



AEROSPACE RECOMMENDED PRACTICE

ARP5507™

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Aircraft Tire-to-Wheel Performance Characteristics

RATIONALE

ARP5507 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE:

The performance of an aircraft tire/wheel assembly in service is dependent on the geometrical fit, load distribution, and performance at the tire/wheel interface while rolling. This document focuses on the tire-to-wheel circumferential movement for a new tubeless tire.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AS4833 Minimum Performance Standard - New Aircraft Tires

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-PRF-5041 Performance Specifications, Tires, Ribbed Tread, Pneumatic Aircraft, General Specification For

FAA TSO-C26 Technical Order, Aircraft Wheels and Wheel-Brake Assemblies

FAA TSO-C62 Technical Order, Tires

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Technical Report, please visit
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2.3 Standards Organization Documents:

- 2.3.1 Tire & Rim Association (TRA) Publications: Available from The Tire & Rim Association, Incorporated, 175 Montrose West Avenue, Suite 150, Copley, OH 44321.

TRA Aircraft Year Book

- 2.3.2 European Tyre and Rim Technical Organisation (ETRTO) Publications: Available from The European Tyre and Rim Technical Organization, 32/2, avenue Brugmann - B-1060 Brussels, Belgium.

Aircraft Tyre and Rim Data Book

- 2.3.3 ISO Publications: Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002.

ISO 3324-1 Aircraft tyres and rims - Part 1 Specifications
ISO 3324-2 Aircraft tyres and rims - Part 2 Test methods for tyres

3. APPLICABILITY:

This recommended practice applies to braked wheel positions using radial or bias tires.

4. TECHNICAL BACKGROUND:

4.1 General:

Aircraft tire/wheel assemblies must develop friction and load bearing capabilities at the tire-to-wheel interface. The design and dimensional control of the wheel seating surface and the tire bead contact area must support the following functions:

- a. ease of mounting and dismounting, without damage to tire or wheel;
- b. sealing of the tire/wheel interface against inflation pressure loss;
- c. transmitting torque during braking;
- d. sustaining the bending forces of standard deflection and over deflection; and
- e. sustaining side load forces without loss of inflation pressure.

In performing the above functions, tires have been observed to move circumferentially relative to the wheel. Since there is no mechanical lock or fixed alignment between the tire and the wheel at the tire/wheel interface, movement from the initial seated location can occur under certain conditions.

This aerospace recommended practice defines the performance criteria and validation for tire circumferential movement on the rim, in the laboratory, by a static test, as well as a performance assessment in service.