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(b) Unless we specify otherwise, the terms ''procedures'' and ''test procedures'' in this subpart include all aspects of testing, including the equipment specifications, calibrations, calculations, and other protocols and procedural specifications needed to measure emissions.

(c) The specification for gasoline to be used for testing is given in 40 CFR 1065.710. Use the grade of gasoline specified for general testing. Blend this grade of gasoline with reagent grade ethanol in a volumetric ratio of 90.0 percent gasoline to 10.0 percent ethanol. You may use ethanol that is less pure if you can demonstrate that it will not affect your ability to demonstrate compliance with the applicable emission standards.

(d) Accuracy and precision of all temperature measurements must be ±2.2 °C or better.

(e) Accuracy and precision of mass balances must be sufficient to ensure accuracy and precision of two percent or better for emission measurements for products at the maximum level allowed by the standard. The readability of the display may not be coarser than half of the required accuracy and precision.

§ 59.652 Other procedures.

(a) *Your testing.* The procedures in this subpart apply for all testing you do to show compliance with emission standards, with certain exceptions listed in this section.

(b) *Our testing.* These procedures generally apply for testing that we do to determine if your portable fuel containers complies with applicable emission standards. We may perform other testing as allowed by the Act.

(c) *Exceptions.* We may allow or require you to use procedures other than those specified in this subpart as follows:

(1) You may request to use special procedures if your portable fuel containers cannot be tested using the specified procedures. We will approve your request if we determine that it would produce emission measurements that represent in-use operation and we determine that it can be used to show compliance with the requirements of § 59.611.

(2) You may ask to use emission data collected using other procedures, such as those of the California Air Resources Board. We will approve this only if you show us that using these other procedures do not affect your ability to show compliance with the applicable emission standards. This generally requires emission levels to be far enough below the applicable emission standards so that any test differences do not affect your ability to state unconditionally that your containers will meet all applicable emission standards when tested using the specified test procedures.

(3) You may request to use alternate procedures that are equivalent to allowed procedures, or more accurate or more precise than allowed procedures.

(4) You may not use other procedures under this paragraph (c) until we approve your request.

§ 59.653 How do I test portable fuel containers?

You must test the portable fuel container as described in your application, with the applicable spout attached except as otherwise noted. Tighten fittings in a manner representative of how they would be tightened by a typical user.

(a) *Preconditioning for durability.* Complete the following steps before an emissions test, in any order, unless we determine that omission of one or more of these durability steps will not affect the emissions from your container.

(1) *Pressure cycling.* Perform a pressure test by sealing the container and cycling it between +13.8 and −1.7 kPa (+2.0 and −0.5 psig) for 10,000 cycles at a rate of 60 seconds per cycle. For this test, the spout may be removed and the pressure applied through the opening where the spout attaches. The purpose of this test is to represent environmental wall stresses caused by pressure changes and other factors (such as vibration or thermal expansion). If your container cannot be tested using the pressure cycles specified by this paragraph (a)(1), you may ask to use special test procedures under § 59.652(c).

(2) *UV exposure.* Perform a sunlight-exposure test by exposing the container to an ultraviolet light of at least

24 W/m^2 (0.40 W-hr/m^2/min) on the container surface for at least 450 hours. Alternatively, the container may be exposed to direct natural sunlight for an equivalent period of time, as long as you ensure that the container is exposed to at least 450 daylight hours.

(3) *Slosh testing.* Perform a slosh test by filling the portable fuel container to 40 percent of its capacity with the fuel specified in paragraph (e) of this section and rocking it at a rate of 15 cycles per minute until you reach one million total cycles. Use an angle deviation of +15° to −15° from level.

(4) *Spout actuation.* Perform the following spout actuation and inversion steps at the end on the slosh testing, and at the end of the preconditioning soak.

(i) Perform one complete actuation/inversion cycle per day for ten days.

(ii) One actuation/inversion cycle consists of the following steps:

(A) Remove and replace the spout to simulate filling the container.

(B) Slowly invert the container and keep it inverted for at least 5 seconds to ensure that the spout and mechanisms become saturated with fuel. Any fuel leaking from any part of the container will denote a leak and must be reported as part of certification. Once completed, place the container on a flat surface in the upright position.

(C) Actuate the spout by fully opening and closing without dispensing fuel. The spout must return to the closed position without the aid of the operator (e.g., pushing or pulling the spout closed). Repeat for a total of 10 actuations. If at any point the spout fails to return to the closed position, the container fails the test.

(D) Repeat the step contained in paragraph (a)(4)(ii)(B) of this section (i.e., the inversion step).

(E) Repeat the steps contained in paragraph (a)(4)(ii)(C) of this section (i.e., ten actuations).

(b) *Preconditioning fuel soak.* Complete the following steps before a diurnal emission test:

(1) Fill the portable fuel container with the specified fuel to its nominal capacity, seal it using the spout, and allow it to soak at 28 ±5 °C for 20 weeks. Alternatively, the container may be soaked for 10 weeks at 43 ±5 °C. You may count the time of the preconditioning steps in paragraph (a) of this section as part of the preconditioning fuel soak, as long as the ambient temperature remains within the specified temperature range and the fuel tank is at least 40 percent full; you may add or replace fuel as needed to conduct the specified durability procedures.

(2) Pour the fuel out of the container and immediately refill to 50 percent of nominal capacity. Be careful to not spill any fuel on the container. Wipe the outside of the container as needed to remove any liquid fuel that may have spilled on it.

(3) Install the spout assembly that will be used in the production containers. The spout and other openings (such as vents) on the container must be tested in their open condition unless they close automatically and are unlikely to be left open by the user during typical storage. All manual closures such as caps must be left off the container and spout during testing.

(c) *Reference container.* A reference container is required to correct for buoyancy effects that may occur during testing. Prepare the reference tank as follows:

(1) Obtain a second container of the same model as the test tank. You may not use a container that has previously contained fuel or any other contents that might affect the stability of its mass.

(2) Fill the reference container with enough dry sand (or other inert material) so that the mass of the reference container is approximately the same as the test container when filled with fuel. Use good engineering judgment to determine how similar the mass of the reference container needs to be to the mass of the test container considering the performance characteristics of your balance.

(3) Ensure that the sand (or other inert material) is dry. This may require heating the container or applying a vacuum to it.

(4) Seal the container.

(d) *Diurnal test run.* To run the test, take the following steps for a portable fuel container that was preconditioned as specified in paragraph (a) of this section.

(1) Stabilize the fuel temperature within the portable fuel container at 22.2 °C. Vent the container at this point to relieve any positive or negative pressure that may have developed during stabilization.

(2) Weigh the sealed reference container and record the weight. Place the reference on the balance and tare it so that it reads zero. Place the sealed test container on the balance and record the difference between the test container and the reference container. This value is $M_{initial}$ Take this measurement within 8 hours of filling the test container with fuel as specified in paragraph (b)(2) of this section.

(3) Immediately place the portable fuel container within a well ventilated, temperature-controlled room or enclosure. Do not spill or add any fuel.

(4) Close the room or enclosure.

(5) Follow the temperature profile in the following table for all portable fuel containers. Use good engineering judgment to follow this profile as closely as possible. You may use linearly interpolated temperatures or a spline fit for temperatures between the hourly setpoints.

TABLE 1 OF § 59.653—DIURNAL TEMPERATURE PROFILE FOR PORTABLE FUEL CONTAINERS

Time (hours)	Ambient Temperature (°C) Profile
0	22.2
1	22.5
2	24.2
3	26.8
4	29.6
5	31.9
6	33.9
7	35.1
8	35.4
9	35.6
10	35.3
11	34.5
12	33.2
13	31.4
14	29.7
15	28.2
16	27.2
17	26.1
18	25.1
19	24.3
20	23.7
21	23.3
22	22.9
23	22.6
24	22.2

(6) At the end of the diurnal period, retare the balance using the reference container and weigh the portable fuel container. Record the difference in mass between the reference container and the test. This value is M_{final}.

(7) Subtract M_{final} from $M_{initial}$ and divide the difference by the nominal capacity of the container (using at least three significant figures) to calculate the g/gallon/day emission rate as follows:

Emission rate = ($M_{initial}$—M_{final})/(nominal capacity)/(one day)

(8) Round your result to the same number of decimal places as the emission standard.

(9) Instead of determining emissions by weighing the container before and after the diurnal temperature cycle, you may place the container in a SHED meeting the specifications of 40 CFR 86.107–96(a)(1) and measure emissions directly. Immediately following the stabilization in paragraph (d)(1) of this section, purge the SHED and follow the temperature profile from paragraph (d)(4) of this section. Start measuring emissions when you start the temperature profile and stop measuring emissions when the temperature profile concludes.

(e) For metal containers, you may demonstrate for certification that your portable fuel containers comply with the evaporative emission standards without performing the pre-soak or container durability cycles (i.e., the pressure cycling, UV exposure, and slosh testing) specified in this section. For other containers, you may demonstrate compliance without performing the durability cycles specified in this section only if we approve it after you have presented data clearly demonstrating that the cycle or cycles do not negatively impact the permeation rate of the materials used in the containers.

SPECIAL COMPLIANCE PROVISIONS

§ 59.660 Exemption from the standards.

In certain circumstances, we may exempt portable fuel containers from the evaporative emission standards and requirements of § 59.611 and the prohibitions and requirements of § 59.602. You