



AGENCE DES NORMES ET DE LA QUALITE®
STANDARDS AND QUALITY AGENCY®

PROJET DE NORME CAMEROUNAISE PNC 3208 : 2026 - CT 28

2026

www.anor.cm

SYNTHETIC DETERGENT POWDERS FOR HOUSEHOLD USE — PART 1: PERFORMANCE-BASED HAND AND NON-AUTOMATIC DOMESTIC MACHINE WASH

Toute reproduction ou représentation intégrale ou partielle, par quelque procédé que ce soit, des pages publiées dans le présent document, faite sans l'autorisation de l'éditeur est illicite et constitue une contrefaçon. Seules sont autorisées d'une part, les reproductions strictement réservées à l'usage privé du copiste et non destinées à une utilisation collective et, d'autre part, les analyses et courtes citations justifiées par le caractère scientifique ou d'information de l'œuvre dans laquelle elles sont incorporées.

PROJET DE NORME CAMEROUNAISE

ENQUETE PUBLIQUE N° : 19

Durée de l'enquête Du 21/09/2026 Au 19/10/2026

Edition et diffusion par l'Agence des Normes et de la Qualité

B.P.: 14966 Yaoundé – CAMEROUN – Tél.: 6992 257 777 /Fax.: (237) 222 22 64 96

E-mail : enquetepublique@anor.cm – www.anor.cm/enquetes-publiques

ANOR®

DN-R2/PR-01/ENR-02
16/12/2015

**Synthetic detergent powders for household use — Part 1:
Performance-based hand and non-automatic domestic machine
wash**



Table of contents

1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Requirements	1
4.1	General Requirements.....	1
4.2	Specific requirements	2
5	Sampling and compliance with this standard	2
5.1	Sampling	2
5.2	Compliance with this standard.....	3
6	Test methods.....	3
7	Packaging and labelling	3
7.1	Packaging	3
7.2	Labelling.....	3
	Annex A (normative) Cleaning efficiency of laundry detergents	5
	Annex B (normative) Determination of redeposition index	7
	Annex C (normative) Determination of water insoluble matter content	9
	Annex D (normative) Determination of foam height of laundry detergents.....	10
	Annex E (normative) Fluorescent whitening agent content of laundry detergents	11
	Annex F (normative) Chemical damage to cotton fibres.....	13
	Annex G (normative) Corrosiveness to corrosion-resistant steel	14
	Annex H (normative) Labelling information.....	15
	Annex J (normative) Fluidity of cotton and certain cellulosic man-made fibres in cuprammonium solution (modified method).....	17

Foreword

The African Organization for Standardization (ARSO) is an African intergovernmental organization established by the United Nations Economic Commission for Africa (UNECA) and the Organization of African Unity (AU) in 1977. One of the fundamental mandates of ARSO is to develop and harmonize African Standards (ARS) for the purpose of enhancing Africa's internal trading capacity, increase Africa's product and service competitiveness globally and uplift the welfare of African communities. The work of preparing African Standards is normally carried out through ARSO technical committees. Each Member State interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, Regional Economic Communities (RECs), governmental and non-governmental organizations, in liaison with ARSO, also take part in the work.

ARSO Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare ARSO Standards. Draft ARSO Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an ARSO Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ARSO shall not be held responsible for identifying any or all such patent rights.

This African Standard was prepared by the ARSO Technical Harmonization Committee Number 5 on Chemistry and Chemical Engineering (ARSO/THC 05).

© African Organisation for Standardisation 2018 — All rights reserved*

ARSO Central Secretariat
International House 3rd Floor
P. O. Box 57363 — 00200 City Square
NAIROBI, KENYA

Tel. +254-20-2224561, +254-20-3311641, +254-20-3311608

E-mail: arso@arso-oran.org

Web: www.arso-oran.org

* © 2018 ARSO — All rights of exploitation reserved worldwide for African Member States' NSBs.

Copyright notice

This ARSO document is copyright-protected by ARSO. While the reproduction of this document by participants in the ARSO standards development process is permitted without prior permission from ARSO, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from ARSO.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to ARSO's member body in the country of the requester:

© African Organisation for Standardisation 2018 — All rights reserved

ARSO Central Secretariat
International House 3rd Floor
P.O. Box 57363 — 00200 City Square
NAIROBI, KENYA

Tel: +254-20-2224561, +254-20-3311641, +254-20-3311608

E-mail: arso@arso-oran.org
Web: www.arso-oran.org

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement. Violators may be prosecuted.

Synthetic detergent powders for household use — Part 1: Performance-based hand and non-automatic domestic machine wash

1 Scope

This African Standard specifies the characteristics of one type of laundry detergent intended for the washing (by hand and in non-automatic domestic washing machines) in either hard or soft water of textiles made of cotton or of cotton-and-synthetic fibre yarns.

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.

EN 10095, *Heat resisting steels and nickel alloys*

ISO 862, *Surface active agents — Vocabulary*

ISO 4313, *Washing powders — Determination of total phosphorus (V) oxide content — Quinoline phosphomolybdate gravimetric method*

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

ISO 4318, *Surface active agents and soaps — Determination of water content — Azeotropic distillation method*

ISO 6839, *Anionic surface active agents — Determination of solubility in water*

3 Terms and definitions

For the purpose of this standard, the definitions in ISO 862 and the following apply.

3.1

batch

Material from a single mix or, in the case of a continuous production process, the material from a single day's production

3.2

detergent

Any substance or preparation containing soaps, and or other surface active agents intended for washing and cleaning

3.3

lot

quantity of a detergent bearing the same batch identification, from one manufacturer, and submitted at any one time for inspection and testing.

4 Requirements

4.1 General Requirements

4.1.1 Form: The detergent shall consist of uniformly blended, non-segregating, free-flowing granules or powder. It shall not give rise to excessive dust.

ARS 496-1:2018(E)

4.1.2 Flow and purity: When visually examined, the detergent shall be free flowing, free from invisible impurities.

4.1.3 Solubility: The detergent shall be readily soluble in water.

4.1.4 The detergent shall be suitable for use in non-automatic domestic washing machines and shall not tarnish or corrode the metals used in the construction of the exposed parts of these machines.

4.1.5 Storage and transport: The detergent shall not cake into hard lumps when stored or transported under normal conditions in the original container.

4.1.6 Colour: When coloured, the colour shall not change appreciably during storage in its original container at ambient temperature.

4.1.7 Odour: Unless otherwise required (see Annex A) synthetic detergent powders shall be perfumed and both as received and when dissolved in hot water, shall possess a pleasant odour. During storage in its original container it shall not develop an objectionable odour and, when perfumed, shall not change its fragrance.

4.1.8 Effect on health: Not be irritating to the normal skin and it shall not contain ingredients in quantities that are toxic to human beings.

4.1.9 Dispersibility: The detergent shall be readily dispersible in water on visual inspection.

4.2 Specific requirements

Synthetic detergent powders shall comply with the relevant requirements given in Table 1.

Table 1 — Detailed requirements

No.	Characteristics	Requirement	Test Methods
(1)	Cleaning efficiency	95%, min.	Annex A
(2)	Redeposition index	Not lower than that of standard synthetic detergent	Annex B
(3)	Fluorescent whitening	Not Lower than that of standard synthetic detergent	Annex E
(4)	Water insoluble matter, % (m/m)	2.0 max	Annex C
(5)	pH value (1% m/v aqueous solution)	6 to 11	ISO 4316
(6)	Moisture content, % (m/m)	12 max	ISO 4318
(7)	Corrosiveness to corrosion-resistant steel*	<2.0mg/100mm ²	Annex G
(8)	Phosphate Levels	15 max	ISO 4313
(9)	Foaming properties*, mm	75 max	Annex D
(10)	Chemical damage to cotton fibres	Any degradation of the cotton fibres shall not result in the fluidity of the fibres exceeding 160 Pa ⁻¹ s ⁻¹ .	Annex F/ Annex J

* test to be performed only for detergent meant to be used in washing machines

5 Sampling and compliance with this standard

5.1 Sampling

5.1.1 General

The following sampling procedure shall be applied in determining whether a batch, submitted for inspection and testing, complies with the relevant requirements of this standard. The samples so drawn shall be deemed to represent the batch.

5.1.2 Sample for inspection

5.1.2.1 From the batch, draw at random the relevant number of containers in accordance with Table 2.

Table 2 — Samples for inspection

Number of containers in batch	Number of samples to be taken
Up to 10	2
11 to 200	4
More than 200	6

5.1.2.2 Inspect the product/batch for compliance with packing and labelling requirements given in Clause 7.

5.1.3 Sample for testing

After inspection of the samples drawn in accordance with 5.1.2, take at random half of the number of containers and from each of the containers take the smallest of the contents of the container. Combine these samples to make up a composite sample for testing.

5.2 Compliance with this standard

Deem the lot to comply with the requirements of this standard if, after inspection and testing of the samples taken in accordance with 5.1.2 and 5.1.3, samples are found to comply with all the requirements of this Standard.

6 Test methods

The methods of test shall be in accordance with those listed in Table 1 and respective annexes.

7 Packaging and labelling

7.1 Packaging

Synthetic detergent powders shall be packed in containers that are strong enough to withstand normal usage and transportation and that will prevent leakage and contamination of the product. These containers can then be packed in bulk packages. Only synthetic detergent powders from the same batch shall be packed in a container and, where relevant, in a bulk package

7.2 Labelling

Each container and each bulk package shall bear in prominent, legible and indelible marking the information required in terms of the relevant national regulations and statutory requirements and the following additional information, as relevant:

- (i) the manufacturer's name or trade mark or both;
- (ii) name and address of manufacturer/distributor/supplier;
- (iii) the packaging of detergents shall indicate the ingredient content (see Annex H)
- (iv) the packaging sold to the general public intended to be used as laundry detergents shall bear dosage given in grams or cup measures and load size specified i.e. Small, medium or large

ARS 496-1:2018(E)

- (v) words indicating that the product is a synthetic laundry detergent suitable for laundering by hand and/or for use in domestic non-automatic washing machines;
- (vi) general instructions for use that are suitable for the purposes specified;
- (vii) batch identification, date of manufacture and best before date;
- (viii) net mass of the contents;
- (ix) in the case of bulk packages, the quantity of containers;
- (x) country of origin.

Annex A (normative)

Cleaning efficiency of laundry detergents

A.1 Materials and reagents

A.1.1 Test cloth

Standard soiled cotton fabric

A.1.2 Standard detergent A

Constituent	% (m/m)
Sodium lauryl sulphate (95% pure)	25.0
Sodium tripolyphosphate (90% pure)	30.0
Sodium sulphate, anhydrous (analytical reagent grade)	43.0
Sodium carboxymethyl cellulose	2.0

A.1.3 Standard hard water

Dissolve 3.520 g of chemically pure calcium chloride ($\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$) and 3.947 g of chemically pure magnesium sulphate ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$) in distilled water and dilute to 20 litres with distilled water. (This standard hard water has a hardness of approximately 200 ppm calculated as calcium carbonate.)

A.2 Apparatus

A.2.1 Washing device

A suitable mechanical washing device capable of maintaining the contents of its container at the specified temperature and of rotating them at a speed of 40 ± 2 r/min.

A.2.2 Balls

Monel-metal or non-corrodible (stainless) steel balls of diameter approximately 6 mm.

A.2.3 Steam iron

A hand or power-operated steam iron that is suitable for pressing and drying cotton fabrics.

A.2.4 Reflectance meter

A photo-electric reflectance meter fitted with a search unit so designed that the light strikes the test surface in the normal direction and the reflected light is measured at an angle of approximately 45° from normal. The search unit shall be fitted with a green tristimulus filter that provides a spectral response equivalent to observation by the human eye in average daylight. The reflectance meter shall be standardized by means of a calibrated white enamel working standard having a reflectance of 79.7 % of that of magnesium oxide.

A.3 Procedure

- 1) Cut 20 swatches of size 70 mm x 70 mm from the test cloth and identify each with indelible marking ink. Using the reflectance meter (with a black backing plate) take 18 reflectance readings on each swatch (nine on each side) and calculate the mean reflectance B, of each swatch.
- 2) Start the washing device and set it to a wash temperature of 40 ± 1 °C.

- 3) From each of the standard detergent and the test sample prepare 3 litres of a 0.200% (m/v) solution in the standard hard water.

NOTE Weigh and dissolve separately each ingredient of standard detergent A. Prepare the solutions not less than 2 h and not more than 4 h before their use and stir them occasionally. Mix each solution thoroughly immediately before use.

- 4) Measure out ten 200 ml volumes of the prepared standard detergent solution and ten 200 ml volumes of the test sample solution; transfer each volume into a separate container of the washing device, add 10 balls to each container and heat the solutions to the wash temperature of 40 ± 1 °C. When the solutions have attained the wash temperature, add one test cloth swatch to each container. Close the containers, install them in the washing device and wash for 30 min at a speed of (40 ± 2) r/min.
- 5) After washing, remove the test cloth swatches from the wash solutions and, without squeezing, blot each swatch separately between filter paper, then rinse all the swatches together in approximately 4 litres of the standard hard water at 25 ± 3 °C by stirring with a glass rod for 1 min. Remove the swatches from the rinse, and without squeezing, blot each one separately between filter paper.
- 6) Steam iron the blotted swatches and condition them at ambient temperature for at least 1 h before determining their reflectance.
- 7) Using the reflectance meter (with a black backing plate) take 18 reflectance readings on each of the conditioned swatches (nine on each side) and calculate the mean reflectance, A, of each swatch.

A.4 Expression of results

- (a) The cleaning efficiency, expressed as % soil removal is given by the formula

$$\frac{A - B}{85.3 - B} \times 100$$

where

A is the mean reflectance of test cloth swatch after washing;

B is the mean reflectance of test cloth swatch before washing.

- (b) If the maximum difference between at least eight of the individual results in each set does not exceed 3% soil removal, discard any result that falls outside the 3% range, and take as the cleaning efficiency of the standard detergent or the test sample (as relevant) the average of the remaining results.

If the individual results do not conform to the above paragraph, discard all the results and repeat the test.

Annex B (normative)

Determination of redeposition index

B.1 Materials and reagents

B.1.1 Test cloth

Bleached cotton sheeting, free from filling and fluorescent whitening agents.

B.1.2 Artificial soil

Colloidal graphite suspended in water.

B.1.3 Standard detergent B.

Constituent %	(m/m)
Sodium lauryl sulphate (95% pure)	25.0
Sodium tripolyphosphate (90% pure)	30.0
Sodium sulphate, anhydrous (analytical reagent grade)	44.8
Sodium carboxymethyl cellulose	0.2

B.2 Apparatus

Equipment specified below shall be as in Annex A.

- (a) Washing device
- (b) Balls.
- (c) Steam iron.
- (d) Reflectance meter.

B.3 Procedure

- 1) Using the reflectance meter (with a black backing plate) take 40 reflectance readings (20 on each side) over the area of the test cloth from which the swatches are to be cut and calculate the mean reflectance, B.

NOTE Take utmost care not to contaminate the test cloth.

- 2) Cut 20 swatches, each of size 68 mm x 88 mm, from the area of the test cloth where the reflectance readings were taken and identify each with indelible marking ink.
- 3) Start the washing device and set it to a wash temperature of 40 ± 1 °C.
- 4) From the standard detergent prepare 4 litres and from the test sample prepare 3 litres of a 0.200% (m/v) solution in the standard hard water. At least 30 min after their preparation add to the standard detergent solution exactly 80 ml and to the test solution exactly 60 ml of a thoroughly mixed dispersion of 18.00 g of the artificial soil in 162 g of distilled water.

NOTE 1 Weigh and dissolve separately each ingredient of standard detergent B.

NOTE 2 Prepare the solutions not less than 2 h and not more than 4h before their use and stir them occasionally. Mix each solution thoroughly immediately before use.

NOTE 3 When using a pipette for measuring the soil dispersion stir the dispersion vigorously whilst drawing it into the pipette.

- 5) Measure out ten 200 ml volumes of the prepared standard detergent - and soil solution and ten 200 ml volumes of the test samples - and - soil solution, transfer each volume into a separate container of the washing device, add 10 balls to each container, and heat the solutions to the wash temperature of 40 ± 1 °C.

When the solutions have attained the wash temperature, add one test cloth swatch to each container, close the containers, install them in the washing device and wash for 30 min at a speed of 40 ± 2 r/min.

- 6) After washing, remove the test cloth swatches from the wash solutions and, without squeezing, place each swatch separately between filter paper and press it for 1 min by applying to it a mass of approximately 3 kg.
- 7) Measure a 200 ml volume of the standard hard water into each of the washing containers and heat the water to the rinse temperature of 40 ± 1 °C. Then add to each container one washed and pressed test cloth swatch, close the containers, install them in the washing device, and wash for 10 min at a speed of 40 ± 2 r/min.
- 8) Remove the test cloth swatches from the containers and, without squeezing, blot each one separately between filter paper. Then steam iron the blotted swatches, and condition them at ambient temperature for at least 1 h before determining their reflectances.
- 9) Using the reflectance meter (with a black backing plate) take 18 reflectance readings on each of the conditioned swatches (nine on each side) and calculate the mean reflectance, A, of each swatch.

B.4 Expression of results

- (a) The redeposition index is given by the formula

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

where

A is the mean reflectance of test cloth swatch after washing;

B is the mean reflectance of test cloth swatch before washing.

- (b) If the maximum difference between at least eight of the individual results in each set does not exceed 3% redeposition index, discard any result that falls outside the 3% range, and take as the redeposition index of the standard detergent or the test sample (as relevant) the average of the remaining results.

If the individual results do not conform to above, discard all the results and repeat the test.

Annex C (normative)

Determination of water insoluble matter content

C.1 Standard hard water

As in Annex A

C.2 Materials and reagents

Glass fibre filter

A clean, dry and tared glass fibre filter having about the same retention as a Whatman No. 5 cellulose filter and about the same speed as a Whatman No. 4 cellulose filter.

C.3 Procedure

Weigh out, to the nearest milligram, 2 g of the test sample into a beaker and add 250 ml of standard hard water. Heat on a water bath (with frequent stirring) until the detergent is dissolved. Filter the solution immediately, under suction, through the glass fibre filter, ensuring that the insoluble matter is transferred quantitatively to the filter, and wash the beaker and the residue four times with approximately 50 ml portions of standard hard water at ambient temperature. Allow the filter to drain completely and dry it and the residue for 1 h at 105 ± 5 °C. Cool in a desiccator and weigh.

C.3 Expression of results

The water insoluble matter content, as a percentage (m/m) is given by the formula

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

where

A is the mass of the residue in grams;

B is the mass of the test sample used in grams.

Annex D
(normative)

Determination of foam height of laundry detergents

D.1 Materials and reagents

Test cloth: same as in B.1.1 in Annex B.

D.2 Apparatus

Equipment specified below shall be as in Annex A.

- (a) Washing device.
- (b) Balls.

D.3 Preparation of test solution

Not less than 2 h and not more than 4 h before it is to be used, prepare from the test sample 1 litre of a 0.200% (m/v) solution in the water, stir it occasionally, and mix it thoroughly immediately before use.

D.4 Procedure

- 1) Cut 1 swatch of size 68 mm x 88 mm from the test cloth.
- 2) Start the washing device and set it to a wash temperature of 65 ± 1 °C.
- 3) Measure 200 ml of the prepared test solution into a container of the washing device, add to it 10 balls and the test cloth swatch, and heat the solution to the wash temperature of 65 ± 1 °C. When the solution has attained this temperature, measure and record the height, A, of the solution in the container.
- 4) Close the container, install it in the washing device, and wash for 10 min at a speed of 40 ± 2 r/min. Then remove and open the container immediately and, 5 min after opening the container, measure the total height, B of the foam plus liquid.
- 5) Repeat the procedure given in (4) two more times, and use the greatest of the three values of B to calculate the foam height (B - A, mm) of the test sample.

Annex E (normative)

Fluorescent whitening agent content of laundry detergents

E.1 Apparatus

E.1.1 Washing device

As in Annex A.

E.1.2 Balls

As in Annex A.

E.1.3 Steam iron

As in Annex A.

E.1.4 Ultraviolet lamp

A suitable screened ultraviolet lamp.

E.2 Materials and reagents

E.2.1 Test cloth

As in Annex B.

E.2.2 Standard detergent

E.2.3 Standard hard water

As in Annex A.

E.2.4 Standard fluorescent whitening agent

E.3 Procedure

- 1) Cut four swatches, each of size 68 mm x 88 mm, from the test cloth and identify each with indelible marking ink.
 - 2) Set the washing device to a wash temperature of 50 ± 1 °C and start the device.
 - 3) Weigh out 0.1000 g of the fluorescent whitening agent and dissolve it in exactly 100 ml of distilled water.
 - 4) prepare 1l of 2.0 g/l solution of the standard detergent in the standard hard water and, using a pipette, add to it exactly 1 ml of the fluorescent whitening agent solution.
 - 5) Dissolve (by warming) 30.000 g of the test sample in 470 ml of distilled water, mix well and add 67.000 g of this solution to 1 933 g of the standard hard water and mix well.
- NOTE Prepare the solutions not less than 2 h and not more than 4 h before use and stir them occasionally. Immediately before use, mix each solution thoroughly.
- 6) Measure out two 200 ml volumes of the prepared standard detergent solution and two 200 ml volumes of the test sample solution. Transfer each volume into a separate container of the

washing device, add 100 balls to each container, and heat the solutions to the wash temperature of 50 ± 1 °C.

When the solutions have attained the wash temperature, add one test cloth swatch to each container, close the containers, install them in the washing device, and wash for 30 min at a speed of 40 ± 2 r/min.

- 7) After washing, remove the test cloth swatches from the wash solutions and, without squeezing, blot each swatch separately between filter paper; then rinse all the swatches together, by stirring with a glass rod for 1 min in approximately 1L of the standard hard water of temperature 25 ± 3 °C. Remove the swatches from the rinse and, without squeezing, blot each one separately between filter paper.
- 8) Steam iron the blotted swatches, condition them at ambient temperature for at least 1 h, and then examine them under the ultraviolet lamp. Compare the intensity of the fluorescence on the swatches washed in the test solution with that on the swatches washed in the standard detergent solution.

Annex F
(normative)

Chemical damage to cotton fibres

F.1 Apparatus

Washing device

Same as in Annex A, but capable of maintaining the contents or its containers at boiling point.

F.2 Materials

Test Cloth

Same as in Annex B.

F.3 Procedure

- (a) From the test cloth, cut two swatches, each of size 68 mm x 88 mm, and identify each with indelible marking ink.
- (b) Switch on the washing device and set it to boiling point.
- (c) Weigh out 30.00 g of the test sample and dissolve it in 750 ml of distilled water. Transfer a 250 ml volume of the well-mixed solution into each of two containers of the washing device and add a test cloth swatch to each container.
- (d) Close the containers, install them in the washing device, start the device and let it run for 5 min. Release the pressure in the containers by opening and closing them momentarily, and then wash for 6 h. Remove the containers from the washing device, open them and let them stand overnight.
- (e) Next morning, drain off and discard the used wash solutions and refill each of the containers with 250 ml of the test solution, freshly prepared as in (c) and repeat the procedure given in (d).
- (f) Repeat (e) three more times.
- (g) After the 30 h total washing time, rinse the swatches (after squeezing them by hand) 4 times in 1L volumes of distilled water at ambient temperature, stirring each time for 1 min with a glass rod.
- (h) Then use Annex J to determine the fluidity of the cotton fibres in each swatch.

Annex G
(normative)

Corrosiveness to corrosion-resistant steel

G.1 Test strip

One strip, of size approximately 80 mm x 10 mm x 1 mm, of a hot-rolled, annealed and published corrosion-resistant steel that complies with the requirements of EN 10095.

G.2 Procedure

- (a) Accurately determine the total area of the surface of the test strip and degrease it in a mixture of equal volumes of ethanol and acetone. After allowing the strip to air-dry, heat it for 30 min in an oven maintained at 105 ± 5 °C, cool it in a desiccator and immediately weigh it to the nearest 0.1 mg.
- (b) Prepare 1L of an aqueous solution containing 10.0 g of the test sample and transfer 250 ml of the freshly prepared solution to a suitable stoppered glass bottle.
- (c) Add the test strip to the bottle and ensure that the strip is completely immersed in the test solution. Heat the bottle and contents to 80 ± 2 °C in an oven, stopper the bottle and maintain it at 80 ± 2 °C for 2 h.
- (d) Remove the test strip from the test solution, rinse it thoroughly, first with water, then with acetone, and allow it to air-dry. Heat the test strip for 30 minutes in an oven maintained at 105 ± 5 °C, cool it in a desiccator, and immediately weigh it to the nearest 0.1 mg.

Calculate the loss in mass in milligrams per 100 mm² of surface area of the test strip.

Annex H (normative)

Labelling information

H.1 Labelling for contents

The following provisions on labelling shall apply to the packaging of detergents sold to the general public.

A The following weight percentage ranges:

- less than 5%
- 5% or over but less than 15%
- 15% or over but less than 30%
- 30% and more

shall be used to indicate the content of the constituents listed below where they are added in concentration above 0.2% by weight:

- phosphates,
- phosphonates,
- anionic surfactants,
- cationic surfactants,
- amphoteric surfactants,
- non-ionic surfactants,
- oxygen-based bleaching agents,
- chlorine-based bleaching agents,
- EDTA and salts thereof,
- NTA (nitrilotriacetic acid) and salts thereof,
- phenols and halogenated phenols,
- paradichlorobenzene,
- aromatic hydrocarbons,
- aliphatic hydrocarbons,
- halogenated hydrocarbons,
- soap,
- zeolites,
- polycarboxylates.

B The following classes of constituent, if added, shall be listed irrespective of their concentration:

- enzymes
- disinfectants
- optical brighteners
- perfumes

C The allergenic fragrances, if added, as such, at concentrations exceeding 0.01% by weight.

H.2 Dosage information

The recommended quantities and/or dosage instructions expressed in millilitres or grams appropriate to a standard washing machine load, for soft, medium and hard water hardness classes and making provision for one or two cycle washing process.

For heavy-duty detergents, the number of standard washing machine loads of 'normally soiled' fabrics and for detergents for delicate fabrics, the number of standard washing machine loads of lightly-soiled

ARS 496-1:2018(E)

fabrics, that can be washed with the contents of the package using water of medium hardness, corresponding to 2.5 millimoles CaCO_3/l .

The capacity of any measuring cup, if provided, shall be indicated in millilitres or grams, and markings shall be provided to indicate the dose of detergent appropriate for a standard washing machine load for soft, medium and hard water hardness classes.

ENQUETE PUBLIQUE N° 19

Annex J (normative)

Fluidity of cotton and certain cellulosic man-made fibres in cuprammonium solution (modified method)

J.1 Coverage

This annex specifies a modified method for the determination of the fluidity of cotton and certain cellulosic man-made fibres in cuprammonium solution.

J.2 Principle

A weighed specimen of the sample is dissolved in cuprammonium solvent of specified composition in a defined capillary viscometer. The viscometer and its contents are brought to a temperature of 20 °C and then the solution is allowed to flow through the capillary of the viscometer, and the time is determined for the meniscus to fall from one fixed mark to the next. The cuprammonium fluidity is calculated by means of a formula containing two constants determined by calibrating the viscometer with a liquid of known kinematic viscosity.

J.3 Apparatus

J.3.1 Capillary viscometer, X-type.

J.3.2 Transparent polyethylene bottles, of capacity 35 mL $\pm$ 5 mL and each fitted with an insert of one of the types shown in figure 1.

J.3.3 Camel-hair brush, artists' type.

J.3.4 Stainless steel balls, of diameter 6 mm.

J.3.5 Short-stemmed glass funnel, of nominal diameter 35 mm.

J.3.6 Drying oven, maintained at 105 °C $\pm$ 5 °C.

J.3.7 Revolving wheel, capable of being rotated at 4 r/min.

J.3.8 Glass water bath, maintained at 20 °C $\pm$ 2 °C, of size such as to accommodate the bottle, and provided with a stirrer.

J.3.9 Stop-watches, each of accuracy 0.2 s (or better).

J.3.10 Balance, with a sensitivity of 0.001 g (or better).

J.4 Reagents

Standard cuprammonium solvent solution, 1 L of which contains 15 g $\pm$ 0.1 g of copper and 200 g $\pm$ 5 g of ammonia, and whose nitrous acid content is less than 0.5 g.

Avoid oxidation of this solvent by storing it in a blackened stoppered glass container at an ambient temperature of 20 °C $\pm$ 2 °C.

J.5 Determination of the total volume (V_0) enclosed by the polyethylene bottle

J.5.1 Place five stainless steel balls in the bottle. Push the insert into the neck of the bottle and determine the mass.

ARS 496-1:2018(E)

J.5.2 Remove the insert and fill the bottle (still containing the steel balls) with distilled water at $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, taking care to tap out any entrapped air bubbles.

J.5.3 Push the insert fully home into the neck of the bottle so that the excess of water overflows and, without squeezing the bottle, carefully dry the outside of the bottle with blotting paper or a paper towel.

J.5.4 Determine the mass.

J.5.5 Record the difference between the initial and final masses of the bottle (containing the five steel balls) as the volume of liquid it will hold.

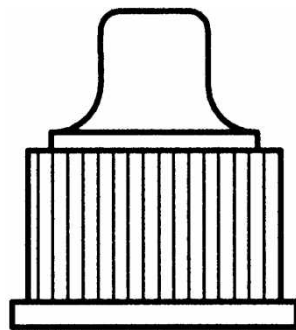


Figure J.1 (a) — Cap

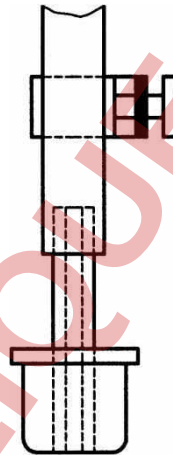
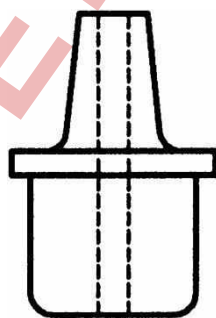


Figure J.1(b) — Alternative plug insert



Figure(c) — Modified plug insert

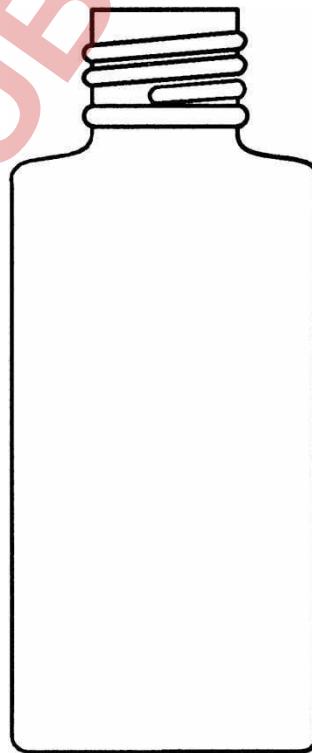


Figure 1(d) — Polyethylene bottle

Figure J.1 — Bottle and accessories

J.6 Preparation of test specimen

J.6.1 Desizing

From the test sample, cut a portion of mass at least 5 g, desize it, dry it for 2 h in the oven, and condition it.

In the case of fabric, cut it first diagonally into narrow strips and then into short fragments.

In the cases of fibres and yarns, cut them into very short lengths.

J.6.2 Determination of mass of specimen required for standard concentration

J.6.2.1 Cotton or cellulosic man-made fibres

Calculate, as follows, the mass of specimen needed to produce the required standard concentration of cellulose in the cuprammonium solvent:

$$M = \frac{V_o P}{m}$$

where

- M is the numerical value of the mass, in grams, of the desized fibres required;
- V_o is the numerical value of the volume, in cubic centimetres, of the polyethylene bottle;
- P is the standard percentage of cellulose required in the cuprammonium solution, i.e. 0.5 % in the case of cotton, and 2 % in the case of rayon and cellulose acetate;
- m is the assumed moisture content of the test specimen, i.e. 6 % for cotton, and 10 % for rayon and cellulose acetate.

NOTE The mass of acetate fibre required to give a 2 % solution of cellulose can be obtained from the following modification of the above formula:

$$M = \frac{V_o P}{m A}$$

where

- A is the acetic acid yield of the desized fibres, i.e. 62.5 %, 48.8 %, and 29.4 % for triacetate, diacetate, and monoacetate respectively.

J.6.2.2 Mixtures of cotton and cellulosic man-made fibres

J.6.2.2.1 Calculate, as follows, the mass of the desized and air-dry mixture needed to produce the standard concentration of cellulose in the cuprammonium solvent:

$$M = \frac{C_m V_o}{100}$$

where

- M is the numerical value of the mass, in grams, of desized and air-dry fibres required;
- C_m is the numerical value of the concentration, in grams per 100 mL, of the air-dry mixture calculated in accordance with J.6.2.2.2;
- V_o is the numerical value of the volume, in cubic centimetres, of the polyethylene bottle.

J.6.2.2.2 Calculate the required concentration C_m as follows:



where

C_m is the mass, in grams, of air-dry mixture per 100 mL of solvent;

R_c is the mass, in grams, of cotton per gram of air-dry mixture.

NOTE The above calculation gives a concentration which equals that which would have been obtained if the components had been separate, the whole of the cotton dissolved at a concentration of 0.5 %, the whole of the cellulosic man-made fibre dissolved at a concentration of 2 %, and the two solutions then mixed.

J.7 Procedure

J.7.1 In all operations, ensure that the cuprammonium solvent and the solution of cellulose in cuprammonium are kept in subdued light and that the ambient temperature is between 18 °C and 22 °C during the outflow of the solution from the viscometer.

J.7.2 From the desized material (see J.6.1) weigh out accurately a test specimen of the mass, determined in accordance with J.6.2, that will provide a solution of standard concentration in the bottle. Using the funnel and brush, introduce the weighed specimen into the bottle and add five stainless steel balls.

Half fill the bottle with the cuprammonium solvent and shake it gently until the specimen is thoroughly wetted. Then, using the technique described for the determination of its volume, completely fill the bottle with the solvent.

J.7.3 Attach the bottle to the revolving wheel and rotate it for not less than 15 h and not more than 25 h. Place the bottle with its contents in the water bath, and cool until its contents reach a temperature of 20 °C ± 2 °C. Then remove the bottle from the bath and dry it with blotting paper or a paper towel.

J.7.4 By holding the bottle against the light, check that the contents are free from undissolved cellulose. Then fill with the test solution the viscometer (clamped in an exactly vertical position) to above the top circumferential mark, by pouring the solution from the bottle into the open end of the viscometer, blocking the outlet as soon as the capillary is filled.

Measure the times, in seconds, required for the meniscus to fall from the top mark to the intermediate mark, and from the top mark to the bottom mark and, by checking that the two periods are approximately equal, ensure that the capillary has not become partially choked during the outflow of the liquid.

J.8 Calculations

J.8.1 Fluidity of cotton and cellulosic man-made fibres

Calculate the fluidity as follows:

a) if $t > 200$ s, $F = C'/t$

b) if $t < 200$ s, $F = C'/(t - (K/t))$

where

F is the cuprammonium fluidity, in rhe, of the cellulose solution;

C' is the viscometer constant;

t is the total time, in seconds, it takes for the meniscus of the liquid to travel from the top to the bottom circumferential mark;

K is the kinetic energy constant of the viscometer.

J.8.2 Fluidity of mixtures of cotton and cellulosic man-made fibres

Calculate, as in J.8.1, the fluidity of the mixture, and then use the following formula to calculate the cuprammonium fluidity of the cotton component:

$$F_c = 1.15F_m - 2.2$$

where

F_c is the cuprammonium fluidity, in rhe, of the cotton component;

F_m is the cuprammonium fluidity, in rhe, of the mixture.

Record the cuprammonium fluidity to the nearest whole number.

NOTE 1 Owing to the variety of man-made cellulosic fibres that can be used and the variation in the percentage of man-made cellulosic fibres in the blend, the cotton fluidity can be in error by 1 or 2 units of cuprammonium fluidity.

NOTE 2 Cuprammonium fluidity is the reciprocal of the dynamic viscosity of a solution of cellulose of prescribed concentration in a cuprammonium solvent of prescribed composition measured under precisely defined conditions. These solutions commonly exhibit non-Newtonian flow behaviour. Cuprammonium fluidity does not, therefore, have absolute physical significance as does the fluidity of a Newtonian liquid and, although it has been expressed in reciprocal poises, it is considered that it should be regarded as an empirical quantity and the results given in "units of cuprammonium fluidity" and not in the SI unit $\text{Pa}^{-1}\cdot\text{s}^{-1}$.

ENQUÊTE PUBLIQUE N° 19

ENQUETE PUBLIQUE N° 19