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IS 8180 (1992): Household laundry detergent bars [CHD 25: Soaps and other Surface Active Agents]
Indian Standard

HOUSEHOLD LAUNDRY DETERGENT B A R S-
SPECIFICATION

(Second Revision)

Second Reprint OCTOBER 2007
(Including Amendments Nos 1, 2, 3 & 4)

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B U R E A U O F I N D I A N S T A N D A R D S
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 1992

Price Group 2
Soaps and Other Surface Active Agents Sectional Committee, CHD 025

FOREWORD

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

Synthetic detergents, or non-soapy detergents (NSD) as they are usually termed, are products specially formulated to promote the development of detergency and comprises of essential components like surface active agents and complementary components like builders, etc. NSD are produced in the country at present mainly from the sodium alkyl benzene sulphonate, for which a separate Indian Standard IS 9985 1981 'Specification for sodium alkyl benzene sulphonate, technical' is available, and thus they are different from soaps, the other class of surface active agents, which are mainly sodium salts of higher fatty acids. Recently, usage of alpha olefin sulphonate (AOS) has also been started in formulation of NSD in the country. Indian Standard on this subject is however, under preparation.

The shortage of vegetable oils and fats for edible and industrial uses, and limitations of soaps for use in hard water areas have led to the development of the synthetic detergents. At present, substantial quantity of detergent bars are being produced both by organized as well as medium and small scale sectors.

This Indian Standard was originally formulated in 1976 and subsequently revised in 1982 incorporating four different grades of detergent bars to cover the material produced by large as well as medium and small scale units. In this revision, the requirement for pH has been substituted with 'active alkalinity' as it was felt that this characteristic would more explicitly reflect the effect of alkaline materials used in the formulation of detergents on their skin irritation potential from the physico-chemical angle as compared to the requirement for pH. The limits for active detergents and sodium tripolyphosphate (STPP) have been suitably modified while doing so usage of AOS in NSD was also kept in view.

With a view to ensure safety from skin irritation and skin sensitization hazards to consumers using the detergents and to ensure that these are also not injurious to the fabrics washed, a requirement for product safety has been included. The concerned technical committee is actively considering to introduce a requirement for detergency for which inter-laboratory testing is being done.

A scheme for labelling environment friendly products in known as ECO Mark is being introduced at the instance of the Ministry of Environment and Forests (MEF). The ECO Mark shall be administered by the Bureau of Indian Standards (BIS) under the BIS Act, 1986 as per the Resolution No. 71 dated 20 February 1991 published in the Gazette of the Government of India. For a product to be eligible for ECO Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional optional environment friendly (EF) requirements. Therefore, optional requirements for ECO Mark are being introduced in this standard for household laundry detergent bars.

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 2:1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.
(Page 2, clause 5.5) — Substitute 'Additional Requirements for ECO Mark' for 'Optional Requirements for ECO Mark'.
AMENDMENT NO. 4 MAY 2002
TO
IS 8180 : 1992 HOUSEHOLD LAUNDRY DETERGENT
BARS — SPECIFICATION
(Second Revision)

(Page 1, clause 2) — Substitute 'IS 13933 1995 Method of test for ready biodegradability of surface active agents (modified Sturm Test)' for 'IS 12795 1989 Specification for linear alkylbenzene'.

(Page 2, clause 5.5.2.2) — Substitute the following for the existing matter

'The active ingredients used in the manufacture of household detergent bars shall pass the biodegradability test as per IS 13933 1995

[Page 2, Table 1, Sl No (ii)] — Substitute the following for the existing

<p>| | | | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>(i) Sodium tripolyphosphate (STPP) percent by mass</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td></td>
<td>05</td>
<td>6</td>
<td>F</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

(CHA 25)
f) Critical ingredients mentioning the actual compound in descending order up to a limit of 0.5 percent by mass:
1) Active ingredients;
2) Builders used,
3) Fillers;
4) Soda ash,
5) Enzymes, if added; and
6) Bleach and bleach activators, if added.
AMENDMENT NO. 2 AUGUST 1999
TO
IS 8180 : 1992 HOUSEHOLD LAUNDRY DETERGENT BARS — SPECIFICATION
( Second Revision )

(Page 1, clause 2) — Insert the following at the end

‘IS No
Title
13933 : 1995 Method of test for ready biodegradability of surface active
agents (modified sturm test)’

(Page 2, clause 5.5.2.1) — Substitute the following for the ???

‘The surfactants used in the manufacture of household ??? determent ??? shall be readily biodegradable when tested by modified sturm test as ??? in IS 13933 : 1995.’
AMENDMENT NO. 1 MAY 1994

TO

IS 8180 : 1992 HOUSEHOLD LAUNDRY DETERGENT
BARs — SPECIFICATION

(Second Revision)

[Page 3, clause 6.2.2 (a) ] — Substitute the following for the existing clause:

'6.2.2 (a) The following identified critical ingredients in descending order of quantity, percent by mass:

i) Active ingredients,

ii) Builders used,

iii) Soda ash,

iv) Fillers, and

v) Enzymes, if added.'
Indian Standard

HOUSEHOLD LAUNDRY DETERGENT BARS —
SPECIFICATION  
( Second Revision )

1 SCOPE
This standard prescribes requirements and methods of sampling and test for household laundry detergent bars.

2 REFERENCES
The following Indian Standards are necessary adjuncts to this standard:

<table>
<thead>
<tr>
<th>IS No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>286 : 1978</td>
<td>Methods of sampling and test for soaps ( second revision )</td>
</tr>
<tr>
<td>1070 : 1992</td>
<td>Reagent grade water — Specification ( third revision )</td>
</tr>
<tr>
<td>4955 : 1992</td>
<td>Household laundry detergent powders ( third revision )</td>
</tr>
<tr>
<td>5785 : 1976</td>
<td>Methods for performance tests for surface active agents: Part 4 Relative detergency ( first revision )</td>
</tr>
<tr>
<td>7597 : 1974</td>
<td>Glossary of terms relating to surface active agents</td>
</tr>
<tr>
<td>8401 : 1977</td>
<td>Alkyl benzene sulphonylic acid ( acid slurry )</td>
</tr>
<tr>
<td>9458 : 1980</td>
<td>Synthetic detergents for washing wooden and other delicate fabrics</td>
</tr>
<tr>
<td>11601 ( Part 2 ) : 1992</td>
<td>Methods of safety evaluation of synthetic detergents: Part 2 Method of test for skin sensitization potential of synthetic detergents ( Guinea pig maximization test )</td>
</tr>
<tr>
<td>12795 : 1989</td>
<td>Specification for linear alkyl benzene</td>
</tr>
</tbody>
</table>

3 TERMINOLOGY
For the purpose of this standard, the definitions given in IS 7597 : 1974 shall apply.

4 GRADES
The material shall be of the following four grades depending on their active detergent content

a) Grade 1,

b) Grade 2,

c) Grade 3, and

d) Grade 4.

5 REQUIREMENTS

5.1 Description
The material shall be in the form of firm and smooth bars, free from cracks and grittiness, and shall possess good lathering and cleaning properties. It shall not have or emit any disagreeable odour.

5.2 Active Ingredients
The active ingredients used in the formulation of detergent bars shall comprise of one or more of the surface active chemicals, namely, alkyl benzene sulphonate, secondary alcohol sulphate, fatty alcohol sulphate, fatty alcohol ethoxylate, salts of sulphated fatty alcohol ethoxylate, sodium alpha olefin sulphonate, alkyl-phenol ethoxylate, alpha-sulpho fatty acid esters, soaps, sugar ester, and other non-ionics.

5.2.1 If sodium alkyl benzene sulphonate is used as the active ingredient it shall be manufactured from alkyl benzene sulphonate conforming to IS 8401 : 1977 for which linear alkyl benzene conforming to IS 12795 : 1989 shall be the starting material.

5.3.2 All other active ingredients shall conform to the relevant Indian Standards, as and when available.

5.3 Formulation
In addition to the active ingredients specified in 5.2, the formulation may also contain one or more of conventional builders and additives as given in Annex A.

5.3.1 In case non-ionic active detergent is used, the total active ingredient shall be determined by the method given in Annex B of IS 9458 : 1980. If soap is present in detergent formulation, the above result will include non-ionic detergents and soap.
5.3.2 The material shall pass the test for skin irritant potential when evaluated as per the method prescribed in IS 11601 (Part 1) : 1986 and for skin sensitization potential when evaluated as per the method prescribed in IS 11601 (Part 2) : 1992.

NOTE — The requirement under 5.3.2 has also been identified as specific requirement for ECO Mark.

5.4 The material shall also comply with the requirements prescribed in Table 1.

5.5 Optional Requirements for ECO Mark

5.5.1 General Requirements

5.5.1.1 The product shall conform to the requirements for quality, safety and performance prescribed under 5.1 to 5.4 for different grades except that for phosphate content which shall be substituted with alternate environment friendly builder(s) to maintain similar detergency when tested according to the method prescribed in IS 5785 (Part 4) : 1976 (see also 5.5.2.1).

5.5.1.2 The manufacturers shall produce to BIS environmental consent clearance from the concerned State Pollution Control Board as per the provisions of the water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 along with (he authorisation, if required under the Environment (Protection) Act, 1986, while applying for ECO Mark.

5.5.2 Specific Requirements

5.5.2.1 The material shall not contain any phosphate when tested as per the method prescribed in Annex D of IS 4955 : 1992. Any other substitute used shall be environment friendly but should be in sufficient quantity to ensure similar performance of the product as compared to that with phosphate.

5.5.2.2 The active ingredient used in the manufacture of household laundry detergent bars shall have a biodegradability of minimum 97 percent by mass when tested as per the method prescribed in Annex B of IS 12795 : 1989.

6 PACKING AND MARKING

6.1 Packing

6.1.1 The material shall be suitably packed as agreed to between the purchaser and the supplier.

6.1.2 For ECO Mark, the product shall be packed in such packages which are made from recyclable/reusable or biodegradable materials and declared by the manufacturer and may be accompanied with detailed instructions for proper use.

6.2 Marking

6.2.1 The packages shall be securely closed and marked with the following particulars:

a) Indication of the source of manufacture;

b) Brand name, grade and recognized trade-mark, if any;

c) Net mass, when packed;

d) Batch number or lot number in code or otherwise, and

e) Month and year of manufacture.

CAUTION — Detergent solutions can be skin irritants. Avoid prolonged contact. Rinse garments and hands thoroughly.

Table 1 Requirements for Laundry Detergent Bars

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Characteristic</th>
<th>Requirement</th>
<th>Method of Test, Ref to</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>Grade 1</td>
<td>Grade 2</td>
</tr>
<tr>
<td>i)</td>
<td>Active detergent (as, sodium salt of alkyl benzene sulphonate, percent by mass, Min)</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>ii)</td>
<td>Sodium tripolyphosphate (STPP) and pyrophosphate, percent by mass, Min</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>iii)</td>
<td>Active alkali (ml of 0.1 N HCl to titrate 50 ml of 1 percent solution to phenolphthalein end point), Min</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

(Clauses 5.4, 7.3.1 and 8.1)
6.2.2 The following additional information shall also be marked on the label for ECO Mark:
   a) List of identified critical ingredients in descending order of quantity, percent by mass, and
   b) The criteria for which the product has been labelled as ECO Mark.

7 SAMPLING

7.1 General
For this purpose general precautions, scale of sampling and preparation of test samples shall be as prescribed in 3.1, 3.2 and 3.3 respectively of IS 286 : 1978.

7.2 Number of Tests
7.2.1 Tests for the determination of characteristics given at SI No. (i), (ii) and (iii) in Table 1 shall be conducted on each of the individual samples separately.
7.2.2 Tests for determination of the remaining characteristics shall be conducted on the composite sample.

7.3 Criteria for Conformity
7.3.1 For Individual Samples
For each of the characteristics which has been determined on the individual samples (see 7.2.1) the mean ($\bar{x}$) and the range ($R$) of the test results shall be calculated as follows:

\[
\text{Range } (R) = \text{The difference between the maximum and the minimum value of the test results}
\]

The lot shall be deemed as conforming to the requirement if the expression \((\bar{x} - 0.4 R)\) is greater than or equal to the minimum value given in Table 1, and \((\bar{x} + 0.4 R)\) is less than or equal to the maximum value given in Table 1.

7.3.2 For Composite Sample
For declaring the conformity of the lot to the requirements of the other characteristics determined on the composite sample, the test results for each characteristic shall satisfy the relevant requirement.

8 TESTS

8.1 Tests shall be carried out as prescribed in IS 9458 : 1980 and IS 4955 : 1992. Reference to TS 9458 : 1980 and IS 4955 : 1992 are given in 5.3.1 and col 7 of Table 1 of this standard respectively.

8.2 Quality of Reagents
Unless specified otherwise, pure chemicals and distilled water (see IS 1070 : 1992) shall be used in tests.

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

ANNEX A
(Clauses 5.3)

LIST OF CONVENTIONAL BUILDERS AND ADDITIVES

1. Trisodium phosphate
2. Sodium carbonate
3. Tetra sodium pyrophosphate
4. Sodium tripolyphosphate
5. Sodium hexametaphosphate
6. Sodium carboxymethyl cellulose
7. Sodium silicate
8. Sodium bicarbonate
9. Borax
10. Optical brighteners
11. Foam boosters
12. Sodium sulphate
13. Binding materials
14. Pet fumes
15. Preservatives
16. Chelating agents (Sequestering agents)
17. Colours
18. Starch
19. Paraffin wax
20. Tale
21. Crystalline sodium aluminosilicate (Zeolite)
22. China clay
ANNEX B

[ Table 1, Sl No. (iii) ]

DETERMINATION OF ACTIVE (RESERVE) ALKALINITY

B-1 APPARATUS

B-1.1 pH Meter
B-1.2 Beaker
100-ml capacity.
B-1.3 Magnetic Stirrer
B-1.4 Burette

B-2 REAGENTS

B-2.1 Quality of Reagents
Unless specified otherwise, pure chemicals and distilled water (see IS 1070 : 1992) shall be used in tests.

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

B-2.2 Hydrochloric Acid — 0.1 N.

B-3 PROCEDURE

Weigh accurately 0.5 g of detergent in powder form in a tared 100 ml beaker and add distilled water to make up the weight to 50 g (1 percent solution, m/m). Place the beaker containing 1 percent solution of the detergent product in aqueous vehicle on a magnetic stirrer and mix the contents thoroughly. Note down the pH of the solution using a pH meter. With the electrode of the pH meter dipping in the solution and keeping the pH meter 'ON' add drop by drop 0.1 N hydrochloric acid from a burette till the pH of the solution drops to 8. While adding hydrochloric acid, stir the solution continuously. Note the amount of 0.1 N hydrochloric acid required to bring down the pH of the solution to 8 which is a measure of the active alkalinity of the test sample.

Mean, of 2 replicate measurements will give active (reserve) alkalinity expressed as amount in ml of 0.1 N hydrochloric acid.
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Amendments Issued Since Publication

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<thead>
<tr>
<th>Amend No</th>
<th>Date of Issue</th>
<th>Text Affected</th>
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</table>

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