Water adjustment

For materials that were thermally stable to higher (~250 °C) temperatures, mass loss observed at 100 °C was attributed to evolution of water used in the dispersing process. Compensation was performed by adjusting the initial "coated" weight to the weight obtained after water was removed (typically at 100 °C).

For example: A crystal was coated and then heated to 100 °C. The material deposited on the crystal typically begins decomposition after 250 °C.

	Heat corrected (Hz)	Mass (wt %)	Mass (μg)
Coated	9982198.1	100.0	4.26
100 °C	9982803.0	87.0	3.71

Because the material in the water dispersion is thermally stable at 100 °C, the mass loss is attributed to water loss.

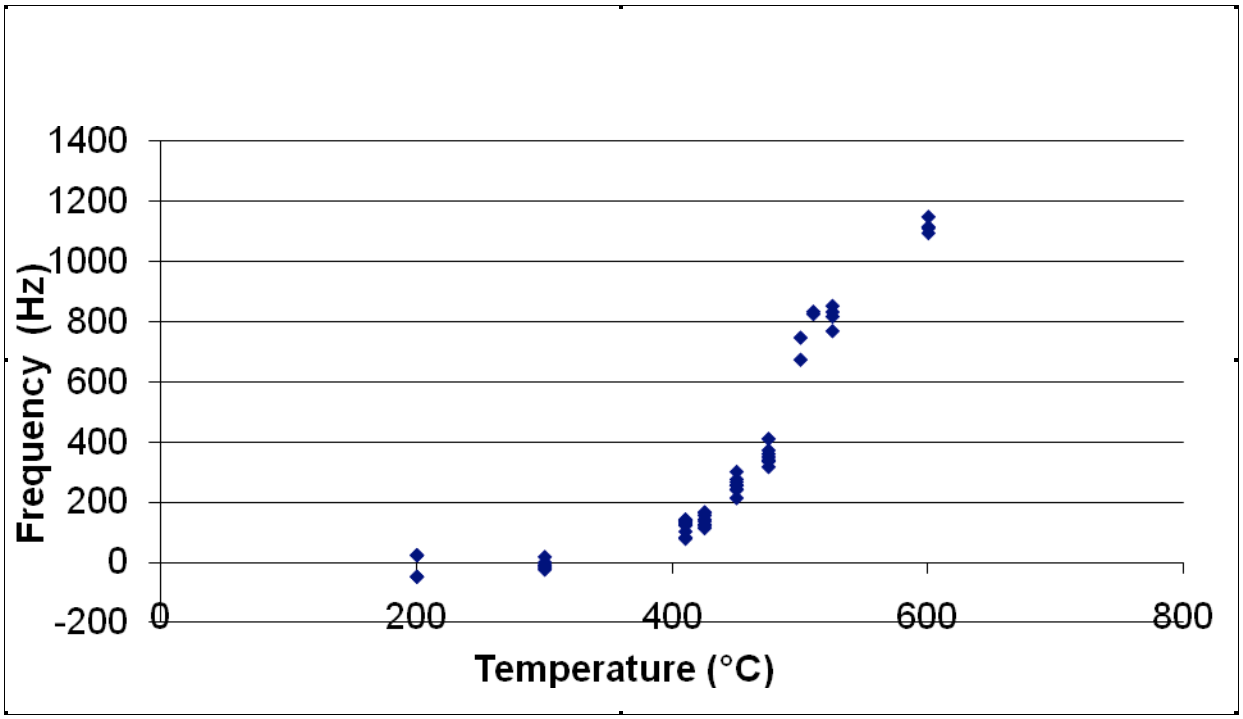
By the Sauerbrey equation, 0.55 μg of water evaporated during the 100 °C heating. The new mass of the coating (3.71 μg) is taken to be the actual coating mass.

A sample calculation of how the water adjustment is applied:

	Heat corrected (wt %)	Mass (μg)		Water adjusted (wt %)	Adj. Mass (μg)
Coated	100.00	4.26			4.26
T_1, 100 °C	86.97	3.71	3.71 μg is set as actual coating mass →	100.0	3.71
T_2, 525 °C	68.80	2.93		79.0	2.93
T_3, 600 °C	36.35	1.55		41.8	1.55

2. Heating Corrections

While bare crystals are heated alongside coated crystals to correct for changes in the crystal as a result of heating, we have found that the changes in the QCM from heating are fairly reproducible on their own. Below is a figure demonstrating change in frequency as a result of temperature.


1400
1200
1000
800
600
400
200
0
-200
Frequency (Hz)
0
200
400
600
800
Temperature (°C)