International Council for the
Exploration of the Sea

C.M.1968/B:2
Gear and Behaviour Committee

Standardisation and Fishing Gear

by

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A first report about "standardisation and fishing gear" was submitted to this Committee in 1963. It has been explained that standardisation is not only one of the modern methods for the rationalization of industries, but also necessary for all discussions on an international level. This is especially true for definitions of terms and description of testing methods.

This Committee has given more than one example of the need for definitions e.g. in connection with problems on the selectivity of fishing gear. Therefore, it may be of interest to revise the report of 1963 and give a new one with the latest development of standardisation for fishing gear in a broad sense.

ISO-Sub-Committee: Textile Products for Fishing Nets

In 1962 the International Organisation for Standardization (ISO) in London established for the Technical Committee ISO/TC 38: Textiles (Secretariat: United Kingdom) a Sub-Committee SC 9: Textile Products for Fishing Nets (Secretariat: Fed. Republic of Germany). The sphere of action is not only problems concerning net materials but also netting and its qualities as far as it is of interest for the fisheries. Ropes and cordages as well as accessory equipment are not included.

ISO-committees have permanent members (P-members) and observers (O-members). In 1968 the following countries have sent representatives:

P-Members	O-Members
Belgium	Argentina
Denmark	Austria
France	Bulgaria
Germany (Fed.Rep.)	Burma
India	Canada
Israel	Ireland
Netherlands	Italy
Poland	New-Zealand
Portugal	Norway
Spain	Sweden
UK	Switzerland
USSR	South Africa
	Turkey
	USA
	Yugoslavia

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Iceland is not a member of ISO but has sent an Observer to the last meeting.

This means that most European countries which are interested in fisheries are members of this Sub-Committee, but, unfortunately, not all countries which are on the toplist for big catches in quantity or value.

ICES as well as FAO have sent Observers. Moreover, ICES has asked member countries to assist the work of SC 9 by an official letter dated May 17th, 1968.

The Sub-Committee: Textile Products for Fishing Nets has held the following meetings:

1. 1962 Hamburg
2. 1963 London
3. 1965 Den Haag
4. 1966 Paris
5. 1968 Ostende.

The proposals of SC 9 are submitted to the Secretariat of the Technical Committee TC 38: Textiles. After agreement the document is sent to the ISO Central Secretariat in Geneva, and when approved by the required majority of the ISO Member Bodies the draft is submitted to the ISO Council for acceptance as an ISO Recommendation.

ISO-Recommendations

Till now no final recommendations of ISO are available. But as Appendix some papers are given, even when they have not the final version.

Appendix 1: Draft ISO recommendation No.1239: Netting yarns: Designation in the Tex system. The tex value indicates the weight in g of 1000 m of yarn, the main point is how to design netting yarns by linear density of the single yarn and the number of single yarns composed in a netting yarn (e.g. 23 tex x 6 x 3) or with the resultant linear density (R.tex). Resultant tex number is especially used for heavy twisted trawl twines and braided netting yarns.

Appendix 2: Draft ISO recommendation No.1198/Netting for fishing: Basic terms and definitions. According to this recommendation all materials used for the manufacture of netting are "netting yarns", including twines. Definitions for different mesh-sizes are given: length of mesh-side, length of stretched mesh, and opening of mesh. Moreover, the direction of the netting yarns in knotted nettings, so important for the shape of meshes, is explained. N = Normal, means the direction at right angles to the general course of the netting yarn. This is the usual form of netting. T = Twinewise, means the direction parallel to the general course of netting.

There are three more working papers, which are more or less in a final stage.

Appendix 3: Requirements for describing and designating knotted netting for fishing nets. This document is intended to facilitate the exchange of information between purchasers and suppliers. Handmade and machine made netting is mentioned as well as types of knots and direction of stretch. This may be less important for the work of the Gear and Behaviour Committee.

Appendix 4: Hanging of netting, basic terms. The efficiency of gill nets is not only influenced by many qualities of the material (especially mesh-size and visibility) but also by the hanging of netting. The hanging ratio is designated by the ratio between the lengths of final rope and the length of netting. This designation shall replace many other calculations unfortunately used in the different branches of fisheries.

Appendix 5: Cutting knotted netting to shape by straight cuts (tapering). The document explains the different possibilities to cut netting: Knots (points) can be cut and bars. In relation to the general course of the netting yarn, knot-cuts may be N-cuts (vertical cuts) or T-cuts (horizontal cuts). The cutting rate is designated by the number of knot-cuts first and of bar-cuts second e.g. 1N2B. Examples are given but not the method of calculation.

Netting Materials and Testing Methods

There is a need for testing netting materials, nettings and also fishing gear. Preliminary work has been done by Mr. Carruthers and the author by a collection of testing methods for netting yarn and netting, submitted to the Second Fishing Gear Congress in London, 1963.

In 1967 the above-mentioned ISO (TC 38/SC 9) has established a Special Working Group (Secretariat: Netherlands). Two documents are under discussion:

114: Method of determining the breaking load of netting yarns

115: Method of determining the mesh breaking load of netting.

This Group will continue with determining the elongation of net materials, considered as one of the items influencing selectivity of trawls. Moreover, test methods for shrinking of netting and stiffness of netting yarn will be discussed.

Future Work

The programme of ISO-Sub-Committee 9 mentions further work in the field of testing methods. This may include also methods for mesh measuring. It may be of interest that the British Standards Institution submitted a draft for "longitudinal spring-loaded mesh-gauge for fishing nets". This gauge is the ICES mesh-gauge.

The ISO-Sub-Committee has also been asked for standardization of net drawings. There are some proposals in "FAO Catalogue of Fishing Gear Designs" (1965) which are may be not sufficient for all types of fishing gear. The Netherlands hope to submit proposals in the near future.

Moreover, Germany and UK will prepare for ISO a document on terminology in the field of mounting and joining netting. Some technics of mounting salmon drift nets are under discussion in connection with the selectivity of these nets.

There are more items, not in the range of ISO. This is gear classification. There are many proposals for local needs with a more or less wide limitation. General Classification for statistics, biological field observations or fishing management have substantial variations.

Fishing Vessel Register

Production means in fisheries are not only fishing gear but also fishing vessels. There are some ideas that especially in sea fisheries, vessel and gear are one unit. Moreover, some proposals have been made for stockregulation by fleet limitation. For this, and also for statistical purposes, more details for definition of fishing vessels are needed. One proposal has been made by OCED (Appendix 6).

This proposal, set up by a group of experts - mostly naval architects - needs further discussion, especially when wanted for fleet limitation for stock preservation. A first trial to use this register is made by OECD for the French fleet. Nevertheless, additions and alterations may be necessary. Moreover, not so much is known about the influence of the different data on the fishing effort of the vessels. This may be decisive for catch regulations by limitation of the number of vessels or the G.T. of a fishing fleet. It could be an item for the Gear and Behaviour Commitee to discuss the possibilities for a conversion key for the different types of fishing vessels.

Appendix 1

ISO/TC 38 (Secretariat 302) 452
November, 1966

INTERNATIONAL ORGANISATION FOR STANDARDIZATION

Sub-Committee 9, Textile Products for Fishing Nets of
ISO Technical Committee 38 - Textiles

DRAFT ISO RECOMMENDATION NO 1239

NETTING YARNS: DESIGNATION IN THE TEX SYSTEM[x)]

(Superseding document ISO/TC 38/SC 9/39E Corr)

Foreword

The designation of netting yarns in the Tex system will replace, ultimately, designations made according to traditional systems.

The new designation will consist principally in naming the resultant linear density.

1. Scope

This draft indicates the manner of designating netting yarns by the use of their linear density or of their resultant linear density expressed in Tex.

2. Range of application

As a general rule, netting yarns designated by their linear density or their resultant linear density are usually grey yarns without preparation.

If the indication of resultant linear density takes account of any effects of chemical or physical treatment, this should be particularly mentioned.

3. Method of designation

3.1 Yarns obtained by twisting

3.1.1 General usage: complete designation.

The complete designation of a netting yarn comprises in the order given, the five characteristics following:

1. The linear density of the single yarn, expressed in Tex.
2. The number of single yarns in the first fold.
3. (a) The number of folded yarns in the finished product, or, if suitable,

   (b) The number of folded yarns, then cabled yarns in the finished product.
4. The resultant linear density, expressed in Tex.
5. The twist direction of the finished product.

The first three characteristics are joined to each other by the multiplication sign (x); (if suitable, the number of cabled yarns is joined likewise to the number of folded yarns by the multiplication sign). The last two characteristics are separated from the first three by a semi-colon (;).

The fourth characteristic (numerical value of the resultant linear density) is preceded by the letter R.

The fifth characteristic is indicated by the letter S or Z (in conformity with ISO/R.2 "Designation of the direction of twist in fextile yarns and related products").

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x) See ISO Recommendations 138, 271 and draft ISO Recommendation (in preparation) on the subject of the Tex system.

Example 1 23 tex x 6 x 3; R 460 tex Z. This designation characterizes a cabled netting yarn composed of three folded yarns each of which comprises six single yarns of a nominal[x] linear density of 23 tex; the resultant linear density of this yarn is 460 tex; the final twist direction is Z.

Example 2 23 tex x 6 x 5 x 3; R 2 400 tex S. This designation characterizes a cabled netting yarn composed of three cabled yarns of which each comprises five folded yarns themselves composed of six single yarns of a nominal[x] linear density of 23 tex; the resultant linear density of this yarn is 2 400 tex; the final twist direction is S.

3.1.2 Particular cases: brief designation

Yarns composed of dissimilar components and heavy twisted trawl twines, complete designations of which would be too complicated, should be designated by

(a) the resultant linear density

(b) the twist direction of the finished product.

Example 3: Netting yarn R 4 000 tex S.

3.2 Yarns obtained by braiding

Braided netting yarns are designated only by their resultant linear density.

Example 4 Braided yarn R 4 000 tex

Note The resultant linear density of a netting yarn is always different from the linear density of the same yarn obtained by calculation.

Reverting to Example 1: Accepting a netting yarn having a designation of:

23 tex x 6 x 3; R 460 tex Z

calculation of linear density of this yarn on the basis of its components gives:

6 x 3 = 18 yarns each of 23 tex, namely 18 x 23 tex = 414 tex.

The difference between the calculated density in tex and the resultant linear density of R 460 tex, namely 46 tex, accrues from the twisting and cabling undergone by the yarns, each one of these operations leading to an increase in the density of the yarns.

x) The term "nominal" indicates that the value is a matter of reference, useful solely for the designation.

Appendix 2

ISO/TC 38 (Secretariat)

July 1968

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO Technical Committee 38: Textiles

DRAFT ISO RECOMMENDATION No. 1198: (REVISED TEXT)

NETTING FOR FISHING: Basic Terms and Definitions

1. Scope

This ISO Recommendation gives the principal terms relating to netting for fishing nets together with their definitions or, in some cases, the method of expressing dimensions.

2. Terms and definitions

2.1 Netting	A meshed structure of indefinite shape and size (a) composed of one yarn or of one or more systems of yarns interlaced or joined; or (b) obtained by other means, for example by stamping or cutting from sheet material or by extrusion
2.2 Netting yarn	All yarns[x] suitable for manufacture of netting NOTE: The principal types of netting yarns are twines. The latter are defined below.
2.2.1 Netting twine	The product of one twisting operation embracing two or more single yarns or monofilaments
2.2.2 Cabled netting twine	The product of further twisting operations embracing two or more netting twines
2.2.3 Braided netting twine	The product of braiding or plaiting netting yarns and/or netting twines
2.3 Size of netting yarn	The size of netting yarn is indicated by its linear density expressed in the tex system (see ISO Recommendation 138, Universal yarn count system). The size of the final product is expressed by the "resultant linear density" (see DIR 1329). NOTE: The resultant linear density is the reciprocal of "runnage" which expresses the length per unit mass, metres per gramme or per kilogramme, for example.
2.4 Mesh	A designedly formed opening, surrounded by netting material.

x) The definition in DIR 1329 "Designation of yarns" denotes "yarn" as a general term embracing a single yarn (including monofilament), multiple wound yarn, folded yarn and cabled yarn.

2.5 Size of Mesh

2.5.1 Length of mesh side — The distance between two sequential knots or joints, measured from centre to centre when the yarn between those points is fully extended (Figure 1).

2.5.2 Length of mesh

(a) for knotted netting, the distance between the centres of two opposite knots in the same mesh when fully extended in the N-direction (see 2.6.1.1.) (Figure 2).

(b) For knotless netting, the distance between the centres of two opposite joints in the same mesh when fully extended along its longest possible axis (see 2.7.1.1.)

2.5.3 Opening of mesh

(a) for knotted netting, the inside distance between two opposite knots in the same mesh when fully extended in the N-direction (see 2.6.1.1) (Figure 3)

(b) For knotless netting, the inside distance between two opposite joints in the same mesh when fully extended along its longest possible axis (see 2.7.1.1)

2.6 Direction in knotted netting

2.6.1 Related to the general course of the netting yarn (Fig.4)

2.6.1.1 N-direction — The direction at right angles (Normal) to the general course of the netting yarn.

2.6.1.2 T-direction — The direction parallel to the general course of the netting yarn (Twinewise)

2.6.2 Independent of the general course of the netting yarn

AB-directions (Figure 5) — The directions parallel to a rectilinear sequence of mesh bars, each from different adjacent meshes.

2.7 Direction in knotless netting

Note: Direction in knotless netting can usually be related to the general course of the netting yarn, but this is not always so because the general course of the netting yarn cannot in every case be determined. Usually the direction of the longest possible axis of the mesh is parallel to the general course of the netting yarn. If the two axes are equal, the direction of the netting cannot be determined and the mesh-size may be determined in either direction.

2.7.1 Related to the general course of the netting yarn or longest axis of mesh

2.7.1.1 N-direction — The direction of the longest possible mesh axis.

2.7.1.2 T-direction — The direction at right angles to the N-direction (see 2.7.1.1).

2.7.2 Independant of the general course of the netting yarn

AB-directions — The directions parallel to a rectilinear sequence of mesh bars each from different adjacent meshes.

2.8 Size of netting — The size of netting is indicated either by the number of meshes in both the T- and N-direction (both indications are joined by a multiplication sign).

or by the number of meshes in one direction and the length indicated in a recognized unit e.g. metres, of the other direction, the netting being fully extended whilst the measurement is made.

Examples: 1 000 T x 100 N
1 000 T x 5 m
10 m x 200 N

A complete description requires a statement of the length of the mesh.

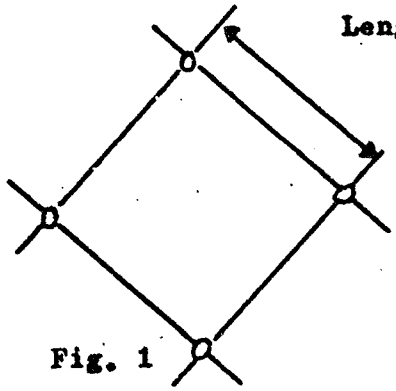

Fig. 1

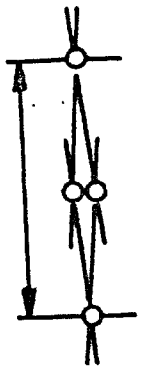

Fig. 2

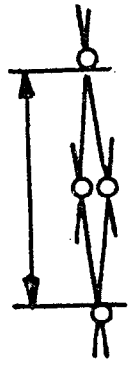

Fig. 3

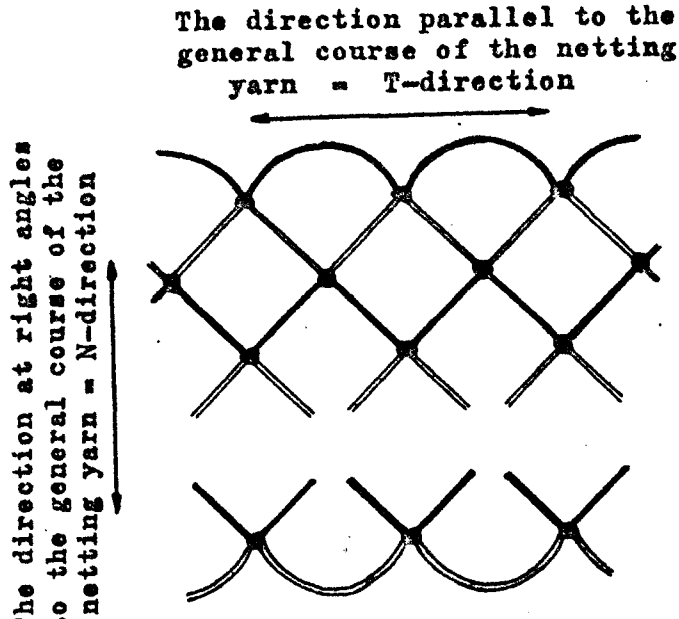

Fig. 4

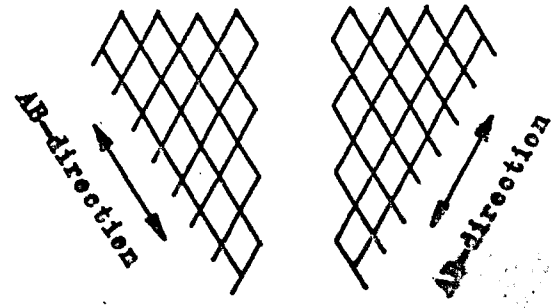

Fig. 5

Appendix 3

ISO/TC 38/SC 9 (Secretariat 43) 95 E
February 1967

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

Sub-Committee 9. Textile Products for Fishing Nets of ISO Technical Committee 38 - Textiles

Requirements for Describing and Designating knotted Netting for Fishing Nets

1. Scope

This document is intended to facilitate the exchange of information between purchasers and suppliers of netting used for making into fishing nets. It indicates the principal characteristics of netting, makes reference to the ISO method of designating the twines used in netting, and finally it deals with methods of packing netting for despatch to purchasers.

Note: It should be understood that a complete designation of netting and its component yarns will not always form part of a contract. There will be occasions when an order is placed on the basis of a sample or some other basis that does not give a complete indication of the properties of the netting or its component yarns. Nevertheless, it is desirable that the complete range of information should be dealt with in this document so that a standard method is available for use on those occasions when it is needed.

2. Principal characteristics of netting

2.1 Types of manufacture

Netting may be manufactured in the two-yarn system or in the single-yarn system as described below.

2.1.1. Two-yarn system

Netting consisting of two systems of yarns is mostly manufactured on a knotting machine. The yarn of one of the two systems runs like a weaving warp from bobbins, while the yarn of the other system is wound on shuttles that guide it towards a hook-shaped or needle-type knotting device. All the knots in one row are knotted simultaneously (Figure 1).

2.1.2. Single-yarn system

Netting consisting of a single-yarn system is mostly hand-made. The yarn is wound on a netting needle and all the meshes in the same row are knotted individually one after another. A uniform mesh-size may be achieved by the use of a mesh gauge during knotting. If the netting is made as a flat panel, then the netting yarn runs alternately from left to right and from right to left (Figure 2). If the netting is knotted round and round (as a "tube" or "cylinder") then the yarn proceeds continously in the same direction.

2.2 Type of knot

The illustrations Figures 3 - 6 show the principal types of knot with their customary designations.

2.3 Direction of stretch [1)]

The directions in which netting may be stretched are designated as follows:

2.3.1.	N-stretch	This relates to netting stretched at right angles (Normal) to the general course of the netting yarn.
2.3.2	T-stretch	This relates to netting stretched parallel to the general course of the netting yarn (Twinewise).

Netting may be fixed after stretching, either by chemical or thermal means.

1) The term "stretch" in this context indicates either the operation of tightening the knots, or that of conferring a permanent shape by thermal or other means or a combination of both processes. For the general definition of the symbols N and T for directions in netting see Draft ISO Rec. No.1198 (formerly Doc. 38/9 N 61).

2.4. Size of netting and special features

The size of netting is specified by the following characteristics:

2.4.1. The number of meshes in both the T- and N-directions marked by the letters T and N respectively following the figure in question and joined by the multiplication sign x. In one of the two directions the indication of the number of meshes can be replaced by the sum of the length of meshes indicated in m or any other recognized unit of length.

2.4.2 The size of mesh in mm, indicating either length of mesh side, length of mesh or opening of mesh (see Draft ISO Recommendation No.1198 formerly Doc. 38/9 N 61).

Special features are sometimes required or may be provided as a matter of course: these include edge meshes for joining or mounting purposes; reinforcement of netting (e.g. double or heavier yarn); width of reinforcement indicated by number of meshes, and any intermediate reinforcement that may be requested.

3. Description of netting yarns

The features requiring descriptions are:

3.1. Size

The designation should follow the requirements laid down in Draft ISO Recommendation No.... "Netting twines, designation in the tex system" (formerly Doc. 38/9 N 39).

3.2. Material

The type of fibre should be stated: descriptions of man-made fibre yarns should indicate whether the yarn is composed of, e.g. staple fibres, or one or more filaments, or of film.

4. Information to be exchanged

4.1. Indication of use

In order to assist the netting manufacturer to offer the most suitable type of netting for a particular type of fishing net, the ultimate use of the netting should be made known, e.g. for gill nets, trawl nets, purse-seine nets, etc.

4.2. Manufacture

The purchaser should state which type of netting (see Clause 2.1) is required.

4.3. Type of knot

If the purchaser has a preference for a particular type of knot (see Clause 2.2) he should state this in his enquiry or order. In the absence of an indication, the supplier may use any of the knots illustrated in Clause 2.2.

4.4. Direction of stretch

The purchaser should state the direction of stretch required (see Clause 2.3) and whether or not the netting is to be fixed after stretching.

4.5. Size of netting

The purchaser should specify the relevant details in accordance with Clause 2,4. Failing this, the supplier should give particulars of the netting offered.

4.6. Netting yarns

If the purchaser requires specific yarns to be used he should give details in accordance with Clause 3. Failing this the netting manufacturer may use his discretion but any particulars given relating to the yarns used should be furnished in terms of Clause 3. Furthermore, the purchaser should specify, if any special treatment (e.g. resin bonding) of the netting yarn is required.

4.7. Finish of netting

The purchaser should specify what finishing process (if any) is required. The following are examples of possible processes:

4.7.1. White (natural), untreated.

4.7.2. White (natural), impregnated

4.7.3. Dyed, without other impregnation or treatment

4.7.4. Dyed and impregnated.

4.8. Packing of netting

The purchaser should advise the supplier on the following points:

4.8.1. Whether netting should be tied together extended in the N-direction or in the T-direction

4.8.2. The method of making-up, e.g. lapped or rolled

4.8.3. Type of packaging required.

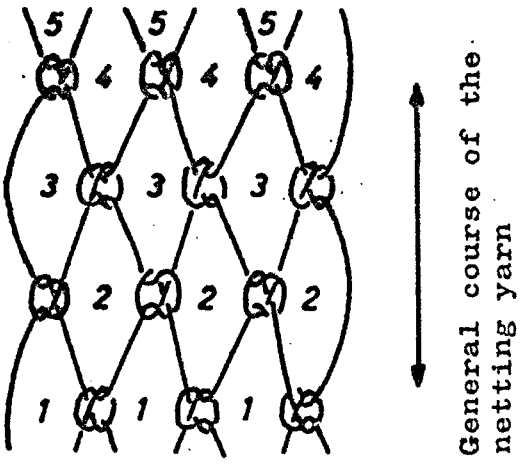

Fig. 1

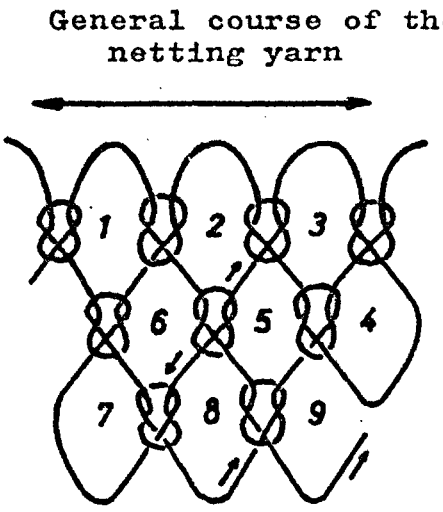

Fig. 2

Weaver's knot
Z-type

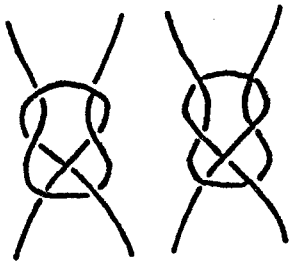

Fig. 3

Weaver's knot
S-type

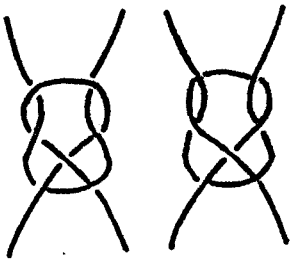

Fig. 4

Double weaver's knot

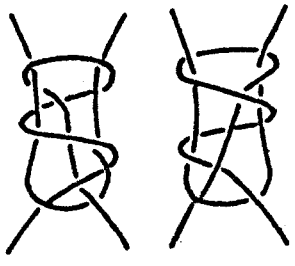

Fig. 5

Reef knot

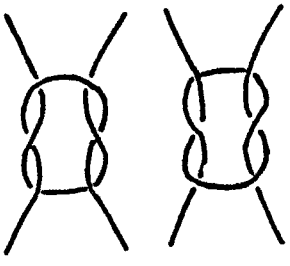

Fig. 6

Appendix 4

ISO/TC 38/Sc 9 (Secretariat 44) 96E

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

Sub-Committee 9, Textile Products for Fishing Nets
of ISO Technical Committee 38, Textiles

Hanging of netting, basic terms

1. Mounting — The attachment of netting to a supporting rope or frame

   Note 1. The netting direction, N or T, (see Draft ISO Rec. formerly 38/9 N 61), in relation to the rope used for mounting, must be stated precisely.

2. Hanging — The mounting of netting according to a specific relationship between the length of that part of the final rope or frame on which the netting is mounted and the length of the netting (see 3).

3. Length of rope — The length of the section of the rope or frame between the extreme points of attachment of the netting.

4. Length of netting — For the calculation of the hanging ratio "length of netting" means the dimension of the netting to be mounted that is parallel to the final rope or frame, measured when the netting is fully extended in the named direction prior to being hung.

5. Hanging ratio (symbol E) — The ratio between the length of final rope (see 3) and the length of netting (see 4) calculated as follows:

$$E = \frac{\text{length of rope}}{\text{length of netting}}$$

Here

(a) The numerator and denominator are both expressed in the same unit of length or

(b) the numerator indicates the length of rope measured in mesh lengths on to which is hung the number of meshes indicated by the denominator

Example: Hanging ratio $E = \frac{7}{10}$ means

(a) that on to 7 m of rope a netting 10 m long is hung or

(b) that a section of rope of length equal to 7 meshes is supporting 10 meshes of netting.

The hanging ratio may be written as a vulgar fraction, or as a decimal fraction or as a percentage.

Thus $E = 7/10$
$E = 0.7$
$E = 70\%$

Note 2. The standard method of expressing the ratio as a percentage, therefore, is as follows:

$$E = \frac{\text{length of rope}}{\text{length of netting}} \times 100\ \%$$

If any other method of calculating the percentage ratio is used, this must be indicated in detail.

Appendix 5

ISO/TC 38/SC 9 (Secretariat 45) 97E
February 1967

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

Sub-Committee 9, Textile Products for Fishing Nets of ISO
Technical Committee 38 - Textiles

Cutting knotted netting to shape by straight cuts "tapering"

Scope

The present document is related to the different kinds of cutting to shape, the types of cutting -N-, T- and Bar-cut - and the rules for the designation of the cutting rate. For the calculation of the cutting rate see Doc. 38/9 N 98.

Term: Cutting netting to shape

By "cutting netting to shape" is understood the cutting from netting of pieces in the shape of trapezia, triangles or parallelograms.

1. Types of cutting

Depending on the desired final shape of the netting, tapering cuts must be made in suitable ways. The various cutting rates are obtained by combining different lengths of cuts, either along a row of sequential knots (N- or T-cuts resp.) or parallel to a line of sequential mesh bars (B-cuts).

Note: For the definition of the symbols N and T in netting see Draft ISO Rec. No.1198, formerly Doc. 38/9 N 61.

The cuts along a row of sequential knots are distinguished by their situation in the drawing of the net or in the netting that has been hung up for tapering as follows:

1.1. N-cut (vertical cut) Symbol N — A cut at right angles to the general course of the netting yarn just beyond the knots (Figure 1).

1.2. T-cut (horizontal cut) Symbol T — A cut parallel to the general course of the netting yarn just beyond the knots (Figure 2).

1.3. Bar-cut Symbol B — A cut parallel to a line of sequential mesh bars severing one or more bars (Figure 3).

2. Cutting rate

2.1. Term: Cutting rate

To obtain a desired shape and area of netting by tapering, N- or T-cuts and B-cuts of a distinct length must follow each other in a rhythmical way. This rhythmical alternation of the various types of cuts is called "cutting rate".

2.2. Designation of the cutting rate

The cutting rate is determined by the length of consecutive sections of N- or T-cuts and B-cuts.

The length of the various cuts are indicated:

for the N- and T-cut by the number of consecutive meshes cut,
for the B-cut by the number of consecutive bars severed along the cutting edge, not counting the bars on the preceding knot.

To describe the cutting rate for tapering netting, the length and the type of cutting are indicated, beginning with N- or T-cuts, thereafter B-cuts.

Exceptions are cutting rates where any of the named types of cutting is used for itself alone. For these the following symbols are valid:

AB = all bars cut
AN = cut entirely in N-direction (at right angles to the general course of the netting yarn)
AT = cut entirely in T-direction (parallel to the general course of the netting yarn).

Cuts AN and AT, though not used for tapering, may be combined with tapering cuts.

2.3. Examples for the designation of the cutting rate

2.3.1. Example: 1N2B means the rhythmical alternation of one N-cut and two B-cuts (Figure 4).

2.3.2. Example: 1T2B means the rhythmical alternation of one T-cut and two B-cuts (Figure 5).

3. Various kinds of cutting (tapering)

3.1. By tapering only one edge of the netting, right-angled trapezia or right-angled triangles are made (Figures 6 and 7).

3.2. By using the same cutting rate in the same direction on two opposite edges of the netting, parallelograms are made (Figure 8).

In the case of netting in the shape of a parallelogram the triangular piece cut off on one side may be joined to the other edge (Figure 9).

3.3. Netting in the shape of isosceles trapezia or isosceles triangles.

The area of such netting (Figure 10) may be divided into two right-angled trapezia or triangles respectively, each of these parts being tapered correspondingly in opposite directions.

For triangular shaped netting (Figure 11) each of the two halves must be tapered to a point.

3.4. Netting in the shape of assymetrical trapezia or parallelograms (Figures 12 and 13).

The area of such netting may be divided into one right-angled trapezium and one right-angled triangle respectively, each of these parts being tapered correspondingly.

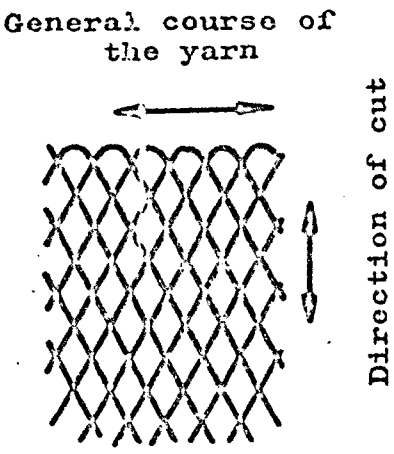

Fig. 1

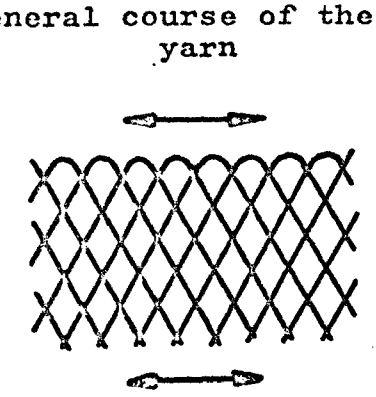

Fig. 2

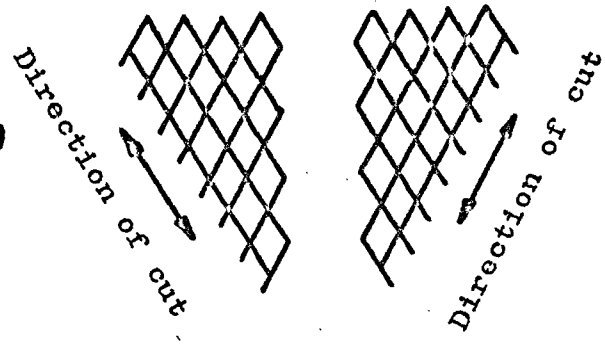

Fig. 3

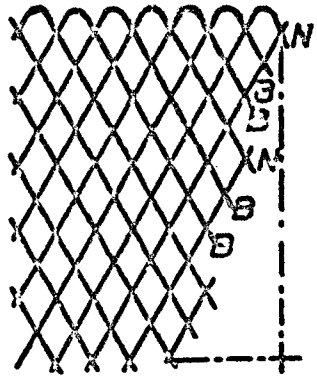

Fig. 4

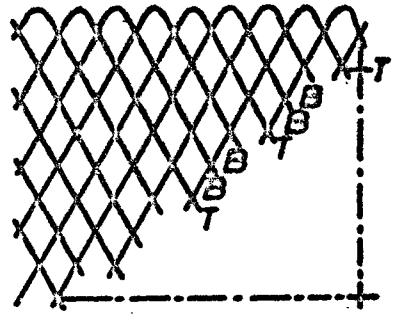

Fig. 5

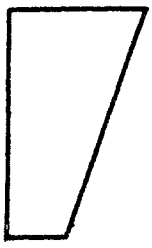

Fig. 6

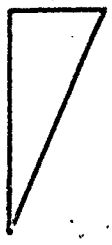

Fig. 7

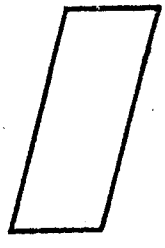

Fig. 8

Fig. 9

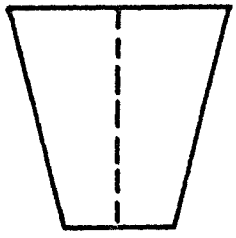

Fig. 10

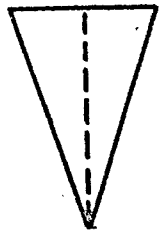

Fig. 11

Fig. 12

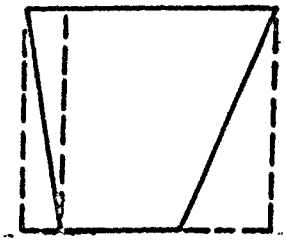

Fig. 13

Suggested data record for fishing vessel register

1. Country
2. Registration number
3. Home port
4. Name of vessel
5. Name of owner
6. Type of vessel
   a) fishing type
   b) non-fishing types
      1. Mother ship - Carrying catching vessels
      2. Mother ship - Not carrying catching vessels
   c) Carrier
   d) Others
7. Overall length (m)
8. Overall breadth (m)
9. Depth (m)
10. Gross registered tonnage
11. Year built
12. Building materials
    a) Steel
    b) Wood
    c) Plastic
    d) Others
13. Main engine
    a) Steam
    b) Motor
    c) Electric
    d) Others
14. Propulsion
    a) Coal
    b) Oil
    c) Petrol/Gasoline
    d) Others
15. Capacity fuel bunkers (m^3)
16. HP (Main Engine)
17. Year installed
18. HP (auxiliary engines)
19. Propeller, revolutions per min.
20. Speed on trial (Knots)
21. Propeller
    a) Fixed
    b) Controllable Pitch
    c) Others

22. Types of fishing

a) Whaling
b) Line
   1. Pole-and-line
   2. Longlining
   3. Longlining (with catching vessels)
   4. Hand lining
   5. Hand lining (dory)
   6. Trolling

c) Pots and Traps

d) Dredge (shellfish)

e) Trawling
   Single
   Pair

   Side
   Stern without ramp
   Stern with ramp
   Midwater
   Bottom
   Beam

f) Danish seine
g) Purse seine type
   1. Single vessel
   2. Single vessel (with skiff)
   3. Pair vessel

h) Lift net
i) Gill net
   1. Drift
   2, Bottom

k) Others

23. Type of product /Salted

a) equipped occasionally for salting
b) equipped for an important part for salting
c) not equipped for salting

24. Crew

a) Total men on board
b) Personnel on board engaged exclusively in processing

25. Total capacity (cu.m.)

26. Capacity without installation (cu.m)

27. Capacity insulated

28. Capacity mechanically refrigerated (cu.m)

29. Freezing capacity "

30. Processing

a) Freezing (t per 24 hours)
b) Fileting machine (Number of machines)
c) Fileting, hand
d) Canning (t of raw material per 24 hours)
e) Meal (t " " " " " ")
f) Oil (" " " " " " ")
g) Others (" " " " " " ")

31. Electronic equipment

a) Radio
b) Radio V.H.F.
c) Radar (number of instruments)
d) Echo-sounder, vertical (Number of instruments)
e) " " , horizontal or ranging " "
f) Decca
g) Decca navigator
h) Loran
i) Auto-pilot
k) Direction finder
l) Fascimile Receiver
m) Netz Sonde
n) Others

32. Other equipment

a) Powered block
b) Fish pump
c) Powered net drum
d) Fishing with light
e) Electric fishing gear
f) Others