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# The Certification of Nets for Use in the Haddock and Cod Fisheries

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This paper is concerned with the history, development and results of a program for before-use certification of codends for use by United States fishermen engaged in the haddock and cod fisheries of the ICNAF Convention Area.

The first mesh regulation for the haddock fishery became effective for United States nationals in June of 1953. While industry acceptance of a minimum mesh size for this fishery was generally good, a rather large majority of vessel owners and captains complained that their knowledge of twine behaviour was not sufficient to permit them to choose a before-use mesh size which would assure an after-use size close to the minimum required but at the same time retain some degree of confidence that the net would not fall below the minimum and thereby subject them to possible legal action.

Such fears on the part of the industry appeared to be reasonable for it was felt that if the Government was to require a specified after-use mesh size, it should be prepared not only to supply guidance to the industry in the selection of new nets which would meet such requirement after use, but in addition to lend legal assurance to the fishermen that were they to follow such advice they would not later find themselves in jeopardy because of some abnormal twine behaviour. Such a system was also considered desirable from a practical standpoint for it was realized that there would be resistance from the courts if actions were presented against fishermen involving relatively small deviations from the required minimum unless the Government could first show that it was in a position to advise.

It was determined that while manila, cotton and, to some extent, synthetic twines were being used, the larger trawlers were using manila almost exclusively because it was relatively inexpensive and easy to use. (Bullis, 1953) Most of these codends were made of 45-, 50-, 75- and 80-yard, 4-ply twines, the term "45 yard, 4-ply" indicating a twine made up of 4 strands, a 45-yard length of which weighs one pound. A series of experiments was then immediately undertaken to ascertain the dry-before-use mesh sizes for these materials which would result in a wet-after-use mesh size at, or close to, the required minimum.

As a result, a regulation (18 F.R. 8903-8904) which became effective on January 1, 1954, carried a certification requirement of 5-5/8 inches for 50-yard, four-ply double manila and 5½ inches for 80-yard, 4-ply double manila. All codends meeting these requirements became eligible for certification for use in the haddock fishery, and when so-certified, removed all liability for use regardless of the resulting mesh size.

Certification of cod ends is usually done in the gear wholesaler's loft and only at his request. A single series of meshes midway between the lacings is stretched under a tension of 200 pounds as

indicated on a spring scale. This tension has been found to give the most uniform results on all types of twines and hence has been adopted as the standard. (Bullis, 1953). After being stretched, the row of meshes is measured, not including the half mesh on both ends because of distortion. The average size of the meshes is then found by dividing the number of full meshes involved into the length of the row. If it is determined that the codend meets the specifications for that particular twine as stated in the regulations, a brass tag which bears a number and the letters "FWS" is attached and the net thus becomes "certified" for use in the haddock and cod fishery.

The necessity for good data upon which the certification program is based becomes immediately apparent, for once a net is "certified" it remains so certified during its entire life unless it is altered materially. When new, before-use sizes become known for any particular twine, the manufacturers of that twine are notified so that they can furnish the specified size to the industry.

Little or no trouble was experienced with manila twines manufactured by hand using standard procedure. It was only when the meshes were made over undersize knitting woods and then the completed product stretched to tighten knots that trouble arose. Since escapement experiments had been done on netting containing hand-tightened knots, there was a gain in mesh size as a result of the tightening of the knots duri/ use and this gain compensated for natural shrinkage of the twine. The change in manufacturing methods no longer offered this compensating gain in mesh size and a slight decrease in the after-use mesh size resulted making it necessary for the manufacturer to increase the before-use mesh size.

It is felt that manila netting offers fewer problems than synthetic nets, because of the relatively shorter useful life of manila fibers. When the certification program was started, all synthetic twines were certified at four- and one-quarter inches per mesh. The smaller mesh measurement for synthetics is based on selection equivalent data reported by McCracken (1957),von Brandt (1957) and Clark (1957) indicating no significant differences among the various types of synthetics and that a mesh size of $4\frac{1}{4}$ inches for synthetics has an escapement equivalent equal to that of $4\frac{1}{2}$-inch manila.

It was discovered, however, that some synthetic cords, depending on hardness, behaved erratically, and for that reason cannot be included in the certifiable list. Soft cords become impregnated with foreign matter (sand, etc.) that causes expansion and thus decreases the mesh size. To assure uniform construction each cord had to be analyzed as to denier (weight per unit of length), whether braided or twisted, and the coarseness of the finished cord used in the netting. Once these specifications are set for each type of synthetic used extensively in the fishery, they are included in the regulations so that manufacturers can be assured that twines which they produce will be eligible for certification.

The following commonly-used twines are presently being certified for use in the haddock and cod fisheries at the before-use sizes indicated:

(24 F.R. 735-736, Feb.3, 1959)

Table 1.

| Type of Twine | Average Mesh Size |
|---|---|
| Manila, double strand: | |
| 4-ply 45-yard | 5.625 inches (5-5/8") |
| 4-ply 50-yard | 5.625 inches (5-5/8") |
| 4-ply 75-yard | 5.625 inches (5-5/8") |
| 4-ply 80-yard | 5.500 inches (5½") |
| Cotton, 120-thread | 4.250 inches (4¼") |
| Synthetic: | |
| 400/3 twisted twine, double strand, 840 denier 3 x 4 x 3 | 4.375 inches (4-3/8") |
| 200/3 twisted twine, single strand, 840 denier 6 x 4 x 3 | 4.500 inches (4½") |
| No.400 single braid | |
| Double strand | 4.375 inches (4-3/8") |
| Single strand | 4.125 inches (4-1/8") |
| No.550 single braid | |
| Double strand | 4.375 inches (4-3/8") |
| Single strand | 4.125 inches (4-1/8") |
| Flat Tubular Braid, single strand | 4.500 inches (4½") |
| Westerbeke No.2 Nylon Braid 100% Nylon Braid | 5.6875 inches (5-11/16") |

As we have previously indicated the real problem involved in a net certification program results from the vast numbers of synthetic twines currently available and in use, many of which are unstable during use. It is obviously not feasible to collect the necessary data for certification of each of these materials nor is certification of all nets necessary or even desirable. Certification of nets is carried out as a service to the fishing industry but the use of certified nets is not compulsory. For that reason, we have adopted the position that data will be collected to allow certification of representative twines so that an individual desiring to avail himself of the service may do so and at the same time have a reasonable choice of types of netting from which to choose.

## References

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