

COMPONENT PERMEATION TEST

Application

The purpose of this test method is to determine the grams of hydrocarbons emitted by each component while simulating vehicle conditions of the CARB/EPA vehicle SHED procedure.

This test method is to be used for permeation testing of components other than fuel/vapor hose and fuel/vapor connectors. Fuel/vapor hose and fuel/vapor connectors shall be tested using FLTM BZ 114-02 (Recirculation Method).

Required Test Equipment

SHED Chamber

Must be suitable for measuring hydrocarbon emission.

Must be capable of maintaining diurnal temperature cycle per attached chart (+/- 2 °C).

Must be Variable Volume/Variable Temperature (VV/VT) SHED.

Must be able to demonstrate a 4 % maximum leakage loss over 24 h diurnal temperature cycle.

FID (Flame Ionization Detector)

Must be suitable for measuring hydrocarbon emission.

Need a heated sample pump for the FID.

Pressure Decay Monitoring System

Must be capable of measuring to +/- 0.025 kPa of water.

Test Fixture (See Figure 1)

Test component must be attached to the fixture using the same component adaptor as intended for production (e.g. cut the fixture top from actual production intent fuel tank). Machined component adaptor is unacceptable.

Soak Stand

Soak stand must be able to hold the test fixture upside down so that the test component will be 100 % immersed in fuel.

Soak Fuel

Reference fuel C + 5 % methanol + 2 % ethanol.

Test Fuel

Indolene Clear (9 # r.v.p.)

Cleaner

Alconox or equivalent.

Date	Action	Revisions
2000 08 30	Revised	Editorial – no technical change A. Cockman
1993 07 02		

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Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Prepare the test component by plugging all holes and ports with teflon plugs, steel plugs, heat sealed teflon tubing, or other non-permeating means.
2. Install the test component onto the test fixture. Once installed, DO NOT REMOVE until testing is complete. This is to simulate installation of the component on a vehicle. There MUST be 100 % contact between the component and the fixture.
3. Fill test canister 50 % full with soak fuel through the 1/2 inch diameter port at top of the fixture.
4. Leak test the fixture assembly at 25 kPa for 5 minutes. System must show 0 pressure decay and pass water submersion test.
5. Place the fixture on the soak stand so that the fixture is upside down with the test component immersed in fuel.
6. Soak the test fixture on the soak stand for a total of 21 d at 40 +/- 2 °C. The test fixture should be vented to atmosphere.
7. After a total of 21 d soak, drain the soak fuel and replace with test fuel per Step 3. Perform a pressure test per Step 4. Wash the test fixture with an alconox solution to remove any hydrocarbons from the fixture.
8. After final pressure check and cleaning, place the test fixture in the test SHED. The test fixture should be set up as follows during the test:

Fuel system components should be tested under vehicle conditions:

Components that are exposed to un-pressurized fuel should be tested with 100 % exposure to the test fuel. Test fixture should be vented to ambient pressure.

Components that are exposed to fuel vapor only should be tested with 100 % exposure to test fuel vapor only. Test fixture should be vented to ambient pressure.

Fuel components that are exposed to pressurized fuel should be tested under 100 % exposure to test fuel. Test fixture should be pressurized to 45 P.S.I. at the beginning of the test.

Vapor system components should be tested under vehicle conditions.

Vapor components should be tested with 100 % exposure to test fuel vapor only. Test fixture should be vented to ambient pressure.

9. Perform 24 h SHED test in accordance with the temperature diurnal cycle per the attached chart. Monitor and record the grams hydrocarbon emission levels per hour.

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities