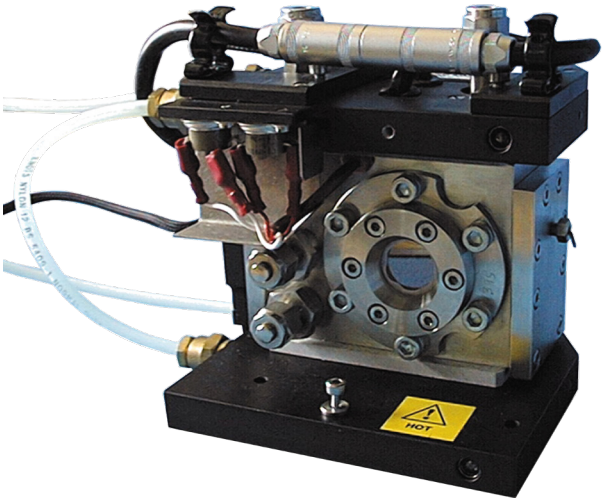
Specac

Product Datasheet

High Temperature / High Pressure Transmission Cell

The Specac high temperature/high pressure cell (HT/HP cell) is intended for characterization of solid samples, including heterogeneous catalyst systems. It can be heated up to 800 °C and pressurized to a certified 1000 psi with a gaseous atmosphere from up to three gas feeds. It is capable of three analysis modes: transmission, reflectance, and decomposition of solids.



Key Features of the HT/HP Cell

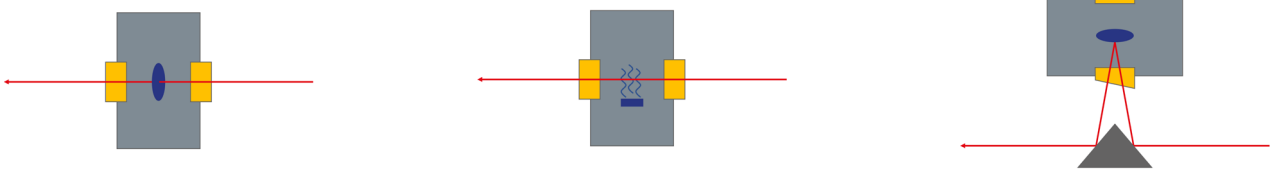
- Sealed sample chamber with controlled atmosphere
- Temperature up to 800 °C / Pressure from vacuum to 68 bar (1000 psi)
- Converts to specular reflectance mode for opaque or reflective samples using external mirrors
- Sample pans allow analysis of gases released from thermal decomposition of solids
- Unmatched performance
- Ideal for characterisation of coal, catalysts, resins/polymers, ceramics, and minerals

Applications

- Catalysts and catalyst supports
- Thermal behaviour of plastics and resins
- Characterisation of optical constants
- Simulation of interstellar media

Specifications

Feature	Specification
Maximum temperature/ pressure	800±1.0 °C (dependent on gas thermal conductivity and pressure†), 1000 Psi
Vacuum	0.003 torr (4.0 x 10^{-3} mbar)
Pathlength	30 mm in transmission mode
Angle of incidence	15° in reflectance mode
Sample	Pellets or films 13 mm in diameter and up to 6 mm thick; powders or granules for decomposition mode.
Windows‡	ZnSe (contact us for other options)
Sealing	Silicone O-rings (contact us for other options)
Temperature Sensor	K-type thermocouple
Connections	4x Swagelok fittings (3 inlets; 1 outlet) for 1/4" O.D. tubing
Materials	Stainless steel (cell body); Incalloy 800HT (sample heating post)
Cell volume	80 ml
Safety features	"Burst disc" valve to prevent over pressurization; thermal cut-out to prevent overheating; water cooling jacket††.



Transmission Mode

The sample is prepared as a pellet or thin film of 13 mm diameter and up to 6 mm thickness. It is clamped directly into the Incalloy sample heating stage.

Decomposition Mode

The sample is placed in an Incalloy pan which rests on the sample heating stage. Evolved gases rise upwards into the path of the beam. The pathlength in this configuration is 30 mm.

Specular Reflectance

A modified baseplate with external mirrors is used. The cell is turned through 90 degrees to rest on its side with one window facing down towards the external mirrors. The angle of incidence is 15° and a specially modified window assembly is provided to help reduce interference fringing.

Ordering Information

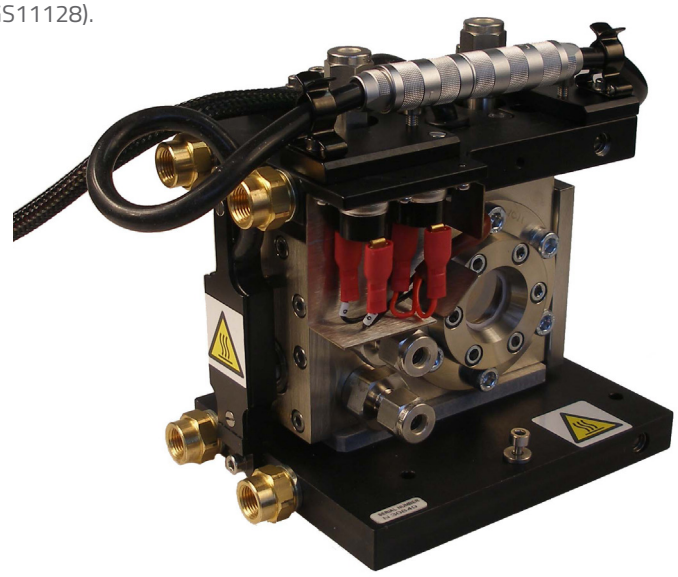
Part Number	Description
GS05850	High temperature / high pressure cell (including windows, baseplate, decomposition pans, and temperature controller)
GS05855	Advanced high temperature / high pressure cell including specular reflectance baseplate and window assemblies
GS05860	Reflectance mode upgrade kit consisting of baseplate, angled window assembly, and additional safety guard
GS05870	Essential spares kit for the HT/HP cell

Note: Please indicate country and spectrometer model to receive the correct baseplate for the accessory and power supply for the temperature controller.

†Maximum temperature varies with the gas thermal conductivity and pressure. For instance at 1000 psi of N_2 the maximum temeprature is 550 °C.

‡ZnSe windows are heated separately up to 240 °C to prevent condensation. Control of both sample and window temperatures is integrated into the same controller provided with the cell.

††A liquid-cooling jacket prevents overheating of the external cell components. A supply of circulating coolant is required, such as the Specac 12 L Thermostatic Bath (GS11128).



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