



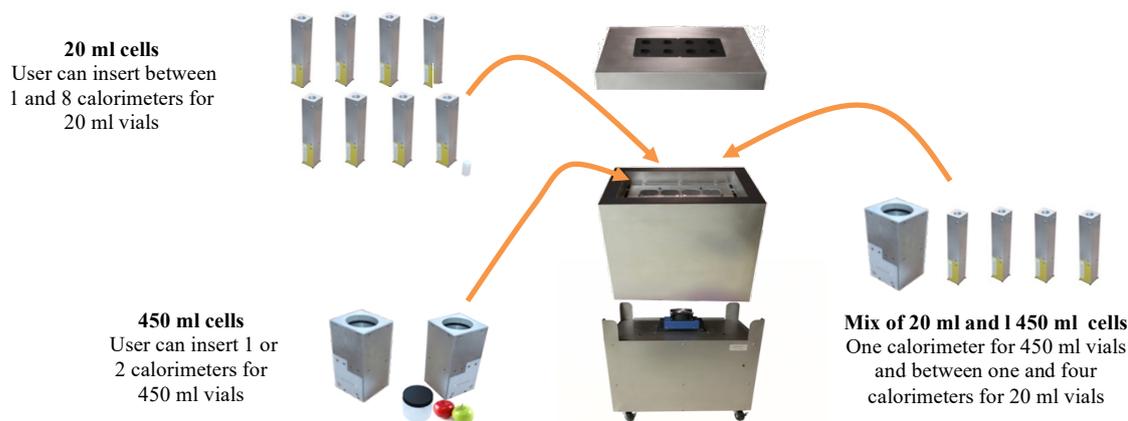
**I-CAL FLEX FOR THE LIFE SCIENCES  
SPECIFICATIONS SHEET**

**About Isothermal Calorimetry in Life Sciences.**

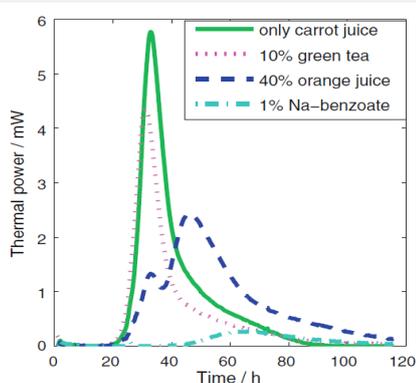
Life Sciences study living things and their life processes, as well as how they are affected by their environment. Isothermal calorimetry is a powerful tool to study such processes, by measuring the heat released by biological or chemical activity in an active sample while the surrounding temperature is maintained constant. The Calmetrix I-Cal Flex is an isothermal calorimeter that combines a high degree of flexibility, outstanding performance and ease of use.

**Built-in flexibility.**

I-Cal Flex not only features the highest performance in its class, it is also flexible in every way. Its design allows for up to eight individual calorimeter cells of 20 ml capacity for smaller homogeneous samples requiring a high level of precision, or up to two large calorimeter cells, with sample vials of 450 ml capacity for large inhomogeneous samples such as soil, meat, marine life, wood, or even fruits up to the size of apples or oranges. The 20 ml and 450 ml cells are seamlessly interchangeable in minutes. An advanced air-circulating thermostat offers excellent temperature stability of +/- 0.001 °C and a temperature range of 2°C to 90°C, I-Cal Flex is ready for long-term studies at all temperatures, including shelf life in real refrigerated conditions, etc.



**Case Study: Effectiveness of preservatives**

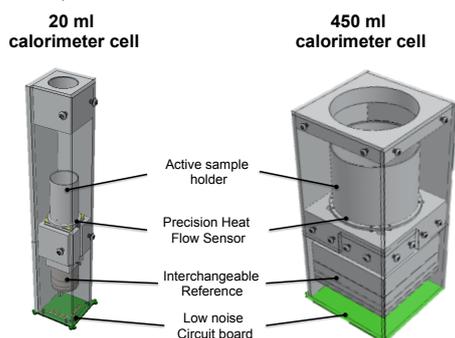


In industry and academia, it is common to assess the influence of a given additive on the activity of microorganisms, for example when developing preservatives or additions of antimicrobial compounds. isothermal calorimetry offers a much less laborious than e.g. plate counts way to quickly assess the efficiency of preservatives. A single sample with each preservative to be tested is enough for the calorimeter to measure microbial activity continuously and in real time. One can rapidly and clearly assess the onset of microbial activity in each sample. In this example, the addition of green tea reduces microbial activity to some degree, but does not increase shelf life. A blend with orange juice produces a similar effect. Only the sodium benzoate increases the shelf life from 20 hours without any preservative to more than 45 hours.

I-Cal Flex 20 ml calorimeters are compatible with plastic or glass vials. Accessories are also available for uses such as injection of liquids, stirring, gas atmosphere control and external sensors or probes.

### Outstanding performance.

The I-Cal Flex has the highest performance of all microcalorimeters in its class. With individual calorimeter cells that are completely isolated from each other, cross-talk is non-existent. A high precision thermostat, with tightly controlled air flow and optimized design of calorimeters gives the I-Cal Flex a baseline that is ten times more stable than that of its closest competitor, which warrants precision especially for long-term measurements (multiple weeks or months).



Specifications	
Operating Voltage	110 - 240 VAC - 50/60Hz
Sample size	Up to 20 ml / up to 450 ml
Operating Temperature Range	2 °C to 90 °C
Temperature Stability	+/- 0.001 °C
Detection Limit	2 μW
Precision*	+/- 2 μW
Number of test channels	1 - 8 (user defined)
Baseline* (24 hours)	
Drift	< 5 μW
Random noise	< +/- 1 μW
Dimensions	L20"xW16"xH44" (50 cm x 40 cm x 108 cm)
Weight	75 lbs (34 kg)

\* as measured in 20 ml calorimeter at 23 °C. I-Cal Flex is an instrument suited for high precision testing in an advanced research laboratory setting. Optimal performance and conformance with specifications is achieved when placed in a climate-controlled room according to standard research laboratory conditions.

### A wide range of applications in the Life Sciences.

I-Cal Flex is versatile without sacrificing ease of use for a wide range of applications in all fields of Life Sciences. The 450 ml calorimeters are well-suited for inhomogeneous or large samples such as whole fruit, soil samples, marine life, germinating seeds, or studies of products in their packaging. The smaller 20 ml calorimeters offer the high level of precision required for applications such as microbial activity, cell studies, drug-excipient compatibility or long-term stability of chemicals.

#### Food Science



Spoilage and shelf life  
Metabolic response  
Preservation techniques  
Fermentation  
Degradation of packaging

#### Microbiology



Microbial growth  
Infectious diseases testing  
Antimicrobial surface coatings  
Mold & yeast growth  
Cell studies

#### Agricultural Science



Seed germination  
Fungal diseases on plants  
Soil testing / contamination  
Composting / Organic decomposition  
Insect resistance to pesticides

#### Environmental Science



Insect metabolism  
Activity of mosses, molds or lichens  
Marine life studies  
Sludge activation / treatment  
Water treatment (purity testing)

#### Pharmaceutical



Active ingredient / excipient compatibility  
Stability testing  
Crystallinity / polymorphic studies  
Degradation and temperature sensitivity  
Packaging and shelf life