

SRI LANKA STANDARD 369 : 2001

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**SPECIFICATION FOR
POLYESTER COTTON/RAYON
SHIRTING MATERIALS
(FIRST REVISION)**

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Gr. 6

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SRI LANKA

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

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

**SRI LANKA STANDARD
SPECIFICATION FOR POLYESTER
COTTON/RAYON SHIRTING MATERIALS
(FIRST REVISION)**

FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Textiles, Clothing & Leather and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2001-02-08.

This standard was first published in 1975. A revision was considered necessary to accommodate the advancements of the industry.

For the purpose of deciding whether a particular requirement of this standard 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 CS 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 obtained from the following publications is gratefully acknowledged :

IS 7085 : 1986 (1991) Indian Standard Specification for Polymer blend shirting
ASTM D 3477 - 92 Standard Performance Specification for Men's and Boys' Woven Dress Shirt Fabrics.

1 SCOPE

This standard prescribes the requirements and methods of test for undyed, dyed or printed polyester cotton/ rayon woven fabrics to be used in the manufacturing of shirts.

2 REFERENCES

- SLS 41 Number of threads per centimetre in woven fabric
- SLS 42 Mass per unit length and per unit area of woven/knitted fabrics
- SLS 43 Breaking load and extension of woven textile fabric
- SLS 44 Linear density of yarn
- SLS 45 Measurement of length of woven fabric
- SLS 46 Measurement of width of woven fabric
- SLS 47 Dimensional changes of fabrics
- SLS 55 Colour fastness to washing

- SLS 62 : Part 2 Colour fastness to artificial light
- SLS 67 Colour fastness to perspiration
- SLS 86 pH value of aqueous extracts of textile materials
- SLS 88 : Part 1 Colour fastness to bleaching with hypochlorite
- SLS 89 Bow and skewness in woven fabric
- CS 102 Presentation of numerical values
- SLS 151 Chemical analysis of polyester fibres with cotton/viscose rayon
- SLS 428 Random sampling methods

3 TYPES

Polyester cotton/rayon shirting material shall be of following two types:

- Type 1 - Spun warp, spun weft
- Type 2 - Filament warp, spun weft

4 REQUIREMENTS

4.1 Yarn

The yarn used in the manufacture of cloth shall be such that the cloth produced complies with the requirements given in Table 1.

4.2 Cloth

4.2.1 Composition

Chemical composition of the fabric shall be any of the following, when determined as in SLS 151. A tolerance of ± 2 per cent on declared composition may be permitted.

Polyester (per cent)	Cotton/rayon (per cent)
80	20
67	33
50	50

4.2.2 Construction

4.2.2.1 The count of yarn shall be as agreed to between the purchaser and the supplier; and shall be declared by the supplier. A tolerance of ± 3 per cent of the declared count of yarn may be permitted, when tested as in SLS 44.

4.2.2.2 The ends and picks per dm shall be as agreed to between the purchaser and the supplier; and shall be declared by the supplier. A tolerance of ± 4 per cent of ends and picks per decimetre may be permitted, when tested as in SLS 41.

4.2.2.3 The cloth shall also comply with the requirements given in Table 1 when tested as in Column 4 of the table.

TABLE 1 - Constructional Requirements For Polyester Cotton/rayon Shirting Material

Sl No.	Characteristic	Requirement	Method of test
(1)	(2)	(3)	(4)
i	Mass g/m ² , min.	100	SLS 42
ii	Breaking strength, N, min. Warp way Weft way	400 300	SLS 43

4.2.3 Appearance

The cloth shall be reasonably free from defects when visually examined. The selvedge shall be straight, even and well secured to prevent fraying.

4.2.4 Colour fastness

The colour fastness ratings of cloth shall conform to the requirements specified in Table 2 when tested as in Column 4 of the table.

TABLE 2 - Requirements For Colour Fastness

Sl. No.	Fastness to	Rating	Method of test
(1)	(2)	(3)	(4)
i	Light	5 or better	SLS 62 Part 2
ii	Washing	4 or better	SLS 55
iii	Bleaching	4 or better	SLS 88
iv	Perspiration	4 or better	SLS 67

4.2.5 Water soluble matter and desizing loss

The water soluble matter and desizing loss of cloth shall not be more than 2 per cent when determined as in Appendix B.

4.2.6 pH Value

The pH of the aqueous extract of cloth shall be between 6.0 and 8.5 when determined as given in SLS 86.

4.2.7 Dimensional change

The dimensional change of cloth, warp way or weft way, shall not be more than 2 per cent when determined as in SLS 47.

4.2.8 Width

The width of the cloth shall be as agreed to between the purchaser and the supplier. It shall be determined as in SLS 46. A tolerance of ± 1 cm of the declared width may be permitted.

4.2.9 Length

The length of each piece of cloth shall be as agreed to between the purchaser and the supplier. It shall be determined as in SLS 45.

4.2.10 Skewness

The skewness at any point of the cloth shall not be more than 4 per cent when determined as in SLS 89.

5 PACKAGING

Each piece of cloth shall be rolled full width (not folded, face inward) on a tube unless otherwise specified by the purchaser.

6 MARKING

6.1 Each piece of cloth shall be marked or labelled legibly and indelibly with the following:

- a) Type and composition;
- b) Trade mark, if any;
- c) Name and address of the manufacturer;
- d) Width in cm; and
- e) Gross length in meters.

6.2 Each material shall be marked with the following:

- a) Trade mark, if any; and
- b) Name of the manufacturer.

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 manufacturers control systems coupled with type testing and check tests or any others procedure, an appropriate scheme of sampling and inspection should be adopted.

A.1 LOT

In any consignment, shirting material of same type belonging to one batch of manufacture or supply shall constitute a lot.

A.2 SCALE OF SAMPLING

A.2.1 Number of pieces of cloth to be selected from a lot shall be in accordance with Table 3.

TABLE 3 - Scale of Sampling

Sl. No.	Number of pieces in the lot	Number of pieces to be selected	Number of pieces in the sub sample	Number of non-conforming pieces allowed
(1)	(2)	(3)	(4)	(5)
i	Up to 100	10	5	0
ii	101 to 300	15	6	1
iii	301 to 500	25	7	1
iv	501 to 800	35	8	2
v	801 to 1300	50	9	3
vi	1301 and above	75	10	4

A.2.2 Pieces of cloth shall be selected at random. In order to ensure randomness of selection, random number tables as given in SLS 428 shall be followed.

A.3 NUMBER OF TESTS

A.3.1 Each piece of cloth selected as in Column 3 of Table 3 shall be inspected for marking and packaging requirements.

A.3.2 Each piece of cloth selected as in Column 3 of Table 3 shall be tested for ends and picks, mass, width and length.

A.3.3 A sub sample as given in Column 4 of Table 3 shall be selected from the pieces tested as in A.3.2. Each piece of cloth in the sub sample shall be tested for the following:

- | | |
|--|--------------------|
| Breaking strength | pH value |
| Water soluble matter and desizing loss | Dimensional change |

A.3.4 Each piece of cloth in the sub sample shall be tested for colour fastness and skewness.

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 piece of cloth inspected as in A.3.1 satisfies the marking and packaging requirements.

A.4.2 Number of non conforming pieces of cloth when tested as in A.3.2 shall not exceed the corresponding number given in Column 5 of Table 3. The length of each piece shall be not less than the declared length.

A.4.3 From results obtained when tested as in A.3.3, following shall be calculated and conclusions shall be made.

A.4.3.1 Breaking strength

$$\text{Average breaking strength for a piece} = \frac{\text{Sum of observed breaking strength values in test specimens of a piece}}{\text{Number of test specimens}}$$

$$\text{Grand average breaking Strength } (\bar{x}) = \frac{\text{Sum of average breaking strength in all pieces}}{\text{Number of pieces tested}}$$

$$\text{Range } (\bar{R}) = \text{maximum average breaking strength} - \text{Minimum average breaking strength}$$

$\bar{x} - 0.4R$ shall be greater than or equal to the specified value.

A.4.3.2 Other parameters

$$\text{Average } (\bar{x}) = \frac{\text{Sum of observed values}}{\text{Number of tests}}$$

$$\text{Range (R)} = \text{Maximum observed value} - \text{Minimum observed value}$$

- a) $\bar{x} + 0.4R$ shall be less than or equal to the specified value for dimensional change.
- b) Values of ($\bar{x} + 0.4R$) and ($\bar{x} - 0.4R$) of the pH value shall be within the range specified.
- c) $\bar{x} + 0.4 R$ shall be less than or equal to the specified value for water soluble matter and desizing loss.

A.4.4 Each piece of cloth when tested as in **A.3.4** satisfies the relevant requirements.

APPENDIX B
DETERMINATION OF WATER SOLUBLE MATTER
AND DESIZING LOSS

B.1 PRINCIPLE

A weighed quantity of the dry material is extracted with an organic solvent in a Soxhlet apparatus. After the extraction, the material is treated with a suitable diastatic enzyme solution, followed by boiling water to remove the sizing matter (namely starch and gum). The total water soluble matter and desizing loss is then the loss in dry mass, expressed as a percentage of the original sized material.

B.2 APPARATUS

B.2.1 Sintered disk filter crucibles, with a porosity of 100 μm to 120 μm and a capacity of 60 ml, provided with a suitable cover.

B.2.2 Ignition crucibles and covers

B.2.3 Desiccator

B.2.4 Air oven, for maintaining the temperature at 105 ± 2 °C.

B.2.5 Soxhlet extractor

B.3 REAGENTS

The reagents used shall be free from any impurities that will affect the result of the determination. Distilled water or water of equal purity shall be used throughout.

B.3.1 Dichloromethane

B.3.2 Diastatic enzyme solution, containing 0.5 per cent of active bacterial diastase and 0.1 per cent of a non-ionic wetting agent which has no inhibitory effect on the enzyme.

NOTE

The enzyme solution should be prepared in strict accordance with the manufacturer's instructions.

B.4 TEST SPECIMENS

Take from the sample, at least two specimens each weighing approximately 2 g. Cut the specimens into pieces of convenient size for treatment in the crucible.

B.5 PROCEDURE

B.5.1 Transfer about 2 g of the specimen into a tared crucible. Dry the crucible and specimen in an oven at 105 ± 2 °C for three hours. Cool in a desiccator for 30 minutes. Weigh the crucible and its contents. Record the mass to the nearest 0.001 g. During the operations, handle the crucible by a pair of clean crucible tongs.

Repeat the process of drying, cooling and weighing until two successive weighings do not differ by more than 0.2 per cent. Record the mass of the dry specimens.

Place the crucible in a Soxhlet extractor with its rim above the level of the siphon. Extract with dichloromethane for one hour. Remove the crucible from the Soxhlet extractor and allow the solvent to evaporate. Wash the specimen in the crucible with about 130 ml of water using suction to draw the water through.

Drain the specimen and transfer it to a 150-ml flask containing 50 ml of diastatic enzyme solution maintained at 70 °C (See Note). Allow the specimen to remain in the solution for 40 minutes. During this period shake the flask frequently or preferably continuously.

NOTE

Diastatic enzymes from different sources may require different conditions of temperature and pH for optimum results. If optimum conditions of temperature and pH are recommended by the enzyme supplier, these should be employed accordingly.

Decant the solution through the same crucible that was previously used for the Soxhlet extraction. Treat the specimen in the flask with another 50 ml of diastatic enzyme solution as before. Decant the solution, add water to the flask and boil for 5 minutes. Finally transfer the desized specimen to the same crucible. Wash the desized specimen with 100 ml of hot water stirring with a glass rod and draining under suction. Repeat the washings two times using 100 ml of water each time. If the washing from the final wash appears turbid, continue washing until it is clear.

Transfer the crucible with its contents to the oven and dry at 105 ± 2 °C for 4 hours. Cool in the desiccator for 35 minutes and weigh immediately. Repeat drying, cooling and weighing until two successive weighings do not differ by more than 0.2 per cent.

B.5.2 Residual mineral filling

If the sample originally contained a substantial amount of insoluble mineral filling (for example china clay) transfer the desized specimen to an ignition crucible which together with its lid has been previously ignited at 700 °C, cooled and weighed. Ash the specimen, starting with low heat and gradually increasing the temperature to 700 °C. Continue heating at 700 °C until no carbonaceous residue remains.

Cool the crucible and its contents and lid in a desiccator for 35 minutes. Weigh and calculate the mass of the ash.

B.6 CALCULATION

Water soluble matters and desizing loss
per cent by mass

$$= \frac{(m_1 - m_2 - m_3)}{m_1} \times 100$$

where

- m_1 is the dry mass, in grams, of the sized specimen;
- m_2 is the dry mass, in grams, of the specimen after extraction and desizing; and
- m_3 is the mass, in grams, of the ash determined as in B.5.2

SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

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