भारतीय मानक
Indian Standard

IS 7845: 2022

वस्त्र रंजक सामग्री — रंगाई विधि द्वारा प्रतिक्रियाशील रंजकों (ट्राइक्लोरोपायरिमिडाइल प्रकार) की तीव्रता के मूल्यांकन की विधि

(पहला पुनरीक्षण)

Textile Dyestuffs — Method for Evaluating Strength of Reactive Dyes (Trichloropyrimidyl Type) by Dyeing Test

(First Revision)

ICS 59.040; 71.040.50

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Textile Speciality Chemicals and Dyestuffs Sectional Committee, TXD 07

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Textile Speciality Chemicals and Dyestuffs Sectional Committee had been approved by the Textiles Division Council.

Reactive dyes are marketed in different strengths. The method laid down in standard for determining the strength of trichloropyrimidyl type (reactone/drimarene) dyestuffs against a mutually accepted standard would be useful for assessing the comparative strength of dyestuffs only. This method may not necessarily be the most economical method of dyeing.

This standard was first published in 1975. The first revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) Title of the standard has been modified;
b) Scope of the standard has been modified;
c) Grade and purity of chemicals used have been specified;
d) Sampling clause has been modified; and
e) References to Indian Standard have been updated.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’.

Indian Standard

TEXTILE DYESTUFFS — METHOD FOR EVALUATING STRENGTH OF REACTIVE DYES (TRICHLOROPYRIMIDYL TYPE) BY DYEING TEST

(First Revision)

1 SCOPE

This standard prescribes a method for determination of strength of reactive dyes (trichloropyrimidyl type) by dyeing test. This standard does not include automated instrumental method.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

IS No.	*Title*
255 : 1982	Specification for sodium sulphate, anhydrous (Technical grade) (*second revision*)
1070 : 1992	Reagent grade water – Specification (*third revision*)

3 SAMPLING

3.1 Lot — All the containers of the same dye and the same strength delivered to a buyer against a dispatch note shall constitute a lot.

3.2 Unless otherwise agreed to between the buyer and the seller the number of containers to be selected at random from a lot shall be in accordance with Table 1.

3.3 From each container draw small quantities of the dye by a suitable sampling instrument from at least three different parts and mix them thoroughly to get a composite sample weighing about 20 g. This shall constitute the test sample.

Table 1 Sample Size
(*Clause* 3.2)

Lot Size (1)	**Sample Size** (2)
2 to 15	2
16 to 25	3
26 to 50	4
51 to 100	5
101 to 150	6
151 to 300	7
301 and above	8

4 STANDARD DYESTUFF

The standard sample of dyestuff against which the strength of dyestuff under test is evaluated shall be as agreed to between the buyer and the seller.

5 QUALITY OF REAGENTS

Unless otherwise specified analytical reagent grade chemicals with 99.0 percent purity shall be employed in tests and distilled water (*see* IS 1070) shall be used where the use of water as reagent is intended.

6 EVALUATION OF STRENGTH OF DYESTUFF

6.1 Prepare dyeings of the standard sample of dyestuff (*see* **4**) by following the procedure given in Annex A; prepare simultaneously additional dyeings of the standard sample, with the percentage variations of dyeing strength by 5 percent on the lower side of the recommended percentage.

6.2 Simultaneously, prepare dyeings of different percentages of the dyestuff under test by following the procedure given in Annex A.

6.3 Compare the dyeings as obtained in **6.2** and the dyeings obtained as in **6.1** (*see* Note). Select a dyeing of the dyestuff under test which exactly matches with one of the dyeings of the standard dyestuff. Note the percentage of the dyeing which matches exactly.

NOTE — Before comparing the dyeings, they shall br spread out properly. The dried hanks shall be laid side by side in the same plane and oriented in the same direction. They should be combed to a uniform thickness to avoid the effects of backing on the appearance. The hanks shall be compared, if possible, in north skylight. The consistency in strength variation of different dyeings of standard dyestuff and the dyestuff under test shall be observed. If the strength variations between the two consecutive dyeings are not constant, the dyeings shall be repeated. If the dyeings of the test sample and the standard do not fall within range, fresh set of dyeings shall be taken.

7 CALCULATION

Calculate the strength of the dyestuff under test by the following formula:

$$S = \frac{A}{B} \times 100$$

Where,

S = strength of dyestuff in percent,

A = percentage dyeing of the standard dyestuff, and

B = percentage dyeing of the dyestuff under test which matches with A.

8 REPORT

Report the value obtained as in **7** as the strength in percent of the dyestuff under test.

ANNEX A
(*Clauses* 6.1 *and* 6.2)

METHOD FOR DYEING REACTIVE DYES (TRICHLOROPYRIMIDYL TYPE)

A-1 APPARATUS

A-1.1 Dye Vessels — porcelain or stainless steel vessels.

A-1.2 Graduated Pipettes — capable of measuring correct to 0.1 ml.

A-1.3 Volumetric Flask — calibrated to 500 ml.

A-2 DYEING ASSISTANTS

A- 2.1 Water — Distilled water (*see* IS 1070) shall be used in the preparation of the dye-bath.

NOTE — For rinsing, water hardness of not more than 50 ppm expressed as calcium carbonate may be used.

A-2.2 Sodium Sulphate (Calcined) Solution — 20 percent (*m/v*) (*see* IS 255).

NOTE — Quality of sodium sulphate solution is extremely important. Commercial brands may be acidic or alkaline, therefore they shall be neutralized.

A-2.3 Sodium Carbonate Solution — 10 percent (*m/v*).

A-2.4 Mild Oxidant Solution — such as meta-nitro benzene sulphonic acid sodium salt, 10 percent (*m/v*).

A-2.5 Soap Solution — containing 0.3 percent (*m/v*) of neutral detergent.

A-3 PREPARATION OF THE HANKS FOR DYEING

A-3.1 A sufficient number of hanks of scoured, bleached, unmercerised cotton yarn (*see* NOTE 1) having no finishing chemicals or blueing agent shall be used in this test. Each hank shall weigh 10 $\pm$ 0.1 g (*see* NOTE 2).

NOTES

1 Any yarn normally used in the laboratories for carrying out trials or yarn of the following requirements is suitable for this test:

a) Count — 10 tex × 2 (or 60s/2)
b) Twist per metre — 750, and
c) Cuprammonium fluidity not more than 5 rhes.

2 If the mass of the hank is not 10 $\pm$ 0.1 g then it shall be weighed accurately and the amount of dyestuff and the chemicals to be taken shall be calculated accurately.

A-3.2 Preparation of the Test Hanks

Treat the hanks in boiling water for 10 minutes, squeeze evenly to contain approximately its own mass of water, cool and enter into the dye-bath.

A-4 PROCEDURE

A-4.1 Preparation of the Dyestuff Solutions

Weigh accurately 1.0 g of the dyestuff under test. Paste the dyestuff with cold water and dissolve by adding hot water (not higher than 50°C). The total volume of water used for dissolution of dyestuff shall not exceed 100 ml. Dilute the solution with cold water and make up 500 ml in a volumetric flask.

A-4.1.1 Similarly, prepare a solution of the standard dyestuff by following the procedure given in **A-4.1** but taking the standard dyestuff instead of the dyestuff under test.

A-4.2 Dyeing (for 10 ± 0.1 g Hank)

A-4.2.1 Pipette out separately the required amount of solution of standard dyestuff in the dye vessels so as to give 1.9, 2.0 and 2.1 percent depth. Add the requisite quantity of water and 30 ml sodium sulphate (calcined) solution, 3 ml of mild oxidant solution to make the volume of the dye liquor 300 ml (liquor to material ratio of 30 : 1) leaving sufficient margin for the addition of alkali and remaining salt solution . Set the dye-bath at 40°C, stir the dye liquor and enter the wetted hanks. Turn the hanks frequently so as to obtain level dyeings. Add 60 ml of sodium carbonate solution and raise temperature of the dye-bath from 40°C to 70°C in 15 minutes turning the hanks at regular intervals. Then add to the dye-bath 30 ml of sodium sulphate (calcined) solution and maintain the temperature at 95°C for 1 hour, turning the hanks frequently to obtain level dyeings.

A-4.2.2 Remove the dyeings and squeeze the dyed hanks evenly. Rinse the dyed hanks first in cold water and then in hot water. Treat the dyed hanks at boil for 15 minutes in a soap solution at liquor to material ratio of 30 : 1; rinse in cold water and again treat the hanks at boil for 15 minutes in soap solution at liquor to material ratio of 30 : 1. Finally rinse the dyeings in cold water and dry.

A-4.2.3 Similarly, pipette out separately required amounts of solution of the dyestuff under test in separate dye vessels (*see* NOTE). Dye the hanks by following the method given in **A-4.2.1**.

NOTE — The dyeings with the solutions of the dyestuff under test and of the standard dyestuff should be done simultaneously in the same water-bath.

ANNEX B
(*Foreword*)

COMMITTEE COMPOSITION

Textile Speciality Chemicals and Dyestuffs Sectional Committee,
TXD 07

Organization	*Representative(s)*
Department for Jute and Fibre Technology Institute of Jute Technology, University of Calcutta, Kolkata	PROF A K SAMANTA (***Chairman***)
Ahmedabad Textile Industry's Research Association,	SHRIMATI DEEPALI PLAWAT SHRIMATI FAHIMUNNISA KHATIB (*Alternate*)
Ama Herbals Laboratories Pvt Ltd, Lucknow	SHRI Y A SHAH
Archroma India Pvt Limited, Mumbai	SHRI RAJESH RAMAMURTHY SHRI ASHIM GHOSH (*Alternate*)
Atul Limited (Colors Business), Valsad	SHRI V R SAI GANESH SHRI ARINDAM CHAKRABORTY (*Alternate*)
Bio Dyes India Pvt Ltd, Goa	DR BOSCO HENRIQUES
Central Coir Research Institute, Alappuzha	SHRIMATI ANITA JACOB SHRIMATI SUMI SABESTIAN (*Alternate*)
ICAR – Central Institute for Research on Cotton Technology, Mumbai	DR SUJATA SAXENA DR A S M RAJA (*Alternate*)
Department for Jute and Fibre Technology Institute of Jute Technology, University of Calcutta, Kolkata	DR D DAS
Global Organic Textile Standard, (GOTS), Thane	SHRI RAHUL BHAJEKAR MS PRACHI GUPTA (*Alternate*)
Indian Jute Industries Research Association, Kolkata	DR S K CHAKRABARTI SHRI SANDIP BASU (*Alternate*)
Northern India Textile Research Association, Ghaziabad	DR M S PARMAR
Office of the Textile Commissioner, Mumbai	SHRI GAURAV GUPTA SHRI SANJAY CHARAK (*Alternate*)
SGS India Pvt Ltd, Mumbai	SHRI KARTHIKEYAN K SHRI GAURAV SARASWAT (*Alternate*)
Shree Pushkar Chemicals & Fertilizers Ltd, Mumbai	DR N N MAHAPATRA
Textiles Committee, Mumbai	SHRI KARTIKEYA DHANDA SHRIMATI SHILPI CHAUHAN (*Alternate*)

Organization	*Representative(s)*
The Arvind Mills Limited, Ahmedabad	SHRI RAJARSHI GHOSH SHRI UMASANKAR MAHAPATRA (*Alternate*)
The Bombay Textile Research Association, Mumbai	DR PADMA S VANKAR SHRI M P SATHIANARAYANAN (*Alternate*)
The South India Textile Research Association, Coimbatore	DR PRAKASH VASUDEVAN SHRI S SIVAKUMAR (*Alternate*)
The Synthetic and Art Silk Mills Research Association, Mumbai	SHRIMATI (DR) MANISHA MATHUR SHRIMATI ASHWINI SUDAM (*Alternate*)
U P Textile Technology Institute, Kanpur	DR ARUN PATRA
Wool Research Association, Thane	SHRIMATI SMITA BAIT SHRIMATI (DR) MRINAL CHOUDHARI (*Alternate*)
BIS Directorate General	SHRI J K GUPTA, Scientist E and Head (Textiles) [Representing Director General (*Ex-officio*)]

Member Secretary
SHRI HIMANSHU SHUKLA
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Bureau of Indian Standards

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Review of Indian Standards

Review of Indian Standards

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