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EAST AFRICAN STANDARD

Production of frozen fish, marine molluscs, and derived products

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EAST AFRICAN COMMUNITY

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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Introduction

In the preparation of this East African Standard, the following sources were consulted extensively:

SANS 585:2009, *The production of frozen fish, marine molluscs, and products derived therefrom*

IS 4303-1:1975, *Code of hygienic conditions for fish industry — Part 1: Pre-processing stage*

IS 4303-2:1975, *Code of hygienic conditions for fish industry — Part 2: Canning stage*

Codex Alimentarius website: http://www.codexalimentarius.net/mrls/vetdrugs/jsp/vetd_q-e.jsp

USDA Foreign Agricultural Service website: http://www.mrldatabase.com

USDA Agricultural Marketing Service website: http://www.ams.usda.gov/AMSv1.0/Standards

European Union: http://ec.europa.eu/enterprise/sectors/pharmaceuticals/veterinary-use/maximum-residue-limits/index_en.htm

Assistance derived from these sources is hereby acknowledged.

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Production of frozen fish, marine molluscs, and derived products

1 Scope

This standard specifies requirements for the handling, preparation, processing, packaging, transportation, freezing, storage and quality of frozen fish, marine molluscs, and products derived therefrom which are intended for human consumption. It also specifies requirements for factories and employees involved in the production.

2 Normative references

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

CAC/GL 21, *Principles for the establishment and application of microbiological criteria for foods*

CAC/RCP 1, *Recommended international code of practice — General principles of food hygiene*

CAC/GL 30, *Principles and guidelines for the conduct of microbiological risk assessment*

CAC/GL 31, *Guidelines for the sensory evaluation of fish and shellfish in laboratories*

CAC/GL 48, *Model certificate for fish and fishery products*

CAC/RCP 52[CD/K/521:2010], *Code of practice for fish and fishery products*

CAC/GL 53, *Guidelines on the judgement of equivalence of sanitary measures associated with food inspection and certification systems*

EAS 12, *Drinking (potable water) — Specification*

EAS 35, *Edible salt — Specification*

EAS 38, *Labelling of prepackaged foods — Specification*

EAS 41, *Fruits, vegetables and derived products — Sampling and methods of test*

EAS 103, *Schedule for permitted food additives*

EAS 123, *Distilled water — Specification*

ISO 4831, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms — Most probable number technique*

ISO 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique*

ISO 4833, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of microorganisms — Colony-count technique at 30 degrees C*

ISO 6579, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Salmonella spp.*

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ISO 6887-1, *Microbiology of food and animal feeding stuffs — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 1: General rules for the preparation of the initial suspension and decimal dilutions*

ISO 6887-3, *Microbiology of food and animal feeding stuffs — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 3: Specific rules for the preparation of fish and fishery products*

ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

ISO 6888-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 2: Technique using rabbit plasma fibrinogen agar medium*

ISO 6888-3, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 3: Detection and MPN technique for low numbers*

ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

ISO 7937, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of Clostridium perfringens — Colony-count technique*

ISO 13720, *Meat and meat products — Enumeration of Pseudomonas spp.*

ISO 21567, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Shigella spp.*

ISO/TS 21872-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of potentially enteropathogenic Vibrio spp. — Part 1: Detection of Vibrio parahaemolyticus and Vibrio cholerae*

ISO/TS 21872-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of potentially enteropathogenic Vibrio spp. — Part 2: Detection of species other than Vibrio parahaemolyticus and Vibrio cholerae*

3 Definitions

For the purpose of this standard the following definition shall apply:

3.1
acceptable
acceptable to the authority administering this standard, or to the parties concluding the purchase contract, as relevant

3.2
battered
product dipped in a thick batter and then fried

3.3
breaded
product dipped in a liquid or thin batter and then coated with crumbs

3.4
brine pre-freezing
process by which fish are rapidly frozen by total immersion in refrigerated brine at a temperature of -9 ℃

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NOTE Brine pre-freezing does not complete the freezing process (see 3.14).

3.5
by-product
product not intended for human consumption

3.6
chill room
insulated and refrigerated room that is specially designed for the storage of foods at temperatures not lower than -1 ℃ and not higher than 4 ℃, that has sufficient refrigeration capacity to maintain the desired storage temperature, and that also has sufficient refrigeration capacity to ensure that products placed in the chill room are cooled to that temperature

NOTE Where the product is to be stored with ice in a chill room, this definition is not applicable.

3.7
disinfectant
chemical agent that kills most vegetative forms of pathogenic and other micro-organisms (but not necessarily all bacteria and fungal spores, mycobacteria, rickettsiae, or viruses) on inanimate surfaces

3.8
factory
premises, vehicle or vessel on or in which fish (see 3.9) or fish products (see 3.11) are handled or treated to prepare them for freezing for commercial purposes

NOTE This definition excludes fish shops, hotels, boarding houses, restaurants or other eating houses.

3.9
fish
edible cold-blooded aquatic (marine or freshwater) vertebrate that has gills throughout its life and has limbs modified into fins, and all marine molluscs (see 3.16) and cephalopods

3.10
fish bone defect
fish bone of length equal to or exceeding 10 mm, or of diameter equal to or exceeding 1 mm

NOTE 1 A bone of length not exceeding 5 mm is not considered a defect if its diameter does not exceed 2mm.

NOTE 2 The foot of a bone (where it has been attached to the vertebra) can be disregarded if its width does not exceed 2 mm, or if it can be easily stripped off with a fingernail.

3.11
fish product
fish intended for human consumption that is in a partly processed or wholly processed form

3.12
freezer
room or equipment that is specially designed to lower the temperature of a food product through the zone of maximum crystallization and down to an equilibrium temperature of -18℃ or lower in a period of time that is acceptable for the product

3.13
freezer storage room
insulated freezer room that is specially designed for the storage of frozen foods, and that has sufficient freezing capacity to maintain a product temperature of -18 ℃ or lower when products that have already been frozen to that temperature are being stored

NOTE A freezer storage room is not designed to freeze products.

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3.14
freezing process
continuous process whereby the temperature of the product is lowered through the zone of maximum crystallization (for most products this is between -1℃ and -5 ℃), at a rate of at least 6 mm of product thickness per hour, and that is only completed when the temperature of the entire product, after thermal stabilization, has reached -18℃ or lower

NOTE The process whereby a product that has undergone brine pre-freezing is so further frozen that the temperature of the entire product, after thermal stabilization, is -18 ℃ or lower, is considered a continuous process in terms of this standard. This is provided that the temperature of the product does not rise above -7 ℃ during this process.

3.15
frozen fish product
fish product (see 3.11), smoked or unsmoked, cooked or uncooked, that has undergone a freezing process and has been preserved by storage in the frozen state

3.16
marine mollusc
marine invertebrate of the phylum *Mollusca* that has a soft unsegmented body and usually covered by a hard shell

NOTE The group includes bivalves (such as clams and mussels) and cephalopods (such as squid).

3.17
minced fish
minced particles of skeletal muscle of fish that have been separated from and are acceptably free from fish bones and skin

3.18
outer container
master container
box, carton or case into which packages of frozen fish products (with or without wrappers) are packed for storage and distribution

3.19
package
immediate container
immediate carton, plastics pouch or other container in which the product is packed for storage and distribution

3.20
preserve
maintain in sound edible condition through the prevention of deterioration

3.21
process
course of operations during production (see 3.23) of the product

3.22
product
fish, marine molluscs, and fish products or marine mollusc products for human consumption which are in the course of handling, preparation, processing, packaging or transportation for freezing, in the course of being frozen, or after having been frozen, as indicated by the context of the standard

3.23
production
handling, preparation, processing or packaging of product for freezing, in the course of being frozen, or after having been frozen, including the process of frozen storage, as indicated by the context of the standard

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3.24
quick-freezing process
continuous process whereby the temperature of the product is lowered through the zone of maximum crystallization (for most products this is between -1 ℃ and -5 ℃) within 4 h, at a rate of at least 25 mm of product thickness per hour, and that is only completed when the temperature of the entire product, after thermal stabilization, has reached -18 ℃ or lower

3.25
quick-frozen fish product
fish product (see 3.11), smoked or unsmoked, cooked or uncooked, that has been frozen by the quick-freezing process

3.26
skewer
pin for holding cuts of fish (with or without vegetables or fruit or any combination thereof) and that may be made of wood, metal or a plastics material specially selected to be used in contact with food

3.27
suitable
acceptable and in compliance with the relevant requirements for the intended purpose

3.28
suitable corrosion-resistant material
impermeable material that has smooth surfaces (free from pits, crevices and scale), that is nontoxic, is unaffected by seawater, ice, fish slime and any other corrosive substance with which it is likely to come into contact, and is capable of withstanding exposure to repeated cleaning, including the use of detergents

3.29
wood smoke
smoke that is derived from wood or from woody plants that are acceptably free from gum and resin, paint, timber preservative and other added substances, in a state of combustion or friction and that can be used to smoke fish in kilns designed for the purpose, or that can be condensed in, or absorbed into, a suitable food grade liquid or powder for the preparation of a smoke dip

4 Requirements for the factory

4.1 General

4.1.1 All the statutory requirements contained in the current relevant national legislation (see foreword) shall be complied with.

4.1.2 Managers shall implement documented methods and procedures, based on the requirements of 4.2, that can testify that an acceptable product safety management system has been incorporated.

4.2 Factory construction, layout and conditions

4.2.1 Location, size, hygienic design and conditions

4.2.1.1 The location of the factory shall be such that the buildings can be kept acceptably free from objectionable odours, smoke, dust and other contamination, in order to comply with the current relevant national legislation (see foreword) for hygiene and sanitation.

4.2.1.2 The factory buildings shall be of sound construction, in good repair, and large enough to prevent crowding of equipment and employees, and to permit adequate cleaning and the maintenance of product quality and hygiene.

4.2.1.3 The factory premises shall be well drained and adequately fenced to keep out larger animals, such as cats and dogs, as well as unauthorized persons and vehicles.

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4.2.1.4 Outdoor work areas, roads and pathways on the premises shall have a permanent surface of concrete, brick, bitumen or other durable material.

4.2.1.5 Areas outside buildings and not in actual use shall either be covered by lawn or have a surface that is not liable to produce dust, and shall not contain toxic substances.

4.2.1.6 The factory and equipment shall be so designed as to permit the processing of raw materials without undue delay. The buildings shall be so designed and constructed as to prevent the entry and harbouring of insects, birds, rodents and other vermin.

4.2.2 Roofs and ceilings

4.2.2.1 Roofs shall be weatherproof and made of non-absorbent material and shall be well maintained to prevent contamination of the product and ingredients, and to prevent other structures from becoming damp.

4.2.2.2 Roofs and, where applicable, ceilings, shall fit tightly to the walls and shall be at least 2.4 m from the floor. In the preparation, processing and packaging areas, the roof and, where applicable, the ceiling, shall be at least 300 mm above any equipment and high enough to allow the free movement of mobile equipment and moving parts of other equipment.

4.2.2.3 In the preparation, processing and packaging areas, and in storage areas for ingredients and for packaging materials for the product, the ceiling (or, where no ceiling is provided, the roof) shall be dustproof and faced with a suitable corrosion-resistant, light-coloured and impermeable material that is so constructed and finished as to minimize condensation, mould development, flaking of paint and the lodgement and accumulation of dirt, and shall be capable of being cleaned without damage.

4.2.2.4 Areas where sauce is prepared or where the cooked product is handled, or where ingredients and packaging materials are stored, shall have a ceiling.

4.2.3 Walls, windows and doors

4.2.3.1 Outer walls shall be weatherproof and impermeable to water.

4.2.3.2 All interior wall surfaces shall be faced with a smooth, light-coloured, washable, water-impermeable, and impact-resistant material to a height of 2 m above the floor. However, if soiling of the walls can occur above this height, then the facing shall be continued to a higher level.

4.2.3.3 All ledges on the inside of walls and all windowsills shall be sloped towards the floor at an angle of at least 45°. The ledges shall be kept to a minimum size and windowsills shall be at least 1 m above floor level.

4.2.3.4 Wall-to-wall and wall-to-floor junctions in production areas shall be closed and coved. The minimum radius of the coving shall be 25 mm and 40 mm, respectively.

4.2.3.5 Doors and door frames shall be sheathed with, or made from, a suitable corrosion-resistant material and shall have a smooth, seamless, light-coloured, water-impermeable, and readily cleanable surface. If wood is used, it shall be sheathed to render it impermeable to water.

4.2.3.6 Doors through which the product is moved between the preparation, processing and packaging areas shall be wide enough to prevent contamination of the product and damage to the doors.

4.2.3.7 All doors that open directly from the outside into the preparation, processing and packaging areas shall be provided with effective air screens or shall, as far as is practicable, be self-closing and tight-fitting. Freezer, chill room and freezer storage room doors shall be tight-fitting.

4.2.4 Floors and drainage

4.2.4.1 Floors shall be constructed of concrete or any other material that is water-impermeable,

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corrosion-resistant and easy to clean, and shall be laid to an even surface that is smooth but not slippery, and free from cracks, crevices and open joints.

4.2.4.2 Floors in the preparation, processing and packaging areas and in freezers, chill rooms and freezer storage rooms shall be suitably sloped and shall drain into external gullies, sumps and sewers. Each outlet shall have, immediately outside the factory walls, a trap that prevents the entry of rodents.

4.2.4.3 Drainage channels shall be of the open type with, where necessary, removable covers, and shall be designed to cope with the maximum expected flow of liquid without overflowing or causing flooding.

4.2.4.4 There shall be no installations in a drainage channel that could obstruct the flow of water or the activities of cleaning. Gully traps shall be fitted with easily removable strainers. Where necessary, duckboards of easily cleanable, impermeable material shall be provided. Wooden duckboards shall not be used in wet areas. Floors and drains shall be maintained in good condition and repair.

4.2.5 Lift cages and staircases

4.2.5.1 Lift cages shall have a corrosion-resistant inside surface that is smooth, easy to clean, and is water-impermeable, and the floor shall be properly drained. Mesh doors may be used, provided that they are not conducive to unhygienic conditions.

4.2.5.2 Staircases in rooms where the product is handled, prepared, processed, or packaged shall have solid risers, and shall be provided with closed balustrades of a height that will prevent contamination of products underneath the stairs.

4.2.6 Cables and pipes

4.2.6.1 Cables and pipes shall, where applicable, be

a) fixed above ceilings,

b) chased into walls,

c) carried under floors, or

d) fixed away from walls and ceilings and above the floor, and spaced in such a manner that the ceilings, walls, floor, cables and pipes can be easily cleaned and maintained in a hygienic condition.

4.2.6.2 Drainage and sewer pipes shall not be installed above ceilings in the preparation, processing or packaging areas, nor shall they be installed in such a way that accidental leakages could contaminate the product. The drainage and sewer pipes shall have an inside diameter of at least 100 mm and shall be properly vented to the outside.

4.2.7 Illumination

4.2.7.1 An illuminance of at least 220 lux is required for general operations, while at least 540 lux is required at points where close examination of the product is carried out.

4.2.7.2 Artificial illumination, if used, shall be such that the colour of the product is not significantly altered.

4.2.7.3 Luminaires suspended over production areas shall be of the safety type or otherwise so protected as to prevent contamination of the product in the event of breakage of a luminaire or lamp.

4.2.8 Ventilation

4.2.8.1 The ventilation shall keep the air fresh, remove excess water vapour, and shall prevent the

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build-up of excessive heat, the formation of condensate and the growth of mould. Natural ventilation shall be augmented, where necessary, by mechanical means.

4.2.8.2 The air shall be free from noxious fumes, vapours, dust and contaminating aerosols. The airflow shall be from the more hygienic to the less hygienic areas of the factory.

4.2.8.3 Windows that open for ventilation purposes shall be insect-screened. The screens shall be easily removable for cleaning and shall be made from a suitable corrosion-resistant material and kept in good repair.

4.2.9 Hand-washing facilities

4.2.9.1 The following shall be provided at the entrances to the preparation and processing areas of the factory used by employees, at other conveniently situated places within easy reach of the employees, and at the toilet exits:

a) an acceptable number of wash-hand basins with an abundant supply of hot and cold or warm potable running water, in the temperature range 40°C to 50 °C, that complies with the requirements of 4.4.1 ;

b) a sufficient supply of unscented liquid soap or hand cleaning detergent and, where required to dry hands, single-use disposable paper towels; and

c) taps operated by means other than the hands or elbows (for example, knee-operated or foot-operated taps) with pre-set volume control.

4.2.9.2 Hand-washing facilities shall, at all times, be unobstructed by equipment and operating activities. Hand-wash basins shall be of a suitable corrosion-resistant water-impermeable material, shall have a smooth finish, be easy to clean, and shall drain directly into drainage channels. In the case of a factory ship, at least one wash-hand basin in the toilet block and one each in the processing and packaging areas shall be supplied with hot and cold potable running water.

4.2.9.3 Disinfectant hand dips, where provided, shall be of such a design that they can be adequately cleaned.

4.2.10 Footbaths

4.2.10.1 Unless their absence in particular circumstances is acceptable, or unless alternative acceptable facilities for cleaning and disinfection are provided, footbaths that contain a suitable disinfectant solution shall be provided at each entrance to the preparation, processing and packaging area that is used by employees, and shall be so located that employees cannot obtain access to those areas without disinfecting their footwear.

4.2.10.2 Footbaths shall be so constructed that they can be adequately drained and cleaned.

4.2.11 Separation of processes and facilities

Separate rooms or well-defined areas of acceptable size shall be provided for

a) the receipt and storage of raw materials,

b) preparatory operations such as the heading, gutting and washing of fish,

c) processing operations such as filleting, steaking and freezing,

d) cooked or ready-to-eat products, which are to be cooled and packed separately from raw (uncooked) products,

e) the freezing process, which is to be performed with or in facilities that are separate from cold storage facilities (so as to prevent excessive temperature fluctuation during cold storage),

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f) packaging, and

g) the storage of the product.

4.2.12 Storage facilities

4.2.12.1 General

The production area of the factory shall not be used for storage purposes.

4.2.12.2 Storage facilities for edible ingredients

Storage facilities for edible ingredients used in the preparation of the frozen fish product shall be dry, free from dust and any other source of contamination, and shall be vermin proof.

4.2.12.3 Storage facilities for packing and packaging materials

Clean, dustproof, vermin proof and dry storerooms shall be provided for the storage of packaging and packaging materials.

4.2.12.4 Storage facilities for poisonous and harmful substances

4.2.12.4.1 Storage facilities for pesticides and other poisonous substances

Pesticides and other poisonous or harmful substances, and the equipment for their application, shall be stored in a room or cupboard in which no foodstuff, food-handling equipment, packaging material or food containers are stored and shall be kept locked. These poisonous or harmful substances shall at all times be segregated from edible substances. All these substances shall be prominently and distinctly labelled with the warning about their toxicity and use, and shall at no time come into contact with food containers, packaging materials, raw materials or the product.

4.2.12.4.2 Storage facilities for substances used for cleaning and disinfection

Substances used for cleaning and disinfection, and the equipment for their application, shall be stored in a room in which no foodstuff, food-handling equipment, packaging material or food containers are stored and shall at no time come into contact with food containers, packaging materials, raw materials or the product.

All substances used for cleaning and disinfection shall be prominently and distinctly labelled.

4.2.13 Storage facilities for utensils and spare parts

4.2.13.1 Utensils and spare parts that come into contact with the product shall, when not in use, be kept in a disinfectant solution or be stored in a hygienic manner in a dry area that is free from dust and any other source of contamination, and is vermin proof.

4.2.13.2 Spare parts for machinery that are capable of contaminating the product shall be kept in a separate storage area away from the production areas.

4.2.14 Smoke rooms

Doors used during the firing of smoke rooms shall not open directly into production areas, unless the smoke generator is so designed as to obviate pollution of these areas. Separate facilities shall be provided for the storage of smoke-generating materials.

4.2.15 Freezers, chill rooms and freezer storage rooms

4.2.15.1 Refrigeration units, such as compressors, shall not be installed in an area where the product is handled, with the exception of equipment that is an integral part of a production unit.

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4.2.15.2 Where freezers, chill rooms and freezer storage rooms are located in processing areas, their floors shall either be an integral part of the floor of the processing area or be adequately sealed to that floor. All storage units shall be installed high enough above the floor to permit easy and adequate cleaning of the area underneath them.

4.2.15.3 The walls and floors shall be in good condition. The surfaces of ceilings, walls and floors shall be of suitable corrosion-resistant material, shall be impermeable to water and shall be smooth and free from cracks, crevices and flaking of surface material. The floors shall be drainable, and the floors of chill rooms shall be sloped to effect complete draining.

4.2.15.4 Freezer storage rooms shall be equipped with automatic temperature recorders with enough suitably placed sensing elements to monitor the overall air temperature. The temperature in freezer storage rooms shall be automatically and continuously monitored and a record of the temperature shall be kept and be made available for inspection.

4.2.15.5 Temperature charts shall be so graduated that each division represents not more than 2 ℃ within the storage temperature range, and shall be easily readable to the nearest 1 ℃ within the storage temperature range. Batch freezers, other than plate freezers, shall be fitted with external gauges or other temperature indicators.

4.2.15.6 Freezer storage rooms on fishing vessels should have temperature recorders, but shall have at least external gauges or temperature indicators, and the indicated temperatures shall be recorded every 4 h.

4.2.15.7 Unless an alarm system is installed to alert the operator of system failure, freezer storage room temperature shall be verified manually every 4 h to ensure correct operation of equipment and recorders.

4.2.15.8 The entrances to freezers, chill rooms and freezer storage rooms shall be protected from the inflow of warm air by the provision of an ante-room, a mechanical air curtain, strip curtains or self-closing shutters.

4.2.16 By-products

Any processing of by-products and non-fish products that are not intended for human consumption shall be conducted in buildings that are physically separated from the factory in such a way that there is no possibility of contamination of the product.

4.2.17 Living quarters

Living quarters shall be completely separated from areas where the product is prepared, processed, packaged or stored.

4.2.18 Refuse

A separate, suitable refuse facility shall be provided on the premises and shall be cleaned daily.

4.2.19 Comfort facilities

4.2.19.1 An acceptable number of suitable change rooms, shower baths, wash-hand basins whose taps operate as described in 4.2.9.1(c), toilet facilities (separate for each sex) and, where appropriate, urinals, shall be provided within practical distance from the factory production areas.

4.2.19.2 Shower baths shall connect directly to the change rooms. Comfort facilities shall be separated and shall not open directly into the preparation, processing, packaging or storage areas.

4.2.19.3 Toilets shall be completely separate from change rooms, the only permissible access being through close-fitting, self-closing doors. Toilet blocks shall have their own hand-washing facilities, separated from those provided in change rooms.

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4.2.19.4 An ample supply of toilet paper, hot and cold running water, nailbrushes, unscented liquid soap or an acceptable detergent solution, and disposable paper towels shall be provided for employees. Receptacles shall be provided for used paper towels. Refuse bins of hygienic construction shall be provided.

4.2.19.5 Notices shall be posted requiring employees to wash their hands with soap or detergent after they have used the toilet. Lockers or controlled clothes baskets shall be provided, and the layout and equipment shall be such as to permit proper cleaning and maintenance.

4.2.19.6 The comfort facilities shall be kept clean and tidy. The comfort facilities shall be adequately ventilated. Change rooms and dressing-rooms shall not be used as living quarters or for the preparation of meals.

4.2.19.7 Staff dining-rooms shall be separate from the change rooms or dressing-rooms.

4.2.20 Facilities for the washing and laundering of protective clothing

Plastics brushes on corrosion-resistant chains, disinfecting soap or powder such as hypochlorite, and spray nozzles shall be provided near the hand-washing facilities for the cleaning of waterproof protective clothing and gloves. The washing or laundering of other types of protective clothing shall be performed by the packing facility or a firm contracted by the packing facility. Workers shall not be allowed to remove work clothing from the premises in order to launder this clothing. Laundering facilities at the packing facility shall not be connected to the preparation or storage areas.

4.2.21 Facilities for cleaning and disinfecting portable equipment

4.2.21.1 Facilities with proper drainage shall be provided for the cleaning and disinfecting of portable equipment.

4.2.21.2 Such facilities shall be located in a separate room or in a designated area in the preparation, processing and packaging areas where there is an ample supply of cold potable water (see 4.4.1) and hot water, where required, or saturated steam, or clean seawater at an adequate pressure which complies with the requirements of 4.4.2.

4.2.22 Specific requirements for fishing vessels

4.2.22.1 General

4.2.22.1.1 Fishing vessels shall be designed for the rapid and efficient handling of fish, and for easy cleaning and disinfection.

4.2.22.1.2 All surfaces with which the fish might come into contact shall be water-impermeable and, where practicable, shall be of suitable corrosion-resistant material. The surfaces shall be easily cleanable and shall have no projections or other features that could cause damage to the product.

4.2.22.1.3 Deck pounds, pen stanchions and dividing boards shall be constructed of suitable corrosion-resistant material and shall be easily removable. The number and height shall be such as to hold the estimated amount of fish and to prevent movement and crushing of the fish as a result of excess mass of fish or the vessel's motion.

4.2.22.1.4 Where practicable, wood shall be sheathed with a suitable corrosion-resistant material such as fibreglass, or shall be so treated as to be impermeable to water. Metalwork, other than stainless steel or galvanized steel or aluminium, which does not come into contact with the product, shall be coated with corrosion-resistant and non-toxic paint or other protective coating.

4.2.22.1.5 A suitable drainage system shall be provided. Areas where the product is prepared, processed, packaged or stored shall be well isolated from grease, oil, fuel, heat, fumes, food for crew, storage areas for material other than the product, and from the engine room and other sources of contamination.

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4.2.22.2 Storage facilities for fish

4.2.22.2.1 If fish is loaded on land within 8 h of the catch, the vessel shall have facilities that will at least protect the fish from the direct rays of the sun and keep the fish cool (at a temperature of 18 ℃ or lower) and moist. If fish is to be kept at sea for more than 8 h but not more than 10 d, facilities for chilling or freezing (or both) shall also be provided. Vessels on which fish is kept for more than 10 d shall have facilities for freezing the fish.

4.2.22.2.2 All vessels that are equipped for chilling or freezing (or both) shall have a suitable drainage system that is able to remove the melt water into a sump as fast as it accumulates.

4.2.22.3 Seawater and brine storage tanks

4.2.22.3.1 In vessels that use refrigerated seawater or refrigerated brine systems for chilling or stowing the catch, all tanks, heat exchangers, pumps and associated piping shall be made of, or coated with, suitable corrosion-resistant material.

4.2.22.3.2 A space of at least 60 mm shall be provided between cooling coils and the tank sides to allow for the scrubbing and flushing of fish debris from the wells. The tanks or wells shall be so designed that the fish can first be washed and pre-cooled with refrigerated seawater, and then frozen by brine pre-freezing.

4.2.22.4 Seawater intake and waste disposal

4.2.22.4.1 Deck hoses shall be supplied with clean seawater, at an acceptable pressure, by a pump used only for clean seawater.

4.2.22.4.2 Subject to good naval architectural practice, the point of intake of seawater for cooling and cleaning the product shall be situated at the deepest practicable point on one side of the vessel, and the sewage and wastewater disposal and engine cooling discharge shall be disposed at the shallowest point practicable on the opposite side of the vessel.

4.2.22.4.3 The water supply pipes and waste disposal lines that service the vessel's toilets, wash-hand basins and kitchen sinks shall be capable of carrying peak loads, shall be watertight and shall not pass through spaces where the catch is prepared, processed, packaged or stored.

4.2.22.4.4 Piping for the supply of clean seawater shall have no cross-connections with the engine or condenser cooling system and shall be so constructed as to prevent any possibility of back-syphoning from the kitchen sinks or the toilets.

4.2.22.5 Water supplies

4.2.22.5.1 An acceptable supply of cold potable water or clean seawater at an acceptable pressure shall be made available at an acceptable number of points throughout the fishing vessel.

4.2.22.5.2 On vessels engaged in processing other than cleaning, a supply of hot water at a temperature of at least 60 ℃ shall be made availab le for use.

4.2.22.5.3 Where practicable, an acceptable water treatment system (such as exposure to ultraviolet light) shall be provided for the treatment of seawater that is used in the processing of the product.

4.3 Equipment for production

4.3.1 General

4.3.1.1 Production areas shall be so designed and equipped as to allow free movement of workers to facilitate cleaning and the maintenance of both hygiene and product quality.

4.3.1.2 All factory, equipment and utensils that come into contact with the product shall be smooth-

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surfaced, light-coloured and of a suitable corrosion-resistant, non-absorbent material (i.e. not wood or other absorbent or porous material) which may have an acceptable plastics-coated surface suitable for use with food but should preferably be made of stainless steel.

4.3.1.3 The equipment for production shall be of hygienic design with no open joints or crevices and shall be so constructed as to facilitate their cleaning and disinfecting. Open ends and curled edges shall be satisfactorily sealed to prevent the accumulation of organic material and dirt. Where necessary, as in the case of equipment that cannot be cleaned *in situ,* it shall be possible to dismantle the equipment for cleaning and disinfection.

4.3.1.4 Surfaces with which the product comes into contact shall not be painted.

4.3.1.5 All parts of stationary equipment or equipment that is not readily movable shall be installed away from the walls and ceilings at distances sufficient to allow access for cleaning and inspection.

All permanently mounted equipment shall be either installed high enough above the floor to allow access for cleaning and inspection, or shall be completely sealed to the floor.

4.3.1.6 Equipment shall preferably not be sunk into the floor but if this is unavoidable, the installation of the equipment shall be such as to be acceptable. Sunken areas shall be well drained.

4.3.1.7 Copper, lead and their alloys (other than solder), and other metals or materials detrimental to health, shall not be used in the construction of equipment that comes into contact with the raw materials or with the unprotected product at any stage of its production.

4.3.1.8 The use of solder in equipment shall be minimized.

4.3.2 Tables

4.3.2.1 Wooden tables shall not be used in the processing areas. Tables shall be of such design and construction that will prevent the development of unhygienic conditions and bacterial build-up. Frames shall be made of smooth corrosion-resistant metal or shall have been so coated as to protect them from corrosion.

4.3.2.2 Table tops shall be of seamless stainless metal or other seamless, corrosion-resistant, smooth, water-impermeable material with similar surface characteristics. The tops shall be of hygienic construction and shall either be removable for cleaning or so secured to their frames as to allow easy cleaning and disinfection.

4.3.2.3 Where metal table tops are folded at the edges, the folds shall be so effectively soldered, welded or sealed with an acceptable mastic sealant as to prevent the accumulation of organic matter and dirt. All joints in tables shall be watertight.

4.3.2.4 Tables shall, as far as possible, allow rapid and effective drainage, shall be easy to clean and shall be free from cracks, crevices and openings.

4.3.3 Cutting boards

If cutting boards are used, they shall be of hygienic construction and shall be made of acceptable light-coloured material (other than wood or other absorbent or porous material) that is suitable for use with food products. Cutting boards shall be easily removable.

4.3.4 Utensils and implements

4.3.4.1 Knives, shovels, brooms and other utensils or implements used in the processing or packaging areas shall not have handles of wood or of other absorbent or porous material.

4.3.4.2 Wicker baskets shall not be used as containers for the product at any stage before, during or after processing.

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4.3.5 Facilities for cleaning and disinfection

4.3.5.1 Facilities for disinfecting gloves and knives shall be made available at convenient and acceptable points.

4.3.5.2 Materials used for cleaning and disinfection, hot and cold running water or saturated steam, hose pipes, spray nozzles, brushes, scrapers and other equipment needed for the cleaning of the fishing vessel, factory, equipment and utensils shall be made available.

4.3.5.3 These materials and equipment (see 4.3.5.2) shall not be stored in a room where food-handling equipment is stored and shall at no time come into contact with raw materials, the products or their containers or packages.

4.3.6 Ice-making equipment

4.3.6.1 All surfaces of ice-making equipment that come into contact with the ice shall be of suitable corrosion-resistant material.

4.3.6.2 The ice-making equipment shall be of hygienic construction throughout.

4.3.6.3 Whenever ice is transferred, stored or transported, it shall be effectively protected from contamination.

4.4 Water

4.4.1 Potable water

4.4.1.1 The water used shall comply with the requirements of EAS 12.

4.4.1.2 Every factory shall have an adequate supply of clean potable water that is free from suspended matter and substances that could be deleterious to the product or harmful to health.

4.4.1.3 All water coming into contact with the product, product contact surfaces or that is used in the preparation areas of the factory shall have been so treated by flocculation, filtration, chlorination or any other acceptable process as to ensure compliance with the requirements for drinking water in terms of EAS 12.

4.4.1.4 Factory installations for the treatment of water shall be thoroughly cleaned at least once a week by an acceptable method.

4.4.2 Seawater

Clean, uncontaminated, freshly pumped treated and untreated seawater may be used in the factory provided that it complies with all the microbiological requirements of EAS 12 and with the following physical and chemical requirements of EAS 12:

a) Physical and organoleptic: Colour and turbidity.

b) Chemical:

   1) Macro-determinands: Ammonia as N, nitrate and nitrite as N and zinc as Zn.

   2) Micro determinands: To comply with class 1 water.

   3) Organic determinands: To comply with class 1 water.

4.4.3 Water for cleaning

Water used for cleaning the factory and equipment shall comply with the requirements of 4.4.1 or 4.4.2, as relevant. Chlorinated water that could have any deleterious effect on the product shall be

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dechlorinated immediately before use. In all cases, the free residual chlorine concentration shall be determined by the *N,N-diethyl-1,4-I-phenylene diamine* test or any other acceptable test that has equivalent sensitivity.

4.4.4 Ice

The purity of ice shall be such that the water derived from it (by melting the ice under aseptic conditions at a temperature not higher than 10 ℃) immediately after the ice has been manufactured, complies with the requirements of 4.4.1 or 4.4.2, as relevant.

4.5 Requirements for employees engaged in the handling, preparation, processing, packaging and storage of the product

4.5.1 Health

4.5.1.1 All the health requirements of the current relevant national legislation (see foreword) shall be complied with.

4.5.1.2 Before being engaged, employees shall pass an appropriate medical examination to ensure that they are free from communicable diseases, and shall thereafter pass an annual medical examination (see 4.5.1.1).

4.5.1.3 No employee who is a carrier of, or is suffering from, any communicable disease, especially a carrier of *Salmonella* or *Shigella,* or one who shows symptoms of, or is suffering from, gastroenteritis or an enterobacterial infection or a disorder or condition that causes discharge of fluid from any part of the skin or body shall be allowed to come into contact with the product or product contact surfaces. Any such employee shall immediately report to the factory management.

NOTE The Department of Health has all the information regarding communicable diseases.

4.5.1.4 The management shall ensure that no employee who is known or suspected to be affected with a disease capable of being transmitted through food shall be permitted to work in any part of the factory in a capacity in which there is a likelihood of the employee contaminating the product with pathogenic organisms.

4.5.1.5 In the case of any absence of more than one day owing to illness, the employee shall, before resuming duty, report the nature of the illness that necessitated the absence to the factory hygiene officer, who shall, should he deem it necessary, take the appropriate steps to obtain a medical opinion on the employee's fitness for work.

4.5.1.6 An appropriate medical record of each employee shall be kept. Medical records and medical certificates submitted by an employee of a factory shall be made available for inspection by the authority administering this standard.

4.5.1.7 The management shall ensure that no employee who is suffering from a cut, an injury, an infected wound or an infected skin irritation shall be allowed to come into contact with the product or product contact surfaces unless the cut or injury has been so treated or dressed that the discharge of body fluid has been prevented, and the wound and its dressing have been so covered as to ensure that infection or contamination of the product is no longer possible.

4.5.2 Protective clothing

4.5.2.1 All employees engaged in the handling, preparation and processing of the product up to and including the packaging stage, but excluding employees operating within freezer storage rooms and chill rooms, shall wear clean, light-coloured, protective clothing, waterproof aprons, waterproof slipovers or boots, and clean, washable or disposable headgear that completely covers their hair. Woollen caps may be worn in freezer storage rooms only.

4.5.2.2 Overalls shall completely cover the personal clothing of the employees. At the end of each working day, soiled overalls and headgear shall be handed in for laundering. Employees shall not

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remove protective clothing from the factory.

4.5.2.3 Gloves, if used, shall be made from impermeable material and shall be of the disposable type. Gloves shall be thoroughly cleaned and then disinfected using chlorinated water or any other acceptable solution or procedure.

4.5.2.4 Sleeves shall not extend below the elbows, except when covered by plastics sleevelets or when worn in freezer storage rooms and chill rooms.

4.5.2.5 Protective clothing, other than waterproof aprons, sleevelets and gloves, shall not be stored in work areas. When not in use, protective clothing shall be kept in change rooms (see 4.2.19) and shall not be removed from the premises except for laundering under hygienic conditions. The homes of employees shall not be regarded as acceptable for laundry purposes.

4.5.2.6 Waterproof protective clothing shall be made of plastics, rubber or other similar acceptable material. All protective clothing shall be of hygienic design, shall have no external pockets, shall be in good repair and shall not constitute a source of contamination to the product.

4.5.2.7 Waterproof aprons, sleevelets and gloves shall be cleaned and disinfected at each time of removal and as frequently as necessary, and shall be hung on hooks or pegs at exits from the production areas during intervals between work and during visits to the toilet. Waterproof aprons, sleevelets and gloves, as well as all equipment used in the preparation, processing and packaging of the product shall not be removed from the work areas except for repairs and for cleaning under hygienic conditions.

4.5.3 Personal hygiene and personal effects

4.5.3.1 Workers shall, at all times, maintain a high degree of personal cleanliness and conform to hygienic practices while on duty. Workers shall be trained and educated in personal cleanliness and hygienic practices. Adequate control shall be exercised to ensure that employees are in compliance with the hygienic requirements such as supervision at the hand-washing facilities before commencing work at the beginning of a work shift and after breaks.

4.5.3.2 Before starting work, after each absence from the factory production area, at regular intervals during production, or at any time when necessary, employees shall wash their hands with warm water and an acceptable unscented liquid soap or detergent and rinse them in clean, running water. They may then dip their hands in an acceptable disinfectant solution, after which they shall rinse their hands in clean running water, if so required by the usage directions of the hand dip.

4.5.3.3 Containers used in the preparation, processing or packaging of the product shall not be used for any other purpose.

4.5.3.4 Neither employees' personal effects nor their food shall be present in any area where the product and its ingredients and packaging materials are handled and stored. Employees' personal effects, including their personal clothes, shall be kept in lockers or hangers provided for this purpose in the change rooms (see 4.2.19).

4.5.3.5 The use of chewing gum and of tobacco in any form shall not be permitted within areas where the product and its ingredients and packaging materials are handled or stored. Spitting shall not be allowed anywhere within the factory premises.

4.5.3.6 Neither varnish nor lacquer shall be used on fingernails, and fingernails shall be kept short and clean. Jewellery, except plain wedding bands which need to be suitably covered, shall not be worn by employees who handle raw materials or the unprotected product (or both).

4.5.4 Notice boards and supervision

4.5.4.1 Notices shall be strategically displayed in the preparation, processing, packaging and storage areas, in the change rooms and in the toilet facilities.

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4.5.4.2 Notices that prohibit eating, spitting and the use of chewing gum and tobacco in any form shall be posted in each production area and in each area designated for the storage of ingredients. Notices that request employees or, where applicable, visitors to wash their hands on entering the production areas shall be posted at each entrance used by employees or visitors to gain access to those areas. Notices that direct employees to wash their hands after using the toilet shall be posted in the toilet facilities (see 4.2.9).

4.5.4.3 Adequate supervision shall at all times be practised to ensure compliance with 4.5.4.2.

4.5.4.4 The responsibility of ensuring observance of all personal practices. operations and requirements of this clause by all persons shall be given to competent staff members.

4.5.5 Visitors

Any person, including employees, who visits or enters the production areas of the factory during the hours of operation, shall, when in those areas, observe and adhere to all the relevant hygiene requirements and shall wear clean protective clothing that shall be provided by the factory.

4.6 Hygienic operating requirements

4.6.1 General

4.6.1.1 In relation to the handling, preparation, processing, packaging, freezing, transportation and storage of the product, no operation(s) shall be performed and no conditions shall exist that are detrimental to the product. Materials liable to contaminate the product shall be kept away from the production areas.

4.6.1.2 Non-edible substances shall not be stored in the same room as edible ingredients or in the preparation or packaging areas of the factory.

4.6.1.3 There shall be no unhygienic conditions on the factory premises. Smoke from factory chimneys and exhaust fumes shall not be allowed to enter the factory buildings in a quantity or manner that is offensive, injurious or dangerous to health, or that causes contamination at any stage during the processing of the product.

4.6.2 Cleaning and disinfection

4.6.2.1 Materials for cleaning and disinfection

An adequate supply of materials for cleaning and disinfection, hot and cold running water that complies with the requirements of 4.4.3, saturated steam, hosepipes, brushes and other materials and equipment necessary for the cleaning of the factory shall be made available. Cleaning materials, such as scouring wool that could contaminate the product, shall not be used.

4.6.2.2 Cleaning of facilities

4.6.2.2.1 The building, premises, equipment, utensils and all other physical facilities of the factory shall be kept clean and in good repair, and shall be maintained in an orderly, clean and hygienic condition.

4.6.2.2.2 The cleaning and disinfection of the preparation, processing and packaging areas of the factory and of all auxiliary equipment and utensils shall be on a regular basis and shall be carried out by trained employees.

4.6.2.2.3 The entire factory, equipment and utensils shall be thoroughly cleaned with a detergent or other cleaning agent and disinfected at the end of each operation.

4.6.2.2.4 A detergent-disinfectant may be used. Immediately before the start of operations, equipment shall be thoroughly rinsed with water (see 4.4.3) to remove any dust and any disinfectant (if used) or residues from the cleaning process.

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4.6.2.2.5 The processing and packaging areas, storage rooms, chill rooms, freezer storage rooms and freezers shall be kept free from mould, dust, dirt, flaking paint and other loose or extraneous material that could fall onto the product from walls, ceilings or overhead structures.

4.6.2.3 Floors and drainage channels

4.6.2.3.1 During periods of operation, the floors and the drainage channels in the preparation, processing and packaging areas shall be kept clean by regular sweeping, scrubbing and flushing with water.

4.6.2.3.2 Refuse shall not be permitted to accumulate in drainage channels or on grids. Thorough cleaning of floors and drainage channels shall take place as often as is necessary and at the end of each day's operations in order to maintain hygienic conditions.

4.6.2.3.3 Footbaths shall be drained and cleaned daily and the disinfectant shall be kept in an active condition.

4.6.2.4 Walls of preparation, processing and packaging areas

The inside walls of the preparation, processing and packaging areas shall, where necessary, be thoroughly washed immediately after each day's operations and the rooms shall be kept as free from dust as possible.

4.6.2.5 Cleaning of water treatment installations

Factory installations for the treatment of water used in production areas shall be thoroughly cleaned once a week by an acceptable method.

4.6.2.6 Cleaning of the processing system

The entire processing system shall be cleaned during each break in production that lasts for more than 1 h or whenever it is deemed to be necessary, and shall be effectively cleaned at the end of each shift and at the end of each day's operations. The processing system shall be clean at the time of further use.

4.6.2.7 Cleaning of utensils

4.6.2.7.1 Knives and similar items of equipment shall, during breaks in production, after use, or at any time when disinfection is necessary, be thoroughly cleaned and then disinfected by the use of chlorinated water or any other acceptable solution or procedure.

4.6.2.7.2 When the factory is in operation, equipment and utensils shall not be removed from the work area except for repair, cleaning or replacement.

4.6.2.8 Cleaning of discharge systems

4.6.2.8.1 All discharge systems at the jetty and all conveyance systems to the factory shall be so drained that stagnant water does not collect. Such systems shall be regularly cleaned of stale material, before and after use.

4.6.2.8.2 Holding tanks shall be treated similarly to the discharge systems (see 4.6.2.8.1).

4.6.3 Repairs

4.6.3.1 Whenever maintenance or repairs have been carried out in production areas, tools and replaced equipment shall be immediately removed from these areas and the affected equipment shall be thoroughly cleaned and disinfected.

4.6.3.2 Welding repairs in the areas where the product is handled, prepared, processed or packaged

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shall be performed either when the factory is not in production or as emergency work during breakdown only, and in such a way that the product is not exposed to welding fumes, splatter or slag particles.

4.6.4 Efficacy of cleaning

4.6.4.1 The efficacy of the cleaning and disinfection process shall be tested in accordance with relevant East African standards the determined percentage efficacy of cleaning and disinfection in the sample shall be acceptable.

4.6.4.2 Effective measures shall be taken to inhibit mould growth and to remove dust, flaking paint and other loose or detachable material likely to fall onto the product from walls, ceilings or overhead structures in the preparation, processing, packaging and storage areas.

4.6.5 Containers, bins and crates for the handling of raw materials and the product

4.6.5.1 When filled or partly filled with raw materials or with the product, containers shall not be stacked in a way that allows contact of the contents of a container with the bottom of the container stacked above it.

4.6.5.2 Containers that hold edible substances shall not be stacked directly on the floor or against the wall, and whenever they are moved, they shall be effectively protected from contamination. They shall be stored at least 250 mm above floor level.

4.6.5.3 Where pallets are used instead of racks, shelves or stands, there shall be a clearance of at least 100 mm above floor level.

4.6.5.4 Containers shall be of hygienic design and shall either be light-coloured or have a bright metallic finish.

4.6.6 Wrapping materials

Wrapping materials used to wrap the product shall be kept in corrosion-resistant containers of hygienic construction, and shall be so dispensed that the wrapping material requires only minimum handling.

4.6.7 Packaging materials

Materials for the packaging of the product shall be stored on racks or shelves at a distance of at least 250 mm from the floor or on pallets, and away from the walls.

4.6.8 Spare parts

Spare parts for machinery, and other items that are capable of contaminating the product, shall be stored away from the preparation, processing, packaging and storage areas.

4.6.9 Freezers, chill rooms, freezer storage rooms and their equipment and instruments

4.6.9.1 Freezers, chill rooms, freezer storage rooms and their equipment and instruments shall operate efficiently and shall be kept clean and in a hygienic condition.

4.6.9.2 The temperature in freezer storage rooms shall be automatically and continuously monitored and a record of the temperature shall be kept and shall be made available for inspection.

4.6.9.3 Products shall not be stacked directly on the floor or against the walls.

4.6.9.4 No material other than the product or ingredients of the product shall be stored in freezers, chill rooms or freezer storage rooms.

4.6.9.5 No condition and no object or matter that could adversely affect the flavour, odour or

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appearance of the frozen fish product shall be present in freezers, chill rooms or freezer storage rooms.

4.6.10 Removal of refuse and offal

4.6.10.1 Litter, waste and overflow shall not be allowed to accumulate or to give rise to unhygienic conditions, and shall be disposed of promptly in an efficient and hygienic way.

4.6.10.2 Offal shall be removed from the production area in a hygienic manner, and containers for offal awaiting removal from the factory shall be well separated from the production areas.

4.6.10.3 A separate refuse room or any other acceptable refuse facility shall be provided on the premises, and shall be cleaned and disinfected at least once a day.

4.6.11 Vermin control

All buildings in which raw materials, ingredients and the product are stored, or in which the product is handled, prepared, processed or packaged, shall be kept free from insects, birds, rodents and other vermin, and shall be insectproof and rodentproof.

4.6.12 The use of pesticides

4.6.12.1 Pesticides shall not be used in work areas while preparation, processing and packaging are in progress, and precautionary measures shall be taken to ensure that equipment and work surfaces are kept free from pesticide residues.

4.6.12.2 Pesticides and cleaning chemicals shall at no time be allowed to come into contact with wrapping material, containers, raw materials or the product.

4.6.12.3 The room in which pesticides are stored shall be kept locked and the materials contained in it shall only be handled by employees trained in their use.

4.6.13 Animals

Animals, including birds, shall not be allowed in any part of the factory.

4.6.14 Operations aboard fishing vessels

4.6.14.1 Shipboard handling, chilling, processing and freezing of the product shall be conducted under conditions of sanitation and hygiene equal to those of the equivalent procedures and practices of shore establishments.

4.6.14.2 Before any product comes on board and between hauls, the deck, deck pounds, pen stanchions and dividing boards, and all other deck equipment that will come into contact with the product shall be hosed down with clean seawater.

4.6.14.3 The deck shall be scrubbed to remove all visible dirt and debris at least once a day.

4.6.14.4 During fishing trips, the hold bilge sump of the vessel shall be drained regularly.

4.6.14.5 All gear shall be thoroughly cleaned when fishing has ceased.

4.6.14.6 The gut of ripped fish shall be removed immediately, and the fish shall be washed in clean water (see 4.4.1 and 4.4.2) that is free from entrails and liver particles.

4.6.14.7 When practicable, the deck shall be cleared before the next haul is landed on deck.

4.6.14.8 The deck, storage hold and production areas of fishing vessels shall be thoroughly cleaned and disinfected immediately after the discharge of the cargo.

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4.7 Records

4.7.1 Adequate quality records shall be maintained on fishing vessels with freezing facilities, or with both freezing and packaging facilities, and in factories on land.

4.7.2 Quality records and records of freezer storage room temperatures (see 4.2.15.4 and 4.2.15.5) on vessels and in factories on land shall be kept for a period of at least two years.

4.8 The handling, preparation, processing, packaging, transportation and storage of the product

4.8.1 General

4.8.1.1 From the time the catch comes on board and during preparation, processing, packaging, transportation and storage, the product shall be protected from heat, the direct rays ofthe sun, frost, the drying effect of wind, and contamination by birds, dust, oil, fuel and noxious fumes.

4.8.1.2 The product shall be processed as soon as possible after having been caught. Except where intended to be frozen in the round, fish shall be gutted as soon as possible and shall be thoroughly washed in clean water to remove all blood, slime and pieces of gut.

4.8.2 Fishing vessels not equipped to chill or freeze

4.8.2.1 On fishing vessels not equipped to chill or freeze, the catch shall be transported to land where the chilling or freezing process shall be started within 8 h of catching.

4.8.2.2 In cases where the fish are immediately processed or packaged on board a fishing vessel not equipped to chill or freeze, the requirements of 4.8.1 shall apply. The temperature of fish on board such a vessel shall not exceed 18℃.

4.8.3 Chilling vessels

4.8.3.1 On board fishing vessels that are equipped with chilling facilities, fish intended for processing shall, where practicable, be chilled or iced as soon as possible after they have been landed on deck. Fish that have not been chilled within 8 h of having been landed on deck shall not be processed. Fish that are to be kept at sea for between 8 h and 10 d shall, as a minimum requirement, be stowed in ice.

4.8.3.2 Flaked ice, cubed ice or finely crushed cobbled *ice,* of diameter less than 5 cm, shall be used, and staging or shelves shall be so installed as to limit the depth of bulk storage to a maximum of 1 m. Individual layers of fish shall be separated from one another, the floor, ship sides and bulkheads by acceptable layers of ice.

4.8.3.3 Species of fish that could have a detrimental effect on one another shall be stored in separate storage holds or containers.

4.8.3.4 Vessels that are equipped to chill but not to freeze shall not be used to keep fish at sea for more than 10 d. In the case of tuna, vessels that are not equipped to freeze shall keep their catch on ice or in chilled or refrigerated seawater and shall transport the catch to factories on land within 5d.

4.8.3.5 Fish shall not be kept iced for longer than good manufacturing practice permits.

4.8.4 Tuna

4.8.4.1 Tuna may be kept on ice for a period not exceeding 5 d (see 4.8.3.4).

4.8.4.2 Brine pre-freezing of tuna at -9 ℃ is adequate for a period not exceeding 14 d.

4.8.4.3 For longer periods of storage, the fish shall be frozen and kept frozen at a temperature of -18℃ or lower.

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4.8.5 Transportation by road and rail

4.8.5.1 Transportation of the product by road shall be carried out in covered and insulated or refrigerated vehicles constructed and equipped to protect the product adequately.

4.8.5.2 Under dusty conditions or conditions that might adversely affect the fish, the transportation by road shall be in a vehicle with a dustproof storage hold.

4.8.5.3 If the duration of road transport is longer than 1 h,

a) unfrozen fish shall be transported in an insulated and refrigerated truck that can keep the fish at the temperature of melting ice, or in an insulated truck where the fish is on ice; and

b) frozen fish product shall be conveyed in an insulated and refrigerated storage hold in a truck, in accordance with the requirements of 6.2.2 and 6.2.3.

4.8.5.4 Transportation of the product by *rail* shall be carried out in insulated and refrigerated vehicles. The frozen final product *awaiting* transportation or loading shall not be kept un refrigerated for longer than 1 h.

4.8.5.5 Adequate precautions shall be taken to prevent the product from becoming physically damaged (for example, as a result of pressure or movement during transportation). The product shall not be transported with other products that can contaminate or impair the product. The means of transport used for the product shall not at any time be used for transporting other products likely to impair or contaminate the product.

4.8.5.6 The product shall be transported under clean and hygienic conditions, fully protected from contamination such as dust and other foreign matter, from the heat of the sun and from other elements.

4.8.5.7 The inside surfaces of the means of transport shall be so finished that they do not adversely affect the product, shall be smooth and shall be easy to clean and disinfect.

4.8.5.8 If ice is used to chill the product, adequate drainage shall be provided in order to ensure that the water from the melted ice does not stay in contact with the product.

4.8.6 Freezing of the product before processing

If the product is to be frozen before processing, the freezing shall start

a) soon after the catch is landed on deck,

b) within 8 h of being caught, in the case of white fish and flat fish and similar species with a low fat content, on condition that the fish temperature is never allowed to rise above 18℃,

c) within 10 d, where the temperature of the fish in 4.8.6 (b) has been brought down to the temperature of melting ice, or

d) within 72 h of landing on board, in the case of high-risk fatty fish (including *Clupeidae* and *Scrombidae),* provided that the fish temperature is brought down to 3 ℃ or lower within 6 h after the fish have been caught and to 0 ℃ within 16 h of landing on board.

4.8.7 Thawing of the frozen fish product for processing

4.8.7.1 When being thawed for processing, the frozen fish product shall not be exposed to ambient temperatures higher than 18 ℃.

4.8.7.2 Thawing shall be as rapid as possible and shall be completed in less than 20 h.

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4.8.7.3 Unless the processing is started before or immediately after thawing is complete, the chilling of the thawed fish to a temperature as close to 0 °C as possible shall be started immediately.

4.8.7.4 Unless the processing requires a longer period, freezing after processing shall be started within 8 h of completion of the thawing process.

4.9 Special requirements for marine molluscs

4.9.1 Marine molluscs shall be protected from heat and contamination, shall be kept moist (and alive, where possible) while on board the fishing vessel, and shall be acceptably protected during transportation.

4.9.2 Where marine molluscs, other than abalone, cannot be kept alive, they shall either be frozen or shall be kept in ice for a period not exceeding 2 d before being processed or frozen.

4.9.3 Any preparation of abalone for freezing or further processing shall start while the abalone is still alive.

4.9.4 Where abalone flesh packs are prepared, the flesh shall be cleaned under hygienic conditions that ensure freedom from contamination.

4.9.5 All viscera and adhering mucous shall be removed and the epithelium between the fringes and the foot shall be brushed off.

4.9.6 The cleaning operation shall be followed by thorough washing in running water that complies with the requirements of 4.4.

4.9.7 The flesh shall be free from unsightly fork marks or any other damage. Abalone that is to be frozen in the round (in the shell) shall be treated as follows:

a) It shall be purged for a minimum of 72 h in clean seawater.

b) The shell and meaty parts shall be brushed clean of all adhering growths, extraneous material and dirt before packing.

c) Where the date of maximum durability of the product is intended to be more than 3 months (at -18 ℃) or 4 months (at -28 ℃ storage), the pr oduct shall be cooked before packaging. The cooking time and temperature shall be adequate to enable pasteurization of the meats and inactivation of enzymatic activity that causes deterioration of product under cold storage.

NOTE The competent authority administering this standard might require that abalone be shucked and properly cleaned, as specified in 4.9.7, before freezing, and, where appropriate, it might specify the sampling that is required to test the product for freedom from certain biotoxins.

This test can be required as a precautionary measure to exclude toxic substances (for example, certain saxitoxins) that might be present on some parts of the abalone when harvested from certain areas with known high incidences of toxic molluscan shellfish or from areas with an unknown status.

5 Requirements for the ingredients and the product

5.1 Condition of ingredients and the product (see annex A)

5.1.1 General

5.1.1.1 All ingredients used shall fall within the scope of and shall comply with the current relevant national legislation (see foreword). All ingredients used in the preparation of the product shall be clean, sound, of good quality and in every way fit for human consumption. In addition, the product shall not contain any substances in amounts that might present a hazard to human health.

5.1.1.2 Wood smoke that is used for the smoking of the product shall be obtained through the use of wood that is acceptably free from gum and resin, paint, timber preservative and other added

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substances.

5.1.1.3 All units and pieces of fish presented in one of the forms described in 5.2(a) to 5.2(p) (inclusive) shall comply with the relevant description. Scraps of fish shall not be included. If frozen fish or frozen fish pieces are glazed with chilled water before packing, the temperature of the water used for glazing shall be 5 ℃ or lower.

5.1.1.4 Fish products described in 5.2(q) to 5.2(w) (inclusive) shall be free from viscera, heads and gills, and acceptably free from scales, fins and tails.

5.1.2 Fish

5.1.2.1 Frozen fish

Frozen fish product shall be prepared and inspected in accordance with 7.1.

5.1.2.2 General characteristics

The fish used in the preparation of the product and not previously frozen shall have the following general characteristics:

a) a characteristic fresh appearance, colour and odour, without any perceptible rancidity or sourness;

b) prominent, bright, clear and moist eyes, where applicable;

c) transparent or creamy white slime, where slime is present and natural to the species;

d) bright red gills, where applicable, and gill odours shall be characteristically fresh for the species;

e) bright abdominal blood, where applicable;

f) firm and elastic flesh adhering to the bone; and

g) an odour and flavour that is characteristically fresh for the species when the fish is cooked, and a firm but tender and succulent texture.

5.1.2.3 Tuna

In the case of tuna, the following more specific and additional characteristics shall apply:

a) skin mucus: preferably transparent but can also be milky, and the colour shall be iridescent to bright;

b) eyes: brilliant colour; convex to slightly convex in shape but not flat, and the pupils shall be black to duller black and transparent clear to slightly bloody;

c) gill colour: bright red, pale red or brown red in colour;

d) gill odour: fresh, cucumber, strong seaweedy, metallic, like freshly cut grass, very slightly musty, and fresh oily. Definitely not tainted, sour, acetic, butyric, lactic, fruity, sulfurous, faecal, rancid, strong fishy or ammoniacal;

e) abdominal wall: intact to slack, but shall not be soft or damaged;

f) peritoneum: preferably, but not necessarily, intact, but not torn or dissolved;

g) colour of flesh: light pink to dark red, depending on the species;

h) colour of flesh along backbone: same as that of the surrounding flesh (see 5.1.2.3(g));

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i) physical damage: slight deformity and mutilation acceptable, but the fish shall not be split; and

j) cooked fish: a flavour characteristic of the species, but not insipid, bitter or peppery.

There shall be no excessive protein curd (coagulated substances of denatured protein) on the surface of the flesh and no digestion of the flesh (honeycombing). The colour shall be off-white or pinkish to light brown, depending on the species. There shall be no orange or green discoloration of the flesh.

5.1.3 Salt

Salt used in the preparation of the product shall be edible, free from bitterness and other off-odours and off-flavours, discoloration and impurities.

5.1.4 Seasoning

Seasoning ingredients shall be free from foreign matter and adulterants.

5.1.5 Additives

Only permitted additives (see 5.1.1.1) shall be used, and then only in the permitted quantities.

5.2 Presentation of fish and fish products

Fish or fish products shall be presented whole or in any other acceptable form, as given in 5.2(a) to 5.2(w) (inclusive).

a) **Whole (round) fish**

A fish as taken from the sea and not yet processed, or a fish that has been bled only.

b) **Gutted fish**

A round fish that has been eviscerated.

c) **Gilled and gutted fish**

A gutted fish (see 5.2(b)) from which the gills have been removed.

d) **Headed and gutted fish**

A gutted fish (see 5.2(b)) from which the head has been removed.

e) **Dressed fish**

A headed and gutted fish (see 5.2(d)) from which the scales have been removed.

f) **Cutlets**

Crosswise cuts, of thickness not exceeding 40 mm, from fish from which all viscera and blood have been removed and in which large fish bones do not protrude conspicuously.

g) **Fillet (wings on)**

The fleshy side of a whole fish (see 5.2(a)) cut lengthwise as close to the backbone as possible and including the pectoral fin, belly flap, pin bones, neck bones and skin. It shall be an intact, un-ragged section of fish and shall be acceptably free from scales.

h) **Single fillet**

The fleshy side of a whole fish as described in 5.2(g), but with the pectoral fin and shoulder girdle removed.

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i) **Skinned fillet**

A single fillet as described in 5.2(h), but with the skin removed.

j) **Skinned and boned fillet (skinless, deboned fillet)**

A skinned fillet as described in 5.2(i), but with the fish bones removed.

k) **Double fillet (butterfly fillet)**

The two fillets from a single fish, as described in 5.2(h) and 5.2(i) or 5.2(j), but joined together along either the back or the belly.

l) **Fish blocks**

Blocks of fish prepared in any acceptable form and interleaved when necessary. Subject to appropriate labelling (see 10.2.1.1 (b)), the blocks may also consist of minced fish. Fish blocks shall, as far as practicable, be free from bulging, voids, surface discoloration, dehydration and "freezer burn" (deep dehydration).

m) **Trawled or trawl-marked whole fish**

Whole fish of good quality showing trawl marks such as depleted skin, some bruising and some surface cuts, that is suitable only for further processing and that, if packed, shall be marked accordingly.

n) **Smoked fish**

1) **General**

Any of the fish and fish cuts described in 5.2(a) to 5.2(m) (inclusive) that have been smoked (see 5.1.1.2).

2) **Hot-smoked fish**

Fish smoked at a sufficiently high temperature and for such a period of time as to ensure heat coagulation of the protein throughout.

3) **Cold-smoked fish**

Fish smoked at a temperature at which the product does not show any signs of heat coagulation of protein.

o) **Smoke-flavoured fish**

Any of the fish or fish cuts described in 5.2(a) to 5.2(m) (inclusive) that have been dipped in a smoke-flavoured liquid or dry material.

p) **Fish fingers (sticks) and fish portions**

1) **General**

Fish fingers (sticks) (see 5.2(p)(2)) and fish portions (see 5.2(p)(3)) prepared from blocks of frozen skinned and boned fish flesh or formed from unfrozen fish flesh, with or without additional ingredients, into portions that are acceptably uniform in size and shape.

2) **Fish fingers (sticks)**

A product, including one with a crumb coating or a batter coating, of unit mass not less

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than 20 g and not more than 50 g and the length of which does not exceed three times its greatest width.

3) **Fish portions**

A product, with or without a crumb coating or a batter coating, of any shape and size. If the mass of the product is less than 50 g. the qualifying word "portion" shall be acceptably inserted on the main panel of the package. Fish portions prepared from un skinned or incompletely boned fish shall be described as "skin-on" portions or "not boneless" portions, respectively (or both), or shall be given other descriptions with the same meaning.

q) **Fish kebabs**

Cuts of fish, with or without vegetables or fruit or any combination thereof, threaded on skewers.

r) **Fish cakes, fish balls and fish patties**

Cakes, balls and patties that have been prepared from edible fish flesh, with or without other ingredients, and that are acceptably uniform in shape, size and texture.

s) **Fish sausages**

Sausages that have been prepared, with or without other ingredients, from edible minced fish flesh or boned fish fillet and that can be smoked. Fish sausages can be formed in natural or artificial casings. Inedible casings shall have been completely stripped off before packing, where appropriate.

Fish sausages shall be uniform in size, shape and texture, and shall be free from discoloration and from ragged ends. There shall be no off-cuts or burst, distorted or cut-marked units. Cross-cut units shall have been cleanly cut at right angles to the longitudinal axes.

t) **Fish in sauce**

Solid fish or pieces of fish packed in sauce, together with permitted seasoning (see 5.1.4), spices or other appropriate ingredients.

u) **Fish with vegetables or cereals (or both)**

Solid fish or pieces of fish packed with vegetables or cereals (or both), with or without sauce, together with permitted seasoning, spices or other appropriate ingredients.

v) **Curried fish**

Solid fish or pieces of fish, with or without batter coating, packed in curry sauce, together with permitted seasoning and spices.

w) **Pickled fish**

Solid fish or pieces of fish, with or without batter coating, packed with onions and curry sauce, together with permitted seasoning and spices.

5.3 Physical requirements

5.3.1 Net mass

The net mass of a frozen fish product, determined in accordance with 7.3 or 7.4, as relevant, shall comply with the current relevant standard.

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5.3.2 Packing

Pre-packed product shall be acceptably packed to prevent deterioration and contamination. (See also 10.1.)

5.3.3 Uniformity of size

In packs where more than one unit is packed in a package, the units shall, on visual inspection, be acceptably uniform in size except that one filler piece may be used. If packs contain units of varying sizes, this shall be declared on the label.

5.3.4 Colour, appearance, texture, odour and flavour

The state of the raw materials, the production process and the packaging shall ensure that, after the frozen fish product has been thawed to a temperature above 0 ℃, and the units have been separated where necessary, the colour, appearance, texture, and odour is fresh and characteristic of the product, and that off-odours and other indications of deterioration or of the use of inferior raw materials are absent. The odour and flavour of the cooked product shall also be fresh and characteristic.

5.3.5 Freedom from other defects

5.3.5.1 The product shall be acceptably free from detached scales and from sand, grit, dirt, pieces of shell, other extraneous matter and visible parasites. The product shall be acceptably free from slime, from "freezer burn" (deep dehydration) that cannot be easily removed by scraping, and from discoloration due to fat oxidation.

5.3.5.2 A product described as boneless shall contain not more than one fish bone defect (see 3.10) per kilogram of the fish component of the product, and shall be free from cartilage or fish bone that, after being cooked, is capable of piercing or hurting the palate.

5.3.5.3 A product described as boned or deboned shall not contain more than five fish bone defects (see 3.10) per kilogram of the fish component of the product.

5.3.5.4 The presentation of the product shall comply with its description on the label.

5.3.6 Other physical requirements

When tested in accordance with the methods given in column 4 of table 1, the product shall comply with the appropriate requirements given in column 3.

5.4 Compositional requirements

5.4.1 When tested in accordance with 7.1 to 7.4 (inclusive), the product shall comply with the relevant requirements of this standard and of the current relevant national legislation (see foreword).

5.4.2 When the fish content is calculated in accordance with 7.2, it shall comply with the relevant requirements given in column 3 of table 1.

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Table 1 — Compositional requirements

1	2	3	4
Product	**Property**	**Minimum requirement % by mass**	**Test method subclause**
Breaded or battered fish products (raw)	Fish content	60[a]	7.2.1
Breaded or battered fish products (partly cooked or fried)	Fish content	50[a]	7.2.1
Fish cakes	Fish content	37.5	7.2.1
Fish sausages, fish balls and fish patties	Fish content	50	7.2.1
Fish in sauce	Washed mass	50[a]	7.2.2
Fish with vegetables or fruit or cereals (or any combination thereof)	Washed mass (i.e. all solid components)	60[a]	7.2.2
	Washed mass of fish component	35[a]	7.2.3
Curried fish	Fish content	40[a b]	7.2.1
	Washed mass (i.e. all solid components)	50[a]	7.2.2
Pickled fish	Fish content	35[a b]	7.2.1
	Washed mass (i.e. all solid components)	50[a]	7.2.2
	Washed mass of fish component (including batter)	45[a]	7.2.3
	Mass of onions	5[a]	7.2.5
Fish pies and similar products	Filling content	50	7.2.4
	Mass of filling (raw)	45	7.2.4
	Mass of filling (cooked)	25	7.2.4
Fishpaste and chopped fish with vegetables, with or without cereals	Fish content	50	7.2.1
Breaded or battered marine molluscs (including calamari rings)	Mollusc content	40[a]	7.2.1

[a] Expressed as a percentage of the declared net mass of the product.
[b] Only tested in the event of concern about the fish content of the coated product.

5.5 Microbiological requirements

When tested in accordance with the appropriate methods given in 8.5 to 8.15 (inclusive), the product shall comply with the requirements given in columns 2, 3 and 4 of table 2.

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Table 2 — Microbiological requirements

1	2	3	4
Organisms	**Contents** colony forming unit (cfu) max.		
	Raw products a (with or without added ingredients)	**Cooked products b or hot smoked products (or both)**	**Cold smoked products c**
Standard plate count	1×10^{6} /g[d]	1×10^{5} /g	2×10^{5} /g
Enterobacteriaceae	[e]	100/g	100/g
Escherichia coli	Nil/10 g[d]	Nil/10 g	Nil/10 g
Staphylococcus aureus	10/g	10/g	10/g
Salmonella	Nil/25 g	Nil/25 g	Nil/25 g
Shigella	Nil/25 g	Nil/25 g	Nil/25 g
Clostridium perfringens	Nil/25 g	Nil/25 g	Nil/25 g
Vibrio cholerae	Nil/25 g	Nil/25 g	Nil/25 g
Vibrio parahaemolyticus	Nil/25 g	Nil/25 g	Nil/25 g
Listeria monocytogenes	[e]	Nil/25 g[f]	Nil/25 g[f]

[a] Products that require cooking before being consumed.

[b] Products that only require thawing and reheating before being consumed.

[c] Intended for consumption without cooking.

[d] A standard plate count is not applicable to raw molluscan shellfish while the appropriate Most Probable Number (MPN) count for *E. coli* is 230/100 g as per ISO 16649-3.

Not to be tested.

If tested in accordance with ISO 11290-1, Listeria shall be absent in 25 g of the food tested before it leaves the control of the food business operator who produced it. In case of products placed on the market, during its shelf-life, the tolerance is 100 cfu/g, when tested in accordance with ISO 11290-2.

6 Delivery and inspection

6.1 General

The requirements of 6.2 and 6.3 shall be subject to the requirements of the relevant applicable regulations.

6.2 Delivery

6.2.1 General

The delivery of frozen fish products shall take place under conditions that will not adversely affect the quality of the product.

6.2.2 Delivery for export

6.2.2.1 The frozen fish product for export shall be conveyed from the factory to the freezer storage depot and delivered into the transporting vessel's freezer storage holds at a temperature of -18℃ or lower.

6.2.2.2 If, at any time during this transportation, the temperature of the product rises above -18 ℃, it shall be lowered to the required temperature as rapidly as possible. If the temperature has risen above -7℃, the product shall be re-inspected.

6.2.3 Delivery for local sale

6.2.3.1 The frozen fish product for local distribution shall be conveyed in refrigerated or insulated trucks from the factory or the freezer storage depot to the point of retail sale.

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6.2.3.2 The temperature of the product during local transportation shall, except at the outer surfaces of a stack, be -18℃ or lower. Refrigerated trucks shall be fitted with at least one thermometer that is so installed as to be readable from outside the refrigerated compartment.

6.3 Inspection for export

6.3.1 Each consignment of frozen fish product shall be made available for inspection at the freezer storage depot from which it is to be shipped for export. The authority administering this standard shall be notified at least 14 d before the expected date of shipment of the product.

6.3.2 Products not accepted for export shall, if stored in freezer storage rooms together with products approved for export, be segregated and clearly identified. The frozen fish product shall be submitted for re-inspection at the point of shipment if, while the product was being held for shipment, doubt arose as to its temperature history.

7 Methods of physical examination

7.1 Physical examination of frozen fish product for its general characteristics

7.1.1 Smaller fish may be thawed whole. In the case of a large fish, cut a sample wedge of suitable size from the back of the fish just behind the head and extending down to the backbone or, alternatively, cut a cross-section piece at least 50 mm thick through the fish, just behind the head or in front of the tail. Where possible, ensure that the mass of each sample piece is at least 1 kg. Thaw the sample and examine it for odour and colour (see 5.1.2.2(a)). Cartilaginous fish such as sharks and rays should be thawed in air to facilitate the detection of any ammoniacal odours.

7.1.2 In the case of tuna, thaw the sample and remove the blood by rinsing in tap water. Then examine each sample for colour in general (see 5.1.2.3(g)) and for colour along the backbone (see 5.1.2.3(h)).

7.1.3 Steam the sample until a core temperature of 70℃ to 75 ℃ has been reached and, in terms of the requirements of 5.1.2.3(j), examine for:

a) flavour,

b) protein curd on the surface of the flesh,

c) separation of muscle layers, and

d) colour.

7.1.4 Visually examine the fish for the remainder of its general characteristics in terms of the applicable requirements given in 5.1.2.2.

7.2 Determination of the fish content, filling content and washed mass

7.2.1 Determination of the fish content of breaded or battered fish products

7.2.1.1 Record the declared net mass (m_0) printed on the package. Place the contents of the package in a waterbath maintained at 47 ℃ to 49 ℃ and allow the units to remain in the water until the crumb coating or batter coating (as applicable) becomes soft and can be easily removed from the still-frozen fish flesh by means of a round-tipped spatula or table knife.

NOTE Several preliminary trials might be necessary to determine the optimum immersion time required for removing the crumb coating or batter coating from the fish units in a package. For these trials only, a saturated solution of copper (II) sulfate may be used instead of water. The optimum immersion time is the minimum time of immersion in the copper sulfate solution required before the crumb coating or batter coating (as applicable) can easily be scraped off, leaving only a slight trace of blue colour on the surface of the scraped fish units.

7.2.1.2 Remove the fish units from the waterbath (see 7.2.1.1) and blot them lightly with paper

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towelling. Scrape and remove the crumb coating or batter coating (as applicable) from the fish flesh by means of a spatula, removing the coating from narrow sides and ends first and then from the wide flat surfaces.

If the coating of a unit is difficult to remove, immerse the unit for up to a further 5 s and remove the residual coating. Ensure that the total immersion time does not exceed 15 s. Determine the mass (m_1) of all the scraped fish units.

7.2.1.3 Calculate the fish content of the product, ω, expressed as a washed mass percentage of the product, using the following formula:

$$\omega = \frac{m_1}{m_0} \times 100$$

where

m_1 is the total mass of all the scraped fish units, in grams;

m_0 is the declared net mass of the package, in grams.

7.2.2 Washed mass of products that contain sauce

7.2.2.1 Record the declared net mass (mo) printed on the package. Place the contents of the package on a tared sieve of aperture size between 2 mm and 3 mm and rinse the product with water, pre-warmed, if necessary, to a temperature not higher than 38 ℃, until free of sauce.

7.2.2.2 Drain for 2 min and then determine and record the mass of the material remaining on the sieve as the washed mass (m_1) of the fish component.

7.2.2.3 Calculate the washed mass percentage of the product by using the formula given in 7.2.1.3.

7.2.3 Washed mass of fish component of products that contain vegetables or fruit or cereals (or any combination thereof)

7.2.3.1 Record the declared net mass (me) printed on the package. Place the contents of the package on a tared sieve of aperture size between 2 mm and 3 mm and rinse the product with water, pre-warmed, if necessary, to a temperature not higher than 38 ℃.

7.2.3.2 Remove the vegetables, fruit or cereals, as applicable. Drain for 2 min and then determine and record the mass of the material remaining on the sieve as the washed mass *(m1)* of the fish component.

7.2.3.3 Calculate the washed mass percentage of the product by using the formula given in 7.2.1.3.

7.2.4 Mass of pie fillings

Thaw five fish pies and determine their total mass (m_0). Remove the crust and determine the mass of the filling (m_1). Calculate the mass of the filling of the product, ω, expressed as a percentage, using the following formula:

$$\omega = \frac{m_1}{m_0} \times 100$$

where

m_1 is the mass of the filling of the five pies, in grams;

m_0 is the mass of the five pies, in grams.

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7.2.5 Mass of onions in pickled fish

7.2.5.1 Record the declared net mass (m_0) printed on the package. Place the contents of the package on a tared sieve of aperture size between 2 mm and 3 mm and rinse the product with water, pre-warmed, if necessary, to a temperature not higher than 38 ℃, until free of sauce.

7.2.5.2 Remove the fish. Drain for 2 min and then determine and record the mass of the material remaining on the sieve as the mass (m_1) of the onion.

7.2.5.3 Calculate the mass percentage of onions in the product by using the formula given in 7.2.1.3.

7.3 Determination of the net mass of frozen fish products other than glazed products

7.3.1 Immediately after removal of the package from frozen storage, remove all ice adhering to the outside of the package and determine the gross mass of the unopened package.

7.3.2 Remove the packaging material. Wash, dry and determine the mass of the packaging material. Record the difference between the gross mass (see 7.3.1) and the mass of the packaging material as the net mass of the frozen fish product.

7.4 Determination of the net mass of glazed products

7.4.1 Immediately after removal of the package from frozen storage, place the contents of the package in a container into which fresh potable water (see 4.4.1) at ambient temperature is introduced from the bottom at a flow rate of approximately 5 l/min. Leave the product in the water until all surface ice has melted. If the product is block-frozen, turn the block over several times during deglazing, probe the block and remove units from the water as they become loose.

7.4.2 After all the glaze that can be seen or felt has been removed and the units are able to separate easily, transfer the contents of the container (see 7.4.1) to a tared sieve of aperture size between 2 mm and 3 mm. Incline the sieve at an angle of approximately 20° and drain for 2 min.

7.4.3 Record the mass of the material remaining on the sieve as the net mass of the glazed product.

8 Methods of microbiological examination

8.1 General

Use aseptic methods throughout the examination.

8.2 Laboratory glassware

8.2.1 General

Ensure that all glassware used is resistant to repeated heat sterilization and that the glass is free from inhibitory substances such as heavy metals and free alkalis. Boroscilicate glass with an expansion coefficient less than 6×10^{-6} K^{-1} is recommended.

8.2.2 Bottles (universal)

Bottles with standard plastics or metal screw stoppers, and of nominal capacity

a) 30 ml,

b) 00 ml,

c) 250 ml,

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d) 500 ml, and

e) 1 000 ml.

8.2.3 Culture tubes

8.2.3.1 Rimless cylindrical tubes with hemispherical ends and a nominal wall thickness of 1.5 mm, and of diameter and length

a) 16 mm x 160 mm, and

b) 20 mm x 200 mm.

8.2.3.2 Plug these tubes (see 8.2.3.1) with cotton wool plugs or with plugs of a foam rubber suitable for autoclaving. Alternatively, use tubes of similar dimensions with screw stoppers.

8.2.4 Graduated pipettes

Total delivery pipettes for bacteriological purposes only, with outflow openings of diameter 2 mm to 3 mm, graduated in units of 0.1 ml, and of sizes capable to deliver 1.0 ml, 5.0 ml and 10.0 ml of solutions or reagents.

8.2.5 Petri dishes

Petri dishes made of glass or of wettable polystyrene, and of diameter and height

a) 90 mm x 15 mm,

b) 100 mm x 20 mm, and

c) 150 mm x 20 mm.

8.2.6 Volumetric cylinders

Graduated measuring cylinders, with or without screw stoppers, and of capacities 5 ml, 10 ml, 100 ml and 1 000 ml.

8.2.7 Sample bottles

Bottles with mouths of diameter 40 mm to 60 mm, with interchangeable ground-glass or plastics stoppers or lined metal closures, and of capacity 250 ml to 300 ml, diameter 70 mm to 80 mm and height 120 mm to 150 mm.

8.2.8 Culture flasks

Flasks or bottles of capacity 200 ml with standard lined metal or plastics stoppers similar to those described in 8.2.2 and 8.2.7, but with holes of diameter 12 mm to 15 mm drilled through the stoppers which can be plugged with cotton wool or other bacteria-trapping filters.

8.2.9 Reagent bottles

Bottles of capacity 50 ml and 100 ml with polypropylene or other plastics stoppers of such design that they can be used to deliver drops of the reagent.

8.2.10 Small test tubes

Rimless cylindrical tubes with hemispherical ends, a nominal wall thickness of 0.5 mm, a diameter of 6 mm to 7 mm, a length of 100 mm and a capacity of 2.5 ml to 3 ml. These tubes can also be used as long Durham tubes.

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8.2.11 Durham tubes

Tubes as described in 8.2.10, but of length 35 mm to 45 mm and capacity 0,9 mL to 1,3 mL.

8.3 Equipment

8.3.1 Autoclave

A pressure vessel that is capable of producing steam (or that is connected to a central steam source) and of attaining a temperature of 121℃ ± 2 ℃ with in 10 min of the beginning of the sterilization cycle.

8.3.2 Incubators and waterbaths

Incubators and waterbaths with thermostatically controlled heating and cooling devices, and so fitted with means of circulation that the temperature of the total enclosed space is maintained to within 2 °C of the thermostat setting.

8.3.3 Hot air oven (for sterilization by means of dry heat)

A thermostatically controlled oven, heated by electricity or gas and so fitted with means of circulation that the temperature of the total enclosed space is maintained at 170 ℃ ± 5 ℃, and the heat supply being such that the working temperature is regained within 10 min of the momentary opening and closing of the oven door.

8.3.4 Homogenizer

A mechanical mixing apparatus of either a rotating or a pulsating type with sterilizable containers in which a homogeneous dispersion of the sample and the prescribed diluent can be produced. The sterilizable containers may be of glass, metal or a suitable plastics material. The homogenizing procedure shall not reduce the number or viability of the micro-organisms in the sample.

8.3.5 Glass spreaders

Glass spreaders ("hockey sticks") made from glass rods of diameter 3,5 mm and of length 200 mm, each rod bent at right angles approximately 30 mm from one end. The cut ends shall be smoothed by heating in a flame.

8.3.6 Membrane filters

8.3.6.1 Types

Membrane filters (preferably marked with a grid) that have been proved to provide full bacterial retention and satisfactory speed of filtration, to be stable in use, and to be free from chemicals that retard the growth and development of bacteria. Use membrane filters with a maximum pore size not exceeding 0.45 µm.

8.3.6.2 Sterilization

8.3.6.2.1 Individually packed membrane filters should have been pre-sterilized by reliable commercial manufacturers.

8.3.6.2.2 If membrane filters are to be sterilized, moisten them with sterile distilled water (to prevent curling), interleave with filter paper, and pack them tightly into Petri dishes that are kept closed. Sterilize by immersing in boiling water for 1 h or by autoclaving at 115 DC for 15 min.

8.3.7 Membrane filter holders

8.3.7.1 Type

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A membrane filter holder constructed of non-corrosive, bacteriologically inert material that permits all fluid being filtered to pass through the membrane.

8.3.7.2 Sterilization

Assemble the filter holder loosely, ensuring that the porous plate is seated flush with the top surface of its receptacle. Wrap the assembled filter holder in brown paper or other suitable material and sterilize by autoclaving at 121 ℃ ± 2 ℃ for 15 mi n or by any other suitable method.

8.3.8 Forceps

8.3.8.1 Type

Round-tipped forceps with smooth inner surfaces to their jaws.

8.3.8.2 Sterilization

Sterilize by dipping in methylated spirits or technical methanol and then ignite the adherent liquid. Alternatively, use any other suitable method.

8.4 Media and reagents

8.4.1 General

8.4.1.1 Water

Use only glass-distilled water, or demineralized water of equivalent purity which is clear, colourless and free from visible suspended matter, and of which the pH value, measured at 25 ℃, is in the range 5.0 to 7.5.

8.4.1.2 Quality of ingredients

In the preparation of the media and reagents, use only ingredients of quality acceptable for microbiological purposes. Unless otherwise specified, use anhydrous salts.

8.4.1.3 Accuracy

Except where otherwise specified, allow the following tolerances:

a) on temperatures ± 2 ℃;

b) on masses ± 1.0 %;

c) on volumes ± 1.0 %; and

d) on pH values ± 0.1 pH unit.

8.4.1.4 Dehydrated media

Many of the media required are obtainable in dehydrated form and, for uniformity of results, the use of such media is recommended. If such media are used, follow the manufacturer's instructions strictly regarding reconstitution and sterilization.

8.4.1.5 Adjustment of pH value

Where the final pH value of a medium or reagent is specified, so adjust the pH value that it is correct at 25 ℃. If necessary, adjust the pH value during preparation and, in the case of media, before sterilization. Unless otherwise specified, use a solution of hydrochloric acid (c(HCl) = 1 mol/l) or of sodium hydroxide (c(NaOH) = 1 mol/l) , as appropriate, to adjust the pH values.

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8.4.1.6 Dispensing

8.4.1.6.1 Where specified quantities of media are to be dispensed into bottles, use 30 ml universal bottles (see 8.2.2(a)) or 16 mm diameter culture tubes (see 8.2.3.1 (a)). Where bulk sterilizing is required, use any suitable glass container of the required quality (see 8.2.1).

8.4.1.6.2 Dispense reagents into reagent bottles (see 8.2.9) and stir media constantly while dispensing. Whenever the preparation of slopes for surface cultivation is required, dispense the medium in 10 ml volumes and sterilize as specified. Immediately after sterilization, and while the medium is still melted, place the bottles or, when relevant, the culture tubes, on a 1-in-4 sloped surface and allow the medium to solidify.

8.4.1.7 Sterilization

When sterilization by autoclaving is specified, and unless otherwise directed, autoclave the medium at 121℃ ± 2℃ for 15 min.

8.4.1.8 Control of prepared media

Ensure, by suitable incubation tests, that prepared media are sterile and are capable of supporting the growth of the relevant organisms under the stated conditions of incubation.

8.4.1.9 Storage of media

Ensure that prepared media are carefully protected from exposure to heat and sunlight and have not evaporated or changed in concentration or in pH value, and that, unless otherwise specified, they are used within three months of preparation.

8.4.2 Buffered isotonic peptone water (diluent)

8.4.2.1 Ingredients

Peptone ..... 10 g
Sodium chloride ..... 5 g
Sodium phosphate dibasic dodecahydrate ..... 3.5 g
Potassium phosphate monobasic ..... 1.5 g
Water ..... 1 000 ml

8.4.2.2 Preparation

8.4.2.2.1 Dissolve the ingredients in the water and adjust the pH value to 7.0. Dispense as follows:

a) 9 ml volumes into 30 ml bottles (see 8.2.2(a));

b) 99 ml volumes into 250 ml bottles (see 8.2.2(c)); and

c) larger volumes into bulk containers.

8.4.2.2.2 Sterilize by autoclaving at 121℃ for 20 min.

8.5 Standard plate count

8.5.1 Use ISO 4833.

8.5.2 Check for compliance with 5.5.

8.6 *Enterobacteriaceae* count

8.6.1 Use ISO 21528-1 and ISO 21528-2.

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8.6.2 Check for compliance with 5.5.

8.7 Presumptive *Escherichia coli*

8.7.1 Use ISO 7251 or ISO 16649-3.

8.7.2 Check for compliance with 5.5.

8.8 *Staphylococcus aureus*

8.8.1 Use ISO 6888-1 and ISO 6888-2.

8.8.2 Check for compliance with 5.5.

8.9 *Salmonella*

8.9.1 Use ISO 6579.

8.9.2 Check for compliance with 5.5.

8.10 *Shigella*

8.10.1 Use ISO 6195.

8.10.2 Check for compliance with 5.5.

8.11 *Clostridium perfringens*

8.11.1 Use ISO 7937.

8.11.2 Check for compliance with 5.5.

8.12 Pathogenic *Vibrio* (*Vibrio cholerae* and *Vibrio parahaemolyticus*)

8.12.1 Use ISO 6196.

8.12.2 Check for compliance with 5.5.

8.13 Detection of *Listeria monocytogenes*

8.13.1 Use ISO 11290-1 and ISO 11290-2.

8.13.2 Check for compliance with 5.5.

8.14 Test for efficacy of cleaning and disinfection of factory, equipment and utensils

8.14.1 Use ISO 5763.

8.14.2 Check for compliance with 4.6.4.

8.15 Microbiological examination of water

8.15.1 Use EAS 12.

8.15.2 Check for compliance with 4.4.

9 Glazing, freezing and frozen storage

9.1 Glazing

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9.1.1 The product may be glazed using chilled water or any other acceptable glazing agent as a substitute for wrapping, provided that the glaze is maintained in an acceptable condition up to and including the final point of sale.

When the product is glazed, the coating of ice shall cover the product completely to ensure that dehydration and oxidation are minimized.

9.1.2 Water used for glazing shall comply with the requirements for potable water (see 4.4.1) or seawater (see 4.4.2), of which the temperature shall be 5 ℃ ± 1 ℃ (for either one).

9.2 Freezing

9.2.1 The stacking of the product in freezers (other than plate or brine freezers) shall be away from floor and wall surfaces and shall be such that air circulation between packages is not impeded.

9.2.2 The product shall be subjected to either the freezing process or the quick-freezing process as soon as possible after processing. When the product is packed into containers before freezing, it shall not be exposed to excessively high temperatures and the delay between packaging and freezing shall not exceed 3 h.

9.2.3 The temperature of a product, other than a smoked or a pre-cooked product or a product processed within 8 h of having been landed on deck, shall not exceed 20℃ during processing.

9.2.4 Freezing capacity shall not be overtaxed. The freezing and the frozen storage of the product shall be carried out in a way that will obviate freezer burn.

9.3 Frozen storage

9.3.1 Records of the temperature of freezer storage rooms (see 4.2.15.4) shall be retained for at least two years from the date of recording, and shall be made available for inspection by the relevant authority.

9.3.2 If at any time during storage the temperature of the product rises above the appropriate storage temperature, it shall be rapidly lowered to that temperature. If the temperature of the product rises above -7 ℃, the product shall be submitted t o the relevant authority (see 9.3.1) for re-inspection.

9.3.3 The temperature shall be measured using a suitable instrument.

10 Packing and marking (see annex A)

10.1 Packing

10.1.1 Packaging

10.1.1.1 Subject to the relevant requirements of the regulations promulgated under the current relevant national legislation (see foreword), packaging for the unprotected product shall be unused, clean, non-toxic and inert, of low moisture-vapour permeability, and shall not contain substances deleterious to the product or harmful to health.

10.1.1.2 No packaging shall impart a flavour to the product or in any way cause discoloration of the product, or be discoloured itself by coming into contact with the product.

10.1.1.3 Unless the fish product is glazed (see 9.1), it shall be packed in a material of acceptably low permeability to moisture and oxygen. Packaging shall:

a) not be such as to impair the organoleptic characteristics of the product;

b) not be capable of transmitting substances injurious to the product or harmful to human health; and

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c) be strong enough to protect the product adequately.

10.1.2 Outer containers

Only fibreboard or any other acceptable outer containers shall be used for packing wrapped fish products. Outer containers shall be unused, clean and intact, and shall be neatly and securely closed. Wooden outer containers shall not be made of green wood and shall not contain any substance that is injurious to the product or harmful to health. Outer containers shall be so securely closed as to prevent contamination of the contents by dust or foreign matter and shall be strong enough to protect the product adequately.

10.2 Marking

10.2.1 Marking on packages that are not for export

10.2.1.1 Except as allowed for in terms of 10.2.2, the following information shall appear on each package, in legible and indelible marking and in accordance with 10.3, in a typeface of such size and presentation as prescribed by the current relevant national legislation (see foreword):

a) the name and full physical address of the manufacturer, producer, proprietor or controlling company, or, in the case of containers packed for any other person or organization, the name and full physical address of that person or organization;

b) a true description of the product, including the name of the product and the presentation of the contents. In addition, if so desired by the person or organization referred to in 10.2.1.1 (a), in the case of a quick-frozen fish product (see 3.25), the words "Quick frozen". The name or designation that is used in the labelling of the product shall not be misleading, and the variety of fish, except in the case of fish sticks, fish portions, fish cakes, fish balls, fish patties and fish sausages, shall be stated. The method of preparation and the presentation of the contents shall be in accordance with the description on the label or package. Where applicable, the description shall be in accordance with the relevant description given in 5.2;

c) where applicable, a list of the ingredients, in descending order of content;

d) a statement that the product is cooked or uncooked, as applicable, and instructions for storage given as such:

— Uncooked (or raw) — Keep frozen.
— Partly cooked — Keep frozen. Do not refreeze once thawed.
— Cooked — Keep frozen. Do not refreeze once thawed.

e) if the product has been glazed with seawater, a statement to this effect prominently displayed on the main panel of the label, in immediate conjunction with the name of the product;

f) the net mass of the contents, where applicable (in accordance with the current relevant national legislation (see foreword». Where the product has been glazed, the declaration of the net mass shall be exclusive of the glaze;

g) the country of origin;

h) directions for use, where relevant;

i) any labelling requirement specifically called for by regulation;

j) the date of manufacture and the identity of the factory in which the product was packed. The use of a code is permissible, provided that the key to the code is disclosed to the authority administering this standard; and

k) the following wording, or wording with a similar meaning, shall appear in close proximity to

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wording that describes the product as either boned, de boned or boneless, in words that are at least half the size of that used for such description: "While every effort is made to remove all the bones, some small bones may remain".

10.2.1.2 Any trade name used shall not be misleading to the customer.

10.2.2 Marking on outer containers that are not for export

10.2.2.1 Outer containers shall be clean, neat and unbroken, and on every such container (carton, box, etc.) shall have printed or stencilled the quantity and size or net mass of the packages it contains and the information required by 10.2.1.1 (a), (b), (d) and (f), except that the physical address required by 10.2.1.1 (a) need not be the full physical address but shall be sufficient for identification purposes. The method of preparation need not be given on the outer container.

10.2.2.2 The date of manufacture, the identity of the factory and the batch number (if applicable) shall be stamped or otherwise indelibly marked on the outer container or on a label securely attached to the outer container, or on a packing slip inserted into the outer container. A code may be used for the date of manufacture, provided that the key to the code is disclosed to the authority administering this standard.

10.2.3 Marking on outer containers and packages for export

Outer containers and packages for export shall be marked in accordance with the requirements of the importing country and may be marked differently from the requirements of 10.2.1 and 10.2.2, provided that there is no attempt to misrepresent the contents. Details as required by 10.2.1.1 (i) shall be printed on each outer container and package.

10.3 labels

10.3.1 The information required in 10.2.1 shall be printed on each individual package or on the overwrap covering such a package, or on a label of acceptable material attached to the package.

10.3.2 Labels on packages shall be clean and neat and securely attached. They shall not be super-imposed on other labels or on matter printed directly on the packages. They shall not be applied by any person other than the manufacturer or his authorized agent.

10.3.3 Labels or sealing adhesives that are liable to deteriorate under the conditions of storage of the packaged products shall not be used.

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Annex A
(normative)

Notes to purchasers

The following requirements shall be specified in tender invitations and in each order or contract:

a) the required condition of ingredients and the product (see 5.1);

b) the type of outer container in which the product is to be packed (see 10.1.2); and

c) in the case of a quick-frozen fish product, whether the words "Quick frozen" are to appear on the packaging (see 10.2.1.1(b)).

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Annex B
(normative)

Sampling and compliance with this standard

B.1 Sampling

B.1.1 General

The following sampling procedure shall be applied in determining whether a lot submitted for inspection complies with the relevant requirements of this standard. The samples so drawn shall be deemed to represent the lot.

This annex applies to the sampling for inspection before acceptance or rejection of single lots (consignments) in cases where no information about the implementation of quality control during production is available to assist in assessing the quality of the lot. It is also used as the procedure for adjudicating in cases of dispute.

B.1.2 Definitions

B.1.2.1
defective
sample of the product that fails in one or more respects to comply with the relevant requirements of this standard

B.1.2.2
lot
that quantity of frozen fish, marine molluscs, and products derived therefrom in sealed containers of the same size and bearing the same batch identification, from one producer, and submitted at any one time for inspection

B.2 Sample for inspection

B.2.1 General

After inspecting the lot for compliance with 6.3, take, at random, the number of containers, as relevant, shown in columns 2, 3 and 4 of table B.1, relative to the appropriate lot size shown in column 1.

8.2.2 Sample for incubation at 37 ℃

From the lot, take, at random, the number of containers as shown in column 2 of table 8.1, relative to the appropriate lot size shown in column 1.

B.2.3 Sample for physical examination and for the inspection of containers (see clause 7 and 10.1, respectively)

From the lot, take, at random, the number of containers as shown in column 3 of table 8.1, relative to the appropriate lot size shown in column 1.

B.2.4 Sample for microbiological examination (see 5.5)

From the samples drawn in accordance with B.2.2, take, at random, two containers and one container from those drawn in accordance with B.2.3.

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Table B.1 — Sample sizes

1	2	3	4
Lot size Number of containers	**Sample for inspection Number of containers**		
	Sample size for incubation at 37 ℃	**Sample size for physical examination and inspection of containers**	**Sample size for microbiological examination**
0 – 5 000	2 % of the lot size	3	3
5 001 – 12 500	2 % of the lot size, with a maximum of 200	6	3
12 501 – 25 000	200	9	3
25 001 – 50 000	200	16	3
50 001 upwards	200	30	3

B.3 Compliance with this standard

The lot shall be deemed to comply with the requirements of this standard if, after inspection of the samples taken in accordance with B.1 and B.2, no defective is found.

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Annex C
(informative)

Quality verification of frozen fish, marine molluscs, and products derived therefrom

When a purchaser requires ongoing verification of the quality of frozen fish, marine molluscs, and products derived therefrom, it is suggested that, instead of concentrating solely on evaluation of the final product, he also direct his attention to the manufacturer's quality system. In this connection it should be noted that ISO 9001 covers the provisions of an integrated quality system.

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