SRI LANKA STANDARD 803 : PART 2 : 1990

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SPECIFICATION FOR

SPUN POLYESTER YARN

PART 2 - FOR KNITTING

SRI LANKA STANDARDS INSTITUTION

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SLS 803 : 1990

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

SRI LANKA STANDARD
SPECIFICATION FOR SPUN POLYESTER YARN
PART 2 : FOR KNITTING

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1990-11-20, after the draft, finalized by the Drafting Committee on Synthetic Yarn, had been approved by the Textiles Divisional Committee.

This part covers spun polyester yarn for knitting. Specifications for spun polyester yarn for weaving on conventional looms (weft insertion rates equal to or less than 300 m/minute) are covered in Part 1 of the standard.

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 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 specification.

In the preparation of this specification, the assistance derived from the Uster News Bulletin is gratefully acknowledged.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for 100 per cent spun polyester yarn intended for knitting.

2 REFERENCES

ASTM D 3108		Method for co-efficient of friction, yarn to solid material.
SLS	20	Determination of the size of yarns (First revision).
CS	22	Determination of breaking strength and extension of single strands.
SLS	23	Twist in yarns-direct counting method (First revision).
CS	102	Presentation of numerical values.
SLS	428	Random sampling methods.
SLS	674	Determination of short-term irregularity of linear density of textile slivers,rovings and yarns using an electronic evenness tester.

3 REQUIREMENTS

3.1 General requirements

3.1.1 The yarn shall be reasonably clean and free from snarls.

3.1.2 The yarn shall be waxed.

3.1.3 In all cones, tail-ends of at least 500 mm shall be provided.

3.2 Other requirements

3.2.1 *Mass*

The average net mass of a cone shall be not less than 1.2 kg when tested by the method prescribed in 8.2. The co-efficient of variation for net mass shall be not more than 4 per cent.

3.2.2 *Linear density*

The average linear density of yarn shall be within 3 per cent of the nominal linear density when tested by the method A (in conditioned state) prescribed in SLS 20. The co-efficient of variation for linear density shall be not more than 4 per cent.

3.2.3 *Twist*

3.2.3.1 The co-efficient of variation for twist per metre shall be not more than 7 per cent when tested by the method prescribed in SLS 23.

3.2.3.2 The twist factor of yarn shall be not more than 33.0.

NOTE

$$\text{Twist factor} = \text{twist per centimetre} \times \sqrt{\text{linear density in tex}}$$

3.2.4 *Friction*

The co-efficient of friction of yarn shall be not more than 0.15 when tested by the method prescribed in Appendix A.

3.2.5 *Single yarn strength, irregularity and imperfections*

The yarn shall also comply with the requirements given in Table 1 when tested by the methods prescribed therein. In addition, the co-efficient of variation for single yarn strength shall be not more than 10 per cent.

TABLE 1 - Requirements for spun polyester yarn

Sl. No.	Linear density of yarn, tex	Single yarn strength, N, min.	Irregularity, U per cent, max.	Imperfections per 1000 m, max. (see Note)		
				Thin places	Thick places	Neps
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	10	2.2	15.0	55	70	55
ii)	13	2.8	14.0	55	65	55
iii)	15	3.4	13.5	50	65	50
iv)	20	4.5	13.5	40	60	40
v)	30	5.0	11.0	25	40	25
Method of test		CS 22	SLS 674	SLS 674		

NOTE

The sensitivity levels for determination of imperfections should be as follows :

a) Thin places : 50 per cent;
b) Thick places : 3; and
c) Neps : 3.

4 DEFECTS IN CONES

The following shall be considered as defects in cones :

a) Soft cones;
b) Hard cones;
b) Collapsed cones;
c) Prominent stains inclusive of chalk and other markings;
d) Cut thread; and
e) Stitches.

5 PACKAGING

The cones shall be individually wrapped in polyethylene or any other suitable material. These packages shall be packed in cartons. All cartons shall have horizontal separators to prevent any damage to cones.

6 MARKING

6.1 Each cone shall be legibly and indelibly marked or labelled with the following information :

a) Name of the product;
b) Linear density of yarn, in tex; and
c) Date of manufacture.

6.2 Each carton shall be legibly and indelibly marked or labelled with the following information :

a) Name of the product;
b) Linear density of yarn, in tex;
c) Name and address of the manufacturer/distributor (including the country of origin);
d) Number of cones ;
e) Gross mass, in kilograms;
f) Net mass, in kilograms; and
g) Batch or code number.

NOTE

Attention is drawn to the certification facilities offered by the Sri Lanka Standards Institution. See the inside back cover of this specification.

7 SAMPLING

7.1 Lot

All cones of yarn of the same linear density and manufactured under similar conditions of manufacture or belonging to one batch of supply shall constitute a lot.

7.2 Scale of sampling

7.2.1 The samples shall be tested from each lot for ascertaining its conformity to the requirements of this specification.

7.2.2 The number of cones to be selected from a lot shall be in accordance with Table 2.

TABLE 2 - Scale of sampling

Number of cones in the lot (1)	Number of cones to be selected (2)	Acceptance number for defective cones (3)
Up to 300	5	1
301 to 500	8	2
501 to 1 000	13	3
1 001 to 3 000	16	3
3 001 and above	20	4

7.2.3 The cones shall be selected from cartons. For this purpose, at least 10 per cent of the cartons subject to a minimum of 3 shall be drawn. As far as possible an equal number of cones shall be drawn from each selected carton to get the sample size given in Table 2.

7.2.4 The cartons and cones shall be selected at random. In order to ensure randomness of selection tables of random numbers as given in SLS 428 shall be used.

7.3 Number of tests

7.3.1 Each carton selected as in 7.2.3 shall be examined for packaging and marking requirements. (This may be done at the place of inspection).

7.3.2 Each cone selected as in 7.2.2 and 7.2.3 shall be examined for packaging and marking requirements.

7.3.3 Each cone selected as in 7.2.2 and 7.2.3 shall be inspected for defects in cones.

7.3.4 Each cone selected as in 7.2.2 and 7.2.3 shall be tested for the requirements given in 3.2.1 to 3.2.5.

NOTES

1. It is necessary to discard at least 50 m from each cone before taking test specimens.
2. For each requirement, the required test specimens should be obtained in accordance with the relevant test methods.
3. Tests for the requirements prescribed in 3.2.2 to 3.2.5 should be carried out prior to determining mass of cones. The discarded lengths (see Note 1) and the test specimens used for the tests should be reserved for determination of mass.

8 METHODS OF TEST

8.1 Tests for the requirements prescribed in 3.2 shall be carried out by the methods given therein.

8.2 Determination of net mass of cones

8.2.1 Determine, to the nearest 1 g, the gross mass of cones in the sample, individually. Remove yarn from two cones and weigh, to the nearest 1 g, the mass of the two empty cones.

8.2.2 Calculate the average mass of an empty cone. Based on this value, calculate individually, the net masses of cones and the average net mass of a cone.

9 CRITERIA FOR CONFORMITY

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

9.1 Each carton examined as in 7.3.1 satisfies the packaging and marking requirements.

9.2 Each cone examined as in 7.3.2 satisfies the packaging and marking requirements.

9.3 The number of defective cones observed when inspected as in 7.3.3 does not exceed the corresponding acceptance number given in Column 3 of Table 2.

9.4 When tested as in 7.3.4, the average value and co-efficient of variation calculated using the test results on mass and linear density satsify the relevant requirements .

9.5 When tested as in 7.3.4, the average value of twist factor and co-efficient of variation for twist per metre calculated using the test results on twist satisfy the relevant requirements.

9.6 When tested as in 7.3.4, the value of the expresion $\bar{x} + 1.1s$ (see Notes) calculated using the test results on friction and irregularity is less than the specified value for each requirement.

NOTES

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

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

9.7 When tested as in 7.3.4, the average value and co-efficient of variation calculated using the test results on single yarn strength satisfy the relevant requirements.

9.8 When tested as in 7.3.4, the average values calculated using the test results on imperfections satisfy the relevant requirements.

APPENDIX A

DETERMINATION OF FRICTION

The test should be carried out by the method prescribed in ASTM D 3108 under the conditions given in Table 3.

TABLE 3 - Test conditions

Sl. No. (1)	Characteristic (2)	Condition (3)
i)	Standard atmosphere for testing	
	(a) Temperature	27 $\pm$ 2 ^{o}C
	(b) Relative humidity	65 $\pm$ 2 per cent
ii)	Friction surface	A steel surface having a diameter of 12.7 mm and a surface roughness of 4 μm to 6 μm.
iii)	Wrap angle	6.28 radian
iv)	Initial tension	5 cN
v)	Test speed	200 m/minute

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SRI LANKA STANDARDS INSTITUTION

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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.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

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