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उत्पाद मैन्युअल
पीने के उपयोग हेतु रिवर्स ऑस्मोसिस आधारित पॉइंट ऑफ यूज़ जल उपचार प्रणाली- विशिष्टि
IS 16240: 2023 के अनुसार

PRODUCT MANUAL FOR
REVERSE OSMOSIS BASED POINT OF USE WATER TREATMENT SYSTEM FOR DRINKING PURPOSES ACCORDING TO IS 16240: 2023

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	**उत्पाद** **Product**	:	IS 16240 : 2023
	शीर्षक **Title**	:	Reverse Osmosis Based Point of Use Water Treatment System for Drinking Purposes — Specification
	संशोधनों की संख्या **No. of Amendments**	:	01
2.	**नमूना दिशानिर्देश** **Sampling Guidelines:**		
a)	**कच्चा माल** **Raw material**	:	Raw material shall be conforming to the requirements specified in clause 5 of IS 16240: 2023. Conformity of materials to the requirement of the specification may be established through either of the following or a combination of the same (No testing is required if the material is ISI marked): Test report from a laboratory recognized by the Bureau/ Government laboratories empanelled by the Bureau/NABL accredited laboratories; Material supplier's test certificate; In-house factory test report. Note: This section indicates the requirements for raw material(if specified in the IS)for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.
b)	**समूहीकरण दिशानिर्देश** **Grouping guidelines**	:	NA
c)	**नमूने का परिमाण** **Sample Size**	:	4 Nos. from the same batch Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for

			testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market.
d)	**परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर** **Parameters to be Declared in Test Request**		a. Production rate in litres per hour b. Recovery rating in percentage c. Maximum operatable feed Water TDS in mg/litre; d. Operating Pressure range (in MPa) e. Supply of voltage whether single or Three-phase, frequency, Working voltage and Wattage f. Conversion factor for TDS calculation g. Claims for inorganic, organic chemicals and microbiological reduction shall be made for the specific contaminants as per Note under Table 1 and Table 2 Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
3.	**परीक्षण उपकरणो की सूची** **List of Test Equipment**	:	Please refer ANNEX – A
4.	**निरीक्षण और परीक्षण की स्कीम** **Scheme of Inspection and Testing**	:	Please refer ANNEX – B
5.	**एक दिन में संभावित परीक्षण/Possible tests in a day**:		
	The following tests are possible to be carried out in a day: i) Reject Water Control Mechanism ii) TDS Reduction iii) Percent Recovery of Product Water iv) Hourly Production Rate v) Leakage Current Test vi) High Voltage Test vii) Pressure Test (Hydrostatic Test) viii) Routine Pressure Test (Pneumatic Test) ix) Full Device Leakage Test Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies(OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6	**लाइसेंस का दायरा /Scope of the Licence:**		
	Licence is granted to use Standard Mark as per IS 16240 : 2023 with the following scope:		
	Name of the product	Reverse Osmosis Based Point of Use Water Treatment System for Drinking Purposes	
	Declared Values	a) Production rate in litres per hour; b) Recovery rating; c) Maximum operatable feed Water TDS; d) Operating Pressure range(in MPa); e) Conversion factor for TDS calculation f) Supply of voltage whether single or Three-phase, frequency, Working voltage and Wattage.	
	Claimed reductions	Claims for inorganic, organic chemicals and microbiological reduction shall be made for the specific contaminants as per Note under Table 1 and Table 2	

ANNEX–A
LIST OF TEST EQUIPMENTS
(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Test Equipment	Tests used in with Clause Reference
1.	TDS Reduction, Clause 6.3.1	– Double distilled or deionized water – Potassium chloride c(KCI) = 0.l mol/l, 0.01 mol/l & 0.001 mol/l – Platinizing solution (1,5 g of hydrogen hexachloroplatinate(IV) hexa-hydrate ($H_2PtCl_6.6H_20$) in 50 ml of water containing 0.012 5 g of lead(II) acetate [$Pb(C_2H_3O_2)_2$] – Conductivity meter in accordance with clause 5.1 of IS 3025 (PART 14) – Platinum Electrodes – Thermometer (having an accuracy of 0.1 °C) – Thermostatic bath (capable of being maintained at 25±0.1°C)
2.	**Chemical Reduction, Clause 6.3.2, 6.3.3 & Table 1**	
	Arsenic	**i. Atomic Absorption Method:** – Atomic absorption spectrometer equipped with gas flow meter for Argon or Nitrogen and Hydrogen and with arsenic electrodeless discharge lamp – Atomizer – Reaction cell for producing arsenic hydride – Eye dropper or syringe – Refrigerator – Argon or Nitrogen and Hydrogen – Sodium borohydride – Sodium hydroxide – Sodium Iodide – Sulphuric acid-18 N & 2.5 N – Potassium persulphate – Concentrated Nitric acid – Concentrated Perchloric acid – Concentrated Hydrochloric acid – Arsenic trioxide – Arsenic pentaoxide – Dimethyl arsenic acid/cacodylic acid – Calcium chloride **OR** **ii. Silver diethyl dithiocarbamate method (Referee method):** – Arsine generator & absorption assembly (Fig. 2 of IS 3025 Pt37) – Spectrophotometer, 535 nm with 1 cm cells **Chemicals/Reagents:** Hydrochoric acid Conc., Potassium Iodide, Stannous chloride, arsenic free Lead acetate, Ephedrine, Pyridine,

		Chloroform Silver diethyl dithiocarbamate, Zinc – 20 to 30 mesh, arsenicfree, Arsenic trioxide, Sodium hydroxide. **OR** **iii. Mercuric bromide stain method:** – Arsine generator glass assembly (Fig 3 of IS 3025 Pt 37) **Chemicals/Reagents:** Sulphuric acid (1:1), Nitric acid, conc., Roll cotton, Lead acetate, Arsenic papers, Mercuric bromide, Ethyl alcohol/isopropanol, Potassium iodide, Arsenic free stannous chloride, Zinc-20 to 30 Mesh, arsenic free, Arsenic trioxide, Sodium hydroxide.
	Cadmium	**i. Atomic Absorption Method (Direct):** – Atomic Absorption spectrophotometer with Air-AcetyleneFlame – Cadmium Hollow Cathode Lamp or Multi Element HollowCathode Lamp for Use at 228.8 nm **Chemicals/Reagents:** Hydrochloric acid, Conc., Nitric acid, Conc.,Nitric acid, dilute – 1:499, Pure Cadmium Metal **OR** **ii. Atomic Absorption Method (Chelation and Extraction):** – Atomic Absorption spectrophotometer with Air-AcetyleneFlame. – Cadmium Hollow Cathode Lamp or – Multi Element Hollow Cathode Lamp – for use at 228.8 nm – Separating funnel – pH meter – pH paper **Chemicals/Reagents:** Hydrochloric acid, Conc., Hydrochloric acid –1:49, Nitric acid, Conc., Nitric acid, dilute – 1:499, Pure Cadmium Metal, Sodium hydroxide, Methyl Isobutyl Ketone (MIBK), Bromophenol Blue, Ethanol or Isopropanol, Pyrrolidine dithiocarbamic acid, Carbon Disulphide. **OR** **iii. Differential Pulse Anodic Stripping Voltammetry:** – Polarograph – Capable of Differential Pulse Work – Hanging Mercury Drop Electrode – Platinum Counter Electrode – Saturated calomel Reference Electrode – Magnetic Stirrer Control Unit with Stirring Bar – Nitrogen Gas (Cylinder) – Scrubber assembly for nitrogen purification – Voltametric Cell assembly **Chemicals/Reagents:** Hydrochloric Acid, Conc., spectro grade, Nitric Acid, Conc., spectrograde, Nitric Acid, dil – 1:1, Hydroxylamine Hydrochloride, L-Ascorbic Acid, Pure Cadmium Metal, Granular Zinc, Mercury, Ammonium Meta Vanadate.

	Chromium	**i. Diphenylcarbazide Method:** – Spectrophotometer, for use at 540 nm, with a light path of 1 cm, pH meter, Standard volumetric glasswares **Chemicals/Reagents:** Stock Chromium Solution, StandardChromium Solution, Nitric Acid—concentrated (16N), Sulphuric Acid—concentrated (36 N), Phosphoric Acid—concentrated (41N), Methyl Orange Indicator Solution, Ammonium Hydroxide—concentrated(14N), Potassium Permanganate Solution, Sodium Azide Solution, Diphenyl carbazide Solution, Acetone OR **ii. Atomic Absorption Method (Direct):** – Atomic absorption spectrophotometer with air- acetylene flame. – Hollow-cathode lamp or electrode less discharge lamp for use at 357.9nm. **Chemicals/Reagents:** Hydrochloric Acid concentrated (11N)and1:1, Nitric Acid—concentrated, Sulphuric Acid—concentrated(36N), Hydrogen Peroxide—(30percent m/m), Stock Chromium Solution.
	Copper	**i. Neocuproine Method:** – Spectrophotometer & 1cm cell Hot plate – Separating funnels (125 ml) – Conical flasks **Chemicals/Reagents:** Ammonium Hydroxide, Chloroform, AR Grade, Hydrochloric acid, Conc., Hydroxylamine Hydrochloride, Isopropyl Alcohol, Neocuproine, Double Distilled water, NitricAcid, Conc., Sulphuric Acid, Conc., Hydrated Sodium Citrate, Stock copper (II) solution 200µg/ml, (Pure Copper Metal, hot plate), Hydrogen Peroxide. **OR** **ii. Atomic Absorption Method (Direct):** – Atomic Absorption Spectrophotometer with air-acetylene flame – Copper hollow cathode lamp – with air-acetylene **Chemicals/Reagents:** Hydrochloric Acid, Conc., Nitric Acid, Conc., Dilute Sulphuric Acid, Stock copper (II) solution – 1.0mg/ml, (Pure Copper metal & hot plate). **OR** **iii. Atomic Absorption Method (Chelation Extraction):** – –Atomic Absorption Spectrophotometer with air-acetylene flame – Copper Hollow Cathode Lamp Separating Funnel – Volumetric Flasks – Distillation Assembly **Chemicals/Reagents:** Hydrochloric Acid, Conc., Nitric Acid, Conc., Pyrrolidine, Dithiocarbamic acid, Methyl Isobutyl Ketone, AR grade, Carbon Disulphide, Sodium Hydroxide, Distilled water,

		Water Standard MIBK, Bromophenol Blue, Ethanol or Isopropanol, Stock copper (II) solution – 1.0mg/ml, (Pure Copper metal & hot plate). **OR** **iv. Differential Pulse Anodic Stripping Voltametry:** – Polarograph capable of Performing differential pulse work – Hanging Mercury Drop electrode – Platinum Counter Electrode – Saturated Calomel Reference Electrode – Magnetic Stirrer – Control unit with Stirring Bar – Scrubber Assembly – Whatman Filter Paper No. 40 **Chemicals/Reagents:** Nitrogen Gas, Hydrochloric Acid Conc. (Spectro Grade), Nitric Acid-Conc. (Spectro Grade), Sulphuric Acid Conc., Pure Copper Metal, Granular Zinc, Mercury
	Fluoride	**i. Zirconium alizarin Method :** – Nessler Tubes (100ml) Distillation Apparatus – Refrigerator (Recommended) • Heating mantle **Chemicals/Reagents:** Thiosulphate Solution (0.1 N), StandardSodium Fluoride Solution (1ml = 0.01 mg F), Zirconium Oxychloride OR Zirconium Oxynitrate, Alizarin Sodium Monosulphonate (AlizarinS), Conc. Hydrochloric Acid, Conc. Sulphuric Acid, Silver Sulphate, Perchloric Acid, Phenolphthalein Indicator, Sodium Hydroxide Solution. **OR** **ii. Electro Chemical Probe Method:** – Millivolt Meter – Fluoride Ion – Selective Electrode – Reference Electrode – Either a calomel electrode, – filled with saturated Potassium Chloride (KCl) Solution or a Silver / Silver Chloride Electrode – Measuring Cells – 100ml(Polypropylene fitted with thermostated jacket) – Water Bath – Magnetic Stirrer with a polytetrafluoroethylene (PTFE) – Polyethylene Beaker – pH meter – Standard Volumetric – Glass wares – Desiccator – Screw Capped Polyethylene Container – Plastic Bottle **Chemicals/Reagents:** Sodium Hydroxide- 5 M, Total Ionic Strength Adjustment Buffer (TISAB)-[Sodium Chloride, Glacial Acetic Acid, Sodium Hydroxide, CDTA(trans -1,2-diaminocyclohexane – N,N,N',N' tetra acetic acid)], Fluoride,

		Stock Solution, 1000mg/1 (Sodium Fluoride)
	Lead	**i. Atomic absorption method (direct):** – Atomic absorption spectrophotometer with air acetylene flame – Hollow cathode lamp OR Electrodeless Discharge lamp for use at 283.3 nm **Chemicals/Reagents:** Hydrochloric acid, conc., Nitric acid, conc., Lead nitrate, Nitric acid, dil (1:499), **OR** **ii. Atomic absorption method (chelation – extraction):** – Atomic absorption spectrophotometer with air acetylene flame – Hollow cathode lamp OR Electrode less Discharge lamp for use at 283.3 nm – Separatory funnel – 0.45µm membrane filter – Acid washed filter paper. – pH meter **Chemicals/Reagents:** Hydrochloric acid, conc., Hydrochloric acid,dil (1:2), Hydrochloric acid, dil (1:49) Nitric acid, conc., Pyrrolidine, Chloroform, Carbon disulphide, Sodium hydroxide, Bromophenol blue, Lead nitrate **OR** **iii. Differential pulse anodic stripping voltametry (DPASV) Method:** – Polarograph capable of performing differential pulse work – Hanging mercury drop electrode – Platinum counter electrode – Saturated calomel reference electrode – Magnetic stirrer control unit with stirring bar – Scrubber assembly for nitrogen purification – Nitrogen gas (cylinder) – 0.45µm membrane filter **Chemicals/Reagents:** Lead nitrate, Hydrochloric acid, conc., Nitric acid, conc., Nitric acid, dil (1:1), Granular zinc, Mercury, Ammonium metavanadate OR **iv. Dithizone method:** – Spectrophotometer for use at 510 nm with 1-cm cell – pH meter – TEF beakers, 100 ml – Separating funnels, 250 ml, 500 ml **Chemicals/Reagents:** Lead free distilled water, Lead nitrate Nitric acid, 95% (w/w), Nitric acid, dil 20% (w/w), Nitric acid, dil (1:1), Ammonium hydroxide Conc. (14 N), Ammonium hydroxide, dil. 10% (v/v), Ammonium hydroxide, dil. 1% v/v), Anhydrous Ammonium Citrate, Anhydrous Sodium Sulphite,

		Hydroxylamine hydrochloride – Potassium cyanide, Dithizone, Chloroform, Hydrochloric acid (1:1).
	Mercury	**i. Cold Vapour Atomic Absorption Spectrophotometric Method:** – Atomic Absorption Spectrometer and Associated Equipment (Cold Vapour Technique) – Mercury Vapour Generation Assembly – Mercury Hollow Cathode Lamp – Recorder/Printer/Display – Meter – BOD bottle, 300 ml – Water bath – Equipment assembly as per Fig 1 **Chemicals/Reagents:** Sulphuric acid, conc., Nitric acid, Conc., Stannous chloride, Hydrochloric acid, Conc., Sodium chloride, Hydroxylamine sulphate, Potassium permanganate Potassium persulphate, Mercuric chloride, Mercury free distilled water OR **ii. Colorimetric Dithizone Method:** – Spectrophotometer – Separating Funnels (250 and 1000ml with PTFE stopcocks) Glass wares – Whatman Filter No. 42 **Chemicals/Reagents:** Redistilled or Deionised Distilled Water (Mercury free), Mercuric chloride, Nitric acid, Conc. Potassium permanganate, Potassium persulphate, Hydroxylamine hydrochloride, Dithiozone solution- 6 µg/ml, Sulphuric acid- 0.25 N, Potassium bromide, Chloroform, Disodium hydrogen phosphate, Anhydrous potassium carbonate, Sodium sulphate, Anhydrous, Hydrochloric acid (1:1), Ammonium hydroxide.
	Nitrate	**ii. Cadmium Reduction Method:** – Reduction Column – Colorimeter OR – Spectrophotometer OR – Filter photometer Glass wool – 0.45 µm pore diameter membrane filter – Refrigerator **Chemicals/Reagents:** Distilled water, Nitrate free water Cadmium granules (40 – 60 mesh), Hydrochloric Acid (6N) Copper Sulphate Solution, Sulphanilamide, Conc. Hydrochloric Acid, N-(1-napthyl))-Ethylenediamine dihydrochloride (NED) Dihydrochloride), Ammonium Chloride, Disodium Ethylene diamine tetra acetate, Ammonia Solution, Copper sulphate Solution – 2% Stock nitrate solution – 100µg/ml, (Potassium Nitrate & Chloroform), Chloroform, Stock nitrite solution - 100µg/ml, (Potassium Nitrite & Chloroform), Nitrite free water. OR **iii. Chromotropic Acid Method:**

		– Spectrophotometer – Standard laboratory glasswaresNitrate free water – Stock Nitrate Solution - 100µg/ml **Chemicals/Reagents:** (Potassium Nitrate, Chloroform), Standard Nitrate solution – 10.0µg/ml, Sulphite Urea Reagent, (Urea & Anhydrous sodium Sulphite), Antimony reagent (Antimony metal, Conc. Sulphuric acid), Chromotropic Acid Reagent (Purified chromotropic Acid crystals, Conc. Sulphuric Acid) Sulphuric Acid, Conc. Nitrate free OR **iii. Devarda's Alloy Reduction Method:** – Distillation Assembly (Kjeldahl Assembly) – Measuring Scoop spectrophotometer **Chemicals/Reagents:** Ammonia Free Water, Borate Buffer Solution (0.1N Sodium, Hydroxide, 0.025M Sodium Tetraborate), Sodium Hydroxide – 6 N, Devarda's Alloy – 20 mesh with less than 0.005 percent Nitrogen, Mixed indicator Solution (Methyl Red indicator, Ethyl alcohol/Isopropyl alcohol, Methylene Blue), Indicating Boric Acid Solution (Hydroboric Acid, mixed indicator solution), Std. Sulphuric Acid Titrant - 0.02 N, Nessler's Reagent (Mercuric Iodide, Potassium Iodine. Sodium Hydroxide), Stock Ammonia Solution - 1.22mg ammonia/ ml (Anhydrous Ammonium ammonia/ ml (Anhydrous Ammonium Chloride), Standard Ammonia Solution
	E. Coli	– General microbiological lab equipment – Incubator capable of maintaining 36±2 ℃ – Equipment, for membrane filtration – Membrane filters – Disinfected forceps, for handling of membrane filters. – Incubator capable of maintaining 44°C – Microscope and Glass slides (for Gram staining) – Distilled water – Chromogenic Coliform Agar (Enzymatic digest of casein, Yeast Extract 2, Sodium chloride, – Sodium dihydrogen phosphate – Disodium Hydrogen Phosphate – Sodium pyruvate, – Sorbitol – Tryptophane, Tergitol – 7, 6-chloro 3 indoxyl Beta D Galactopyranoside, 5- Bromo 4-Chloro 3Indoxyl Beta D Glucuronic Acid, – Iso propyl Beta D thiogalactopyranoside (IPTG) – Bacteriological Agar – Oxidase reagent – N,N,N',N'- Tetramethyl p phenylenediamine dihydrochloride – Water – Tryptone Soya Agar – Tryptone

		– Soya Peptone – Sodium Chloride – Medium for indole production – Kovac's reagent (for indole test) – Gram stain – (Methyl violet or Crystal violet, Iodine, Potassium iodide; Neutral red, Acetic acid, Ethanol)
	Recovery rate of Product Water, Clause 6.4.1	Stop Watch, Measuring Flasks, Air Conditioner, Thermometer
	Hourly Production rate, Clause 6.4.2	Stop Watch, Measuring Flasks, Air Conditioner, Thermometer
3.	**Electrical Safety, Clause 6.5**	
	Leakage Current Clause 6.5.1	Microampere meter
	High Voltage Test, Clause 6.5.2	High Voltage Tester, Stop watch
	Pressure test Hydrostatic Test), Clause 6.7	Pressure Gauge (capable of reading pressure of 0.294 MPa and capable of reading pressure of 1.5 times the maximum pressure exerted by the booster pump. Stop Watch
	Routine Pressure Test (Pneumatic Test), Clause 6.8	Air Compressor with Pressure Gauge (capable of reading pressure of 0.2 MPa), Stop Watch, Manual Valve with Pressure Gauge (capable of reading pressure of 0.2 MPa).

Note- The list does not cover the requirements of Pesticide Residues, S2 Phage, Cryptosporidium parvum and Giardia lamblia as these tests are to be done from outside lab

ANNEX B

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: all Water purifiers of the same capacity produced under similar condition of manufacturing using same raw material in a week shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 **Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as "R" in Column 2 of Table 1)**, where different tests given in the specification shall be carried out in accordance with the method given in the specification**.** They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS

website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 **TEST RECORDS**- The manufacturers maintaining an in-house laboratory or utilizing commoncluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each conformance label affixed with the RO system, provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements**: The material shall also be marked with the following additional requirement on each conformance label affixed with the RO system:

a) "For BIS certification details please visit www.bis.gov.in"

4. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1
(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		
Testing Details				**Test equipment requirement R: required (or) S: Sub-contracting permitted**	**Levels of control**		
Clause	**Requirement**	**Test Method Cl. Ref.**	**Test Method IS**		**No. of Samples**	**Frequency**	**Remarks**
4	Construction	4	IS 16240	S	Firm to have adequate in-process controls to check compliance of this parameter as per the requirements specified in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
4.3.1	Total Dissolved Solids(TDS)	--	IS 3025 (Part 14)	R	One	Each Consignment	
5	**Materials**						
5.1	Materials in contact with water	5.1	IS 9845	--	Each consignment of material received shall be accompanied with test certificate in compliance to Clause 5.1 of IS 16240:2015		
5.2	Materials of Construction	5.2.1	IS 16240	--	Each consignment of materials used for construction of components of the RO system, which are expected to get wetted by the flow of water through the RO system, shall be accompanied with test certificates as per Clause 5.2.1 of IS 16240:2015		
5.3	Membrane Preservatives	5.3	IS 16240	--	Manufacturer to submit declaration/ undertaking in compliance to Clause 5.3.1 of IS 16240:2015 and the same shall also be declared in the user manual provided alongwith the RO system		
6	**Performance Requirements**						
6.2.1	Reject water control Mechanism	6.2.1	IS 16240	R	One	Each Control unit	
6.3.1	TDS reduction	6.3.1	IS 3025 (Part 14)	R	One	Each Control unit	

6.3.3 & Table 1	**Chemical reduction**						
	i) Arsenic	--	IS 3025(Part 37)*	S	One	Once in three months	Please see Note 4
	ii) Cadmium	--	IS 3025 (Part 41)*	S	One	Once in three months	Please see Note 4
	iii) Chromium	--	IS 3025 (Part 52)*	S	One	Once in three months	Please see Note 4
	iv) Copper	--	IS 3025 (Part 42)*	S	One	Once in three months	Please see Note 4
	v) Fluoride	--	IS 3025 (Part 60)*	S	One	Once in three months	Please see Note 4
	vi) Lead	--	IS 3025 (Part 47)*	S	One	Once in three months	Please see Note 4
	viii) Mercury	--	IS 3025 (Part 48)*	S	One	Once in three months	Please see Note 4
	vii) Nitrate	--	IS 3025 (Part 34)*	S	One	Once in three months	Please see Note 4
	ix) Pesticides total	--	IS 10500	S	One	Once in three months	
6.3.4 & Table 1	**Microbiological reduction**						
	i) E. Coli	--	IS 15185	S	One	Once in three months	
	ii) MS-2 Coliphage (Viruses)	Annex B	Annex B of IS 10500 or USEPA method in Manual of Method for Virology Chapter 16, June 2001	S	One	Once in six months	
6.3.4.1 & Table 2	**Optional requirements for Microbiological Reduction**						
	i) Cryptosporidium parvum	Annex D	IS 16240	S	One	Once in six months	Please see Note 3
	ii) Giardia lamblia	Annex D	IS 16240	S	One	Once in six months	Please see Note 3

6.4	Percent Recovery of product Water						
6.4.1	Percent Recovery of product Water	6.4.1	IS 16240	R	One	Each Control	
6.4.2	Production Rate	6.4.2	IS 16240	R	One	Each Control unit	
6.4.3	Hourly Production Rate	6.4.3	IS 16240	R	One	Each Control unit	
6.5	Electrical Safety						
6.5.1	Leakage current	6.5.1	IS 16240 IS 302(P-1)	R	One	Each Control unit	
6.5.2	High voltage test	6.5.2	IS 16240 IS 302(P-1)	R	One	Each Control unit	
6.6	Power Supply	6.6	IS 16240	R	One	Each Control unit	
6.7	Pressure test (Hydrostatic test) – Type test	Annex E	IS 16240	R	One	Once in three months or change of design/model	
6.8	Routine Pressure Test	6.8	IS 16240	R	One	Each Control unit	Provisions of Cl. 6.8.1 of IS 16240 Shall be maintained