

DRAFT UGANDA STANDARD

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Hair spray — Specification



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Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 327, of the Laws of Uganda, as amended. UNBS is mandated to coordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO) and
- (b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and
- (c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of key stakeholders including government, academia, consumer groups, private sector and other interested parties.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

The committee responsible for this document is Technical Committee UNBS/TC 5, *Chemicals and Environment products*

Hair spray — Specification

1 Scope

The Draft Uganda standard specifies the requirements, sampling and test methods for hair spray. This working draft applicable to both water based and oil based hair sprays delivered by the aerosol or non-aerosol system.

This Draft standard does not apply to medicinal products for which therapeutic claims are made. Such products shall be registered with the Ministry of Health.

2 Normative references

The following referenced documents referred to in the text in such a way that some or all of their content constitutes requirements 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.

DUS ISO 18416, Cosmetics — Microbiology — Detection of candida albicans

DUS ISO 21148 — Cosmetics -- Microbiology — General instructions for microbiological examination

DUS ISO 22717, Cosmetics — Microbiology — Detection of Pseudomonas aeruginosa

DUS ISO 22718, Cosmetics — Microbiology — Detection of Staphylococcus aureus

DUS ISO 24153 — Random sampling and randomisation procedures US EAS 339:2013, Hair creams, lotions and gels — Specification

US EAS 346:2013, Labelling of cosmetics — General requirements

US EAS 377-1, Cosmetics and cosmetic products — Part 1: List of substances prohibited in cosmetic products

US EAS 377-2, Cosmetics and cosmetic products — Part 2: List of substances which cosmetic products must not contain except subject to the restrictions laid down

US EAS 377-3, Cosmetics and cosmetic products — Part 3: List of colorants allowed in cosmetic products

US EAS 377-4, Cosmetics and cosmetic products — Part 4: List of preservatives allowed in cosmetic products

US EAS 377-5, Cosmetics and cosmetic products — Part 5: Use of UV filters in cosmetic products

US ISO 6887-1, Microbiology of food and animal feeding stuffs — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 1: General rules for preparation of the initial suspensions and decimal dilutions

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EAS 846 and the following 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>

3.1

Aerosol

system of solid or liquid particles suspended in gas

3.2

Fragrance

pleasant smell. Usually this smell comes from essential oils

3.3

Propellant

gas utilized to accelerate or spray particles.

4 Delivery systems for hair sprays

Hair sprays are formulated as aerosols that are propelled by pressurized gasses (propellants) or non-aerosols that are dispensed by manually depressing a pump.

4.1 Aerosol hair sprays

Aerosol hair sprays are packaged in containers under pressure and a release valve is used to emit the pressurized suspension into the air in a mist propelled by propellant gases. With an aerosol, you can usually get a continuous emission of the suspension as long as the gas or particles last. (See figure 1)

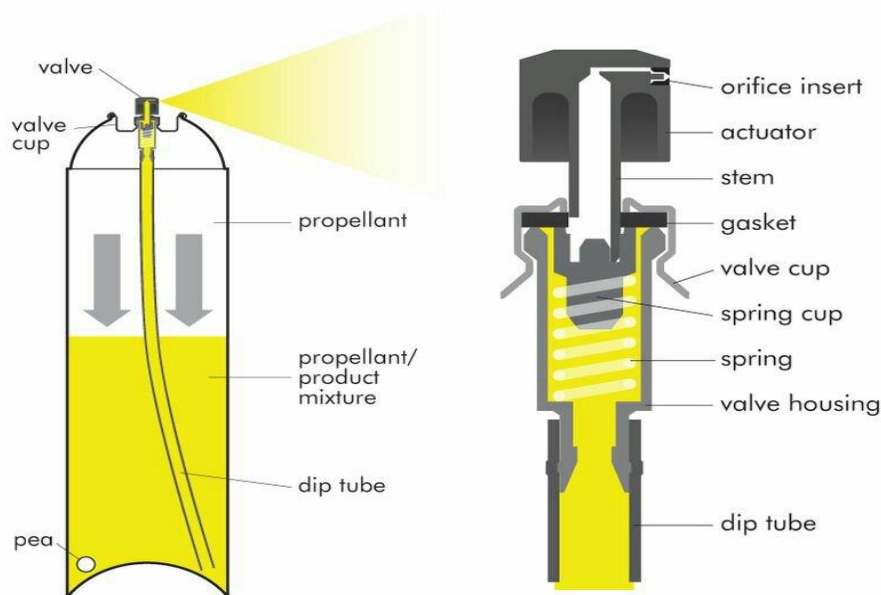


Figure 1 — Aerosol delivery system

4.2 Non Aerosol hair sprays

Non-aerosol hair sprays are packaged as liquids, usually in bottles with an atomizer attachment such as a pump-sprayer. The pump sprayer uses springs, valves and tubes to mix the liquid with small amount of air and

emits the liquid as small droplets propelled in short bursts. Unless the pump mechanism malfunctions, you can generally use the non-aerosol hair sprays until the liquid inside is used up.

5 Requirements

5.1 General requirements

5.1.1 Appearance

The hair spray shall be a clear liquid free from sediment and suspended matter. It may be coloured or colourless

5.1.2 Odour

5.1.2.1 The hair spray may be with or without perfume. The perfume shall not be objectionable.

5.1.2.2 If a perfume is added, it shall be of cosmetic grade.

5.1.3 Ingredients

5.1.3.1 The product shall contain acceptable ingredients necessary to achieve the intended end use as stipulated on the label.

5.1.3.2 All ingredients used shall conform to all Parts of US EAS 377

5.1.4 Dermatological Safety

The hair spray shall be dermatologically safe. It shall not be irritating or harmful to the scalp, when used as instructed by the manufacturer.

5.2 Specific requirements

5.2.1 Water based hair sprays

The hair sprays shall comply with the requirements given in Table 1.

Table 1— Requirements for water based hair sprays

Characteristic	Requirement	Test method
pH	5 - 8	Annex C
Thermal stability	To pass test	US EAS 339
Rancidity	To pass test	US EAS 339

5.2.2 Oil based hair sprays

The hair sprays shall comply with the requirements given in Table 2

Table 2— Requirements for oil based hair sprays

Characteristic	Requirement	Test method
Acid value max	1.0	Annex A
Peroxide value mg/1000g,max	7.5	Annex B
Rancidity	To pass test	US EAS 339
Thermal stability	To pass test	US EAS 339
CFC's	Absent	Annex D
Delivery rate, g/s min.	0.01	Annex E
General leakage	To pass test	Annex F
Net weight delivery, % min	95	Annex H
Stability of smell	To pass test	Annex I

5.3 Microbiological requirements

The hair sprays shall also comply with the microbiological limits given in Table 3

Table 3 — Microbiological limits for hair sprays

Characteristics	Limits	Test method
Microbiological examination Total viable count for aerobic mesophyllic micro-organisms per g, max.	100	US EAS 339
Pseudomonas aeruginosa	Not detectable in 0.5 g of cosmetic product	DUS ISO 22717
Staphylococcus aureus		DUS ISO 22718
Candida albicans		DUS ISO 18416
E coli		

5.4 Heavy metal contaminants

The hair sprays shall comply with the limits for heavy metal contaminants in accordance with Table 4.

Table 4 — heavy metal contaminants limits for hair sprays

Characteristic	Limit	Test Method
Lead, ppm, max.	20	US EAS 339
Arsenic, ppm, max.	2	US EAS 339
Mercury, ppm, max.	2	US EAS 339

NOTE — The total amount of heavy metals as lead, mercury and arsenic, in combination, in the finished product should not exceed 20 ppm.

5.5 Propellant

5.5.1 The propellant used shall be of hydrocarbons or any other propellant with low mammalian toxicity

5.5.2 Chlorofluorocarbons (CFC's) banned under Montreal protocol as ozone depleting shall be not used as aerosol propellants.

5.6 Flammability

The flammability of an aerosol formulation shall be kept as low as possible to ensure safety during use.

5.7 Handling and Storage

The hair spray shall be kept away from fire and flames in closed containers for aerosols.

Note — Keep away from radiators and heat. Store in a room with room temperatures, away from heating elements since they are flammable. Follow flammable liquid storage requirements.

6 Packaging and labelling

6.1 Packaging

6.1.1 The container (including the closure) in which the hair spray is packaged shall not interact chemically or physically with the hair spray and shall be strong enough to protect the hair spray adequately during normal handling, transportation and storage

6.1.2 Filled aerosol containers shall be appropriately classified in terms of flame propagation characteristics of their contents when tested in accordance with annex G;

- a) Highly flammable — if the average length of the flame is greater than 0.45 m or if the flame burns back to the actuator, or continues to burn when the test flame is extinguished.
- b) Flammable — if the average length of the flame is between 0.20 m and 0.45 m
- c) Non-flammable — if the product does not burn in the manner described (a) and (b)

6.2 Labelling

In addition to the labelling requirements outlined in US EAS 346:2013, the package shall be legibly marked with the following information:

- a) manufacturer's name and physical address;
- b) product name hair spray;
- c) net mass of the material when packed;
- d) instructions for use;
- e) country of origin;
- f) month and year of manufacture and expiry;
- g) precaution /warnings; and
- h) all ingredients shall be declared in descending order of predominance. The International Nomenclature for cosmetic ingredients (INCI) label names shall be used

7 Sampling

Random samples of the product shall be drawn for test in accordance with DUS ISO 24153 from the market, factory or elsewhere.

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ANNEX A (normative)

Determination of acid value

A.1 Principle

The acid value is determined by directly titrating the material in an alcoholic medium with aqueous sodium or potassium hydroxide solution.

A.2 Reagents

A.2.1 Ethyl Alcohol

95% ethanol or rectified spirit neutral to phenolphthalein indicator.

A.2.2 Mixed Indicator Solution

Dissolve 1 g of phenolphthalein in 100 ml of ethyl alcohol and add 1 ml of 0.1% solution of methylene blue in water.

A.2.3 Standard Aqueous Potassium Hydroxide or Sodium Hydroxide Solutions

0.1 N or 0.5 N

A.3 Procedure

Mix the sample thoroughly before weighing. Weigh accurately a suitable quantity of the sample in a 200 ml conical flask. The mass of the sample taken shall be such that the volume of alkali required for the titration does not exceed 10 ml. Add 50 ml of hot ethyl alcohol, and 1 ml of phenolphthalein indicator solution. Boil the mixture for about five minutes and titrate while as hot as possible with standard aqueous alkali solution, shaking vigorously during titration.

B.4 Calculation

$$\text{Acid value} = \frac{56.1 \times V \times N}{M} \text{ when potassium hydroxide is used.}$$

OR

$$\frac{40.0 \times V \times N}{M} \text{ If Sodium hydroxide is used.}$$

Where,

V = Volume in ml of standard potassium hydroxide or sodium hydroxide solution used,

N = Normality of standard potassium hydroxide or sodium hydroxide solution,

M = Mass of sample in grams taken for the test

ANNEX B (normative)

Determination of peroxide value

B.1 Principle

The sample is treated in solution with a mixture of acetic acid and a suitable organic solvent and then with a solution of potassium iodide. The liberated iodine is titrated with a standard solution of sodium thiosulfate

B.2 Reagents

B.2.1 Glacial acetic acid

B.2.2 Chloroform

B.2.3 Potassium iodide solution

Saturated, freshly prepared

B.2.4 Standard sodium thiosulphate solution

0.01 N freshly standardized

B.2.5 Starch indicator solution

Mix 5 g of starch and 0.01 g mercuric iodide with 30 ml of cold water and slowly pour it while stirring into one litre of boiling water. Boil for three minutes. Allow to cool and decant off the supernatant clear liquid.

B.3 Procedure

B.3.1 Weigh accurately about 5 g of the sample in a 250 ml glass stoppered conical flask and dissolve by shaking in 30 ml of a mixed solvent containing 3 parts by volume of glacial acetic acid and 2 parts by volume of chloroform. Add 0.5 ml of saturated potassium iodide solution, allow the solution to stand for exactly one minute with occasional shaking, then add 30 ml of water and titrate with standard sodium thiosulphate solution.

B.3.2 Add the thiosulphate solution until the colour of the titrated solution becomes light yellow. Then add 1 ml of starch indicator and continue the titration until the disappearance of the blue colour.

B.3.3 Carry out a blank determination without using the sample.

B.4 Calculation

$$\text{Peroxide Value, mg/1000g} = \frac{1000(V_1 - V_2) N}{M}$$

Where,

V_1 = volume of standard sodium thiosulphate solution required with the sample,

V_2 = volume of standard sodium thiosulphate solution required with the blank,

N = Normality of standard sodium thiosulphate solution and

M = mass of the sample in grams taken for the test.

ANNEX C
(normative)

Determination of pH

C.1 Apparatus

C.1.1 pH meter, equipment with a glass electrode

C.1.2 Beaker, of 100 ml capacity

C.2 Reagents

C.2.1 pH 7.0 buffer solution

C.2.2 pH 4.0 and pH 9.0 buffer solutions

C.2.3 Deionised water

C.3 procedure

C.3.1 Dip the pH meter into about 50 ml of 7.0 buffer solution. Ensure that the reading is 7.0 ± 0.05

C.3.2 Rinse the meter with deionised water and dip it into about 50 ml; of 4.0 buffer solution. Ensure that the reading is 4.0 ± 0.05 . Repeat using pH 9.0 buffer solution.

C.3.3 Determine the pH on the undiluted sample by a suitable pH meter, using glass electrode

ANNEX D (normative)

Determination of the propellant composition

D1 procedure

D.2.1 The analysis of the propellant mixture in most aerosol is carried out conveniently by gas chromatography. For Sampling, a hypodermic needle is fitted to the valve of the aerosol can and approximately 0.5 g of the propellant is injected into the heavy duty centrifuge tube closed with serum cap, containing about 8 ml of benzene. After mixing, 5µl samples are taken out from this tube with a microlitre syringe and injected into the gas chromatograph.

D.2.2 Two 4572 mm × 6.35 mm OD columns operated at 40 °C are recommended for the analysis containing 20 percent weight hexadecane and diethylhexyl sebacate respectively on silanized chromosorb W60/S0 mesh.

The first column should be used mainly for initial screening and the second column for the confirmation and determination of the identified propellants.

Table D1 lists the relative retention data of the most widely used propellant together with some other fluorinate hydrocarbons and benzene used as the solvent IN the two columns.

Table D1 — Relative retention data of propellants

Chemical name	Stationary phase diethylhexyl sebacate	Stationary phase hexadecane
Octafluorocyclobutane	0.214	0.122
1-chloro-1,2,2 trifluoroethylene	0.268	0.196
Propane	0.275	0.22
1,2-difluoroethane	0.289	0.141
Dichlorodifluoromethane	0.296	0.220
1,2-dichloro-1,1,2,2-tetrafluoromethane	0.345	0.290
Isobutane	0.366	0.378
Monochlorodifluoromethane	0.368	0.152
1-Chloro-1,1-difluoroethane	0.402	0.236
n- butane	0.449	0.527
Vinylchloride	0.529	0.353
Trichlorofluoroethane	1.000	1.000
1,1,2-trichloro-1,2,2-tetrafluoroethane	1.254	1.342
Dichloromonofluoroethane	1.354	0.515
1,2-dibromo-1,1,2,2 tetrafluoroethane	1.634	1.363
Methylene Chloride	2.565	1.070
Benzene	6.786	5.661

D.2 Results

The sample shall be considered as having failed the test if it contains any of the above CFCs

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ANNEX E (normative)

Determination Delivery Rate of the dispenser

E.1 Material and apparatus

The following material and apparatus shall be used in this test

E.1.1 Any suitable timing device

E.1.2 Balance

Having accuracy to 0.01 g and with a capacity greater than 500 g.

E.1.3 pair of gloves

Made of cloth or fabric or towel for handling dispensers during test.

E.1.4 pair of tongs

For removing dispensers from water bath.

E.1.5 Water bath

Set at 26 °C ± 0.3 °C, thermostatically controlled.

E.2 Procedure

E.2.1 Hold a dispenser upright, spray for two seconds to fill the education tube. Then weigh the dispenser

E.2.2 Submerge the dispenser into the water bath for 15 minutes using tongs, remove the dispenser from the bath and immediately dry the container with a towel Spray the dispenser in one continuous burst for 10 seconds. Re-weigh the dispenser.

E.2.3 Repeat the procedure and take an average of three tests. The difference between the maximum and minimum delivery rates shall not exceed 0.2 g per second

E.3 Calculation

Calculate the delivery rate according to the following formula;

$$\text{Delivery rate (in g per second)} = \frac{M_1 - M_2}{N}$$

Where;

M_1 = initial weight of the dispenser in grams

M_2 = final weight of the dispenser in grams

N = time in seconds

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ANNEX F
(normative)

Testing of filled aerosol containers

F.1 Procedure

F.1.1 All filled aerosol containers shall be tested by immersion in a water bath set at 55 °C

F.1.2 The container shall be such that the pressure generated within the immersed container reaches not less than 90 percent of the pressure generated within the containers at equilibrium at 55 °C.

F.2 Interpretation of results

Any filled aerosol container that shall leak, get distorted or burst as a result of this test shall be considered to have failed the test and shall be discarded.

ANNEX G (normative)

Flame propagation

G.1 principle

The filled aerosol container is sprayed as a test flame under controlled conditions and the length of the burning spray cone is measured.

G.2 Apparatus

G.1.1 In its simplest form, the apparatus consists of a base marked at 0.15 m intervals, an adjustable stand to carry the aerosol container which may be raised or lowered to accommodate differences in container height, a means of measuring the burning spray cone (usually a one metre fuel placed horizontally at the same level as the top third of the flame, the hottest part) a means of igniting the spray cone in the form of a test flame 0.05 m ± 0.005 m in height (usually a candle flame is used).see figure G.1

G.1.2 Water bath maintained at 20 °C .This equipment shall be used to bring the aerosol container and its contents to equilibrium at 20 °C (Heat the cans to 20 °C in the water bath)

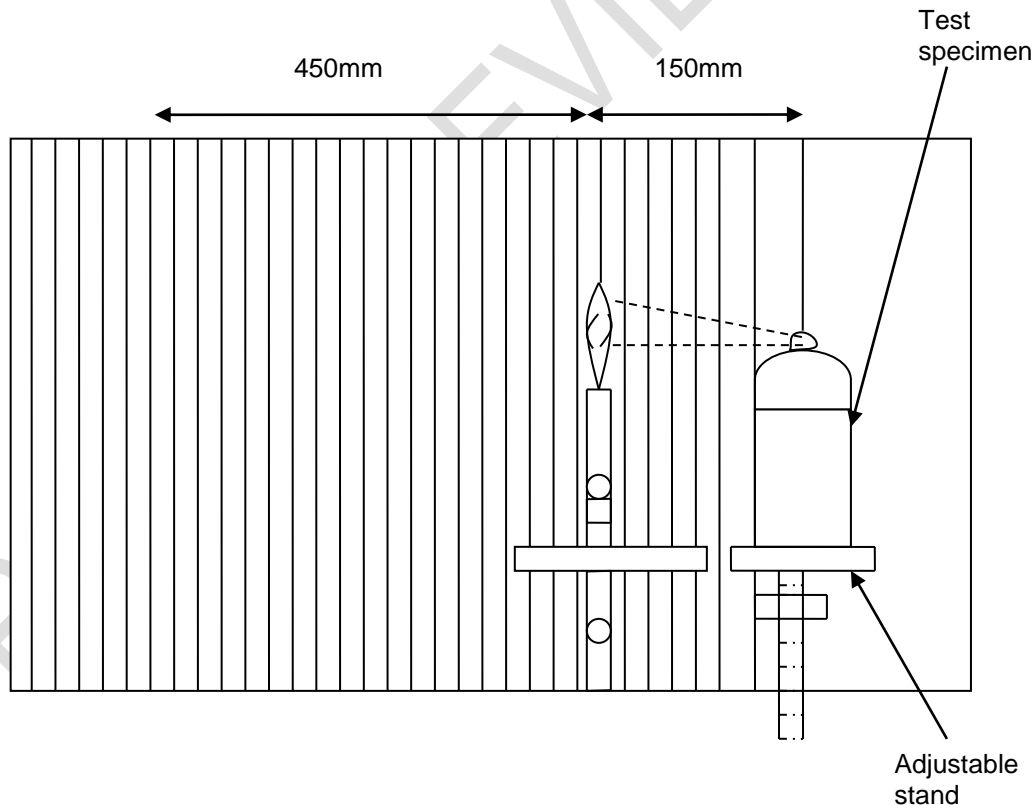


Figure G 1 — Apparatus for flame propagation test

G.3 Procedure

G.3.1 place the aerosol container on the stand. Depress the actuator and adjust the height of the stand so that the spray cone will pass through the upper third test flame (hottest part).

G.3.2 Bring the aerosol container and its content to the equilibrium temperature of 20 °C. Place the container on the stand so that the point where the spray emerges is 0.15 m from the test flame. Then light the test flame and depress the actuator for 15 seconds to 20 seconds. Record the total length of the burning spray cone and specify whether or not it burns back to the actuator.

G.3.3 Extinguish the test flame and record whether the spray cone continues to burn while the actuator is depressed.

G.3.4 Repeat each test twice and record the flame length as the average of the three tests.

ANNEX H (normative)

Net weight delivery

Procedure

H.1 For the determination of the net weight delivery, a random sample of at least three packages is selected. After the removal of any dust cover or caps not required for dispensing the product, the gross weight of each package is determined and after shaking for 15 seconds, the content of the lightest container is drained by holding the valve wide open. Now the exhausted container is weighed. The result is called wet – tare weight and is equal to the weight of the container plus any product remaining after draining.

H.2 Consequently, the regeneration allowance is determined and subtracted from the wet-tare weight to obtain the corrected wet-tare weight. The regeneration allowance is defined as the difference between the weight of the product which would be delivered through normal usage and the weight of the product delivered by the present accelerated procedure. It is calculated by multiplying the label weight of the container by 0.02 g and rounding the result to the next lowest gram.

H.3 By subtracting the corrected tare weight from the gross weight, the adjusted net weight of the package is obtained. If this is greater than 95 percent of the label weight the lot is assumed to be satisfactory. However, if it is less than 95 percent of the label weight, the lot is rejected.

Annex I (normative)

Stability of smell

I.1 Apparatus

I.1.1 Porcelain cup

I.1.2 Pincers

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

I.1.4 Thermometer

I.1.5 Hygrometer

I.2 Procedure

Put some pieces of bleached gauze which have been pre-washed in hot water without soap and dried into a porcelain cup. Spray continuously about 2 ml of the sample into this cup. After the gauze gets soaked, remove one piece using a pair of pincers. Without squeezing it, dry it in an environment with temperature of $27\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and humidity of $65 \pm 5\%$ for 12 hours.

I.3 Results

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

Bibliography

- [1] 76/768/EEC, *The European Economic Community Cosmetics Directive*
- [2] KS 602:1999 —*Specification for hair oils*
- [3] KS 1669:2001 —*Specification for cosmetic and air freshener aerosols*
- [4] IS 1546:2004 *Glossary of terms — Cosmetics*

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