

Differential Scanning Calorimeter (DSC)

The specifications of parameters obtained by measurement of temperature ($^{\circ}\text{C}$) must be based on raw data, without subjecting it to any mathematical operations such as interpolation, convolution/deconvolution, smoothing, etc. The parameters related to heat energy (μW) must be similarly derived from such raw data measured in real time. An explicit statement to this effect must be provided by the bidder. Modulated DSC system for the measurement of the phase transition, Enthalpy, OIT, Glass Transition, Crystallinity & Heat capacity applications for various sample & software for data analysis.

Specifications:

Temperature Range	-130 $^{\circ}\text{C}$ to 550 $^{\circ}\text{C}$ with suitable cooling system
Temperature Accuracy	$\pm 0.1^{\circ}\text{C}$
Temperature Precision	$\pm 0.01^{\circ}\text{C}$
Baseline Flatness	$< 100 \mu\text{W}$
Baseline Repeatability	$< 50 \mu\text{W}$
Baseline Accuracy	$\pm 85 \mu\text{W}$
Sensitivity	0.2 μW with resolution of 0.001 μW
Heating Rate	0.1 C to 200 C/ min
Cooling Rate	0.1 C to 100 C/min
Calorimetric Accuracy (reproducibility in the measurement of enthalpy in ≥ 10 independent runs with Indium standard)	$\pm 0.5\%$
Calorimetric Precision (repeatability of determined enthalpy change in three or more Indium samples)	$\pm 0.2\%$
Dynamic Range	± 350
Furnace and stage configuration	Same furnace, separate stages for sample and reference pans
Temperature sensors	Area temperature detectors must be employed.. Separate detectors for sample and reference stage must be provided, plus an additional, thermally isolated thermocouple for independent reference of temperature control must be provided. Sensors must be positioned so as to enable users to replace their own DSC cells in the same DSC system, without having to contact delicate thermocouple leads.
Purge gas	Purge gas must be dried and preheated before entry into furnace. Gas flow rate must be programmable from instrument control front end and must form part of record via instrument data acquisition

Sinusoidal modulation of heating and cooling ramp.	Amplitude of sine wave: ± 0.01 to 3°C ; frequency: 10 to 200 seconds. Real-time Fourier transform must be performed on data as it is acquired in real time. Fourier transform of entire thermogram, post-acquisition, is not acceptable.
Press and dies	For sealing Aluminum pans & Hermetic pan
Data acquisition, data analysis and instrument control software	Temperature and time data should be acquired and processed in real time. The software should be able to analyse thermograms to calculate: Total Heat Flow, Total Heat Capacity, Reversing Heat Capacity, Reversing Heat Flow, Kinetic Heat Flow, Modulated Temperature, Modulated Heat Flow, Heat Flow Phase, Reference Sine Angle, Temperature Amplitude, Heat Flow Amplitude and to be able to analyse and integrate individual endo/exotherms to calculate Onset, Maximum, Endpoint, Enthalpy, Heat Flow. Options to carry out transforms including first and second derivative, Fourier transforms, must be provided.
Spares and consumables	Emergency spares and consumables and pans/lids 500 no(Each) for experiments must be supplied for solid, powder & liquid sample.
Warranty	1 years
Local Item	1.Nitrogen Gas cylinder + Regulator
	2.PC + Printer
	3.ONLINE UPS 3KVA with 30min backup
	4.Analytical Balance 4 digit prefer (milligram)