उत्पाद मैन्युअल
आई एस 7872: 2020 के अनुसार
गहरे फ्रीजर के लिए

दस्तावेज़ संख्या – पी एम/आई एस 7872/3/ फरवरी 2022

भारतीय मानक ब्यूरो की स्कीम-I (अनुरूपता मूलयाांकन) विनियम, 2018 के तहत यह उत्पाद मैन्युअल प्रमाणीकरण के प्रचालन में रीति और पारिर्शिता की सुसंगतता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों और लाइसेंसी द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस प्रमाणीकरण लाइसेंस/ प्रमाणपत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है ।

PRODUCT MANUAL FOR
DEEP FREEZERS
ACCORDING to IS 7872:2020

Document No.- PM/IS 7872/3/February 2022

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.

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1.	**Product**	:	IS 7872: 2020
	Title	:	Deep Freezers
	No. of Amendments	:	One
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	---
b)	**Grouping guidelines**	:	Please refer ANNEX – A
c)	**Sample Size**	:	02 Nos.
d)	**Sampling guidelines during operation of licence**	:	Please refer ANNEX – B
3.	**List of Test Equipment**	:	Please refer ANNEX – C
4.	**Scheme of Inspection and Testing**	:	Please refer ANNEX – D
5.	**Possible tests in a day**	:	Please refer ANNEX – E
6.	**Scope of the Licence**	:	Please refer ANNEX- F

BUREAU OF INDIAN STANDARDS
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ANNEX A

Grouping Guidelines

1. Deep freezers as per IS 7872: 2020 may be classified as follows:

a) Rated Storage Volume, in litres

b) Rated Voltage or Voltage range and Rated frequency of supply

c) Type of Refrigerant used: Flammable/ Non- flammable

d) Door type: Hinged/ Sliding

2. Based on the above classification, following guidelines shall be followed for considering Grant of Licence (GoL)/Change in Scope of Licence (CSoL):

a) Deep freezer of largest Rated Storage Volume of the range offered shall be tested to cover the entire range of rated storage volume offered.

b) Separate sample of each rated voltage or Voltage range and rated frequency of supply shall be tested for covering all voltages and supplies.

c) Separate sample of each refrigerant type shall be tested for covering both types of refrigerants.

d) Separate sample of each door type shall be tested for covering both types of door types.

3. The Firm shall declare the rated storage volumes, rated voltage or Voltage ranges, type of refrigerants, and door type of the deep freezers intended to be covered in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

4. During the operation of the Licence, BO shall ensure that all the deep freezers covered in the Licence are tested in rotation, to the extent possible.

ANNEX B

Sampling Guidelines During Operation of Licence

During an operative year of a licence, 1 FS shall be drawn for complete testing.

Another FS shall be drawn for only the following tests:

- Door Seal test (Cl. 8),
- Protection against access to live parts (Cl. 8 of IS/IEC 60335-2-89),
- Power input and current (Cl. 10 IS/IEC 60335-2-89),
- Provision for earthing (Cl. 27 of IS/IEC 60335-2-89),
- Leakage current and electric strength at operating temperature (Cl. 13 of IS/IEC 60335-2-89).

No Market Sample shall be drawn. Feedback shall be obtained.

ANNEX C

List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1.	Corrosion resistance test, Cl. 4.3	Test chamber and chemicals as per IS 9000 (Part 11)
2.	Durability test for Doors and fittings, Cl. 4.8	Door Durability Tester / Door Fatigue Tester / Door opening –Closing cyclic arrangement fitted with angle protactor, cycle counter measurement device
3.	Strength-Pressure test for components, Cl. 5.4, Cl. 11.7	HST pressure arrangement with pressure gauges/Air Pressure arrangement or arrangement for pressure with nitrogen gas
4.	Sound Pressure level, Cl. 7	•Test chamber with background noise less than 45 dBA •dBA meter/analyser/recorder
5.	Storage Capacity, Cl. 8	Measuring tape/scale, Vernier caliper, micrometer
6.	No Load Pull down test, Cl. 11.1	• Environment Test Chamber/test room: • Thermocouple/Wire Sensors • Instrument for measuring Voltage, Current and power • RTD sensors • Dimmer/ Voltage and power Controller • Data Monitoring System , PLC. • Test Packages & M packages (Dimension and Mass as given in clause No. 12.1) • Humidifier
7.	Energy Consumption test, Cl. 11.2	
8.	Temperature rise test, Cl. 11.3	
9.	Thermal Insulation test, Cl. 11.6	
10.	Door Seal test, Cl. 11.4	Strip of paper of required width and thickness, Micrometer
11.	Mechanical Strength test of the shelves and similar components , Cl. 11.5	Height measure, Caliper or Ruler, Load,
	Safety requirements , Cl. 6.1 (Cl. 8 to 32 of IS/IEC 60335-2-89)	
12.	Protection Against access to live parts, Cl. 8	Test probe B, 13 and 41 of IS 1401, Voltmeter, mili-ammeter, force gauges, 2000 ohm non-inductive resistor,
13.	Power input and current, Cl. 10	Voltmeter, Ammeter, Wattmeter, Timer

14.	Heating, Cl. 11	Temp recorder, Fine wire thermocouples, Winding resistance measurement system, Test Corner, probe for measurement of surface temperature
15.	Leakage current and electric strength at operating temperature, Cl. 13	IR Meter, Micro ammeter, HV Tester, Stopwatch
16.	Transient Over voltages, Cl. 14	Impulse voltage test generator and monitor
17.	Moisture resistance, Cl. 15	IP test equipment, Measuring beaker, Spray Nozzle (only when the second numeral is greater than 0), Humidity Chamber with Temperature and Humidity controller, HV test facilities
18.	Leakage current and Electric Strength, Cl. 16	Leakage Current Tester/ Low impedance ammeter, HV test supply
19.	Overload protection of transformers and associated circuits, Cl. 17	Temp recorder, Fine wire thermocouples, Winding resistance measurement system, Test Corner, probe for measurement of surface temperature
20.	Abnormal Operation, Cl. 19	Facility to lock the rotor, Electrostatic discharge test apparatus, Radiated field test apparatus, Fast transient burst test apparatus, Voltage dip and interruption test apparatus
21.	Stability & Mechanical Hazards, Cl. 20.	Inclined plane, masses, force gauges, test probe similar to test probe B of IS 1401 with circular stop face 50 mm Ø, Stop plate, test rod
22.	Mechanical Strength, Cl. 21	Spring hammer, Hardened steel pin, Force gauges
23.	Construction, Cl. 22	Test rig for torque on pin supported appliance, Heating cabinet, Test probe , Test fingernail , Force gauge, Pressure test apparatus Automatic cord reel test apparatus Oxygen bomb with pressure apparatus Methylated spirits
24.	Internal wiring, Cl. 23	Flexing test apparatus
25.	Components, Cl. 24	Endurance test apparatus as per 6.10 and 6.11 of IEC 60730-1:2013
26.	Supply connection and external flexible cords, Cl. 25	Flexing test apparatus, Cord anchorage force & torque tester, Cold chamber
27.	Terminals for external conductors, Cl. 26	Torque screwdriver
28.	Provision for earthing, Cl. 27	Earth continuity tester
29.	Screws and connections, Cl. 28	Torque gauge
30.	Clearances, Creepage distances and solid Insulation, Cl. 29	Mechanical measurement tools, Rod or ball gauges, Proof tracking test apparatus

31.	Resistance to heat and fire, Cl. 30	Heating Oven with Temp controller, Ball pressure Apparatus, Glow wire test apparatus
32.	Resistance to Rusting, Cl. 31	Humidity Chamber with Temp and Humidity Controller Measuring Cylinder 500 ml Ammonium Chloride, Carbon Tetrachloride, Distilled Water

The above list is indicative only and may not be treated as exhaustive.

ANNEX D

Scheme of Inspection and Testing

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipment.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING AND MARKING – As per the requirement of IS 7872: 2020.

4. CONTROL UNIT –All Freezers of same rated storage volume, rated power input, frequency and rated voltage or voltage range, with same door type and same type of refrigerant used, manufactured in a day shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

6. REJECTIONS – 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

(1)				(2)	(3)		
Test Details				**Test equipment requirement R: required (or) S: Sub-contracting permitted**	**Levels of Control**		
Cl.	**Requirement**	**Test Method**			**No. of Sample**	**Frequency**	**Remarks**
		Clause	Reference				
4	**Construction**						
4.1	General Design	4.1	IS 7872	-	Each freezer		-
4.2	Material	4.2	IS 7872	-	Each Consignment		Please see Note 1
4.3	Finish (Except test for corrosion resistance)	4.3	IS 7872	-	Each freezer		-
	Test for Corrosion Resistance	4.3	IS 7872	S	Once in a year or whenever there is a change in material/ design for protection against corrosion, whichever is earlier		-
4.4	Thermal Insulation	4.4	IS 7872	-	Each freezer		-
4.5	Fittings (also see 11.4)	4.5	IS 7872	-	Each Consignment		Please see Note 1

4.6	Hardware	4.6	IS 7872	-	Each Consignment		Please see Note 1
4.7	Interior Fittings (also see 11.5)	4.7	IS 7872	-	Each Consignment		Please see Note 1
4.8	Doors and Fittings (Except durability test as prescribed in 4.8.1)	4.8	IS 7872	-	Each freezer		Each consignment shall be checked for requirement of handles and hinges (Also please see Note 1)
	Durability test for external doors	4.8.1	IS 7872	S	One freezer from each rated storage volume	Once in a year for each design	-
4.9	Disposal of Defrost / Condensate Water	4.9	IS 7872	-	Each Freezer		-
5	**Refrigeration System**						
5.1	Construction	5.1	IS 7872	-	Each Freezer		-
5.2	Control of Operation	5.2	IS 7872	-	Each Freezer		-
5.3	Location of Components	5.3	IS 7872	-	Each Freezer		-
5.4	Strength-Pressure Test for components	5.4.2, 5.4.3, 5.4.4	IS 7872	S	Every 3 months for each design		Compliance can be checked by any of the tests at 5.4.2 to 5.4.4

6	**Safety Requirements**						
6.1	**General (as applicable as per IS/IEC 60335-2-89)**						
	Protection against access to live parts	6.1 8	IS 7278 IS/IEC 60335-2-89	R	Each Freezer		
	Power input and current	6.1 10	IS 7278 IS/IEC 60335-2-89	R	10 % of production	Each Control Unit	
	Heating	6.1 11	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Leakage current and electric strength at operating temperature	6.1 13	IS 7278 IS/IEC 60335-2-89	R	10 % of production	Each Control Unit	
	Transient over voltages	6.1 14	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Moisture resistance	6.1 15	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Leakage current and electric strength	6.1 16	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	

	Overload protection of transformers and associated circuits	6.1 17	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Abnormal operation	6.1 19	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Stability and mechanical hazards	6.1 20	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Mechanical Strength	6.1 21	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Construction	6.1 22	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Internal wiring	6.1 23	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Components	6.1 24	IS 7278 IS/IEC 60335-2-89	S	Each consignment		Please see Note 1

	Supply connection and external flexible cords	6.1 25	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Terminals for external conductors	6.1 26	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Provision for earthing	6.1 27	IS 7278 IS/IEC 60335-2-89	R	Each Freezer		
	Screws and connections	6.1 28	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Clearances, creepage distances and solid insulation	6.1 29	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Resistance to heat and fire	6.1 30	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
	Resistance to rusting	6.1 31	IS 7278 IS/IEC 60335-2-89	S	One freezer from each rated storage volume	Once in a year for each design	
6.2	Hermetically Sealed Compressor	6.2	IS 7872,	-	Each Consignment		Please see Note 1

			IS 10617				
6.3	Protective Guards	6.3	IS 7872	-	Each Freezer		-
6.4	Electrical Accessories	6.4	IS 7872	-	Each Freezer		-
6.5	Flammable Refrigerant	6.5	IS 7872 IS/IEC 60335-2-89.	-	Each Consignment		Please see Note 1
7	Sound Pressure Level	7	IS 7872	S	One freezer from each rated storage volume	Once in 6 months for each design	-
8	Measurement of freezer storage capacity	8.1 to 8.10	IS 7872	R	Once in 3 months for each rated storage volume		-
11.1	No-Load Pull-Down Test	11.1	IS 7872	S	One freezer from each rated storage volume	Once in a year for each design	-
11.2	Energy Consumption Test	11.2	IS 7872	S	One freezer from each rated storage volume	Once in a year for each design	-
11.3	Temperature Rise Test	11.3	IS 7872	S	One freezer from each rated storage volume	Once in a year for each design	-
11.4	Door Seal Test	11.4	IS 7872	R	Each Freezer		-

11.5	Mechanical Strength of the Shelves and Similar Components	11.5	IS 7872	S	One freezer from each rated storage volume	Once in a year for each design	-
11.6	Thermal Insulation Test (External Condensation Test)	11.6	IS 7872	S	One freezer from each rated storage volume	Once in a year or whenever there is any change in design whichever is earlier.	-

Note-1: Raw material/Components which are covered under mandatory certification of BIS shall be ISI marked and received along with manufacturers test certificate. For other materials, no further testing is required if received with a test certificate or is ISI Marked.

Note-2: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-3: Levels of control given in column 3 are obligatory, to which the licensee shall comply with.

ANNEX E

Possible Tests in a Day

1) Strength Pressure test, Cl. 5.4.3
2) Sound Pressure Level, Cl. 7
3) Freezer Storage Capacity, Cl. 8
4) No load Pull down test, Cl. 11.1
5) Door Seal test, Cl. 11.4
6) **Safety tests as per IS/IEC 60335-2-89**
   a) Protection against Access to live parts, Cl. 8
   b) Power Input and current, Cl. 10
   c) Leakage current and electric Strength, Cl. 13
   d) Provision for earthing, Cl. 27

ANNEX F

Scope of Licence

"Licence is granted to use Standard Mark as per IS 7872:2020 with the following scope:	
Name of the product	Deep Freezers
Rated Storage Volume, up to and including, in litres	
Rated Voltage or Voltage range	
Rated frequency of supply	
Type of Refrigerant used	Flammable/ Non- flammable
Door type	Hinged/ Sliding