

**PS: 1669-2008  
(ICS No.67.220.20)**

**PAKISTAN STANDARD  
SPECIFICATION  
FOR  
IODIZED FOOD GRADE SALT  
(2<sup>ND</sup> REV.)**



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**PAKISTAN STANDARDS AND QUALITY CONTROL AUTHORITY**  
**Standards Development Centre,**  
39 – Garden Road, Saddar,  
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**PAKISTAN STANDARDS & QUALITY CONTROL AUTHORITY**  
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**PAKISTAN STANDARD SPECIFICATION  
FOR  
IODIZED FOOD GRADE SALT (2<sup>ND</sup> REV.)**

**0. FOREWORD**

- 0.1 This Pakistan Standard Specification was adopted by the Pakistan Standards & Quality Control Authority, Standards Development Centre, on 18-01-2008 after the draft finalized by the Food Additives Technical Committee, had been approved by the National Standards Committee For Agriculture & Food Products
- 0.2 Standards Development Centre, PSQCA laid down this Standard on Iodized Salt PS: 1669 in 1985 and first revised in 1996. The committee felt it necessary to revise in the light of latest developments made in the Industries.
- 0.3 Iodine, in traces, is considered as one of the essential elements for the proper functioning of the hormones of thyroid glands which control the basic rate of metabolism in human and animal life. Its deficiency causes goiter. The simple and inexpensive way to prevent and eradicate, it is the use of iodized salt on the table and in cooking.
- 0.4 For the iodization of salt, Potassium Iodide, Potassium Iodate and Calcium Iodate may be used. If Potassium Iodide used, it shall be stabilized by the addition of suitable stabilizing agents. The stability of Potassium and Calcium iodate is high under tropical condition and they do not require any stabilization.
- 0.5 In drawing up this standard, the views of the consumers, manufacturers, technologists and testing Authorities have been taken into consideration by the Sectional Committee.
- 0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the results of a test or analysis, shall be rounded off in accordance with PS: 103-1991 (1<sup>st</sup> Rev.) Method and Rules for rounding off numerical values. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

- 0.7 In order to keep abreast with the progress in the industry, Pakistan standards are subject to periodical reviews and suggestion for the improvement shall always be welcomed.

## **1. SCOPE**

- 1.1 This standard prescribes the requirements and the methods of sampling and test for Iodized Food Grade Salt.

## **2. DESCRIPTION**

- 2.1 The material shall be white, crystalline product consisting phenomenally of sodium chloride and free from any visible impurities and deleterious substances.

It is obtained from the sea, from rocks salt deposits or from natural brine. This shall conform to PS: 3746 – 1996 for Food Grade Salt.

- 2.2 Moisture – the material as received shall not contain more than 3.0 percent by mass of moisture when tested in accordance with the method prescribed in PS:ISO:2483 – 1973 for Determination of loss of mass at 110° C.

- 2.3 Particle Size – Ninety-nine percent of the material shall preferably pass through 1.00 mm PS: Sieve.

- 2.4 The material, dried in accordance with the method prescribed in PS : 3746 – 1996 for Food Grade Salt shall also comply with the requirements given in Table 1 when tested according to the relevant methods prescribed in column 4 and 5 of Table 1.

- 2.5 Keeping quality: The Iodine content shall not be lower than 30 ppm or Potassium Iodate ( $KIO_3$ ) shall not be lower than 50 ppm on dry weight basis with one year of manufacture.

**TABLE – 1**  
**REQUIREMENTS FOR IODIZED FOOD GRADE SALT**

Sl. No.	CHARACTERISTICS	REQUIREMENT	METHOD OF TEST REF. TO (APP. A PS : 3746 – 1996*
(1)	(2)	(3)	(4)
i)	Water insoluble matter, percent by mass, Max.	0.5	A-3
ii)	Sodium Chloride content (as NaCl) percent by mass, Min.	98.0	A-4
iii)	pH range	6.5 to 7.5	A -6
iv)	Iodine content at - (a) Manufacturers level  (b) Distribution channel including retail level	Not less than 30 parts per million on dry weight basis  15 to 25 parts per million on dry weight basis	Annexure -1 of this Standard

\* Pakistan Standard Specification for Food Grade Salt

### 3. **FOOD ADDITIVES**

Food additives listed in tables 1 & 2 of the Codex General Standard for Food additives (CODEX STAN 1-192-1995) in Food Category 12.1.1 (Salt) may be used in foods subject to this standard.

3.1 All additives used shall be of food grade quality.

### 4. **CONTAMINANTS**

Iodized Food Grade Salt may not contain contaminants in amounts and in such form that may be harmful to the health of the consumer. In particular the following maximum limits shall not be exceeded.

4.1 ARSENIC

Not more than 0.5mg/kg expressed as As.

#### 4.2 COPPER

Not more than 2mg/kg expressed as Cu.

#### 4.3 LEAD

Not more than 2mg/kg expressed as Pb.

#### 4.4 CADMIUM

Not more than 0.5mg/kg expressed as Cd.

#### 4.5 MERCURY

Not more than 0.1mg/kg expressed as Hg.

### 5. **HYGIENE**

- 5.1 In order to ensure that proper standards of food hygiene are maintained until the product reaches the consumer, the method of production, packing, storage and transportation of Iodized Food Grade Salt shall be such as to avoid any risk of contamination.

### 6 **LABELLING**

In addition to the requirements of the Pakistan Standard for the labelling of Prepackaged Foods (PS: 1485 - 1980) the following specific provisions apply:

#### 6.1 THE NAME OF THE PRODUCT

- 6.1.1 The name of the product, as declared on the label shall be "Iodized Food Grade Salt".
- 6.1.2 Only when salt contains one or more Ferro cyanide salt, added to the brine during the crystallization step, the term "dendritic" could be included accompanying the name.
- 6.1.3 Where salt is used as a carrier one or more nutrients, and sold as such for public health reasons, the name of the product shall be declared properly on the label, for

example “Salt Fluoridated”, “Salt Iodated”, “Salt Iodized”, “Salt Fortified with Iron”, Salt Fortified with Vitamins” and so on, as appropriate.

6.1.4 An indication of either the origin or the method of production may be declared on the label, provided such indication does not mislead or deceive the consumer

## 6.2 LABELLING OF NON-RETAIL CONTAINERS

Information for non-retail containers shall either be given on the container or in accompanying documents, except that the name of the product, lot identification and name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

## 7 **PACKING AND MARKING**

7.1 Packing – Dried material shall be packed in propylene or any suitable flexible Food Grade material.

7.2 Marking – The following details shall appear on the package and marking on the bags shall be indelible and legible:

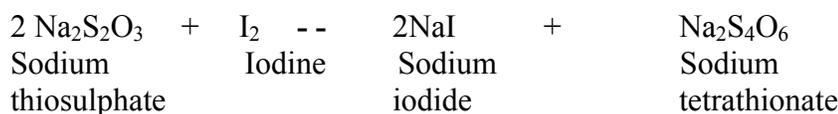
- a) Name , ‘IODIZED FOOD GRADE SALT’
- b) Name of the manufacturer , address and his recognized trade mark if any,
- c) Lot or batch Number,
- d) Date of manufacture and expiry,
- e) PS Mark, PS number and License Number,
- f) Caution Note : Store in a cool and dry place

## **ANNEXURE – 1**

### **METHOD OF TEST FOR IODIZED FOOD GRADE SALT**

#### **PRINCIPLE:**

The Iodine content in iodized salt containing potassium iodate is estimated by a process called iodometric titration. Free iodine reacts with sodium thiosulphate solution as follows:



Sulphuric acid to solution of iodized salt which liberates iodine, which is titrated with sodium thiosulphate. Starch is used as an external indicator. Potassium iodide solution is added to keep the Iodine in the dissolved state.

#### **PREPARATION OF REAGENTS**

1. Sodium thiosulphate ( $\text{Na}_2\text{S}_2\text{O}_3$ )

Dissolve 1.24 g  $\text{Na}_2\text{S}_2\text{O}_3$  in 1 L boiled, double-distilled water. This volume is sufficient for testing 200 salt samples. Store in a cool, dark place. Properly stored, the solution can be kept for a few months.

2. 2 N Sulphuric acid ( $\text{H}_2\text{SO}_4$ )

To 90 ml double – distilled water add 0.6 ml concentrated  $\text{H}_2\text{SO}_4$  slowly .Add boiled, double-distilled water to make 100ml. This volume is sufficient for 100 salt samples. store in a cool dark place. The solution may be kept indefinitely.

**Caution:** To avoid violent and dangerous reaction always add the acid to water, never water to acid;

3. Potassium iodide (KI, AR)

Dissolve 10 g KI in 100 ml double-distilled water. This volume is sufficient for testing 20 salt samples. Store in a cool, dark place. Properly stored, the solution may be kept for 6 months.

4. Soluble chemical starch

Dissolve sodium chloride (NaCl) reagent (AR) in 100 ml boiled, double-distilled water. While stirring, add NaCl until no more dissolves. Heat the contents of the beaker till excess salt dissolves. While cooling the NaCl crystals will form on the sides of the beaker. When it is completely cooled, decant the supernatant in a clean bottle. This can be stored for 3 to 4 weeks.

Dissolve 1 g chemical starch in 10 ml boiling double-distilled water. Continue to boil till in completely dissolves. Add the saturated NaCl solution to make 100 ml starch

solution. This volume is sufficient for testing 20 salt samples. Prepare fresh starch solution every day since starch solution cannot be stored.

### **LABORATORY PROCEDURE**

The procedure is as follows:

1. Carefully weigh 10 g of the salt to be tested;
2. Pour the salt into a 50 ml measuring cylinder;
3. Slowly add boiled, double-distilled water;
4. Shake to dissolve the salt completely;
5. Add more water to make 50 ml;
6. Pour the salt solution (50 ml) into a conical flask with stopper;
7. Pipette out 1 ml of 2 N sulphuric acid and add this to the salt solution;
8. Pipette out 5 ml of 10% potassium iodide and add this to the salt solution;
9. The solution turns yellow; Close the flask with the stopper and put it in the dark for 10 minutes. A closed box, cupboard or drawer may be used;
10. Pour sodium thiosulphate into a burette;
11. Adjust the level in the burette to '0' ;
12. After 10 minutes, take the flask out of the dark box;
13. Shaking the flask, titrate the solution in the flask with sodium thiosulphate from the burette;
14. Stop titration as soon as the solution turns pale (becomes very light yellow);
15. Add a few drops (1 to 5 ml) of 1% starch solution to the flask;
16. The solution turns deep purple;
17. Continue titration until the purple coloration disappears and the solution becomes colourless;
18. Note the burette reading;
19. From the attached table, read the iodine content of the sample in parts per million.

### **REPORTING**

Iodine testing is easy and takes only about twenty minutes per sample. Maintaining accurate records is as important as the testing itself. The results are to be recorded in a register indicating.

- date of testing
- sample number
- batch number of the salt,
- date of iodization
- where the sample was taken from,
- date of sampling, and finally,
- level of iodine in the sample

Daily reports of the findings are made and the supervisor is to be alerted if the iodine content is less than the prescribed level. Your report will lead to action to protect the consumer. Delay on your part will delay these actions and harm the consumer.

A list of laboratory equipment and reagents required for analysis of iodized salt and available as a standard kept through UNICEF Copenhagen is attached..

**IODINE CONTENT (IN PARTS PER MILLION)**

<b>Burette Reading</b>	<b>Parts per million</b>	<b>Burette Reading</b>	<b>Parts per million</b>	<b>Burette Reading</b>	<b>Parts per million</b>
<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
0	0.0	4.0	42.3	8.0	84.6
01	1.1	4.1	43.4	8.1	85.7
02	2.1	4.2	44.4	8.2	86.8
03	3.2	4.3	45.5	8.3	87.8
04	4.3	4.4	46.6	8.4	88.9
05	5.3	4.5	47.6	8.5	89.9
06	6.3	4.6	48.7	8.6	91.0
07	7.4	4.7	49.7	8.7	92.0
08	8.5	4.8	50.8	8.8	93.1
09	9.5	4.9	51.9	8.9	94.2
1.0	10.6	5.0	52.9	9.0	95.2
1.1	11.6	5.1	54.0	9.1	96.3
1.2	12.7	5.2	55.0	9.2	97.3
1.3	13.8	5.3	56.1	9.3	98.4
1.4	14.8	5.4	57.1	9.4	99.5
1.5	15.9	5.5	58.1	9.5	100.5
1.6	16.9	5.6	59.2	9.6	101.6
1.7	18.0	5.7	60.3	9.7	102.6
1.8	19.0	5.8	61.4	9.8	103.7
1.9	20.1	5.9	62.4	9.9	104.7
2.0	21.2	6.0	63.5		
2.1	22.2	6.1	64.5		
2.2	23.3	6.2	65.6		
2.3	24.3	6.3	66.7		
2.4	25.4	6.4	67.7		
2.5	26.5	6.5	68.8		
2.6	27.5	6.6	69.8		
2.7	28.6	6.7	70.9		
2.8	29.6	6.8	71.9		
2.9	30.7	6.9	73.0		
3.0.	31.7	7.0	74.1		
3.1	32.8	7.1	75.1		
3.2	33.9	7.2	76.2		
3.3	34.9	7.3	77.2		
3.4	36.0	7.4	78.3		
3.5	37.0	7.5	79.4		

3.6	38.1	7.6	80.4		
3.7	39.1	7.7	81.5		
3.8	40.2	7.8	82.5		
3.9	41.3	7.9	83.6		