उत्पाद मैन्युअल

भा. मा. 16542: 2016 के अनुसार

समस्त ग्लास एवैक्युईतिद नलिका सौर संग्रहक हेतु भंडारण पानी की टंकी के लिए

दस्तावेज़ संख्या–पी एम/आई एस 16542/2/मई 2026

भारतीय मानक ब्यूरो की स्कीम–I (अनुरूपता मूल्यांकन) विनियम, 2018 के तहत यह उत्पाद मैन्युअल प्रमाणीकरण के प्रचालन में रीति औरपारिर्शिता की सुसंगतता सुनिश्चित करनेके 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 DIRECT INSERTION TYPE STORAGE WATER TANK FOR ALL GLASS EVACUATED TUBES SOLAR COLLECTOR ACCORDING to IS 16542:2016

Document No.-PM/IS 16542/2/ May 2026

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 16542: 2016
	Title	:	Direct Insertion Type Storage Water Tank for All Glass Evacuated Tubes Solar Collector
	No. of Amendments	:	Two
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	As per Cl. 5 of IS 16542: 2016
b)	**Grouping guidelines**	:	Please refer **ANNEX –A**
c)	**Sample Size**	:	1 No., along with the ETC water heating system, if required by the lab (Also refer to Cl. 2.2 of IS 16368 for specific requirement of Tank)
3.	**List of Test Equipment**	:	Please refer **ANNEX –B**
4.	**Scheme of Inspection and Testing**	:	Please refer **ANNEX –C**
5.	**Possible tests in a day**	:	Storage water tank capacity (Cl. 7.1), Leakage test (Cl. 7.2)
6.	**Scope of the Licence:**	**:**	Licence is granted to use Standard Mark as per IS 16542:2016 with the following scope:
	Name of product	**:**	Direct Insertion Type Storage Water Tank for All Glass Evacuated Tubes Solar Collector
	Water capacity, litres	**:**	
	Material of Tank (Inner and outer)	**:**	
7.	Any other product specific guidelines	**:**	Please refer **ANNEX-D**

ANNEX A

Grouping Guidelines

1. "Direct Insertion Type Storage Water Tank for All Glass Evacuated Tubes Solar Collector" as per IS 16542: 2016 of different types may be classified in to different varieties based in following:

- Water capacity, litres
- Material of Tank :

2. **Grouping of water tanks based on capacity:**

Sl.No.	Group	System Capacity (lpd)
1	Group-1	50, 75 & 100
2	Group-2	150, 200, 250 & 300
3	Group-3	400 & 500

3.1 Following guidelines shall be followed for testing of samples for Grant of licence and Change in Scope of licence:

a) Water tank of each material shall be tested separately.

b) Water tank of highest capacity (declared by the firm) is to be tested for all requirements to include all the capacities (declared by the firm) in that particular group, provided that material of tank, is same.

c) In addition to sample of the highest capacity from each applicable group as above, sample of lowest capacity in the entire size range intended to be covered in scope, shall also be tested separately.

3.2 If the firm declares models of Solar water heating systems having system capacities other than mentioned in the above table (as per Note-4 of Annexure-A of IS 16544), then Tank used in each of those models shall be tested for considering Grant of Licence/Change in Scope of Licence.

4. The Firm shall declare all the varieties of Water tanks intended to be covered in the Licence along with their capacity and material of tanks.

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

Annex B
List of Test Equipment

Indicative list of major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Storage tank capacity, Cl. 7.1	Measuring jar
2	Leakage Test, Cl. 7.2	Pressure Gauge, Stop Watch
4	Idle Heating test, Cl. 7.3	Pyranometer, Anemometer (Device for measuring wind speed)
5	Integral test, Cl. 7.4	
6	Performance test, Cl. 7.5	Test Set up as per IS 16368
7	Thermal Shock Test, Cl. 7.6, 7.7	Electric oven

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

ANNEX C

Scheme of Inspection and Testing

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) 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 (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in Table 1. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

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.

2. ENSURING COMPLIANCE THROUGH TESTING – Manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

i) Shared testing resources like common facility,

ii) Cluster based testing facility,

iii) Sub-contracting to outside laboratories which may either be:

a) BIS recognized/empaneled laboratories, or

b) Any accredited laboratory as per ISO/IEC 17025

2.1 TEST RECORDS - The manufacturers shall maintain test records for the tests carried out (either in- house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. LABELLING AND MARKING – As per the requirements given in IS 16542: 2016**.** The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on the product, provided always that the product so marked conforms to each requirement of the specification.

3.1 **Additional Marking requirements**: Additionally, the following shall also be marked on product or package :

"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

(1)				(2)		
Test Details				**Levels of Control**		
Cl.	**Requirement**	**Test Method**		**No. of Sample**	**Frequency**	**Remarks**
		Clause	**Reference**			
	Raw Materials					
5.1	Inner tank material	**5.1**	**IS 16542**	One	Each consignment	No further testing is required, if accompanied with the Test Certificate or ISI Marked.
5.2	Outer cladding	**5.2**	**IS 16542**	One	Each consignment	No further testing is required, if accompanied with the Test Certificate or ISI Marked.
5.3	Insulation layer	**5.3**	**IS 16542**	One	Each consignment	No further testing is required, if accompanied with the Test Certificate
5.4	Inner sealing	**5.4**	**IS 16542**	One	Each consignment	No further testing is required, if accompanied with the Test Certificate
5.5	Outer	**5.5**	**IS 16542**	One	Each consignment	No further testing is required, if accompanied with the Test Certificate
6	General Requirements	**6.1, 6.2, 6.3, 6.4, 6.5, 6.6**	**IS 16542**	Manufacturer shall exercise adequate levels of control to ensure that entire production should conform to the Standard. Appropriate records of testing indicating conformity shall be maintained		
7.1	Capacity	**5.2**	**IS 16542**			

9.1	***Routine tests***					
9.1, 7.2	Leakage test	**8.2**	**IS 16542**	Each tank		
9.2	***Type tests***					
9.2, 7.3	Idle heating Test	**8.3**	**IS 16542**	One	Once in three years	It shall be ensured that Tanks of all capacities and material produced during the period is tested at least once during the period
9.2, 7.4	Integral Test	**8.4**	**IS 16542**	One	Once in three years	It shall be ensured that Tanks of all capacities and material produced during the period is tested at least once during the period
9.2, 7.5	Performance Test	**8.5**	**IS 16542**	One	Once in three years	It shall be ensured that Tanks of all capacities and material produced during the period is tested at least once during the period
9.2, 7.6	Thermal Shock Test for inner sealing	**7.6**	**IS 16542**	One	Once in three years	It shall be ensured that Tanks of all capacities and material produced during the period is tested at least once during the period
9.2, 7.7	Thermal Shock Test for inner sealing	**7.7**	**IS 16542**	One	Once in three years	It shall be ensured that Tanks of all capacities and material produced during the period is tested at least once during the period

ANNEX-E

Requirement of BIS Certification for "Direct Insertion Type Storage Water Tank For All Glass Evacuated Tubes Solar Collector" as per IS 16542: 2016 for Manufacturers making and supplying Complete System i.e. "All Glass Evacuated Solar Water Heating System" as per IS 16544: 2016

A. **Introduction**:

1. Both "All glass evacuated Solar water heating system" as per IS 16544: 2016 and "Direct insertion type Storage Water tank for All glass Evacuated Tubes Solat Collector" as per IS 16542: 2016 have been covered under "the Solar Thermal Systems, Devices and Components (Quality Control) Order, 2024" (QCO) issued by MNRE.

2. As per Cl. 4.3 of IS 16544: 2016 (Standard for the complete product i.e. "All glass evacuated Solar water heating system" in this context), "Direct insertion type Storage Water tank for All glass Evacuated Tubes Solat Collector" shall conform to IS 16542. Accordingly, manufacturers applying for grant of BIS Certification for the complete product as per IS 16544: 2016 are required to submit test report of storage tanks as per IS 16542: 2016. Conformity of storage tanks as per IS 16542: 2016 is to be checked for every such application made for grant of licence on complete product as per IS 16544: 2016

3. Many manufacturers are manufacturing storage tanks in-house and are using solely for the captive consumption for the complete product, while it is also possible that some are manufacturing and selling these tanks to the manufacturers of the complete product also.

B. **REQUIREMENT OF BIS CERTIFICATION**: In view of the above, following guidelines are to be followed for certification:

   1. Manufacturers who are manufacturing storage tanks in-house and are using solely for the captive consumption, are **not** required to obtain a separate BIS licence for "Direct insertion type Storage Water tank for All glass Evacuated Tubes Solar Collector" as per IS 16542**, provided** they have valid BIS licence for the **same variety (i.e. material and Capacity)** of the complete product i.e "All Glass Evacuated Solar water Heating System" as per IS 16544. However, all manufacturers shall ensure that the storage tanks manufactured and used by them conform to IS 16542, and records of production and testing shall be maintained as per the levels of control specified in Annex- C of this manual (Whether as per levels of control specified by BIS or as per manufacturer's own designed levels of control).

   2. However, any licensee manufacturer holding BIS licence for complete product, intends to sell the Storage Tanks outside also, then (s)he shall be required to obtain **separate** BIS Certification for "Direct insertion type Storage Water tank for All glass Evacuated Tubes Solar Collector" **also** as per IS 16542, as per the requirement of the QCO. **However, separate sample of storage tank as per IS 16542 need not be drawn or separate test report of storage tank as per IS 16542 need not be submitted , provided that they have valid BIS licence for the same variety (i.e. material and Capacity) of the complete product.**

   3. Any manufacturer who is manufacturing complete product, but procuring the Tank from outside, shall buy only ISI Marked Tanks, the as per the provisions of the QCO. Records of all such procurement indicating traceability of purchase of ISI Marked material shall be maintained.

4. Manufacturer applying for BIS Certification of both Complete system as well as storage Tank, are not required to get the tanks tested again, provided the test reports of the complete system including of tanks, issued by BIS recognized labs is available. It may be noted that this relaxation is given for same scope (in terms of capacity, material of tank) only.

C. **OPERATION OF BIS LICENCE**:

1. Records of Production and Dispatch shall be maintained by all manufacturers and manufacturers shall be responsible to establish the consumption of the Tanks (whether used in-house for captive consumption OR sold outside).

2. All manufacturers (***whether holding a separate licence for IS 16542 or not***) shall ensure that the storage tanks manufactured and used by them conform to IS 16542, and records of production and testing shall be maintained as per the levels of control specified in Annex- C of this manual (Whether as per levels of control specified by BIS or as per manufacturer's own designed levels of control).

3. For manufacturers who have licences for both complete product i.e. "All glass evacuated Solar water heating system" as per IS 16544, as well as for "Direct insertion type Storage Water tank for All glass Evacuated Tubes Solat Collector" as per IS 16542, separate sample of storage tank as per IS 16542 need not be drawn if sample of complete product i..e. "All glass evacuated solar water heating system" is already drawn during the visit during Surveillance inspections.