CCR1000 - Catalyst Cell Reactor System

The CCR1000 Catalyst Cell Reactor enables the user to carry out small scale tests on catalyst formulations and analyse the results using a number of gas analysis techniques.

Features and Benefits

The new catalyst stage from Linkam has been designed to study catalytic reactions at high temperature and pressure. Samples are mounted on a virtually unreactive disposable ceramic fabric filters placed inside the ceramic heating element .

The carrier gas is introduced into the stage via a high pressure 1/16 gas line. The gas is then partially pre heated and passes through the sample and ceramic fabric filter. The tube of the heater is very narrow to prevent dead space and hot enough to prevent any condensation of the gas before it is available for gas analysis. Corrosive gases can be used and even highly conductive gases such as helium or hydrogen with no compromise on temperature performance.

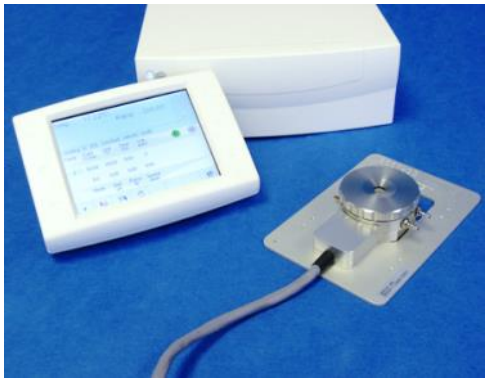
All parts of the cell in contact with the sample and gas are selected for their unreactive properties. The majority of the parts in contact with sample and carrier gas are either ceramic or stainless steel. A variety of different lid window materials are available so that reflected light microscopy, and Raman techniques can be used.

The base plate can be modified to fit either Marzhauser or Prior Motorized stages. Regular Linkam stage clamps can be used to mount to the substage of standard light microscopes.

The temperature is accurately controlled by the T95 controller via the S-type platinum/rhodium thermocouple. This new controller can heat samples at an incredible 200°C/min. The programmer contains a DC power supply - to eliminate electromagnetic interference and solid state heater protection to prevent accidental damage to the stage. Thermocouple linearization (linearized to 0.1° C and displayed to 1°C) and cold junction compensation are performed inside the T95 controller.

The CCR1000 heating stage

Temperature Range ambient to 1000°C



CCR1000 System with T95-LinkPad controller

System Options

There are two different system controller options:

T95 LinkPad

This system includes the excellent new standalone T95-LinkPad system controller with ergonomic LCD touch screen control and data sampling of 20 times per second. The controller has both USB and RS232 connectivity to add Linksys 32X system control software. See the T95 system controller Product Brochure for more details.

T95 LINK

This system includes the new T95-LINK system controller including new LINK system control software, enabling PC control of temperature, data acquisition and export as well as multiple ramp programming. (Requires PC, cannot be used as standalone controller).

Optical Specifications

The high temperature stages are designed to be used with an upright microscope, where the objective lens is above the sample. (Vertical mounting for x-ray is also possible).

When working with heating stages, it is necessary to use long working distance objective lenses. The objective lens is isolated from the sample by the stage lid window which is a fixed distance from the heating/cooling element. The diagram shown here demonstrates how this distance is measured.

We recommend that you use an objective lens with at least 6mm working distance. The CCR1000 can only be used in reflected light applications. Transmission is not possible.

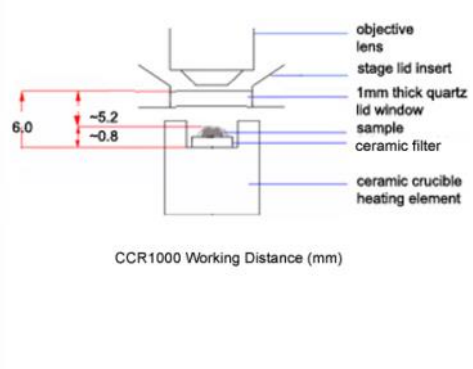


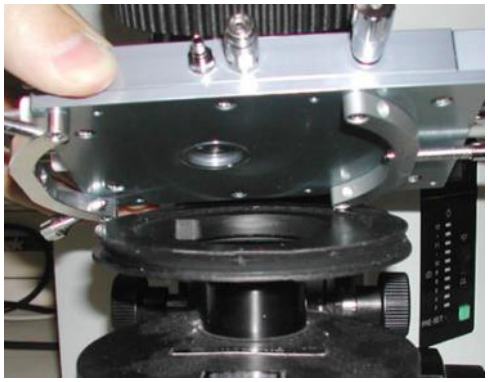
Diagram of objective lens working distances.

Attaching CCR1000 to Microscope

Upright microscopes whether standard optical, or part of a Raman system, usually have an XY table or circular POL table to move the sample relative to the objective lens. If the XY table is a motorized type made by Marzhauser or Prior, the CCR1000 will fit into the recess in the table. Standard mechanical XY and POL tables should be removed from the microscope substage and stage clamps mounted on the base of the CCR1000 should be used.

Linkam manufactures different stage clamps to attach the CCR1000 stage to many different brands of microscope. The stage clamps are required to adjust the position of the hotstage relative to the light path of the objective lens.

Select the stage clamps you require from the Stage Clamps section on our website.



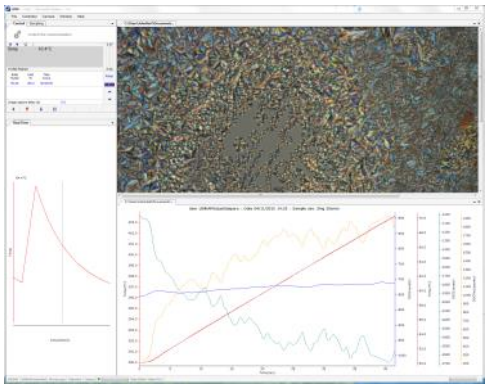
stage clamps being attached to circular dovetail substage.

Increase Capability Options

There are several options to increase the capability of the high temperature systems.

LINK (Digital Image Capture) and Digital Camera

Add system control with digital capture software and one of the range of Linkam approved cameras to enable multiple ramp temperature profiles with time lapse image and data capture. All T95 controller data is saved with the image. Quickly find single or groups of images by dragging a box around an area of the time/temperature graph or scrolling through the gallery. Create movies of experiments and add scale bar, annotations, and measurements. (See 'Software and Image Capture' on our website for more information).



LINK software. A sequence of time lapse captured images is shown in the gallery.

Specifications:

- Temperature range from ambient to 1000°C
- Heating rates from 1 to 200°C/min
- Temperature stability 1°C
- Pressure up to 5bar (with quartz window installed)
- Sample size: 5.5mm diameter, accommodates between 70-100mg (dependent on sample type)
- Samples loaded on low cost disposable ceramic fabric filters
- Standard size 1/16 gas analyser high pressure connectors
- Compatible with reflected light upright microscopes and Raman microscopes
- Objective lens minimum working distance: 6mm
- Easily replaced quartz or glass window
- Simple removable ceramic sample holder
- All critical component parts manufactured from non reactive materials
- Water cooling to keep stage body at safe temperature
- Gases remain at elevated temperatures preventing condensation before analysis
- Compatible with Marzhauser and Prior motorized XY stages

What do you need for a complete solution?

Add the options below to complete the Catalyst system.

Add Controller

Either T95-LinkPad standalone system controller

Or T95-LINK PC interface and LINK system controller software

Add Stage Clamp to mount to microscope substage (unless using Prior or Marzhauser XY Stages)

See Website ‘Stage Clamps’

Add System Control Software (Not necessary if T95-LINK is selected.)

LINK, set up temperature control profiles, save and export data.

Add System Control software including the Digital Video Capture Option

LINK, set up temperature control profiles, display live image, capture time lapse images with data. Requires digital camera

Add LINK compatible Camera

Required to work with LINK, many camera options in the range.

Add Linkam Imaging Station

Imaging platform with optics mounted on a retractable arm to allow unrestricted sample access. See website ‘Imaging Station’.

Suggested Spares

These spares are organised into a convenient kit. Purchase a spares kit to avoid downtime with your stage and eliminate future shipping costs.

Part No.	Part Name	Part Description
9848	**CCR1000 kit**	**Replacement Spares Kit**
	CCR-SLK	Sample Loading Kit
	CCR-CC	Ceramic Cloth for Sample Loading (6x3.5cm) **x4**
	CCR-CPF	Cole Palmer Fitting with Ferrule **x4**
	W22Q1	22mm Diameter Quartz Window, 1mm thick **x2**
	CCR-ALSH	Alumina Sample Holder
	RING	O Ring ID18.0 x CS1.5 Viton **x2**
	WTK	Water Tube Kit: 3x WVC Hose Valve, 3x Clear PVC 3x6mm Tubing
	CCR-SP	Micro Spatula

Part No.	Part Name	Part Description
9754	**CCR-B**	**Ceramic Heating Element including S-Type Thermocouple**