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Marine finfish farms — Open net cage — Design and operation

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 234, *Fisheries and aquaculture*.

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Introduction

This International Standard is developed to ensure that a net cage marine finfish farms are adequately designed, constructed, and maintained to meet the anticipated rigours of the marine environment in which they will be deployed to prevent escapes (unintended impacts) during every day operations and unforeseen events. The standard is to be applied by the farm operators on a site-specific basis. Aquaculture producers are recommended to ensure that the combination of technologies that they have selected for a site meets environmental and other operational considerations for that site. Equipment manufacturers can use this International Standard, methodology, and terminology so that their customers (farm operators) can have the opportunity to meet the requirements with this International Standard.

The physical rigours of the marine environment to which a net cage marine finfish farm can be subjected include tidal currents, wave action, storm surges, hurricanes, wind exposures, icing; equipment design (net cage structures, mooring systems, netting components, predator control, and site markers. Other factors influencing the integrity of a net cage marine finfish farm include qualifications of equipment manufacturers and suppliers, handling practices, inspection and maintenance, reporting and auditing, and stock loss and recovery planning.

Within marine aquaculture, an increasing degree of farming on high energy sites (strong tidal currents, wave action, storm surges, hurricanes, wind exposure, icing) is predicted. Further developments in equipment and technology for farming in cages on high energy sites can result in improved water quality and fish health. The use of high energy locations will necessitate improvements of cages, mooring systems, and feeding systems. It can also require larger boats for servicing, and calls for new techniques for installation and daily operations.

This international technical standard is intended to reduce technical and operational failures, consequently enhancing the sustainability of the industry. All precautions are recommended to be taken to prevent escapes (unintended impacts) from aquaculture installations as a result of improper specification of technical main components or improper operational use. This International Standard will offer one tool in a link of other guidelines needed for the aquaculture industry to be environmentally sustainable.

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Marine finfish farms — Open net cage — Design and operation

1 Scope

This International Standard presents a general method to be followed for the systematic analysis, design, and evaluation of net cage marine finfish farms. One common style of a net cage finfish farm is shown in Figure 1. A mooring system holds together a series of net cages which contain finfish. Water from the outside environment freely passes through the nets, providing the necessary environment for farming finfish. The methodology presented in this International Standard allows for determination of the adequacy of a given finfish farm's floating structure, nets, and mooring equipment for a given environment. The standard addresses specification of a design basis through evaluation of environmental conditions and acceptable risk, and specifies acceptable techniques for the design and analysis of finfish farms. This International Standard also provides guidelines for development of a handbook which documents procedures for correct maintenance and operation of the finfish farm.

The application of the standard is intended to reduce the risk of escape from marine finfish farms. This International Standard is designed to be used by the operator of a net cage marine finfish farm. It is intended that through application of this International Standard that increased human safety and system integrity levels can be achieved.

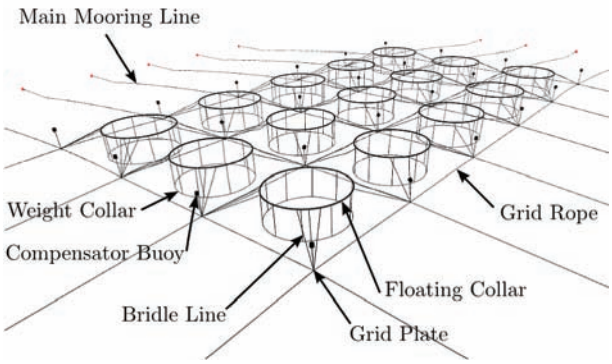


Figure 1 — Typical net cage marine finfish farm design

2 Normative references

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

ISO 1107, *Fishing nets — Netting — Basic terms and definitions*

ISO 19900, *Petroleum and natural gas industries — General requirements for offshore structures*

ISO 19901-1, *Petroleum and natural as industries — Specific requirements for offshore structures — Part 1: Metocean design and operating conditions*

3 Terms and definitions

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

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3.1
cage
floating collar with attached net cage for the purpose of containing finfish

3.2
floating collar
frame which provides buoyancy and attachment for one or more net cages

3.3
net cage
net construction attached to a floating collar for the purpose of containing fish

3.4
net pen
net construction that rests on the seabed and whose purpose is to contain fish

3.5
mooring system
system of lines (e.g. polyester rope, chain, wire rope) and bottom attachments for the purpose of keeping the floating components in a desired position

3.6
barge
floating work station on a marine finfish farm, separate or integrated, with technical equipment for performing certain functions connected to fish farming

Note 1 to entry: The barge can have functions as storage, feeding, electricity supply, crewing, and monitoring of the site and others.

3.7
marine finfish farm
containment system for the purposes of farming finfish

Note 1 to entry: A marine finfish farm typically consists of a mooring system, floating collars, anchoring system, net cages, and can include a barge.

3.8
net cage
containment system through which water freely flows through the net cage from the outside environment

Note 1 to entry: This is in contrast to closed containment systems, in which water from the outside environment does not pass freely through the structure.

3.9
predator net
barrier cage preventing predators from entering the net cage

Note 1 to entry: A predator net could be a birdnet, jumpnet or other types of nets used for protection against predators such as e.g. birds, sea lions, seals, and sharks.

3.10
operator
party responsible for the operation of a net cage marine finfish farm and may or may not be the owner or producer

3.11
supplier
organization that provides a product or a service to a customer

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