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General Information on Humidification:

How does the accuracy of your Saturator / Humidifier affect the results of your tests?

Currently, state of the art Proton Exchange Membrane(PEM) Membrane Electrode Assemblies (MEAs) are optimized to manage water. Existing ionomers require water to conduct ions. But, too much water in the gas reduces the concentration of the reactant gas and dramatically reduces the diffusion of the reactant gas.

To illustrate the effects of Relative Humidity (RH) on membrane performance, consider that the conductivity of Nafion at 80% RH is a factor of two less than its conductivity at 100% RH. So, the accuracy of your humidifier is going to directly affect the results of your tests.

For a given set point, many humidifiers produce dew points which are a function of flow rate and/or time on test. When flow rates change, as current is increasing, you may see features in the data that appear to be a function of current density. These changes may actually be attributed to changes in dew points that are occurring at the varying flow rates. Changing dew points may also be occurring in samples tested over periods of time, as many humidifiers are unable to achieve stable dew point control.