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SPECIFICATION FOR TOILET PAPER (*Second Revision*)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

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SLS 798: 2022

Gr. 7

SRI LANKA STANDARDS INSTITUTION
No, 17, Victoria Place
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Sri Lanka.

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This Standard does not purport to include all the necessary provisions of a contract

Sri Lanka Standard
SPECIFICATION FOR TOILET PAPER
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FOREWORD

This Standard was approved by the Sectoral Committee on Paper, Board and Packaging and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2022-02-21.

This Standard was First published in 1987. This Revision introduces three grades of toilet papers. Requirements for brightness of paper and disintegration of toilet paper have been introduced. Considering the actual practice of usage, requirement of total absorption of water has been removed. Limit of pH has been revised to be in compatible with the human skin.

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 Specification is complied with the final value, observed or calculated, expressing the result of a test or an analysis, shall be rounded off in accordance with **SLS 102**. The number of significant places 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:

BSEN 12625 :1999 Tissue paper and tissue products
SANS 1887-1:2015 Tissue paper Part 1: General requirements
SANS 1887-2:2015 Tissue paper Part 2: Toilet paper

1 SCOPE

This Standard prescribes the requirements and methods of sampling and test for toilet paper also referred to as toilet tissue supplied in rolls.

2 REFERENCES

ISO	187	Paper, board and pulps - Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples
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	1268	Offset ink for general purposes
SLS	1276	Method of test for paper, board and pulps for diffuse blue reflectance factor
		Part 1 Indoor daylight conditions (ISO brightness)
SLS	1371	Method of test for tissue paper and tissue products
		Part 1 Determination of tensile strength, stretch at break and tensile energy absorption
		Part 2 Determination of grammage
		Part 9: Determination of disintegration in water
SLS	1394	Glossary of terms for tissue paper and tissue products
SLS ISO	22716	Guidelines on good manufacturing practices for cosmetics

3 DEFINITIONS

For the purpose of this Standard, the definitions given in **SLS 1394** and the following shall apply:

3.1 break-up: Disintegration of the tissue specimen in to small pieces approximately 10 mm × 10 mm

3.2 cross direction (CD): The direction of a paper at right angles to the machine direction

3.3 defective: Wrapper, holder, a roll, sheet or a set of test pieces, whose average properties have been determined, and that failed in one or more respects to comply with the relevant requirements of the Standard

3.4 emboss: The impression of a raised or a depressed pattern on a sheet

3.5 hole: Opening of which the largest dimension exceeds 1 mm, in the paper

3.6 machine direction (MD): The direction of a paper corresponding to the direction of flow of the stuff on the machine

3.7 non-wet strength tissue product: Product that has not had any wet strength enhancing material added during manufacturing

3.8 sheet: Portion of toilet paper between consecutive rows of perforations on a roll irrespective of whether the toilet paper is single ply, double ply or three ply

3.9 single ply: Sheet material manufactured on a tissue machine or after converting as a part of a single or multi-ply tissue product

3.10 specimen: Area of paper cut to given dimensions, from the sheets

4 GRADES

The toilet paper shall be one of the following grades, as specified by the purchaser

i) Single ply;
ii) Double ply; and
iii) Three ply.

5 REQUIREMENTS

5.1 General requirements

5.1.1 Toilet paper shall be manufactured by a process adhering to Good Manufacturing Practices (GMP) complying with **SLS ISO 22716**. Toilet paper rolls shall be constructed by winding toilet paper evenly and firmly on a cylindrical core. The sides of the toilet paper rolls shall be neatly cut. The toilet paper shall be non perforated or uniformly perforated across the width at regular intervals, the portion between two adjacent rows of perforations constituting a sheet.

5.1.2 Ink used (where necessary) for printing pictures or logo on toilet tissue shall be in accordance with **SLS 1268**.

5.2 Material requirements

5.2.1 Paper

5.2.1.1 The paper shall be a creped or creped and embossed tissue paper

5.2.1.2 Toilet paper shall be made of virgin pulp or recycled tissue paper pulp trimmed with smooth edges and shall present neat, well finished appearance.

5.2.1.3 The toilet paper shall be smooth and shall be reasonably free from visible fibre bundles, wood splinters, specks, holes, tears, wrinkles, abrasive particles or other imperfections.

5.2.1.4 The paper shall not have disagreeable odour, either wet or dry.

5.2.1.5 The toilet paper shall be white or coloured as specified by the purchaser and uniform in cloour. Colourants added (if any), shall comply with the provisions of **Part 1** and **Part 2** of **SLS 457**.

5.2.1.6 The fragrances used shall comply with the Standards for fragrances published by the International Fragrances Association (IFRA).

5.2.2 Core of the roll

The core shall be rigid enough not to collapse under ordinary conditions of handling and usage. The internal diameter of the core shall be as agreed to between the purchaser and the supplier.

5.3 Construction of toilet paper rolls

The paper shall comply with the following construction requirements:

a) paper shall be evenly and firmly wound on a cylindrical core. The number of malformed sheets at the core end of a roll shall not exceed ten; and

b) sides of each roll shall be neatly cut.

5.4 Ease of separation of sheets

The sheets shall readily be separated cleanly at the perforations when tested as per the method given in Appendix **B**.

5.5 Number of sheets or length of a roll

The number of sheets for perforated toilet roll or total length of non perforated toilet roll shall be as agreed to between the supplier and the purchaser. A tolerance of five per cent shall be permitted on the declared number of sheets or length of roll.

5.6 Dimensions

5.6.1 *Diameter of toilet paper roll*

The internal diameter of a toilet paper roll shall be ~~as~~ agreed to between the purchaser and the supplier.

5.6.2 *Width of a toilet paper roll*

The width of a toilet paper shall be minimum of 100 mm.

5.6.3 *Length of a sheet*

The length of a each sheet in perforated rolls (distance between two adjacent rows of perforations) shall be minimum of 110 mm.

5.7 Disintegration

Toilet tissue paper product shall breakup under the action of water as per the method prescribed in **SLS 1371** Part **9**.

5.8 Other requirements

The toilet paper shall comply with the requirements specified in Table **1** when tested according to the relevant methods given in Column **(6)** of the table.

TABLE 1 – Requirements for toilet paper

Sl No.	Characteristic	Requirement			Method of test
		Single ply	Double ply	Three ply	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Grammage (substance), g/m^2, min.	30	30	45	**SLS 1371 Part 2**
ii)	Rate of absorption of water, (0.01 ml of water), s, max.	60	60	60	Appendix **C**
iii)	pH value, at 27±2 ^{0} C	5.0 - 8.0	5.0 - 8.0	5.0 - 8.0	Appendix **D**
iv)	Dry tensile strength, N/m, min.				Appendix **E**
	Cross direction (CD)	50	50	110	
	Machine direction (MD)	75	75	140	
v)	Brightness of white paper, %, min.	73	73	82	**SLS 1276 Part 1**

6 PACKAGING AND MARKING

6.1 Packaging

6.1.1 The toilet paper rolls shall be wrapped individually and number of such rolls shall suitably packed to prevent any damage to the toilet paper at the point of sale, during storage and transportation.

NOTE: *If necessary wrapped toilet paper rolls may be packed in bundles as agreed to between the purchaser and the supplier.*

6.2 Marking

6.2.1 The following shall be marked legibly and indelibly on the wrapper of each toilet paper rolls:

a) Name of the product as “Toilet paper” or “Toilet tissue”;
b) Type of pulp “virgin” or “recycle”;
c) Grade as “single ply” or “double ply” or three ply”;
d) Name and address of the manufacturer and country of origin ; (**NOTE :** *Name and address of the manufacturer and the distributor should be marked on imported tissues*)
e) Batch or code number;
f) Width of toilet paper, in millimetre ;
g) Length of a sheet (where perforated), in millimetres ;
h) Colour of toilet paper when colour is not visible through the wrapper ;
j) Registered trade mark , if any ;
k) Brand name, if any ; and
m) Number of sheets (if perforated) or length of a toilet paper roll in metre.

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

a) Name of product as “Toilet paper” or “Toilet tissue”;
b) Name and address of the manufacturer and country of origin ; (**NOTE :** *Name and address of the manufacturer and the distributor should be marked on imported tissues*)
c) Batch or code number;
d) Colour of the toilet paper (The word “ASSORTED” shall be marked if the package contains toilet paper rolls of different colours) ;
e) Number(s) of toilet paper rolls ;
f) Registered trade mark, if any ; and
g) Brand name, if any.

NOTE : *Attention is drawn to certification marking facilities offered by the Sri Lanka Standards Institution. See the inside back cover of the standard.*

7 SAMPLING

Representative samples of the material for ascertaining conformity to the requirements of this specification shall be drawn as prescribed in Appendix **A.**

8 METHOD OF TEST

8.1 Tests shall be carried out as specified in Appendices **B** to **E** of this Specification and**, SLS 1276 Part 1**and **SLS 1371 Part 1, Part 2** and **Part 9**.

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8.2 The test samples shall be conditioned prior to test and tests shall be carried out at the Standard atmospheric temperature 27 ±1 ^{o}C and relative humidity 65 ±2 % in accordance with **ISO 187**.

APPENDIX A
COMPLIANCE OF A LOT

The sampling scheme given in this Appendix shall apply where compliance of a lot to the requirements of this Specification has to be assessed based on sampling and inspection.

Where compliance with this Specification is to be assured, appropriate schemes of sampling and inspection shall be adopted based on manufacturer's control systems coupled with Type Tests and Testing Procedures.

A.1 LOT

In any consignment all the toilet paper/ toilet tissue supplied in rolls of same grade belonging to one batch of manufacture or supply shall constitute a lot.

A.2 SCALE OF SAMPLING

A.2.1 Samples shall be tested from each lot for ascertaining conformity of the lot to the requirements of this Standard.

A.2.2 The number of toilet paper/ toilet tissue supplied in rolls to be selected as a sample from a lot shall be in accordance with Column **(1)** and Column **(2)** of Table **2**.

A.2.3 The number of toilet paper/ toilet tissue supplied in rolls in the lot shall be calculated by determining the number of rolls in each package.

TABLE 2 – Scale of sampling

No. of toilet paper rolls in the lot (1)	**No. of toilet paper rolls to be selected for sample** (2)	**No. of toilet paper rolls to be selected for sub sample** (3)	**Acceptance No. in accordance with sample** (4)
Up to 1 200	13	9	1
1 201 to 3 200	13	9	1
3 201 to 10 000	20	14	2
10 001 to 35 000	20	14	2
35 001 and above	32	21	3

A.2.4 If toilet paper/ toilet tissue supplied in rolls are packed in packages five per cent of the packages subject to a minimum of four packages shall be selected. As far as possible, equal number of rolls shall be drawn from each package to form a sample as given in Column **(2)** of Table **2**.

A.2.5 The number of toilet paper/ toilet tissue supplied in rolls to be selected as the sub sample from the sample selected as in **A.2.2**, **A.2.3** and **A.2.4** shall be in accordance with Column **(1)** and Column **(3)** of Table **2**.

A.2.6 The packages and wiping paper rolls shall be selected at random. In order to ensure randomness of selection, random number tables as given in **SLS 428** shall be used.

A.3 NUMBER OF TESTS

A.3.1 Each package selected as in **A.2.4** shall be inspected for packaging and marking requirements specified in Clauses **6.1** and **6.2.2**.

A.3.2 Each toilet paper/ toilet tissue supplied in roll selected as in **A.2.2**, **A.2.3** and **A.2.4** shall be inspected for packaging and marking requirements specified in Clauses **6.1** and **6.2.1**.

A.3.3 Each toilet paper/ toilet tissue supplied in roll selected as in **A.2.2**, **A.2.3** and **A.2.4** shall be inspected for the requirements given in **5.2** and **5.3**. (material requirements & construction)

A.3.4 Each toilet paper/ toilet tissue supplied in roll selected as in **A.2.5** shall be inspected for the requirements given in **5.4** and **5.5**. (ease of separation of sheets & number of sheets/length of a roll)

A.3.5 Each toilet paper/ toilet tissue supplied in roll selected as in **A.2.5** shall be tested for the requirements specified in Clause **5.6**. (dimensions – diameter of the core, width of a toilet paper roll & length of a sheet)

A.3.6 Composite sample chosen from the toilet paper/ toilet tissue supplied in roll sample, selected as in **A.2.5** shall be tested for the requirements specified in Clause **5.7**. (disintegration)

A.3.7 Each toilet paper/ toilet tissue supplied in roll selected as in **A.2.5** shall be tested for the requirements specified in Clause **5.8**. (other requirements – grammage, rate of absorption of water, pH value, dry tensile strength and brightness of white paper)

A.4 CRITERIA FOR CONFORMITY

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

A.4.1 Each package inspected as in **A.3.1** satisfies the relevant requirements.

A.4.2 Each toilet paper/ toilet tissue supplied in roll inspected as in **A.3.2** satisfies the relevant requirements.

A.4.3 The number of toilet paper/ toilet tissue supplied in roll not satisfying any one or more requirements when inspected as in **A.3.3** is less than or equal to the corresponding acceptance number given in Column **(4)** of Table **2**.

A.4.4 Each toilet paper/ toilet tissue supplied in roll inspected as in **A.3.4** satisfies the relevant requirements.

A.4.5 Each toilet paper/ toilet tissue supplied in roll inspected as in **A.3.5** satisfies the relevant requirement for diameter of toilet paper roll.

A.4.6 The values of the expression $\bar{x} - 1.2s$ calculated using the test results on width of a toilet paper roll and length of a sheet, tested as in **A.3.5** is not less than the relevant specification limit.

NOTE:

1. $\bar{x}$ *= The sum of values of the observations divided by the number of observations.*

2. s *= The positive square root of the quotient obtained by dividing the sum of squares of the deviation of the observations from their mean by one less than the number of observations in the sample.*

A.4.7 Composite sample inspected as in **A.3.6** satisfies the relevant requirements.

A.4.8 The values of the expression $\bar{x} - 1.2s$ calculated using the test results on grammage, tested as in **A.3.7** is not less than the relevant specification limit.

A.4.9 Each toilet paper/ toilet tissue supplied in roll tested as in **A.3.7** satisfies the requirements for rate of absorption of water, dry tensile strength and brightness of white paper.

A.4.10 The values of the expressions $\bar{x} - 1.2s$ and $\bar{x} + 1.2s$ calculated using the test results on pH value, tested as in **A.3.7** are lie between the two specification limit

APPENDIX B
DETERMINATION OF EASE OF SEPARATION OF SHEETS

B.1 PROCEDURE

Select a position at random on the toilet paper roll and detach a sheet by holding it between thumb and forefinger at its perforated end exerting a steady pull at an angle of about 10 ^{o} to the edge of

the toilet paper roll. Carry out the test on ten consecutive sheets of the toilet paper roll. The sheets shall be severed along the perforations and the tear shall be manifestly due to the perforations only.

APPENDIX C
DETERMINATION OF RATE OF ABSORPTION OF WATER

C.1 APPARATUS

C.1.1 Water applicator, that consists of a micrometer syringe or a suitable pipette that can deliver accurately 0.01 mL or 0.02 mL of water.

C.1.2 Stop-watch, capable of measure the time in second

C.2 TEST SPECIMENS

Ten sheets shall be used.

C.3 PROCEDURE

C.3.1 Place a test specimen on the rim of a beaker having a diameter of about 50 mm. Fill the syringe with distilled water at 27 ±2 ^{o}C such that no air bubbles are trapped in the syringe. Allow 0.01 ml of water to flow on to the specimen, holding the syringe at an angle of about 30 ^{o} to the horizontal with the tip almost in contact with the specimen. Keep the tip of as the syringe in the drop of water until delivery is complete. Measure, with stop-watch, the time taken for complete absorption of the drop of water as indicated by no further reflection of light from the drop of water when viewed at an angle, from the instant the water touches the specimen. Carry out five tests on each side of the paper. Calculate and record the average water absorption rate in seconds.

NOTE
In the case of double-ply or three–ply paper, test the two plies or three plies together, i.e. as if they were one.

APPENDIX D
DETERMINATION OF pH VALUE

D.1 APPARATUS

D.1.1 pH meter, equipped with a glass electrode capable of measuring pH value to an accuracy of 0.1 and standardized against a suitable buffer solution.

D.2 TEST SPECIMENS

D.2.1 Sufficient pieces of toilet paper which having an rea of about 150 mm^2 cut randomly from the toilet paper rolls to provide two specimens of approximately 1 g shall be used.

D.3 PROCEDURE

D.3.1 Place a specimen in a 200-ml Erlenmeyer flask and add 20 ml of freshly boiled distilled water. Shake the flask until the pieces constituting the specimen are properly wetted. Add a further 50 ml of water and fix a reflux condenser to the flask. Boil gently the contents of the flask for one hour. Stopper the flask tightly and allow to cool to room temperature and measure the pH value. Repeat the test with the second specimen and record the average pH value to the nearest 0.1.

NOTE
In the case of double-ply or three–ply paper, test the two plies or three plies together, i.e. as if they were one.

APPENDIX E
DETERMINATION OF DRY TENSILE PROPERTIES

E.1 APPARATUS

Use the apparatus given in **SLS 1371 Part 1**

E.2 TEST SPECIMENS

Use ten specimens. Cut at random ten specimens in the machine direction and ten specimens in the cross direction of the paper, each specimen being at least 100 mm long and 50 mm ± 1,0 mm wide.

E.3 PROCEDURE

Test shall be carriedout as per the method given in **SLS 1371 Part 1** and following instructions shall be followed:

a) adjust the distance between the jaws of the apparatus to 65 mm and clamp a test specimen securely in position;

b) apply the load at such a rate that the test specimen breaks within (10 ± 5) s and determine the tensile strength; and

c) if a test specimen slips in a clamp or breaks in or at the edge of a jaw, reject the result and repeat the test on another test specimen taken from the sample.

NOTE
In the case of double-ply or three–ply paper, test the two plies or three plies together, i.e. as if they were one.

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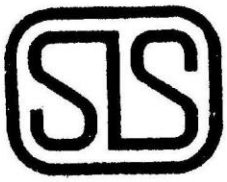

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SRI LANKA STANDARDS INSTITUTION

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