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Test Methods of Rolling Resistance for Motor Vehicle Tyres - Single Point Test and Correlation of Measurement Results

汽车轮胎滚动阻力试验方法 单点试验和测量结果的相关性

(ISO 28580:2009 Passenger Car, Truck and Bus Tyres - Methods of Measuring Rolling Resistance - Single Point Test and Correlation of Measurement Results, MOD)

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Standardization Administration of PRC.

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Foreword

This standard was drafted according to the rules specified in GB/T 1.1-2009.

This Standard is modified in relation to ISO 28580:2009 "Passenger Car, Truck and Bus Tyres - Methods of Measuring Rolling Resistance - Single Point Test and Correlation of Measurement Results".

There are some adjustments in the structure for this Standard which is compared with ISO 28580:2009; the comparison list of chapter and article numbers of this Standard and ISO 28580:2009 is given in Appendix A.

There are some technical differences between ISO 28580:2009 and this Standard, those technical differences have already been incorporated into the text and marked with perpendicular single line on the margin of relevant clauses. Appendix B gives a summary list of these technical differences and their reasons for your reference.

To be convenient for use, the following editorial changes are also made in this Standard:

— Standard name was changed;

— Bibliography was deleted.

This national standard was proposed by China Petroleum and Chemical Industry Association.

This Standard is under the jurisdiction of National Technical Committee 19 on Tyres and Rims of Standardization Administration of China (SAC/TC 19).

Chief drafting organizations of this Standard: Beijing Research & Design Institute of Rubber Industry, Michelin (China) Investment Co., Ltd., Double Coin Holdings Ltd., Shandong Linglong Tyre Co., Ltd., Inspection and Quarantine Center of Shandong Exit & Entry Inspection and Quarantine Bureau, Triangle Tyre Co., Ltd., Sailun Co., Ltd., Hangzhou Zhongce Rubber Co., Ltd., Bridgestone (China) Investment Co., Ltd., Qingdao Gaoxiao Measurement & Control Technology Co., Ltd. and Sichuan Haida Rubber Group Co., Ltd.

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Test Methods of Rolling Resistance for Motor Vehicle Tyres - Single Point Test and Correlation of Measurement Results

1 Scope

This Standard specifies methods for measuring rolling resistance, under controlled laboratory conditions, for new pneumatic tyres designed primarily for use on passenger cars, and trucks.

This Standard is applicable to the new pneumatic tyres designed primarily for use on passenger cars, trucks and motorcycles. Tyres intended for temporary use only are not included in this Standard.

2 Normative References

The following document is essential for the application of this Standard. For dated references, only the edition cited applies. For undated references, the latest edition (including any amendments) is applicable to this document.

GB/T 2977 Size Designation, Dimensions Inflation Pressure and Load Capacity for truck tyres

GB/T 2978 Size Designation, Dimensions Inflation Pressure and Load Capacity for Passenger Car Tyres

GB/T 6326 Tyre Terms and Definitions (GB/T 6326-2005, ISO 4223-1:2002, Definitions of Some Terms Used in Tyre Industry - Part 1: Pneumatic Tyres, NEQ)

ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories

ISO/TS 16949 Quality Management Systems - Particular Requirements for the Application of ISO 9001: 2008 for Automotive Production and Relevant Service Part Organizations

3 Terms and Definitions

For the purpose of this Standard, the terms and definitions defined in GB/T 6326 apply.

3.1 Rolling resistance F_r

described in ISO 18164, SAE J1269 and SAE J2452.

Note 2: It is permissible to repeat an accepted test procedure.

3.8 Measurement result correlation

Set of rolling resistance measurements to be carried out on a regular time basis by separate laboratories, in order to allow direct comparisons between their rolling resistance results.

Note: The results of these measurements are used to compute "alignment" corrective coefficients and permit calculation of aligned rolling resistance measurement (see Clause 10).

3.9 Compare laboratory

Laboratory that participates in the establishment of reference laboratory and execute alignment procedure.

3.10 Reference laboratory

A virtual laboratory that is established on the base of test data of compare laboratory. Take specified quantity of tyres which required to be aligned; carry out rolling resistance measurement by multiple approved compare laboratories in accordance with relevant requirements; and take the average value of test results as the test results of the virtual laboratory.

3.11 Candidate laboratory

Non-compare-laboratory that participates in alignment procedure.

3.12 Alignment tyre

A test tyre that is used to execute the alignment procedure.

3.13 Alignment tyres set

A set of five or more alignment tyres.

3.14 Laboratory control tyre

Tyre used by an individual laboratory to control machine behaviour as a function of time.

Note: An example of machine behaviour is drift.

3.15 Measurement reproducibility σ_m

Capability of a machine to measure rolling resistance.

Note: σ_m can be obtained by measuring a set of tyres for n times ($n \geq 3$), as the complete procedure described in Clause 7. For a set of p($p \geq 5$) tyres, it assumes that the variances of the set of p tyres are

10.2.1 Alignment tyres shall be a set of tyres, at least 5, of different sizes.

10.2.2 For the predetermined alignment tyres used to conduct the alignment procedure, the load index (LI), C_r and F_r, shall satisfy the requirements as follows:

a) the different value between C_r maximum and minimum

— passenger car and smaller truck and bus tyres (LI ≤ 121): ≥ 3 N/kN;

— smaller truck and bus tyres (LI > 121) and larger truck and bus tyres: ≥ 2 N/kN

b) C_r value shall be evenly distributed, and the interval range is as follows:

— for passenger car and smaller truck and bus tyres (LI ≤ 121), it is (1.0±0.5) N/kN;

— for smaller truck and bus tyres (LI > 121) and larger truck and bus tyres, it is (1.0±0.5) N/kN.

c) section width of alignment tyres

— passenger car and smaller truck and bus tyres (LI ≤ 121): ≤ 245 mm;

— smaller truck and bus tyres (LI > 121) and larger truck and bus tyres: ≤ 385 mm.

d) outer diameter of alignment tyres

— for passenger car and smaller truck and bus tyres (LI ≤ 121), it is between 510 mm and 800 mm;

— for smaller truck and bus tyres (LI > 121) and larger truck and bus tyres, it is between 771 mm and 1143 mm.

e) load index values shall adequately cover the range for the tyres to be tested, ensuring that the Fr values can also cover the range for the tyres to be tested.

10.2.3 Each alignment tyre shall be checked prior to use and replaced when:

a) it shows a condition that makes it unusable for further tests;

b) there are deviations of C_r for alignment tyre measurement greater than 1.5 % relative to earlier measurements after correction for any machine drift.

10.3 Alignment procedure

10.3.1 Each time an alignment tyre is measured, the tyre/wheel assembly shall be removed from the machine and the entire test procedure specified in Clause 7 shall be followed again. This requirement applies to both the compare laboratory and the candidate laboratory.

10.3.2 Compare laboratory shall measure each alignment tyre three times in accordance

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