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SRI LANKA STANDARD 271:1974

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METHOD FOR THE DETERMINATION OF BREAKING LOAD AND KNOT BREAKING LOAD OF NETTING YARN FOR FISHING NETS

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BUREAU OF CEYLON STANDARDS

METHOD FOR THE DETERMINATION OF BREAKING LOAD AND KNOT BREAKING LOAD OF NETTING YARN FOR FISHING NETS

S. L. S. 271 : 1974

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BUREAU OF CEYLON STANDARDS
53, DHARMAPALA MAWATHA,
COLOMBO - 3.

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.

BUREAU OF CEYLON STANDARDS
53, DHARMAPALA MAWATHA,
COLOMBO-3.

Telephone: **26055**
26054
26051

Telegrams: "PRAMIKA"

SRI LANKA STANDARD METHOD FOR THE DETERMINATION OF BREAKING LOAD AND KNOT BREAKING LOAD OF NETTING YARN FOR FISHING NETS

FOREWORD

This Sri Lanka Standard has been prepared by the Drafting Committee on fishing nets. It was approved by the Textiles Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 21st May 1974.

Breaking load and knot breaking load of netting yarns in the dry state and wet state are important characteristics which determine the efficiency of a fishing net.

In the preparation of this standard assistance obtained from the publications of the British Standards Institution and International Stanoards Organisation is gratefully acknowledged.

1. SCOPE

This standard deals with the determination of breaking load and knot breaking load of netting yarns for fishing nets.

Tests may be carried out in both the dry and wet state, but tests in the wet state on the knotted yarn are considered to be particularly appropriate in indicating the behaviour of the yarn in use.

2. DEFINITIONS

For the purposes of this standard the following definitions shall apply:

2.1 **Breaking load**—The maximum load observed during a breaking test.

Applicable to:—

(1) dry yarn,
(2) wet yarn,
(3) dry knot,
(4) wet knot.

2.2 **Load at rupture**—The final load at the moment that the specimen or the first component of the specimen breaks when, or after, the breaking load has been reached. The load at rupture is usually, but not always, identical with the breaking load.

2.3 **Tenacity**—The breaking load per unit resultant linear density of the unstrained specimen in the conditioned state.

2.4 **Breaking length**—The calculated length of a yarn whose conditioned mass exercises a force equal to its breaking load. It is expressed in km.

2.5 **Time to break**—The time in seconds, taken to reach the breaking load measured from the moment of application of the load.

3. PRINCIPLE

A test specimen is extended in a dry or wet state until it reaches the load at rupture by suitable apparatus that records or indicates the applied load.

4. APPARATUS

4.1 **Tensile testing machines**—Testing machines of any of the following types may be used:

(1) constant rate of extension,

(2) constant rate of load,

(3) constant rate of traverse.

4.1.1 All tensile testing machines shall include a pair of suitable devices to hold the specimen, a means of loading or elongating the specimens at suitable rates (see 8.4) and a load indicating mechanism which will indicate or record, continuously the load applied to the specimen.

For determining the breaking load of netting yarns without knots, the specimens should be mounted in special holding devices, e.g. of the types shown in Fig. 1, to avoid slipping of the specimens or breaking due to damage caused by the holding devices.

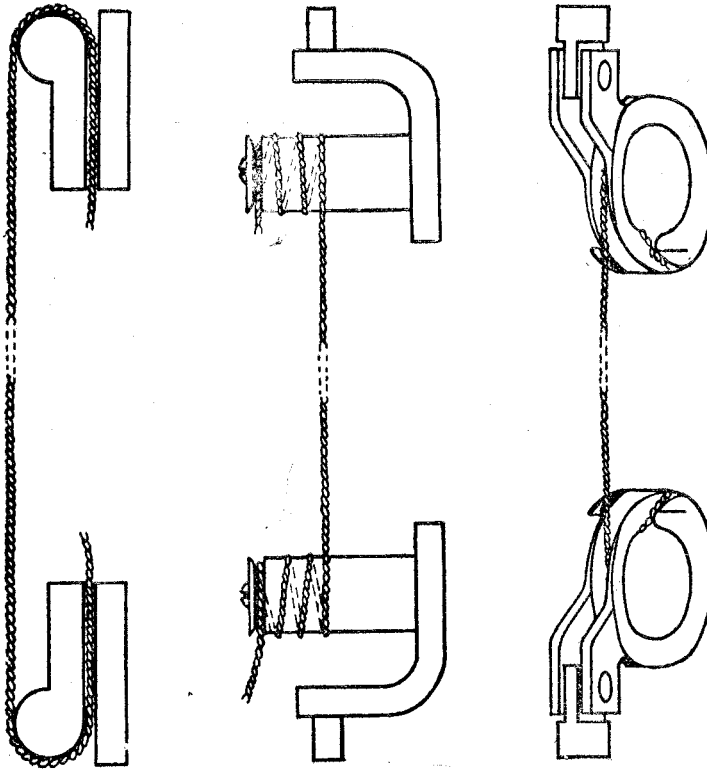

Fig. 1 **Holding devices for the testing of netting yarns without knot**

4.1.2 The maximum error of the indicated load at any point in the range in which the machine is used shall not exceed $\pm 1\%$. Check the accuracy of the graduated scale of the apparatus dynamically, for example, by means of calibrated springs of appropriate characteristics.

4.1.3 The testing machine shall be capable of testing specimens having a nominal gauge length of at least 250 mm.

4.1.4 All testing machines shall include facilities for producing different rates of loading in order to break specimens in the specified average time to break.

4.2 Equipment for producing and maintaining the standard atmosphere for testing (see 8.1).

4.3 Equipment in which specimens can be immersed in water preparatory to wet testing.

4.4 Stopwatch or interval timer.

5. ATMOSPHERE FOR CONDITIONING AND TESTING

The atmosphere to be used shall be the standard atmosphere for testing as described in C.S. 16*, i.e. 65±2% relative humidity at a temperature of 27±2° C.

6. SAMPLING

Sampling shall be carried out in accordance with the procedure given in Appendix A, or by agreement between the parties concerned.

7. PREPARATION OF SPECIMENS

The specimens shall be removed from the package, before exposure in the standard atmosphere, or before immersing in water, in such a manner that there is no alteration in the twist.

8. REQUIREMENTS FOR TESTING

8.1 **Testing in the dry state**—Specimens to be tested in the dry state shall be exposed to the standard atmosphere for testing described in clause 5 until they have reached equilibrium. For netting yarns of man-made fibres a period of 24h exposure is generally sufficient. Where it is not possible to carry out the tests in the standard atmosphere the tests shall be carried out immediately after removal of the samples from the standard atmosphere.

8.2 **Testing in the wet state**

8.2.1 All specimens to be tested in the wet state shall be immersed in tap water without wetting agents at 27±2°C for a period of not less than 12 h. Surplus water shall be shaken off.

8.2.2 By agreement between the parties concerned, a shorter wetting time with the addition of a wetting agent may be used. The specimens are immersed for one hour in a 2% solution of wetting agent in water at a temperature of 27±2°C. A shorter period of immersion is allowed if the specimen is completely wetted in less than one hour.

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* *C.S. 16—Standard atmospheres, for conditioning and testing textiles.*

8.3 **Distance between the holding devices**—The free length of the sample shall be at least 250 mm.

8.4 **Time to break**—The mean duration of the test should be 20±3s. It is to be determined by preliminary tests. Where this time cannot be obtained due to limitations of the apparatus and/or holding devices, the duration of the test may be 30±3s or 60±6s. This should be recorded in the test report.

9. NUMBER OF TESTS

At least 20 single valid tests on each sample package are to be carried out.

10. TEST PROCEDURE

10.1 **General**

10.1.1 Check that the distance between the holding devices is not less than 250 mm (see 8.3).

10.1.2 Mount the specimen in the testing machine so that the axis of the specimen is parallel and coincidental to the direction of the applied force.

10.1.3 Wet samples shall be tested immediately after removal from the water (see 8.2.1).

10.1.4 Apply the force to reach the prescribed mean time to break.

10.1.5 Discard all observations obtained on specimens which slip between the holding devices or break due to damage caused by the holding devices.

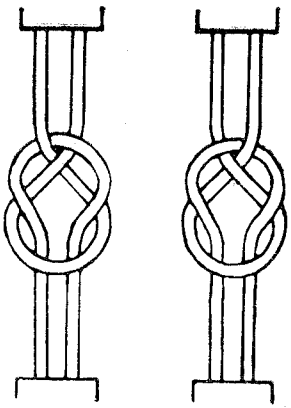
10.1.6 If any component breaks before the breaking load is reached, this should be reported.

10.2 **Knotted netting yarns in the dry and wet state**—

10.2.1 All knots shall be made immediately before testing and gently tightened by hand. Precautions should be taken to ensure that the twist is not altered.

10.2.2 Specimens should be tested with the weaver's knot. All four ends of the weaver's knot should be fastened in the holding devices. Each holding device hold the two ends of the same yarn of approximately the same length (see Fig. 2).

10.2.3 If a sample does not break at the knot, this test is discarded.



Weaver's knot

Fig. 2

11. CALCULATION AND EXPRESSION OF RESULTS

11.1 Average breaking load is equal to:

$$\frac{\text{sum of observed breaking loads}}{\text{number of observations}}$$

breaking load being expressed in newtons*. Calculate the average breaking load to four significant figures and round it off to three significant figures.

11.2 **Tenacity**—Average tenacity in milli-newtons per tex is equal to

$$\frac{\text{Average breaking load expressed in milli-newtons}}{\text{Average resultant linear density (in tex) of conditioned sample}}$$

Calculate the average tenacity to four significant figures and round it off to three significant figures.

11.3 If necessary the co-efficient of variation and the confidence interval may be calculated by recognized statistical methods.

12. REPORT

12.1 The report shall provide information on the following points and should state that the tests were performed in accordance with this Sri Lanka Standard. The date of the test should be stated.

12.2 Type, size and direction of final twist of the netting yarn (SLS. . . . . **)

12.3 Type and capacity of testing machine used, the type of holding devices employed and the ranges of indication.

12.4 The sampling method employed.

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*4.448 22N (newton) = 1 lbf.

9.806 65N (newton) = 1 kgf.

** SLS. . . . . 'The designation of netting yarns for fishing nets'.

12.5 The number of specimens tested.

12.6 The number of irregular tests.

12.7 The kind and time of wetting (with or without wetting agents).

12.8 The average breaking load in newtons.

12.9 Any deviation of the test procedure. If required, the report should also state:—

12.9.1 The co-efficient of variation of the breaking load and confidence interval.

12.9.2 The average tenacity in milli-newtons per tex.

12.9.3 The average breaking length in km.

APPENDIX A

SAMPLING

Samples, each to provide the required number of test specimens, shall be taken from the consignment or delivery being tested by a convenient and representative system of sampling. The number of samples taken should be agreed between the purchaser and the supplier, so as to ensure satisfactory representation of the consignment, but shall be not less than 10 unless agreed between the purchaser and the supplier.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

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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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All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

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