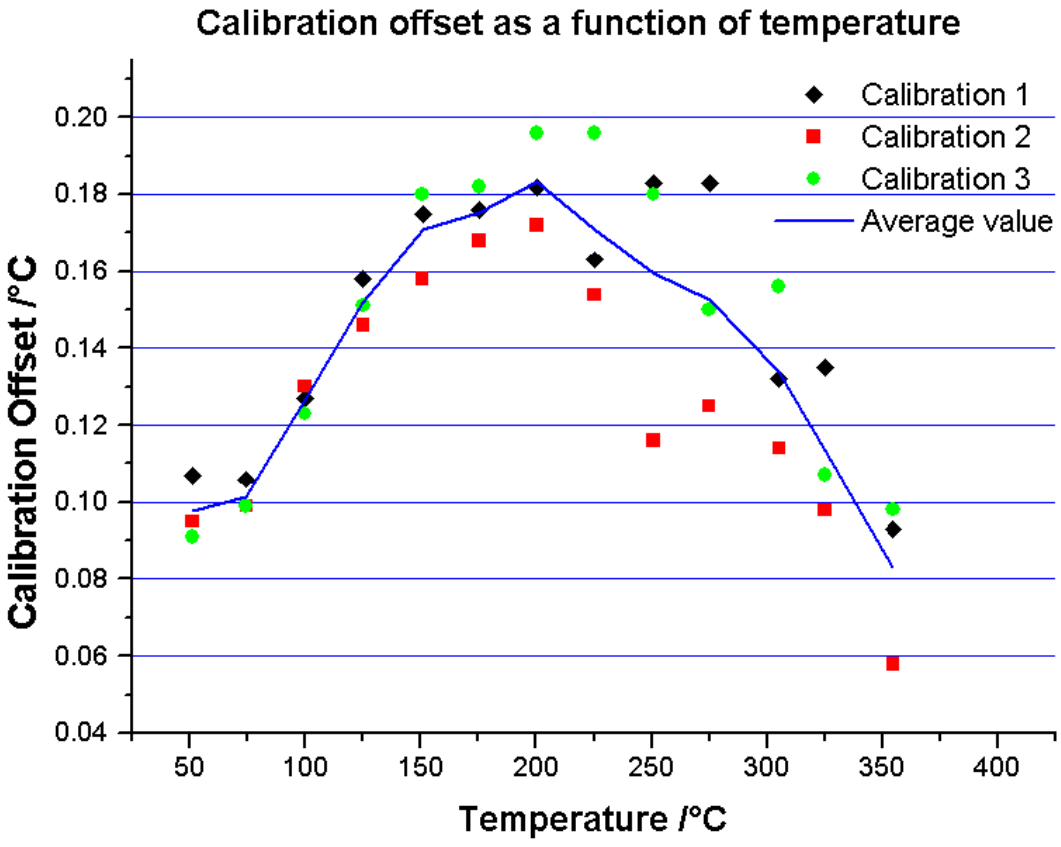
Technical Information Sheet No 71

Calibration for High Sensitivity Operation and Calibration Reproducibility with the THT Accelerating Rate Calorimeter

In order to work with onset detection below 0.02°C/min, calibration at higher sensitivity is required. This may be 0.005°C/min but calibration down to 0.003°C/min or 0.002°C/min is possible. Calibration at high sensitivity will take longer than the lower sensitivity and may often be carried out over a smaller temperature range. For example, if an onset is expected at around 100°C then a calibration range of 50-200°C may be appropriate.



The above data shows three consecutive calibrations at 0.005°C/min over the range 50-300°C and compares these to the average of the three values. We would not recommend calibrating to temperatures above 300°C at high sensitivities

From these data and their repeatability, the maximum sensitivity of the instrument can be determined. Note that the maximum sensitivity of an adiabatic calorimeter depends on its thermal stability under adiabatic conditions.

Temp (°C)	Average (°C)	Spread (°C)
50	.099	.008
75	.103	.004
100	.126	.004
125	.152	.006
150	.168	.011
175	.175	.007
200	.184	.012
225	.175	.021
250	.150	.034
275	.154	.029
300	.135	.021
325	.117	.019
350	.076	.018

The data shown here were collected with a THT design square calorimeter, which is approximately 4 years old. This calorimeter has been used for approximately 300 tests and is still functioning with the original thermocouples. It is likely that as calorimeters age their performance deteriorates – though this is not indicated here.

At a sensitivity of 0.005°C/min providing the thermocouples are functioning normally and there is no detrimental chemical contamination there should be no problems achieving satisfactory calibration. A new calorimeter will provide better performance however these data show the quality of data that can be measured with old equipment.