भारतीय मानक **IS 5785 (Part 1) : 2024**

Indian Standard

सतह सक्रिय अभिकर्मक — परीक्षण पद्धतियाँ

भाग 1 सापेक्ष फैलाव शक्ति

(पहला पुनरीक्षण)

Surface Active Agents — Methods of Test

Part 1 Relative Dispersing Power

(First Revision)

ICS 71.100.40

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

April 2024 **Price Group 4**

Soaps, Detergents and Surface Active Agents Sectional Committee, CHD 25

FOREWORD

This Indian Standard (Part 1) (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Soaps, Detergents and Surface Active Agents Sectional Committee had been approved by the Chemical Division Council.

For a practical and realistic evaluation of quality of the class of products known as surface active agents, performance tests constitute the ideal yardstick. Physico-chemical analysis alone is inadequate. However, in actual practice uniform procedures have not been evolved so, far for carrying out these tests and the results obtained are, therefore, not reproducible. The Committee responsible for the preparation of this standard felt that publication of the test methods in the form of an Indian Standard would promote adoption of uniform, procedures within the country. The test methods, which are based on available data and current practices, are expected to be revised from time to time to improve their precision and accuracy.

In view of the poor reproducibility of these methods, these are presently being published as a starting point for collection of experience and data. It is expected that after these have been adequately improved upon, these will form the basis of corresponding requirements in the material specifications for surface active agents.

This standard (Part 1) was first published in 1970. In this revision, the following changes have been made;

a) The references clause has been added;

b) The definition of surface active agents has been modified;

c) Provisions have been made allowing testing at different concentration of surface active agents;

d) The requirement of repeating the test after settling time of 24 hours has been deleted; and

e) The formula for calculating the percentage solid dispersed has also been modified.

This Indian Standard is published in several parts. The other parts of the standard are;

Part 2 Relative emulsifying power

Part 3 Foaming power

Part 4 Relative detergency

Part 5 Wetting power

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

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SURFACE ACTIVE AGENTS — METHODS OF TEST

PART 1 RELATIVE DISPERSING POWER

(First Revision)

1 SCOPE

This standard (Part 1) prescribes the method of test for evaluating the relative dispersing power of surface active agents used in the textile industry.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provision 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 edition of these standards:

IS No.	*Title*
IS/ISO 835 : 2007	Laboratory glassware — Graduated pipettes
IS 878 : 2008/ ISO 4788 : 2005	Laboratory glassware — Graduated measuring cylinders (*second revision*)
IS 1070 : 2023	Reagent grade water — Specification (*fourth revision*)
IS 2626 : 2015/ ISO 13132 : 2011	Laboratory glassware — Petri dishes (*second revision*)
IS 7597 : 2001	Surface active agents — Glossary of terms (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 7597 shall apply. In addition, the following definition shall apply:

3.1 Surface Active Agents — A chemical compound possessing surface activity which, dissolved in a liquid in particular in water, lowers the surface tension or interfacial tension, by preferred adsorption at the liquid/vapour surface, or other interfaces.

NOTE — A chemical compound including in its molecule at least one group with an affinity for markedly polar surfaces, ensuring in most cases its dissolution in water, and a non-polar group which has little affinity for water.

4 ESTIMATION OF RELATIVE DISPERSING POWER

4.1 Outline of Method

A known amount of finely divided carbon black in white oil (*see* IS 1083) is suspended in different concentrations of the surface active agent solutions for different durations of time. After a definite interval of time, a known amount of sample solution is taken from the centre of the solution and the amount of solid dispersed in the liquid is determined.

4.2 Apparatus

4.2.1 *Graduated Cylinders* **—** of 250 ml capacity, provided with a glass stopper (*see* IS 878)

4.2.2 *Petri Dishes* — of 100 mm nominal size (*see* IS 2626)

4.2.3 *Pipette* **—** of 5 ml capacity (*see* IS/ISO 835)

4.3 Reagents

4.3.1 *Quality of Reagents*

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

4.3.2 *Carbon Black*

Finely divided carbon black about 18 nm particle diameter.

Finely divided iron oxide of 15 nm to 21 nm particle diameter may also be used instead of carbon black.

4.3.3 *White Oil* **—** (*see* IS 1083)

4.4 Preparation of Solutions

Dissolve separately 25 g of different surface active agents under test in sufficient amount of water and make up the volume of each solution to one litre.

4.5 Procedure

4.5.1 Take a 250 ml graduated cylinder for each of the surface active agents. Weigh 4 g of carbon black and transfer it to the cylinder. Add 5 ml of white oil to it and also 40 ml of 2.5 percent solution of the surface active agent (solution from 4.4). Make up the volume to 200 ml by adding more of water.

4.5.1.1 Prepare similarly solutions of all the surface active agents in separate cylinders.

4.5.2 Stopper each cylinder, hold them upright and tilt in the clockwise direction to invert with stopper down and restore back in the same way. Repeat the procedure 10 times and then keep the cylinders stationary without disturbing the contents.

NOTE — The shaking should be uniform and undue jerks should be avoided.

4.5.3 After a period of one hour, pipette out 5 ml of solution from the centre of each cylinder (*see* Note 1) and transfer each aliquot portion to a previously tared petri dish. Evaporate the solutions in different dishes and dry the residue at 105 ºC to 110 ºC to constant weight (*see* Note 2).

NOTES

1 Mark the pipette at a place which coincides with the top of the cylinder when the tip of the pipette is at 100 ml graduation mark on the cylinder.

2 The residue shall be taken to have attained constant weight when two consecutive weighings taken at an interval of 30 min do not differ by more than 2 mg.

4.5.4 Repeat the procedure given in 4.5.3, by pipetting out the solutions from each cylinder after an interval of 2 h and 5 h.

4.5.5 Repeat the procedure given in 4.5.1 to 4.5.4, by taking 80 ml, 120 ml and 160 ml of solutions of different surface active agents (*see* 4.5.1) each for 1 h, 2 h and 5 h duration.

4.5.6 Alternatively, prepare a solution of surface active agent at the recommended concentration, for laundry detergents this could be 4 000 ppm and run the procedure given in 4.5.1 **to** 4.5.4 at this concentration changing the duration for 1 h, 2 h and 5 h.

4.6 Calculation and Reporting

4.6.1 *Calculation*

4.6.1.1 Calculate separately the percentage of the solid dispersed by each surface active agent by the following formula:

$$C = \frac{W - D}{8\,250} \times 100$$

where

C = percentage of the solid dispersed;

W = mass, in mg, of the residue; and

D = mass, in mg, of surface active agent present in 5 ml of the solution of surface active agent.

4.6.1.2 Calculate separately the percentage of the solid dispersed by each surface active agent at the end of the different durations of time (1 h, 2 h and 5 h). Calculate separately for each concentration of each surface active agent.

4.6.2 Draw the graphs of different concentrations of the surface active agent against the percentage of solid dispersed after 1 h time duration, with a different curve for each surface active agent. Similarly draw the graphs for 2 h and 5 h time duration.

NOTE — If the test is carried out for other durations of time, graphs for the corresponding time duration may be drawn.

4.6.3 *Reporting*

From the graphs compare the results to determine the relative dispersing power of surface active agents bearing in mind that for the same duration of time and the same concentration of different surface active agents, the higher the percentage of solids dispersed, the more efficient is the corresponding surface active agent.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Soaps, Detergents, and Surface Active Agents Sectional Committee, CHD 25

Organization	*Representative(s)*
Harcourt Butler Technical University, Kanpur	DR P. K. S. YADAV **(*Chairperson*)**
Central Drugs Standard Control Organization, New Delhi	SHRIMATI L. SUGANTHI SHRIMATI D. HEMALATHA (*Alternate*)
Central Pollution Control Board, New Delhi	SHRI DINABANDHU GOUDA SHRI VISHAL GANDHI (*Alternate*)
Consumer Guidance Society of India, Mumbai	DR SITARAM DIXIT DR M. S. KAMATH (*Alternate*)
Consumer Voice, New Delhi	SHRI M. A. U. KHAN DR RAJIV JHA (*Alternate*)
Dabur India Limited, Sahibabad	SHRI ASHISH KUMAR DIXIT SHRI SURYAJI JADHAV (*Alternate*)
FASSSDMI, Delhi	SHRI ASEEM GALHOTRA
Fena Private Limited, New Delhi	SHRI DALIP JOLLY SHRI BENNY G. JACOB (*Alternate*)
Godrej Consumer Products Limited, Mumbai	DR MANOJ GAUR SHRI VENKATESWARA YADLAPALLI (*Alternate* I) SHRIMATI RUPINDER KAUR RAWAT (*Alternate* II)
Harcourt Butler Technical University, Kanpur	SHRI GAURAV SINGH SHRI SANJAY KUMAR SINGH (*Alternate*)
Hindustan Unilever Limited, Mumbai	SHRIMATI PRITI CHODANKAR SHRIMATI SEEMA YADAV
Indian Home and Personal Care Industry Association, Mumbai	SHRI SANJAY N. TRIVEDI SHRI ANANTHASUBRAMANIAN SIVAKUMAR (*Alternate*)
Indian Institute of Technology Jammu, Jammu	DR AUSHTOSH YADAV
Indian Oil Corporation Limited, Mumbai	DR Y. S. JHALA SHRI RISHIKESH PRAJAPATI (*Alternate* I) SHRI ALOK SRIVASTAVA (*Alternate* II)
Institute of Chemical Technology, Mumbai	DR AMIT P. PRATAP DR R. D. KULKARNI (*Alternate*)
ITC Limited, Kolkata	DR DOSS JAYAPRAKASH DR GURU PRASAD K. V. (*Alternate*)
Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	DR PAWAN DEVIDAS MESHRAM

Organization	*Representative(s)*
Micro, Small and Medium Enterprises, Testing Centre, Mumbai	SHRI MANOJ KUMAR SHRI VIPUL GAIKWAD (*Alternate*)
National Test House, Kolkata	DR AMARNATH CHAKRABORTY SHRI VINOD KUMAR AMIRUNAND RAM (*Alternate*)
Novozymes South Asia Private Limited, Mumbai	DR VASUDHEVA REDDY SHRI SAURABH ARUN SRIVASTAVA (*Alternate*)
Procter and Gamble India, Mumbai	SHRI GIRISH PARHATE SHRI SIVAKUMAR THANIGACHALAM (*Alternate*)
Reckitt Benckiser India Private Limited, Mumbai	SHRI RUCHIR SHAH SHRIMATI JASMIN KALRA (*Alternate* I) SHRIMATI ANCHAL KHERA (*Alternate* II)
In Personal Capacity, (*3A/148 Azad Nagar, Kanpur - 200802*)	DR R. K. TRIVEDI
BIS Directorate General	SHRI AJAY KUMAR LAL, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (CHEMICAL) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRI VIRENDRA SINGH
SCIENTIST 'D'/JOINT DIRECTOR
(CHEMICAL), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: CHD 25 (19457).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Manakalya, 4th Floor, NTH Complex (W Sector), F-10, MIDC, Andheri (East), Mumbai 400093	283 25838

Branches : AHMEDABAD, BENGALURU, BHOPAL, BHUBANESHWAR, CHANDIGARH, CHENNAI, COIMBATORE, DEHRADUN, DELHI, FARIDABAD, GHAZIABAD, GUWAHATI, HARYNA, HUBLI, HYDERABAD, JAIPUR, JAMMU & KASHMIR, JAMSHEDPUR, KOCHI, KOLKATA, LUCKNOW, MADURAI, MUMBAI, NAGPUR, NOIDA, PARWANOO, PATNA, PUNE, RAIPUR, RAJKOT, SURAT, VIJAYAWADA.

Published by BIS, New Delhi