

- Thermometers must be checked annually for accuracy.
- Batteries must be changed every 6 to 12 months and the date recorded.
- Each PBVR must have a back-up battery operated min/max thermometer in use, in case of power outage or transport of vaccines. (see [Appendix 1](#) 'Vaccine management protocol').

4.6 How to check the accuracy of a thermometer ('slush test')

The slush test is a practical, reliable technique for checking the accuracy of a thermometer at the freezing point of water. By leveraging the stable temperature of an ice-water mixture at equilibrium, users can quickly assess whether a thermometer requires recalibration or replacement. While the test is best suited for routine checks and offers a meaningful snapshot of accuracy, it should be complemented with comprehensive calibration procedures for high-precision applications.

Conducting the test:

1. Place a cup of cold water in the freezer until a fine layer of ice forms on the top and small sections of ice form within the fluid (this may take up to 2½ hours). The presence of ice is an indication that the temperature of the water has reached 0°C.
2. Place the temperature probe into the middle of the container (be careful not to let the probe touch the container).
3. Observe the temperature on the display screen after 2 minutes.
4. Document the date of the accuracy check.

Note: This test is only for water-proof devices.

Rationale

The temperature reading will drop quickly at first and then more slowly. The temperature should drop to 0°C within 2 minutes.

An 'acceptable' degree of accuracy of a thermometer can vary within $\pm 1^\circ\text{C}$, so it is recommended to check with the thermometer supplier for the expected accuracy. Even if the thermometer is considered accurate to within $\pm 1^\circ\text{C}$, the accuracy check could result in 3 possible readings - $+1^\circ\text{C}$, 0°C and -1°C .

Record the results of the accuracy check on your temperature monitoring chart. This information is important, particularly if the PBVR temperature goes outside the recommended range of $+2^\circ\text{C}$ to $+8^\circ\text{C}$.

If the temperature reading is more than $+1^\circ\text{C}$ above or below 0°C at 2 minutes:

- Replace the battery (record the date).
- Retest.
- If the temperature reading is still not within range, replace the thermometer.

Accuracy checks are recommended:

- After the battery is changed.
- At least every 12 months, for auditing purposes.
- If cold chain issues occur.

The supplier of the thermometer may be able to offer a validation or accuracy check for their product.