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Krožna zasnova ribolovnega orodja in opreme za akvakulturo - 6. del - Zahteve in navodila za digitalizacijo informacij o orodju in komponentah

Circular design of fishing gear and aquaculture equipment - Part 6 - Requirements and guidance for digitalization of information on gear and components

Kreislaufwirtschaft von Fischfanggeräten und Aquakulturausrüstungen - Teil 6: Digitalisierung von Geräten und Komponenten

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Circular design of fishing gear and aquaculture equipment - Part 6: Digitalization of gear and components

Digitalisierung von Geräten und Komponenten

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European foreword

This document (prEN 17988-6:2023) has been prepared by Technical Committee CEN/TC 466 “Circularity and recyclability of fishing gear and aquaculture equipment”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

EN 17988 consists of the following parts, under the general title Circular design of fishing gear and aquaculture equipment:

- Part 1: General requirements and guidance
- Part 2: User manual and labelling
- Part 3: Technical requirements
- Part 4: Environmental and circularity requirements and guidelines
- Part 5. Circular business models
- Part 6. Digitalization of gear and components.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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Introduction

Directive (EU) 2019/904 of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment lays down rules on different plastic products, including fishing gear and aquaculture equipment containing plastics and sets requirement to the Member States to establish Extended Producer Responsibility schemes (EPR schemes).

In accordance with Article 8(9) of the Directive, in 2021 the Commission Implementing Decision M/574 on a standardization request (mandate M/574) to the European Committee for Standardization as regards circular design of fishing gear aquaculture equipment in support of Directive (EU) 2019/904 was approved.

Based on the mandate, a standard with 6 parts and a technical report (TR) on terms and definitions has been developed by CEN/TC 466.

The purpose of this series of documents is to provide the stakeholders with requirements and guidelines to address the different aspects of circular design of fishing gear and aquaculture equipment, including encourage preparing for reuse and facilitate recyclability at end-of-life. The standard parts are developed not only to support the Single Use Plastics directives (SUP), but the Port Reception Facilities directive and the Extended Producer Responsibility, (ERP), as well.

The standard parts specify requirements and guidance for the circular design of fishing gear and aquaculture equipment containing plastics that could be applied in the design, manufacturing, use and recycling of such fishing gear/equipment.

To get a broader understanding of the legislative and policy background, see regulations commission implementing regulation (EU) No 404/2011 of 8 April 2011.

NOTE EU 404/2011 is laying down detailed rules for the implementation of Council Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy, in particular: TITLE II general conditions for access to waters and resources CHAPTER III Marking and identification of EU fishing vessels and their gear Section 2 Marking and identification of fishing gear and crafts from art 8 to art 17.

Digitalization in the fishing gear/aquaculture equipment is not about whether product and services are physical or information based, it is merely about the manner in which value chain operations and processes are managed with a wide variety of emerging technologies.

Digital transformation is characterized by the European Commission (EC) as “a fusion of advanced technologies and the integration of physical and digital systems, the predominance of innovative business models and new processes, and the creation of smart products and services” (European Commission, 2017).

Currently there is confusion between digital transformation, digitalization and digitization of conceptual terms:

- Digital transformation (Business level) – change the strategy business model and customer experience:
 - o Digital data.
 - o Automation.
 - o Integration between suppliers and customers.

- o Digital Customer Access.
- Digitalization (Process level): emerging technologies' use to transform processes.
- Digitization (Data level) data conversion from analogue to digital form.

Therefore, to transform the business model digitally value chain processes, digitalization and data digitizing are necessary but insufficient. Further, other elements need to be considered, such as data integrity.

Digitalization can connect end-to-end value chain processes at various levels. First within a location then between locations and ultimately across the whole value chain to deliver greater value creation. An increased use of digital technologies is crucial to shifting the linear and functional design of fishing gear and aquaculture equipment management towards more sustainable circular design. Such technologies improve mechanical, chemical and thermochemical recycling, facilitating the use of recyclates by producers, enabling better purchasing and sorting decisions and improving waste avoidance options for recyclers.

Advanced digitalization in recycle management and treatment is currently mostly in the innovation phase. New business models, such as e-trading platforms, and specific software and business analytics are emerging.

Digital technologies can be found across the whole life cycle of the value chain process, with some already in widespread use. The current situation in Europe, however, is heterogeneous, with different technologies being applied at various scales.

This document, part 6 of the standard, specifies requirements for the hardware, software and systems for digitalization of product information of circular designed fishing gear and aquaculture equipment. It is structured as follows:

- Clause 4 of this document outlines the general requirements and guidance for digitalized information of fishing gear and aquaculture equipment.
- Clause 5 reviews the fishing gear and aquaculture equipment labelling options with focus on coded wire tags, radio frequency identification tags and Automatic Identification and Data Capture, and Data Exchange approaches and standards.
- Clause 6 addresses traceability requirements and options
- Clause 7 addresses software requirements and options.
- Clause 7 addresses issues related to access to data.
- Clause 7 addresses issues related to ownership of data.
- Clause 10 addresses IP sensitive and proprietary information.
- Clause 11 addresses issues related to interoperability and data standards.
- Clause 12 address implementation of digital solutions.

The specification of how to identify and uniformly label gear and equipment to ensure traceability of components throughout their life cycle is covered in part 2 of the standard.

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To understand how part 6 relates to the other parts of this standard series, and to understand how the standard series relate to different stakeholders over the life cycle of gear and equipment product, see part 1 – General requirements and guidance.

The focus of this document is on digitalization related to circularity. It does not address other important environmental aspects, efficiency, etc. To be practical and efficient digitalized systems will cover all aspects of importance. When implementing the requirements and guidance in these standard parts, balanced trade-offs to other environmental issues therefore need to be taken into account.

This multipart standard also intends to facilitate organizations in contributing to the UN Sustainability Development Goals, SDG 9 Industry, innovation, and infrastructure, SDG 12 Responsible consumption and production and SDG 14 Life below water, especially SDG 14.1 that aims by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution.

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1 Scope

This standard part 6 specifies requirements for the hardware and software for digitalization of product information of circular designed fishing gear and aquaculture equipment.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Requirements for digitalized information

4.1 General requirements

The digital transformation of the fishing and aquaculture sector should be aligned with plans to make greater use of digital technologies in the development of a circular economy.

Marking, labelling and information sharing are the key elements of digitalization. The availability and transparency of information sharing between different actors, across the value chain will improve the vertical integration across the value chain. However, this could be achieved through a high level of collaboration access to appropriate digitalization technology. The transparency of trace and track technology also requires a certain level of interoperability across value chain participants. Sharing accurate, real-time operational information between the trading partners can lead to better use of assets such as fishing gear in the value chain.

Annex A demonstrates the main general marking options for fishing gear and aquaculture equipment.

4.2 Fishing Gear and Aquaculture equipment Digital Material Passports (DMP) Master Data

4.2.1 Benefits

According to the new Circular Economy Action Plan (CEAP), Digital Material (product) Passports (DMPs) allow benefiting from digitalization for increasing sustainability and circularity of products (European Commission, 2020). DMPs can be universally used for describing products and substances contained in them. DMP is a structured set of data about the components and materials that an individual product contains to enhance its use, recovery and reuse in the future.

Having a unique identifier for each Fishing Gear and /or Aquaculture equipment facilitates organizing, displaying, and communicating with data exchange and avoid duplicate resolutions.

Such data provide a wide range of properties of the product and its constituents that enable its safe management and recycling. Information in DMPs can be structured on different hierarchy levels, where materials integrate into components, products and systems. Digital technologies allow the

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exchange and integration of such data from multiple players. For each material, a data set describing its physical, chemical and other properties is developed. An important part of data on material properties contains the description of Substances of Concern (SoCs) and other safety information collected by the manufacturers/suppliers/importers to comply with legislative requirements.

4.2.2 Minimum requirements

The introduction of a fishing gear or aquaculture equipment identifier enables the implementation of a global labelling system and, at the same time, local fishing industry support for its implementation at the level of national units in the local language.

Example:

Using Global Individual Asset Identifier (GIAI) as a primary key is a quick way to find attributes of fishing gear and/or aquaculture equipment in a database. The attributes of the fishing gear/aquaculture equipment can be recorded and shared digitally using the GIAI as the key to the information. Examples of the type of information held include the fisher who owns the fishing gear, the vessel, the location of the fishing gear and the component material list of the fishing gear.

See Annex B for further examples on code-based marking and labelling.

4.2.3 Optional digitalization

In general, the choice of properties depends on the type, the characteristics of materials and size of the fishing gear being made, the species of fish being caught, the fishing ground and the fishing conditions under which the gear is being operated, the type, size and engine power of the vessel, the type of operation and the auxiliaries employed as well as on the habits and traditions of the fishermen and the local availability and price of netting materials.

An optional data set for fishing gear and /or aquaculture equipment can be found in Annex C.

4.3 Value chain material and information flows**4.3.1 Benefits**

Digital technologies are considered vital enablers to create circular economy business models and address plastic waste and pollution. Digitalization can help close the material loops by providing accurate information on products availability, location and condition; it also enables more efficient processes and minimizes waste. Digitalization of all processes and workflows, including the signature process for legal documents through a Qualified Electronic Signature (EU Sign).

4.3.2 Guidance

Figure 1 in Annex D shows two processes simultaneously, the fishing gear or aquaculture equipment value chain material and information flows which are like two sides of the same coin. In the process the material flow is a movement of materials but people should also consider there is another flow i.e. information flow which helps each process with what to do next. Typically, material flows are one-directional while information flows are bi-directional. For further details, see Stakeholder / value chain overview Part 1 – General requirements and guidance.

Example 1 – Chemical Raw Material Producer – Monomer producer:

A monomer producer places an order to a chemical raw materials producer (based on catalogue data which is based on Master data sets for monomers); the chemical raw materials producer acknowledges the order and delivers the materials and issues an invoice then the buyer pays the amount according to the invoice.

Example 2 - Sorted / Pre-processed materials –Mechanical recycling:

Fishing gear leftovers (Abandoned, Lost or otherwise Discarded Fishing Gear – ALDFG) waste can be recycled in a different way depending on types of polymers, and fishing gear type design and if the ALDFG leftovers consist of a single polymer or mixed polymers. Mechanical recycling is one of the most common methods for recycling of thermoplastic polymers such as PP, PE and PA. This process implies collection, sorting, washing and grinding of the material.

Collection and sorting are addressed separately in this document. Further washing of products is a mandatory step for removal of contaminants such as biofouling and adhesives. There are various techniques to remove residues, e.g. via wet by water or dry cleaning of the surfaces through friction without using water. Afterwards, the size reduction from products to flakes via grinding is the last step in mechanical recycling. The compounding and pelletizing can be the optional reprocessing of the flakes into granulate due to easier work for converters.

Example 3 - Digital exchange platforms and applications support reuse, repair, remanufacture design with the help of blockchain-based payment systems and smartphone applications.

5 Fishing gear and Aquaculture equipment marking with tags

5.1 Identification of ownership and capacity, position, and material information

Fishing Gear can be marked permanently with codes. A recommended solution would consist of marking both existing and new fishing gears and/or aquaculture equipment to register their use in fishing processes. The net tags should be read when released for departure from the port and at return to port. Registering (or not registering) the presence of the nets at both points of the process will indicate the possibility of losing gears and the need to undertake search action. Simultaneously the net markers can also be used to control the legality of fishing operations, their volume, duration, etc. Automatic registration of net exposure from the vessel's side and taking them (with complete control) will allow effective and detailed documentation of processes.

An important aspect of the application of automatic identification technology is the use of solutions known from logistics (also partially used in the fishing industry – in the processes of identifying the origin of seafood – the so-called “traceability”). Systems implemented in logistics processes are, in a significant part, based on the use of global standards, which allows for easy data exchange and cooperation in supply chains. Regulations introduced to the economy increasingly require control of production processes (including food production, including seafood), and automatic identification systems are increasingly and more often used in connection with the reduction of implementation costs.

- a) The first type is identification marking, which helps in identifying the ownership of lost or deliberately abandoned gear. By creating a link between the gear and the responsible vessel, authorities can better enforce penalties for intentionally dumping fishing gear and nets into the sea. Marking gear also creates an opportunity to return gear that was accidentally lost to the owner for reuse.
- b) The second type of gear labelling is to increase the position visibility of gear. For example, floating gear labellings attached to stationary nets under the surface can help notify vessels about the risk of entanglement in the area.
- c) Current labelling requirements do not include information on the material of the fishing gears.

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However, new technologies such as electronic labelling make it possible to store composite material information. Detailed information regarding material characteristics of a fishing gear or an aquaculture equipment should preferably be recorded in a database (of a standardized format to ensure compatibility between relevant databases). Examples of a code-based labelling system are provided in Annex “B”.

5.1.1 Fishing Gear identification for ownership and capacity purposes

The Voluntary guidelines of Food and Agriculture Organization of the United Nations (FAO) recommends in Annex III the authorization to fish should, in general, include a requirement for the following information to be given on:

- Name and address of person(s) authorized to fish and name of vessel (where relevant).
- Gear type.
- Expected area of use.
- Principal target species.

Traditionally, various physical tags have been used, usually inscribed with the permit number of its owner. In some fisheries, tags are fixed in the gear itself (e.g. gill-nets) or attached to its surface markers (e.g. buoy of a pot). These physical tags can only contain limited information (e.g. license number). More advanced tags that contain static information (e.g. license number, owner, vessel, etc.) as well as dynamic information (such as time in water, location deployed, etc.) would have advantages both for fishers and for management. Advanced tags that can be detected over a longer distance would help fishery enforcement in combating Illegal, Unreported and Unregulated (IUU) fishing.

Fishing gear types has defined by the United Nations Fisheries and Aquaculture Department of the FAO and is used to identify the type of fishing gear used for catching the fisheries product. The fishing gear type list provides definitions of fishing gear of all kinds, grouped by categories. These definitions and classifications are valid on a world-wide basis for both inland waters and sea fisheries, as well as, for small-, medium- and large-scale fisheries.

The fishing gear type code list (Table 2) is based upon a study to support the implementation of obligations set out in the Single Use Plastics (SUP) and Port Reception Facilities Directives.

Table 1 — SUP Proposed taxonomy of fishing gear and aquaculture equipment

Level 1	Level 2	What would fit in level 2 category
1. Net panels made of thick twine (>1 mm)	1.1 Net panels from demersal trawls	Net panels from beam trawls, single bottom otter trawls, twin bottom otter trawls, bottom pair trawls
	1.2 Net panels from seines and pelagic trawls	Net panels from purse seines, beach seines, Scottish and Danish seines, midwater otter trawls, midwater pair trawls
	1.3 Net panels from other gear	Net panels from FADs, lift nets, barriers, fences, weirs, etc., <u>fish cages (nets)</u>

Level 1	Level 2	What would fit in level 2 category
2. Net panels and lines made of thin twine (<1 mm)	2.1 Net panels from gill-nets or trammel nets	Net panels from set gill-nets (anchored), drift and encircling gill-nets, trammel nets, combined gill-nets-trammel nets
	2.2 Net panels from other gear	<u>Bouchot netting, predator protection (aquaculture)</u>
	2.3 Lines	Hand lines, troll lines, branch lines of set and drifting longlines
3. Other plastic based gear or part thereof	3.1 Pots	Any pot
	3.2 Rods	Any rod
	3.3. General twine	3.3. General twine
	3.4 Misc. plastic-based gear or part of gear	Dolly ropes, <u>Fish cages (floating collars), pipes, pond liners, bags for off-bottom culture</u>
4. Non plastic parts of gear	4.1 Metal component of gear	Hooks, swivels, wire, chains, weights, reels, etc.
	4.2 Non-metal and non-plastic components of gear	Rubber from trawl ground ropes, <u>rubber pond lining</u>
5 Buoys, floats and ropes	5.1 Buoys and floats	Any type of buoys or floats
	5.2 Ropes	Any rope segment

NOTE The underlined text is relevant for aquaculture gear

5.1.2 Fishing Gear identification for marking of position visibility

Two kinds of orbiting systems are mainly suitable for fisheries management and enforcement of legal measures protecting marine ecosystems:

- a) Systems enabling calculation of a vessel's positional data coupled to different kinds of onshore/satellite receivers.
- b) The use of satellite remote sensing with very high resolution (VHR) images of the visual spectrum or synthetic aperture radars (SARs) that detect vessels from space.

Positional systems are based on mature technologies, with a proven history of successful data delivery, and have been used for decades in fisheries control. Satellite remote sensing and the use of visual or radar images is more recent; its results in fisheries control are promising, complementing the use of positional data.

Annex III of FAO's Voluntary guidelines recommends to reflect the special requirements of:

- Vessels fishing on the high seas.
- Vessels fishing in waters of States other than those of the flag State.