INTERNATIONAL STANDARD

ISO 1805

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Fishing nets — Determination of breaking force and knot breaking force of netting yarns

Filets de pêche — Détermination de la force de rupture et de la force de rupture au noeud des fils pour filets

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 1805 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products*, in collaboration with Technical Committee ISO/TC 38, *Textiles*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 1805:1973), of which it constitutes a technical revision.

Fishing nets — Determination of breaking force and knot breaking force of netting yarns

1 Scope

This International Standard specifies a method of testing the breaking force and knot breaking force of netting yarns for fishing nets.

Tests may be carried out in both the dry and wet states, 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 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 858, *Fishing nets — Designation of netting yarns in the Tex system*

3 Terms and definitions

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

3.1
breaking force
force, equal to the maximum force observed during a breaking test

NOTE Distinction is made between

— the dry yarn breaking force,

— the wet yarn breaking force,

— the dry knot breaking force,

— the wet knot breaking force.

3.2
force at rupture
final force at the moment that the specimen or the first component of the specimen breaks at, or after, attainment of the breaking force

NOTE The force at rupture is usually, but not always, identical to the breaking force.

3.3
tenacity
breaking force per unit resultant linear density of the unstrained specimen in the conditioned state

3.4
breaking length
calculated length of a specimen whose conditioned weight exercises a force equal to its breaking force

3.5
time-to-break
time taken to reach the breaking force, measured from the moment of application of the force

NOTE The time-to-break is expressed in seconds.

4 Principle

A length of yarn is extended in the dry or wet state until it reaches the load at rupture. The test is performed using a suitable apparatus that records or indicates the applied force

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 load machine;

c) constant rate of traverse machine.

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

5.1.2 All tensile testing machines shall include a pair of suitable devices to hold the sample, a means of applying force or elongating the sample at suitable rates, and a force-indicating mechanism which will indicate or continuously record the force applied to the sample.

For determining the breaking force of netting yarns without knots, the samples shall be mounted in special holding devices, for example, of the types shown in Figure 1, to avoid slipping of the samples or breaking due to damage caused by the holding devices.

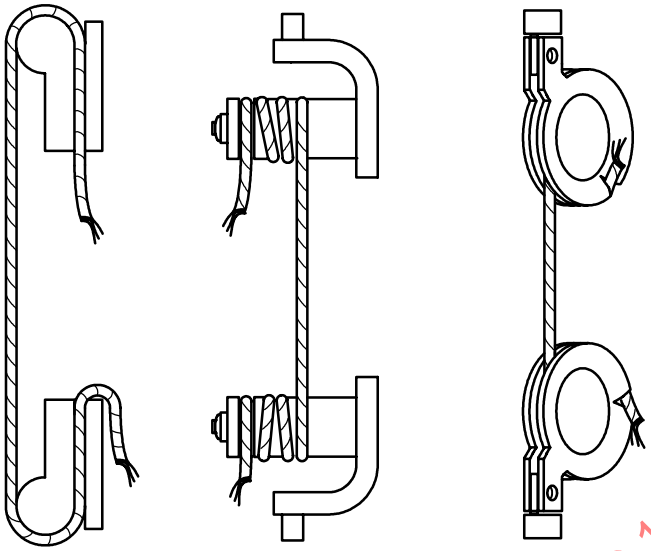

Figure 1 — Holding devices for the testing of netting yarns without knots

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

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

5.1.5 All testing machines shall include facilities for producing different rates of loading 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 specimens can be immersed in water preparatory to wet testing.

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

6 Sampling

Sampling shall be carried out in accordance with recognized national standards or in a manner agreed between the parties concerned.

7 Preparation of samples

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

8 Requirements for testing

8.1 Atmosphere for testing

All samples to be tested in the dry state shall be exposed to the standard atmosphere for testing as described in ISO 139, until they have reached equilibrium. For netting yarns 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

8.2.1 All samples to be tested in the wet state shall be immersed in tap water, without wetting agents, at a temperature of (20 ± 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, a shorter wetting time with the addition of a wetting agent shall be used. The specimens are immersed for 1 h in 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 h.

8.3 Distance between the holding devices

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

8.4 Time-to-break

The mean duration of the test shall be (20 ± 3) s. It shall be determined by preliminary tests.

Where this time cannot be obtained due to limitations of the apparatus and/or the holding devices, the duration of the test may be (30 ± 3) s or (60 ± 6) s.

This shall be recorded in the test report.

9 Number of tests

At least ten single valid tests on each sample package shall be carried out. If a distinct confidence interval for the mean value is prescribed, as many additional tests shall be carried out as necessary to secure this confidence interval.

10 Test procedure

10.1 General

10.1.1 Check that the distance between the holding devices is at least 250 mm (see 8.3).

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

10.1.3 Wet samples shall be tested immediately after removal from the water (see 8.2).

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

10.1.5 Discard all observations obtained on samples that slip between the holding devices or break due to damage caused by the holding devices. The number of observations discarded as directed above shall be noted.

10.1.6 If any component breaks before the breaking force is reached, this fact shall be recorded in the test report.

10.2 Knotted netting yarns in the dry and wet states

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

10.2.2 Samples shall be tested with the weaver's knot. All four ends of the weaver's knot shall be fastened in the holding devices. Each holding device holds the two ends of the same yarn of approximately the same length (see Figure 2).

10.2.3 If a sample does not break at the knot, the test shall be discarded.

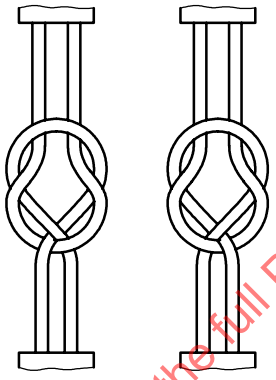

Figure 2 — Weaver's knot

11 Calculation and expression of results

11.1 Average breaking force, in decanewtons (daN), is equal to

$$\frac{\text{sum of observed breaking forces, in decanewtons (daN)}}{\text{number of observations}}$$

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

11.2 Average tenacity, in centinewtons per tex, is equal to

$$\frac{\text{average breaking force, in centinewtons (cN)}}{\text{average resultant linear density, in tex, of conditioned sample}}$$

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

11.3 Breaking length, in kilometres, is equal to

$$\frac{\text{average breaking force, in decanewtons (daN)}}{\text{average resultant linear density, in kilotex, of conditioned sample}}$$

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

11.4 If necessary, the coefficient of variation and the confidence interval shall be calculated by a recognized statistical method.