

**Deodorants and antiperspirants —
Specification**

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Deodorants and antiperspirants — Specification

KENYA BUREAU OF STANDARDS (KEBS)

Head Office: P.O. Box 54974, Nairobi-00200, Tel.: (+254 020) 605490, 602350, Fax: (+254 020) 604031
E-Mail: info@kebs.org, Web: <http://www.kebs.org>

Coast Region

P.O. Box 99376, Mombasa-80100
Tel.: (+254 041) 229563, 230939/40
Fax: (+254 041) 229448

Lake Region

P.O. Box 2949, Kisumu-40100
Tel.: (+254 057) 23549, 22396
Fax: (+254 057) 21814

Rift Valley Region

P.O. Box 2138, Nakuru-20100
Tel.: (+254 051) 210553, 210555

KS 1764: 2018

Foreword

This Kenya Standard has been prepared by the Technical Committee on Cosmetics and Related Products under the guidance of the Standards Projects Committee and it is in accordance with the procedures of the Kenya Bureau of Standards.

Use of deodorants and antiperspirants is on the increase. The safety of the consumer and utility of the product need to be taken into consideration by laying down the requirements for the product.

This standard was first issued in 2003. In the second edition, the title and the scope of the standard were rectified to cover all deodorants and antiperspirants packaged as roll-ons, aerosols, squeeze, stick products and any other permitted packaging. The first edition only covered roll-on deodorants and antiperspirants.

In this third edition, the pH has been adjusted to 3-7 to cater for innovation in formulations.

In the preparation of this standard, reference was made to the following documents.

Regulation (EC) No. 1223/2009 of the European Parliament and of the Council of the European Union. (2009): Cosmetic Products. Brussels.

ASTM E1207 American Standard Test Methods.

IS 10758 Indian Standard Specification for deodorants.

Godwin G. (1982). *Harry's Cosmetology*.

Abamba G. (1996). *Skin and Skin products*. Module 14

Acknowledgement is made for assistance obtained from these sources.

Deodorants and antiperspirants — Specification

1 Scope

This Kenya Standard prescribes the requirements, sampling and methods of test for deodorants and antiperspirants.

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.

KS EAS 377, Cosmetics and cosmetic products

- *Part 1: List of substances prohibited in cosmetic products*
- *Part 2: List of substances which cosmetic products must not contain except subject to the restrictions laid down*
- *Part 3: List of colorants allowed in cosmetic products*
- *Part 4: List of preservatives allowed in cosmetic products*
- *Part 5: Use of UV filters in cosmetic products*

KS 1669, Specification for cosmetic and air freshener aerosols.

KS EAS 346, Labelling of cosmetic products.

KS ISO 24153, Random sampling and randomisation procedures.

3 Application

- 3.1** This standard applies to all deodorants and antiperspirants packaged as roll-ons, aerosols, squeeze, stick products and any other permitted packaging.
- 3.2** This standard does not apply to the medicated deodorants and antiperspirants, which claim therapeutic value. Such products shall be registered with the Ministry of Health.

4 Definitions

For the purposes of this standard, the following definitions shall apply:

4.1 antiperspirant

preparation for preventing the flow of sweat

4.2 body odour

refers specifically to the armpit (or axillary) odour which tends to have a characteristic smell

4.3 cosmetic

any preparation intended for placing in contact with various external parts of the human body (epidermis, hair, nails, or lips) or with the teeth and mucous membranes of the oral cavity with a view to exclusively or principally cleaning them, perfuming them, or protecting them in order to keep them in good condition, change their appearance or correct body odours.

4.4 deodorant

substance applied to the body to mask the smell of perspiration

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4.5 roll-ball

a spherically shaped object, with the capacity to roll in all directions. It is put at the opening of a roll-on container and serves the role of closing the container as well as dispensing the contents, when rolled on the skin.

4.6 roll-on deodorant and antiperspirant

a cosmetic preparation with the effect of deodorizing and providing antiperspirant properties to the body of the user. It is packed in a container fitted with a roll-ball.

5 Ingredients

- 5.1 All ingredients used including dyes, pigments and colour shall conform to all parts of KS EAS 377.
- 5.2 The deodorant and antiperspirant shall contain acceptable amounts of the ingredients necessary to effect the intended end use performance as stipulated on the label.

6 Requirements

- 6.1 The preparation shall be of uniform colour, and shall be free from visible impurities.
- 6.2 The final product shall not be harmful to the user under normal use.
- 6.3 Deodorants and antiperspirants packed in aerosol containers shall in addition be tested as per KS 1669, Specification for cosmetic and air freshener aerosols. in addition to meeting the specifications of this standard.
- 6.4 The deodorant and antiperspirant shall also comply with the requirements given in Table 1 when tested in accordance with the methods prescribed therein.
- 6.5 Heavy metal contaminants shall not exceed the limits shown in Table 2 when tested in accordance with the methods prescribed therein.

Table 1 — Requirements for deodorants and antiperspirants

| SL No | Characteristic | Requirement | Test method |
|---|---|--------------|-------------|
| i) | Stability of smell | To pass test | Annex A |
| ii) | pH neat ^a | 3 - 7 | Annex B |
| iii) | Non-volatile matter, percentage m/m, min ^b | 10.0 | Annex C |
| ^a This test does not apply to stick products and aerosols. ^b This test does not apply to stick products. | | | |

Table 2 — Limits for heavy metal^a contaminants

| | | | |
|---|---|------|---------|
| i) | Lead (Pb), ppm, max. | 20.0 | Annex D |
| ii) | Arsenic (As), ppm, max. | 2.0 | Annex E |
| iii) | Mercury (Hg), ppm, max. | 2.0 | Annex F |
| iv) | Total amount of lead, arsenic and mercury, ppm, max., ppm, max. | 20.0 | Annex G |
| ^a The heavy metals including Lead, Arsenic and Mercury shall be as a result of contamination during processing and not deliberate addition as an ingredient. | | | |

7 Marking and labelling

- 7.1 The product shall comply with the labelling requirements outlined in KS EAS 346, Labelling of cosmetic products.
- 7.2 In addition, the following warning shall be labelled on all products containing aluminium zirconium chloride hydroxide complexes $Al_xZr(OH)_yCl_z$ and the aluminium zirconium chloride hydroxide glycine complexes:

‘Do not apply to irritated or damaged skin.’

8 Packaging

The deodorant and antiperspirant shall be packed in suitable containers that shall protect the contents and shall not cause contamination or react with the product.

9 Roll-ball construction

If the container is fitted with a roll ball:

- 8.1 The roll ball shall be made of plastic material.
- 8.2 The roll ball shall be fitting on the container such that on holding the container upside down the contents shall not pour out.
- 8.3 The roll ball shall be free rolling, leaving a thin layer of the contents on the skin during dispensation.

10 Sampling

Representative unopened samples shall be drawn for test from the market or anywhere else following the procedure outlined in KS ISO 24153, Random sampling and randomisation procedures. The samples shall be declared as conforming to the specification if they satisfy all the specified requirements.

11 Methods of test for deodorants and antiperspirants

Unless specified otherwise, analytical reagent (AR) grade chemicals and distilled water shall be used in tests. All calculations shall be done to 3 decimal places.

Annex A
(normative)

Determination of stability of smell

A.1 Apparatus

A.1.1 Porcelain cup

A.1.2 Pincers

A.1.3 Ten pieces of bleached gauze of dimension 5 cm x 10 cm

A.1.4 Thermometer

A.1.5 Hygrometer

A.2 Procedure

Put some pieces of bleached gauze which have been pre-washed in hot water without soap and dried into a porcelain cup and pour 1.5 mL of the sample into this cup.

After the gauze gets soaked, take it out with the help of pincers.

Without squeezing it, dry it in a premise having temperature $37\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and humidity of $65 \pm 5\%$ for 12 h.

A.3 Results

The product shall be taken to have passed the test if, after 12 h, the smell of the sample can clearly be picked up.

Annex B
(normative)

Determination of pH neat

B.1 Apparatus

B.1.1 pH meter equipped with glass electrode

B.1.2 Beakers of 100 mL capacity

B.2 Reagents

B.2.1 pH 7.0 buffer solution

B.2.2 pH 4.0 and pH 9.0 buffer solution

B.2.3 Deionized water.

B.3 Procedure

B3.1 Dip the pH meter into about 50 mL of pH 7.0 buffer solution. Ensure that the reading is 7.0.

B3.2 Rinse the meter with deionized water and dip it into about 50 mL of pH 4.0 buffer solution. Ensure that the reading is 4.0. Repeat using 9.0 buffer solution.

Determine the pH of the sample solution using the pH meter.

Annex C
(normative)

Determination of non-volatile matter

C.1 Apparatus

C.1.1 Flex glass petri dish of 8 cm diameter

C.1.2 Oven

C.2 Procedure

Weigh accurately 1 ± 0.2 g of the sample in the petri dish and place it in an oven at $105 \pm 2^\circ\text{C}$ for 1 h. Cool to room temperature and weigh the dish. Repeat the process to bring it to constant mass.

C.3 Calculation

Non-volatile matter per cent by mass

$$= \frac{M_2 - M_1}{M} \times 100$$

where,

M = mass, in grams, of the material taken,

M_1 = mass, in grams, of the dry and empty petri dish, and

M_2 = mass, in grams, of the petri dish and dried material.

Annex D (normative)

Determination of lead content in cosmetics by graphite furnace Atomic Absorption Spectrophotometer (AAS)

D.1 Scope

This test method specifies an electrothermal atomization technique using graphite furnace AAS method for the determination of lead content of cosmetics.

D.2 Warning and safety

The acids used in the test are highly corrosive and should be handled with maximum care and where appropriate, use a fume hood during preparation of standards. Lead is very toxic/carcinogenic and must be handled with maximum care avoiding physical contact.

If spillage occurs, use adequate amounts of water and soap to wash off the spill.

D.3 Principle

The prepared solution is injected into a graphite furnace. Spectrometric measurements of the atomic absorption of the 228.8 spectral line emitted by lead hollow cathode lamp are then taken.

D.4 Materials

D.4.1 Reagents, chemicals and standards

D.4.1.1 Nitric Acid, ρ about 1.4 g/mL.

D.4.1.2 Nitric Acid (1+1) v/v, mix 1 volume of conc. HNO_3 with 1 volume of distilled water.

D.4.1.3 Nitric Acid (0.1M), place 17 mL of concentrated acid in 100 mL volumetric flask then top to the mark with distilled water and mix.

D.4.1.4 Lead standard solution, 1 000 ppm

In 1 litre volumetric flask, dissolve 1.598 g of $\text{Pb}(\text{NO}_3)_2$ in minimum volume of 1 % v/v HNO_3 and finally top the mark using 1 % HNO_3 .

NOTE Commercial grade standards can also be used when available.

D.4.1.5 Lead standard solution - 100 ppb, this shall be prepared freshly by serial dilution of the lead solution (4.1.4).

D.4.1.6 Purge gas - Argon

Sufficiently pure, free from water and oil and free from lead.

D.4.2 Apparatus and equipment

D.4.2.1 Atomic absorption spectrophotometer fitted with graphite furnace

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The atomic absorption spectrophotometer used will be satisfactory if after optimization according to the manufacturer's instructions and when in reasonable agreement with the values given by the manufacturer and it meets the performance criteria as set out in the manual.

D.4.2.2 Lead hollow cathode lamp

D.4.2.3 Ordinary laboratory apparatus, note all glassware shall first be washed in hydrochloric acid (ρ about 1.19 g/mL, diluted).

D.5 Performance

D5.1 Sample preparation

Ignite 1 g of sample at $500 \pm 2^\circ\text{C}$ to ash. Extract the lead from the ash with 20 mL of 2N HNO_3 , and repeat with 10 mL of 2N HNO_3 . Combine the extracts and dilute to 50 mL with 0.5 N HNO_3 .

D.5.2 Calibration

D.5.2.1 Preparation of calibration curve

D5.2.1.1 Dilute the stock 100 ppb solution with 0.1M HNO_3 to obtain solutions with 10 ppb, 20 ppb, 40 ppb, 60 ppb, 80 ppb and 90 ppb of lead.

D5.2.1.2 Inject 20 microlitres each of the six solutions in turns at the same rate starting from the lowest concentrated solution to the highest concentrated solution.

D5.2.1.3 Record the corresponding absorbance values and plot calibration curve.

D5.3 Quality control checks

D.5.3.1 Duplicates

D5.3.1.1 All samples will be analyzed in duplicates and the stated acceptance criteria shall apply. The absolute difference between two independent test results obtained using the same procedure shall be not greater than 10 % of the arithmetic mean of the two results.

D5.3.1.2 Spike distilled water with 10.0 ppb of lead and obtain the recovery percentage.

D5.3.1.3 Recovery % ≥ 96 .

D.6 Procedure

D.6.1 Test portion

Use sample as prepared in **D.5.1**.

D.6.2 Blank test

D.6.2.1 Run a parallel reagent blank determination replacing the test solution with distilled water.

D.6.2.2 Reagent blank should be ≤ 0.0001 ppb of lead.

D6.3 Instrumentation

D.6.3.1 Follow the manufacturer's instructions for preparing the instrument for use.

D.6.3.2 Install the appropriate lamp and adjust the current to the recommended value.

D.6.3.3 Ensure that the autosampler pipette is correctly aligned and that the drain is available.

D.6.3.4 Select the sample tray type installed.

D.6.3.5 Ensure that the graphite tube is in good condition and correctly aligned.

D.6.3.6 Switch on the cooling system, turn on the purge gas and finally start the instrument software.

D.6.3.7 Select the relevant method and then condition tube.

D.6.4 Instrument conditions

The following conditions shall be used for the furnace during analysis of lead in addition to those given in Table D.1.

D.6.4.1 Wavelength: 283.3

D.6.4.2 Slit: 0.7

D.6.4.3 Atomization site: Pyro/platform

Table D.1 — Furnace conditions for lead

| Step | Temperature C | Ramp time (seconds) | Hold time (seconds) | Internal gas flow (L/min) | Gas type |
|------------------|------------------|------------------------|------------------------|------------------------------|----------|
| 1 (drying) | 120 | 10 | 60 | 250 | Normal |
| 2 (pretreatment) | 700 | 1 | 30 | 250 | Normal |
| 3 (cooling) | 20 | 1 | 15 | 250 | Normal |
| 4 (atomization) | 1800 | 0 | 5 | 0 | Normal |
| 5 (cleanout) | 2600 | 1 | 5 | 250 | Normal |

D.6.5 Spectrometric measurements

D.6.5.1 Inject into the flame the calibration standards, the blank solution and the test solution.

D.6.5.2 Record the absorbance reading.

D.6.5.3 If the absorbance of the sample is greater than the highest calibration standard, dilute the test solution appropriately using 0.1M HNO₃ for lead then measure the absorbance.

D.6.5.4 Inject the calibration solutions in ascending order.

NOTE The calibration curve shall only be acceptable for analysis when the correlation coefficient (r) \geq 0.99.

D.7 Expression of results

D.7.1 Method of calculation

The lead content of the sample expressed in mg/L of product is equal to:

$$[(C_1 - C_2) \cdot V]/M_0$$

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where,

C_1 = lead content of test solution expressed in mg/L read from calibration curve,

C_2 = lead content of blank solution expressed in mg/L read from calibration curve,

M_0 = grams of sample taken for analysis (5 g), and

V = volume of sample taken for analysis (100 mL).

NOTE If the test solution was diluted, then the dilution factor shall be taken into consideration in calculation.

D.7.2 Expression of Results — Report results of manganese content in mg/L as Pb in the sample into two decimal points.

D.8 Method validation

D.8.1 Method validation data.

Table D.2 — Method validation data

| Element | Linearity | LOQ ppb | LOD ppb |
|---------|---------------|---------|---------|
| Pb | $r \geq 0.99$ | 32.356 | 3.804 |

D.8.2 Precision: Repeatability

the absolute difference between two independent test results obtained using the same method on identical test material in the same laboratory by the same operator using the same equipment within a short interval of time should be not greater than 10 % of the arithmetic mean of the two results.

D.8.3 Working range

Pb 10 ppb – 100 ppb

D.8.4 Reporting limits

Pb 30 ppb

Annex E (normative)

Test for arsenic using Atomic Absorption Spectrophotometer (AAS)

E.1 Scope

This method describes the determination of arsenic in roll-on deodorants and antiperspirants.

E.2 Reagents

E.2.1 0.15 mol/L (\cong 1.5 % v/v) hydrochloric acid, carefully add 15 mL conc. HCl to deionized water and make up to 1 L.

E.2.2 0.25 mol/L (\cong 1 per cent w/v) NaOH Solution, carefully dissolve 10 g sodium hydroxide flakes in deionized water and make up to 1 L.

E.2.3 0.8 mol/L (\cong 3 % w/v) NaBH₄ Solution, dissolve 3 g sodium tetrahydroborate in 1 % NaOH solution and make up to 100 mL with 1 % NaOH solution.

E.3 Stock solution

The stock solution contains 1 000 mg/L As. The use of commercially available concentrated calibration solutions for AAS is recommended.

WARNING Arsenic solutions are toxic.

E.4 Calibration solution

1 mg As/L (in 1.5 % HCl).

E.4.1 Aliquots for calibration: 10, 25, 50 μ L.

E.4.2 Corresponding to: 10, 25, 50 ng As.

E.4.3 Diluent: 1.5 % (v/v) hydrochloric acid.

E.4.4 Calibration volume: 10 mL.

E.5 Reductant solution

3 % NaBH₄ in 1 % NaOH solution.

E.6 Oxidation state

The hydride is generated much more slowly from As(v) than from As(III). To prevent interferences, AS(V) must be pre-reduced to As(III) prior to the determination.

Pre-reduction can be performed with KI in semiconcentrated (5 mol/L) HCl solution or, preferably, with L-cysteine.

E.7 Pre-reduction

E.7.1 KI Solution, dissolve 3 g KI and 5 g L (+) - ascorbic acid in 100 mL water. Prepare fresh daily. Add 1 mL of the KI solution per 10 mL of the sample solution in 5 mol/L HCl and stand for 30 min.

Or

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E.7.2 L-cysteine solution, dissolve 5 g L-cysteine in 100 mL 0.5 mol/L HCl. This solution is stable for at least a month. Add 2 mL of the L-cysteine solution per 10 mL of the sample solution and stand for 30 min.

E.8 Instrument conditions

E.8.1 Analytical wavelength: 193.7 nm.

E.8.2 Slit Width and height: 0.7 nm Low.

E.8.3 Radiation source: Electrodeless discharge lamp for As.

E.8.4 QTA heating: Heat the QTA in a lean, blue air-acetylene flame.

E.8.5 Prepared measurement volume: 10 mL minimum to 50 mL maximum.

E.8.6 Pre-reaction purge time: Approximately 50 s.

E.8.7 Post-reaction purge time: Approximately 40 s.

E.8.8 Characteristic mass: 0.95 ng As for 1 % absorption ($A = 0.0044$).

E.8.9 Characteristic concentration: 0.095 $\mu\text{g/L}$ 1 % absorption for 10 mL calibration volume.

E.8.10 Characteristic concentration check: 50 μL of the 1 000 mg/L As stock solution (50 ng) give an absorbance of approximately $A = 0.2$.

Table E.1 — Alternate analytical wavelengths

| Wavelength Nm | Slit width Nm | Sensitivity relative to main Analytical wavelength |
|------------------|------------------|--|
| 189.0 | 0.7 | 0.8 |
| 197.2 | 0.7 | 2.0 |

NOTE Condition the QTA in cold hydrofluoric acid if there is a decrease in sensitivity (and other causes are excluded).

Annex F (normative)

Test for mercury using Atomic Absorption Spectrophotometer (AAS)

F.1 Method 1: Using sodium tetrahydroborate (NaBH_4) as reductant

F.1.1 Scope

This method describes the determination of mercury in roll-on deodorants and antiperspirants using sodium tetrahydroborate (NaBH_4) as reductant.

F.1.2 Reagents

F.1.2.1 0.15 mol/L (\cong 1.5 % v/v) hydrochloric acid, carefully add 15 mL concentrated HCl to deionized water and make up to 1 L.

F.1.2.2 0.22 mol/L (\cong 1.5 % v/v) nitric acid, carefully add 15 mL concentrated HNO_3 to deionized water and make up to 1 L.

F.1.2.3 5 % (w/v) KMnO_4 solution, dissolve 5 g potassium permanganate in deionized water and make up to 100 mL.

F.1.2.4 0.25 mol/L (\cong 1 % w/v) NaOH solution, carefully dissolve 10 g sodium hydroxide flakes in deionized water and make up to 1 L.

F.1.2.5 0.8 mol/L (\cong 3 % w/v) NaBH_4 solution, dissolve 3 g sodium tetrahydroborate in 1 % NaOH solution and make up to 100 mL with 1 % NaOH solution.

F.1.3 Stock solution, the stock solution contains 1000 mg/L Hg. The use of commercially available concentrated calibration solutions for AAS is recommended.

WARNING Mercury solutions are toxic.

F.1.4 Calibration solution, 1 mg Hg/L (in 1.5 % HNO_3 stabilized by the addition of a few drops of 5 per cent KMnO_4 solution).

F.1.4.1 Aliquots for calibration: 100, 200, 500 μL .

F.1.4.2 Corresponding to: 100, 200, 500 ng Hg.

F.1.4.3 Diluent: 1.5 % (v/v) nitric acid or 1.5 % (v/v) hydrochloric acid.

F.1.4.4 Calibration volume: 10 mL.

F.1.5 Reductant solution, 3 % NaBH_4 in 1 % NaOH solution.

F.1.6 Instrument conditions

F.1.6.1 Analytical wavelength: 253.6 nm.

F.1.6.2 Slit width and height: 0.7 nm Low.

F.1.6.3 Radiation source: Electrodeless discharge lamp or hollow cathode lamp for Hg.

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F.1.6.4 QTA heating: No flame required. If condensation in the QTA is a problem, heat the QTA gently by mounting an infrared lamp above it.

F.1.6.5 Prepared measurement volume: 10 mL minimum to 50 mL maximum.

F.1.6.6 Pre-reaction purge time: Approximately 5 s.

F.1.6.7 Post-reaction purge time: Approximately 50 s.

F.1.6.8 Characteristic mass: 4.68 ng Hg for 1 % absorption ($A = 0.0044$).

F.1.6.9 Characteristic concentration: 0.468 $\mu\text{g/L}$ 1 % absorption for 10 mL calibration volume.

F.1.6.10 Characteristic concentration check: 250 μL of the 1 000 mg/L Hg stock solution (250 ng) give an absorbance of approx. $A = 0.2$.

F.1.7 Notes

F.1.7.1 Stabilize stock and calibration solutions by adding KMnO_4 or KI solution.

F.1.7.2 Stabilize all solutions in the reaction flask by adding 1 drop of 5 % (w/v) KMnO_4 solution before starting the determination.

F.2 Method 2: using tin (II) chloride (SnCl_2) as reductant

F.2.1 Scope

This method describes the determination of mercury in roll-on deodorants and antiperspirants using tin (II) chloride (SnCl_2) as reductant

F.2.2 Reagents

F.2.2.1 0.15 mol/L ($\cong 1.5$ % v/v) hydrochloric acid, carefully add 15 mL concentration HCl to deionized water and make up to 1 L.

F.2.2.2 1 mol/L ($\cong 10$ % v/v) hydrochloric acid, carefully add 100 mL concentration HCl to deionized water and make up to 1 L.

F.2.2.3 0.22 mol/L ($\cong 1.5$ % v/v) nitric acid, carefully add 15 mL concentration HNO_3 to deionized water and make up to 1 L.

F.2.2.4 5 % (w/v) KMnO_4 Solution, dissolve 5 g potassium permanganate in deionized water and make up to 100 mL.

F.2.2.5 5 % (w/v) SnCl_2 , dissolve 50 g tin (II) chloride dihydrate ($\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$) in 10 % HCl solution and make up to 1 L with 10 % HCl solution.

F.2.3 Stock solution

The stock solution contains 1 000 mg/L Hg. The use of commercially available concentrated calibration solutions for AAS recommended.

WARNING Mercury solutions are toxic

F.2.4 Calibration solution, 1 mg Hg/L (in 1.5 % HNO_3 stabilized by the addition of a few drops of 5 % KMnO_4 solution).

F.2.4.1 Aliquots for calibration: 100, 200, 500 μL .

F.2.4.2 Corresponding to: 100, 200, 500 ng Hg.

F.2.4.3 Diluent: 15 % (v/v) nitric acid or 1.5 % (v/v) hydrochloric acid.

F.2.4.4 Calibration volume: 10 mL.

F.2.5 Reductant solution, 5 % $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ in 10 % HCL solution.

F.2.6 Instrument conditions

F.2.6.1 Analytical wavelength: 253.6 nm.

F.2.6.2 Slit width and height: 0.7 nm Low.

F.2.6.3 Radiation source: Electrodeless discharge lamp or hollow cathode lamp for Hg.

F.2.6.4 QTA heating: No flame required. If condensation in the QTA is a problem, heat the QTA gently by mounting an infrared lamp above it.

F.2.6.5 Prepared measurement volume: 10 mL minimum to 50 mL maximum.

F.2.6.6 Pre-reaction purge time: Approximately 5 s.

F.2.6.7 Pre-reaction purge time: Approximately 50 s.

F.2.6.8 Characteristic mass: 4.68 ng Hg for 1 % absorption ($A=0.004$).

F.2.6.9 Characteristic mass: 0.468 $\mu\text{g/L}$ per cent absorption for 10 mL calibration volume.

F.2.6.10 Characteristic concentration check: 250 μL of the 1 000 mg/L Hg stock solution (250 ng) give an absorbance of approximately $A=0.2$.

F.2.7 Notes

F.2.7.1 Stabilize stock and calibration solutions by adding KMnO_4 solution. Do not use KI solution since iodine interferes in the release of mercury.

F.2.7.2 Stabilize all solutions in the reaction flask by adding 1 drop of 5 % (w/v) KMnO_4 solution before starting the determination.

Annex G
(normative)

Total heavy metals

The total amount of heavy metals shall be calculated by adding up the values obtained for Lead (Annex D), Arsenic (Annex E) and Mercury (Annex F). The report shall be given in ppm.

PUBLIC REVIEW DRAFT

AMMENDMENT SLIP NO. 1, PUBLISHED SEPTEMBER 2015

TO

KS 1764:2012 Deodorants and antiperspirants — Specification

AMMENDMENT

In Table 1, amend the requirement for pH neat to read **3 – 7 instead of 5 – 7.**

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