

Cells for MICROCALVET line: Specifications and applications**INTRODUCTION**

In calorimetry, the sample holder - more commonly called the cell - is certainly as important as the calorimeter itself. If the latter provides the functions of heating, cooling and measuring heat flow, the cell allows to perform specific operations within the calorimeter. It encloses the sample in the calorimeter sensor. It avoids most of the side reactions of the sample. And if it is instrumented, it allows to measure other experimental parameters such as pressure.

The choice of an experimental cell is therefore crucial to design a calorimetric test. First of all, it is necessary to choose the desired function: mixing, addition of gas, solid or liquid, pressure measurement, pressure control, etc. Then, it is necessary to make sure that the materials used in the cell will remain inert with respect to the tested samples and their possible corrosive emissions. Finally, it must ensure its function and stability over the temperature and pressure ranges considered for the calorimetric test.

This technical note lists the calorimetric cells available with the MICROCALVET calorimeters family at the time of writing. However, this list is not fixed and Setaram always offers its special development services in case an adaptation of the cells mentioned seems necessary.

**MICROCALVET****MICROCALVET
ULTRA**

1. MICROCALVET & Cells

INSTRUMENT

MICROCALVET

-45°C to 120°C



HIGHEST HEAT MEASUREMENT ACCURACY

3D sensor based on Peltier elements with Joule effect calibration.

MODIFIABLE TEMPERATURE CONDITIONS

for increased flexibility and replication of real life conditions.

CONVENIENT INTERCHANGEABLE CRUCIBLES AND CELLS

to perform even the most demanding experiments using one instrument :

- high pressure (1000bar) and high vacuum
- pressure measurement and control
- mixing experiment


EXTERNAL COUPLING CAPABILITY

designed to increase your research options including manometry, BET instrumentation, gas analyzers, humidity controllers and gas panels

BATCH CELL

Main functions and applications :



Melting - Crystallisation / Thermal stability / Phase transitions / Heat capacity (Cp) / Denaturation

CELL	MAIN APPLICATION	MAXIMUM TEMPERATURE	MAXIMUM PRESSURE	MAXIMUM VOLUME
 <p>Standard cell</p>	Heat capacity, thermal behaviour, phases transformation, denaturation	120°C	20 bar	850 µl

MIXING AND REACTION CELLS

Main functions and applications :





Dissolution / Hydratation / Chemical reaction / Interaction

CELL	MAIN APPLICATION	MAXIMUM TEMPERATURE	MAXIMUM PRESSURE	MAXIMUM INTERNAL VOLUME
 <p>Mixing Cell</p>	Reaction, dissolution, dilution, wetting...	120°C	5 bar	200µl (upper) + 550µl (lower)
 <p>Wetting glass ampoule cell</p>	Immersion, wetting, reaction, adsorption...	120°C	5 bar	Ampoule: 100µl Cell: 650µl

CONTROLLED HIGH PRESSURE CELLS

Main functions and applications :

Sorption / Thermal stability / Phase transitions / Heat capacity (Cp)

CELL		MAIN APPLICATION	MAXIMUM TEMPERATURE	MAXIMUM PRESSURE	MAXIMUM INTERNAL VOLUME
High Pressure Cell 400 bar		Heat capacity, thermal behaviour, phases transformation, sorption...	120°C	400 bar	330 µl
High pressure cell 1000 bar		heat capacity, thermal behaviour, phases transformation, sorption...	120°C	1000 bar	190 µl
High Pressure Cell with stirring		Liquid-gas reaction, gas hydrate...	120°C	150 bar	300 µl
Gas circulation cell		Solid-gas reaction, liquid-gas reaction, humid gases, thermal behaviour, phases transformation...	85°C	20 bar	850 µl

2. MICROCALVET ULTRA & Cells

INSTRUMENT

MICROCALVET ULTRA

-20 to 170°C




- HIGHEST HEAT MEASUREMENT ACCURACY**
 3D sensor based on Peltier elements with Joule effect calibration.
- MODIFIABLE TEMPERATURE CONDITIONS**
 for increased flexibility and replication of real life conditions.
- CONVENIENT INTERCHANGEABLE CRUCIBLES AND CELLS**
 to perform even the most demanding experiments using one instrument :
 - high pressure (1000bar) and high vacuum
 - pressure measurement and control
 - mixing experiment
- EXTERNAL COUPLING CAPABILITY**
 designed to increase your research options including manometry, BET instrumentation, gas analyzers, humidity controllers and gas panels

BATCH CELL

Main functions and applications :


Melting - Crystallisation / Thermal stability / Phase transitions / Heat capacity (Cp) / Denaturation

CELL	MAIN APPLICATION	MAXIMUM TEMPERATURE	MAXIMUM PRESSURE	MAXIMUM VOLUME
Standard cell 	Heat capacity, thermal behaviour, phases transformation, denaturation	170°C	20 bar	850 µl

MIXING AND REACTION CELLS

Main functions and applications :


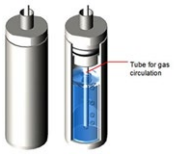
Dissolution / Hydratation / Chemical reaction / Interaction



CELL	MAIN APPLICATION	MAXIMUM TEMPERATURE	MAXIMUM PRESSURE	MAXIMUM INTERNAL VOLUME
Membrane mixing Cell 	Reaction, dissolution, dilution, wetting...	180°C	5 bar	170 µl (upper) + 200 µl (lower)

CONTROLLED HIGH PRESSURE CELLS

Main functions and applications :

Sorption / Thermal stability / Phase transitions / Heat capacity (Cp)

CELL		MAIN APPLICATION	MAXIMUM TEMPERATURE	MAXIMUM PRESSURE	MAXIMUM INTERNAL VOLUME
High pressure cell 300/400 bar		Heat capacity, thermal behaviour, phases transformation, sorption...	150°C (400bar) or 170°C (300bar)	300 and 400 bar	330 µl
Gas circulation cell		Solid-gas reaction, liquid-gas reaction, humid gases, thermal behaviour, phases transformation...	170°C	20 bar	850 µl

		
BATCH CELLS		
Standard cell	●	●
CONTROLLED HIGH PRESSURE CELLS		
High Pressure Cell 400 bar	●	
High pressure cell 1000 bar	●	
High Pressure Cell with stirring	●	
Gas circulation cell	●	●
High pressure cell 300/400 bar		●
MIXING AND REACTION CELLS		
Membrane mixing Cell		●
Mixing Cell	●	
Wetting glass ampoule cell	●	