

TEMPERATURE OF FRESHLY MIXED PORTLAND CEMENT CONCRETE FOP FOR AASHTO T 309

Scope

This procedure covers the determination of the temperature of freshly mixed Portland Cement Concrete in accordance with AASHTO T 309-2022.

Warning—Fresh Hydraulic cementitious mixtures are caustic and may cause chemical burns to skin and tissue upon prolonged exposure.

Apparatus

- Container—~~The container shall be made:~~ Made of non-absorptive material and large enough to ~~provide cover the sensor with concrete~~ at least 75 mm (3 in.) ~~of concrete~~ in all directions ~~around the sensor~~; concrete cover must also be a least three times the nominal maximum size of the coarse aggregate.
- ~~Temperature measuring device—The temperature measuring device shall be calibrated and capable~~ Thermometer: Capable of measuring the temperature of the ~~freshly mixed concrete to $\pm 0.5^{\circ}\text{C}$ ($\pm 1^{\circ}\text{F}$) throughout the temperature range likely to be encountered. Partial immersion liquid-in-glass thermometers (and possibly other types) shall have a permanent mark, at least -18 to 50°C (0 to~~ which the device must be immersed without applying a correction factor.
- ~~Reference temperature measuring device—The reference temperature measuring device shall be a thermometric device 120°F , and readable to 0.2°C (0.5°F) that has been verified and calibrated. The calibration certificate $\pm 0.5^{\circ}\text{C}$ ($\pm 1^{\circ}\text{F}$) or report indicating conformance to the requirements of ASTM E 77 shall be available for inspections~~ smaller.

~~Calibration of Temperature Measuring Device~~

Note 1: Thermometer types suitable for use include ASTM E1 mercury thermometer or ASTM E2251 Low Hazard Precision Liquid-in-glass thermometer; ASTM E2877 digital metal stem thermometer; or thermocouple thermometer ASTM E230, Type T Special or IEC 60584 Type T, Class 1.

Standardization of Thermometer

Each ~~temperature measuring device~~ thermometer shall be verified for accuracy annually and whenever there is a question of accuracy. ~~Calibration~~ Standardization shall be performed by comparing readings on the ~~temperature measuring device~~ thermometer with another calibrated ~~instrument~~ thermometer at two temperatures at least 15°C or 27°F apart.

Sample Locations and Times

The temperature of freshly mixed concrete may be measured in the transporting equipment, in forms, or in sample containers, provided the sensor of the ~~temperature measuring device~~ thermometer has at least 75 mm (3 in.) of concrete cover in all direction around it.

Complete the temperature measurement of the freshly mixed concrete within 5 minutes of obtaining the sample.

Procedure

1. Dampen the sample container.
2. Obtain the sample in accordance with the FOP for WAQTC TM 2.
3. Place sensor of the ~~temperature measuring device~~[thermometer](#) in the freshly mixed concrete so that it has at least 75 mm (3 in.) of concrete cover in all directions around it.
4. Gently press the concrete in around the sensor of the ~~temperature measuring device~~[thermometer](#) at the surface of the concrete so that air cannot reach the sensor.
5. Leave the sensor of the ~~temperature measuring device~~[thermometer](#) in the freshly mixed concrete for a minimum of two minutes, or until the temperature reading stabilizes.
6. Complete the temperature measurement of the freshly mixed concrete within 5 minutes of obtaining the sample.
7. Read and record the temperature to the nearest 0.5°C (1°F).

Report

- Results on forms approved by the agency
- Sample ID
- Measured temperature of the freshly mixed concrete to the nearest 0.5°C (1°F)