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

GB/T 4509-2010

Replacing GB/T 4509-1998

Standard test method for penetration of bitumen

沥青针入度测定法

(English Translation)

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Foreword

This standard is modified using the ASTM D5.:2006 "Asphalt Penetration Test" (English version).

This standard is redrafted according to ASTM D5.:2006.

This standard compared with ASTM D5.:2006 technical changes are as follows.

- This standard is used to remove ASTM D5.:2006, Chapter 2, cited in ASTM 2.1, ASTM E77, ASTM E 1137/E1137M, ASTM E2251 reference file, delete 2.2 in ANSI Standard. B46.1 and 2.3 ISO Standard 468 reference file;

--- this standard does not belong to the national standard content, the standard to remove ASTM D5.:2006 Chapter 4 meaning and use;

The greater the size of the needle, the smaller the effect on the nature of the sample. So this standard will be inserted into the diameter and depth of the dish size the requirements are changed to the corresponding minimum dimensions (see 5.3, ASTM D5.:2006, version 6.3);

In order to facilitate the application of standards, this standard will ASTM D5.:2006 in the formula to calculate the precision of the data range (See Chapter 9 of this edition, Chapter 11 in ASTM D5.:2006);

In order to more accurately measure the penetration of the sample, this standard will ASTM D5.:2006 11.1 250 ~ 500 into the scope of the range plan Divided into 250 ~ 350, 350 ~ 500 two ranges, and the results of the parallel test results should meet the requirements were changed to 8 and 20. (See 8.1, ASTM D5.:2006, 11.1);

--- because this does not belong to the national standard content, this standard removed ASTM D5.:2006 Chapter 12 keywords.

This standard changes with ASTM D5.:2006 as follows.

- Remove ASTM D5.:2006, Chapter 4 Meaning and Use;
- This standard will be ASTM D5.:2006 Chapter 8 test conditions and Chapter 4 method summary of the merger into Chapter 4;
- Remove ASTM D5.:2006, Chapter 12;
- other chapter number for the corresponding changes.

Compared with ASTM D5.:2006, the editorial changes are as follows. Remove all non-SI units in parentheses and keep SI unit system (see text).

This standard replaces GB/T 4509-1998 "Asphalt penetration determination method".

This standard and GB/T 4509-1998 compared to the main changes are as follows.

- This standard adds the contents of the long needle (see version 5.2.1, GB/T 4509-1998 standard 6.2.1);
- This standard has increased the penetration of less than 40 into the degree of the size of the requirements (see Edition 5.3, GB/T 4509-1998 standard 6.3);
- the contents of this standard to increase "or meet the accuracy, and sensitivity of the temperature measurement device are available." (See this version 5.7, GB/T 4509-1998 6.7);
- in this standard, "if the test time is in the water bath, the sample dish directly on the immersed in the water on the bracket, so that the sample is completely immersed in water. If the experimental time into the meter is not in the water bath, "the content (see this version of 7.2, GB/T 4509-1998 8.2);

This standard increases. "When the penetration rate exceeds 200, each sample is numbered and the three samples are given three data.

The sample was left with at least three needles, and each test needle was left in the sample until the needle was finished and the needle was removed from the sample.

However, the difference between the maximum and minimum values of the measured penetration shall not exceed the requirements of 9.1. "(See version 7.5, GB/T 4509-1998 8.5);

- This standard will "heating the sample time not more than 30min," to "heating time to ensure the full flow of samples on the basis of less. "(See Edition 6.1, GB/T 4509-1998, 7.1);
- This standard increases the range of 350 ~ 500 range of parallel samples of the results of the maximum difference of 20 requirements (see this version 8.1, GB/T 4509-1998 Standard 9.1);

--- delete the GB/T 4509-1998 standard Chapter 4 meaning and use chapter.

This standard is proposed by the National Standard Committee on Petroleum Products and Lubricants.

This standard by the National Petroleum Products and Lubricants Standardization Technical Committee of Petroleum asphalt subcommittee.

The drafting unit. China University of Petroleum (East China) heavy oil research institute.

1 Scope

This standard specifies standard needle, sample pan and other test conditions with a range of (0 to 500) 1/10 mm.

This standard is applicable to the penetration of solid and semi-solid asphalt materials ranging from (0 to 500) 1/10mm.

Note: For the preparation and testing of emulsified asphalt residue samples used in this method, refer to the SH/T 0099.4 test method.

2 Normative reference documents

The terms of the following documents are hereby incorporated by reference into this standard. Whichever is the date of the reference file, which is followed by all (Excluding the contents of the errata) or the revised version shall not apply to this standard, however, the parties to the agreement under this standard are encouraged to study Whether you can use the latest version of these files. The latest version of the reference document that is not dated is applicable to this standard.

Determination of asphalt softening point GB/T Determination of Residual Content of Emulsified Asphalt by SH/T 0099.4

3 Terms and definitions

The following terms and definitions apply to this standard.

Penetration Under the specified conditions, the standard needle vertically penetrates into the depth of the asphalt sample, expressed in 1/10mm.

4 Method summary

Asphalt penetration to the standard needle in a certain load, time and temperature conditions perpendicular to the depth of the asphalt sample, expressed in 1/10mm. Unless otherwise specified, the total mass of standard needle, link and additional weight is (100 ± 0.05) g, the temperature is (25 ± 0.1) °C, Time is 5s. The other conditions that can be used for a particular test are shown in Table 1.

Table 1

Temperature/°C load/g time/s 0.200 60 4.200 60 Specific test, the report should indicate the test conditions.

5.1 Penetration meter

Can make the needle link in the absence of friction under the vertical movement, and can indicate the depth of penetration to 0.1mm instruments can be used. Needle connection the mass of the rod is (47.5 ± 0.05) g. The total mass of the needle and needle link is (50 ± 0.05) g, and the instrument is accompanied by (50 ± 0.05) g and (100 ± 0.05) g and (200 ± 0.05) g of the load to meet the required load condition. The instrument is equipped with a flat-bottomed glass dish and has an adjustable level mechanism. The needle link should be perpendicular to the platform. The instrument is equipped with a needle connecting rod Brake button, press the button pin link can be free to fall. The needle link is easy to disassemble to regularly check its quality.