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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 4502-2023

Laboratory test methods for passenger car tyres capabilities

轿车轮胎性能室内试验方法

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Foreword

This document was issued on 23 May 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 December 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

This document was drafted in accordance with the provisions of GB/T 1.1-2020

Directives for standardization - Part 1.Rules for the structure and drafting of standardizing documents.

This document replaces GB/T 4502-2016 Laboratory test methods for passenger car tyres capabilities. Compared with GB/T 4502-2016, except for the structural adjustment and editorial revisions, the main technical changes are as follows.

-- The scope of application is changed (see Chapter 1; see Chapter 1 of the 2016 edition);

-- The term and definition of "test drum speed" is deleted (see 3.1 of the 2016

edition);

- The term and definition of "parasitic tread block chunking" is added (see 3.1);
- The type of standard pressing block for bead unseating that the testing machine shall be equipped with is changed (see 4.1.2; see 4.1.2 of the 2016 edition);
- The requirement that the accuracy of the P value indicator is ± 1 mm is added (see 4.1.5);
- The regulation that the maximum range of the inflation pressure gauge shall be at least 500 kPa is deleted (see 4.4 of the 2016 edition);
- The instructions and requirements for the test samples are changed, and they constitute a separate chapter (see Chapter 5; see 6.1 of the 2016 edition);
- The content that appearance quality shall comply with the provisions of GB 9743 is deleted (see 5.1.1.1, 5.2.1.1, 5.3.1.1, and 5.4.1.1 of the 2016 edition);
- The regulations on test rims are changed (see 6.1.1.2, 6.2.1.1, 6.3.1.1, and 6.4.1.1; see 5.1.1.2, 5.2.1.2, 5.3.1.2, and 5.4.1.2 of the 2016 edition);
- The scope of use of different types of pressing blocks for bead unseating is changed (see 6.1.1.6; see 5.1.1.6 of the 2016 edition);
- The rounding rule of the H value related to the calculation of P value is changed (see Table 2; see Table 2 of the 2016 edition);
- The description of "If the same set of tyre and rim assembly used for the bead unseating resistance test is used, the test can be continued." is added (see 6.2.1.3);
- The provision of "If the device for automatically calculating the breaking energy is used, when the specified minimum breaking energy is reached, the indenter shall be immediately stopped pressing into the tyre." is added (see 6.2.2.8);
- The requirement that necessary means used to maintain the specified test pressure during the test shall be noted in the test report is added (see 6.2.2.9);
- The regulation that when the same sample is used for the second test of the passenger car tyre with a speed exceeding 300 km/h, it needs to be stood and the tyre pressure shall be readjusted is added (see 6.3.1.7);

- The requirement that "no bead unseating but slippage" is considered to pass the test is added to the judgment rule of the bead unseating resistance test (see 7.1);
- The provision of "If the rim is touched and the tyre isn't punctured, the tyre is judged to pass the test." is added to the judgment rule of the strength performance (see 7.2);
- The description of "Tyres with a maximum speed of 300 km/h and above may have bulges on the tread surface or chunking caused by bulging." is added to the judgment rule of the high-speed performance (see 7.3);
- The provision of "chunking (except PTBC of snow tyres)" is added to the judgment rules of the endurance test and low-pressure performance (see 7.4, 7.5);
- The provision of "slippage or the rim is touched" is added to the condition of each test point of the tyre in the test report of bead unseating resistance [see j) in Chapter 8].

This document is modified in relation to ISO 10191.2021 Passenger car tyres - Verifying tyre capabilities - Laboratory test methods.

Compared with ISO 10191.2021, this document has more structural adjustments; the comparison list of structure numbers between the two documents is shown in Appendix A.

Compared with ISO 10191.2021, this document has many technical differences, and the outer margin of the terms involved is marked with a vertical single line (|). See

1 Scope

GB/T 4502-2023 covers the bench tests that decide whether a passenger car tyre is fit to sell - the test equipment and the precision it has to hold, the samples drawn for each test, the test methods themselves, the judgment rules, and the report. The methods run through bead unseating resistance, tyre strength, high speed, endurance and low-pressure behaviour, which between them stand in for the ways a tyre fails on the road: a bead that walks off the rim under a hard cornering load, a casing that gives way against a kerb or a pothole, a carcass that overheats at sustained speed, and a tyre run soft that destroys itself from the inside. Because the verdict is a plain pass or fail against tabulated limits, the

standard has to fix everything that would otherwise let two laboratories disagree - the shape, dimensions and material of the pressing blocks used to unseat the bead, the test rim, the condition and preparation of the sample tyres, and what the report must carry so a result can be traced back to a particular production run. The terms clause names defect modes such as parasitic tread block chunking. Written for tyre manufacturers, vehicle makers and testing laboratories; an informative annex maps the clause numbering onto ISO 10191:2021.

This document describes the laboratory test methods for performance testing of passenger car tyres, including test equipment and its precision, test conditions, test procedures, judgment rules and test reports.

2 Normative references

The following documents contain the provisions which, through normative reference in this document, constitute the essential provisions of this document. For the dated referenced documents, only the versions with the indicated dates are applicable to this document; for the undated referenced documents, only the latest version (including all the amendments) is applicable to this document.

GB/T6326 Tyre terms and definitions (GB/T 6326-2014, ISO 4223-1.2002, NEQ)

GB/T 8170 Rules of rounding off for numerical values & expression and judgment of limiting values

3 Terms and definitions

Terms and definitions defined in GB/T 6326 and the following apply to this document.

3.1 parasitic tread block chunking; PTBC

A defect characterized by rubber pieces separated from the tyre tread or tearing without exposing the tyre reinforcing material (such as carcass ply, belt, etc.).

4 Test equipment and its precision

The testing machine shall be equipped with standard pressing blocks for bead unseating (A-type and C-type), and the size, shape and manufacturing materials shall comply with the provisions of Appendix C.

The testing machine shall be equipped with a sufficiently long cylindrical metal