



Pressure Testing of Non-metallic Fuel Tanks

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard is used to determine the ability of a non-metallic fuel tank shell and fuel tank assemblies to maintain an applied pressure without leakage.

This standard is called out by GMW3086. Refer to this standard or the pertinent technical specification for requirements.

1.2 Applicability. Fuel tank and fuel tank assemblies.

1.3 Remarks. This is a component/subsystem level test only. Nothing in this standard supercedes vehicle level requirements.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3086

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 Air line or other equipment capable of introducing pressure at a constant rate.

3.2.2 Pressure gage.

3.2.3 Timer with second hand.

3.2.4 Fuel tank fixture.

3.3 Test Vehicle/Test Piece. Fuel tank shell or fuel tank assembly.

3.4 Test Time. Not applicable.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation. When test is being performed for design verification, a minimum of six samples per cavity shall be tested unless otherwise agreed to by GM Engineering. The sample quantity for all other usages shall be agreed to by GM Engineering.

4.1.1 Fuel Tank Shell. For design verification, full dimensional requirements for tank shell shall be measured prior to testing.

4.1.2 Fuel Tank Assemblies. For design verification of the tank assemblies, a minimum of the following measurements shall be made prior to testing:

4.1.2.1 Dimensional requirements for machined and welded tanks assembly.

4.1.2.2 Dimensional requirements for Module Reservoir Assembly (MRA) related to the sealing surface.

Any deviations to the preceding requirements shall be agreed to by GM Engineering prior to testing.

Note: The inlet check valve restrictor may be removed from the production tank assembly to ensure the completion of the pressurization within the recommended 30 s.

4.1.3 Test Specimen Stabilization. The test shall be performed on "as molded" production tanks with a minimum of 48 h of aging at $(+23 \pm 2)$ °C.

4.2 Conditions.

4.2.1 Environmental Conditions. The test shall be performed at $(+23 \pm 3)$ °C.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Install pressure tap near MRA sender interface. If gage is used, ensure it can record maximum obtained pressure. If pressure transducer is used, recorder should be set at 1 Hz scan rate.

4.3.2 All connections shall be sufficiently sealed to enable pressure testing.

4.3.3 For design verification, the tank/tank assembly shall be fixtured in a vehicle representative buck.

4.3.4 Fill the tank 100% full with water.

4.3.5 Introduce pressure into the tank through the inlet check valve until burst. Choose a rate to complete test within 30 s.

5 Data

5.1 Calculations. During the test, record the pressure at the first evidence of leak.

Acceptance Criteria: Tank must show no evidence of bursting, splitting or leaking below the specified pressure.

5.2 Interpretation of Results.

5.2.1 Once the sample has burst or the pressure no longer increases, record the pressure value as ultimate burst pressure.

5.2.2 Record time to reach ultimate pressure.

5.2.3 Photograph any damage and the location of any leak.

5.3 Test Documentation. Report for design verification must include the following data. Any deviations from the report requirements shall be agreed to by GM Engineering prior to submission.

5.3.1 Document tank shell mold information.

5.3.2 Dimensional data for tank shell and tank assembly as required by 4.1.1 and 4.1.2.

5.3.3 Record value at first evidence of leak. Identify the specified pressure and document if the tank meets the acceptance criteria from 5.1.

5.3.4 Record value for ultimate burst pressure and time to reach ultimate burst pressure per 5.2.1 and 5.2.2.

5.3.5 Include photographs of any damage or areas where leak was detected per 5.2.3.