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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 22391-2017

Replacing GB/T 22391-2008

Test method for the endurance of solid tyres - Drum method

实心轮胎耐久性能试验方法 转鼓法

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Standardization Administration of the PRC

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009. This Standard replaces GB/T 22391-2008, Test method of endurance for solid tyres - Drum method; compared with GB/T 22391-2008, the main technical changes are as follow: -- Remove the "judgment rules" from the scope (see Chapter 1); -- Add the requirements for the diameter of the probe of the temperature measuring instrument (see 4.3;

4.3 of the 2008 edition); -- Modify the requirements for the accuracy of the drum speed of the testing machine (see 4.4;

4.4 of the 2008 edition); -- Add the requirements for the position of the ambient temperature measuring device (see 4.7); -- Modify the requirements for the number and position of thermometer holes (see 5.2;

5.2 of the 2008 edition); -- Add a schematic diagram of punching requirements for the thermometer holes (see 5.2); -- Add drum acceleration time limit (see 5.4); -- Delete the provision of "adjust at least 8 h under the standard laboratory environment specified in GB/T 2941" (

5.3 of the 2008 edition); -- Adjust the test procedure (see 6.4;

6.4 of the 2008 edition); -- Change the temperature measurement time from "within 1 min after the end of the running interval" to "within 1 minute after the drum stops at the end of each test stage" (see 6.5); -- Delete the judgment rules and the conclusion part of the test report (Chapter 7 and Chapter 8 of the 2008 edition). This Standard was proposed by China Petroleum and Chemical Industry Federation. This Standard shall be under the jurisdiction of National Technical Committee on Tyres and Rims of Standardization Administration of China (SAC/TC 19). Drafting organizations of this Standard: Zhongce Rubber Group Co.,

Ltd., Xiamen Zhengxin Rubber Industry Co., Ltd., Xuzhou Xulun Rubber Co., Ltd., Guizhou Tyre Co., Ltd., Shandong Linglong Tyre Co., Ltd., Beijing Research and Design Institute of Test method of endurance for solid tyres - Drum method

1 Scope

China's national endurance test for solid tyres, run on a drum. It specifies the terms and definitions, the test equipment and its accuracy, the test conditions, the test procedures and the test report, and it applies to new solid tyres. A solid tyre carries its load in the rubber itself rather than in compressed air, which is why it is used on forklifts, on port and industrial equipment and on anything that would otherwise be stopped by a puncture. The consequence is that all the deflection under load is deformation of the rubber, and rubber deformed cyclically generates heat internally through hysteresis. A pneumatic tyre loses that heat partly through the air inside it; a solid tyre has nowhere to put it. So the failure mode of a solid tyre is thermal: heat builds in the interior faster than it escapes through the rubber, the core temperature rises, and above a threshold the rubber degrades and the tyre separates from within - it does not wear out, it comes apart. That is exactly what an endurance test has to reproduce, and it is why the test is run on a drum at a defined load and speed for a defined duration rather than on a road. The standard fixes what determines whether the result is meaningful: the drum diameter, since a small drum bends the tyre more and heats it faster; the load and its relation to the rating; the speed; the ambient temperature and the airflow around the tyre, which changes the heat balance directly; the duration and the steps; and the criteria of failure and the examination afterwards. Issued on 29 December 2017 and in force since 1 November 2018, it replaces GB/T 22391-2008.

This Standard specifies the terms and definitions, test equipment and accuracy, test conditions, test procedures and test reports for the test of endurance for solid tyres. This Standard applies to new solid tyres.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies to this document. For undated references, the latest edition (including any amendment) applies to this document.

GB/T 6326, Tyre terms and definitions

GB/T 10823, Size designation dimensions and load capacity of solid tyres for pneumatic tyres rims

GB/T 16622, Size designation, dimensions and load capacity for pressed-on solid tyres

3 Terms and definitions

Terms and definitions determined by GB/T 6326 are applicable to this document.

4 Test equipment and accuracy

4.1 The outer diameter of the test drum is 1 700 mm ± 17 mm.

4.2 The test surface of the test drum shall be a smooth steel surface, and the surface width shall be greater than or equal to the total section width of the test tyre.

4.3 The temperature measuring instrument shall be a needle thermometer with digital display, the accuracy of the thermometer shall be ±0.1 °C, and the diameter of the probe shall be 1 mm ~ 3 mm smaller than the thermometer hole.

4.4 The speed of the drum of the testing machine shall meet the test requirements, and its speed accuracy shall be ±