भारतीय मानक

Indian Standard

IS 14543 : 2024

पैकेजबंद पेय जल (पैकेजबंद प्राकृतिक मिनिरल जल के अलावा) — विशिष्टि

(तीसरा पुनरीक्षण)

Packaged Drinking Water (other than Packaged Natural Mineral Water) — Specification

(Third Revision)

ICS 13.060.20

भारतीय मानक ब्यूरो
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Drinking Water and Carbonated Beverages Sectional Committee, FAD 14

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Drinking Water and Carbonated Beverages Sectional Committee had been approved by the Food and Agriculture Division Council.

Since the advent of 1990s, consumption of packaged water for drinking purposes had increased considerably in the country. Apart from water shortages at times, real and perceived needs to safeguard health have also contributed to an escalating trade in packaged drinking water at the national and international level. Accordingly, Indian Standard on packaged drinking water (PDW) was formulated considering the consumers' health and safety and to ensure that the packaged water offered for sale is safe and free from harmful organisms.

This standard was originally published in 1998. In formulating this standard, assistance had been derived from following:

a) Manual on water supply and treatment (third edition), 1991, prepared by expert Committee constituted under the Ministry of Urban Development, New Delhi.
b) Codex Code of practice for collecting, processing and marketing of natural mineral waters (CAC/RCP33-1985).
c) EEC Directive, 80/778/EEC relating to the quality of water intended for human consumption.

The standard was subsequently revised in 2004 and 2016. The first revision was undertaken to incorporate six amendments along with the technological developments, check list for hygienic requirements during manufacturing of PDW and consumer requirements. The second revision was undertaken to incorporate eight amendments, revision of definition of packaged drinking water, updation of the requirements of *p*H, barium, cadmium and arsenic to align them with latest version of the WHO Guidelines for drinking water and introduction of clause for 'Marking on Water not Meant for Human Consumption'.

This revision has been undertaken to update the test methods standards prescribed particularly with respect to incorporation/ addition of advanced instrumental test methods for determination of various parameters such as inductively coupled plasma mass spectrometry (ICP-MS), liquid chromatography of ions and inductively coupled plasma optical emission spectrometry (ICP-OES) apart from incorporation of 8 amendments issued to the standard.

Separate standards have been formulated for packaged natural mineral water (*see* IS 13428) and drinking water (*see* IS 10500).

In the formulation of this standard due consideration has been given to the provisions of the *Food Safety and Standards Act*, 2006 and *Legal Metrology Act*, 2009 and Rules framed thereunder. However, this standard is subject to the restrictions imposed under these rules and regulations, wherever applicable.

The composition of the Committee responsible for the formulation of this standard is given at Annex G.

For the purpose of deciding whether a particular requirement of the standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PACKAGED DRINKING WATER (OTHER THAN PACKAGED NATURAL MINERAL WATER) — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for packaged drinking water (other than natural mineral water) offered for consumption and/or for sale in packaged form.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

3 TERMINOLOGY

For the purpose of this standard, the following terms shall apply.

3.1 Drinking Water (Other than Natural Mineral Water) — Means water from any potable water source including public drinking water supply systems (*see* IS 10500).

3.2 Packaged Drinking Water (Other than Packaged Natural Mineral Water) — Means water, other than natural mineral water that is likely to be used for human consumption and that is offered or sold in packaged form, by whatever name it may be called, offered or sold.

4 HYGIENIC CONDITIONS

Source water shall be collected, processed, handled, packaged and marketed in accordance with the hygienic practices given in Annex B. A check list for good hygienic practices and food safety system for packaged water processing units is given in Annex C.

5 REQUIREMENTS

5.1 General Requirements

5.1.1 Water shall be derived from surface water or civic water supply or underground water or sea water or any other consistent source of water which may be subjected to herein under specified treatments, namely, decantation, distillation, filtration, combination of filtration, aerations, filtration with membrane filter, depth filter, cartridge filter, activated carbon filtration, demineralization, remineralization, reverse osmosis and packed after disinfecting the water to a level that shall not lead to any harmful effect in the drinking water by means of chemical agents or physical methods to reduce the number of micro-organisms to a level below scientifically accepted level for food safety or its suitability: Provided that sea water, before being subjected to the above treatments, shall be subjected to desalination and related processes.

5.1.2 It shall be filled in sealed containers of various compositions, forms and capacities that are suitable for direct consumption without further treatment. In case remineralization is a part of the treatment process, the ingredients used shall conform to food grade/pharma grade quality.

5.2 Microbiological Requirements

Packaged drinking water shall comply with the requirements given in 5.2.1 to 5.2.9.

5.2.1 *Escherichia coli* — (or thermotolerant bacteria) shall be absent in any 250 ml sample when tested in accordance with the method given in IS 15185.

5.2.2 *Coliform* — bacteria shall be absent in any 250 ml sample when tested in accordance with the method given in IS 5401 (Part 1) or IS 15185*.

NOTE — In case of dispute, the method indicated by '*' shall be the reference method.

5.2.3 *Faecal Streptococci and Staphylococcus aureus* — shall be absent in any 250 ml sample when tested in accordance with the method given in IS 5887 (Part 2). *Faecal Streptococci* (*Enterococci*) may also be tested by the method specified in IS 15186*.

NOTE — In case of dispute, the method indicated by '*' shall be the referee method

5.2.4 *Sulphite Reducing Anaerobes* — shall be absent in 50 ml sample when tested in accordance with the method given in Annex C of IS 13428.

5.2.5 *Pseudomonas Aeruginosa* — shall be absent in 250 ml sample when tested in accordance with the method given in Annex D of IS 13428* or ISO 16266-2.

5.2.6 *Aerobic Microbial Count*

The total viable colony count shall not exceed 100/ml at 20 °C to 22 °C in 72 h and 20/ml at 37 °C ± 1 °C in 24 h when tested in accordance with the methods given in IS 5402 (Part 1).

5.2.7 Yeast and mould shall be absent in 250 ml sample when tested in accordance with the method given in IS 16069 (Part 1) (*see* Note under **5.2.9**) .

5.2.8 *Salmonella and Shigella* — shall be absent in 250 ml sample when tested in accordance with the method given in IS 15187 and IS 5887 (Part 7) (*see* Note under **5.2.9**), respectively.

5.2.9 *Vibrio cholera* and *V. parahaemolyticus* — shall be absent in 250 ml sample when tested in accordance with the method given in [IS 5887 (Part 5/Sec 1) (*see* Note)].

NOTE — The membrane filtration technique outlined in IS 15188 may be used to pass the sample of water to be tested through membrane before the microbiological tests specified from **5.2.1** to **5.2.3**, **5.2.5** and **5.2.7** to **5.2.9** are carried out.

5.3 Packaged drinking water shall be clear without any sediments, suspended particles and extraneous matter. It shall also comply with the requirements given in Table 1, Table 2, Table 3 and 4.

5.4 In the packaged drinking water, the maximum limit of the pesticide residues for pesticides as given in Annex D shall be as follows:

Sl No.	*Parameters*	*Limits*
(1)	(2)	(3)
i)	Pesticide residues considered individually	Not more than 0.000 1 mg/l
ii)	Tota1 pesticide residue	Not more than 0.000 5 mg/l

The analysis for pesticide residues shall be conducted by a recognized laboratory using internationally established test methods meeting the residues limits specified above as given in Annex D.

6 PACKING

6.1 It shall be packed in clean, hygienic and tamperproof containers/bottles/pouches made of food grade plastic material or other food grade packaging materials, namely paper and paper board materials; glass (*see* IS 11984); and metal and metal alloys which may or may not contain plastic as component, compatible with the water to be packaged.

6.1.1 Plastic containers shall conform to IS 15410 and polyethylene flexible pouches shall conform to IS 15609. Guidelines for handling of polyethylene flexible pouches are given in Annex E.

6.1.2 Paper based multilayer laminated/extruded composite cartons shall conform to IS 17753 and aluminium cans shall conform to IS 18285.

6.1.3 All packaging materials of plastic origin shall pass the overall migration, colour migration and specific migration limits for toxic substances as laid down in IS 15410.

7 MARKING

7.1 The following particulars shall be marked legibly and indelibly on the label of the bottle/container:

a) Name of the product in capital letters (that is, packaged drinking water);

b) Name and address of the processor;

c) Brand name, if any;

d) Batch or code number;

e) Date of manufacture or packaging and 'Expiry/use by;

f) Treatment of disinfection, if any;

g) Best before date (optional);

h) Net quantity;

j) Direction for storage;

k) Keep away from direct sunlight; and

m) Any other information required under the *Legal Metrology* (*Packaged Commodities*) *Rules, 2011 and the Food Safety and Standards* (*Labelling and Display*) *Regulations*, 2020.

NOTE — The manner of declaration of date of manufacture or packaging/Expiry/Use by/Best before, shall follow the DD/MM/YY format for products with shelf life upto three months. For products with shelf life more than three months, either DD/MM/YY format shall be used or the month and the year shall be declared in un-coded numerical sequence except that the month shall be indicated by capital letters and abbreviations (at least first three letters of the month) may be used.

Table 1 Organoleptic and Physical Parameters

(*Clause* 5.3)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Colour, true colour units, *Max*	2	IS 3025 (Part 4)
ii)	Odour	Agreeable	IS 3025 (Part 5)
iii)	Taste	Agreeable [action tendency scale (a) or (b) or (c)]	IS 3025 (Part 8)
iv)	Turbidity, nephelometric turbidity unit (NTU), *Max*	2	IS 3025 (Part 10)
v)	Total dissolved solids, mg/l, *Max*	500	IS 3025 (Part 16)
vi)	*p*H	6.0 to 8.5	IS 3025 (Part 11)

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts

(*Clause* 5.3)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Barium (as Ba), mg/1, *Max*	0.7	Annex G of IS 13428 or IS 15302 or IS 3025 (Part 2) or IS 3025 (Part 65)*
ii)	Copper (as Cu), mg/1, *Max*	0.05	IS 3025 (Part 42) or IS 3025 (Part 2) or IS 3025 (Part 65)*
iii)	Iron (as Fe), mg/1, *Max*	0.1	IS 3025 (Part 53) or 15303 or IS 3025 (Part 2) or IS 3025 (Part 65)*
iv)	Manganese (as Mn), mg/1, *Max*	0.1	IS 3025 (Part 59) or IS 3025 (Part 2) or IS 3025 (Part 65)*
v)	Nitrate (as NO_3) mg/1, *Max*	45	IS 3025 (Part 34/Sec 1) or IS 3025 (Part 75)*
vi)	Nitrite (as NO_2), mg/1, *Max*	0.02	IS 3025 (Part 34/Sec 1) or IS 3025 (Part 75)*
vii)	Fluoride (as F), mg/1, *Max*	1.0	IS 3025 (Part 60/Sec 1 or Part 60/Sec 2 or Part 60/ Sec 3) or IS 3025 (Part 75)*
viii)	Zinc (as Zn), mg/1, *Max*	5	IS 3025 (Part 49) or IS 3025 (Part 2) or IS 3025 (Part 65)*
ix)	Silver (as Ag), mg/1, *Max*	0.01	Annex K of IS 13428 or IS 3025 (Part 2) or IS 3025 (Part 65)* or IS 3025 (Part 79)

Table 2 (*Concluded*)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
x)	Aluminium (as A1), mg/1, *Max*	0.03	IS 3025 (Part 2) or IS 3025 (Part 55) or IS 15302 or IS 3025 (Part 65)*
xi)	Chloride (as Cl), mg/1, *Max*	200	IS 3025 (Part 32) or IS 3025 (Part 75)*
xii)	Selenium (as Se), mg/1, *Max*	0.01	IS 3025 (Part 2) or IS 3025 (Part 56) or IS 15303 or IS 3025 (Part 65)*
xiii)	Sulphate (as SO_4), mg/1, *Max*	200	IS 3025 (Part 24/Sec 1 or Part 24/Sec 2) or IS 3025 (Part 75)*
xiv)	Alkalinity (as HCO_3), mg/1, *Max*	200	IS 3025 (Part 23)
xv)	Calcium (as Ca), mg/1, *Max*	75	IS 3025 (Part 40) or IS 3025 (Part 2) or IS 3025 (Part 65)*
xvi)	Magnesium (as Mg), mg/1, *Max*	30	IS 3025 (Part 46) or IS 3025 (Part 2) or IS 3025 (Part 65)*
xvii)	Sodium (as Na), mg/1, *Max*	200	IS 3025 (Part 45) or IS 3025 (Part 2) or IS 3025 (Part 65)*
xviii)	Residual free chlorine, mg/1, *Max*	0.2	IS 3025 (Part 26)
xix)	Phenolic compounds (as C_6H_5OH), mg/1, *Max*	0.001	IS 3025 (Part 43/Sec 1)
xx)	Mineral oil, mg/1, *Max*	1.0	IS 3025 (Part 39)
xxi)	Anionic surface active agents (as MBAS), mg/1, *Max*	0.2	IS 3025 (Part 68)* or IS 3025 (Part 78)
xxii)	Sulphide (as H_2S), mg/1, *Max*	0.05	IS 3025 (Part 29)
xxiii)	Antimony (as Sb), mg/1, *Max*	0.005	Annex H of IS 13428 or IS 3025 (Part 2) or IS 15303 or IS 3025 (Part 65)*
xxiv)	Borates (as B), mg/1, *Max*	5	Annex J of IS 13428 or IS 3025 (Part 2) or IS 3025 (Part 65)*
xxv)	Bromates (as BrO_3), mg/l, *Max*	0.01	IS 3025 (Part 67)

NOTES

1 Approved and validated international test methods from ISO/APHA/ASTM/AOAC/EPA/EN may also be followed.

2 In case of dispute, methods given at col (4) and wherever indicated by'*' shall be the reference method.

Table 3 Parameters Concerning Toxic Substance

(*Clause* 5.3)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Mercury (as Hg), mg/l, *Max*	0.001	IS 3025 (Part 48) or IS 3025 (Part 65)*
ii)	Cadmium (as Cd), mg/l, *Max*	0.003	IS 3025 (Part 2) or IS 3025 (Part 41) or IS 3025 (Part 65)*
iii)	Arsenic (as As), mg/l, *Max*	0.01	IS 3025 (Part 2) or IS 3025 (Part 37) or IS 3025 (Part 65)*
iv)	Cyanide (as CN)	Absent	IS 3025(Part 27/Sec 1)* or IS 3025 (Part 27/Sec 2) or IS 3025 (Part 27/Sec 3)
v)	Lead (as Pb), mg/l, *Max*	0.01	IS 3025 (Part 2) or IS 3025 (Part 47) or IS 3025 (Part 65)*
vi)	Chromium (as Cr), mg/l, *Max*	0.05	Annex K of IS 13428 orIS 3025 (Part 2) or IS 3025 (Part 65)*
vii)	Nickel (as Ni), mg/l, *Max*	0.02	Annex L of IS 13428 or IS 3025 (Part 2) or IS 3025 (Part 65)*
viii)	Polychlorinated biphenyl (PCB)	Not detectable	Annex M of 13428
ix)	Polynuclear aromatic hydrocarbons	Not detectable	APHA 6440
x)	Uranium, mg/l, *Max*	0.03	IS 3025 (Part 65)* or IS 14194 (Part 3)

NOTES

1 Approved and validated international test methods from ISO/ APHA/ASTM/AOAC/EPA/EN may also be followed.

2 In case of dispute, methods given at col 4 and wherever indicated by'*' shall be the reference method.

Table 4 Parameters Concerning Radio-Active Residues

(*Clause* 5.3)

Sl No.	Characteristic	Requirement	Method of Test, Ref to IS
(1)	(2)	(3)	(4)
i)	Alpha emitters, Becquerel (Bq/l), *Max*	0.1	IS 14194 (Part 2)
ii)	Beta emitters, Becquerel (Bq/l), *Max*	1	IS 14194 (Part 1)

NOTE — In case of non-conformity of radioactive residues, the source of water shall be abandoned and water shall be recalled immediately.

7.2 Labelling Prohibitions

7.2.1 No claims concerning medicinal (Preventative, alleviative or curative) effects shall be made in respect of the properties of the product covered by this standard. Claims of other beneficial effects related to the health of the consumer shall not be made.

7.2.2 The name of the locality, hamlet or specified place may not form part of the brand name unless it refers to a packaged drinking water collected processed at the place designated by that brand name.

7.2.3 The use of any statement or of any pictorial device which may create confusion in the mind of the public or in any way mislead the public about the nature origin, composition and properties of drinking water is prohibited.

7.3 BIS Certification Marking

7.3.1 The product may also be marked with the Standard Mark.

7.3.2 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

8 SAMPLING

Representative samples of the material shall be drawn and the criteria of conformity to this standard shall be established according to method described in Annex F.

ANNEX A

(*Clause 2*)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 3025	Methods of sampling and test (physical and chemical) for water and waste water:
(Part 2) : 2019/ ISO 11885 : 2007	Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (*first revision*)
(Part 4) : 2021	Colour (*second revision*)
(Part 5) : 2018	Odour (*second revision*)
(Part 8) : 2023	Taste rating (*second revision*)
(Part 10) : 2023	Turbidity (*second revision*)
(Part 11) : 2022/ ISO 10523 : 2008	*p*H value (*second revision*)
(Part 16) : 2023	Filterable residue (total dissolved solids) at 180 °C (*second revision*)
(Part 23) : 2023	Alkalinity (*second revision*)
(Part 24)	Sulphates,
(Sec 1) : 2022	Gravimetric and turbidity methods (*second revision*)
(Sec 2) : 2021/ ISO 22743 : 2006	Method by continuous flow analysis
(Part 26) : 2021	Chlorine, residual (*second revision*)
(Part 27)	Cyanide,
(Sec 1) : 2021	Titrimetric, colorimetric and ion-selective methods (*second revision*)
(Sec 2) : 2022/ ISO 14403-1 : 2012	Method using flow injection analysis
(Sec 3) : 2021/ ISO 14403-2 :	Method using continuous flow analysis (CFA)
(Part 29) : 2022	Sulphide (*second revision*)
(Part 32) : 1988	Chloride (*first revision*)
(Part 34/Sec 1) : 2023	Nitrogen, Section 1 Determination of various types of nitrogen like ammoniacal, nitrate, nitrite and organic nitrogen (*second revision*)
(Part 37) : 2022	Arsenic (*second revision*)
(Part 39) : 2021	Oil and grease (*second revision*)
(Part 40 : 1991)	Calcium (*first revision*)
(Part 41 : 2023)	Cadmium (*second revision*)
(Part 42 : 1992)	Copper (*first revision*)
(Part 43/Sec 1 : 2022)	Phenol, Section 1 4-aminoantipyrine method with and without chloroform extaction method (*second revision*)
(Part 45) : 1993	Sodium and potassium (*first revision*)
(Part 46) : 2023	Magnesium (*second revision*)
(Part 47) : 1994	Lead (*first revision*)
(Part 48) : 1994	Mercury (*first revision*)
(Part 49) : 1994	Zinc (*first revision*)
(Part 53) : 2003	Iron (*first revision*)
(Part 55) : 2003	Aluminium (*first revision*)
(Part 56) : 2003	Selenium (*first revision*)
(Part 59) : 2006	Manganese (*first revision*)
(Part 60)	Fluoride,
(Sec 1) : 2023	Ion-selective electrode, SPANDS and liquid chromatography methods (*second revision*)

IS No.	*Title*
(Sec 2) : 2022/ ISO/TS 17951-1 : 2016	Method using flow injection analysis (FIA) and spectrometric detection after off-line distillation
(Sec 3) : 2022/ ISO/TS 17951-2 : 2016	Method using continuous flow analysis (CFA) with automated in-line distillation
(Part 65) : 2022/ ISO 17294-2 : 2016	Application of inductively coupled plasma mass spectrometry (ICP-MS) — Determination of selected elements including uranium isotopes (*first revision*)
(Part 67) : 2018/ ISO 15061 : 2001	Determination of dissolved bromate — Method by liquid chromatography of ions
(Part 68) : 2019	Anionic surfactants
(Part 75) : 2022/ ISO 10304-1 : 2007	Determination of dissolved anions by liquid chromatography of ions — Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate
(Part 78) : 2021/ ISO 16265 : 2009	Determination of the methylene blue active substances (MBAS) index — Method using continuous flow analysis (CFA)
(Part 79) : 2023	Silver
IS 4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (*first revision*)
IS 5401 (Part 1) : 2012/ISO 4832 : 2006	Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms: Part 1 Colony-count technique (*second revision*)
IS 5402 (Part 1) : 2021/ISO 4833-1 : 2013	Microbiology of the food chain — Horizontal method for the enumeration of microorganisms: Part 1 Colony count at 30 °C by the pour plate technique (*third revision*)
IS 5887	Methods for detection of bacteria responsible for food poisoning:
(Part 2) : 1976	Isolation, identification and enumeration of *Staphylococcus aureus* and faecal streptococci (*first revision*)
(Part 5/Sec 1) : 2023/ISO 21872-1 : 2017	Horizontal method for the determination of *Vibrio* spp., Section 1 Detection of potentially enteropathogenic *Vibrio parahaemolyticus, Vibrio cholerae and Vibrio vulnificus* (*second revision*)
(Part 7) : 1999	General guidance on methods isolation and identification of *Shigella*
IS 10500 : 2012	Drinking water — Specification (*second revision*)
IS 11984 : 1986	Specification for glass bottles for free flowing liquids
IS 13428 : 2005	Packaged natural mineral water — Specification (*second revision*)
IS 14194	Radionuclides in environmental samples — Methods of estimation:
(Part 1) : 2020	Gross beta activity measurement (*second revision*)
(Part 2) : 2022	Gross alpha activity measurement (*second revision*)
(Part 3) : 2021	Uranium (*first revision*)
IS 15185 : 2016/ ISO 9308-1 : 2014	Water quality — Detection and enumeration of *Escherichia coli* and *Coliform* bacteria — Membrane filtration method for water with low bacterial background flora (*first revision*)

IS No.	*Title*
IS 15186 : 2002/ ISO 7899-2 : 2000	Water quality — Detection and enumeration of intestinal *Enterococci* — Membrane filtration method
IS 15187 : 2016/ ISO 19250 : 2010	Water quality — Detection of *Salmonella* species (*first revision*)
IS 15188 : 2022/ ISO 8199 : 2018	Water quality — General requirements and guidance for microbiological examinations by culture (*second revision*)
IS 15302 : 2003	Determination of aluminium and barium in water by direct nitrous oxide — Acetylene flame atomic absorption spectrometry
IS 15303 : 2003	Determination of antimony, iron and selenium in water by electrothermal atomic absorption spectrometric method
IS 15410 : 2003	Containers for packaging of natural mineral water and packaged drinking water — Specification
IS 15609 : 2005	Polyethylene flexible pouches for the packaging of natural mineral water and packaged drinking water — Specification
IS 15669 : 2006/ ISO 10695 : 2000	Water quality — Determination of selected organic nitrogen and phosphorus compounds — Gas chromatographic method
IS 16069 (Part 1) : 2013/ISO 21527-1 : 2008	Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 1: Colony count technique in products with water activity greater than 0.95
IS 17753 : 2021	Paperbased multilayer laminated/extruded composite cartons (aseptic and non-aseptic) for processed liquid food products and beverages — Specification
IS 18285 : 2023	Aluminium cans for packaged natural mineral water and packaged drinking water — Specification
ISO 16266-2 : 2018	Water quality — Detection and enumeration of *Pseudomonas aeruginosa* — Part 2: Most probable number method

ANNEX B

(*Clause 4*)

HYGIENIC PRACTICES

B-1 FIELD OF APPLICATION

The hygienic practices cover the appropriate general techniques for collecting drinking water, its treatment, bottling, packaging, storage, transport, distribution and sale for direct consumption, so as to guarantee a safe, healthy and wholesome product.

B-2 HYGIENE PRESCRIPTIONS FOR COLLECTION OF DRINKING WATER

B-2.1 Extraction or Collection

In the case of extraction or collection of water intended for packaging from surface water or ground water or sea water sources or any other consistent source of water, it should be ensured that it is safe from pollution, whether caused by natural occurrence or actions or actions or neglect or ill will.

B-2.2 Materials

The pipes, pumps or other possible devices coming into contact with water and used for its collection should be made of such material that they do not change the quality of water.

B-3 PROTECTIVE MEASURES

B-3.1 All possible precautions should be taken within the protected perimeter to avoid any pollution of, or external influence on, the quality of the ground or surface water or sea water or any other consistent source of water. Preventive measures should be taken for disposal of liquid, solid or gaseous waste that could pollute the ground or surface water or sea water or any other consistent source of water. Drinking water resources should not be in the path of potential source of underground contamination.

B-3.2 Protection of the Area of Origin

The immediate surroundings of the extraction or collection area should be protected by limiting access to authorized persons only. Wellheads and spring outflows should be protected by a suitable structure to prevent entry by unauthorized individuals, pests and other sources of extraneous matter.

B-4 TRANSPORT OF DRINKING WATER

B-4.1 Means of Transport, Piping and Reservoirs

Any vehicle, piping or reservoir used in the processing of water from its source to the bottling facilities, should be made of inert material such as ceramic and stainless steel which prevent any deterioration, be it by water, handling, servicing or by disinfection; it should allow easy cleaning.

B-4.2 Maintenance of Vehicles and Reservoirs

Any vehicle or reservoir should be properly cleaned and, if necessary, disinfected and kept in good repair so as not to present any danger of contamination of drinking water and of deterioration of its quality.

B-5 ESTABLISHMENT FOR PROCESSING OF DRINKING WATER-DESIGN AND FACILITIES

B-5.1 Location

Establishments should be located in areas which are free from objectionable odours, smoke, dust or other contaminants and are not subject to flooding. When subsequent (after establishment of the unit) developments in the area result in any deterioration of the conditions, appropriate remedial measures shall be put in place to prevent contamination in the final product during its processing, filling, storage and dispatch.

B-5.2 Roadways and Areas Used by Wheeled Traffic

Such roadways and areas serving the establishment which are within its boundaries or in its immediate vicinity should have a hard paved surface suitable for wheeled traffic. There should be adequate drainage and provision should be made for protection of the extraction area.

B-5.3 Building and Facilities

B-5.3.1 *Type of Construction*

Buildings and facilities should be of sound

construction and maintained in good repair.

One or more of the following should be installed on doors, hatches and other opening to the building to render opening pest proof:

a) Doors, self-closing type;

b) Air curtains; and

c) Strip curtains.

B-5.3.2 *Disposition of Holding Facilities*

Rooms for recreation, for storing or packaging of water and areas for cleaning of containers to be reused should be apart from the bottling areas to prevent the end product from being contaminated. Raw materials and packaging materials and any other materials which come into contact with drinking water should be stored apart from other materials.

B-5.3.3 Adequate working space should be provided to allow for satisfactory performance of all operations.

B-5.3.4 The design should be such as to permit easy and adequate cleaning and to facilitate proper supervision of hygiene for drinking water.

B-5.3.5 The buildings and facilities should be designed to provide separation by partition, location or other effective means between those operations which may cause cross-contamination.

B-5.3.6 Buildings and facilities should be designed to facilitate hygienic operations by means of a regulated flow in the process from the arrival of the drinking water at the premises to the finished product, and should provide for appropriate conditions for the process and the product.

B-5.3.7 *Drinking Water Handling, Storing and Bottling Areas*

B-5.3.7.1 *Floors*

Where appropriate, should be of water-proof, non-absorbent, washable, non-slip and non-toxic materials, without crevices, and should be easy to clean and disinfect. Where appropriate, floors should have sufficient slope for liquids to drain to trapped outlet.

B-5.3.7.2 *Walls*

Where appropriate, should be of water proof, non-absorbent, washable and non-toxic materials and should be light coloured. Up to a height appropriate for the operation they should be smooth and without crevices, and should be easy to clean and disinfect.

Where appropriate, angles between walls, between walls and floors and between walls and ceilings should be sealed and smoothen to facilitate cleaning.

B-5.3.7.3 *Ceilings*

Should be so designed, constructed and finished as to prevent the accumulation of dirt and minimize, condensation, mould growth and flaking, and should be easy to clean.

B-5.3.7.4 *Windows*

Windows and other openings should be so constructed as to avoid accumulation of dirt and those which open should be fitted with screens. Screens should be easily movable for cleaning and kept in good repair. Internal window sills should be sloped to prevent use as shelves (*see* also B-5.3.1).

B-5.3.7.5 *Doors*

Should have smooth, non-absorbent surfaces and, where appropriate, be self closing and close fitting type (*see* also B-5.3.1).

B-5.3.7.6 *Stairs, lift cages and auxiliary structures*

Platforms, ladders, chutes, should be so situated and constructed as not to cause contamination to drinking water. Chutes should be constructed with provision of inspection and cleaning hatches.

B-5.3.7.7 *Piping*

Piping for drinking water lines should be independent of non-potable water.

B-5.3.8 In drinking water handling areas all overhead structures and fittings should be installed in such a manner as to avoid contamination directly or indirectly of drinking water and raw materials by condensation and drip and should not hamper cleaning operations. They should be insulated where appropriate and be so designed and finished as to prevent the accumulation of dirt and to minimize condensation, mould growth and flaking. They should be easy to clean.

B-5.3.9 Living quarter, toilets and areas where animals are kept should be completely separated

and should not open directly on to drinking water handling areas.

B-5.3.10 Where appropriate, establishments should be so designed that access can be controlled.

B-5.3.11 The use of material which cannot be adequately cleaned and disinfected, such as, wood, should be avoided unless its use would not be a source of contamination.

B-5.3.12 *Canalization, Drainage Lines*

Canalization and drainage and used water lines should be built and maintained in such a manner as not to present any risk whatsoever of polluting the underground water source.

B-5.3.13 *Fuel Storage Area*

Any storage area or tank for the storing of fuels, such as, coal or hydrocarbons should be designed, protected, controlled and maintained in such a manner as not to present a risk of pollution during the storage and manipulation of these fuels.

B-5.4 Hygienic Facilities

B-5.4.1 *Water Supply*

B-5.4.1.1 Ample supply of potable water under adequate pressure and of suitable temperature should be available with adequate facilities for its storage, where necessary, and distribution with adequate protection against contamination. The potable water should conform to IS 10500.

B-5.4.1.2 Potable water, non-potable water for steam production or for refrigeration or for any other use should be carried in separate lines with no cross connection between them and without any chance of back siphonage. It would be desirable that these lines with no cross connection between them and without any chance of back siphonage. It would be desirable that these lines be identified by different colours.

B-5.4.2 *Effluent and Waste Disposal*

Establishments should have an efficient effluent and waste disposal system which should at all times be maintained in good order and repair. All effluent lines (including sewer system) should be large enough to carry the full loads and should be so constructed as to avoid contamination of potable water supplies.

B-5.4.3 *Changing Facilities and Toilets*

Adequate, suitable and conveniently located changing facilities and toilets should be provided in all establishment. Toilets should be so designed as to ensure hygienic removal of waste matter. These areas should be well lighted, ventilated and should not open directly on to drinking water handling areas. Hand washing facilities with warm or hot and cold water, a suitable hand cleaning preparation, and with suitable hygienic means of drying hands, should be provided adjacent to toilets and in such a position that the employee shall have to use them when returning to the processing area. Where hot and cold water are available mixing taps should be provided. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided near each washing facility. Care should be taken that these receptacles for used paper towels are regularly emptied. Taps of a non-hand operatable type are desirable. Notices should be posted directing personnel to wash their hands after using the toilet.

B-5.4.4 *Hand Washing Facilities in Processing Area*

Adequate and conveniently located facilities for hand washing and drying should be provided wherever the process demands. Where appropriate facilities for hand disinfection should also be provided. Warm or hot and cold water should be available and taps for mixing the two should be provided. There should be suitable hygienic means of drying hands. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided adjacent to each washing facility. Taps of a non-hand operatable type are desirable. The facilities should be furnished with properly trapped waste pipes leading to drains.

B-5.4.5 *Disinfection Facilities*

Where appropriate, adequate facilities for cleaning and disinfection of equipment should be provided. These facilities should be constructed of corrosion

resistant materials, capable of being easily cleaned, and should be fitted with suitable means of supplying hot and cold water in sufficient quantities.

B-5.4.6 *Lighting*

Adequate lighting should be provided throughout the establishment. Where appropriate, the lighting should not alter colours and the intensity should not be less than,

a) 540 lux (50 foot candles) at all inspection points,
b) 220 lux (20 foot candles) in work rooms, and
c) 110 lux (10 foot candles) in other areas.

Suspended light bulbs and fixtures in any stage of production should be of a safer type and protected to prevent contamination of drinking water in case of breakage.

B-5.4.7 *Ventilation*

Adequate ventilation should be provided to prevent excessive heat, steam condensation and dust and to remove contaminated air. The direction of the air flow should never be from a dirty area to a clean area. Ventilation openings should be provided with a screen or other protecting enclosure of non-corrodible material. Screens should be easily removable for cleaning.

B-5.4.8 *Facilities for Storage of Waste and Inedible Material*

Facilities should be provided for the storage of waste and inedible material prior to removal from the establishment. These facilities should be designed to prevent access to waste or inedible material by pests and to avoid contamination of drinking water; equipment, buildings or roadways on the premises.

B-5.5 Equipment and Utensils

B-5.5.1 *Materials*

All equipment and utensils used in drinking water handling areas and which may contact the drinking water should be made of material which does not transmit toxic substances, odour or taste, is non-absorbent, is resistant to corrosion and is capable of withstanding repeated cleaning and disinfection. Surfaces should be smooth and free from pits and crevices. The use of wood and other materials which cannot be adequately cleaned and disinfected should be avoided except when their use would not be a source of contamination.

B-5.5.2 *Hygienic Design, Construction and Installation*

All equipment and utensils should be so designed and constructed as to prevent hazards and permit easy and thorough cleaning and disinfection.

B-6 ESTABLISHMENT

B-6.1 Maintenance

The buildings, equipment, utensils and all other physical facilities of the establishment, including drains, should be maintained in good repair and in an orderly condition.

B-6.2 Cleaning and Disinfection

B-6.2.1 To prevent contamination of drinking water, all equipment and utensils should be cleaned as frequently as necessary and disinfected, whenever circumstances demand.

B-6.2.2 Adequate precautions should be taken to prevent drinking water from being contaminated during cleaning or disinfection of rooms, equipment or utensils, by wash water and detergents or by disinfectants and their solutions. Detergents and disinfectants should be suitable for the purpose intended. Any residues of these agents on a surface which may come in contact with drinking water should be removed by thorough rinsing with water, before the area or equipment is again used for handling drinking water.

B-6.2.3 Either immediately after cessation of work for the day or at such other times as may be appropriate, floors, including drains, auxiliary structures and walls of water handling areas should be thoroughly cleaned.

B-6.2.4 Changing facilities and toilets should be kept clean.

B-6.2.5 Roadways and yards in the immediate vicinity of and serving the premises should be kept clean.

B-6.3 Hygiene Control Programme

A permanent cleaning and disinfection schedule should be drawn up for establishment to ensure that all areas are appropriately cleaned and that critical areas, equipment and material are designated for special attention. An individual, who should preferably be a permanent member of the staff of the establishment and whose duties

should be independent of production, should be appointed to be responsible for the cleanliness of the establishment. He should have a thorough understanding of the significance of contamination and the hazards involved. All cleaning personnel should be well-trained in cleaning techniques.

B-6.4 Storage and Disposal of Waste

Waste material should be handled in such a manner as to avoid contamination of drinking water. Care should be taken to prevent access to waste by pests. Waste should be removed from the water handling and other working areas as often as necessary and at least daily. Immediately after disposal of the waste, receptacles used for storage and any equipment which has come into contact with the waste should be cleaned and disinfected. The waste storage area should also be cleaned and disinfected.

B-6.5 Exclusion of Animals

Animal that are uncontrolled or that could be a hazard to health should be excluded from establishments.

B-6.6 Pest Control

B-6.6.1 There should be an effective and continuous programme for the control of pests. Establishments and surrounding areas should be regularly examined for evidence of infestation.

B-6.6.2 If pests gain entrance to the establishment, eradication measures should be instituted. Control measures involving treatment with chemical, physical or biological agents should only be undertaken by or under direct supervision of personnel who have a thorough understanding of the potential hazards to health resulting from the use of these agents, including those hazards which may arise from residues retained in the drinking water.

B-6.6.3 Pesticides should only be used, if other precautionary measures cannot be used effectively. Before pesticides are applied, care should be taken to safeguard drinking water, equipment and utensils from contamination. After application, contaminated equipment and utensils should be thoroughly cleaned to remove residues prior to being used again.

B-6.7 Storage of Hazardous Substances

B-6.7.1 Pesticides or other substances which may present a hazard to health should be suitably labelled with a warning about their toxicity and use. They should be stored in locked rooms or cabinets, and dispersed and handled only by authorized and properly trained personnel or by persons under strict supervision of trained personnel. Extreme care should be taken to avoid contamination.

B-6.7.2 Except when necessary for hygienic or processing purposes, no substance which could contaminate drinking water should be used or stored in drinking water handling areas.

B-6.8 Personal Effects and Clothing

Personal effects and clothing should not be deposited in drinking water handling areas.

B-7 PERSONNEL HYGIENE AND HEALTH REQUIREMENTS

B-7.1 Hygiene Training

Managers of establishments should arrange for adequate and continuing training of all water handlers in hygienic handling of water and in personal hygiene so that they understand the precautions necessary to prevent contamination of drinking water.

B-7.2 Medical Examination

Persons who come into contact with drinking water in the course of their work should have a medical examination prior to employment, if the official agency having jurisdiction acting on medical advice, considers that this is necessary, whether because of epidemiological considerations or the medical history of the prospective water handler. Medical examination of water handlers should be periodically carried out and when clinically or epidemiologically indicated.

B-7.3 Communicable Diseases

The management should take care to ensure that no person, whether known or suspected to be suffering from, or to be a carrier of disease likely to be transmitted or afflicted with infected wounds, skin

infections, sores or diarrhoea, is permitted to work in any drinking water handling area in any capacity in which there is any likelihood of such a person directly or indirectly contaminating drinking water with pathogenic micro-organisms. Any person so affected should immediately report to the management.

B-7.4 Injuries

Any person who has a cut or wound should not continue to handle drinking water or contact surfaces until the injury is completely protected with a waterproof covering which is firmly secured and which is conspicuous in colour. Adequate first-aid facilities should be provided for this purpose.

B-7.5 Washing of Hands

Every person, while on duty in a drinking water handling area, should wash the hands frequently and thoroughly with a suitable hand cleaning preparation under running warm water. Hands should always be washed before commencing work, immediately after using the toilet, after handling contaminated material and whenever else necessary. After handling any material which might be capable of transmitting disease, hands should be washed and disinfected immediately. Notices requiring hand-washing should be displayed. There should be adequate supervision to ensure compliance with this requirement.

B-7.6 Personal Cleanliness

Every person engaged in a drinking water handling area should maintain a high degree of personal cleanliness while on duty and should, at all times while so engaged, wear suitable protective clothing including head covering and footwear, all of which should be cleanable, unless designed to be disposed off and should be maintained in a clean condition consistent with the nature of the work in which the person is engaged. Aprons and similar items should not be washed on the floor. When drinking water is manipulated by hands. Personnel should not wear any insecure jewellery when engaged in handling drinking water.

B-7.7 Personal Behaviour

Any behaviour which could result in contamination of drinking water, such as eating, use of tobacco, chewing (for example, gum sticks, betel nuts, etc,) or unhygienic practices, such as, spitting, should be prohibited in drinking water handling areas.

B-7.8 Visitors

Precautions should be taken to prevent visitors as far as possible from visiting the drinking water handling areas. If unavoidable, the visitors should observe the provisions of B-6.8 and B-7.3.

B-7.9 Supervision

Responsible for ensuring compliance by all personnel with all requirements of B-6.1 to B-6.8 and the responsibility should be specifically allocated to competent supervisory personnel.

B-8 ESTABLISHMENT— HYGIENIC PROCESSING REQUIREMENTS

B-8.1 Raw Material Requirements

To guarantee a good and stable quality of drinking water, the quality criteria should be monitored regularly.

B-8.2 Should there be a perceptible lacking in meeting the requirements, necessary corrective measures are immediately to be taken.

B-8.3 Treatment

The treatment may include decantation, filtration, combination filtration (for example, membrane filters, depth filters, cartridge filters, activated carbon), demineralization, reverse osmosis, aeration, and disinfection. Sea water shall be subjected to desalination and related process before being subjected to the above processes.

B-8.3.1 Processing should be supervised by technically competent personnel.

B-8.3.2 All steps in the production process, including packaging, should be performed without unnecessary delay and under conditions which will prevent the possibility of contamination, deterioration, or the growth of pathogenic and spoilage micro-organisms.

B-8.3.3 Rough treatment of containers should be

avoided to prevent the possibility of contamination of the processed product.

B-8.3.4 Treatments are necessary controls and should be such as to protect against contamination or development of a public health hazard and against deterioration within the limits of good commercial practice.

B-8.4 Packaging Material and Containers

B-8.4.1 All packaging materials should be stored in a clean and hygienic manner. The material should be appropriate for the product to be packed and for the expected conditions of storage and should not transmit to the product objectionable substances beyond the limits specified. The packaging material should be sound and should provide appropriate protection from contamination. Only packaging material required for immediate use should be kept in the packing or filling area.

B-8.4.2 Product containers should not have been used for any purpose that may lead to contamination of the product. In case of new containers, if there is a possibility that they have been contaminated, should be cleaned and disinfected. When chemicals are used for these purposes, the container should be rinsed. Containers should be well drained after rinsing. Used and, when necessary, unused containers should be inspected immediately before filling.

B-8.5 Filling and Sealing of Containers

B-8.5.1 Packaging should be done under conditions that preclude the introduction of contaminants in the product.

B-8.5.2 The methods, equipment and material used for sealing should guarantee a tight and impervious sealing and should not damage the containers nor deteriorate the physical, chemical, microbiological and organoleptic qualities of drinking water.

B-8.6 Packaging of Containers

The packaging of containers should protect the latter from contamination and damage and allow appropriate handling and storing.

B-8.7 Lot Identification

Each container shall be permanently marked with code to identify the producing factory and the lot. A lot is quantity of drinking water produced under identical conditions, all packages of which should bear a lot number that identifies the production during a particular time, interval and usually from a particular processing line or other processing unit.

B-8.8 Processing and Production Records

Permanent, legible and dated records of pertinent processing and production details should be kept concerning each lot. These records should be retained for a period that exceeds the shelf life of the product or longer, if required. Records should also be kept of the initial distribution by lot.

B-8.9 Product Durability

Product durability shall be declared on the container as per 7.1 (g). It shall be based on in-house shelf life study for which proper records be maintained conforming to declared product durability.

B-8.10 Storage and Transport of the End-Product

The end-product should be stored and transported under such conditions as will preclude contamination with and/or proliferation of micro-organisms and protect against deterioration of the product or damage to the container. During storage, periodic inspection of the end-product should take place to ensure that only drinking water which is fit for human consumption is dispatched and that the end-product specification is complied with.

ANNEX C

(*Clause 4*)

CHECKLIST FOR GOOD HYGIENE PRACTICES AND FOOD SAFETY SYSTEMS FOR PACKAGED DRINKING WATER PROCESSING UNITS

Sl No.	Requirements	Answers		Remarks
		Applied	Not Applied	
(1)	(2)	(3)	(4)	(5)
a) Building, Facilities and Locations				
i)	Is the facility location area free from objectionable odour, smoke, dust or other contaminants and not subject to flooding?			
ii)	Are the areas immediately surrounding the buildings, roads, packing places, suitably paved, grassed and kept clean?			
iii)	Is adequate facility for drainage of surroundings which is designed to handle peak load?			
iv)	Is the facility used for processing water free from domestic animals?			
v)	Is the facility surroundings free from refuse, waste materials, rubbish, overgrown weeds and grasses?			
vi)	Are there adequate facilities for the disposal of effluents and wastes?			
vii)	Are the buildings and facilities of sound construction and maintained in good repair?			
viii)	Are the buildings and facilities designed and maintained to prevent entrance and harboring of pests and entry of contaminants?			
ix)	Are building and facilities designed to facilitate hygienic operations?			
b) Plant and Physical Facilities				
x)	Is adequate lighting provided at working station, hand washing area, and storage areas?			
xi)	Is the lighting intensity adequate: 1) 540 lux in all inspection area, and 2) 220 lux in work areas and walls.			
xii)	Are light fixtures safety type and protected to prevent contamination in the event of breakage in the processing and packing area?			
xiii)	Is adequate ventilation provided in processing areas to minimize odours, noxious fumes and condensates?			

Table (*Concluded*)

Sl No.	Requirements	Answers		Remarks
		Applied	Not Applied	
(1)	(2)	(3)	(4)	(5)
xiv)	Are the barriers/traps provided at drains to prevent the entry of rodents from the drains into the facility?			
xv)	Is effective screening provided against entry of birds, animals, insects, rodents, etc.?			
xvi)	Are doors, hatches and other openings to the building constructed to render opening pest proof?			
xvii)	Are floors, walls, ceilings, windows and doors so designed and constructed as to prevent accumulation of dust, dirt and render them washable?			
xviii)	Is product in process and storage area adequately protected from any leakage from external surfaces and other sources of contamination?			
xix)	Are immediate surroundings of extraction or collection protected from entry of unauthorized persons?			
	c) Raw Water Processing			
xx)	In case of extraction/collection for processing are the sources free from contaminations/ impurities?			
xxi)	Are water storage tanks, pipe lines utilized for handling water constructed and so designed as to facilitate cleaning and inspection?			
xxii)	Are inspections of containers/carriers/pipe lines of raw water supply performed for the material of construction and cleanliness?			
xxiii)	Are possible chances of contamination from incoming water assessed?			
xxiv)	Are water storage tanks effectively cleaned to prevent entry of pests and potential contaminator?			
xxv)	Are the storage tanks periodically cleaned and records maintained?			
xxvi)	Are the processed water contact surfaces regularly cleaned and sanitized?			
xxvii)	Are all equipment utensils so designed and constructed as to prevent hygiene hazards and prevent easy cleaning and sanitation?			
	d) Post-processing Handling			
xxviii)	Are cleaning operation of bottles/containers so done as to preclude contamination of product and product contact services with residues?			
xxix)	Has absence of residual cleaning chemicals been ensured?			

Table (*Concluded*)

Sl No.	Requirements	Answers		Remarks
		Applied	Not Applied	
(1)	(2)	(3)	(4)	(5)
xxx)	Is preventive maintenance in place for all processing machinery and equipment?			
xxxi)	Are the primary packing materials and containers of food grade conforming to relevant Indian Standards?			
xxxii)	Are packing and sealing, where required, monitored?			
xxxiii)	Are containers visually /electronically inspected for their soundness?			
xxxiv)	Are physical hazards prevented from entering into processed water?			
xxxv)	Are glassware excluded from production area?			
e) Packaging Material and Finished Goods Storage				
xxxvi)	Are the primary packing materials and containers of food grade conforming to relevant Indian Standards?			
xxxvii)	Are packaging material inspected to ensure their suitability?			
xxxviii)	Are the packing materials especially primary packing material properly stored and properly handled to preclude contamination?			
xxxix)	Are packaging material purchased, stored and handled in sanitary manner?			
f) Finished Product Storage and Distribution				
xl)	Is first-in-first out (FIFO) of stored product maintained?			
xli)	Is storage properly sanitized and disinfected periodically?			
xlii)	Are stores protected from pest infestations?			
xliii)	Are coding and tracking clear and in place?			
xliv)	Are the instruction clear and in place?			
xlv)	Are hold/release procedure in place and product identified?			
xlvi)	Are the records maintained for batch number, date of and volume of production?			
xlvii)	Are transport containers/vehicles maintained in clean condition?			
g) Customer Handling of Products				
xlviii)	Are the storage instructions provided on containers?			
xlix)	Is the shelf life period/best before mentioned on containers in accordance with FSSAI requirements?			
l)	Are instructions provided for handling defective/damaged products?			

Table (*Concluded*)

Sl No.	Requirements	Answers		Remarks
		Applied	Not Applied	
h) Sanitary Facilities and Control				
li)	Are toilets provided in sufficient numbers and are they provided with: 1) Doors of self-closing type? 2) Opening directly into processing areas? 3) Hand washing signs provided in appropriate language? 4) Proper lighting and ventilation? 5) Proper maintenance to keep in clean and tidy manner?			
lii)	Are hand washing facilities provided adequately and conveniently to wash hands, foot, elbow or sensor operated taps?			
liii)	Are germicidal soaps/soap solution and hand drying facility provided?			
liv)	Are notice/ instructions prominently pasted in toilet directing employees to wash their hands on entry and re-entry into the packaged drinking water handling areas?			
lv)	Are the refuse receptacles self-closing type maintained in a manner to protect from contaminations?			
j) Personnel Hygiene and Habits				
lvi)	Is any individual assigned to supervise overall sanitation of plant and personnel?			
lvii)	Is there any person responsible for day-to-day monitoring of health and hygiene?			
lviii)	Have the employees in processing, packing and maintenance been medically examined?			
lix)	Are the personnel with infectious diseases, skin infection and open lesion or any other source of microbial contamination excluded from working in process/packing areas?			
lx)	Are the following personnel hygiene practices regularly maintained and monitored: 1) Clean outer garments-protective clothing? 2) Personal cleanliness-finger nails? 3) Head cover-hair restraints, caps, head bands, beard cover? 4) No tobacco in any form-smoking, chewing? 5) No eating at work stations?			
lxi)	Are protective clothing stored on the premises and not allowed to be used for outside wear?			
lxii)	Are there clear legible notices defining limits of no smoking areas such as 'NO SMOKING BEYOND THIS POINT' displayed?			
liii)	Are personnel imparted regular training or hygienic food handling, processing food and personal hygiene?			

ANNEX D

(*Clause* 5.4)

STANDARDS ON METHODS OF RESIDUE ANALYSIS

Sl No.	Characteristic	Test Methods	
		USEPA	AOAC/ISO/IS
(1)	(2)	(3)	(4)
i)	DDT (*o,p* and *p,p*-isomers of DDT, DDE and DDD)	508	AOAC990.06
ii)	γ-HCH (lindane)	508	AOAC990.06
iii)	α, β and δ HCH	508	AOAC990.06
iv)	Endosulfan (α, β and sulphate)	508	AOAC990.06
v)	Monocrotophos	8141 A	-
vi)	Ethion	1657A	-
vii)	Chlorpyrifos	525.28141A	-
viii)	Phorate (Phorate and its oxygen analogue that is, phorate sulphoxide and phorate sulphone)	8141A	-
ix)	2,4-D	515.1	-
x)	Butachlor	525.2, 8141A	-
xi)	Isoproturon	532	-
xii)	Alachlor	525.2,507	-
xiii)	Atrazine	525.2, 8141A	-
xiv)	Methyl parathion (methyl parathion and its oxygen analogue that is, methyl-paraoxon)	8141A	IS 15669
xv)	Malathion (malathion and its oxygen analogue	8141A	-
xvi)	Aldrin and dieldrin	525.2	AOAC 990.06

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

ANNEX E

(*Clause* 6.1.1)

GUIDELINES FOR HANDLING OF POLYETHYLENE FLEXIBLE FILM MEANT FOR PACKING OF PACKAGED DRINKING WATER IN POUCHES

E-1 Polyethylene flexible film meant for packing of packaged drinking water in pouches should have suitable sturdy and dust proof outer packing to prevent contamination during transport, storage and handling. The supplier must be instructed to apply such packing immediately after the film manufacture. Such outer packaging must remain intact till the final loading of the film on the pouch filling machine. Care should however be taken to clean such outer packaging and render the same dust-free before the same is carried into the filling room.

E-2 Printing of the film must be done in such a way that the printing material does not interfere with the final product.

E-3 Such film must be stored in dry, cool and dust-free environment away from strong smelling substances, chemicals, cleaning material, etc. It shall be ideal to have separate store rooms exclusive for packaging material.

E-4 While handling the film the personnel should adhere to the following basic hygiene precautions:

a) Finger nails of personnel should be trimmed close and well so that no unhygienic substances are found below the nail;
b) Hands should be cleaned with disinfecting soap and dried, preferably gloved; and
c) Personnel should wear head cover and mask while handling the film.

E-5 The pouch filling machine must have suitable means to sterilize the film prior to forming the pouch. UV sterilization may be considered taking into account the following aspects:

a) The length and intensity of the lamps must be suitable for sterilizing the film on the active surface, that is, the surface that shall be in contact with the product and the speed of the machine. The equipment supplier's certificate to that effect must be maintained for record;
b) The UV lamp supplier must certify as to the expected life in number of hours. The filling machine should have a mechanism to monitor the number of hours of usage, suitably interlocked with the rest of the equipment so that a reliable method to record the actual usage is available;
c) Partly used and unused film must be stored with all precautions in accordance with **E-3**; and
d) Guide-rods, etc, that may direct the film in the formation of the flexible packaging and other contact parts must be suitably sanitized with 3 percent hydrogen peroxide before start of every filling operation and records of the same maintained.

E-6 Fumigation of the filling room with suitable agent is recommended.

E-7 Size of the secondary packaging must take into account that at the retail point the flexible packaged drinking water is often refrigerated and so the secondary packaging should be of appropriate size to facilitate refrigeration in the secondary packaging itself. This would shield the pouches from contaminations.

E-8 The following storage instructions must be issued to retailer/whole seller and all concerned in the supply chain:

a) Packaged drinking water in flexible packaging must be handled with care;
b) It should be stored away from sunlight and in a cool place;
c) It should be hygienically stored in a place away from chemicals, paints pesticides and similar substances that can affect the product;
d) It should also be stored away from strong smelling substances;
e) Chilling the product with commercially produced ice must be discouraged as it would expose the consumer to product with possible contamination from ice produced with unsafe water;
f) To check for any leakage, etc, before opening;

g) Instruments used for opening/cutting sachets should be kept exclusive for these pouches in a suitable place to avoid any contamination and should not be used for cutting or opening any other non-food product;

h) Consumer must be advised to use clean scissors to open sachet; and

j) Product should not be consumed, if any foreign material is found.

ANNEX F

(*Clause* 8)

SAMPLING PLAN FOR PACKAGED DRINKING WATER

F-1 GENERAL REQUIREMENTS OF SAMPLING FOR CONTAINERS UP TO AND INCLUDING 2 LITRE

F-1.1 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed as far as possible:

a) Sample shall be drawn in original sealed bottle/container and kept protected place not exposed to damp air, dust or soot; and

b) Each bottle/pouch in original shall be sealed and marked with full details of sampling.

F-1.2 Scale of Sampling

F-1.2.1 *Lot*

The quantity of packaged drinking water of the same type belonging to the same batch of manufacture and packed in a day, shall constitute a lot.

F-1.2.2 For ascertaining the conformity of the material to the requirements of the standard, samples shall be tested from each lot separately.

F-1.2.3 The number of bottles/pouches to be selected from a lot shall depend on the size of the lot and shall be according to Table 5. Separate bottle(s) shall be drawn for testing for the microbiological requirements.

Additional bottles/ pouches may be drawn, if required for carrying out complete testing or when the samples are required to be sent in more than one laboratory.

Table 5 Scale of Sampling

(*Clauses* F-1.2.3, F-1.2.4 *and* F-1.3.1)

Sl No.	No. of Bottles/Pouches in the Lot	Number of Samples
(1)	(2)	(3)
i)	Up to 5 000	3
ii)	5 001 to 10 000	5
iii)	10 001 to 15 000	7
iv)	15 001 and above	9

F-1.2.3.1 The bottles/pouches shall be chosen at random from the lot. In order to ensure the randomness of selection, procedure given in IS 4905 shall be followed.

F-1.2.4 Initially the number of cartons/bags equal to the number of bottles/pouches to be taken from the lot [according to col (3) of Table 5], shall be chosen at random. These cartons/bags thus selected shall be opened and the bottles/ pouches in these cartons/bags examined visually for the condition of packing, external appearance and the fill. The lot shall be considered satisfactory for inspection of other characteristics given in the standard, if all the bottles/pouches in the cartons/bags opened are found satisfactory for these characteristics.

F-1.2.5 In case any defective bottle/pouch is found according to **F-1.2.4**, twice the number of cartons/ bags shall be opened and the bottles/pouches examined for these characteristics. If no defective bottle is found; the lot shall be considered satisfactory for inspection of other characteristic given in the specification.

F-1.3 Preparation of Test Samples

F-1.3.1 From each of the cartons/bags opened according to **F-1.2.4**, three bottles/pouches shall be taken from its different layers so as to obtain three times the required number of bottles/pouches/ pouches in the sample [*see* col (3) of Table 5].

F-1.3.2 In case the number of cartons/bags to be opened is according to **F-1.2.4**, the number of cartons/bags equal to the number of bottles/pouches in the sample shall be taken at random from these cartons/bags and then the required number of bottles/pouches picked up according to **F-1.3.1**.

F-1.3.3 The sample bottles/pouches selected as in **F-1.3.1** or **F-1.3.2** shall be divided at random into three equal sets and labelled with all the particulars of sampling. One of these sets of sample bottles/ pouches shall be for the purchaser, another for vendor and the third for referee.

F-1.3.4 *Referee Sample*

Referee sample shall consist of a set of sample bottles/pouches marked for this purpose and shall bear the seals of the purchaser and the supplier. These shall be kept at a place agreed to between the purchaser and the supplier so as to be used in case of dispute between the two.

F-1.4 Criteria for Conformity

The lot shall be declared as conforming to the requirements of the standard, if all the requirements are complied with.

F-2 GENERAL REQUIREMENTS OF SAMPLING FOR ABOVE 2 LITRE CONTAINERS

F-2.1 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed as far as possible:

a) Sample shall be drawn in original sealed container and kept in protected place not exposed to damp air, dust or soot; and

b) Each container in original shall be sealed and marked with full details of sampling.

F-2.2 Scale of Sampling

F-2.2.1 *Lot*

The quantity of packaged drinking water of the same type belonging to the same batch of manufacture and packed in a day, shall constitute a lot.

F-2.2.2 For ascertaining the conformity of the material to the requirements of the standard, samples shall be tested from each lot separately.

F-2.2.3 The number of containers to be selected from a lot shall depend on the size of the lot and shall be drawn at random, according to Table 6. Separate container(s) shall be drawn for testing for the microbiological requirements. In order to ensure the randomness of selection, procedure given in IS 4905 shall be followed.

Table 6 Scale of Sampling

(*Clause* F-2.2.3)

Sl No.	No. of Bottles/Pouches in the Lot	Number of Samples
(1)	(2)	(3)
i)	0 to 500	5
ii)	501 to 1 200	8
iii)	1 201 to 3 200	13
iv)	3 201 and above	20

F-2.2.4 These containers shall first be examined visually for the condition of packing, external appearance and the fill. The lot shall be considered satisfactory for inspection of other characteristics given in the standard, if all the containers are found satisfactory for these characteristics.

F-2.2.5 In case any defective container is found according to F-2.2.4, twice the number of containers shall be examined for these characteristic(s). If no defective container is found, the lot shall be considered satisfactory for inspection of other characteristics given in this standard.

F-2.3 Preparation of Test Samples

F-2.3.1 Out of the containers selected according to F-2.2.3, any three containers shall be selected at random and stored separately.

F-2.3.2 Each of the sample containers selected as in F-2.3.1 shall be divided at random into three equal sets and labelled with all the particulars of sampling. One of these sets of sample containers shall be for the purchaser, another for vendor and the third for referee.

F-2.3.3 *Referee Sample*

Referee sample shall consist of a set of sample containers marked for this purpose and shall bear the seals of the purchaser and the supplier. These shall be kept at a place agreed to between the purchaser and the supplier so as to be used in case of dispute between the two.

F-2.4 Criteria for Conformity

The lot shall be declared as conforming to the requirements of the standard, if all the requirements are complied with.

ANNEX G

(*Foreword*)

COMMITTEE COMPOSITION

Drinking Water and Carbonated Beverages Sectional Committee, FAD 14

Organization	*Representative(s)*
CSIR - Central Food Technological Research Institute, Mysuru	DR SRIDEVI ANNAPURNA SINGH **(*Chairperson*)**
All India Association of Natural Mineral Water Industry, Ahmedabad	SHRI BEHRAM MEHTA
All India Food Processors Association, New Delhi	SHRI K. GANESH SHRI VENKATESH SOSLE (*Alternate* I) SHRI MOHIT CHAUDHARY (*Alternate* II)
All India Network Project on Pesticide Residues, New Delhi	DR VANDANA TRIPATHY
Bhabha Atomic Research Centre, Food Technology Division (BARC), Mumbai	DR SANJAY KUMAR JHA DR SUNIL KUMAR SAHOO (*Alternate*)
Bhavan's Research Center (Microbiology), Mumbai	DR SANDHYA SHRIVASTAVA DR NISHITH DESAI (*Alternate*)
Central Ground Water Board (CGWB), Faridabad	DR NEELAM NIGAM DR S. K. SHRIVASTAVA (*Alternate*)
Central Pollution Control Board (CPCB), New Delhi	SHRI P. K. MISHRA
Centre for Science and Environment (CSE), New Delhi	MS SUNITA NARAIN SHRI AMIT KHURANA (*Alternate*)
Confederation of Indian Industry, New Delhi	MS NEHA AGGARWAL MS MAMTA ARORA BUDHIRAJA (*Alternate*)
Confederation of Indian Food Trade & Industry (CIFTI)-FICCI, New Delhi	SHRI DEEPAK JASYAL MS VARSHA YADAV (*Alternate*)
Consumer Education and Research Centre, Ahmedabad	SHRI H. S. TRIPATHI DR DOLLY A. JANI (*Alternate*)
Consumer Research, Education, Action, Training and Empowerment (CREATE), Paramakudi	DR P. DURAISINGAM
CSIR - Central Food Technological Research Institute (CSIR - CFTRI), Mysuru	DR MUKESH KAPOOR MS VANAJAKSHI (*Alternate*)
CSIR - Indian Institute of Toxicology Research, Lucknow	DIRECTOR DR KAUSAR M. ANSARI (*Alternate*)
CSIR - National Environment Engineering Research Institute, Nagpur	DR P. K. LABHASETWAR DR NOOR AFSHAN KHAN (*Alternate*)
Delhi Jal Board, New Delhi	DR SANJAY SHARMA DR ANIL KUMAR MISHRA (*Alternate*)
Envirocare Laboratories Private Limited, Thane	DR NILESH AMRITKAR DR PRITI AMRITKAR (*Alternate*)
Food Research and Analysis Centre, New Delhi	SHRI ANIL KUMAR MS KAVITA RANA (*Alternate*)

Organization	*Representative(s)*
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ICMR - National Institute of Nutrition, Hyderabad	DIRECTOR DR A. LAXMAIAH (*Alternate*)
ICMR - National Institute of Cholera and Enteric Diseases, Kolkata	DR SHANTA DUTTA DR RANJAN KUMAR NANDY (*Alternate*)
Indian Beverage Association, New Delhi	SHRI J. P. MEENA SHRI RAJENDRA MOHAN DOBRIYAL (*Alternate*)
Bureau of Indian Standard, New Delhi	MS SHUBHANJALI UMRAO
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Mohan Meakins Limited, Ghaziabad	DR CHAUDHARY SHALU SINGH SHRI SUDEEP TYAGI (*Alternate*)
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The Greater Chennai Packaged Drinking Water Manufacturers Association, Chennai	SHRI J. AANTHNARAYANAN SHRI V. MURALI (*Alternate*)
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