



Technical Specifications for the manufacture of:

## CANNED TUNA

Version: **V14.0**

Date of issue: **10 December 2014**

### 1. SCOPE

This specification applies to **Canned Tuna** distributed by WFP, hermetically sealed and processed by heat to achieve commercial sterility and prevent spoilage. Unless otherwise specified in the tender and contract, the fish will be packed in 200g or 425g cans, in a medium:

- of tomato sauce with or without vegetable oil and brine
- *or* of vegetable oil.

### 2. DEFINITIONS

**Solid** (skin-on or skinless) - fish cut into transverse segments which are placed in the can with the planes of their transverse cut ends parallel to the ends of the can. The proportion of free flakes or chunks shall not exceed 18% of the drained weight of the container.

**Chunk** - pieces of fish most of which have dimensions of not less than 1.2cm in each direction and in which the original muscle structure is retained. The proportion of pieces of flesh of which the dimensions are less than 1.2 cm shall not exceed 30% of the drained weight of the container.

**Flake or flakes** - a mixture of particles and pieces of fish most of which have dimensions less than 1.2 cm in each direction but in which the muscular structure of the flesh is retained. The proportion of pieces of flesh of which the dimensions are less than 1.2 cm exceed 30% of the drained weight of the container.

**Grated or shredded** - a mixture of particles of cooked fish that have been reduced to a uniform size, in which particles are discrete and do not comprise a paste.

### 3. RAW MATERIALS

#### 3.1 Tuna

Tuna fish shall be manufactured from fresh or frozen fish of a quality fit for human consumption. As tuna belongs to the family of fish with high risk from scombroid toxin, post-harvest handling of the starting raw material must prevent histamine formation through strict time and temperature controls. The tuna species can be used in Tuna canning is showed in table 2.

#### 3.2 Vegetable oil and fat

Vegetable oil, if used in pre-cooking fish or as an ingredient, should conform to:

- Codex Standard for Named Vegetable Oils (CODEX STAN 210-1999);
- Codex Standard for Olive Oils and Olive Pomace Oils (CODEX STAN 33-1981);
- Codex Standard for Fats and Oils not Covered by Individual Standards (CODEX STAN 19-1981).

### 3.3 Tomato and tomato sauce

**Tomato** used in manufacturing tomato sauce shall conform to Codex Standard for Tomatoes (CODEX STAN 293-2008) or Codex Standard for Preserved Tomatoes (CODEX STAN 13-1981).

**Tomato sauce** used as a medium for filling shall be manufactured in accordance with Codex Standard for Tomatoes (CODEX STAN 293-2008).

### 3.4 Other ingredients and food additives

All other ingredients and food additives used for canning shall be of food grade quality and conform to all applicable Codex standards.

## 4. PROCESSING

**Canned Tuna** shall be manufactured in accordance with:

- Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003);
- Codex Standard for Canned Tuna and Bonito (CODEX STAN 70 - 1981, REV. 2013);
- Recommended International Code of Practice for Canned Fish (CAC/RCP 10-1976);
- Recommended International Code of Hygienic Practice for Low-Acid and Acidified Low-Acid Canned Foods (CAC/RCP 23-1979);
- Recommended International Code of Practice: General Principles of Food Hygiene, CAC/RCP 1-1969 Rev 3 1997 Amended (1999) including Annex “Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its application”.

For compliance with Codex standards, the processor must be able to demonstrate by principle and practice the adoption, implementation and recording of:

- Good Manufacturing Practices
- Hazard Analysis Critical Control Point program

In this context an appointed WFP Inspector / Quality Surveyor is entitled to visit the factory without prior notice during any period when WFP product is being manufactured to check that the GMP and HACCP systems are in place. The Inspector / Quality Surveyor may request to see:

- **Records** (i.e. names of people in charge of the process and quality control, temperatures and other details of the thermal process establishment, retort records, visual inspection and teardown for empty and seamed cans, incoming inspection of empty cans, cooling water chlorination, Cook-Chex monitoring records, swab test results, etc).
- **Procedures** (e.g. SOPs such as cleaning, personnel hygiene and their verification; HACCP; sampling and analysis protocols for raw material and finished products, decomposition controls, retorting by-pass controls, etc).
- **Instructions** (e.g. process instructions, cleaning instructions, testing instructions).
- The **SOPs, HACCP Plan and Quality Manual** for the process or factory.

The producer must be *registered under national food law* as a processor of foods for human consumption. In addition, the producer must have a *legal authorization* to produce this commodity in the country where the factory is located and the country where the product will be exported (e.g. *FCE- Food Canning Establishment- and SSID- Process Filing- numbers in the USA or equivalent*).

## 5. PRODUCT SPECIFICATIONS

### 5.1 General requirements

Tuna fish can be of following types: Skin-on; Skinless; Chunk; Flake; Grated.

The product shall have an odour, flavour and texture characteristic of the Tuna genus and the tomato sauce used as fill medium and shall not contain any objectionable odour, flavour and texture of any kind.

## 5.2 Specific requirements

The product must also comply with other requirements specified in table 2.

## 5.3 Thermal process establishment

The manufacturing facility shall establish the thermal processes used to assure commercial sterility of its canned products through scientific validation studies. Thermal process establishment must consist of two parts: 1) temperature distribution studies specific to the process lines and retort systems used; and 2) heat penetration studies specific to the product form, fill medium, ingredients and can size. The results for such studies must determine how the **minimum Fo value to achieve commercial sterility** is achieved when the operating parameters for the facility's cook schedules are followed. The studies shall also determine the critical factors for the thermal process, provide alternative process schedules, document the retort configuration and instrumentation, determine vent schedules and cooling protocols. Retort records must provide proof that these are monitored and complied. Such records shall be reviewed by a trained individual within 24 hours of the completion of the cook. Thermal processes must be established prior to use and validated at a frequency that reflects any changes that may impact the safety of the process or product. In the absence of such validation triggers, thermal process validation may be done annually or once every two years.

## 5.4 Hygiene

5.4.1 The final product shall be free from any foreign material that poses a threat to human health.

5.4.2 When tested by appropriate methods of sampling and examination prescribed by the Codex Alimentarius Commission, the product:

- shall be free from micro-organisms capable of development under normal conditions of storage; and
- no sample unit shall contain histamine that exceeds 20 mg per 100 g. This applies only to species of the families *Scombridae*, *Clupeidae*, *Coryphaenidae*, *Scombresocidae* and *Pomatomidae*.
- shall not contain any other substance including substances derived from microorganisms in amounts which may represent a hazard to health in accordance with standards established by the Codex Alimentarius Commission; and
- shall be free from container integrity defects which may compromise the hermetic seal.

## 5.5 Chemical contaminants and toxins

Contaminants and toxins in the **Canned Tuna** could come from the fish itself, the fishing grounds, from ingredients, equipment, utensils and even from the cans. These shall not exceed the levels or country-specific regulatory requirements, whichever is stricter.

**Canned Tuna** shall not contain pesticide residues in amounts which may represent a hazard to health. In some markets, there are chemical requirements about can lacquers.

## 5.6 Hermetic seal

The manufacturing facility shall have an incoming goods sampling program for empty cans and lids. Specifications for can bodies and ends must be on file and specific to the can supplier. They shall include details of can dimensions, end profile, can body weight, can body and end thickness, side seam weld, empty can water capacity, external and internal lacquers (coatings), seam dimensions of the sealed end. The seam dimensions must specify acceptable range or limits for parameters, such as seam thickness, seam length, body hook and cover hook, needed to calculate overlap as well as those, such as vacuum, countersink, wrinkle, that could indicate potential can defects from the seaming operation.

During production, the manufacturing facility shall ensure that seamers are operated to match the can properties and obtain a vacuum to maintain a hermetic seal. Checks for defects in seamed finished product cans shall be done visually at a minimum of every 30 minutes. In addition, seam teardowns must be carried out at minimum every four hours, using either a micrometer or a seam projector. All seaming records are considered legal documents and therefore, must be recorded accurately and reviewed within 24 hours of production.

### 5.7 Shelf life

It shall retain normal product qualities for at least three years from the date of manufacture when stored dry at ambient temperatures prevalent in the country of destination. Thermal processing, seaming and other HACCP records shall be kept for a minimum of shelf-life plus one year.

## 6. PACKAGING

Unless otherwise specified in the tender and contract, the product shall be packaged into 200g or 425g can to constitute the primary packaging. The secondary packaging is cartons to facilitate transportation and storage.

### 6.1 Can

The metal containers (cans) must be coated internally and externally with materials which are safe and appropriate for the product. The facility must obtain the acceptable ranges and limits for the double seam dimensions and other characteristics of the filled can specific to the can type, size and supplier. Together with fill standards required for the product, these specifications will be used to ensure the finished product is hermetically sealed during the seaming operation.

Some guidelines for specification of can are shown in table 1.

*Table 1: Specification for can*

	Can size	
	200g	425g
Can size	74.1 x 59.0 mm	115.0 x 75.0 mm
Can weight	Min. 29.9g	Min. 59.0g
Lid type	regular or easy open	

### 6.2 Cartons

Supplier must use the carton which is fit for export and multiple-harsh handling.

Some guidelines for cartons are:

- Cartons should be new, strong cardboard cartons containing 50 cans of 200g or 24 cans of 425g, manufactured from well-constructed single wall, fluted paper, corrugated board with a specific weight of 750g per square meter. This specific weight corresponds to a carton weight of 560g.

- Cartons should have burst strength (edge crush test) of 44 pounds per square inch or 3.2 kg/cm<sup>2</sup> or equivalent.
- Carton sides and flaps should be glued, not stapled or strapped.
- Substance of cartons should be 275-120-275 (750g per m<sup>2</sup>).

Two percent marked cartons (included in the price) must be sent with the lot.

Dunnage of strong sheets (e.g carton, plywood...) should be placed inside each container at every three layer of cartons to provide the required stacking strength. Pallets with appropriate stacking configuration could also be used.

*Note: For shipping containers, unless otherwise specified in the contract, 20 bags of desiccant (such as silica gel or other authorized products) of at least 1 kg each must be placed in each 20 feet container in order to absorb moisture. In addition, kraft paper must be laid to all internal sides of container.*

## **7. MARKING**

Unless otherwise specified in the tender and contract, the marking for cans and cartons shall comply with below requirements.

### **7.1 On cans**

The following information should be available on cans:

- Name of the product
- Net weight
- Name of manufacturing facility (including country of origin)
- Batch number (should be traceable to retort and seamer used for manufacturing)
- Production date (and shift, if there is more than one shift)
- Best before date
- Instruction for use

Additional marking as per contractual agreement.

### **7.2. On cartons**

The following information should be available on each carton:

- Name of the product
- Number of cans per carton
- Net weight
- Name and address of the supplier (including country of origin)
- Production date
- Best before date

Additional marking is as per contractual agreement.

## **8. STORING**

**Canned Tuna** must be stored under cool, dry and hygienic conditions.

## **9. INSTRUCTION FOR USE**

Consume all contents once opened.

## **10. ANALYTICAL REQUIREMENTS**

The principal tests in table 2 must be performed in order to check if the quality of the product meets above requirements. Additional analyses shall be defined in case of further quality assessment is required.

Table 2: Limit of compulsory tests and reference method

No	Tests	Requirements		Reference method (or equivalent)
		200g cans	425g cans	
1	Net weight	200g	425g	CODEX 119 - 1981, Rev.1-1995
2	Drained weight	Min. 120g	Min. 255g	CODEX 119 - 1981, Rev.1-1995
3	Can size	As per contractual agreement		
4	Empty can weight			
5	Fish species	<ul style="list-style-type: none"> <li>- <i>Thunnus alalunga</i></li> <li>- <i>Thunnus albacares</i></li> <li>- <i>Thunnus atlanticus</i></li> <li>- <i>Thunnus obesus</i></li> <li>- <i>Thunnus maccoyii</i></li> <li>- <i>Thunnus thynnus</i></li> <li>- <i>Thunnus tongoe</i></li> <li>- <i>Euthynnus affinis</i></li> <li>- <i>Euthynnus alleteratus</i></li> <li>- <i>Euthynnus lineatus</i></li> <li>- <i>Katsuwonus pelamis</i> (syn. <i>Euthynnus pelamis</i>)</li> <li>- <i>Sarda chilensis</i></li> <li>- <i>Sarda orientalis</i></li> <li>- <i>Sarda Sarda</i></li> </ul>		
6	Organoleptic (texture, color, smell, taste)	Characteristic of fresh fish and good quality fill medium		CAC-GL31-1999
7	Type (Skin-on, skinless; Chunk, Flake, grated)	As per contractual agreement		Visual inspection
8	Incubation Tests	Negative		GB/T4789.26 (2003); TIS 335; BAM Chapter 21A
9	Seam checks (vacuum, overlap...)	Normal		BAM: Examination of Metal Containers for Integrity; Chapter 22A
10	Total Coliform	0 cfu/g		BS 5763:1991 Part 2
11	Escherichia Coli	0 cfu/g		AOAC 966.23B
12	Salmonella	Absence (in 25g of sample)		ISO 6579:2002
13	Staphylococcus aureus	Absence (in 25g of sample)		AOAC 975.55
14	Lysteria monocytogenes	Absence (in 25g of sample)		AOAC 993.09 AOAC 994.03
15	Mercury (Hg)	Max. 0.5 ppm		AOAC 977.15
16	Cadmium (Cd)	Max. 0.05 ppm		AOAC 945.58
17	Lead (Pb)	Max. 0.5 ppm		AOAC 972.23
18	Inorganic Arsenic (As)	Max. 1.0 ppm		EN 15517
19	Tin (Sn)	Max. 200 ppm		AOAC 985.16
20	Para red	Absence		HPLC or LC-MS/MS
21	Rhodamine	Absence		HPLC or LC-MS/MS
22	Sudan red dyes (I, II, II and IV)	Absence		HPLC or LC-MS/MS
23	Histamine	Max. 10 mg/100 g		AOAC977.13