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**Draft Sri Lanka standard Specification for
Hair Creams
(First Revision) (DSLS 611 :)**

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This draft should not be regarded or used as a Sri Lanka Standard.

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Draft Sri Lanka Standard
SPECIFICATION FOR HAIR CREAMS
(First Revision)

DSLS 611 :

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Draft Sri Lanka Standard
SPECIFICATION FOR HAIR CREAMS
(First Revision)

FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Chemical and Polymer Technology and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on

This Standard was first published in 1983. In this First Revision, the requirement for pH has been changed. The microbiological limits and limits for heavy metal have been updated. Method of test for the determination of peroxide value has been modified.

Hair creams are intended to provide the hair good grooming, luster and some degree of hair conditioning. The major property required for conditioning is moisturizing. Moisture must be added for this purpose, but direct application of water is of little benefit, since evaporation is equally rapid and an equilibrium is soon reached. A means has to be provided to prevent the absorbed water from evaporating and emulsions of oil and water prove useful in this respect.

It is necessary that the raw materials used in hair creams are in such concentrations that after interaction with other raw materials, the finished product is free from any harmful effect for the user. It should be the responsibility of the manufacturer to ensure the physiological and dermatological safety of this product using appropriate protocols.

This Standard is subject to the restrictions imposed under the applicable State Legislative requirements.

For the purpose of deciding whether a particular requirement of this Standard is complied with, the final value, observed or calculated, expressing the results of a test or an analysis, shall be rounded off in accordance with **SLS 102**. The number of significant figures to be retained in the rounded off value shall be the same as that of the specified value in this Standard.

In the preparation of this Standard, the assistance derived from the following publications is gratefully acknowledged:

IS 7679	Hair Creams – Specification
ISO 17516	Cosmetics – Microbiology – Microbiological limits
Standards for fragrances published by the International Fragrance Association (IFRA)	

1 SCOPE

1.1 This Standard prescribes the requirements and methods of sampling and test for hair creams. This include water-in-oil and oil-in water emulsions.

1.2 This Standard does not cover hair oils, hair gels, brilliantine and pomades.

1.3 This Standard does not cover products which do not qualify under the criteria for "cosmetics" on evaluation by the local regulatory authority. (See **5.2.12** of **SLS 1587**.)

2 REFERENCES

ISO/TR	17276	Cosmetics - Analytical approach for screening and quantification methods for heavy metals in cosmetics
ISO/TR	18811	Cosmetics — Guidelines on the stability testing of cosmetic products
SLS ISO	22716	Guidelines on good manufacturing practices for cosmetics
SLS	102	Rules for rounding off numerical values
SLS	428	Random sampling methods
SLS	457	Cosmetics - Classification of raw materials Part 1 Substances permitted subject to restrictions and permitted colourants, preservatives and UV filters Part 2 Prohibited substances
SLS	1349	Method for the enumeration and detection of aerobic mesophilic bacteria in cosmetics
SLS	1350	Method for the detection of <i>Pseudomonas aeruginosa</i> in cosmetics
SLS	1351	Method for the detection of <i>Staphylococcus aureus</i> in cosmetics
SLS	1445	Method for the enumeration of yeast and mould in cosmetics
SLS	1488	Cosmetics - Microbiology - Detection of <i>Candida albicans</i> in cosmetics
SLS	1489	Cosmetics - Microbiology - Detection of <i>Escherichia coli</i> in cosmetics
SLS	1587	Cosmetics – Packaging and labeling

3 DEFINITION

3.1 cosmetic: Any substance or mixture of substances manufactured, sold or represented for use in cleansing, improving or altering the complexion, skin, hair or teeth and includes deodorants and perfumes

4 REQUIREMENTS

4.1 General requirements

4.1.1 Hair cream shall be in the form of an emulsion. It shall be of uniform texture, free from extraneous matter and may be perfumed.

4.1.2 Hair cream shall be manufactured by a process adhering to Good Manufacturing Practices (GMP) complying with **SLS ISO 22716**.

4.1.3 Hair cream shall not segregate or physically deteriorate during normal conditions of storage and use.

4.1.4 Hair cream shall meet performance and requirements of this specification for the complete duration of the declared shelf life. The date of expiry / best before / shelf life of the finished product shall be determined using appropriate stability tests as per **ISO/TR 18811**.

4.1.5 It shall be the responsibility of the manufacturers of finished hair cream, to ensure the safety of their formulation before releasing the product for sale. Results of safety assessments/such studies shall be available and shall be produced, whenever required.

4.2 Raw materials

4.2.1 All raw materials used in the manufacture of hair cream shall comply with the provisions of **Part 1** and **Part 2** of **SLS 457**.

4.2.2 It shall be the responsibility of the manufacturer to provide evidence for compliance of any fragrances used with the standards published by International Fragrance Association.

4.3 Other requirements

4.3.1 Hair cream shall also comply with the requirements given in **Table 1** when tested in accordance with the relevant methods given in **Column (4)** of the table.

TABLE 1 - Requirements for hair cream

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of Test (4)
i)	pH at 27 ± 2 °C	4.5 – 7.5	Appendix B
ii)	Total non aqueous content, per cent by mass, min.	15	Appendix C
iii)	Water content, per cent by mass, max.	70	Appendix D
iv)	Peroxide value, milliequivalents/kg, max.	10.0	Appendix E
v)	Thermal stability	Pass the test	Appendix F

4.4 Microbiological limits

Hair cream shall also comply with the microbiological limits given in Table 2 when tested in accordance with the relevant method given in Column (4) of the table.

TABLE 2 - Microbiological limits

Sl. No. (1)	Test (2)	Limit (3)	Method of test (4)
i)	Total aerobic mesophilic microorganisms (bacteria, yeast and mould count), per g or ml, max.	1 000	SLS 1349 and SLS 1445
ii)	<i>Pseudomonas aeruginosa</i>	Absent in 1 g	SLS 1350
iii)	<i>Staphylococcus aureus</i>	Absent in 1 g	SLS 1351
iv)	<i>E.coli</i>	Absent in 1 g	SLS 1489
v)	<i>Candida albicans</i>	Absent in 1 g	SLS 1488

4.5 Limits for heavy metals

Hair cream shall also comply with the heavy metals limits given in Table 3 when tested in accordance with **ISO /TR 17276**.

TABLE 3 – Heavy metals limits

Sl. No. (1)	Test (2)	Limit (3)
i)	Lead (as Pb), mg/kg, max.	10
ii)	Arsenic (as As), mg/kg, max.	3
iii)	Mercury (as Hg), mg/kg, max.	1
iv)	Cadmium (as Cd), mg/kg, max.	3

5 PACKAGING AND LABELING

5.1 Packaging

Hair cream shall be packed in suitable, well closed containers. A number of such containers, as agreed to between the purchaser and the supplier, shall be suitably packed.

5.2 Labeling

5.2.1 The following information shall be legibly and indelibly marked on the containers:

- a) Name of the product as “Hair cream”;
- b) Name and address of the manufacturer for locally manufactured products;
- c) Name and address of the distributor in Sri Lanka / importer including the country of origin, in the case of imported products;
- d) Registered trade mark, if any;
- e) Brand name, if any;
- f) Net content;
- g) Batch or code or lot identification number;
- h) Date of manufacture;
- j) Best before / date of expiry;
- k) List of ingredients;
- l) Instruction for use where necessary;
- m) Special precautions to be observed in use, if required ; and
- n) Specific warning statement necessary or appropriate, if any.

5.2.2 The following information shall be legibly and indelibly marked on each package:

- a) Name of the product as “Hair cream”;
- b) Name and address of the manufacturer for locally manufactured products;
- c) Name and address of the distributor in Sri Lanka / importer including the country of origin, in the case of imported products;
- d) Registered trade mark, if any;
- e) Batch or code or lot identification number;
- f) Brand name, if any; and
- g) Number of containers.

5.2.3 The packaging and labeling shall also be in accordance with **SLS 1587**.

6 SAMPLING

Representative samples of the product for ascertaining conformity to the requirements of this Specification shall be drawn as prescribed in Appendix A.

7 METHODS OF TEST

7.1 Tests shall be carried out as per the methods given in Column (4) of Table 1 and Table 2 and **ISO /TR 17276**.

7.2 Unless otherwise specified all reagents used shall be of recognized analytical grade and wherever water is mentioned distilled water or de-ionized water shall be used.

APPENDIX A COMPLIANCE OF A LOT

The sampling scheme given in this Appendix should be applied where compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assured based on manufacturer's control systems coupled with type testing and check tests or any other procedure, appropriate schemes of sampling and inspection should be adopted.

A.1 LOT

In any consignment all the containers containing hair cream representing one batch of manufacture shall constitute a lot.

A.2 GENERAL REQUIREMENTS OF SAMPLING

In drawing, preparing, storing and handling samples, the following precautions shall be observed.

A.2.1 Samples shall be drawn in an environment not exposed to damp air, dust or soot.

A.2.2 A sampling tube may be used for drawing the materials from the containers. It shall be clean and dry when used.

A.2.3 The samples shall be placed in clean, dry, glass or any other suitable containers. The sample containers shall be sealed air-tight after filling and shall be marked with necessary details of sampling.

A.2.4 The material being sampled, the samples, the sampling instrument and the sample containers shall be protected from adventitious contamination.

A.2.5 Samples shall be stored so that the conditions of storage do not affect the quality of the material.

A.2.6 When drawing samples for microbiological examination in addition to the requirements specified in **A.2.1** to **A.2.5**, the following precautions shall be observed.

A.2.6.1 Samples shall be drawn under aseptic conditions.

A.2.6.2 The sampling instrument and sample containers shall be sterilized using an appropriate method.

A.2.6.3 If storage is necessary, the samples shall be stored at room temperature and testing shall be carried out as soon as possible.

A.3 SCALE OF SAMPLING

A.3.1 Samples shall be tested from each lot for ascertaining the conformity of the material to the requirements of this specification.

A.3.2 The number of packages to be selected from a lot shall be in accordance with **Table 4**.

TABLE 4 - Scale of sampling

No. of packages in the lot (1)	No. of packages to be selected (2)
Up to 50	3
51 to 200	4
201 to 400	5
401 to 650	6
651 to 900	7
901 to 1 200	8
1 201 to 1 500	9
1 501 and above	10

A.3.3 The packages shall be selected at random. In order to ensure randomness of selection, random number tables as given in **SLS 428** shall be used.

A.4 COMPOSITE SAMPLE

A.4 All equal quantity of material shall be drawn from the top, middle and bottom portions of each container selected as in **A.3.2**. with the help of a sampling instrument. The material so obtained shall be mixed thoroughly to form a composite sample which shall be of a size sufficient to carry out tests for all requirements specified in **A.6.2**.

A.4.2 A separate composite sample of about 20 g shall be prepared under the conditions specified in **A.2.6** for testing microbiological requirements before the preparation of a composite sample for testing the other requirements.

A.5 REFERENCE SAMPLE

If a reference sample is required for requirements other than the microbiological requirements, the size of the composite sample shall be three times as much as the amount required in **A.4.1**.

The composite sample so obtained shall be divided into three equal parts, each forming a composite sample. One for the purchaser, another for the supplier and third as the reference sample which shall be used in case of dispute between the purchaser and supplier.

A.4 NUMBER OF TESTS

A.4.1 Each package selected as in **A.2** and each container selected as in **A.3** shall be inspected for packaging and labeling requirements.

A.4.2 The individual samples prepared as in **A.3** shall be tested for microbiological limits given in **4.4** of this Specification.

A.4.3 The composite sample prepared as in **A.3** shall be tested for the requirements specified in Table **1**, Table **2** and Table **3** of this Specification.

A.5 CONFORMITY TO STANDARD

A lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied:

A.5.1 Each package and each container inspected as in **A.4.1** satisfies the relevant requirements.

A.5.2 Each container tested as in **A.4.2** conforms to the microbiological limits.

A.5.3 The test results on the composite samples satisfy the relevant requirements.

APPENDIX B DETERMINATION OF pH

B.1 APPARATUS

A pH meter, preferably equipped with a glass electrode.

B.2 PROCEDURE

B.2.1 For oil – in - water emulsion creams

Weigh to the nearest 0.1 g, approximately 5 g of the material into a 100 ml beaker. Add 45 ml of water and disperse the cream in it. Determine the pH of the suspension at 27 ± 2 °C using the calibrated pH meter.

B.2.2 For water – in – oil emulsion creams

Weigh to the nearest 0.1 g, approximately 10 g of the material and add 90 ml of rectified spirit previously adjusted to pH 6.5 to 7.0. Warm if necessary, to 45 °C and stir thoroughly for 15 min. Filter the alcoholic layer through a filter paper and measure the pH of the filtrate at 27 ± 2 °C using the calibrated pH meter.

APPENDIX C DETERMINATION OF TOTAL NON-AQUEOUS CONTENT

C.1 PRINCIPLE

The emulsion is broken up with dilute mineral acid and the fatty matter is extracted with ethyl ether. It is weighed after removal of the solvent.

C.2 REAGENTS

C.2.1 Hydrochloric acid, dilute 1:1 (v/v)

C.2.2 Ethyl ether

C.2.3 Methyl orange indicator solution

Dissolve 0.1 g of methyl orange in 100 ml of distilled water.

C.2.4 Sodium sulphate, desiccated.

C.3 PROCEDURE

Weigh to the nearest 0.1 g, approximately 2 g of the material into a conical flask, add 25 ml of dilute Hydrochloric acid, fit a reflux condenser to the flask and boil the contents until the oil and water phases separate. Pour the contents of the flask into a 300-ml separating funnel and allow it to cool to 20 °C. Rinse the conical flask with 50 ml of Ethyl ether in 10 ml portions and pour the ether rinsings into the separating funnel. Shake the separating funnel well and leave until the layers separate. Separate out the aqueous phase and wash with 50 ml portions of ether twice. Combine all the ether extracts and wash them with water until free of acid (test with Methyl orange indicator solution). Filter the ether extracts through a filter paper containing Sodium sulphate into a conical flask which has been previously dried at a temperature of 60 ± 2 °C and then weighed. Wash the Sodium sulphate on the filter paper with ether and dry the material remaining in the flask at a temperature of 60 ± 2 °C till the difference between two successive weightings does not exceed 1 mg.

C.4 CALCULATION

Total non-aqueous content, per cent by mass = $100 \times \frac{m_1}{m_2}$

where,

m_1 is the mass, in grams, of the residue; and

m_2 is the mass, in grams, of the material taken for the test.

APPENDIX D DETERMINATION OF WATER CONTENT

D.1 APPARATUS

The apparatus, shown in Figure 1 consists of the following:

- a) Flask, 500 ml capacity, made of hard resistant glass;
- b) Trap, the cylindrical portion of the receiving tube is 146 mm to 156 mm in length, graduated to contain a volume of 10 ml and is sub-divided into 0.1 ml divisions; and
- c) Condenser, approximately 400 mm in length and the, bore diameter of the inner tube is 16 mm to 17 mm. The condenser is connected to the trap as shown in the figure.

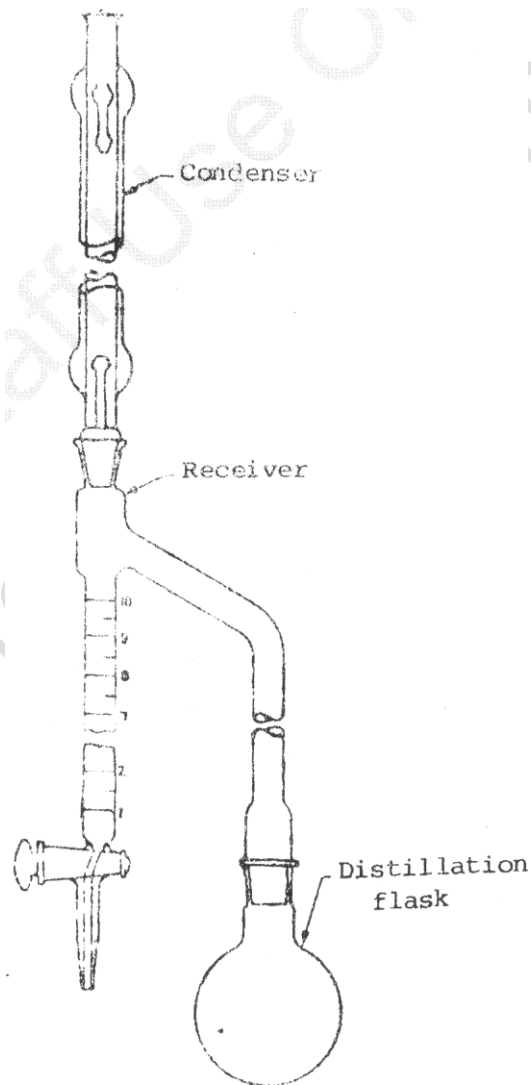


Figure 1- Entrainment distillation of water

D.2 REAGENTS

D.2.1 Toluene, treated with excess water and distilled

D.3 PROCEDURE

Weigh to the nearest 0.1 g approximately 10 g of the material into the flask. Add about 200 ml of the Toluene and a few pieces of dry pumice stone. Connect the apparatus and fill the receiving end of the trap with the solvent, poured through the top of the condenser. Heat the flask gently for 15 min, and then the solvent begins to boil, reflux at a rate of 2 drops per second until most of the water has passed. Increase the rate to about 4 drops per second. When all the water has apparently distilled, rinse the inside of the condenser tube with solvent while brushing down the tube with a tube brush attached to a copper wire and saturated with the solvent. Continue the distillation for 5 min, then remove the source of heat, and allow the receiving tube to cool to room temperature. If any droplets of water are seen adhering to the wall of the receiving tube, scrub down with a brush consisting of a rubber band wrapped around a copper wire and dipped with the solvent. When the water and solvent have separated, read the volume of water.

D.4 CALCULATION

Water content, per cent by mass = $\frac{V \times d \times 100}{m}$

where,

V is the volume of water, in ml, at room temperature collected in the receiving tube;

d is the density of water, at room temperature; and

m is the mass, in grams, of the material taken for the test.

APPENDIX E DETERMINATION OF PEROXIDE VALUE

E.1 PRINCIPLE

E.1.1 The peroxide value is the quantity of those substances in the sample, expressed in milliequivalents of active oxygen per kilogram of oil, which oxidize Potassium iodide under the conditions described.

E.2 REAGENTS

All reagents and distilled water shall be free from dissolved oxygen.

E.2.1 Chloroform, AR grade, freed from oxygen by flushing with a current of pure, dry inert gas

E.2.2 Glacial acetic, freed from oxygen by flushing with a current of pure, dry inert gas

E.2.3 Aqueous Potassium iodide solution, fresh, saturated, and free from free iodine and iodates

NOTE

Make sure the solution remains saturated as indicated by the presence of undissolved crystals. Store in the dark. Test daily by adding 2 drops of starch solution (E.2.5) to 0.5 ml of Potassium iodide solution in 30 ml of Acetic acid - Chloroform (3 volumes: 2 volumes) solution. If a blue colour is formed which requires more than 1 drop of 0.01 M Sodium thiosulphate solution to discharge, discard the iodide solution and prepare a fresh solution.

E.2.4 Sodium thiosulphate solution 0.005 M, standardized just before use.

E.2.5 Starch solution, Mix 5 g of soluble starch in 30 ml of water, add this mixture to 1 000 ml boiling water and leave boiling for 3 min.

E.2.6 Petroleum ether: Diethyl ether (1:1) solvent mixture

E.2.7 Ethanol, AR grade

E.3 APPARATUS

All equipment used shall be free from reducing or oxidizing substances.

NOTE: *Do not grease ground glass surfaces.*

E.3.1 Flasks, of about 500 ml capacity, with ground necks and ground glass stoppers, dried before hand and filled with a pure, dry inert gas (Nitrogen or preferably, Carbon dioxide)

E.3.2 Air condenser

E.3.3 Separatory funnels, 500 ml

E.3.4 Flasks, 250 ml capacity, with ground necks and ground glass stoppers

E.3.5 Measuring cylinders

E.3.6 Evaporating dishes, glass

E.3.7 Filter funnel, glass

E.4 PROCEDURE

E.4.1 Ensure that the sample is taken and stored away from strong sunlight, kept cold and contained in completely filled glass containers, hermetically sealed with ground glass or cork stoppers.

E.4.2 Extraction of oil/fat from test sample

Weight, around 25 g of hair cream in to a clean, dry flask (**E.3.1**), such that the weighted portion contains approximately 2 g of oil. Add approximately 100 ml of solvent mixture in to test portion and swirl gently. Connect the air condenser to flask containing test portion and reflux in heating mantle under low heat for around 45 minutes. Remove the flask from heating block and cool the contents and add 20 ml saturated Sodium chloride solution into the mixture in the flask. Connect the air condenser to the flask containing test portion and reflux in heating mantle under low heat for about 1-14.5 hours.

After cooling transfer all the contents in the flask to a separatory funnel. Rinse the flask twice with distilled water (around 40-50ml) and add these rinsings into the separatory funnel. Stopper the separatory funnel and shake the contents in the funnel. Stopper the separatory funnel and shake the contents in the funnel, and allow to stand until there is complete separation of the two phases. Add small quantities of ethanol to eliminate emulsion formation.

After two phases are well separated, remove the lower aqueous layer. Pass the solvent layer in the separatory funnel through glass filter funnel with anhydrous sodium sulfate layer. Collect the filtered ether layer in to an evaporating dish (**E.3.6**).

Kept evaporating dish on a water bath and warm until all ether was evaporated. Dry the oil in the dish in an oven under 40 ± 2 °C for several minutes.

E.4.3 Analysis of Peroxide value

Weight approximately 1.5-2 g of oil into a dry flask (m). Add 10 ml of the chloroform (**E.2.1**) and dissolve the oil quickly by swirling. Add 15 ml of the acetic acid (**E.2.2**), then 1 ml of fresh saturated aqueous potassium iodide solution (**E.2.3**). Immediately stopper the flask (**E.3.1**), shake/stir for about 1 min and leave for exactly 5 minutes away from the light in a cool dark place.

Add about 75 ml of distilled water. Stir vigorously and titrate the liberates iodine in the presence of few drops of the starch solution with the 0.005 M standard volumetric Sodium thiosulphate solution.

Carry out a blank test in parallel with the test sample.

E.5 CALCULATION

Peroxide value, milliequivalents per kilogram = $\frac{(V - V_0) \times M \times 1000}{m}$

where,

- V_0 is the volume, in milliliters, of the thiosulphate solution (E.2.4) used for the blank;
 V is the volume, in milliliters, of the Sodium thiosulphate solution (E.2.4) used for the determination;
 M is the molarity of the Sodium thiosulphate solution (E.2.4) used; and
 m is the mass, in grams, of the material taken for the test.

**APPENDIX F
 TEST FOR THERMAL STABILITY**

F.1 APPARATUS

A humidity chamber controlled at 60 per cent to 70 per cent relative humidity and 40 ± 1 °C.

F.2 PROCEDURE

F.2.1 Spread a 20 mm broad, 5 mm thick strip of the material on the internal wall of a beaker. Keep the beaker for 8 hours in the humidity chamber between 60 per cent to 70 per cent relative humidity and 40 ± 1 °C.

F.2.2 The cream shall be considered to have passed the test if no oil separation is observed on removal from the humidity chamber.

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