

ICS 71.100.40
CCS Y43



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

GB/T 13174-2021

Replacing GB/T 13174-2008

**Determination of detergency and cycle of washing property for
laundry detergents**

衣料用洗涤剂去污力及循环洗涤性能的测定

Issued on: March 9, 2021

Implemented on: October 1, 2021

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

1 Scope
1.0 L and dilute to
2 Normative References
3 Terms and Definitions, Symbols and Codes
4 Test Principle
5 Reagents and Materials
6 Instruments and Equipment
6.1 Vertical-type Detergency Test Machine
7 Test Procedures
7.2 Detergency Determination
8 Result Calculation and Determination
8.1 Calculation and Determination of Test Results of Detergency
8.2 Evaluation of Cycle of Washing Property
9 Test Report

1 Scope

GB/T 13174-2021 is the Chinese national standard on determination of detergency and cycle of washing property for laundry detergents, in the field of chemical technology. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 9 March 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 October 2021. Classification: ICS 71.100.40, CCS Y43. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the methods of evaluating the detergency of detergents by performing detergency tests with artificial test cloths and evaluating the anti-soil-redeposition property of detergents by using white cotton cloths for control cycle washing. This Standard is applicable to the evaluation of detergency and anti-soil-redeposition property of laundry detergents.

1.0 L and dilute to

10.0 L, which is 250 mg/kg hard water.

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 210.1-2004 Specification and Determination Methods of Sodium Carbonate for Industrial Use - Part

3 Terms and Definitions, Symbols and Codes

3.1 Terms and Definitions The following terms and definitions are applicable to this document.

3.1.1 test cloths Test cloths refer to artificially soiled cloths made by treating the original white cotton cloths with the specified types of stains through a certain procedure, which are used to determine the ability of detergents to remove such stains.

3.1.2 pieces of test cloths Pieces of test cloths refer to soiled cloths cut into a circle or square of a certain size as required, and used for the detergency test.

3.1.3 whiteness index Whiteness index refers to the reflectance of the test cloths or pieces of test cloths to the light wave at the specified wavelength, which shall be read at 457 nm with a whiteness meter.

3.1.4 whiteness index before washing Whiteness index before washing refers to the whiteness index of the pieces of test cloths before washing with detergent.

3.1.5 whiteness index after washing Whiteness index after washing refers to the whiteness index of the pieces of test cloths after washing with detergent.

3.1.6 difference of the whiteness index Difference of the whiteness index refers to the difference between the whiteness index after washing and the whiteness index before washing.

4 Test Principle

In the detergency test machine, in accordance with the specified temperature and washing time, use water with a certain hardness to prepare a detergent solution with a certain concentration; wash the various types of soiled test pieces, and use a whiteness meter to determine the whiteness index of the pieces of test cloths before and after washing at the

selected wavelength. Take the whiteness difference of the pieces of test cloths to evaluate the detergency of the detergent.

5 Reagents and Materials

Unless it is otherwise specified, only reagents that are confirmed as analytically pure and Grade- 3 water that complies with GB/T 6682 are used in the analysis.

5.1 Calcium chloride (CaCl_2). NOTE. calcium chloride with a certain hydration number may also be used, but it needs to be converted in accordance with the usage of CaCl_2 specified in

7.1 during specific use.

5.4 Reference detergents. The formulation and preparation methods of the reference detergents are listed in Appendix B. The reference detergents are processed and produced with raw materials of uniform specifications and processes, and if necessary, uniformly customized. During use, in accordance with the requirements of this Standard or product standards, prepare them to the specified concentration.

5.5 Reference proteases Specifications of reference proteases. the reference proteases should be produced with raw materials of uniform specifications and processes, requiring uniform activity and a clarified shelf life. For the technical requirements of the product, see the superior product index in QB/T 1806-1993. In addition, carry out necessary identification of enzyme activity.

6.1 Vertical-type Detergency Test Machine

6.2 Whiteness Meter Fluorescent whiteness meter. The illumination and detection modes are vertical illumination diffuse detection (o/d). It conforms to the verification requirements of JJG 512.

6.8 Rinsing Controller (optional) See the technical parameters in Appendix C.

7 Test Procedures

7.1 Preparation of Hard Water In the washing test, the detergent solution is prepared using 250 mg/kg (calculated as CaCO_3 , the same below) hard water, and the molar ratio of Ca^{2+} and Mg^{2+} is 6.4. The preparation method is as follows: weigh-take

16.70 g of calcium chloride (5.1) and

20.37 g of magnesium chloride (5.2), prepare

10.0 L, which is 2,500 mg/kg hard water. When in use, take

7.2 Detergency Determination

7.2.1 Preparation of pieces of test cloths In accordance with the requirements of the detergent performance test, select the required variety of JB series test cloth pieces. Cut the soiled cloths (5.3) used for determination into pieces of test cloths. In accordance with the category, respectively match them into six groups with similar average chromaticity (in order to eliminate the differences among different batches of soiled cloths, the six groups of test cloth pieces shall be cut from the same piece of JB series soiled cloth as much as possible). In each group, there shall be 4 or more JB test cloth pieces for the detergency test, and 6 JB-00 test cloth pieces for the whiteness preserved or cycle of washing property test. Meanwhile, record the numbers of the test cloth pieces, and each group of test cloth pieces is used for the performance test of one sample.

7.2.2 Measurement of whiteness During the detergency or cycle of washing property test, stack the pieces of test cloths in accordance with the same category, and use the whiteness meter to read the whiteness index before and after washing one by one at 457 nm.

7.3 Detergency and Washing Tests The detergency and washing tests are carried out in accordance with the following steps.

8.1 Calculation and Determination of Test Results of Detergency

8.1.1 Calculation of value of detergency of test cloths The value of detergency (R_i) of a certain type of test cloths is calculated in accordance with Formula (1).

8.1.2 Calculation of rate of the value of detergency in comparison with reference detergent The rate of the value of detergency of the i th type of test cloth (P_i) in comparison with the reference detergent is calculated in accordance with Formula (2).

8.2 Evaluation of Cycle of Washing Property

8.2.1 Calculation and determination of test results of whiteness preserved In accordance with the test results of 7.4.1, in accordance with Formula (3), calculate the value of whiteness preserved (T_k).

8.2.2 Calculation of test results of ash deposition In accordance with the test results of 7.4.2 and Formula (5), calculate the ash deposition (S_k).

8.2.3 Evaluation of appearance (roughness) and softness The evaluation of the appearance (rough / smooth) and softness of the fabric after washing can be conducted through artificial sensory evaluation or instrumental method. Artificial sensory evaluation is carried out by more than five experienced judges. For the two test cloth pieces reserved in 7.4.2, carry out visual inspection and hand-touch comparison to judge whether the appearance (rough / smooth) and softness of the test cloth pieces after being subjected to the washing