



Standard Test Method for Accelerated Laboratory Roadwheel Generation of Belt Separation in Radial Passenger Car and Light Truck Tires through Load Range E¹

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INTRODUCTION

The United States Congress passed the Transportation Recall Enhancement, Accountability and Documentation (TREAD) Act in November 2000. Included in the Act were specific directions to the National Highway Traffic Safety Administration (NHTSA) to upgrade tire safety standards.

As tire wear life has increased over the years, interest in the in-service aging of a tire's internal components has increased. To quote NHTSA, "... some members of Congress expressed the view that there is a need for an aging test to be conducted on light vehicle tires. The agency tentatively concludes that we agree there is a need for an aging test in the proposed light vehicle tire standard because most tire failures occur at mileages well beyond 2,720 kilometers (1,700 miles) to which tires are exposed in the current FMVSS No. 109 Endurance Test."² Until the publication of this standard, there was neither an industry nor a government standard practice for the accelerated laboratory roadwheel generation of belt separation in tires.

This standard represents the body of work whose goal was to develop a scientifically valid, short duration aged tire test standard focused on the generation of belt edge separation. The scope of this work is limited to radial passenger car and light truck tires through Load Range E. The standards development task group conducted research in order to determine: (1) the appropriate accelerated laboratory aging conditions which correlate material property changes at the belt edge of the tire as produced in the laboratory with those observed in service (as described in Practice F2838), and (2) the appropriate laboratory roadwheel durability test parameters which are capable of producing belt edge separations while avoiding those conditions which are exclusively by-products of roadwheel testing (as described in this standard).

1. Scope

1.1 This standard describes a laboratory method to evaluate tires for their tendency to develop belt edge separation, via the use of a standard roadwheel (Practice F551/F551M). This evaluation is conducted on tires that have undergone accelerated laboratory aging as described in Practice F2838.

¹ This test method is under the jurisdiction of ASTM Committee F09 on Tires and is the direct responsibility of Subcommittee F09.30 on Laboratory (Non-Vehicular) Testing.

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² Federal Register Vol. 67, No. 43, Tuesday, March 5, 2002, p. 10068, Paragraph 6, "Aging Effects."

1.2 The End-of-Test (EOT) conditions that can be produced by this method include target (belt-edge separation), non-target (conditions other than belt-related separations that can be developed in passenger and light truck tires through on-road use), and non-representative (conditions that are typically developed only on laboratory roadwheels). There is also the possibility that no visible EOT conditions may be generated during the course of this test. In this instance the user may choose to select a designated completion time (DCT) as the EOT condition.

1.3 The values stated in SI units are to be regarded as the standard. The values given in the data log in Appendix X1 in parentheses are provided for information only.