
40 C.F.R. § 53.57

Test for filter temperature control during sampling and post-sampling periods.

- (a) *Overview.* This test is intended to measure the candidate sampler's ability to prevent excessive overheating of the PM sample collection filter (or filters) under conditions of elevated solar insolation. The test evaluates radiative effects on filter temperature during a 4-hour period of active sampling as well as during a subsequent 4-hour non-sampling time period prior to filter retrieval. Tests shall be conducted in an environmental chamber which provides the proper radiant wavelengths and energies to adequately simulate the sun's radiant effects under clear conditions at sea level. For additional guidance on conducting solar radiative tests under controlled conditions, consult military standard specification 810-E (reference 6 in appendix A of this subpart). The performance parameters tested under this procedure, the corresponding minimum performance specifications, and the applicable test conditions are summarized in table E-1 of this subpart. Each performance parameter tested, as described or determined in the test procedure, must meet or exceed the associated performance specification to successfully pass this test.
- (b) *Technical definition.* Filter temperature control during sampling is the ability of a sampler to maintain the temperature of the particulate matter sample filter within the specified deviation (5 °C) from ambient temperature during any active sampling period. Post-sampling temperature control is the ability of a sampler to maintain the temperature of the particulate matter sample filter within the specified deviation from ambient temperature during the period from the end of active sample collection by the sampler until the filter is retrieved from the sampler for laboratory analysis.
- (c) *Required test equipment.* (1) Environmental chamber providing the means, such as a bank of solar-spectrum lamps, for generating or simulating thermal radiation in approximate spectral content and intensity equivalent to solar insolation of 1000 ± 50 W/m inside the environmental chamber. To properly simulate the sun's radiative effects on the sampler, the solar bank must provide the spectral energy distribution and permitted tolerances specified in table E-2 of this subpart. The solar radiation source area shall be such that the width of the candidate sampler shall not exceed one-half the dimensions of the solar bank. The solar bank shall be located a minimum of 76 cm (30 inches) from any surface of the candidate sampler. To meet requirements of the solar radiation tests, the chamber's internal volume shall be a minimum of 10 times that of the volume of the candidate sampler. Air velocity in the region of the sampler must be maintained continuously during the radiative tests at 2.0 ± 0.5 m/sec.

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