



Chloride Formation | Metal Corrosion | Thermal Analysis

Technical Specification

Temperature Range	From ambient to 1000°C
Heating/Cooling Rates	From 0.1°C to 200°C/min
Temperature Stability	0.1°C
Pressure	Up to 5 Bar
Sample Size	5.8mm ø chamber (accommodates 70-100mg dependent on sample type)
Objective Lens Working Distance	7.9mm
Compatibility	Reflected light, upright and Raman microscopes. Clamping options are additionally available for most microscopes*.

* The CCR1000 is designed for use in reflected light applications only.

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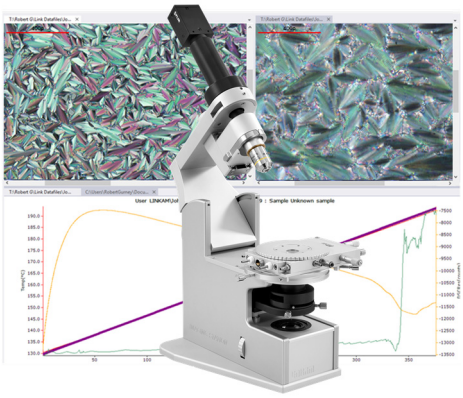
Discover More...

Control Options

Take control of your experiment with LINK software, or the stand-alone LinkPad touch screen, alongside the T96 temperature controller.

Both LINK software and LinkPad share a unified user interface that can control and monitor temperature and many other parameters including vacuum, humidity, tensile and shear force (dependent on system). The LinkPad provides an easy-to-use interface to the T96, for total control without a PC. Profiles with up to 100 ramps can be programmed, allowing simulation of complex processes.

LINK software enhances this with data-logging functions and real time graphical feedback. Optional modules to enhance your system include the LINK Imaging Module for synchronised image capture, the LINK Extended Measurements module to measure key image features, the LINK 21CFR11 Module for data regulatory compliance, and LINK TASC providing image-based thermal analysis.



Imaging Station

The Imaging Station provides a digital imaging platform compatible with Linkam temperature and environmental control systems. Use our high-resolution camera to capture images and videos of your samples while controlling the temperature and environmental conditions.

The Imaging Station has been specially designed with a pivoted mechanism to allow greater access to your Linkam stage, making it quick and easy to access the chamber and change samples. It has a built-in LED light source for transmitted light with further options available for reflected light, polarisation and phase contrast imaging.

The Imaging Station is also compatible with a range of long working distance objective lenses which can be easily switched with the quick-release mechanism.

CAP500

The CAP500 is designed to study samples in a ≤ 50mm section of high pressure quartz capillary with temperature control from < -195°C up to 500°C.

Samples can be pumped through the capillary at a specific pressure using a pump and pressure gauge to investigate the rheology of the sample with respect to temperature and pressure using brightfield, IR or Raman microscopy.

The CAP500 has also been used to study the geological fluid inclusions created in quartz capillaries. Our dual capillary CAP500 option allows two capillaries to be tested simultaneously.

Contact Details

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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 products are constantly being improved, hence specifications are subject to change without notice.
TASC products are a family of techniques developed by Prof. Mike Reading (Cyversa) and Linkam.

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