

PAKISTAN STANDARD : PS:2102-2003.

(I. C. S. NO: 67.100.30)

SPECIFICATION

FOR

BOTTLED NATURAL MINERAL WATER (2ND REV.).



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STANDARDS DEVELOPMENT CENTRE
39 – GARDEN ROAD, SADDAR,
KARACHI – 74400.

BOTTLED NATURAL MINERAL WATER(2ND REV.)CONTENTS

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FOR
BOTTLED NATURAL MINERAL WATER

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PAKISTAN STANDARD SPECIFICATION
FOR
BOTTLED NATURAL MINERAL WATER (2ND REV.)

0. FOREWORD

- 0.1 This Pakistan Standard was adopted by the Pakistan Standards & Quality Control Authority, Standards Development Centre on 14-07-2003 after the draft finalized by the Food Hygiene Sectional Committee had been approved by the Agriculture & Food Products Divisional Council.
- 0.2 Natural mineral water characterized by its content of non-adverse health related mineral salts and their relative proportions and the presence of non-toxic trace elements or of other constituents. It is not subjected to any treatment other than those permitted by this standard.
- 0.3 Guidelines for the determination of a compliance of a lot with the requirements of this standard based on inspection and statistical sampling are given in clause – 8 and clause-19.
- 0.4 For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test or an

analysis, shall be rounded off in accordance with PS:103-1991 (R). The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

1. SCOPE

- 1.1 This standard applies to all bottled natural mineral water offered for sale as food. It does not apply to natural mineral water sold or used for other purposes.

2. DEFINITION

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

- 2.1 Natural mineral water : Water which originates from underground water bearing strata and extracted for human consumption from natural or drilled sources like springs, wells or boreholes and not derived from a municipal system or public water supply.

Natural mineral water is a water clearly distinguishable from ordinary drinking water because :

- a. It is characterized by its content of certain mineral salts and their relative proportions and the presence of trace elements or of other constituents;

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- b. it is obtained directly from natural or drilled sources from underground water bearing strata;
- c. of the constancy of its composition and the stability of its discharge and its temperature, due account being taken of the cycles of natural fluctuations;
- d. it is collected under conditions which guarantee the original bacteriological purity;
- e. it is bottled close to the point of emergence of the source with particular hygienic precautions;
- f. it is not subjected to any treatment other than those permitted by this standard;
- g. it is in conformity with all the provisions laid down in this standard.

3. AUTHORISED TREATMENT

- 3.1 Natural Mineral Water shall not be subjected to any treatment whether for disinfection or any other purpose during its processing, other than filtration or decanting, preceded if necessary by aeration, provided that such treatment does not alter the composition of the water in respect of its stable constituents and is not intended to change its total viable colony count.

- 3.1.1 The transport of natural mineral water in bulk containers for packaging or for any other process before packaging is prohibited.

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4. Bottled Natural Mineral Water shall conform to the requirements prescribed in Table-1.

TABLE – 1 – PHYSICAL &CHEMICAL REQUIREMENTS

SL. NO.	CHARATERISTICS	LIMITS	METHOD OF TEST REFERENCE TO APPENDICES OF PS:4639-2002*.
1.	pH Range.	6.5 – 8.5	A
2.	Total dissolved solids (Tds). max.	1000 mg/l	B
3.	Total hardness as CaCO ₃ max	250 mg/l	C
4.	Nitrite (NO ₂)	0.020 mg/l	D
5.	Chloride	250 mg/l.	E
6	Sulphate	100 mg/l	F
7.	Sodium	30 mg/l.	G
8.	Potassium	30 mg/l.	H
9.	Magnesium	100 mg/l.	I
10.	Calcium	200 mg/l.	J

*specification for Bottled Drinking Water (2nd Rev.).

5. The product may also conform to the following specified limits given under Table-II (Optional).

TABLE – II.

<u>CHARACTERISTIC</u>	<u>MAXIMUM ADDMISSIBLE CONCENTRATION (MAC) mg/l</u>
Antimony (Sb)	0.005
Arsenic (As)	0.010
Barium (Ba)	1.0
Borate (B)	1.0
Cadmium (Cd)	0.003
Chromium (Cr)	0.050
Copper (Cu)	1.0
Cyanide (CN)	0.070

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Fluoride (F)	1.5
Lead (Pb)	0.010
Manganese (Mn)	0.500
Mercury (Hg)	0.001
Nickel (Ni)	0.020
Nitrate (NO ₃)	10.0
Selenium (Se)	0.010
Benzene	0.010
Benzo(a) pyrene	0.0070
Bromate	0.025
Carbon tetrachloride	0.002
Dichloromethane	0.020
0-dichloromethane	1
p-dichlorobenzene	0.300
1,2 dichloroethane	0.030
Cis-1,2 dichloroethylene	0.030
Trans – 1,2 dichloroethylene	0.050
1,2 – dichloropropane	0.040
Ethylbenzene	0.3
Monochlorobenzene	0.3
Styrene	0.020
Tetrachloroethylene	0.040
Trichloroethylene	0.070
Toluene	0.700
1,1,1 trichloroethane	0.002
1,1,2,2 tetrachloroethane	0.040
Vinyl chloride	0.005
Xylenes	0.5
Alachlor	0.020
Aldicarb	0.010
Atrazine	0.002
Carbofuran	0.007
Chlordane	0.00020
1,2 – dibromo – 3 - chloropropane	0.001
2,4 – D	0.030
Ethylene dibromide	0.00003
Heptachlor	0.00003
Heptachlor epoxide	0.00003
Lindane	0.002
Methoxychlor	0.020
Pentachlorophenol	0.009
Simazine	0.002

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Aldrine 0.000030

Dieldrine	0.000030
2,4,5 – TP	0.009
di(2-ethylhexy) adipate	0.0080
di(2-ethylhexy) phtalate	0.080
Total trichlorobenzenes	0.020
Hexachlorobenzene	0.001
Diquat	0.010

6. METHODS OF TEST

- 6.1 Tests for characteristics given Table – 1 shall be carried out according to the methods prescribed in PS:4639-2003 for Bottled Drinking Water (2nd Rev.).

7 Hygiene

- 7.1 Natural Mineral Water shall be collected, processed and marketed under hygienic conditions in accordance with PS:4718-2001 Code of Hygienic Practice for the Collecting, Processing and Marketing of Natural Mineral Water.
- 7.2 Natural mineral water shall be bottled closed to the point of emergence of the source with particular hygienic precautions.

8. Source

- 8.1 The source or the point of emergence shall be protected against risks of pollution.
- 8.2 The installation intended for the production of Natural Mineral Water shall be such as to exclude any possibility of contamination. For this purpose, and in particular :
- (a) The installations for collection, the pipes and the reservoirs shall be made from materials suited to the water and in such a way as to prevent the introduction of foreign substances into the water;
 - (b) the equipment and its use for production, especially installations for washing and packaging shall meet hygienic requirements;
 - (c) if during production it is found that the water is polluted, the producer shall stop all operations until the cause of pollution is eliminated.

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9 MICROBIOLOGICAL REQUIREMENTS :

The product shall conform to the limits given in Table-III.

TABLE – III: MICROBIOLOGICAL LIMITS DISINFECTED BY

	ozonation	other process	Method of Test
Total coliform	0/250 ml	0/250 ml	PS:ISO:9308-2-1990*
Faecal E-Coli	0/250 ml	0/250 ml	ASTM Vol.11.02 D 5392
Enterococci (Faecal Streptococci)	0/250 ml	0/250 ml	PS:ISO 7899-2-2000**
Pseudomonas aeruginosa	0/250 ml	0/250 ml	ASTM Vol.11.02 D 5246

* Water quality – Detection and enumeration of Escherichia coli and coliforms bacteria part 2.

** Water quality - Detection & enumeration of intestinal enterococci part 2

10 The product may also conform to the limits given in Table-IV.

TABLE – IV MICROBIOLOGICAL LIMITS (Optional)

	ozonation	other process
Total Plate Count	< 100 cfu/ml at	22 °C (72 hours)
	< 20 cfu/ml at	37 °C (24 hours)
Sporulated SRA	0/100 ml	shall be free

11. HYGIENE

11.1 Natural Mineral Water for the purpose of bottling shall be prepared in accordance with PS:3944-1997 for Code of Practice – General Principles of food Hygiene and in accordance with the PS:4718-2001 for Code of Practice for the collecting, processing and marketing of natural mineral waters.

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12. PACKAGING

- 12.1 The containers/bottles shall be hygienic suitable completely clean and shall not cause any undesirable change in taste odour or colour or quality of the water. It can be inspected at random just prior to being filled and sealed.
- 12.2 It shall be packed in hermetically sealed containers/bottles of food grade material to prevent contamination of Natural Mineral Water.
- 12.3 Filling and sealing operations of containers/bottles shall be done in an aseptic atmosphere so as to prevent any contamination.
- 12.4 Transportation. Bottled Natural Mineral water shall be transported by any suitable means of transport to protect it from contamination.

13 Marking

In addition to the PS:1485-1994 (R) for Pakistan Standard for Labelling of Pre-Packaged Foods, the following provisions shall apply :

- (a) Name of the product (Natural Mineral Water).
- (b) Brand name or trade name if any,
- (c) Net volumes in System International/Metric System,
- (d) Name and address of the manufacturer,
- (e) Batch number or code number.
- (f) Date of Expiry,
- (g) Location and name of the source,
- (h) Chemical composition for e.g. Sulphate, Magnesium, Potassium, Chloride and Hardness.
- (i) This Pakistan Standard number, PS Mark & Licence Number.

14. SAMPLING

- 14.1 **L O T** : In any consignment all the bottles of the same size and belonging to one batch of manufacture or supply shall constitute a lot.

14.1.1 General Requirements of Sampling

- 14.1.2 Each container/bottle of the sample shall be marked with necessary details of sampling and the bottles for bacteriological testing shall be marked separately.

- 14.1.3 The containers/bottles of the sample shall be stored in such a manner that there shall be no deterioration of quality of water.
- 14.1.4 The containers/bottles for bacteriological testing shall be brought to the testing laboratory within one hour of sampling. If this is not possible the bottles shall be stored at 10 °C or below and transported to the testing laboratory within 24 hours. In case of small units, the original packing shall be treated as sample.

14.2 Scale of Sample:

- 14.2.1 Samples shall be tested from each lot for ascertaining its conformity to the requirements of this specification.
- 14.2.1 The number of containers/bottles to be selected from a lot shall be in accordance with the Table-V.

TABLE – V - SCALE OF SAMPLING

Number of Bottles in the Lot	Number of bottles to be selected
Up To 1000	15
1001 to 3000	17
3001 to 10,000	18
10001 and above	24

- 14.3 If the containers/bottles are packed in cases, 10 percent of the cases subject to a minimum of five cases shall be selected from the lot and as far as possible an equal number of bottles shall be selected from each case so selected to form a sample of size given in 14.2.2.

14.4 Number of tests:

- 14.4.1 Each container/bottle selected as in 14.2.2 shall be inspected for packaging and marking requirements.
- 14.4.2 Each container/bottle selected as in 14.2.2 shall be tested individually for the microbiological limits given in 9.
- 14.4.3 A sufficient quantity of water shall be drawn from each of the remaining bottles and mixed to form a composite sample and the composite sample thus obtained shall be tested for the requirements given in Table-I and Table-III.

15. CRITERIA FOR CONFORMITY:

A lot shall be declared as conforming to the requirements of this specification, if the following conditions are satisfied.

- 15.1 Each bottle inspected as in 14.4.1 satisfies the relevant requirements.
 - 15.2 Each bottle when tested as in 14.4.2 satisfies the relevant requirements.
 - 15.3 Composite sample when tested as in satisfies the relevant requirements.
-