INTERNATIONAL STANDARD 1805

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

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, International Standard ISO 1805 replaces ISO Recommendation R 1805-1970 drawn up by Technical Committee ISO/TC 38, *Textiles*.

The Member Bodies of the following countries approved the Recommendation :

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

No Member Body expressed disapproval of the Recommendation.

Printed in Switzerland

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

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method of testing the breaking load and knot breaking load 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 REFERENCES

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

ISO 858, *Fishing nets — Designation of netting yarns in the Tex system.*[1)]

3 DEFINITIONS[2)]

3.1 breaking load : The breaking load, equal to the maximum load observed during a breaking test.

Distinction is made between

- the dry yarn breaking load;
- the wet yarn breaking load;
- the dry knot breaking load;
- the wet knot breaking load.

3.2 load at rupture : The final load at the moment that the specimen or the first component of the specimen breaks at, or after, attainment of the breaking load. The load at rupture is usually, but not always, identical with the breaking load.

3.3 tenacity : The breaking load per unit resultant linear density of the unstrained specimen in the conditioned state.

3.4 breaking length : The calculated length of a specimen whose conditioned weight exercises a force equal to its breaking load. It is expressed in kilometres and, when calculated in kgf units, is numerically equal to the tenacity calculated in gf units. When the calculations employ decanewtons and centinewtons respectively, the values obtained for both parameters, although equivalent, will be approximately 2 % lower, so that the value for breaking length will be slightly less than the traditional theoretical value.

3.5 time-to-break : The time, in seconds, taken to reach the breaking load, measured from the moment of application of the load.

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 load.

5 APPARATUS

5.1 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.

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

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

1) At present at the stage of draft. (Revision of ISO/R 858.)

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

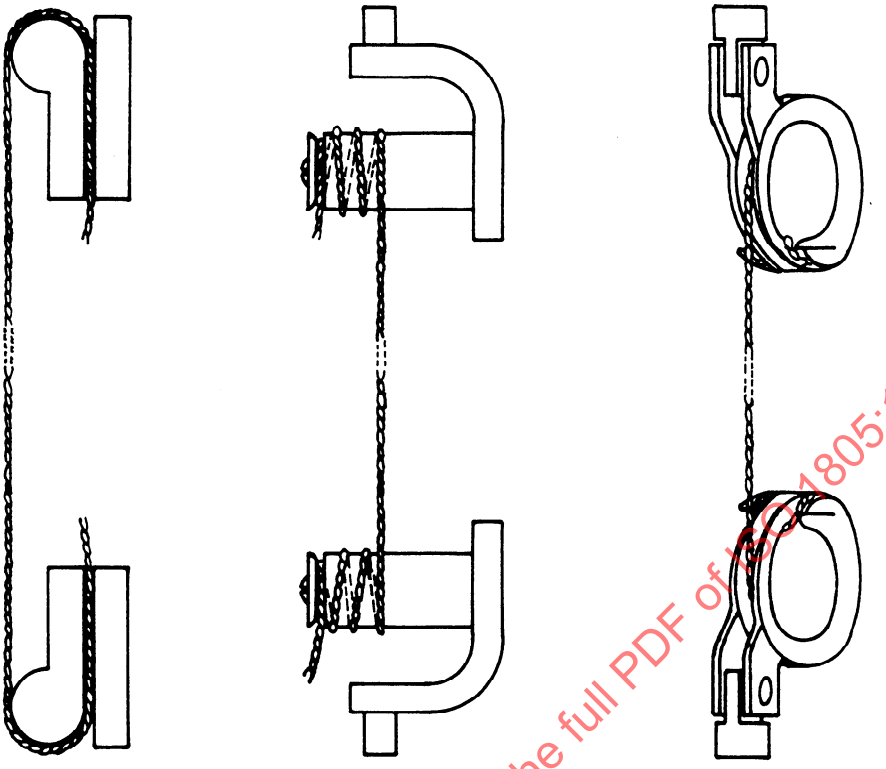

FIGURE 1 — **Holding devices for the testing of netting yarns without knots**

5.1.2 The maximum error of the indicated load 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.

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

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

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 SPECIMENS

The specimens 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 specimens to be tested in the dry state should be exposed to the standard atmosphere for testing 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 specimens 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 may be used. The specimens are immersed for 1 h 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 h.

8.3 Distance between the holding devices

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

8.4 Time-to-break

The mean duration of 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 20 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 specimen in the testing machine so that the axis of the specimen 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 specimens which 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 load 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 Specimens 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).

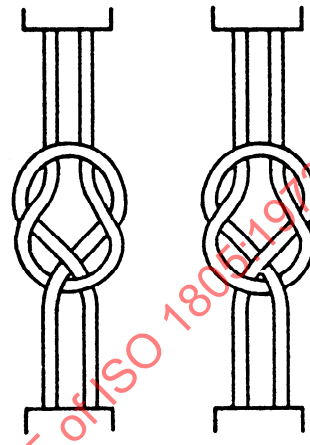

FIGURE 2 – **Weaver's knot**

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

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 decanewtons (or kilograms-force[1]).

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

11.2 Average tenacity, in centinewtons (or grams-force) per tex, is equal to

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

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

$$\frac{\text{average breaking load, in decanewtons (or kilograms-force[1])}}{\text{average resultant linear density, in kilotex, of conditioned sample}}$$

1) 1 kgf = 9,806 65 N

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 may be calculated by recognized statistical methods.

12 TEST REPORT

The test report shall include the following particulars :

a) a statement that the tests were performed in accordance with this International Standard;

b) date of the test;

c) the type, size and direction of final twist of the netting yarn (see ISO 858);

d) the type and capacity of testing machine used, the type of holding devices employed and the range of indication;

e) the sampling method employed;

f) the number of specimens tested;

g) the number of irregular tests;

h) the kind and time of wetting (with or without wetting agents);

i) the average breaking load in decanewtons (or kilograms-force[1]);

j) any deviation from the specified test procedure.

If required :

k) the coefficient of variation of the breaking load and the confidence interval;

l) the average tenacity, in centinewtons (or grams-force) per tex;

m) the average breaking length, in kilometres.

1) 1 kgf = 9,806 65 N