
**Fishing nets — Determination of mesh
breaking force of netting**

*Filets de pêche — Détermination de la force de rupture de la maille
de nappe de filet*

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Printed in Switzerland

Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 1806 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 38, *Textiles*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European Standard..." to mean "...this International Standard...".

This second edition cancels and replaces the first edition (ISO 1806:1973), which has been technically revised.

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Foreword

This document EN ISO 1806:2002 has been prepared by Technical Committee CEN/TC 248 "Textiles and textile products", the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 38 "Textiles".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2003, and conflicting national standards shall be withdrawn at the latest by June 2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies a method of determining the mesh breaking force of netting for fishing.

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

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO 139, *Textiles — Standard atmospheres for conditioning and testing*.

ISO 1805, *Fishing nets — Determination of breaking load and knot breaking load of netting yarns*.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

dry mesh breaking force

maximum force measured during a tensile test on meshes of netting in standard atmosphere

3.2

wet mesh breaking force

maximum force measured during a tensile test on meshes of netting in wet conditions

3.3

time-to-break

time, in seconds, taken to reach the mesh breaking force, measured from the moment of application of the force

4 Principle

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

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

5 Apparatus

5.1 Tensile testing machine

5.1.1 Any of the following types may be used:

- a) constant rate of elongation machine;
- b) constant rate of force machine;
- c) constant rate of traverse machine.

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

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

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

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

5.1.4 The maximum error of the indicated force 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.

5.1.5 All testing machines shall include facilities for producing different rates of applying force in order to break samples in the specified average time-to-break.

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

5.3 Equipment in which samples can be immersed in water preparatory to wet testing

5.4 Stop-watch or interval timer

6 Sampling

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

7 Preparation of samples

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

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.

If during testing one of the knots slips before the breaking force is obtained, then a sample of netting with a size of 3×3 meshes shall be used.

The mesh strength has to be determined on the central mesh.

8 Requirements for testing

8.1 Atmosphere for testing

As specified in ISO 139, all samples to be tested in the dry state (with the exception of the samples for the test in the wet state) shall be exposed to the standard atmosphere for testing of $20\text{ °C} \pm 2\text{ °C}$ and a relative humidity of $65\% \pm 2\%$ until they have reached equilibrium. For netting of man-made fibres, a period of 24 h 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

All samples to be tested in the wet state shall be fully wetted before testing. To achieve wetting, they shall be immersed in tap water without wetting agents at a temperature of $20\text{ °C} \pm 2\text{ °C}$ for a period of not less than 12 h or in a chemical solution of 1 g wetting agent per 1 litre tap water at a temperature of $20\text{ °C} \pm 2\text{ °C}$ for a period of 1 h. A shorter time of immersion is allowed if it can be shown that the sample is completely wetted in less than 1 h.

8.3 Time-to-break

The mean duration of test should be $20\text{ s} \pm 3\text{ s}$. It shall be determined by preliminary tests.

9 Number of tests

At least 10 single tests on each piece of netting shall be carried out, unless otherwise agreed between the purchaser and supplier. If a distinct confidence interval for the mean value is prescribed, as many additional tests shall be carried out as are necessary to secure this confidence interval.

10 Test procedure

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

10.2 Mount the sample 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 Figures 1 and 2).

10.3 Wet samples should be tested immediately after removing from water (see 8.2).

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

10.5 If a sample does not break at one of the knots or joints, this test shall be discarded.

10.6 Discard all observations obtained on samples of which the loose ends of the mesh slip in the knots or the joints distort. Such a test shall be repeated with a new sample. The number of observations discarded as directed above shall be noted.

10.7 If in more than half of the tests, the knots slip, the method of mesh testing described in this European Standard shall not be used. It shall 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 (see ISO 1805). 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 shall be opened (see Figure 3).

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

11 Calculation and expression of results

The average mesh breaking force shall be calculated in daN and if necessary, the coefficient of variation and the confidence interval. Discard all observations obtained on samples of which the loose ends of the mesh slip in the knots or the joints dissolve. The number of observations discarded as directed above shall be noted.

12 Test report

The test report shall include the following particulars:

- a) a statement that the tests were performed in accordance with this European Standard;
- b) the sampling method employed;
- c) a description of the netting including the material, the type of yarn (twisted or braided), the type of netting (single or multiple yarn), the mesh size, the nominal linear density of the twine;
- d) the type and capacity of testing machine used and the range of indication;
- e) the type of holding device for the meshes : pin, hook or loops;
- f) the number of sample tested (number of meshes broken in the knots or in the joints);
- g) the number of the meshes broken outside the knots or joints;
- h) the average breaking force in daN; the coefficient of variation and confidence interval if required;
- i) the wet mesh breaking force if required;
- j) any deviation from the specified test procedure;
- k) the date of the test.

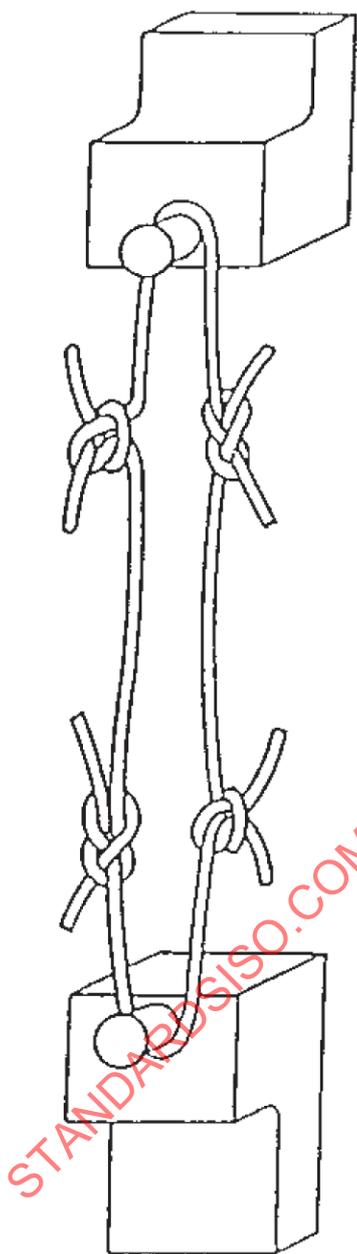


Figure 1 — Mounting of a mesh by pins

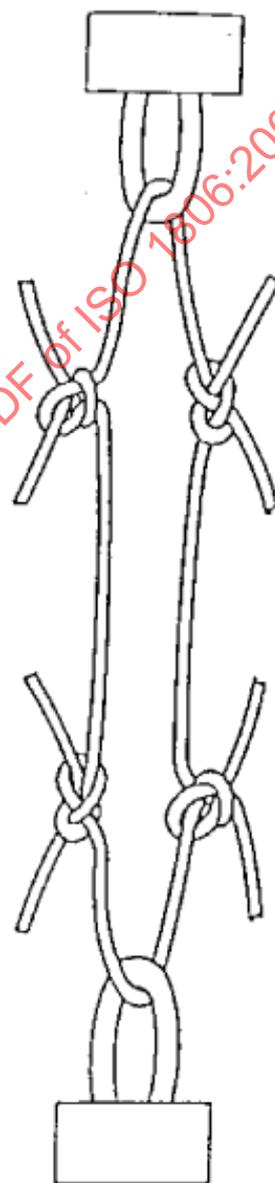


Figure 2 — Mounting of a mesh by loops