(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 ((°deg;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 do not need an exemption for any containers that you own but do not sell, offer for sale, introduce or deliver for introduction into U.S. commerce, or import into the United States. Submit your request for an exemption to the Designated Compliance Officer.

(a) Portable fuel containers that are intended for export only and are in fact exported are exempt provided they are clearly labeled as being for export only. Keep records for five years of all portable fuel containers that you manufacture for export. Any introduction into U.S. commerce of such portable fuel containers for any purpose other than export is considered to be a violation of § 59.602 by the manufacturer. You do not need to request this exemption.

(b) You may ask us to exempt portable fuel containers that you will purchase, sell, or distribute for the sole purpose of testing them.

(c) You may ask us to exempt portable fuel containers for the purpose of national security, as long as your request is endorsed by an agency of the federal government responsible for national defense. In your request, explain why you need the exemption.

(d) You may ask us to exempt containers that are designed and marketed solely for rapidly refueling racing applications which are designed to create a leak proof seal with the target tank or are designed to connect with a receiver installed on the target tank. This exemption is generally intended for containers used to rapidly refuel a race car during a pit stop and similar containers. In your request, explain how why these containers are unlikely to be used for nonracing applications. We may limit these exemptions to those applications that are allowed to use gasoline exempted under 40 CFR 80.200(a).

(e) EPA may impose reasonable conditions on any exemption, including a limit on the number of containers that are covered by an exemption.

§ 59.662 What temporary provisions address hardship due to unusual circumstances?

(a) After considering the circumstances, we may exempt you from the evaporative emission standards and requirements of § 59.611 of this subpart and the prohibitions and requirements of § 59.602 for specified portable fuel containers that do not comply with emission standards if all the following conditions apply:

(1) Unusual circumstances that are clearly outside your control and that could not have been avoided with reasonable discretion prevent you from meeting requirements from this subpart.

(2) You exercised prudent planning and were not able to avoid the violation; you have taken all reasonable steps to minimize the extent of the nonconformity.