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# A comparison between a few mesh measuring gauges

by

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## Introduction

To avoid overfishing it is essential that the meshes of fishing nets should be regulated. Experiments have revealed what width is the right one and this size has been prescribed by various regulations.

The idea "mesh width" is new to net manufacturers. In this branch of industry it is still customary to consider and speak of the mesh length of the netting, both in the production and in the sales sector.
This mesh length is the sum of the mesh width and the length of one single knot of the netting. The great difficulty in the comparison between mesh length and mesh width is the length of the knot, which depends not only on the thickness of the twine but also on the kind of twine.
The way in which the knots in the netting are drawn tight may and will also be of importance.

All the instruments which are used to measure this mesh width do this in one single mesh. During the measuring, a certain pressure is always put on the twine, which slightly stretches the twine. In some cases this stretching, which is due to the pressure, is left to the decision of the measurer, while, in other cases, it is determined mechanically. The results obtained with these instruments can be divided into two groups.
The first group includes instruments which only determine if the mesh width is smaller or larger than has been prescribed; the second group includes those which indicate exactly to what extent the mesh is too small or to what extent it is bigger than has been prescribed.

## Comparison

The following instruments have been used for this comparison:

the "Wedge gauge" used by the Netherlands inspectors (fig.1)
the "I.C.N.A.F.gauge" (fig. 3)
the "I.C.E.S.gauge" (fig. 5)

All these instruments put some pressure on the mesh to measure the width. For a good comparison these instruments have been used with a 3, 4 and 5 kilogram pressure on the mesh. Wherever possible, this was inspected objectively, but where not, efforts were made to do this subjectively. The gauges given in fig. 2 and 4 were not used in this test because they have not a subdivision into millimeters.

## Description of instruments

### Netherlands wedge gauge

This is the instrument which is generally used for these measurements. It is an isosceles triangle, which is pressed into the opening with the sharp point. The user decides when the wedge gauge is pressed into the mesh and if the pressure is right, after which the mesh width can be read (see fig. 1). The wedge gauge used in the United Kingdom (fig. 2) has, at the "75 mm" mark, a parallel piece for the mesh to glide over.

In practice both wedge gauges are used in the same manner with the distinction that the Netherlands wedge gauge indicates the size of the mesh width in mm and the United Kingdom gauge only indicates whether the width is too small, correct or wider than prescribed.

The pressure with which the wedge gauge in accordance with the law is pressed into the mesh, shall be such that it passes through the mesh "easily". "Easily" in relation to what ? Strength of the twine or muscular strength of the operator ?

The term "easily" is therefore very subjective and will be different for every person. Now that it is known that even a slight load difference can cause different elongations of the twine, especially in the beginning owing to the great differences in stretch, it is understandable that the results of the wedge gauge methods are highly disputable, because various persons may give different pressure.

I.C.N.A.F.gauge

This gauge is in principle a wedge gauge with the understanding that the pressure with which the wedge gauge is pressed into the mesh can be measured.

On the inner of the two tubes, sliding over each other, is a scale, indicating the pressure with which the wedge gauge is pressed into the mesh (fig. 3). There is an objection to this instrument, however. It is not that the spring is not good; the instrument will be right as long as the tubes do not touch each other, but the readings of the pressure will be wrong as soon as friction occurs.

During previous tests it was sometimes stated that, if this gauge was pressed into the mesh in a somewhat slanting position and this was continued until the prescribed pressure had been reached, the mesh, which then had also been drawn over the wedge gauge in a somewhat slanting position, could be straightened without any increase of the indicated pressure. That the pressure does not increase in fact is impossible. Therefore the not-increasing of the indicated pressure must be due to the gauge being blocked, even after the gauge had, purposefully and specially been oiled.

When the instrument was tested and, consequently, every care had been given to avoid friction as much as possible, the readings on the instrument proved right and the instrument correct.

I.C.E.S.gauge

This gauge is of such a construction that, if a fixed pressure is given on certain parts of the gauge, it is blocked and the scale can be read. These parts (jaws) are put into the mesh and pulled apart until the fixed pressure is reached (see fig. 5).

To this gauge could be objected that the reading is not constant unless the gauge has been operated at least twice.

The fact is that there is a small difference between pressing the gauge suddenly and reading the scale and pressing the gauge at least twice and then reading it. The latter method was applicated for the experiments according to the directions for use published by the producer of this gauge.

Comparative test

To carry out this comparative test for the three methods accurately, it is of importance that the right net should be used.
With the assistance of the manufacturer, a piece of netting from the current production could be borrowed which had been made for the cod end of a trawl net. It was a very big piece of netting, produced on a normal knotting machine, 800 knots long and 100 meshes deep and made of double twine having a dry breaking strength of about 100 kilograms per twine.

After braiding the netting, the piece was stretched in the mesh direction in order to draw the knots tightly and then under some tension, exposed to high temperatures. It was therefore practically excluded that the knots could slide under a pressure of 3, 4 and 5 kilograms since the tensions on the mesh did not stand in any proportion to the strength of the two twines, of which the net had been made.

For the test, which was made in one day, the net was put for 2 hours under water and then spread out on a large table covered with a plastic sheet. During the measurements at room temperature big quantities of water were regularly sprayed on the net; the water remained on the sheet and ensured that the measurements were always made when the netting was wet.

The instruments were compared under a pressure of 3, 4 and 5 kilograms. The instrument was put with a three kilograms pressure into a series of meshes. After this series had been measured, the same was done with 4-kilograms and 5-kilograms pressure always in the same meshes. This method was also applied with the next instrument, but in another series of meshes. The meshes for each instrument were marked (with plastic rings) so that mistakes were out of the question. To avoid any influence of slipping knots on the measurements (though pratically excluded in this case), the meshes were chosen in such a way, that no measurements were made in the adjacent meshes.

Ten measurements were made in every series, but, after one series with a certain instrument had been completed, the next series was measured with another instrument. The series were divided over the netting as follows:

A, B, C, A2, B2, C2 and A3, B3, C3, in which letters indicate the instruments and the numbers of the series.

This was done successively in the direction of the twine and transversely on it. Previously four series of 20 meshes had been measured. In this case the I.C.E.S.gauge was put purposefully into the mesh as has been given in fig. 6C. In two series the gauge was put <u>on</u> the knot and in two series the gauge was put <u>beside</u> the knot. It appeared that the total average results of the 4-kilogram pressure measurements on and beside the knot were the same so that it seams that this twine thickness does not give any difference.

With mechanical braiding of netting in theory one turn of a machine may differ from the other, which means that in the netting, transversely to the direction of the twine, the meshes may be irregular. Therefore the measurements of the meshes were made in two directions, one direction running parallel to that of the twine, the other transversely.

Another practical experience had also to be considered, namely, that the side meshes, the meshes on the sides running parallel to the twine direction, might be smaller than those in the middle.

The meshes to be measured had therefore been chosen at some distance from the sides.
The mesh width in both directions was always measured in the same, fixed way, namely, transversely to the direction of the twine.

<u>Test I</u>

During this test, only the wedge gauge was used, which is customary for routine tests on the meshes of a trawl net. The first two series were, with purpose, measured by person A with 3 and 4-kilograms pressure and by person B with 5-kilograms pressure.
The results of these measurements are given in the tables III and IV, while the total results of the measurements with the wedge gauge are given in table V, with a summary in table VII.

Considering the arithmetical mean it appears that, with 3-kilograms pressure there is no difference between parallel and transverse measurements; the greater the pressure, the greater the difference. It was remarkable that greater pressure widened the mesh width and that the difference between the imitated 3- and 4-kilogram pressure was smaller than that between the imitated 4- and 5-kilogram pressure.

<u>Test II</u>

In this test measurements were made with the I.C.N.A.F.gauge. The 3-, 4- and 5-kilogram measurements were made by the persons A, A and B.
When comparing the arithmetical means, a greater pressure proved to give a greater mesh width, just as in test I. It is remarkable, however, that the measurements made with the same pressure, but in different directions of the twine, were different too.

Test III

The I.C.E.S.gauge was used in this test. The 3-, 4- and 5-kilogram pressure measurements were made by the persons A, A and B.
When comparing the arithmetical means, it appeared that, here, too, the greater pressure increased the mesh width. As regards the direction of the twine, it appeared that, notwithstanding previous tests, the results of the measurements approached each other rather closely, much more than in test I and II.

Comparison of the results

For a good comparison of the results of instruments the comparison of the arithmetical means is not exactly the right method. It is much more accurate to work out the results statistically.
The Statistics Department T.N.O. took charge of this part of the work. It arrived at the following three conclusions:

I. The results of the 3 series of 30 measurements having been set out in one graph, the width length on the vertical axis and the pressure on the horizontal axis, a straight line can be drawn through these points by calculation by means of the smallest squares for the series parallel to the twine direction with a 3-, 4- and 5-kilogram pressure and another line for the measurements transversely to the twine direction.
For each instrument two lines can be calculated, one for the observations parallel to the twine direction and one for the transvers observations. Judgement of these lines leads to the following conclusions:

For the Wedge gauge
The inclination of these lines as well as the relative level of these lines diverge such that the difference is significant (1). It must be assumed however, that the pressure has been 3, 4 and 5 kilograms.

For the I.C.N.A.F.gauge
Here, too, the difference in the level of the lines is significant but not the difference in the inclination of the lines.

For the I.C.E.S.gauge
Here, the difference of the inclination and of the level of the lines is not significant.

II. It proved to be possible to find a formula for the mesh width in which the factor "pressure" was expressed. Here, too, a 3-, 4- and 5-kilogram pressure of the wedge gauge was assumed.
The results of these calculations are given below:

(1) Significant: Difference is significant when it is greater than could be expected from the fluctuations in the measurements.

| | | |
|---|---|---|
| Wedge gauge | parallel to twine direction | 53.2 + 4.42 x pressure strength |
| | transversely to " " | 51.4 + 4.98 x " " |
| I.C.N.A.F.gauge | parallel to twine direction | 66.8 + 1.47 x " " |
| | transversely to " " | 66.5 + 1.28 x " " |
| I.C.E.S.gauge | parallel to twine direction | 68.0 + 0.65 x " " |
| | transversely to " " | 67.7 + 0.68 x " " |

This leads to the conclusion that the strength with which the gauge was used, was of greatest importance in the wedge gauge, and least in the I.C.E.S.gauge.

III. One can also draw conclusions from the spreading of a single measurement:

This spreading is for:

| | | |
|---|---|---|
| the wedge gauge | parallel to twine direction | 1.51 mm |
| | transversely to " " | 1.53 mm |
| the I.C.N.A.F.gauge | parallel to twine direction | 1.62 mm |
| | transversely to " " | 1.46 mm |
| the I.C.E.S.gauge | parallel to twine direction | 1.20 mm |
| | transversely to " " | 1.20 mm |

This reveals that, for the wedge gauge and the I.C.N.A.F.gauge, the spreadings are equal and that the spreading for the I.C.E.S.gauge is much smaller.

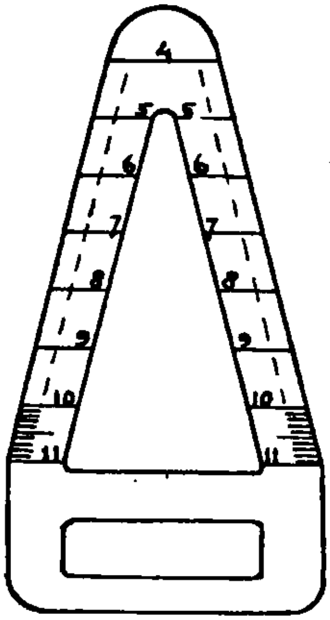
Conclusion

Based on the measurements in this particular piece of netting, the conclusion must be that the I.C.E.S.gauge gives the most regular and the most constant results. After that comes the I.C.N.A.F.gauge and only then the wedge gauge.-

ANNEX 1

# MESH GAUGES

FIG 1

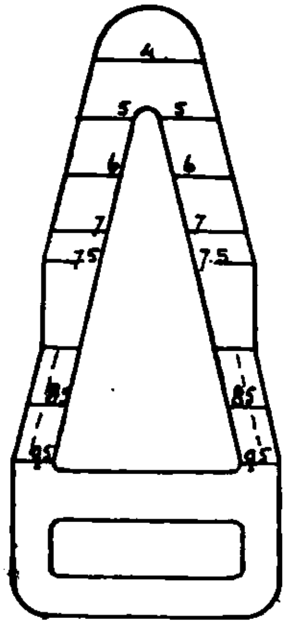


(PROP. GEN. INSP. S)

NETH. WEDGE GAUGE

BRASS 2MM

FIG 2



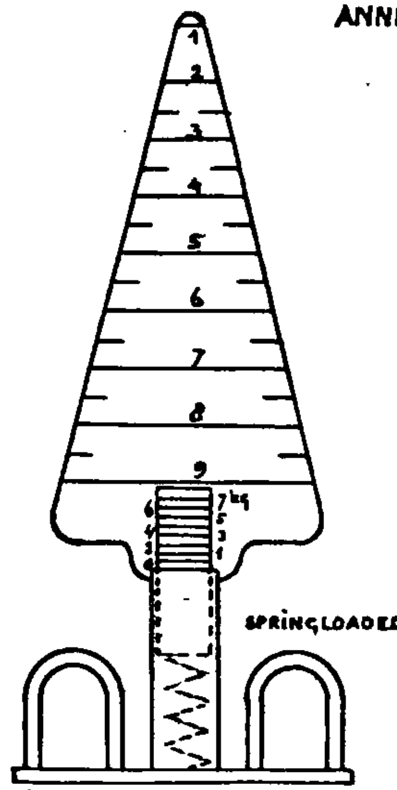
(PROP. GEN. INSP. S)

WEDGE GAUGE

AFTER UK. TYPE

SCALE 1:2

FIG 3




(PROP. RIVO. IJMUIDEN)
NETH.

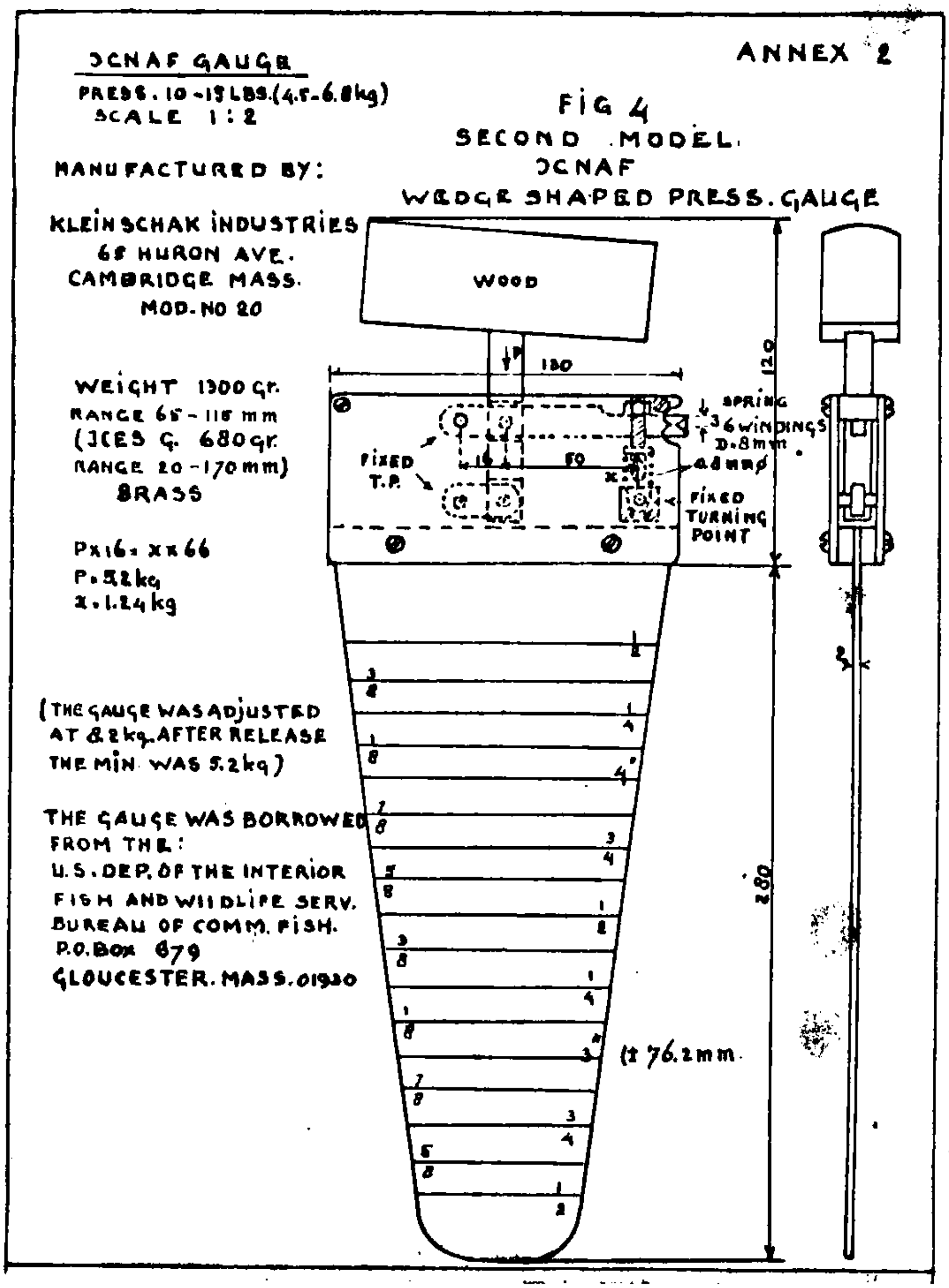
FIRST MODEL

ICNAF

WEDGE SHAPED

PRESSURE GAUGE

0 - 7 KG

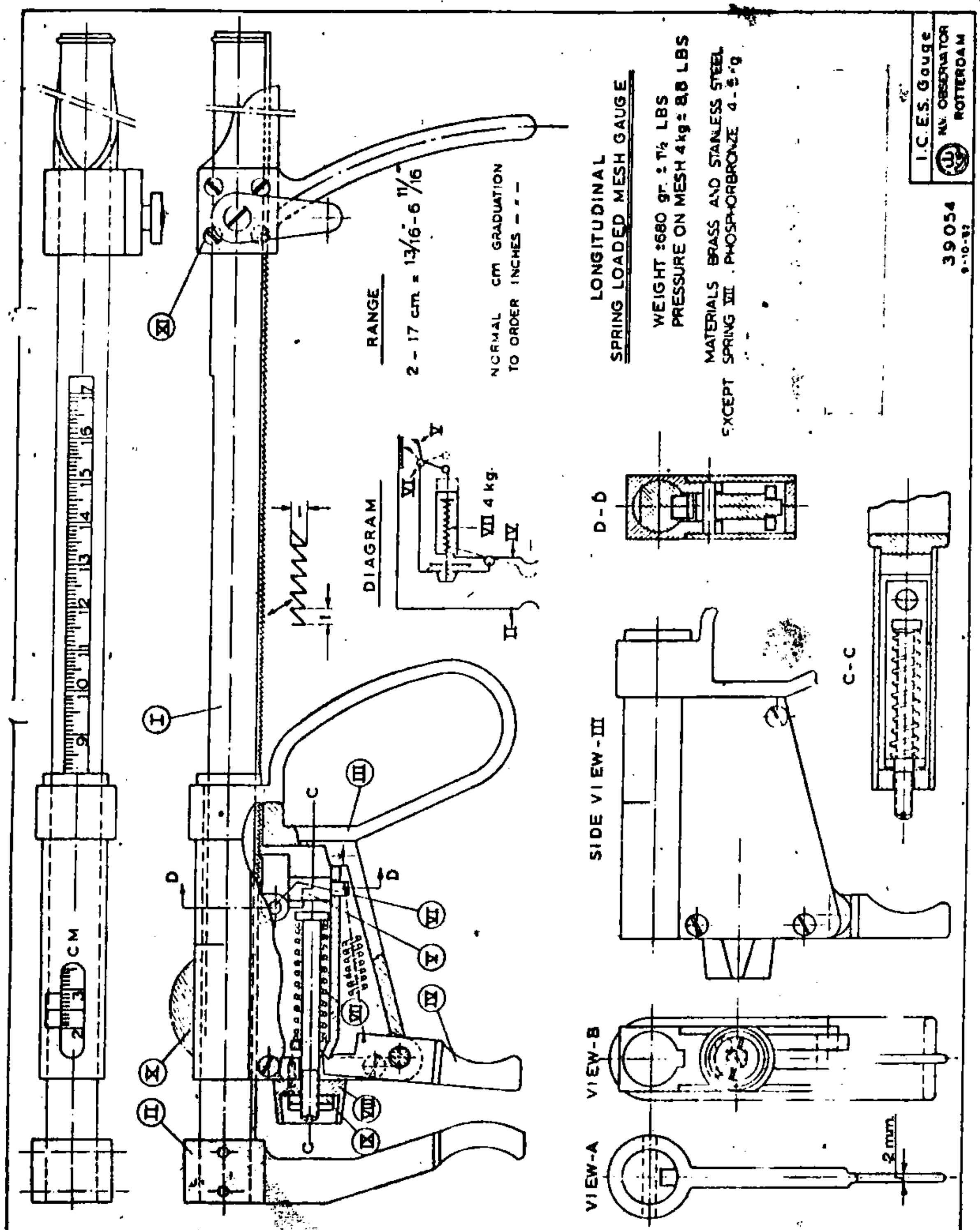

ANNEX 2
ICNAF GAUGE
PRESS. 10-15 LBS.(4.5-6.8kg)
SCALE 1:2
FIG 4
SECOND MODEL.
ICNAF
WEDGE SHAPED PRESS. GAUGE
MANUFACTURED BY:
KLEINSCHAK INDUSTRIES
65 HURON AVE.
CAMBRIDGE MASS.
MOD. NO 20
WOOD
130
120
WEIGHT 1300 gr.
RANGE 65-115 mm
(ICES G. 680 gr.
RANGE 20-170 mm)
BRASS
SPRING
36 WINDINGS
D.8 mm
FIXED T.P.
FIXED TURNING POINT
50
Px16 = xx66
P=5.2kg
x=1.24kg
(THE GAUGE WAS ADJUSTED AT 6.2kg. AFTER RELEASE THE MIN. WAS 5.2kg)
THE GAUGE WAS BORROWED FROM THE:
U.S. DEP. OF THE INTERIOR
FISH AND WILDLIFE SERV.
BUREAU OF COMM. FISH.
P.O. BOX 679
GLOUCESTER. MASS. 01930
280
(3" 76.2mm.

ANNEX 3

LEGEND

FIG. 5

ICES LONG. PRESS. GAUGE

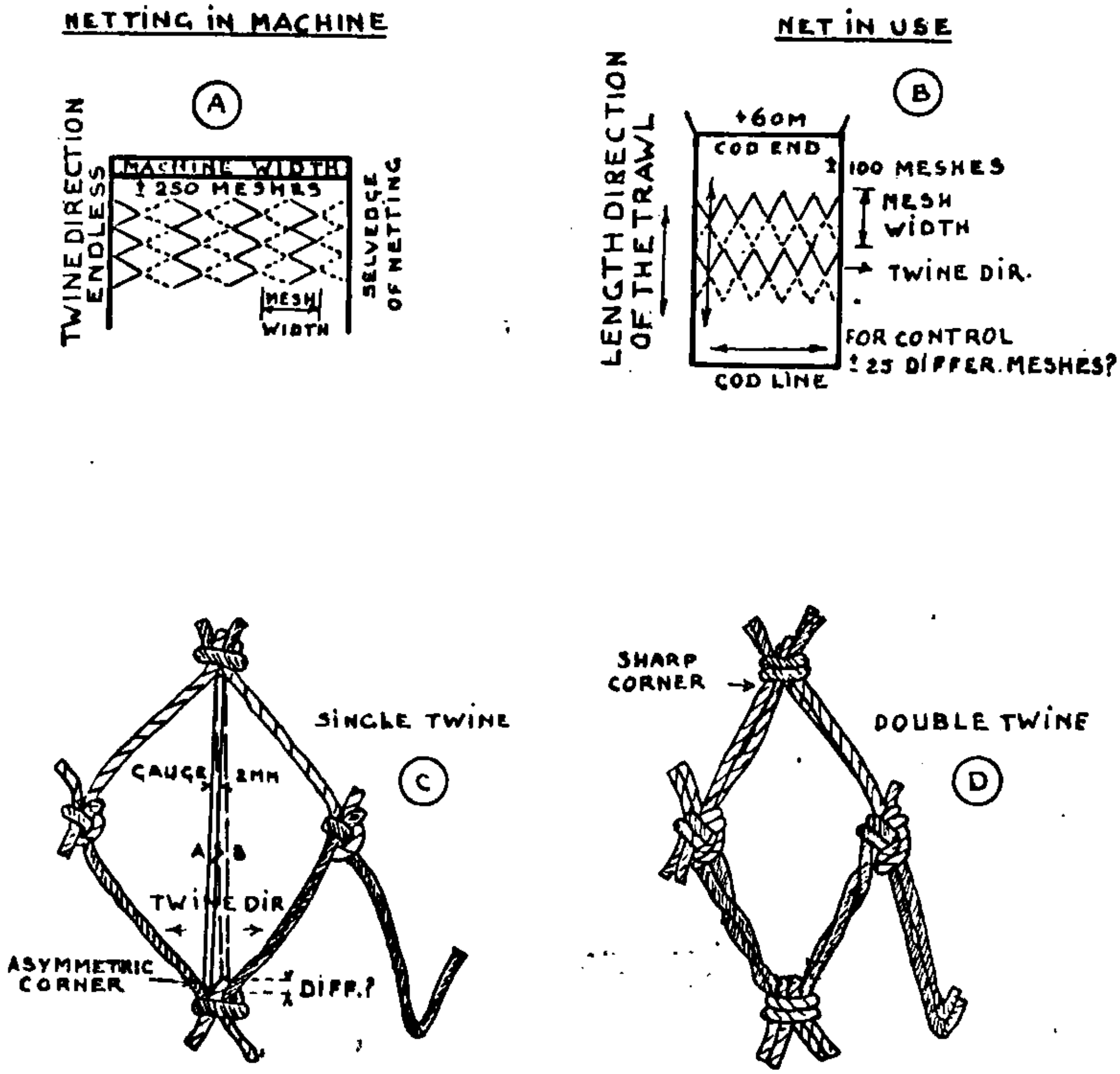


ANNEX 4

## DIFFERENT METHODS OF NETBRAIDING

### SINGLE AND DOUBLE TWINE    MACHINE BRAIDED

FIG. 6



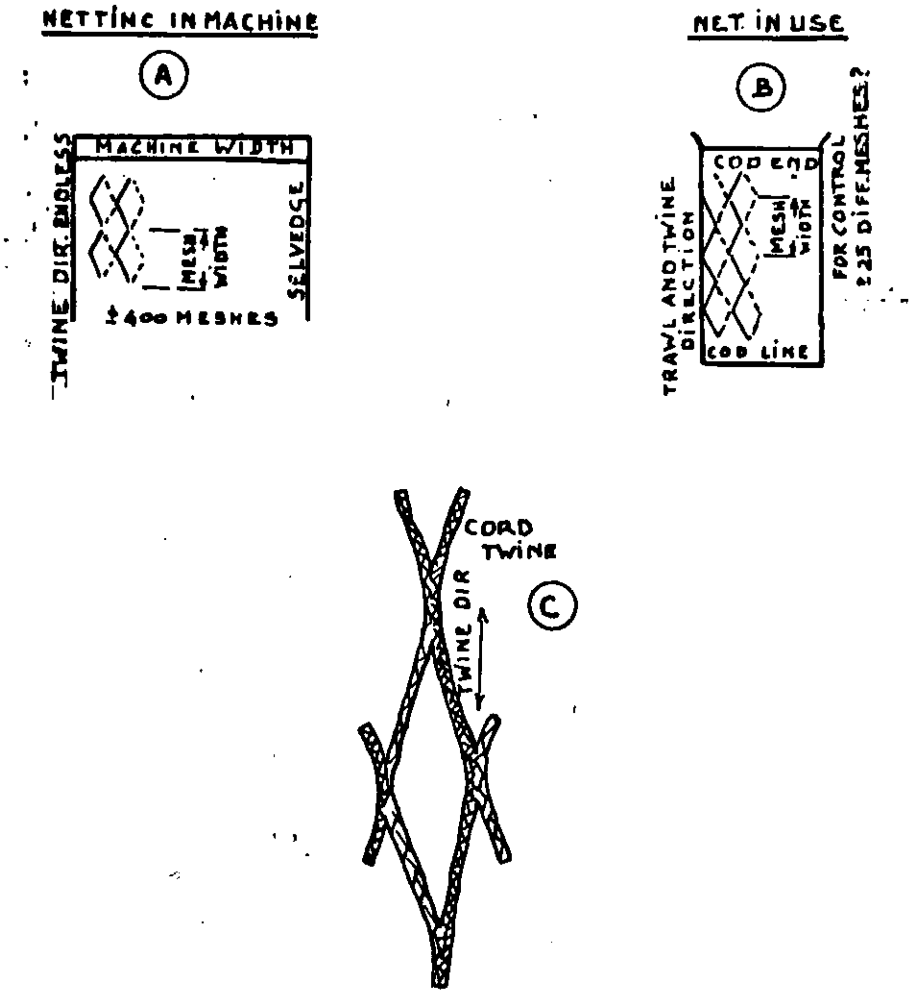
ANNEX 5

## DIFFERENT METHODS OF NETBRAIDING

### KNOTLESS

### SINGLE TWINE

FIG. 7



## DIFFERENT METHODS OF NETBRAIDING

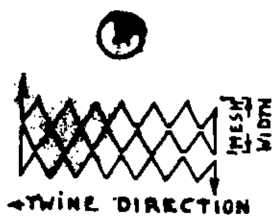
ANNEX 6

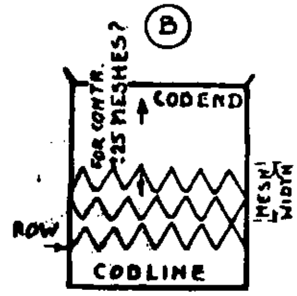
### HAND BRAIDED

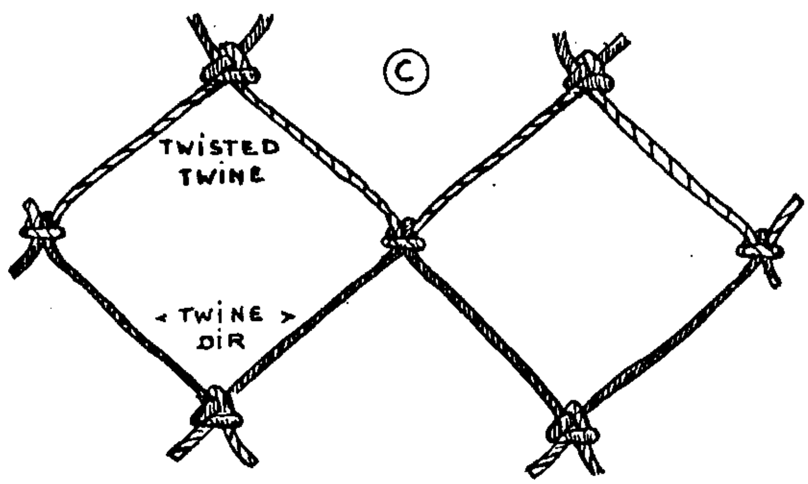
SINGLE TWINE.

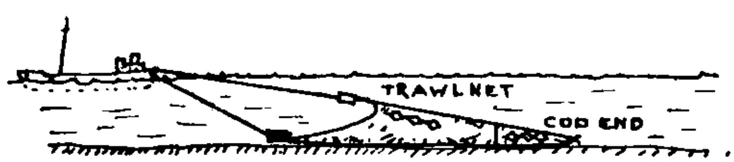
FIG 8

NET. IN USE.



ANNEX 7

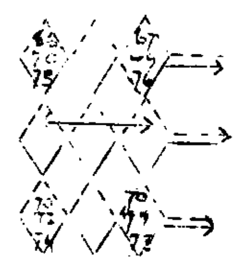
TABLE III

| MESH NUMBER ROW NUMBER | TWINE DIRECTION 1 | 3 | 5 | 7 | 9 | 11 | PARALLEL TO TWINE DIRECTION 13 | 15 | 17 | 19 | AVERAGE | MIN. MAX. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 $A_1$ | 66 | 67 | 68 | 70 | 67 | 68 | 68 | 68 | 68 | 68 | 67.8 | 66-70 |
| | 70 | 69 | 69 | 72 | 70 | 70 | 70 | 69 | 68 | 69 | 69.9 | 68-72 |
| | 75 | 76 | 78 | 75 | 76 | 75 | 78 | 74 | 75 | 73 | 75.5 | 73-78 |
| 4 $A_2$ | 67 | 66 | 66 | 69 | 67 | 67 | 68 | 65 | 67 | 66 | 66.8 | 65-69 |
| | 69 | 68 | 68 | 72 | 70 | 69 | 70 | 70 | 68 | 69 | 69.3 | 68-72 |
| | 75 | 75 | 75 | 78 | 75 | 77 | 77 | 78 | 75 | 77 | 76.2 | 75-78 |
| 7 $A_3$ | 67 | 68 | 67 | 67 | 66 | 67 | 67 | 65 | 65 | 67 | 66.6 | 65-68 |
| | 70 | 70 | 69 | 70 | 70 | 69 | 70 | 69 | 70 | 70 | 69.7 | 69-70 |
| | 79 | 77 | 75 | 77 | 76 | 74 | 76 | 75 | 75 | 76 | 76.1 | 75-79 |
| 2 $B_1$ | 70 | 70 | 72 | 73 | 72 | 74 | 74 | 74 | 70 | 68 | 71.7 | 68-74 |
| | 72 | 71 | 74 | 74 | 73 | 75 | 75 | 75 | 72 | 70 | 73.1 | 70-75 |
| | 74 | 73 | 75 | 75 | 74 | 76 | 77 | 77 | 73 | 71 | 74.4 | 71-77 |
| 5 $B_2$ | 70 | 70 | 70 | 75 | 73 | 70 | 72 | 72 | 71 | 70 | 71.3 | 70-75 |
| | 73 | 72 | 72 | 76 | 74 | 73 | 73 | 73 | 73 | 72 | 73.1 | 72-76 |
| | 75 | 73 | 73 | 77 | 75 | 74 | 75 | 74 | 75 | 73 | 74.4 | 73-75 |
| 8 $B_3$ | 73 | 72 | 70 | 73 | 70 | 69 | 70 | 69 | 70 | 71 | 70.7 | 69-73 |
| | 74 | 74 | 72 | 74 | 72 | 70 | 73 | 70 | 72 | 72 | 72.3 | 70-74 |
| | 75 | 75 | 75 | 75 | 73 | 72 | 74 | 71 | 73 | 74 | 73.7 | 71-75 |
| 3 $C_1$ | 70 | 71 | 70 | 72 | 71 | 71 | 73 | 71 | 70 | 69 | 70.8 | 69-73 |
| | 70 | 71 | 70 | 72 | 73 | 70 | 72 | 71 | 71 | 69 | 70.9 | 69-73 |
| | 71 | 71 | 71 | 74 | 74 | 72 | 74 | 73 | 71 | 70 | 72.1 | 70-74 |
| 6 $C_2$ | 70 | 69 | 69 | 69 | 69 | 69 | 69 | 69 | 71 | 69 | 69.3 | 69-70 |
| | 70 | 69 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 69.9 | 69-70 |
| | 70 | 69 | 70 | 70 | 71 | 70 | 71 | 71 | 71 | 71 | 70.4 | 69-71 |
| 9 $C_3$ | 70 | 70 | 69 | 71 | 69 | 71 | 71 | 70 | 68 | 68 | 69.7 | 68-71 |
| | 70 | 70 | 70 | 72 | 70 | 71 | 72 | 71 | 71 | 70 | 70.7 | 70-72 |
| | 71 | 71 | 71 | 75 | 71 | 71 | 72 | 70 | 69 | 71 | 70.2 | 69-75 |

MACHINE - DOUBLE BRAIDED
(ANNEX 4. FIG.6 B.D)
WET NET

MEASURING EVERY OTHER M.
IN T-DIRECTION PARALLEL TO
THE GENERAL COURSE OF THE TWINE
(TWINE WISE)

EXAMPLE



$A_1$. $A_2$. $A_3$ /1-19 WEDGE GAUGE
ANNEX 1 FIG.1
WITH LOW, MIDDLE, HIGH PRESS.

$B_1$. $B_2$. $B_3$ /1-19 ICNAF GAUGE
FIRST MODEL - ANNEX 1 FIG.3
WITH 3, 4, 5 kg

$C_1$. $C_2$. $C_3$ /1:19 ICES GAUGE
ANNEX 3 FIG.5
WITH 3, 4, 5 kg.
( 3 ICES GAUGES WITH
3, 4, 5 kg RESP.WERE USED)

ANNEX 8

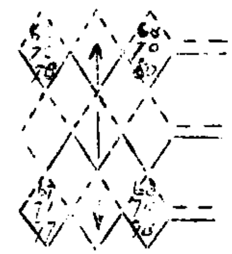
## TABLE IV

| | TWINE DIRECTION | | | RIGHT ANGLE TO TWINE | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ROW NUMBER | 1 | 4 | 7 | 2 | 5 | 8 | 3 | 6 | 9 |
| MESH NUMBER | $A_4$ | $A_5$ | $A_6$ | $B_4$ | $B_5$ | $B_6$ | $C_4$ | $C_5$ | $C_6$ |
| 1 | 68 | 68 | 68 | 70 | 72 | 69 | 71 | 71 | 69 |
| | 72 | 70 | 72 | 71 | 74 | 70 | 71 | 72 | 73 |
| | 78 | 80 | 78 | 72 | 75 | 71 | 72 | 72 | 73 |
| 3 | 67 | 68 | 67 | 70 | 71 | 69 | 69 | 68 | 69 |
| | 71 | 70 | 70 | 72 | 72 | 70 | 70 | 69 | 71 |
| | 77 | 78 | 73 | 75 | 74 | 71 | 70 | 71 | 70 |
| 5 | 67 | 68 | 66 | 68 | 71 | 69 | 72 | 68 | 69 |
| | 69 | 69 | 70 | 70 | 74 | 70 | 71 | 69 | 70 |
| | 75 | 78 | 77 | 71 | 75 | 72 | 72 | 69 | 71 |
| 7 | 67 | 69 | 65 | 69 | 74 | 71 | 70 | 70 | 71 |
| | 69 | 71 | 70 | 70 | 75 | 73 | 70 | 71 | 71 |
| | 78 | 76 | 76 | 71 | 76 | 75 | 70 | 72 | 72 |
| 9 | 67 | 69 | 66 | 70 | 73 | 72 | 69 | 69 | 70 |
| | 70 | 72 | 71 | 72 | 74 | 73 | 70 | 70 | 71 |
| | 75 | 78 | 78 | 73 | 75 | 74 | 70 | 71 | 72 |
| 11 | 68 | 67 | 66 | 70 | 70 | 70 | 69 | 71 | 69 |
| | 69 | 69 | 69 | 71 | 71 | 71 | 70 | 69 | 72 |
| | 76 | 76 | 75 | 72 | 73 | 72 | 71 | 69 | 72 |
| 13 | 68 | 68 | 69 | 70 | 72 | 70 | 71 | 69 | 69 |
| | 69 | 70 | 71 | 71 | 74 | 71 | 71 | 69 | 74 |
| | 78 | 78 | 79 | 72 | 75 | 72 | 72 | 70 | 72 |
| 15 | 67 | 67 | 65 | 70 | 72 | 70 | 72 | 68 | 70 |
| | 70 | 70 | 69 | 73 | 73 | 72 | 68 | 68 | 71 |
| | 78 | 77 | 74 | 73 | 74 | 74 | 71 | 69 | 73 |
| 17 | 65 | 67 | 68 | 70 | 71 | 69 | 69 | 71 | 71 |
| | 70 | 70 | 70 | 71 | 73 | 70 | 69 | 71 | 70 |
| | 78 | 77 | 78 | 72 | 75 | 71 | 71 | 72 | 71 |
| 19 | 65 | 66 | 66 | 68 | 70 | 70 | 69 | 69 | 70 |
| | 69 | 70 | 70 | 69 | 71 | 72 | 69 | 70 | 70 |
| | 78 | 76 | 76 | 70 | 73 | 74 | 70 | 72 | 71 |
| AVERAGE | 66.9 65/68 | 67.7 66/69 | 66.6 65/69 | 69.5 68/70 | 71.6 70/74 | 69.9 69/62 | 70.1 69/72 | 69.4 68/71 | 69.7 69/71 |
| | 69.8 69/72 | 70.1 69/72 | 70.2 69/72 | 70.1 69/73 | 73.1 71/75 | 71.2 70/73 | 69.9 68/71 | 69.7 68/72 | 71.3 70/74 |
| | 77.1 75/78 | 77.4 76/80 | 76.6 74/79 | 71.9 70/73 | 74.5 73/76 | 72.5 71/74 | 70.9 70/72 | 70.7 69/72 | 71.7 70/73 |

MACHINE - DOUBLE BRAIDED NET
(ANNEX 4. FIG. 6 B, D)
WET NET

MEASERING EVERY OTHER MESH.
IN N-DIRECTION AT RIGHT ANGLE
(NORMAL) TO THE GERENAL COURSE
OF THE NETTING TWINE

EXAMPLE



$A_4$, $A_5$, $A_6$/1-19 WEDGE GAUGE
ANNEX 1 FIG. 1
WITH LOW, MIDDELE, HIGH PRESS.

$B_4$, $B_5$, $B_6$/1-19 ICNAF GAUGE
FIRST MODEL
-ANNEX 1 FIG.3
WITH 3, 4, 5 kg

$C_4$, $C_5$, $C_6$/1-19 ICES GAUGE
ANNEX 3 FIG.5
WITH 3, 4, 5 kg

(3 ICES GAUGES WITH
3, 4, 5 kg RESP. WERE USED)

ANNEX 9

## TABLE V

### WET NET

RE. TABLE III (ANNEX 8)

| GAUGE PRESSURE SERIES MESH No. | A WEDGE G. LOW | | | A WEDGE G. MIDD. | | | A WEDGE G. HIGH | | | B ICNAF 3 kg | | | B ICNAF 4 kg | | | B ICNAF 5 kg | | | C ICES 3 kg | | | C ICES 4 kg | | | C ICES 5 kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | |
| 1 | 66 | 67 | 67 | 70 | 69 | 70 | 75 | 75 | 79 | 70 | 70 | 73 | 72 | 73 | 74 | 74 | 75 | 75 | 70 | 70 | 70 | 70 | 70 | 70 | 71 | 70 | 71 | 1 |
| 3 | 67 | 66 | 68 | 69 | 68 | 70 | 76 | 75 | 77 | 70 | 70 | 72 | 71 | 72 | 74 | 72 | 73 | 75 | 71 | 69 | 70 | 71 | 69 | 70 | 71 | 69 | 71 | 3 |
| 5 | 68 | 66 | 67 | 69 | 68 | 69 | 78 | 75 | 75 | 72 | 70 | 70 | 74 | 72 | 72 | 75 | 73 | 75 | 70 | 69 | 69 | 70 | 70 | 70 | 71 | 70 | 71 | 5 |
| 7 | 70 | 69 | 67 | 72 | 72 | 70 | 75 | 78 | 77 | 73 | 75 | 73 | 74 | 76 | 74 | 75 | 77 | 75 | 72 | 69 | 71 | 72 | 70 | 72 | 74 | 70 | 75 | 7 |
| 9 | 67 | 67 | 66 | 70 | 70 | 70 | 76 | 75 | 76 | 72 | 73 | 70 | 73 | 74 | 72 | 74 | 75 | 73 | 71 | 69 | 69 | 73 | 70 | 70 | 74 | 71 | 71 | 9 |
| 11 | 68 | 67 | 67 | 70 | 69 | 69 | 75 | 77 | 74 | 74 | 70 | 69 | 75 | 73 | 70 | 76 | 74 | 72 | 71 | 69 | 71 | 70 | 70 | 71 | 72 | 70 | 71 | 11 |
| 13 | 68 | 68 | 67 | 70 | 70 | 70 | 78 | 77 | 76 | 74 | 72 | 70 | 75 | 73 | 73 | 77 | 75 | 74 | 73 | 69 | 71 | 70 | 70 | 72 | 74 | 71 | 72 | 13 |
| 15 | 68 | 65 | 65 | 69 | 70 | 69 | 74 | 78 | 75 | 74 | 72 | 69 | 75 | 73 | 70 | 77 | 74 | 71 | 71 | 69 | 70 | 71 | 70 | 71 | 73 | 71 | 70 | 15 |
| 17 | 68 | 67 | 65 | 68 | 68 | 70 | 75 | 75 | 75 | 70 | 71 | 70 | 72 | 73 | 72 | 73 | 75 | 73 | 70 | 71 | 68 | 71 | 70 | 71 | 71 | 71 | 69 | 17 |
| 19 | 68 | 66 | 67 | 69 | 69 | 70 | 73 | 77 | 76 | 68 | 70 | 71 | 70 | 72 | 72 | 71 | 73 | 74 | 69 | 69 | 68 | 69 | 70 | 70 | 70 | 71 | 71 | 19 |
| SUB. AVER | 67.8 | 66.8 | 66.8 | 69.6 | 69.3 | 69.7 | 75.3 | 76.2 | 76.1 | 71.7 | 71.3 | 70.7 | 73.1 | 73.1 | 72.3 | 74.4 | 74.4 | 73.7 | 70.8 | 69.3 | 69.7 | 70.9 | 69.9 | 70.7 | 72.1 | 70.4 | 70.4 | |
| 1.2.3 AVER | | 67.1 | | | 69.5 | | | 76.0 | | | 71.2 | | | 72.8 | | | 74.2 | | | 70.0 | | | 70.5 | | | 70.9 | | |
| MIN.MESH | 66 | 65 | 65 | 68 | 68 | 69 | 73 | 75 | 75 | 68 | 70 | 69 | 70 | 72 | 70 | 71 | 73 | 71 | 69 | 69 | 68 | 69 | 69 | 70 | 70 | 69 | 69 | |
| MAX.MESH | 70 | 69 | 68 | 72 | 72 | 70 | 78 | 78 | 79 | 74 | 75 | 73 | 75 | 76 | 74 | 77 | 75 | 75 | 73 | 70 | 71 | 73 | 70 | 72 | 74 | 71 | 75 | |
| | | 65/70 | | | 68/72 | | | 73/79 | | | 68/75 | | | 70/76 | | | 71/77 | | | 68/73 | | | 69/73 | | | 69/75 | | |

RE. TABLE IV ( ANNEX 9)

| GAUGE PRESSURE SERIES MESH No. | A WEDGE G. LOW | | | A WEDGE G. MIDD | | | A WEDGE G HIGH | | | B ICNAF 3 kg | | | B ICNAF 4 kg | | | B ICNAF 5 kg | | | C ICES 3 kg | | | C ICES 4 kg | | | C ICES 5 kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 | |
| 1 | 68 | 68 | 68 | 72 | 70 | 72 | 78 | 80 | 78 | 70 | 72 | 69 | 71 | 74 | 70 | 72 | 75 | 71 | 71 | 71 | 69 | 71 | 72 | 73 | 72 | 72 | 73 | 1 |
| 3 | 67 | 68 | 67 | 71 | 70 | 70 | 77 | 78 | 75 | 70 | 71 | 69 | 72 | 72 | 70 | 73 | 74 | 71 | 69 | 68 | 69 | 70 | 69 | 71 | 70 | 71 | 70 | 3 |
| 5 | 67 | 68 | 66 | 69 | 69 | 70 | 75 | 78 | 77 | 68 | 71 | 69 | 70 | 74 | 70 | 71 | 75 | 72 | 72 | 68 | 69 | 71 | 69 | 70 | 72 | 69 | 71 | 5 |
| 7 | 67 | 69 | 65 | 69 | 71 | 70 | 78 | 76 | 76 | 69 | 74 | 71 | 70 | 75 | 73 | 71 | 76 | 74 | 70 | 70 | 74 | 70 | 74 | 71 | 70 | 72 | 72 | 7 |
| 9 | 67 | 69 | 66 | 70 | 72 | 71 | 75 | 78 | 78 | 70 | 73 | 72 | 72 | 79 | 73 | 73 | 75 | 74 | 69 | 69 | 70 | 70 | 70 | 71 | 70 | 71 | 72 | 9 |
| 11 | 68 | 67 | 66 | 69 | 69 | 69 | 76 | 76 | 75 | 70 | 70 | 70 | 71 | 71 | 71 | 72 | 73 | 72 | 69 | 71 | 69 | 70 | 69 | 72 | 71 | 69 | 72 | 11 |
| 13 | 68 | 68 | 69 | 69 | 70 | 71 | 78 | 78 | 79 | 70 | 72 | 70 | 71 | 74 | 71 | 72 | 75 | 72 | 71 | 69 | 69 | 71 | 69 | 74 | 72 | 70 | 72 | 13 |
| 15 | 67 | 67 | 65 | 70 | 70 | 69 | 78 | 77 | 74 | 70 | 72 | 70 | 73 | 73 | 72 | 73 | 74 | 74 | 72 | 68 | 70 | 68 | 68 | 71 | 71 | 69 | 73 | 15 |
| 17 | 65 | 67 | 68 | 70 | 70 | 70 | 78 | 77 | 78 | 70 | 71 | 69 | 71 | 73 | 70 | 72 | 75 | 71 | 69 | 71 | 71 | 69 | 71 | 70 | 71 | 72 | 71 | 17 |
| 19 | 65 | 66 | 66 | 69 | 70 | 70 | 78 | 76 | 76 | 68 | 70 | 70 | 69 | 71 | 72 | 70 | 73 | 74 | 69 | 69 | 70 | 69 | 70 | 70 | 70 | 72 | 71 | 19 |
| SUB. AVER | 66.9 | 67.7 | 66.6 | 69.8 | 70.1 | 72.2 | 77.1 | 77.4 | 76.6 | 69.5 | 71.6 | 69.9 | 70.1 | 73.1 | 72.2 | 71.9 | 74.5 | 72.5 | 70.1 | 69.4 | 69.7 | 69.9 | 69.7 | 71.3 | 70.9 | 70.7 | 71.7 | |
| 4.5.6 AVER | | 67.1 | | | 70.0 | | | 77.0 | | | 70.3 | | | 71.5 | | | 73.0 | | | 69.7 | | | 70.3 | | | 71.1 | | |
| MIN.MESH | 65 | 66 | 65 | 69 | 69 | 69 | 75 | 76 | 74 | 68 | 70 | 69 | 69 | 71 | 70 | 70 | 73 | 71 | 69 | 68 | 69 | 68 | 68 | 70 | 70 | 69 | 70 | |
| MAX.MESH | 68 | 69 | 69 | 72 | 72 | 72 | 78 | 80 | 79 | 70 | 74 | 72 | 73 | 75 | 73 | 73 | 76 | 74 | 72 | 71 | 71 | 71 | 72 | 74 | 72 | 72 | 73 | |
| | | 66/70 | | | 69/72 | | | 74/80 | | | 68/74 | | | 69/75 | | | 70/76 | | | 68/72 | | | 68/74 | | | 69/73 | | |

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TABLE VI

WET NET SPREADING OF THE MESHWIDTH

| | WEDGE GAUGE | | | | | | ICNAF GAUGE | | | | | | ICES GAUGE | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LOW | | MIDD | | HIGH | | 3 kg | | 4 kg | | 5 kg | | 3 kg | | 4 kg | | 5 kg | | |
| mm | HOR | WERT | H | V | H | V | H | V | H | V | H | V | H | V | H | V | H | V | |
| 65 | 3 | 4 | | | | | | | | | | | | | | | | | 65 |
| 66 | 5 | 5 | | | | | | | | | | | | | | | | | 66 |
| 67 | 12 | 9 | | | | | | | | | | | | | | | | | 67 |
| 68 | 8 | 9 | 4 | | | | 1 | 2 | | | | | 2 | 3 | | 2 | | | 68 |
| 69 | 1 | 3 | 10 | 9 | | | 2 | 5 | | 1 | | | 11 | 13 | 2 | 6 | 2 | 3 | 69 |
| 70 | 1 | | 14 | 14 | | | 12 | 13 | 3 | 6 | | 1 | 7 | 5 | 17 | 9 | 6 | 6 | 70 |
| 71 | | | | 4 | | | 2 | 4 | 3 | 8 | 2 | 5 | 0 | 7 | 6 | 9 | 15 | 8 | 71 |
| 72 | | | 2 | 3 | | | 5 | 4 | 7 | 5 | 2 | 7 | 1 | 2 | 4 | 2 | 2 | 11 | 72 |
| 73 | | | | | 1 | | 4 | 1 | 10 | 5 | 6 | 5 | 1 | | 1 | 1 | 1 | 2 | 73 |
| 74 | | | | | 2 | 1 | 3 | 1 | 3 | 4 | 6 | 7 | | | | 1 | 3 | | 74 |
| 75 | | | | | 12 | 4 | 1 | | 3 | 1 | 10 | 5 | | | | | 1 | | 75 |
| 76 | | | | | 5 | 6 | | | 1 | | 1 | | | | | | | | 76 |
| 77 | | | | | 5 | 4 | | | | | 3 | | | | | | | | 77 |
| 78 | | | | | 4 | 13 | | | | | | | | | | | | | 78 |
| 79 | | | | | 1 | 1 | | | | | | | | | | | | | 79 |
| 80 | | | | | | 1 | | | | | | | | | | | | | 80 |

TABLE VII

WET NET COMPARISON BETWEEN THE 3 GAUGES AND DIFF. PRESS

| | LOW | 3 kg | 3 kg | MIDDLE | 4 kg | 4 kg | HIGH | 5 kg | 5 kg |
|---|---|---|---|---|---|---|---|---|---|
| SERIES | WEDGE | ICNAF | ICES | WEDGE | ICNAF | ICES | WEDGE | ICNAF | ICES |
| HOR. 1-3 | 67.1 | 71.2 | 70.0 | 69.5 | 72.8 | 70.5 | 76.0 | 74.2 | 70.9 |
| VERT. 4-6 | 67.1 | 80.3 | 69.7 | 70.0 | 71.5 | 70.3 | 77.0 | 73.0 | 71.1 |
| TOTAL AVER | 67.1 | 70.7 | 69.8 | 69.8 | 72.1 | 70.4 | 76.5 | 73.6 | 71.0 |
| MIN. MESH | 65 | 68 | 68 | 68 | 69 | 68 | 73 | 70 | 69 |
| MAX. MESH | 70 | 75 | 73 | 72 | 76 | 74 | 80 | 77 | 75 |

H = HORIZ. = PARALLEL TO THE NETING TWINE

V = VERTIC. = AT A RIGHT ANGLE TOT THE NETTING TWINE