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**NATIONAL STANDARD OF THE
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Motor vehicle brake fluids

机动车辆制动液

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1 Scope

China's mandatory national standard for motor vehicle brake fluids. Brake fluid is the only component of a car whose failure removes the brakes entirely and without warning, and the mechanism is specific: the fluid is hygroscopic, absorbing water from the atmosphere through the hoses and the reservoir over years, and water lowers the boiling point. On a long descent the fluid at the calliper reaches that lowered boiling point, vapour forms, and vapour is compressible - so the pedal goes to the floor exactly when the brakes are needed most. That is why the standard specifies two boiling points, dry and wet, the wet one measured after the fluid has been humidified to represent a fluid that has been in service. Around them sit the viscosity at low temperature, which governs ABS response in the cold, and the compatibility with the rubber of the seals.

This document specifies the product types and labeling, technical requirements and test methods, inspection rules and marks, packaging, transportation and storage of non-petroleum-based brake fluids used in hydraulic braking and clutch systems of motor vehicles. This document applies to motor vehicle brake fluids that come into contact with seals made primarily of styrene-butadiene rubber (SBR) or ethylene propylene diene monomer (EPDM), and are based on non-petroleum-based raw materials (alcohols, alcohol ethers, and their compounds) with the addition of various additives.

2 Normative references

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

GB/T 265, Petroleum Products -- Determination of Kinematic Viscosity and Calculation of Dynamic Viscosity

GB/T 514, Specification for liquid-in-glass thermometers for testing of petroleum products

GB/T 531.1, Rubber vulcanized or thermoplastic -- Determination of indentation hardness -- Part

3 Terms and definitions

This document does not contain any terms or definitions that need to be defined.

4 Product types and labeling

4.1 Product types This document pertains to a series of non-petroleum-based brake fluids for motor vehicle hydraulic braking and clutch systems. The product series is named HZY, where H, Z, and Y are the first letters of the first Chinese characters in the Chinese words for "synthetic", "braking" and "liquid" respectively. Based on different operating temperature and viscosity requirements, the products are divided into five grades. HZY3, HZY4, HZY5, HZY6, and HZY7, corresponding to Class 3, Class 4, Class 5.1, Class 6, and Class 7 in ISO 4925.2020, respectively. HZY3, HZY4, and HZY5 correspond to DOT3, DOT4, and DOT

5.1 brake fluid types from the U.S. Department of Transportation.

4.2 Product labeling Brake fluid products shall be labeled with at least the following. product grade, motor

6.1 Inspection classification and items

6.1.1 Exit-factory inspection Exit-factory inspection is divided into batch inspection and periodic inspection. The exit-factory batch inspection items include. appearance, kinematic viscosity, equilibrium reflux boiling point, wet equilibrium reflux boiling point, and pH value. The exit-factory periodic inspection items include. evaporation performance (HZY3 and HZY4), reserve alkalinity, corrosivity, and rubber compatibility. Periodic inspections are conducted monthly.

6.1.2 Type inspection Type inspection covers all technical requirements specified in Chapter

5. Type inspection is typically conducted every two years. This period can be extended if there are no changes to the production process. Type inspection is required in one of the following situations.

- a) When a new product is put into production or when a product is finalized and approved;
- b) When a product is switched to another production line or transferred to another factory;
- c) During formal production, when there are significant technical changes to raw materials, production processes, or operating procedures that may affect product performance;

- d) When production resumes after a shutdown of one year or more;
- e) When the results of the exit-factory inspection differ significantly from the results of the previous type inspection, and the factors causing the difference and their impact on product performance cannot be determined;
- f) When the national quality supervision agency requests type inspection;
- g) When the user has special requirements.

6.2 Batching Under the condition that the raw materials, production process and operating procedures remain unchanged, each can or kettle of product produced constitutes a batch.

6.3 Sampling Proceed according to GB/T 4756. Take 4 L of specimen from each batch of product for testing and retention purposes.

6.4 Judgment rules The numerical rounding of the exit-factory inspection and type inspection results shall be carried out in accordance with GB/T 8170. If all inspection results meet the technical requirements of Chapter 5, the product shall be deemed qualified.