

Digital Thermometer Calibration



Thermometer basics:

- Thermometers used frequently must be calibrated frequently (weekly or monthly).
- Follow manufacturer's instructions for taking temperatures.
- Always calibrate a new thermometer, one that has been dropped on a hard surface, or one with a temperature reading that is off by more than $\pm 2^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$).
- It's best to test both ice-point and boiling-point calibration, as thermometer sensitivity may differ at extreme ranges.
- If the thermometer uses batteries, check battery freshness often and replace if necessary.
- Calibration is also available from manufacturers or third-party facilities, for a fee.
- Keep a calibration log according to your store's policy.
- Make sure the thermometer has a reset button. If it does not, you cannot recalibrate the thermometer.



probe

Photo credit:
Ed Kohler (www.TheDeets.com)

To calibrate an adjustable digital thermometer:

Ice-Point Method

- Fill a glass with crushed ice and add cold water until the glass is full.
- Insert thermometer probe in the center of the glass of ice water, not touching the thermometer to the bottom or sides of glass.
- Stir slightly, then wait until temperature indicator on the thermometer is stabilized.
- The temperature should read 32°F (0°C). If it doesn't, push reset button and adjust to read 32°F (0°C) while probe is in ice water bath.

Boiling-Point Method

- In a deep pan, boil distilled water to a rolling boil. DO NOT REMOVE FROM HEAT.
- Place thermometer probe in the center of the rapidly boiling water, not touching the thermometer to the bottom or sides of pan. Make sure to protect your hands from steam.
- Wait until temperature indicator on the thermometer is stabilized.
- The temperature should read 212°F (100°C).
- If it doesn't, push reset button and adjust to read 212°F (100°C) while probe is in boiling water.
- An adjustment is also necessary for high altitudes. For every 550 feet above sea level, the boiling point of water is 1°F lower than 212°F . For example, at 5,500 feet above sea level, the boiling point of water is 202°F . Thermometers will need to be adjusted accordingly.

For all thermometers:

- Non-adjustable digital thermometers may be accuracy checked, even if they can't be adjusted by the user.
- Use a National Institute of Standards and Technology (NIST)-certified thermometer for testing thermometer accuracy. (NIST provides certification that a thermometer is accurate within certain limits for a specified time period.)
- Insert the probe of the NIST thermometer into the same ice water or boiling water bath as the test thermometer, making sure they don't touch each other or touch the bottom or sides of the container.
- Compare readings on both thermometers. Temperature readings using the test thermometer must be adjusted by the degree difference between the NIST and test thermometer. For example, if the NIST thermometer reads the boiling point at 212°F and the test thermometer reads the boiling point at 210°F , all high-range temperature readings using the test thermometer would be adjusted up by 2°F .
- NIST-certified thermometers may be used for accuracy comparison for adjustable digital thermometers and analog thermometers, as well.

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