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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 1806

FISHING NETS

METHOD OF DETERMINING THE MESH BREAKING LOAD OF NETTING FOR FISHING

1st EDITION

October 1970

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 1806, *Fishing nets – Method of determining the mesh breaking load of netting for fishing,* was drawn up by Technical Committee ISO/TC 38, *Textiles,* the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1806, which was circulated to all the ISO Member Bodies for enquiry in March 1969. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Belgium	Iran	Spain
Brazil	Israel	Sweden
Czechoslovakia	Netherlands	Switzerland
Denmark	New Zealand	Turkey
France	Norway	U.A.R.
Germany	Peru	United Kingdom
Greece	Poland	U.S.S.R.
Hungary	Portugal	
India	South Africa, Rep. of	

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 1806 October 1970

FISHING NETS

METHOD OF DETERMINING THE MESH BREAKING LOAD OF NETTING FOR FISHING

1. SCOPE

This ISO Recommendation deals with the method of testing the mesh breaking load of netting for fishing.

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

2. DEFINITIONS*

2.1 *Mesh breaking load.* The breaking load, equal to the maximum load applied to a mesh, as observed during a breaking test.

Distinction is made between

- the dry mesh breaking load;
- the wet mesh breaking load.

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

3. PRINCIPLE

A mesh is extended in the dry or wet state until one of the knots or joints reaches the load at rupture. The test is performed using a suitable apparatus that records or indicates the applied load.

The testing machine is operated at such a rate that the average time-to-break of a group of specimens falls within specified time limits.

4. APPARATUS

4.1 *Tensile testing machine.* Any of the following types may be used :

(*a*) constant rate of elongation machine;

(*b*) constant rate of load machine;

(*c*) constant rate of traverse machine.

Preference should be given to a constant rate of elongation machine.

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* Symbolic abbreviations of the parameters defined have been omitted pending discussion of the general subject by Technical Committee ISO/TC 38.

4.1.1 The clamps of the tensile testing machines should be replaced by pins of stainless material which stand at right angles to the direction of pull. These should be of sufficient strength and have a diameter suitable for the mesh size.

Alternatively, loops of netting yarn heavier than that of the netting may be used. It is necessary to use these loops if the meshes are very small.

4.1.2 It should be possible to regulate the distance between the pins so that netting of different mesh openings can be submitted to the test.

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

4.1.4 The testing machine should be capable of testing mesh specimens having different mesh openings.

4.1.5 All testing machines should 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 clause 7.1)

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

4.4 *Stop-watch* or *interval timer.*

5. SAMPLING

Test samples should be selected at random from the netting so as to be representative of the whole.

6. PREPARATION OF SPECIMENS

To prevent untwisting of the loose ends, proceed as follows :

6.1 **Netting with small meshes**

Cut a sample of netting with a size of 3 × 3 meshes. The mesh strength has to be determined on the central mesh.

6.2 **Netting with large meshes**

Cut the loose ends of the sample mesh as far as possible from the knots or joints. Whenever possible, melting instead of cutting is preferred.

6.3 The specimen should be placed in the standard atmosphere for testing (see clause 7.1).

7. REQUIREMENTS FOR TESTING

7.1 **Atmosphere for testing**

All specimens to be tested in the dry state should be exposed to the standard atmosphere for testing described in ISO Recommendation R 139*, *Standard atmospheres for conditioning and testing, textiles,* until they have reached equilibrium. For netting of man-made fibres, a period of 24 hours exposure is generally sufficient. Where it is not possible to carry out the tests in the standard atmosphere the tests should be carried out immediately after removal of the samples from the standard atmosphere.

* 2nd edition – 1967.

7.2 **Testing in the wet state**

7.2.1 All specimens to be tested in the wet state should be immersed in tap water without wetting agents at 20 ± 2 °C for a period of not less than 12 hours. Surplus water should be shaken off.

7.2.2 By agreement between the parties, a shorter wetting time with the addition of a wetting agent may be used. The specimens should be immersed for 1 hour in a solution of wetting agent in water at a temperature of 20 ± 2 °C. A shorter time of immersion is allowed if it can be shown that the specimen is completely wetted in less than 1 hour.

7.3 **Time-to-break**

The mean duration of test should be 20 ± 3 seconds. It should be determined by preliminary tests.

8. NUMBER OF TESTS

At least 20 single valid tests on each piece of netting should be carried out, unless otherwise agreed between the purchaser and supplier. If a distinct confidence interval for the main value is prescribed, as many additional tests should be carried out as are necessary to secure this confidence interval.

9. TEST PROCEDURE

9.1 Check that the pins or loops of the testing machine are properly aligned and parallel so that the subsequent application of force to the specimen will not cause any angular deflection.

9.2 Mount the specimen in the testing machine over the pins or in the loops in such a way that its knots do not touch the pins or loops (see Fig. 1 and 2).

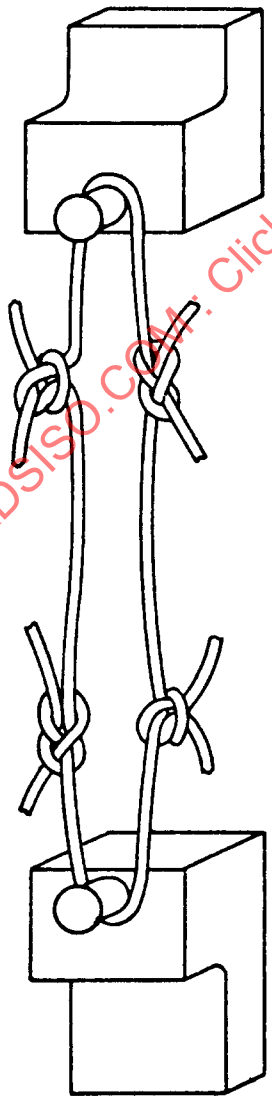


FIG. 1 – Mounting of a mesh by pins

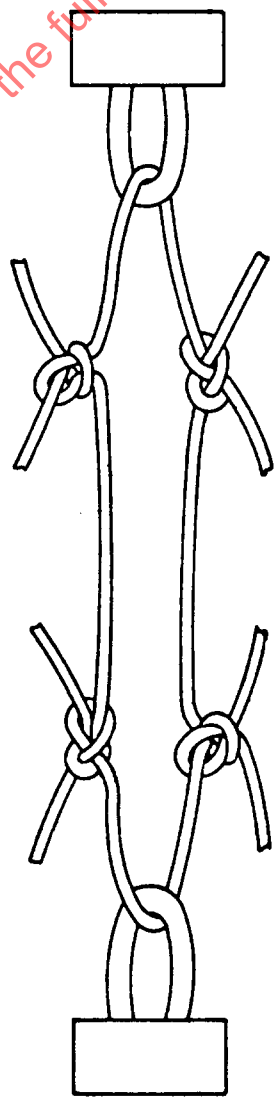


FIG. 2 – Mounting of a mesh by loops

9.3 Wet specimens should be tested immediately after removing from water (see clause 7.2.1).

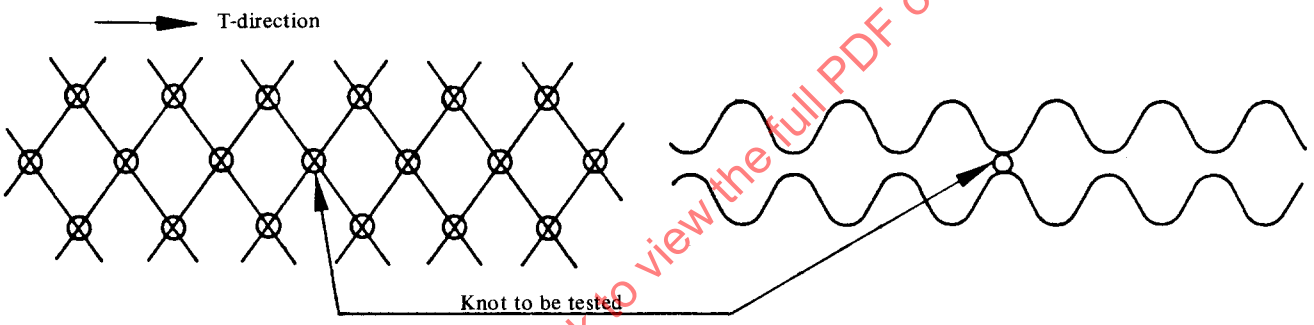
9.4 Apply the force to reach the prescribed mean time-to-break.

9.5 If a specimen does not break at one of the knots or joints, this test should be discarded.

9.6 Discard all observations obtained on specimens of which the loose ends of the mesh slip in the knots or the joints dissolve. Such a test should be repeated with a new specimen. The number of observations discarded as directed above should be noted.

9.7 If more than ten knots of the twenty meshes tested slip, the method of mesh testing described in this ISO Recommendation should not be used. It should be replaced by the method of determining the knot breaking load of netting yarns by fastening all four ends in the holding devices of the testing machine.* If the meshes are too small to ensure that all four ends of the knot are gripped by the holding devices, the knots around the knot to be tested should be opened (see Fig. 3).

NOTE. – The results of such knot breaking load tests are not comparable with the results of mesh breaking load tests, the latter always giving lower values than knot breaking load tests.



(*a*) Specimen before opening the knots (*b*) Specimen after opening the knots

FIG. 3 – **Preparation of specimen for determination of knot breaking load**

10. CALCULATION AND EXPRESSION OF RESULTS

10.1 Average mesh breaking load is equal to

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

breaking load being expressed in decanewtons (or kgf**).

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

10.2 If necessary, the coefficient of variation and the confidence interval may be calculated by recognized statistical methods.

* See ISO Recommendation R 1805, *Fishing nets – Method of determining the breaking load and knot breaking load of netting yarns for fishing nets.*

** 1 kgf = 9.806 65 N (newtons)