

# Temp Calibration-Ice Point

## APPARATUS

Measurements shall be made on an apparatus suitable for the characteristic of the component to be measured as follows;

Ice point temperature resistance measurements may be taken using a digital multimeter with an accuracy of +/- .01%.

## ICE POINT TEMPERATURE RESISTANCE

In a Dewar flask, place distilled water, and shaved or crushed clear ice (<2mm pieces) made from distilled water. The bath should have enough water to provide good thermal contact with the thermometers, but not enough to float the ice. The spaces between ice particles must be filled with water (no air pockets) and the ice must extend all the way to the bottom of the Dewar flask. Left to itself, a cavity may form as the conducted heat melts the ice, hence stirring is required every few minutes. The tool used for stirring should not be removed from the Dewar flask during the test, to avoid introducing heat sources.

Thoroughly clean the Standard Thermometer and Test Instrument with distilled water and insert them into the bath, leaving a minimum of 1" of ice at the bottom of the Dewar Flask.

Note: In general, when you push down on the ice pack, the water should rise only ¼" above the ice pack.

Refer to the Job Card Instruction form 4.9 and or the drawing to determine the allowable tolerance at the ice point temperature.

Measure the ice point resistance of the sensor.

Note: The ice point bath is the most widely used and simplest fixed point. The ice bath may be realized with an error of less than 0.01°C. Contamination of any surfaces and or touching the ice with your hands, may be jeopardize the accuracy of the ice point. Wipe down the Dewar flask and ice crusher with distilled water prior to performing this test. Immersion Error may occur if the thermometers are not immersed at least 2 to 3 inches into the bath. To avoid this error, place small thermometers into quartz tubes filled with Magnesium Oxide (MgO) to enable full immersion. Allow the temperatures to stabilize for at least ½ hour, stirring the ice frequently, and draining off excess water. Add ice as necessary. Galvanic Error may occur if water is allowed to touch element or extension wires, especially dissimilar metals in thermocouples. A galvanic cell may be set up, causing voltages that alter thermometers output in millivolts or resistance.