



Tire Sealant Dynamic Creep Test

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. To determine static imbalance of a sealant tire caused by sealant creep in a highway speed laboratory environment.

1.2 Applicability. The procedure applies to passenger car tires for which sealant technology is deemed appropriate.

2 References

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

2.1 External Standards/Specifications.

ASTM F551

2.2 GM Standards/Specifications.

GMW16590

2.3 Additional References.

- European Tyre and Rim Technical Organisation (ETRTO) Year Book, Brussels, Belgium (www.etrto.org)
- The Tire and Rim Association Incorporated (T&RA) Year Book, Copley, Ohio (www.us-tra.org)

3 Resources

3.1 Facilities. Tire testing laboratory with a 1.7 m, or greater, diameter road wheel dynamometer.

3.2 Equipment.

3.2.1 Wheels appropriate for testing the tire per the appropriate published tire standards (e.g., The Tire and Rim Association, Incorporated (T&RA) Year Book, European Tyre and Rim Technical Organisation (ETRTO) Year Book, or equivalent).

3.2.2 Standard tire testing 1.7 m road wheel dynamometer or equivalent conforming to ASTM F551.

3.2.3 Static tire balance equipment.

3.2.4 Tire mounting equipment.

3.3 Test Vehicle/Test Piece.

3.3.1 Tires with sealant applied using production equipment.

3.3.2 Minimum of two (2) sealant tires must be tested.

3.4 Test Time.

Calendar time: 1 day

Test hours: 9 hours

Coordination hours: 1 hour

3.5 Test Required Information. Not applicable.

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3.6 Personnel/Skills. Dynamometer operators must be trained in the proper set up and operation of the equipment and this test procedure.

4 Procedure

4.1 Preparation.

4.1.1 Mount sealant tires on test wheels following acceptable mounting procedures.

4.1.2 Inflate sealant tire to the test inflation pressure shown in Table 1 and place in the ambient test environment to thermally equilibrate prior to beginning the dynamic test.

4.2 Conditions.

4.2.1 Environmental Conditions. Ambient temperature shall be controlled to $38^{\circ}\text{C} \pm 3^{\circ}\text{C}$. The location of ambient temperature measurement is defined as a point on the rotational axis of the tire, $0.31\text{ m} \pm 0.01\text{ m}$ from the plane touching the nearest tire sidewall or at a point where an equivalent temperature exists.

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.

4.2.3 Test inflation pressure is specified in Table 1. These pressures result from a consideration of both the maximum sidewall markings and expected usage pressures.

Table 1: Test Inflation Pressure

Tire Type and Load Range	Cold Inflation Pressure (kPa)
Passenger Car	
Standard Load and Light Load	250
Extra Load or Reinforced	290

4.2.4 Test load shall be 90% of maximum load capacity for the tire. The maximum load capacity is typically molded into the sidewall of the tire and should be in agreement with the applicable published tire standards (e.g., T&RA Year Book).

4.3 Instructions.

4.3.1 Record the information on the Data Sheet A1 in Appendix A.

4.3.2 Reset the inflation pressure to the test inflation pressure, cap the valve stem, and record the pressure on Data Sheet A1 in Appendix A. No further inflation pressure adjustments are necessary.

4.3.3 Statically balance the assembly and record the residual imbalance on Data Sheet A1 in Appendix A.

4.3.4 Do not correct the static imbalance for the remainder of the test procedure.

4.3.5 Install the assembly onto the roadwheel dynamometer.

4.3.6 Break in assembly for 2 h at 90 km/h and at the test load.

4.3.7 Remove the assembly from the roadwheel dynamometer.

4.3.8 Measure the assembly static imbalance and record on Data Sheet A1 in Appendix A.

4.3.9 Install the assembly onto the roadwheel dynamometer.

4.3.10 Operate the assembly at the test load for 2 h at 95 km/h.

4.3.11 Remove the assembly from the roadwheel dynamometer.

4.3.12 Measure the assembly static imbalance and record on Data Sheet A1 in Appendix A.

4.3.13 Repeat 4.3.9 through 4.3.12 for each of the duration and speed test conditions.

4.3.13.1 Run for 2 h at 110 km/h.

4.3.13.2 Run for 1 h at 125 km/h.

4.3.13.3 Run for 1 h at 140 km/h.

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