



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

GB/T 27592-2023

**Reactive dyes - Determination of degree of fixation in pad
dyeing**

反应染料 轧染固色率的测定

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Foreword

This document was issued on 17 March 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 October 2023.

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

1 Scope

GB/T 27592-2023 covers the determination of the degree of fixation of reactive dyes in pad dyeing - the share of the dye applied to the cloth that ends up bound to the fibre rather than carried off in the wash. A reactive dye is bought on that figure as much as on its shade: dye that does not fix is dye that was paid for, coloured nothing and then has to leave the mill in the effluent. The standard gives the terms and definitions, built on GB/T 6687, the instruments and equipment and the reagents and materials, both referred to GB/T 2374-2017 and including a laboratory padder, then the determination method and the test report. The determination method opens with an extraction method, in which the specimen is pad dyed and fixed on cotton cloth and the unfixed dye is afterwards extracted for measurement. Because fixation depends on how the padding, the fixation and the washing were run, a laboratory procedure that pins all three down is what makes one dye comparable with another rather than with the mill that happened to run it. Of use to dye producers, dyehouses and textile testing laboratories.

This document describes the determination method for the degree of fixation in pad dyeing of reactive dyes.

This document is applicable to the determination of the degree of fixation in pad dyeing of reactive dyes.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. 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 2374-2017 Dyestuffs - General Rules for Dyeing Test

GB/T 2387-2013 Reactive Dyes - Determination of Shade and Relative Strength

GB/T 6687 Glossary of Dyestuff Terms

3 Terms and Definitions

What is defined in GB/T 6687, and the following terms and definitions are applicable to this document.

3.1 degree of fixation

Degree of fixation is a characteristic index of the amount of dye on the fiber after the removal

of floating color.

NOTE: there are two methods for calculating the degree of fixation:

a) Based on the total amount of dye used for dyeing, which means the degree of fixation is the ratio of the amount of dye fixed on the fiber to the total amount of dye put into the dye bath;

b) Based on the amount of dye on the fabric before color fixation, which means the degree of

fixation is the ratio of the amount of dye per unit mass of fabric after color fixation to the amount of dye per unit mass of fabric before color fixation.

3.2 pad dyeing

After the fabric is soaked in the dye solution, use a roller to roll-compact it, so that the dye solution enters the gaps of the fabric; uniformly distribute the dye on the fabric, then, after performing treatment under certain conditions (for example, steaming or hot-melting), complete the dyeing process.

3.3 soaping

Soaping refers to the process of washing the dyed matter with detergent in a near-boiling water

bath after dyeing in order to remove the floating color on the surface of the dyed matter and enhance the color fastness and color brightness.

4 Instruments and Equipment

The instruments and equipment shall comply with the relevant stipulations of Chapter 4 in GB/T

2374-2017:

- a) Small padder for laboratory use;
- b) Spectrophotometer;
- c) Steamer or steam box for laboratory use;
- d) Analytical balance, with a division value of 0.0001 g.

5 Reagents and Materials

The reagents and materials shall comply with the relevant stipulations of Chapter 3 in GB/T 2374-2017.

Sulfuric acid solution: use a graduated cylinder to measure-take 408 mL of analytically pure reagent - sulfuric acid, slowly add it to 250 mL of water and mix it well.

6 Determination Method

6.1 Extraction Method

6.1.1 Principle

Perform pad dyeing and color fixation of the specimen on cotton cloth. By extracting a certain

mass of reactive dyes on the pad-dyed cloth specimen without steam fixation and the

pad-dyed

cloth specimen with steam fixation, respectively determine the absorbance value of each extract

liquor and calculate the degree of fixation of the specimen in pad dyeing on fiber.

solution on the cotton cloth after the pad dyeing; after color fixation of the pad-dyed cotton cloth, perform soaping. Then, respectively determine the absorbance value of the dyeing stock

solution and the soaping solution, and calculate the degree of fixation of the specimen in pad

dyeing on fiber.

6.2.2 Determination steps

6.2.2.1 Preparation of dye solution

In accordance with the relevant stipulations of 6.2.1 ~ 6.2.3 in GB/T 2387-2013, prepare the dye solution. The mass concentration of the dye is specified as 20 g/L. Then, accurately weigh-

take 0.5 g ~ 1 g (accurate to 0.0001 g) of the dye solution m_0 , dilute to an appropriate constant

volume V_0 and determine the absorbance A_0 of the dyeing stock solution.

6.2.2.2 Pad dyeing

Accurately weigh the mass m (accurate to 0.0001 g) of the cotton cloth to be pad-dyed. In accordance with the relevant stipulations of 6.2 in GB/T 2387-2013, perform pad dyeing. The

pad dyeing process is one dipping and one padding. After dipping the pad-dye solution, immediately weigh the mass m_1 (accurate to 0.0001 g) of the cloth specimen. In accordance

with the relevant stipulations of 6.2 in GB/T 2387-2013, perform color fixation on the weighed

pad-dyed cloth specimen. The selection of the color fixation method shall be based on the specific variety and performance, with the principle of the highest chromogenic force.

6.2.2.3 Soaping

For the specimen after color fixation, use 1 g/L detergent MA solution to perform soaping at