How do I calibrate a Heated Golden Gate?

Within the top plate area of the Heated Golden Gate diamond ATR accessory (P/N GS10540 – 200°C, or P/N GS10640 - 300°C), the temperature measuring thermocouple is situated as close as it can be to the diamond to record the actual surface temperature. Diamond is a very good heat conductor and so any discrepancies between the measurement position temperature and the surface temperature of the diamond should be small.

If the actual surface temperature of the diamond is required to be known, it could be necessary to calibrate the heated Golden Gate top plate diamond surface itself using a range of solid samples with different melting point temperatures. If suitable standards can be found corresponding to say 50°C, 100°C, 150°C, 200°C and 250°C melting point temperatures they can be placed on the diamond and observed for their melting point as the temperature is reached and indicated on the temperature controller. The temperature should be raised slowly and steadily to account for any thermal lag etc. As the actual temperature when the standard sample should melt is known, the temperature could be raised to say within 10 degrees of the melt temperature and approached by 1 degree changes to get an accurate representation of the temperature melt figure.

A graph can be constructed for the temperature displayed by the controller when the sample melts, against the actual known melting point temperature of the standard sample. The more samples you can measure the better as there would be a wider spread of more points to plot. A calibration curve can be constructed which should indicate the likely temperature of the diamond surface as opposed to the temperature being read by the thermocouple for the controller display.

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