



## Technical Specifications for

### SALT – IODIZED

Commodity code: **MSCSAL010**

Version: **1, adopted 2018**

Replacing: **Version 13.1, dated 26 March 2013**

Date of **OSCC** issue: **20.12.2018**

*This version replaces the versions 13.1 adopted in March 2013  
The adjustments are:  
1. Revising iodine fortification requirements to align with WHO  
2014 Guidelines on "Fortification of food-grade salt with iodine  
for the prevention and control of iodine deficiency disorders"*

#### 1. SCOPE

This specification applies to Iodized Salt as an ingredient of food and used as food grade salt. Food grade salt is a crystalline product consisting pre-dominantly of Sodium Chloride (NaCl). It is obtained by dry or solution mining of underground rock salt deposits and by evaporation of sea water, salt lake water or natural brine. The specification does not apply to the salt which is a by-product of chemical industry.

#### 2. REFERENCES

Unless otherwise specified, the product must comply with the following guidelines or standards (latest versions):

- Codex standard for Food Grade Salt: CODEX STAN 150-1985
- WHO 2014 Guidelines on "Fortification of food-grade salt with Iodine for the prevention and control of iodine deficiency disorders"
- Recommended International Code of Practice: General Principles of Food Hygiene CAC/RCP 1-1969 including Annex "Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its application".
- General standard for Contaminants and Toxins in food and feed: CODEX STAN 193-1995
- General Standard for Food Additives (GSFA), CODEX STAN 192-1995

#### 3. RAW MATERIALS

##### 3.1 Main ingredient

The product covered by the provision of this specification shall be manufactured from good quality ingredients, free from foreign materials, substances hazardous to health, excessive moisture, and must comply with all relevant national food laws and standards where applicable.

- The Iodized Salt must conform to Codex STAN 150-1985.
- The Iodized Salt may comprise of natural secondary products, which are present in varying amounts depending on the origin and the methods of production of the salt, which are composed of mainly calcium, potassium, magnesium and sodium sulphates, carbonates, bromides, and of calcium, potassium, magnesium chloride as well.
- Natural contaminants may also be present in amounts varying with the origin and the method of production of the salt.

- The Salt rocks and evaporated salt from the sea or lake must be kept under dry, covered and hygienic conditions.

### **3.2 Iodine compounds**

For the fortification of Iodized Salt with iodine, use fortificant made of sodium and/or potassium iodides or iodates. The iodine compound e.g. Potassium iodate (KIO<sub>3</sub>) added in salt shall be of food grade quality and conform to all applicable Codex standards.

The Iodine compound should be purchased from GAIN Premix Facility or any of the GAIN approved premix suppliers, a complete list is available at the following link:

<http://gpf.gainhealth.org/suppliers/current-suppliers>

The iodine compound must be delivered to the processor of Iodized Salt with a complete Certificate of Analysis (CoA) and a Proof of Purchase. The two documents must be presented with other documents to WFP as proof for fortification. Micronutrient premix must be stored in a dry, cool and clean place by following premix manufacturer's recommendations.

## **4. PROCESSING**

The production of Iodized Salt shall only be performed by reliable manufacturers having the knowledge and the equipment requisite for the adequate production of food grade salt, and especially, for the correct dosage, mixing and quality monitoring.

### **4.1 Methods of Salt Iodization**

The most common method of iodating salt is called "wet mixing". This involves the preparation of a fortificant (iodate) solution which is sprayed or dripped onto the salt as it moves along a conveyor belt or a screw conveyor. In a simpler set-up, which can be equally effective when carried out well, the iodate solution is sprayed onto a batch of salt that is mixed in a blender or roller mixer. The preparation and spraying of solution requires the fortificant, clean filtered water and a pump with a nozzle for spraying.

When Iodized Salt is manufactured by dry mixing, the KIO<sub>3</sub> is first blended with an anti-caking agent to serve as the standard premix, which is then mixed with the input salt in a set proportion. Commonly permitted anti-caking agents are calcium carbonate, tricalcium phosphate and magnesium carbonate.

An estimated additional variability of  $\pm 10\%$  during iodization procedures could be considered at the production site for use in quality control and assurance procedures. This variability depends on the iodization methods used and quality assurance system in place.

### **4.2 Homogeneity of KIO<sub>3</sub> mixing**

Theoretical calculations indicate that a mixing system with a Coefficient of Variation of 10% using Iodine as the indicator element, will enable product to meet the above variation target on 95%, provided that all conditions of mixing are rigorously applied. The guidelines for this calculation is shown at <http://foodqualityandsafety.wfp.org/coefficient-of-variation-calculator>

The iodine content of the Iodized Salt as it is being produced should be constantly controlled, preferably through "in line" product sampling and iodine content analysis at short intervals.

### 4.3 Food safety and risk assessment at manufacturing premises

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

- Good Manufacturing Practice
- 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 of the process, mixing times / quantity, cleaning schedules, etc.)
- Procedures (e.g. cleaning, personnel hygiene, HACCP, sampling and analysis)
- Instructions (e.g. process instructions, cleaning instructions.
- The quality manual for the process or factory.
- The manufacturer must be registered under national food law as a processor of foods for human consumption.

## 5. PRODUCT SPECIFICATIONS

### 5.1 General requirements

#### 5.1.1 Food Additives

Food additives listed in Tables 1 and 2 of the Codex General Standard for Food Additives (CODEX STAN 192-1995) in Food Category 12.1.1 (Salt) may be used in foods subject to this standard. All additives used shall be of food grade quality.

#### 5.1.2 Contaminants

The product covered by this specification shall comply with the maximum levels of the General Standard for Contaminants and Toxins in Foods and Feed as per Codex Standard 193-1995.

Contaminants in the Iodized Salt shall not exceed the following levels:

*Table 1: Limit of chemical contamination in Iodized Salt*

Item	Maximum limit
Alkalinity (as Na <sub>2</sub> CO <sub>3</sub> )	0.1 % (m/m)
Acid insoluble matter	0.15 % (m/m)
Sulphate (as SO <sub>4</sub> )	0.5 % (m/m)
Arsenic	0.5 mg/kg
Copper	2.0 mg/kg
Lead	2.0 mg/kg
Cadmium	0.5 mg/kg
Mercury	0.1 mg/kg
Calcium	0.5 % (m/m)
Tin (as Sn)	100.0 mg/kg

Iodized Salt shall not contain other contaminants and toxins in amounts which may represent a hazard to health.

### **5.1.3 Food Hygiene**

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the:

- Recommended International Code of Practice – General Principles of Food Hygiene (CAC/RCP 1-1969), and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to these products.

## **5.2 Specific requirements**

### **5.2.1 Physio-chemical**

Iodized Salt is dried, sieved, edible and iodized for human consumption.

- Sodium chloride as NaCl: min 97.0 % (on dry matter)
- Moisture content: max 3.0% (m/m)
- Water insoluble matter: max 0.2 % (m/m)
- Colour: shall be white and 10 g of salt in 100 ml water shall give a colourless solution having a neutral reaction.
- Iodine: 39.0-65.0 mg/kg (means 65 – 110 mg of potassium iodate per kg of salt)

**Note:** The maximum and minimum levels used for the iodization of food grade salt are to be calculated as iodine (expressed as mg/kg) and shall be established by the WHO 2014 Guidelines on Fortification of food-grade salt with iodine for the prevention and control of iodine deficiency disorders and/or by the National Health Authorities in the light of the local iodine deficiency situation where recommended.

### **5.2.2 Particle size distribution**

- Min 85 % pass through 1.00 mm sieve
- Max 20 % pass through 0.212 mm sieve

Otherwise: particle size will be specified in the purchase contract.

### **5.2.3 Shelf life**

No shelf life restriction for Iodized Salt as per WFP requirements. Iodized Salt shall be stored away from excessive humidity, direct sunlight at any stage of storage and transportation.

## **6. PACKAGING**

### **6.1 General requirements**

Iodised salt shall be packed in air tight bags of either high density polyethylene (HDPE) or polypropylene (PP) or LDPE-lined jute bags (Grade 1803 DW jute bags lined with 150-gauge polyethylene sheet).

### **6.2 Packaging material**

#### **25/50 kg PP bags**

- Countenance: fit to contain 25/50kg of product
- Virgin woven polypropylene (PP) (no recycled material or colorant allowed)
  - 50 Kg: typical size 60 x 100 cm, Minimum PP grammage of 110 gsm – typical weight 130 gr
  - 25 Kg: typical size is 50 x 75 cm, Minimum PP grammage of 80 gsm – typical weight 75 gr
- Minimum meshing 10 x 10,

- Minimum Denier 1000,
- Heat cut to prevent fibrillation,
- Sewn with a double folded bottom with a minimum 4 dots per inch.

#### **Inner Liner**

- Virgin Low Density Polyethylene (LDPE) (no recycled material or colorant allowed)
- Minimum PE thickness: 100 µm,
- Easy sealable material
- The bottom must not be hollowed when the bottom of outer bag is sewn

It is under supplier responsibility to select a packaging material that will protect Iodized Salt from excessive humidity, direct sunlight at any stage of storage and transportation.

- Food grade materials compliant with national regulations in the country of production and reception
- Properly double stitched from top and bottom with no leakages.
- The bags that have already been used for packing other articles such as fertilizers, cement, chemicals etc. should not be reused for packing of iodized salt included any production or intermediate stages.

#### **6.3 Compliance testing:**

- The bags of finished product must pass the drop test (after each drop, there shall be no rupture or loss of contents) following the principles of the drop test standard (EN 277, ISO 7965-2 or equivalent) with following sequence:
  - Butt dropping: Bag is dropped from a height of 1.20m on the bottom and the top of the bag.
  - Flat dropping: Bag is dropped from a height of 1.60m twice on one flat face and twice on the opposite flat face.

#### **7. MARKING**

Below information must be printed on the bags:

- Name of the food: **Salt Iodized**
- Net weight
- Name of supplier (Name and address)
- Country of origin
- Production date (mm/yyyy)
- Batch/Lot identification
- Storage instructions
- Note for Sale

Additional marking may be required as per contract and/or Country specific National Regulations on product labelling.

#### **8. STORING**

The product covered by the provision of this specification must be stored under dry, ventilated and hygienic conditions. The bags of Iodized Salt shall be stored only in covered rooms or go-downs to protect from excessive humidity and direct sunlight.

## 9. ANALYTICAL REQUIREMENTS

The principal tests in table 2 must be performed to check if the quality of Iodized Salt meets below requirements. Additional analyses/stringent requirement shall be followed in case of Country Specific regulatory requirements on Iodized Salt.

Table 2: List of compulsory tests and reference method

No	Parameter/Test	Requirements	Analytical method (or equivalent)
1	Organoleptic	- Normal smell - Colour: white - 10g of salt in 100ml water shall give a colourless solution having a neutral reaction	
2	Particle size	- min 85 % pass through 1.00 mm sieve - max 20 % pass through 0.212 mm sieve Or: as per specified in the purchase contract.	
3	Sodium chloride (NaCl)	Min 97.0 % (m/m, on dry matter)	ISO 2481
4	Moisture content	Max 3.0 % (m/m)	ISO 2483:1973
5	Water insoluble matter	Max 0.2 % (m/m)	ISO 2479
6	Iodine	39.0 – 65.0 mg/kg (Based on estimated salt consumption 3-5g per day, WHO 2014 Guidelines)	ESPA/CN 109/84
7	Alkalinity (as Na <sub>2</sub> CO <sub>3</sub> )	Max 0.1 % (m/m)	ISO 3196
8	Acid insoluble matter	Max 0.15 % (m/m)	ISO 2479
9	Sulphate (as SO <sub>4</sub> )	Max 0.5 % (m/m)	ISO 2480
10	Arsenic (As)	Max 0.5 mg/kg	ECSS/SC 312-1982
11	Copper (Cu)	Max 2.0 mg/kg	ECSS/SC 144-1977
12	Lead (Pb)	Max 2.0 mg/kg	ECSS/SC 313-1982
13	Cadmium (Cd)	Max 0.5 mg/kg	ECSS/SC 314-1982
14	Mercury (Hg)	Max 0.1 mg/kg	ECSS/SC 312-1982