भारतीय मानक

Indian Standard

IS 1475 : 2024

पेयजल कूलर — विशिष्टि

(चौथा पुनरीक्षण)

Drinking Water Coolers — Specification

(*Fourth Revision*)

ICS 27.200; 97.130.20

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

August 2024 **Price Group 7**

Refrigeration and Air Conditioning Sectional Committee, MED 03

FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Refrigeration and Air Conditioning Sectional Committee had been approved by the Mechanical Engineering Division Council.

Drinking water coolers facilitates easy supply of cool drinking water. It plays a vital role in places like educational institutions, offices, railway stations, industrial canteens, factories, restaurants, fast food outlets, etc. With advancements in technology, water coolers today come with environment-friendly and energy saving options. It is also commercially known as self-contained drinking water cooler.

This standard was first issued in 1959 and was subsequently revised in 1971, 1978, and 2001. On publication of this standard IS 1475 (Part 1) : 2001 'Self-contained drinking water coolers — Specification: Part 1 Energy consumption and performance' shall be withdrawn. It was previously decided to split the standard in two parts for performance and energy requirements. However, the revised version is a composite standard covering all requirements like safety, construction, performance, and energy consumption.

This revision has been contemplated to bring in more clarity in the test procedure and its requirements. The major changes incorporated in this revision are as follows:

a) The title and scope have been revised;

b) The requirements for material, refrigerant, compressor, BLDC motor, and three pin plugs have been added;

c) Corresponding minimum water pressure for each static water head have been added (*see* Table 1); and

d) The annual energy consumption test has been added.

Water coolers of bubble type, which may employ bottle or container for storing supply of water to be cooled have been excluded from the scope of this standard. Water purification system like UV C, and reverse osmosis (RO) technology integration with water coolers shall be considered in future based on the market requirements and demand.

This standard specifies storage capacity as per the prevailing market in India. Higher capacity water coolers are under consideration.

This standard also provides recommended drinking water requirements for guidance in Annex B.

In view of the prevailing energy scenario in the country, the Government of India is laying emphasis on the energy conservation through various means by emphasizing the use of energy efficiency products. Accordingly, Government of India is considering introduction of scheme of energy labelling for drinking water cooler as this is one of the energy intensive product which consumes considerable amount of energy.

The use of refrigerant shall be guided by the provision of the Act, Rules and Regulation prescribed by the Ministry of Environment, Forest and Climate Change of India (MoEFCC) from time to time including the phase out period of refrigerant with higher ozone depletion potential (ODP) and global-warming potentials (GWP).

This standard contributes to the Sustainable Development Goal 9: Industry, innovation and infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this 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

DRINKING WATER COOLERS — SPECIFICATION

(Fourth Revision)

1 SCOPE

1.1 This standard specifies the general construction, performance, safety, and methods of testing of pressure and storage type drinking water coolers up to and including 225 l/h cooling capacity and up to and including 550 litre storage capacity. This standard covers the water coolers with rated voltage not exceeding 240 V, 50 Hz a.c. for single phase and 415 V, 50 Hz a.c. for three phase including units with fixed speed and variable speed compressors.

1.2 The recommended drinking water requirements for various types of services given in Annex B is for information only.

1.3 This standard does not apply to:

a) Bottled water dispenser which is covered under a separate standard, that is, IS 17681 and;

b) Water coolers of bubble type, which may employ bottle or container for storing supply of water to be cooled. Hereafter, the word ‘water cooler’ used throughout this standard would refer to drinking water cooler.

NOTES

1 This standard specifies rated capacity as per prevailing market demand in India.

2 Water coolers of higher capacity incorporating built-in water purifier is under consideration.

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 definitions shall apply.

3.1 Cooling Capacity Rating of a Drinking Water Cooler — It is the quantity of water cooled under given ambient temperature conditions with a given inlet water temperature and a given outlet water temperature. This shall be expressed as number of litres of water cooled per hour.

3.2 Power Input of a Drinking Water Cooler — It is the total power input in watts when the water cooler is operated under given conditions.

3.3 Self-Contained Drinking Water Cooler/ Drinking Water Cooler — A factory-made assembly, in one structure that includes a complete mechanical refrigerating system, which has the primary function of cooling potable water and also a provision for dispensing such water, by either integral or remote means, or both.

3.3.1 *Pressure/Instantaneous Type Drinking Water Cooler* — A type of water cooler which employs a refrigeration system (cooling coil) having connections for inlet water under pressure and outlet for cold water without the need of storing water. It may employ faucet/spout for dispensing water.

3.3.2 *Storage Type Drinking Water Cooler* — A type of water cooler which stores and cools the water in the same container and/or separate containers. Such water coolers may or may not be fitted with plumbing connections for water inlet, drain, overflow, etc.

3.4 Static Head — It is the minimum head in meters of water column required to promote the flow at the rated cooling capacity defined in **3.1** through cooling unit and its controlling valve. This is essentially applicable to pressure type water cooler.

3.5 Storage Capacity of Tank in the Storage Type Water Cooler — It shall be the amount of water in liters that can be drawn from drinking water faucet after the storage tank has been first filled to the level which is normally maintained, either by a water level actuated automatic shut off valve or manually in case of non-plumbing type models.

3.6 Stable Operating Conditions — The stable operating conditions deemed to have been achieved when the outlet water temperature does not vary by more than 0.5 ºC while the water is drawn after every 15 min over a period of 2 h.

4 CLASSIFICATION

Drinking water coolers shall be classified as:

a) Pressure or instantaneous type water

coolers; and

b) Storage type water coolers.

5 CONSTRUCTION

5.1 The water coolers shall have adequate mechanical strength and be constructed to withstand handling and transportation. There shall be no sharp edges or corners liable to cause injury to the user in the normal conditions of use.

5.2 Chassis shall be of rigid construction, made of steel or alloy steel members, and coated with anti-rust plating or paint.

NOTE — Wherever there is no external impact, non-metallic parts may be used.

5.3 Cooling unit for storage type water cooler shall consist of storage tank with its surfaces acting as heat exchanger on the exterior. If the heat exchanger consists of cooling coil it shall be bonded to the tank on the exterior and held in good thermal contact. The coil, if prone to rust, shall be given a good coating of suitable rust preventing material.

5.4 Cooling unit for pressure or instantaneous type water cooler shall comprise a suitable heat exchanger designed to promote effective heat transfer. In case of double coil heat exchanger, both coils shall be held in good thermal contact. The portion of the heat exchanger in contact with the cooled water shall be of suitable corrosion resistant alloy so as to keep the water safe for human consumption.

5.5 The condensing unit shall be selected to balance the rated output plus all the losses. If not internally spring mounted, the compressor shall be securely supported on anti-vibration mountings to prevent transmission of mechanical vibrations. Low pressure and high pressure cut outs shall be provided to protect the compressor against unusually low suction and high pressure for water coolers using expansion valve only. This provision, however, will not be applicable to systems using capillaries. The compressor motor shall be equipped with an overload protection.

5.6 The refrigerant designation and safety classification shall be as per IS 16656. Water coolers having A3 refrigerant shall comply with IS/IEC 60335-2-89 for safety requirements.

NOTE — Any regulation on the use of refrigerant type issued by the appropriate regulatory authority from time to time shall prevail.

5.7 The refrigerant flow to the low side shall be controlled by expansion valve or capillary preceded by suitable liquid refrigerant drier.

5.8 Thermostat capable of adjustment shall control the automatic operation of the condensing unit to maintain the required temperature of the cooled water.

5.9 In storage type unit, the storage tank shall be of corrosion resistant, non-toxic, non-absorbent, and durable materials. The tank shall be provided, where necessary, with overflow and make up correction with ball float and drain. The construction of the tank shall be such that the possibility of any dirt accumulating in the tank due to rough surface and improper welded joints is eliminated. There shall be no direct contact of any lead-based solder with the water so as to keep the water safe for human consumption.

The material used for the storage tank shall be either of stainless-steel conforming to IS 5522 or IS 6911 or of plastic conforming to IS 10146 or IS 10151 or IS 10910 or equivalent FDA grade material.

5.10 A cleanable or throwaway type strainer (filter) to remove suspended matters from water may also be fitted externally to the water cooler at the inlet to the cooling unit when desired by the purchaser. The filter elements shall not be of asbestos based materials. The filter shall have suitable mesh size (500 microns and more) and shall be free from mercury, lead, aluminium, cadmium, arsenic, and other poisonous materials for human consumption.

5.11 The drain tray shall be made of sufficiently strong corrosion-resistant material which shall not warp or get deteriorated due to constant use with cooled water under varying weather conditions. The drain tray shall be of suitable size to prevent any splash outside its periphery. The drain wherever provided, shall have a suitable strainer so as to prevent this from being clogged.

5.12 The outlet device and its valve for fitting the container or for direct feed shall be drip proof and made of a material which is corrosion resistant or where the material is not corrosion resistant it shall be suitably protected against corrosion so as to keep the water safe for human consumption.

5.13 The thermal insulation for the cooling unit, connections therefrom to the outlets, and for suction pipe of the condensing unit shall be of vapour-proof materials or covered with external vapour-proof barrier. The insulation shall have no interior air gap and shall be of sufficient thickness to prevent condensation on the exterior cold surfaces.

5.14 The inflow drains and overflow connections wherever provided, shall be accessible so as to facilitate easy connection at the time of the

installation.

5.15 The enclosure of the unit shall be of suitable materials (steel sheets, galvanized iron, aluminium or plastics or decorative laminates) having proper thickness and suitably protected against the corrosion and coated to give decorative finish and long life under condition of use.

5.16 The inspection lid for storage type water cooler shall be of rigid construction and hinged. It shall be provided with a gasket to keep the storage tank dustproof. The internal part of the inspection lid shall be of corrosion resistant material so as not to contaminate the water and make it unsafe for human consumption, if necessary.

5.17 Three-core cable conforming to IS 9968 (Part 1 or IS 694 of at least 1.5 m length when measured from entry point of the water cooler to the point of entry of the cord into the plug shall be provided with each unit. A three-pin plug conforming to IS 1293 and starter, if required, shall be provided at the time of installation.

5.18 Where the static head is in excess of 12 m, a suitable pressure reducing device shall be provided at the time of installation.

5.19 The capacitor type single phase motor shall comply with IS 996. For brushless direct current (BLDC) motor, compliance shall be checked by the tests specified in **5.9** of IS 1391 (Part 1).

5.20 The compressor shall conform to IS 10617.

5.21 The water cooler with remote type dispensing means has the primary function of cooling potable water for delivery to remotely installed dispensers. Such remotely installed dispensing means are not considered part of the water cooler. Water coolers with remote type dispensing means can be either of pressure type or storage type.

5.22 The water coolers may also employ means of pre-cooling. In another arrangement suction line of refrigeration system may be used to pre-cool incoming water before it enters storage tank.

6 COOLING CAPACITY TESTS

6.1 Preparation of Test Specimen

6.1.1 The drinking water cooler shall be tested in a room in which the temperature can be effectively controlled.

6.1.2 Pressure type water coolers shall have an arrangement to maintain a constant head at the inlet of the water coolers. This shall be connected to a pressure water supply which is provided with means of controlling the water pressure.

Pressure type water coolers shall be connected to water supply with minimum water pressure head as specified in **7.3** and Table 1.

6.1.3 Water coolers shall have a hand regulated shutoff valve, if necessary, attached at the cooled water outlet faucet for regulating the flow of water.

6.1.4 The storage type water cooler shall be tested with the storage tanks filled up to the normal level required for the rated storage capacity.

6.1.5 The water cooler being tested shall be located in a room so that its temperature is not affected by direct radiation to or from external cooling or heating equipment. The air circulation in the room shall be such that the specified uniformity of ambient temperature is obtained without direct draught upon the water cooler under test.

6.1.6 The fan motor and compressor shall be so connected as to facilitate measurement of the power input.

6.2 Test Conditions

The water coolers of all type shall be rated under the following conditions:

a) Ambient temperature 35 °C;
b) Inlet water temperature 30 °C; and
c) Maximum outlet water temperature 16 °C.

6.3 Test Procedure

The object of the test is to determine the cooling capacity of a water cooler under rating conditions specified in **6.2**. The following shall be measured while carrying out the cooling capacity test:

a) Temperature of inlet water;
b) Temperature of outlet water;
c) Volume of water in liters cooled per h;
d) Ambient temperature;
e) Test voltage;
f) Power consumption of the unit; and
g) Current taken by the unit.

6.3.1 The procedure given below shall be followed for the cooling capacity test.

Start the water cooler unit and regulate the voltage at the service connection to within 1 percent of the rated voltage and rated frequency.

Adjust the temperature of the inlet water for all types of water coolers or the average temperature of the water coolers to within ± 0.5 °C of the rating

conditions as specified in 6.2. For non-plumbing type storage water coolers, a temporary inlet water connection with a flow regulator/valve shall be provided to facilitate maintenance of constant water level in the tank to rated storage capacity, as specified by the manufacturer.

The temperature control device shall be bridged so that continuous operation during the test is assured.

Operate the water cooler until steady temperatures and thermal equilibrium are established. For storage type water cooler, the water cooler shall be run for a time depending upon storage and cooling capacity so as to ensure that a stable outlet water temperature is established.

The temperature data shall be recorded at equal measuring intervals not greater than 15 min. All temperature measurements shall be recorded to the nearest 0.1 K or better.

Continue the test until eight successive readings of outlet water temperature are steady, with individual readings varying within ± 0.5 °C and average of such readings conforming to 6.2.

Ambient temperatures shall be maintained within ± 1 °C of the specified value and shall be measured at points located 30 cm from the sides other than the sides in which the condenser outlet is located, on the perpendicular passing through the geometrical centers of the surfaces of these sides.

The evaluation and report of cooling capacity rating test results shall be as follows:

a) The cooling capacity rating of the cooler tested shall be the average of the eight successive readings recorded; and

b) The test report shall contain the measurements of parameters given in 6.3(a) to 6.3(g) after specified rating conditions have been become established.

6.4 Maximum Operating Condition Test

6.4.1 *Test Conditions*

The water coolers of all types shall perform satisfactorily and meet the requirements given in 6.4.2 when tested under the following conditions:

a) Ambient temperature 43 °C;
b) Inlet water temperature 35 °C;
c) Maximum outlet water temperature 21 °C;
d) Water flow rate maintained at 90 percent of the rated capacity as per the conditions specified in 6.2; and
e) Supply voltage at 90 percent and 110 percent of rated voltage.

Temperature data shall be recorded at equal measuring intervals not greater than 15 min. All temperature measurements shall be recorded to the nearest 0.1 K or better.

6.4.2 *Maximum Operating Condition Test Procedure*

The water coolers shall be tested at the conditions specified in 6.4.1. The water cooler shall operate continuously for a period of 2 h after the test conditions are established without tripping of motor overload protective device.

6.5 Pull Down Test

The pull down test shall be conducted without withdrawal of water from the water cooler outlet tap as per the conditions as specified in 6.2. The storage tank shall be filled with water till the float valve level. This test is applicable for storage type water coolers only. Measurement shall be made of the following:

a) Ambient temperature;
b) Initial water temperature;
c) Final water temperature;
d) Pull down time;
e) Voltage;
f) Current; and
g) Power consumption.

Once the initial temperature of water is measured is the unit is switched ON and the thermostat or temperature control shall be set for maximum cooling. The initial and final temperature of the water shall be measured in the top layer of the water surface in the tank after thoroughly mixing the water. Then, the measured pull down time shall be less than 110 percent of the value declared by the manufacturer.

7 PUBLISHED RATINGS

7.1 Published ratings shall include the rated cooling capacity under the conditions as specified in 6.2.

7.2 The cooling capacity ratings for any type of water cooler shall be as given in Table 1. The static heads and the corresponding water pressure for pressure type water coolers, and storage capacity for storage type water coolers shall be as given in Table 1.

7.3 The static water head in the inlet pipe, wherever provided, shall not exceed 12 m in any type of water cooler.

8 TOLERANCES

8.1 To comply with this standard, declared or reported water cooler ratings shall be based on conditions as specified in **6.2** and shall be such that performance of any unit shall have a capacity not less than 95 percent of the stated cooling capacity.

8.2 The storage capacity of the storage type water coolers shall not be less than 95 percent of the values specified.

9 MAXIMUM POWER CONSUMPTION TEST

The power consumption for any type of water coolers tested under test conditions laid down in **6.2** shall not be more than the values given in Table 2 for respective capacity rating.

Table 1 Ratings for Water Coolers

(*Foreword*, *Clauses* 6.1.2 *and* 7.2)

Sl No.	Cooling Capacity Rating	Storage Capacity for Storage Type Water Coolers	Minimum Static Head/ Pressure (Applicable only for Pressure Type Water Cooler)
	l/h	l	m/kg/cm^2
(1)	(2)	(3)	(4)
i)	5	5, 10, and 15	3/0.3[1)]
ii)	10	10, 20, and 30	3/0.3[1)]
iii)	15	15, 30, and 40	3/0.3[1)]
iv)	30	30, 40, and 60	3/0.3[1)]
v)	40	40, 60, and 80	4.5/0.45[1)]
vi)	60	60, 80, and 120	4.5/0.45[1)]
vii)	80	80, 120, and 225	4.5/0.45[1)]
viii)	120	120, 225, and 300	4.5/0.45[1)]
ix)	150	150, 300, and 400	4.5/0.45[1)]
x)	225	225 ,400, and 550	4.5/0.45[1)]

Table 2 Power Consumption

(*Clause* 9)

Sl No.	Cooling Capacity Rating	Maximum Power Consumption
	l/h	W
(1)	(2)	(3)
i)	5	175
ii)	10	270
iii)	15	300
iv)	30	400
v)	40	575
vi)	60	775
vii)	80	950
viii)	120	1 300
ix)	150	1 550
x)	225	2 200

10 ANNUAL ENERGY CONSUMPTION TEST

10.1 The test conditions and the test set up shall be as given in 6.1 and 6.2.

10.2 For storage type of water cooler, water withdrawal shall be done immediately after the stable operating condition is achieved. The period of withdrawal shall be for 6 h at rated cooling capacity. For every 1 h, minimum 4 readings of outlet water temperature to be recorded and which shall be in accordance with the test procedure given in capacity rating test.

10.3 Annual energy consumption shall be calculated based on water withdrawal of 6 h per day using the following equation.

$$E_{AEC} = E_{Total} \times 2 \times 365$$

where

E_{AEC} = Annual energy consumption, in kWh; and

E_{Total} = Total energy consumption, in kWh, in 6 h stable period.

E_{Total} is multiplied by 2 as total 12 h have been considered as number of hours the water cooler is switched on per day and 365 is the number of days in a year.

10.4 For instantaneous type water cooler, 15 min water withdrawal will be done for 6 h at rated cooling capacity. For every 1 h, minimum 4 readings of outlet water temperature to be recorded and which shall be within functional test.

10.5 The annual energy consumption of the water cooler shall not exceed 10 percent of the declared annual energy consumption.

11 STORAGE CAPACITY TEST

11.1 The storage tank shall be filled up to its full capacity by flow meter or measuring jar.

11.2 The storage capacity shall be as per 8.2.

12 INSTRUMENTS

12.1 Temperature measurement shall be made with one or more of the following instruments:

a) Mercury-in-glass thermometers;
b) Thermocouples;
c) Electric resistance thermometers; or
d) Electric resistance measuring instruments having accuracy 0.2 percent of the scale.

Accuracy of measurement shall be within ± 0.25° C.

12.2 Electrical measurements shall be made with indicating instrument. The accuracy of indicating instruments shall be within 0.5 percent of the full-scale reading.

12.3 Volume measurement shall be made with one or more of the following instruments:

a) Liquid quantity measuring device; measuring either volume or weigh; or
b) Liquid flow metre.

Accuracy of measurement shall be within ± 1 percent.

12.4 The smallest division on the scale of any instrument shall not exceed twice the specified accuracy for it.

13 FUNCTIONAL TEST

13.1 For pressure type water cooler, the product is connected to water connection and switched ON for minimum 10 min by connecting the electrical power supply. Under prevailing ambient conditions, measurement shall be made of the following parameters as given from (a) to (g) which shall be conforming as per manufacturer's quality control manual:

a) Temperature of inlet water;
b) Temperature of outlet water;
c) Flow rate (LPH);
d) Ambient temperature;
e) Voltage;
f) Power consumption; and
g) Current.

13.2 For storage type water coolers, the product is connected to electrical power supply, switched ON and operated till first refrigeration cycle of compressor on thermostat or for 10 min whichever is earlier, without water in the storage tank of water cooler. Under prevailing ambient conditions, measurement shall be made of the following parameters as given from (a) to (d) which shall be conforming as per manufacturer's quality control manual:

a) Ambient temperature;
b) Voltage;
c) Current; and
d) Power consumption.

14 SCHEDULE OF TESTS

14.1 Type Tests

14.1.1 The tests specified in this standard shall constitute the type tests and shall be carried out on two samples of the same type and rating selected preferably at random from a regular production lot.

Before commencement of the tests, the water coolers shall be visually examined and inspected for obvious visual defects in respect of components, parts and their assembly, construction mechanical hazards, markings, provision of suitable terminalsfor supply connections, earthing, and the effectiveness of screws and connections. The external surface finish shall be even and free from finishing defects. The following shall constitute the type tests:

a) Protection against electric shock (*see* **8** of IS 302-1);
b) High voltage (electric strength) test (*see* **13.3** of IS 302-1);
c) Leakage current tests (*see* **13.2** of IS 302-1);
d) Provision for earthing (*see* **27.5** of IS 302-1);
e) Cooling capacity rating test (*see* **6.3**);
f) Maximum operating condition test (*see* **6.4**);
g) Power consumption test (*see* **9**);
h) Energy consumption test (*see* **10**); and
j) Storage capacity test (*see* **11**).
k) Pull down test (*see* **6.5**);

14.1.2 The type test report shall also contain the following identification data:

a) Name-plate data of water cooler;
b) Name-plate data of compressor;
c) Type of water cooler;
d) Motor nameplate data; and
e) Name of the refrigerant.

14.2 Routine Tests

Every water cooler shall be subjected to the following routine tests at the manufacturer's works:

a) Functional test (*see* **13**);
b) Earthing continuity test (*see* **A-1** of IS 302-1); and
c) High voltage test (*see* **A-2** of IS 302-1).

14.3 Acceptance Tests

The following tests shall constitute the acceptance tests. The sample size and the compliance level shall be as specified in IS 2500 (Part 1).

a) High voltage (electric strength) test (*see* **13.3** of IS 302-1);
b) Leakage current tests (*see* **13.3** of IS 302-1);
c) Cooling capacity rating test (*see* **6.3**);
d) Power consumption test (*see* **9**);
e) Energy consumption test (*see* **10**);
f) Storage capacity test (*see* **11**); and
g) Pull down test (*see* **6.5**).

15 MARKING AND INFORMATION

15.1 Each water cooler shall have the following information marked in a permanent and legible manner in a location where it is easily accessible and easily visible after installation:

a) Name-plate data of water cooler including make, model, and serial number of the unit;
b) The name and quantity of refrigerant;
c) Rated voltage and frequency;
d) Cooling capacity rating;
e) Wiring diagram;
f) Full load current;
g) Annual energy consumption, in kWh;
h) Type of water cooler;
j) Marking of earthing terminal; and
k) Manufacturers name/trademark and country of manufacture.

15.2 BIS Certification Marking

15.2.1 The water cooler may also be marked with the Standard Mark.

15.2.2 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.

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 302 (Part 1) : 2008	Safety of household and similar electrical appliances: Part 1 General requirements (*sixth revision*)
IS 694 : 2010	Polyvinyl chloride insulated unsheathed and sheathed cables/cords with rigid and flexible conductor for rated voltages up to and including 450/750 V (*fourth revision*)
IS 996 : 2009	Single phase a.c. induction motors for general purpose (*third revision*)
IS 1293 : 2019	Plugs and socket-outlets for household and similar purposes of rated voltage up to and including 250 V and rated current up to and including 16 A — Specification (*fourth revision*)
IS 1391 (Part 1) : 2023	Room air conditioners — Specification: Part 1 Unitary air conditioners (*fourth revision*)
IS 2500 (Part 1) : 2000/ISO 2859-1 : 1999	Sampling procedure for inspection by attributes: Part 1 Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (*third revision*)
IS 5522 : 2014	Stainless steel sheets and strips for utensils — Specification (*third revision*)
IS 6911 : 2017	Stainless steel plate, sheet and strip — Specification (*second revision*)
IS 9968 (Part 1): 1988	Specification for elastomer insulated cables: Part 1 For working voltages up to and including 1 100 V (*first revision*)
IS 10146 : 1982	Specification for polyethylene for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
IS 10151 : 2019	Polyvinyl chloride (PVC) and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water — Specification (*first revision*)
IS 10617 : 2018	Hermetic compressors — Specification (*second revision*)
IS 10910 : 1984	Specification for polypropylene and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
IS 16656 : 2017/ ISO 817 : 2014	Refrigerants — Designation and safety classification
IS 17681: 2022	Bottled water dispensers — Specification
IS/IEC 60335-2-89 : 2010	Household and similar electrical appliances — Safety Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant unit or compressor

ANNEX B

(*Foreword* and *Clause* 1.2)

RECOMMENDED DRINKING WATER REQUIREMENTS FOR VARIOUS TYPES OF SERVICE

Sl No. (1)	*Type of Service* (2)	*Requirement* (3)
i)	Office	0.166 litre/person hour
ii)	Light manufacturing	0.5 litre/person hour
iii)	Heavy manufacturing	1.0 litre/person hour
iv)	Heavy manufacturing	1.0 litre/person hour
v)	Restaurant	0.5 litre/person hour
vi)	Cafeteria	0.33 litre/person hour
vii)	Cinema	6 liter/100 seats
viii)	Theatre	6 liter/100 seats
ix)	School	0.166 litre/person hour
x)	Hospitals: per bed per attendant	0.33 litre
xi)	Hotels	0.33 litre/hour/room
xii)	Public fountains, parks, fairs, etc	120-160 litres/hour
xiii)	Departmental stores hostel and offices building lobby	23-28 litres/hour fountain

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Refrigeration and Air Conditioning Sectional Committee, MED 03

Organization	*Representative* (*s*)
Indian Institute of Technology Roorkee, Roorkee	PROF RAVI KUMAR **(*Chairperson*)**
BSH Household Appliances Manufacturing Private Limited, Chennai	SHRI LOGANATHAN VIJAY KUMAR SHRI BALASUBRAMANIAN ANAND (*Alternate*)
Blue Star Limited, Mumbai	SHRI JITENDRA BHAMBURE SHRI SUNIL KUMAR JAIN (*Alternate*)
Bureau of Energy Efficiency, New Delhi	MS PRAVATANALINI SAMAL MS DEEPSHIKHA WADHWA (*Alternate* I) SHRI KAMRAN SHAIK (*Alternate* II) SHRI DHEERAJ PANDEY (*Alternate* III)
Carrier Air Conditioning and Refrigeration Limited, Gurugram	SHRI BIMAL TANDON SHRI MANMOHAN KULASHRI (*Alternate* I) SHRI JATINDER SHARMA (*Alternate* II)
Central Power Research Institute, Bengaluru	DR P. CHANDRA SEKHAR SHRI GUJJALA B. BALARAJA (*Alternate*)
CEPT University, Ahmedabad	SHRI YASH SHUKLA
Copeland India Private Limited, Pune	SHRI S. CHETHAN THOLPADY
Daikin Air Conditioning India Private Limited, Gurugram	Shri Gaurav Mehtani
Danfoss Industries Private Limited, Gurugram	SHRI MADHUR SEHGAL SHRI K. L. NAGAHARI (*Alternate* I) SHRI M. N. S. V. KIRAN KUMAR (*Alternate* II)
Directorate General of Quality Assurance, Ministry of Defence, New Delhi	LT COL DEEPAK SHARMA SHRI S. S. NIKAM (*Alternate*)
Electrical Research and Development Association, Vadodara	SHRI GUATAM BRAHMBHATT SHRI RAKESH PATEL SINGH (*Alternate*)
Emerson Climate Technologies (India) Private Limited, New Delhi	SHRI CHETHAN THOLPADY SHRI D. P. DESPANDE (*Alternate*)
Frigoglass India Private Limited, Gurugram	SHRI MAHESH KUMAR MAWAI SHRI MANDEEP SINGH (*Alternate* I) MS RITU CHOUHAN (*Alternate* II)
Godrej & Boyce Manufacturing Company Limited, Mumbai	SHRI BURZIN WADIA SHRI JASVIR SINGH (*Alternate* I) SHRI NARENDRA SHEDGE (*Alternate* II)

Organization	*Representative* (*s*)
Honeywell International India Private Limited, Gurugram	SHRI AADITYA PEGALLAPATI SHRI AVINASH KUMAR (*Alternate*)
Indian Institute of Chemical Engineering, Kolkata	DR D. SATHIYAMOORTHY DR SUDIP K. DAS (*Alternate*)
Indian Institute of Technology Madras, Chennai	DR G. VENKATARATHNAM
Indian Society of Heating, Refrigerating and Air Conditioning Engineers, New Delhi	DR JYOTIRMAY MATHUR SHRI ASHISH RAKHEJA (*Alternate* I) SHRI V. MANJUNATH (*Alternate* II)
Ingersoll Rand India Limited, Bengaluru	SHRI M. VENKANNA SHRI J. GURUSAMY (*Alternate*)
International Copper Association India, Mumbai	SHRI MAYUR KARMAKAR SHRI SHANKAR SAPALIGA (*Alternate*)
Intertek India Private Limited, Gurugram	SHRI C. M. PATHAK
Johnson Controls-Hitachi Air Conditioning India Limited, Mehsana	SHRI RAHUL RAMTEKKAR MS HEENA RAMSINGHANI (*Alternate*)
LG Electronics India Private Limited, New Delhi	SHRI ADITYA ANIL
Refrigeration and Air Conditioning Manufacturers Association, New Delhi	SHRI KANWALJEET JAWA SHRI HARSH VARDHAN PANT (*Alternate*)
Samsung India Electronics Private Limited, New Delhi	SHRI KALICHARAN SAHU SHRI AMIT KUMAR JHA (*Alternate*)
Sierra Aircon Private Limited, Gurugram	SHRI D. K. MUDGAL SHRI S. DHIMAN (*Alternate*)
The Chemours India Private Limited, Gurugram	SHRI VIKAS MEHTA SHRI NISHIT SHAH (*Alternate*)
UL India Private Limited, Bengaluru	SHRI V. MANJUNATH SHRI SATISH KUMAR (*Alternate*)
Voltas Limited, Mumbai	SHRI SRINIVASAN MOTURI SHRI A. D. KUMBHAR (*Alternate*)
Voluntary Organisation in Interest of Consumer Education (VOICE), New Delhi	SHRI B. K. MUKHOPADHYAY SHRI H. S. WADHWA (*Alternate*)
In Personal Capacity (*H.No. 03, Savita Vihar, Delhi*)	SHRI J. K. AGRAWAL
In Personal Capacity (*506/2, Kirti Apartments, Mayur Vihar, Phase-1 Extension, Delhi*)	SHRI P. K. MUKHERJEE
BIS Directorate General	SHRI K. VENKATESHWARA RAO, SCIENTIST 'F'/ SENIOR DIRECTOR AND HEAD (MECHANICAL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
MS NEHA THAKUR
SCIENTIST 'C'/DEPUTY DIRECTOR
(MECHANICAL ENGINEERING), BIS

Panel for Revision of IS 1475 (Part 1), MED 03 : P18

Organization	*Representative*(*s*)
Voltas Limited, Mumbai	SHRI SRINIVASU **(*Convener*)**
Blue Star Limited, Mumbai	SHRI SUNIL KUMAR JAIN SHRI SUSHIL KUMAR
Intertek India Private Limited, Gurugram	SHRI C. M. PATHAK
UL India Private Limited, Bengaluru	SHRI SATISH KUMAR
Usha Pvt Ltd, Gurugram	SHRI PRAMOD TRIVEDI SHRI VIKAS DUA
Veeline Media Limited, Kolkate	SHRI PRASHANT HANWANTE
Voltas Limited, Mumbai	SHRI SHESHADRI H. G.
In Personal Capacity (*506/2, Kirti Apartments, Mayur Vihar, Phase-1 Extension, Delhi*)	SHRI P. K. MUKHERJEE

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: MED 03 (22200).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Manakalya, 5th Floor/MTNL CETTM, Technology Street, Hiranandani Gardens, Powai Mumbai 400076	25700030 25702715

Branches : AHMEDABAD, BENGALURU, BHOPAL, BHUBANESHWAR, CHANDIGARH, CHENNAI, COIMBATORE, DEHRADUN, DELHI, FARIDABAD, GHAZIABAD, GUWAHATI, HARYANA (CHANDIGARH), HUBLI, HYDERABAD, JAIPUR, JAMMU, JAMSHEDPUR, KOCHI, KOLKATA, LUCKNOW, MADURAI, MUMBAI, NAGPUR, NOIDA, PARWANOO, PATNA, PUNE, RAIPUR, RAJKOT, SURAT, VIJAYAWADA.

Published by BIS, New Delhi