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General purpose detergent (beads, granules and powders) — Specification

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Foreword

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General purpose detergent (beads, granules and powders) — Specification

1 Scope

This Draft African Standard specifies requirement and test methods for general purpose detergents (beads, granules and powders) for cleaning of hard surfaces such as painted surfaces, floors, ceilings, ceramic and plastic tiles, and the surfaces of equipment.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ASTM D501, *Standard Test Methods of Sampling and Chemical Analysis of Alkaline Detergents*

ASTM D1308, *Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes*

ASTM D5343, *Standard Guide for Evaluating Cleaning Performance of Ceramic Tile Cleaners*

EN 573-3, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 3: Chemical composition*

ISO 457, *Soaps — Determination of chloride content — Titrimetric method*

ISO 607, *Surface active agents and detergents — Methods of sample division*

ISO 2813, *Paints and varnishes — Determination of gloss value at 20°, 60°, and 85°*

ISO 3696, *Water for analytical laboratory use*

ISO 4316, *Surface active agents — Determination of pH of aqueous solutions — Potentiometric method*

ISO 4323, *Soaps — Determination of chloride content — potentiometric method*

ISO 5156, *Corrosion of metals and alloys — Corrosion test method for disinfectant — Total immersion method*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
batch
a defined quantity of raw material, packaging material or finished product manufactured in one process or series of processes so that it could be expected to be homogeneous.

3.2
lot
a definite quantity of some product, material, or service collected together and submitted for inspection.

4 Requirements

4.1 General requirements

4.1.1 The detergent shall be in the form of beads, granules or a powder, and shall be free flowing, free from visible impurities, abrasives, and organic solvents, and readily soluble in water.

4.1.2 When stored or transported under normal conditions in the original container, the beads, granules or powder shall not cake into hard lumps.

4.1.3 The detergent shall not be irritating to skin when tested in accordance with Annex A or OECD TG 404 and shall not contain any prohibited materials by relevant regulations.

4.2 Specific requirements

The detergent shall also comply with the requirements given in Table 1 when tested against the methods prescribed therein.

Table 1 – Specific requirements

S/No.	Characteristic	Requirement	Test Method
i.	pH (10 g/L), range	6.0 – 10.5	ISO 4316
ii.	Chloride Content (as NaCl), % (m/m), max.	2	ISO 4323/ISO 457
iii.	Cleaning Efficiency, % min.	90	ASTM D5343
iv.	Rinsing properties	Shall be free-rinsing	Annex C
v.	Effect on painted surfaces	Shall pass test	Annex D
vi.	Corrosiveness to aluminium	Shall pass test	Annex E
vii.	Insoluble Matter (in water), % (m/m), max.	2.5	ASTM D501

5 Packaging and labelling

5.1 Packaging

5.1.1 The packaging shall ensure integrity of the product during handling, storage and transportation

5.1.2 Bulk packaging: Only detergents of the same type and the same batch shall be packed together in one bulk package

5.2 Labelling

Each container and each bulk package shall bear the following information in prominent, legible and indelible markings:

a) manufacturer's name and physical address

NOTE The name, physical address of the distributor/supplier may be added as required.

b) trade mark if applicable

c) words indicating that the product is a general purpose detergent;

d) Name of product

e) general instructions for use that are suitable for the purposes specified;

f) the batch or lot identification

g) Net content;

h) in the case of bulk packages, the quantity of containers; and

i) date of manufacture

j) list of ingredients

k) country of origin

l) Expiry date or Best Before date

6 Reagents and sampling

6.1 Reagents and water used

Unless inconsistent with the text, all reagents used shall be of analytical, reagent grade and all water shall be distilled or deionized water grade complying with the requirement s of ISO 3696.

6.2 Sampling

6.2.1 Sampling shall be done in accordance with ISO 607

6.2.2 Carry out the determinations specified in clause 4 on the composite test sample taken.

Annex A
(normative)

Test for skin irritation and sensitization potential of synthetic detergents

A.1 Skin irritancy test on human subjects — hand immersion test

A.1.1 Outline of the method

Human Volunteers immerse one of their hands in the solution of the detergent product to be tested while the other hand, simultaneously in a solution of a positive control for 10 min, twice daily for 4 consecutive days under supervision. Monitor the hands for any adverse skin responses prior to and after each immersion and finally on the morning after the last immersion. If the skin responses with the product tested are very similar to that manifested by the positive control, the product could be judged to have an unacceptable level of skin irritancy potential.

A.1.2 Procedure

A.1.2.1 Volunteers

Select 24 healthy adult volunteers (except pregnant ladies and breast feeding mothers) between the age of 18 and 55 years, with no known acute or chronic diseases or no adverse skin responses to cosmetics, personal wash or fabric wash products and no skin blemishes on their hands and forearms. They should not be under any medication, particularly anti-inflammatory drugs. Inform the volunteers about the study in detail including the likely hazards and obtain a signed informed consent from each of them.

A.1.2.2 Products

Carry out the test on newly formulated fabric washing synthetic detergent products, the skin irritancy potential of which is in doubt, prior to marketing. Store samples for the test properly to prevent contamination or spoilage. Do not use spoiled or contaminated sample. Preserve adequate quantity of the sample which is used for testing for at least 2 years for any re-testing. Identified each sample with a unique code number and make appropriate entry in the records. Ingredients used in the formulation should be of appropriate quality and have sufficient data to support safety at the level which issued in the product. In order to have a realistic approach for product dosing in the test, use the dosage regime given on the pack, however, in the event of not having such recommendation on the pack, a dosage of 7, 10 or 14 g/l is recommended depending on the grade of the product, namely, 1, 2 or 3 as these are the levels commonly found in wash liquor with these grades.

A.1.2.3 Positive control

A 3 percent (w/v) solution of sodium lauryl sulphate (SLS) with 99.9 percent purity (analytical grade) in water is used as positive control.

A.1.2.4 Procedure

Prepare fresh solution of the product and the positive control at the concentration mentioned above (see A.1.2.2 and A.1.2.3 respectively) using warm (37 °C) municipal water on each of the immersion days. Determine the pH and buffering capacity of the detergent solution and pH of SLS solution on all the treatment (immersion) days. Transfer 500 ml of the respective solution into a suitable beaker/container for each volunteer for every immersion. Organize the seating arrangements of volunteers for hand immersion in a convenient/comfortable manner. 50 percent of the volunteers in a test immerse their left hand in the test product/sample coded as ‘A’ and right hand in the positive control coded ‘B’, the other 50 percent, vice versa. Each volunteer immerses his/her respective hand up to the wrist in the solution with constant movement of the fingers for agitating the liquid for 10 minutes twice a day (one in the morning and the other in the afternoon with a gap of about 4 h

between two immersions) for 4 consecutive days. After each immersion, the volunteers wash the hands thoroughly with tap water and gently wipe with a dry towel.

A.1.2.5 Assessment and Scoring

Assess the skin reactions and score them (Double blind) as per the scale given in Table 1, before each immersion under a constant light source by a trained assessor. The assessor should not know which hand received what product treatment. The final assessment and scoring shall be carried out on the morning after the last treatment. Add up the scores obtained at each assessment (total 9 assessments) and the mean of this score (total score divided by 9) is used for evaluating the product. Examine carefully the back of the hand, palm and the webs for scaling and glaze. Any sensation felt by the volunteer either during or after the immersion, and any other comments shall be taken into consideration in evaluating the product. Skin pH, hydration and trans epidermal water loss (TEWL) may also be monitored (purely optional) and recorded, to support the clinical observation.

Table A.1 Scale for Assessing the Skin Reaction

Sno.	Skin Reaction	Score
i.	No reaction	0
ii.	Very slight reaction (barely perceptible dryness and scales)	1
iii.	Slight reaction (perceptible dryness and scales usually in a small area)	2
iv.	Moderate reaction (perceptible dryness and scales in a major or whole area)	3
v.	Severe reaction (severe dryness and scales in the whole area with or without cracking)	4

A.1.2.6 Analysis of Data and Conclusion

Analyse the final score using student's paired t-test for determining the significance between the product and the positive control. If the product tested is found to cause adverse skin responses very similar to that manifested by the positive control, such a product could be judged to have unacceptable level of skin irritancy potential.

A.1.2.7 Reporting Skin Reactions

The report shall contain the following information:

a) Location of the study and date;

b) Identification of the sample;

c) Number of volunteers used;

d) Procedure followed and any deviation;

e) Result of the test in tabular form;

f) Any unusual findings;

g) Conclusion; and

h) Name of the investigator.

A.2 Skin sensitization test on guinea pigs — Buehler test

A.2.1 Outline of the Method

Apply the material at a suitable concentration topically on the clipped skin of guinea pigs under covered patch for 6h once a week, for 3 consecutive weeks for inducing sensitization. Challenge the animals topically 2 weeks later with the highest non-irritant concentration of the test material in an identical manner as was done for sensitization induction. Assess the resulting skin reactions 24 h and 48 h after removal of the patch and compare them with the reactions produced on the control group of animals treated simultaneously with vehicle.

A.2.2 Procedure

The test is carried out in two phases:

a) Preliminary irritancy test — To determine the suitable concentrations of the test material for sensitization induction and challenge treatments; and

b) Main test — Carry out induction and challenge treatments with the test substance using the concentrations determined in the preliminary irritancy test.

A.2.2.1 Animals

Use equal number of male and non-pregnant female healthy albino guinea pigs, weighing about 300 to 400 g each. Use 4 animals for the preliminary irritancy test and 30 animals (20 for the test substance and 10 as control) for the main test. Select a few more, two days prior to the treatment, to replace the ones which may be found unsuitable due to skin blemishes, at the start of the test. Keep the animals individually in cages located in a room maintained at 23 + 3“C, relative humidity 40-70 percent, light dark cycle of 12 h in 24 h, with adequate ventilation and air changes. Animals should have access to standard feed and water all the time. Prior to each treatment, remove hair from the flanks by clipping depending on the nature of the treatment. Assess sensitivity of the animal stock every 6 months by the use of any one of the positive control substances, for example, dinitro fluoro benzene (DNFB), dinitro chloro benzene (DNCB), hexyl cinnamic aldehyde (HC), etc., which are strong to moderate sensitizers. These compounds should give a response in 15 percent (for non-adjuvant tests) or more of the animals. For such confirmation, use the same method described in this standard. In the event, the animals are sourced from an outside agency, where the sensitivity monitoring is not conducted, carry out sensitivity test using the same stock ideally before carrying out the actual test or in parallel with the test on another group of animals. A test carried out on an insensitive stock is invalid.

A.2.2.2 Test Patches for Topical Treatment

Fold 2.5 cm wide surgical cotton gauze, into 12ply of 2.5 cm x 2.5 cm dimension. Place this on a2cm x 2cm thin polythene sheet, which is stuck at the centre of a 2.5-cm wide and 6-7 cm long surgical adhesive plaster.

A.2.2.3 Samples

Store, preserve and identify the samples as described under A.1.2.2.

A.2.2.4 Preparation of sample

Prepare solutions/suspension on a weight-to-weight basis using distilled water. For water insoluble material (some of the positive controls) use either refined groundnut oil or pharmaceutical grade paraffin oil or propylene glycol. Prepare adequate quantity of the solution/suspension in a single batch to complete all treatments of the day. When a very low concentration is required, it is best to prepare a concentrated stock solution/suspension and dilute a quantity of the stock to the required concentration for treatment. Use a mechanical agitator and heat (not more than 38°C) to facilitate solution preparation, if required.

A.2.2.5 Preliminary Irritancy Test

Select four treatment sites, two on the right and two on the left flanks, each approximately 2.5 cm x 2.5 cm, from the clipped area of each animal. Take 0.5 ml each of 4 serial concentrations (for example 0.5, 1.0, 2.0, 5.0

percent and so on) of the test substance on 4 different patches supported by polythene sheets. Apply them on the four selected sites of each animal. Cover the patches, hold them tightly by the aid of cloth bandage, and return the animals to their respective cages. After six hours, remove the patches and mark the four comers of each test sites with indelible ink. Assess the sites for skin irritancy response 24 h after the removal of the patches (30 h after the application of the patch). Select the concentration which produces a mild irritation (score 1on a scale of Oto 3 as described in 5.2.6.3, based on the mean of readings from four animals) for topical induction, select the highest concentration (based on the mean of readings from four animals) which does not produce any irritancy response as the challenge concentration.

A.2.2.6 Main Test

In the main test, induction and challenge treatments are carried out.

A.2.2.6.1 Induction

As mentioned in A.2.2.1, use 20 animals for inducing sensitization with the test sample and 10 as control. Induction treatment is given once a week for 3weeks. Take 0.5 ml of the solution/suspension of the test sample at the selected concentration on a single patch (see A.2.2.2), apply on the left flank of the animal of the test group, bandage as described earlier (see A.2.2.5) and allow a contact period of 6 h. Give the control group a similar treatment but with vehicle (distilled water) in place of the test substance. At the end of the contact period, remove the patches and any substance sticking to the treatment site with moistened tissue paper. Repeat the application 7 days and 14days later on the very same treatment site on each animal.

A.2.2.6.2 Challenge

Fourteen days after the last induction treatment, give the untreated flank of all the animals (including that of the control group) a challenge treatment, using the highest non-irritant concentration of the test substance in the same manner as described earlier (see A.2.2.5). After 6 hours remove the patches, clean the area with moistened tissue paper and mark with indelible ink. After 24 hours of the removal of the patches, examine the area and clip the hair if necessary. Approximately 3 h later, assess the skin reactions (double blind) under a constant artificial day light source and grade them as per Table 2. Assess the reaction again24 h later that is, 48h after the patch removal. If the response in the first challenge is not conclusive, then a second challenge treatment may be given one week later using a new set of control animals.

A.2.2.6.3 Scale for Evaluation

Scale for evaluation is given in Table A.2.

Table A.2 Scale for Evaluation

(Clauses A.2.2.6.2, A.2.2.6.3 and A.3.2.7)

Sno.	Skin Reaction	Reaction	Score
i.	No visible change	No reaction	0
ii.	Discrete or patch erythema	Mild reaction	1
iii.	Moderate and confluent erythema	Moderate reaction	2
iv.	Intense erythema and swelling	Severe reaction	3

A.2.2.7 Conclusion

Consider a reaction in attest animal as positive if it is significantly greater than the response on the control animals. When there is no reaction on the control animals, a reaction score of 1 or more in any of the test animal is considered to be a positive sensitization response. Fabric washing synthetic detergent product producing a positive sensitization in 15 percent of the animals in this test poses a risk to the consumer.

A.2.2.8 Reporting

The test report shall include the following information:

a) Location of the study and date;

b) Identification of the sample;

c) Guinea pigs: Strain, source, number, age, sex, housing conditions, diet. Date and results of the last sensitivity check including the substance and vehicle used. Individual weight of animals at the start and at the conclusion of the test;

d) Procedure followed and any deviation;

e) Result of the preliminary irritancy study with conclusion on induction and challenge concentration to be used in the test;

f) Result of the main test should be summarized in tabular form, giving skin reactions of each animal at each observation along with any narrative description of the nature and degree of effects observed;

g) Any unusual findings;

h) Conclusion; and

i) Name of investigators.

A.3 Skin sensitization test on guinea pigs — Magnusson and Kligman guinea pig maximization test

A.3.1 Outline of the method

Inject the test material along with Freund's Complete Adjuvant (FCA) intradermally for inducing sensitization in guinea pigs. FCA enhances the sensitivity of the immune system of the animals. Boost the induction further with the help of a closed patch application of the test material on the injected sites after a week. This is followed by topical challenge treatments with the test material a fortnight later to finally assess the allergenicity potential. Necessary concentrations of the test materials for the above mentioned treatments are determined through preliminary irritancy studies as described below.

A.3.2 Procedure

Carry out the test in two phases:

a) Preliminary irritancy test — To determine suitable concentrations of the test material for sensitization induction and challenge treatments; and

b) Main test — Induction, boosting and challenge treatments with the test substance using the concentrations determined in the preliminary irritancy test.

A.3.2.1 Animals

Use a total of 26 albino guinea pigs (8 for preliminary irritancy test, 10 for the test material, 4 for treated control and 4 for untreated control) of either sex bred from a stock which is disease-free as well as showing positive sensitization response with a well-known skin sensitizers. Select a few more, 2 days prior to the treatment, to replace the ones which may be found unsuitable due to skin blemishes, at the start of the test. House the animals and look after them as described earlier (see A.2.2.1). Follow the currently described procedure to assess the sensitivity of the animal stock and 30 percent (for adjuvant test) or more animals should show a positive response in the sensitivity test. Prior to each treatment hair from the flanks/ shoulder is removed by clipping depending on the nature of the treatment.

A.3.2.2 Samples

Store, preserve and identify the samples as described under A.1.2.2.

A.3.2.3 Preparation of Sample

Prepare solutions/suspension on a weight-to-weight basis using distilled water/normal saline. Prepare adequate quantity of the solution/suspension in a single batch to complete all treatments of the day. When a very low concentration is required, it is best to prepare a concentrated stock solution/suspension and dilute a quantity of the stock to the required concentration for treatment. Use a mechanical agitator and heat (not more than 38°C) to facilitate solution preparation, if required.

A.3.2.4 Preliminary Irritancy Test

A.3.2.4.1 Intradermal irritancy test

This test is done to find out the suitable intradermal induction injection concentration which will be used for sensitizing the animals. Inject intradermally (at least 1 cm apart on the clipped and shaved flank of 4 guinea pigs of the same sex and weighing around 300 g each) with 0.1 mL each of 0.1, 0.25, 0.5, 1 percent or more of the test substance in normal saline (0.9 percent sodium chloride) using a sterilized tuberculin or disposable syringe fitted with 26 gauge needle. Return the animals to their individual cages. After 24 h examine the intensity and extent of reactions by size in millimetres (length and breadth) for erythema (redness) and oedema (swelling). Select the concentration which produces a slightly irritant reaction, namely, 7 mm x 7 mm erythema and oedema (mean from 4 animals) for intradermal induction injection concentration.

A.3.2.4.2 Test

Saturate eight millimetre diameter chromatography paper (Whatman No. 3) discs with a range of concentrations, for example. 0.5, 1,2, 5, 10 percent and soon of the test material in distilled water/suitable solvents and place them in 10 mm diameter aluminium discs/cup, Locate these cups/discs at least 1cm apart on the clipped and shaved flank of four guinea pigs, each weighing about 400 g.. Hold the patch test discs/cups containing the paper in such a way that the paper is in contact with the skin. Fasten the discs/cups to the trunk with surgical adhesive plaster tapes and cloth bandage. Leave the animals in their individual cages. Remove the patches 24 h after application. Examine the treated sites 24 h and 48 h after the removal of patches. Score the resulting reactions for irritation on a O-3 scale as described under A.2.2.6.3 (see Table A.2). For boosting the sensitization response through topical application, select the concentration giving a slightly irritant (score 1) reaction. Select the highest concentration which causes no visible reaction (score 0) for challenge treatment (final treatment).

A.3.2.5 Main Sensitization Test

Select 10 guinea pigs weighing about 300 g each from the stock as described under A.3.2.1.

A.3.2.5.1 Sensitization treatment — Induction

Carry out the sensitization treatment in two stages: Intradermal injection followed one week later by topical application.

a) Intradermal injection — Clip the hair from a 2 cm x 4 cm area of skin on the dorsal shoulder region and give 3pairs of intradermal injections within the clipped area (see Figure A.1) using a sterilized tuberculin or disposable syringe fitted with a 23 gauge needle in the following manner:

   i) Two 0.1 mL injections of 50 percent FCA in normal saline on sites marked ‘1‘.

   ii) Two 0.1 mL injections on sites marked ’2’ of the test material in normal saline at the concentration selected for sensitization induction from the intradermal irritancy test (see A.1.2.4.1).

   iii) Two 0.1 ml injections on sites marked’3’ of test material in normal saline mixed with 1:1 FCA, such that the final concentration of test substance injected is the same as that in (ii) above.

b) Topical treatment: boosting — One week after the injection, clip and shave the same 2 cm x 4cm treated area. Saturate a 2 cm x 3 cm chromatography paper (Whatman No, 3) with the test material at the selected concentration as determined under 6.2.4.2 and place over the shaved site. Cover this by 4 cm x 6 cm piece of thin polyethylene sheet. Hold the paper saturated with test substance covered by polyethylene sheet in place for 48 h by surgical adhesive plaster tape and cloth bandage. Remove the patches at the end of 48 h.

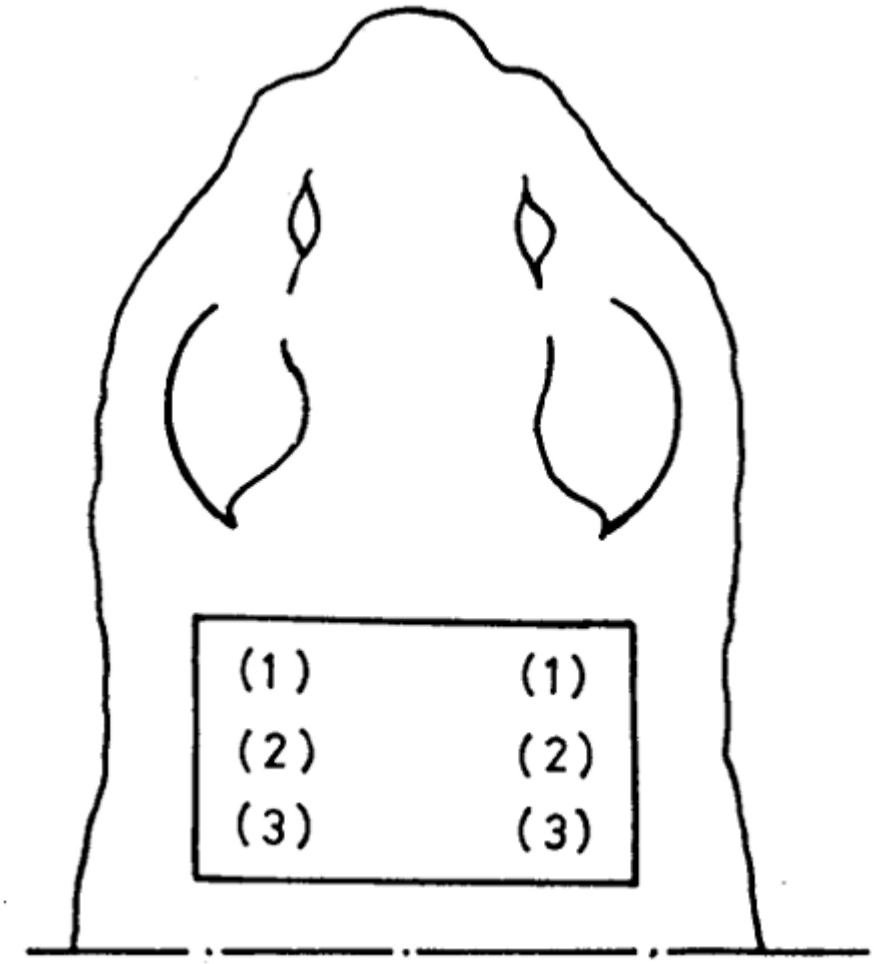

Figure A.1 guinea pig viewed from above showing the sites of intradermal induction injections

A.3.2.5.2 Topical challenge

Fourteen days after the boosting treatment, challenge (final treatment to determine sensitization) the guinea pigs using an occluded patch. For each animal, saturate an 8mm diameter chromatography paper (Whatman No. 3) disc with the test material at the selected challenge concentration (highest topical non-irritant concentration (see **A.3.2.4.2**) and place it in a 10 mm diameter aluminium patch test disc/cup. Apply this on to the clipped and shaved flank (see Figure A.2) and hold in position using surgical adhesive plaster tape and cloth bandage for 24 h. Examine the challenged site for inflammatory response, redness (erythema), swelling (oedema) 24 h and 48 h after removal of the patches. One week after the first challenge, a further challenge on the opposite flank maybe given exactly in the same manner as the first one. Provide a third challenge one week later on the opposite flank if the earlier challenge results are inconclusive.

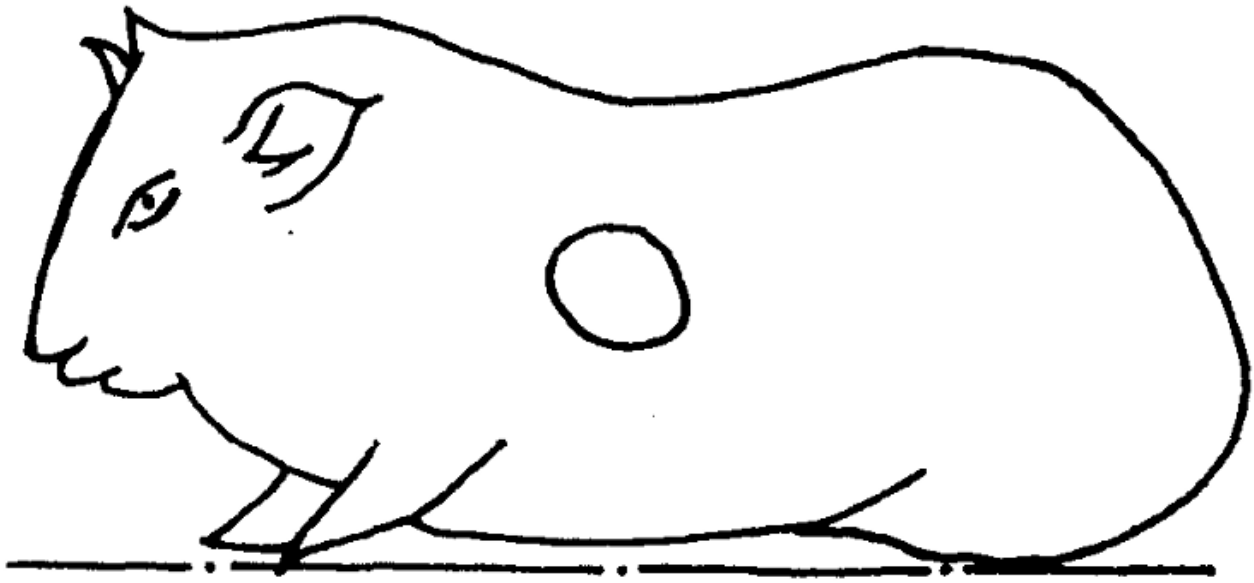

Figure A.2 site of topical challenge on guinea pig

A.3.2.6 Treated and Untreated Controls

A.3.2.6.1 Treated control

At the same time as the main test, select 4 guinea pigs of the same weight range as treated controls. Give them mock sensitization treatment at the same time and in the same way as for the main test animals except that the test substance is omitted from the intradermal injection induction and topical application boosting. But treat them exactly in the same way as the test animals at every challenge with the test material.

A.3.2.6.2 Untreated controls

Challenge4 animals which did not receive any treatment previously but are of the same weight range as the main test animals, exactly in the same manner as the test and treated control animals.

A.3.2.7 Scale for Evaluation

Score the skin reactions resulting from treatment using the scale given in A.2.2.6.3 (see Table A.2).

A.3.2.8 Conclusion

Consider a reaction in a test animal as positive response if it is significantly greater than the response on treated and untreated control animals. When there is no reaction on treated and untreated control animals, a reaction score of 1 or more in any of the test animals is considered to be a positive sensitization response. Fabric washing synthetic detergent product producing a positive sensitization response in 30 percent of the animals in this test poses a risk to the consumer.

A.3.2.9 Reporting

The test report must include the information as required under A.2.2.8.

Annex B
(normative)

Preparation of standard hard water

B.1 Standard hard water

Dissolve 3.520 g of chemically pure calcium chloride ($CaCl_2.2H_2O$) and 3.947 g of chemically pure magnesium sulfate ($MgSO_4.7H_2O$) in distilled water and dilute to 20 L with distilled water. (This standard hard water has a hardness of approximately 200 mg/L calculated as calcium carbonate.)

Annex C
(normative)

Test for rinsing properties

C.1 Rinsing properties

C.1.1 Accurately weigh (to ± 0.001 g) approximately 0.4 g of the test sample (see 6.2) into a thoroughly cleaned 500 mL conical flask and add 200 mL of the standard hard water (see B.1).

C.1.2 Stopper the flask and shake it vigorously for 1 min.

C.1.3 Pour out the solution and rinse the flask by adding 200 mL of the standard hard water, shaking vigorously for 1 min and pouring off the water.

C.1.4 Invert the flask and allow to dry.

C.1.5 Carry out a blank by repeating the above procedure but omitting the test sample.

C.1.6 Compare the two flasks.

C.1.7 Consider the detergent to comply if the streaks and marks on the flask used for the test do not exceed those on the flask used for the blank.

Annex D
(normative)

Test for effect on painted surface

D.1 Effect on painted surfaces

Use the test method given in ASTM D1308, but modify as follows:

Use an aqueous solution of the test sample at a concentration of 2.0 g/L (see 6.2).

D.2 Results

Check for compliance; the loss of 60° specular gloss of the test panel (caused by the test solution) shall not exceed 50 % of the loss of 60° specular gloss of the control panel (caused by the trisodium phosphate solution) when tested in accordance with ISO 2813.

Annex E
(normative)

Test for Corrosiveness to aluminium

E.1 Test strips

Two strips, each of size approximately 75 mm x 19 mm x 1.5 mm, of bright-finished uncoated aluminium that complies with the requirements for material designation EN AW-1050A of EN 573-3.

E.2 Procedure

Use the relevant procedure given in ISO 5156, but modify as follows:

Completely immerse the test strips in 250 mL of an aqueous solution of the test sample at a concentration of 5.0 g/L contained in a suitable bottle. Heat the unstoppered bottle and contents in an oven to a temperature of 80 °C ± 2 °C, then stopper the bottle and maintain it at 80 °C ± 2 °C for 5 h.

E.3 Results

Examine the test strips for compliance, the aluminium test strips shall show no evidence of pitting, etching or discoloration. (Slight dulling of the test strips is permissible.)

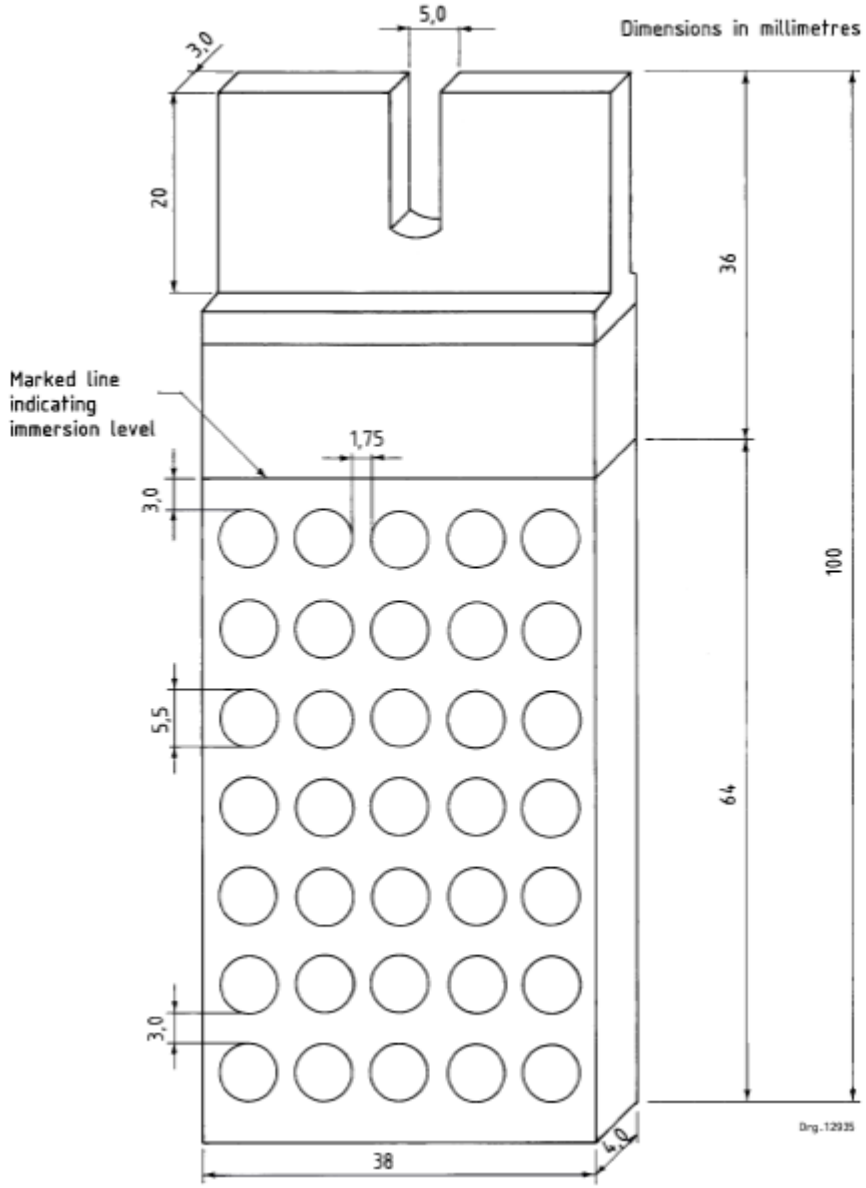

Figure E.1 — Aluminium test panel

Annex F
(normative)

Test for insoluble matter

F.1 Procedure

F.1.1 Accurately weigh (to ± 0,000 1 g) approximately 2 g of the test sample (see 6.2) into a beaker and add 250 mL of the standard hard water (see B.1).

F.1.2 Heat on a steam bath, with frequent stirring, until the sample is completely dispersed.

F.1.3 Filter the solution immediately, under suction, through a dried and tared Whatman GF/A glass-fibre filter paper or equivalent and ensure that the insoluble matter is quantitatively transferred to the filter.

F.1.4 Wash the beaker and the residue five times with 20 mL portions of hot standard hard water.

F.1.5 Allow the solution to drain completely and dry the residue at 105 °C until a constant mass is attained.

F.2 Calculation

Calculate the insoluble matter content S (as a percentage by mass) as follows:

$$S = \frac{m_2}{m_1} \times 100$$

where

S is the insoluble matter content as a percentage by mass;

m_1 is the mass of the test sample taken, expressed in grams (g); and

m_2 is the mass of the insoluble matter after it has been dried, expressed in grams (g).

Check for compliance with 4.2.

Bibliography

[1] IS 11601:2002, *Methods of safety evaluation of synthetic detergents — tests for skin irritation and sensitization potential of synthetic detergents*

[2] OECD Test Guideline. 404, *Acute Dermal Irritation/Corrosion*

[3] SANS 892:2003, *General purpose detergent (beads, granules and powders)*

[4] Working Group to identify and acknowledge useful literature used in the preparation of this standard.

[5] ARS 1466: 2017 General purpose detergent (beads, granules and powders) — Specification