

MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)



(A Government of Maharashtra Institution)

REQUEST FOR QUOTATION

For

**DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND
COMMISSIONING OF SOLAR WATER HEATING SYSTEM (ETC) WITH FIVE YEARS
COMPREHENSIVE MAINTENANCE CONTRACT OF 3000 LPD (500 LPD × 6 Nos.)
CAPACITY AT MAHARASHTRA GUPTAVARTA PRABODHINI (SHIKHAR SANSTHA
MAHARASHTRA SHASAN), PUNE IN THE STATE OF MAHARASHTRA**

QUOTATION DOCUMENT

Quotation RFQ No.: 01/2024-25/MEDA/SWHS/Dated 05/02/2025

Last Date of Submission: 12/02/2025

General Manger (Solar)

Maharashtra Energy Development Agency,

Aundh Road, Opp.Spicer College,

Aundh, Pune – 411 007

Phone No: - 020-35000450

E-mail ID: - gmsolar@mahaurja.com

Web site: <http://www.mahaurja.com>

General Manager (Solar)
Maharashtra Energy Development Agency

Subject:-DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF SOLAR WATER HEATING SYSTEM (ETC) WITH FIVE YEARS COMPREHENSIVE MAINTENANCE CONTRACT OF 3000 LPD (500 LPD × 6 Nos.) CAPACITY AT MAHARASHTRA GUPTAVARTA PRABODHINI (SHIKHAR SANSTHA MAHARASHTRA SHASAN), PUNE IN THE STATE OF MAHARASHTRA.

The important dates and information for quotation is given below in the table:

S.N.	Description	Details
1	Request for Quotation (RFQ) No.	01/2024-25/MEDA/SWHS/Dated 05/02/2025
2	Quotation Type (open/Limited/Auction/EOI/Single)	Limited
3	Quotation Issued Through	RFQ Request for quotation (RFQ)
4	Quotation Category (Services/Goods/works/Supply)	Design, Manufacture, Supply, Installation, Testing and Commissioning support.
5	Scope of Work	DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF SOLAR WATER HEATING SYSTEM (ETC) WITH FIVE YEARS COMPREHENSIVE MAINTENANCE CONTRACT OF 3000 LPD (500 LPD × 6 Nos.) CAPACITY AT MAHARASHTRA GUPTAVARTA PRABODHINI (SHIKHAR SANSTHA MAHARASHTRA SHASAN), PUNE IN THE STATE OF MAHARASHTRA.
6	Pre-bid Meeting at MEDA, Pune Office & on VC	07/02/2025 15.00 Hrs.
6	Place of submission of quotation and address for communication	General Manger (Solar) Maharashtra Energy Development Agency, Aundh Road, Opp.Spicer College, Aundh, Pune – 411 007 Phone No: - 020-35000450 E-mail ID: - gmsolar@mahaurja.com Web site: http://www.mahaurja.com
7	Period of validity of quotation	120 days
8	Last date & time of submission of quotation	Date: 12/02/2025 & Time: 15:00 Hrs
9	Estimated Cost (Rs.)	Rs. 4,24,672/- (Including all Taxes, GST, etc)

1. INTRODUCTION:

The Maharashtra Energy Development Agency is of Government of Maharashtra Institution. Government of Maharashtra has established Maharashtra Energy Development Agency (MEDA) as the state Nodal Agency for promotion, propagation and development of renewable energy sources in the state. MEDA is registered under the societies Registration Act, 1860 MEDA is also notified as the 'State Designated Agency' to implement the energy Conservation Act. 2001 in the State. MEDA has also been designated to be the state agency under RPO-REC Mechanism.

2. Invitation for Quotation:

General Manager (Solar) MEDA, Pune has invited the sealed quotations from Manufacturers who has experience to DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF SOLAR WATER HEATING SYSTEM (ETC) WITH FIVE YEARS COMPREHENSIVE MAINTENANCE CONTRACT OF 3000 LPD (500 LPD × 6 Nos.) CAPACITY AT MAHARASHTRA GUPTAVARTA PRABODHINI (SHIKHAR SANSTHA MAHARASHTRA SHASAN), PUNE IN THE STATE OF MAHARASHTRA.

3. Qualification Criteria:

- The bidder should be a manufacturer of Solar Water Heater systems.
- The bidder must have a registered firm/company with valid GST registration.
- The bidder should have experience in development of Solar water heater system (SWHS) on Turnkey basis including Design, Supply, Installation and Commissioning SWHS of 1500 LPD capacity in last Seven Financial years as on last date of bid submission. However, such SWHS capacity must have been in satisfactory operation for at least six (06) months from the date of commissioning.

And

- As per above, the bidder should have experience in development of Solar water heater system (SWHS) on Turnkey basis including design, supply, installation & commissioning of at least 02 (Two) SWHS having an individual capacity of 300 LPD or above in last Seven Financial years and till last date of bid submission. However, such System's capacity must have been in satisfactory operation for at least six (06) months from the date of commissioning.
- The list of projects commissioned at least 6 months prior to Techno-Commercial Bid Opening date, indicating whether the project is working, along with a scanned copy of the Commissioning certificate and Work order / Contract / Agreement/LOI from the Client / Owner shall be submitted in support of Clause above.
- The Performance Certificate must be issued minimum six (06) months from the date of commissioning. The Performance Certificate reports shall be issued by official from government departments.

- A job executed by a Bidder for its own plant/ projects cannot be considered as experience for the purpose of meeting the Eligibility Conditions of the quotation. Also, the jobs executed for Subsidiary/ Fellow subsidiary/ Holding company will not be considered as experience for the purpose of meeting Eligibility Conditions.
- Subcontractor experience will not be considered.
- The bidder should have a minimum annual turnover of Rs. 3,85,900/- for the work under consideration in the last 5 years, duly certified by a Chartered Accountant.
- The bidder must provide self-attested copies of Income Tax returns for FY 2021-22, 2022-23, and 2023-24 (Assessment Year 2023-24 and 2024-25).
- The bidder should not be blacklisted by any government or other organizations.
- The bidder must have arrangements for providing after-sales service in Pune district for the maintenance of the system.
- Contractor/Supplier/Installer by Joint venture is not allowed.
- Incomplete, conditional, fax, late quotation will be rejected summarily. Additional Director General, MEDA, Pune reserves the right to reject any or all the quotations at his discretion without assigning any reason thereafter.

4. Terms & Conditions: -

- a. Location for installation of Solar Water Heating System shall be assigned immediately by the user agency to the selected manufacturer to get the work done in stipulated time.
- b. The installation of Solar Water Heating System should be done in excellent manner and meet technical standards prescribed by the MEDA.
- c. As per the technical criteria set by the Ministry of New and Renewable Energy, Govt. of India the Solar Water Heating System should fulfill the BIS standards.
- d. The manufacturer shall check the quality of water and assess the hardness of it and ensure that the system shall function seamlessly.
- e. The manufacturer shall provide valid BIS certificate for the Solar Water Heating System from govt. approved test centers.
- f. The Solar Water Heating System shall provide with name of company supplying the same along with installation date and contact details etc.
- g. If the Solar Water Heating System does not function as per given standards, then the loss incurred shall be borne by the contractor and paid Maharashtra Guptavarta Prabodhini (Shikhar Sanstha Maharashtra Shasan), Pune.
- h. If contractor fails to complete the work, then any balance payment will be forfeited and contractor shall be blacklisted.
- i. Contractor shall give training of system operation to a person duly nominated by user agency and same shall be informed to Divisional office, Pune.

- j. The Contractor should successfully complete the project within timeframe set out by the MEDA. For this purpose, Contractor shall provide Activity Bar Chart within a week time after issue of Work Order.
- k. The Contractor shall provide the user manual, warranty card to the user agency and copy of same shall be provide to MEDA Pune.
- l. The Contractor/Supplier/Installer should visit the site & carryout the survey and upload the certificate indicating that the survey is carried out by the bidder as per Annexure - 2. The Contractor/Supplier/Installer submitted without site visit report will be rejected out rightly.
- m. The work being of limited nature and to seek prompt after sales service the Contractor within Pune District shall be preferred while allotting the work against the invited quotes. Documentary proof in this matter need to be submitted by concern Manufacturer along with quote.
- n. The Contractor shall provide the detailed information about Company/firm in attached Format (Contractor's Information sheet)
- o. The Contractor shall submit their quotations in two different sealed envelopes i.e. First envelop shall contains documents a per the technical eligibility criteria and second envelop shall contain financial details (quoted rate).**
- p. The Contractor should mention the subject on each sealed envelope i.e Technical Envelop and Financial Envelop.**
- q. The financial envelop of technically qualified proposals will only be opened.**

5. Terms of Payment:

a. Release of 80% of total project cost: - (As per availability of funds)

It will be released after supply, installation & successful commissioning of the Solar Water Heater systems duly certified by Contractor, MEDA representative & authorized person of user agency along with following documents:

- i. Joint Inspection Report duly signed by authorized person of user agency, Contractor representative, MEDA official, along with system photographs with lat-long.
- ii. Submission of Project Insurance policy documents effective from date of commissioning of the system for period of 01 year and undertaking from insurance provider / bidder for annual renewals during next 4 years of CMC period, covering all eligible risks.
- iii. Warranty/Guaranty Certificate of materials used in system.
- iv. . Invoice (2 copies)

b. Release of 10% of eligible payment (including GST) after one year of successful functioning of the Solar Water Heater systems.

- c. **Balance 10% of the eligible payment including GST, Security Deposit shall be released by MEDA after successful completion of CMC for a period of 60 Months from the date of successful installation & commissioning.**
- d. **Payment for Comprehensive Maintenance Contract (CMC) shall be paid every quarter (3 months) from the Date of Commissioning till the end of 60th month, on submission of CMC report to MEDA in the prescribed format.**
- e. **Deduction: -**
- i. The TDS will be deducted as per the Govt. rule and regulations.
 - ii. MEDA will issue necessary certificates of TDS deduction.
 - iii. C' / D' form will not

6. TAX INVOICE TO BE SUBMITTED ON PRINTED FORMS:

The successful Contractor shall submit all tax invoices in duplicate only on printed form to MEDA, HO. Pune.

7. Price Variation, Taxes, Duties & Levies etc.

Contractor shall take care of variations in prices/taxes/duties/levies of the Quotation document etc and quote the price is expected to cover all such variations. MEDA shall not entertain any addition in project cost during the project preparation phase.

8. Judicial Jurisdiction:

All disputes arising out of and touching or relating to subject matter of the Agreement / Contract shall be subject to jurisdiction of local courts of (Pune) and the High Court of (Bombay).

9. TIME FRAME:

The time frame for the completion of work in all respect is 30 days from the issue of work order.

10. Applicable Law:

The Contractor shall be interpreted in accordance with the laws of the Union of India and all disputes shall be subject to place of jurisdiction in Pune, Maharashtra.

11. Rejection Terms:

Incomplete, conditional, fax, late quotation will be rejected summarily. Additional Director General, MEDA, Pune reserves the right to reject any or all the quotations at his discretion without assigning any reason thereafter.

12. Check List of Documents to Be Furnished with Below Quotation –

- PAN and GST Details.
- Copy of IT Returns.
- Declaration on company letter head.
- Contractors Information Sheet.
- Annual Turnover Certificate.

- Work Experience Details.
- Site Visit Report. (In format)

We look ahead to seek your sealed quotation on or before 12/02/2025 till 15:00 Hrs.

Thanking you,

Sd/-

General Manager (Solar)
HO. Pune, MEDA,

Encl.: -

1. Quotation Format (**Annexure – 1**)
2. Site Survey Form (**Annexure – 2**)
3. Contractor Information Sheet. (**Annexure – 3**)
4. Declaration Format. (**Annexure – 4**)
5. Annual Turn Over certificate format. (**Annexure – 5**)
6. Technical Specifications of Solar Water Heating System. (**Annexure – 6**)

QUOTATION Format
(On Company's Letterhead)

Ref No.:

Date:

QUOTATION to be Submitted

General Manger (Solar)
Maharashtra Energy Development Agency,
Aundh Road, Opp. Spicer College,
Aundh, Pune – 411 007
Phone No: - 020-35000450
E-mail ID: - gmsolar@mahaurja.com

Subject: DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF SOLAR WATER HEATING SYSTEM (ETC) WITH FIVE YEARS COMPREHENSIVE MAINTENANCE CONTRACT OF 3000 LPD (500 LPD × 6 Nos.) CAPACITY AT MAHARASHTRA GUPTAVARTA PRABODHINI (SHIKHAR SANSTHA MAHARASHTRA SHASAN), PUNE IN THE STATE OF MAHARASHTRA.

Sr. No.	Site Name	Estimate Cost (Rs.) (including GST)
1.	DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF SOLAR WATER HEATING SYSTEM (ETC) WITH FIVE YEARS COMPREHENSIVE MAINTENANCE CONTRACT OF 3000 LPD (500 LPD × 6 Nos.) CAPACITY AT MAHARASHTRA GUPTAVARTA PRABODHINI (SHIKHAR SANSTHA MAHARASHTRA SHASAN), PUNE IN THE STATE OF MAHARASHTRA.	
	Total	

Note: Please quote prize for all above Solar Water Heater System.

Amount in words (Rs.)

(The total cost Mentioned in column no 1 will be consider for evaluation)

Signature :

Name of the Representative Submitting the Bid :

Designation :

Company Seal :

(Annexure - 2)

SITE VISIT REPORT

(To be submitted on letterhead of contractor)

Date:

To,
General Manager (Solar),
Maharashtra Energy Development Agency
(A Government of Maharashtra Institution)
Address: Aundh Road, Opp. Spicer College,
Aundh, Pune – 411 007
Phone No: - 020-35000450.

Sub. : Site Visit Report for Design, Manufacture, Supply, Installation, Testing And Commissioning Of Solar Water Heating System (ETC) With Five Years Comprehensive Maintenance Contract Of 3000 Lpd (500 Lpd × 6 Nos.) Capacity At Maharashtra Guptavarta Prabodhini (shikhar sanstha Maharashtra shasan), Pune In The State Of Maharashtra.

Ref.: Quotation Call

No..... Date:

Sir,

This has reference to above quotation call for Design, Manufacture, Supply, Installation, Testing And Commissioning Of Solar Water Heating System (ETC) With Five Years Comprehensive Maintenance Contract Of 3000 Lpd (500 Lpd × 6 Nos.) Capacity At Maharashtra Guptavarta Prabodhini (shikhar sanstha Maharashtra shasan), Pune In The State Of Maharashtra.

I / We hereby declare that we have visited the site.

I / We have made my ourselves acquainted with site conditions, approach to site, requirement of area, availability of water and its quality, requirement of quotation conditions etc.

I / We have verified all details required to execute the project successfully.

I / We have no problems in undertaking the project and complete them in the given time period.

Thanking you

Yours faithfully,

(Signature of Contractor)

Name of Contractor -----

Designation -----

Seal:

Signature of User Agency authorities.

Seal:.....

Date: _____

Site Survey Form

Name of Beneficiary	
Address	
Latitude	
Longitude	
Direct Insertion Type Storage Water Tank Capacity	
Proposed Capacity of Solar Water Heater System	
Nature of Shadow free area	Roof top / Ground mounted
Area available for solar Water Heater System installation in Sq.mtr	
Proposed area suitable for installation of plant	Yes / No
The proposed area falls under flood line	Yes / No
Is there requirement to increase structure height to avoid submergence of structure	Yes / No

Declaration: I / we have visited the proposed site for installation of solar plant. The site is found to be suitable for installation of solar water heater system plant of ----- capacity.

Surveyed by:

Name and Sign of Contractor Organization:

Witnessed by Representative of Consumer

Name and Sign

CONTRACTOR'S INFORMATION

Sr.No	Particulars	
1	Name of Firm	
2	Details of Mailing Address	
3	Firm Status (PSU/Incorporate/Ltd/Pvt.Ltd/LLP/Partnership/Proprietary)	
4	Name & Designation of Contact Person	
5	Contact No.	
6	E-mail Address for correspondence	
7	Firm website Address	
8	Firm registration No/ROC Establish Year of firm	
9	PAN No.	
10	GST No.	
11	Turnover (in Rs.)	
12	Skilled manpower	
13	*Experience in Solar Water Heating System (LPD)	

Authorised Sign and Stamp

* Enclose documentary evidence accordingly.

DECLARATION

(On company's letter head)

To,

General Manager (Solar),

Maharashtra Energy Development Agency
(A Government of Maharashtra Institution)
Address: Aundh Road, Opp. Spicer College,
Aundh, Pune – 411 007

Respected Sir/Madam,

1. We have carefully read and understood all the terms and conditions of the quotation and hereby convey our acceptance to the same.
2. The information / documents furnished along with our offer are true and authentic to the best of my knowledge and belief, we are well aware of the fact that furnishing of any false information/ fabricated document would lead to rejection of our quotation at any stage besides liabilities towards prosecution under appropriate law.
3. We have apprised our self fully about the job to be done during the currency of the period of agreement and also acknowledge bearing consequences to of non-performance or deficiencies in the services on our part.
4. We have no objection, if enquiries are made about the work listed by us.
5. We have not been barred or blacklisted by any Government Agency / Department/ PSU or any such competent Government authority, organization where we have worked. Further, if any of the partners/directors of the organization /firm is blacklisted or having any criminal case against them, our quote shall not be considered. At any later point of time, if this information is found to be false, General Manager (Solar), Head Office, Maharashtra Energy Development Agency, may terminate the assigned contract immediately.
6. We have not been found guilty by a court of law in India for fraud, dishonesty or moral turpitude.
7. We agree that the decision of General Manager (Solar), MEDA, in selection of quotation and shall final and binding to us.

For

(Company Name)

Name of signing authority / Designation / Place / Date

Annual Turnover

Each Contractor must fill in this form including private/public limited company.

- **Annual Turnover Data for the FY 2020-21, 2021-22, 2022-23, 2023-24 & 2024-25**
- **Name of Company:**

Financial Year	Rs in Lacs
2020-21	
2021-22	
2022-23	
2023-24	
2024-25	

The information supplied should be the Annual Turnover of the Contractor in terms of the amounts billed to clients for each year for work in progress or completed.

Signature of Applicant
Auditor

Certified by Applicant's

(Affix Stamp)

**TECHNICAL SPECIFICATIONS OF EVACUATED SOLAR WATER HEATING
SYSTEM (ETC)**

Components	Specification for Solar Water Heater System
Direct Insertion Type Storage Water Tank	Direct Insertion Type Storage Water Tank solar water heating system shall conform to IS 16542 : 2016
<p align="center">Inner Tank (As per IS 16542 : 2016)</p>	<p>Material: - Inner tank shall be manufactured from any of the following materials:</p> <ol style="list-style-type: none"> 1. Stainless Steel Sheet conforming to grade X02Cr19Ni10 or X02Cr17Ni12Mo2 of IS 6911. The thickness of Stainless-Steel Sheet shall be minimum 0.5 mm for up to 300 litre water capacity and 0.6 mm for above 300 litre water capacity and shall withstand a pressure of 1.5 times working pressure. 2. Mild Steel Sheet conforming to IS 1079 with anti-corrosive coating. The thickness of Mild Steel Sheet shall be minimum 1.5 mm for up to 300 litre water capacity and 2.0 mm for above 300 litre water capacity. The thickness of coating shall be minimum 150 micron and should be capable to withstand minimum five years of performance. Anti-corrosive coating should be enamel coating (glass lining or enamel lining) or any other food grade coating conforming to suitable Indian Standard. 3. GI Sheet conforming to IS 277 with anti-corrosive coating. The thickness of GI Sheet shall be minimum 1.5 mm for up to 300 litre water capacity and 2.0 mm for above 300 litre water capacity. The thickness of coating shall be minimum 150 micron and should be capable to withstand minimum five years of performance. Anti-corrosive coating should be enamel coating (glass lining or enamel lining) or any other food grade coating conforming to suitable Indian Standard. <p>NOTE — For purpose of protective coating on mild steel plate / GI sheet Total Dissolved Solids (TDS) considered is (more than 300 PPM) and chlorides contents (more than 50 PPM) in water.</p>
Outer Cladding	The material of outer cladding shall be pre-painted galvanized steel conforming to IS 14246. Alternatively, material of outer cladding may be aluminum/stainless steel/FRP of suitable thickness.
Insulation Layer	The Thermal insulation layer shall be pre-injected poly urethane foam (PUF) of minimum thickness 50 mm. The density of PUF shall be 28 to 36 kg/m ³ .
Inner Sealing	The material of inner sealing shall be high temperature resistant silicon rubber.
Outer Sealing	The material of outer sealing shall be ethylene propylene diene monomer (EPDM) rubber.
Gasket for Flanges	3 mm thick gasket of Neoprene / synthetic rubber gasket shall be used for sealing the joints between flanges

All Glass Evacuated Tubes	<p>All glass evacuated tubes in the solar water heating system shall conform to IS 16543</p> <p>Material</p> <ol style="list-style-type: none"> 1. The material of glass tubes shall be borosilicate glass conforming to ISO 3585. The solar transmittance ratio of the glass tube shall be $\tau \geq 0.89$ (at air mass 1.5, that is AM 1.5). 2. There shall not be any bubble (stone) bigger than 1 mm on the glass tube and there shall not be more than 1 bubble (stone) within an area of 10 mm × 10 mm and not more than 5 bubbles (stones) on the whole of the tube. There shall be no crack around the bubble. 3. There shall be no dense knots bigger than 1.5 mm on the glass tube. There shall not be more than 5 knots on the whole tube. 4. The solar absorbing ratio of solar selective coating shall be a minimum of 92 percent (at AM 1.5). The material for three target coating shall be aluminum nitrate, aluminum nitrate stainless steel, and copper multilayer selective coating and shall conform to the above requirements. <p>Appearance and Dimensions</p> <ol style="list-style-type: none"> 1. The accumulative length of minor scratches shall not be more than 1/3 tube length and the scratches shall not be visible from a distance of a minimum of 1 200 mm. 2. The selective coating of the all-glass evacuated solar collector tube shall have no smear, peel off and fade off. 3. Distance from the obvious colour fading area of the selective absorber coating at the open end of the all-glass evacuated solar collector tube shall be no more than 50 mm. 4. The strut member supporting the free end of the inner glass tube shall be properly placed and shall not be loose. 5. The inner and cover tube at the open end of the all-glass evacuated solar collector tube shall have smooth ends without any glass peel-off and shall not have any deformation. 6. The length of an all-glass evacuated solar collector tube is the distance from the open end to the point at which the diameter of the outer glass cover measured 15 mm. 7. Bending of the all-glass evacuated solar collector tube shall not be more than 0.2 percent of the length of the tube. 8. The cross-section of the open end of all-glass evacuated solar collector tube at a distance of (20 ± 10) mm from the open end is of a round shape. The ratio of the radius maximum size to the minimum size of the cover glass is no more than 1.02. 9. The sealed end of the tube shall not have any sharp end and shall be smooth. <p>Please Note: - Tube Size Diameter (D) - Shall not be less than 58 mm Tube Length (L) - Shall not be less than 2100 mm</p>
Structure (collector support frame)	The structure should be in a position of withstand a wind velocity of 100 kms/hr. shall be made with angle iron of 35mmx35mmx4mm; will have vertical support at top and bottom edge of the inclined plane of the collector at a distance of 1.5 M or less. The vertical support shall be firmly grouted with the roof. As per EEREM
Cold Water Storage Tank	HDPE/LDPE material with Gun metal float valve (ISI marked) equal to the capacity of Hot water storage tank. 2.4 mtrs. From the terrace level. As per EEREM
Stand for Cold Water Storage Tank	The tanks will be mounted on stands made out of angle iron frame of 35x35x4mm up to 2000 liters and 65x65x6mm for capacity above 2000 liters with each leg duly grouted with PCC 1:2:4 of 1'x1'x1'size.

	The cold-water tanks will be placed over angle iron frame having 4 cross members in 4 legs with 5mm thick MS sheet for full bottom support fixed of 4 horizontal members based on the size of the cold-water tank. As per EEREM
Piping	<p>a) Material Medium class (B class) GI as per IS 1239 shall be used for piping.</p> <p>b) Insulation 25mm thick insulation of 48kg/cu.m. density and K value+0.03 W/MK R value+1.67 sq.m. C/W to withstand and temp. of 250 deg. C be used.</p> <p>Thin plastic sheet shall be used as covering between glass wool and aluminum cladding besides other retaining material like chicken mesh etc.26 SWG thick aluminium sheet shall be used for cladding the insulated pipe.</p> <p>The pipe line should be properly supported and fixed with clamp with the help of suitable size stand/civil structure (cement concrete ratio 1:4) ISI mark strainer of standard make should be fitted in the main cold water supply line before the system. As per EEREM</p>
Air Vent	In which contact between the heat transfer fluid and the atmosphere is restricted either to the free surface of a feed and expansion cistern or to an open vent pipe only. As per IS 16544 : 2016

TECHNICAL DETAILS:

➤ **Water Tank: -**

- Direct Insertion Type Storage Water Tank solar water heating system shall conform to IS 16542 : 2016

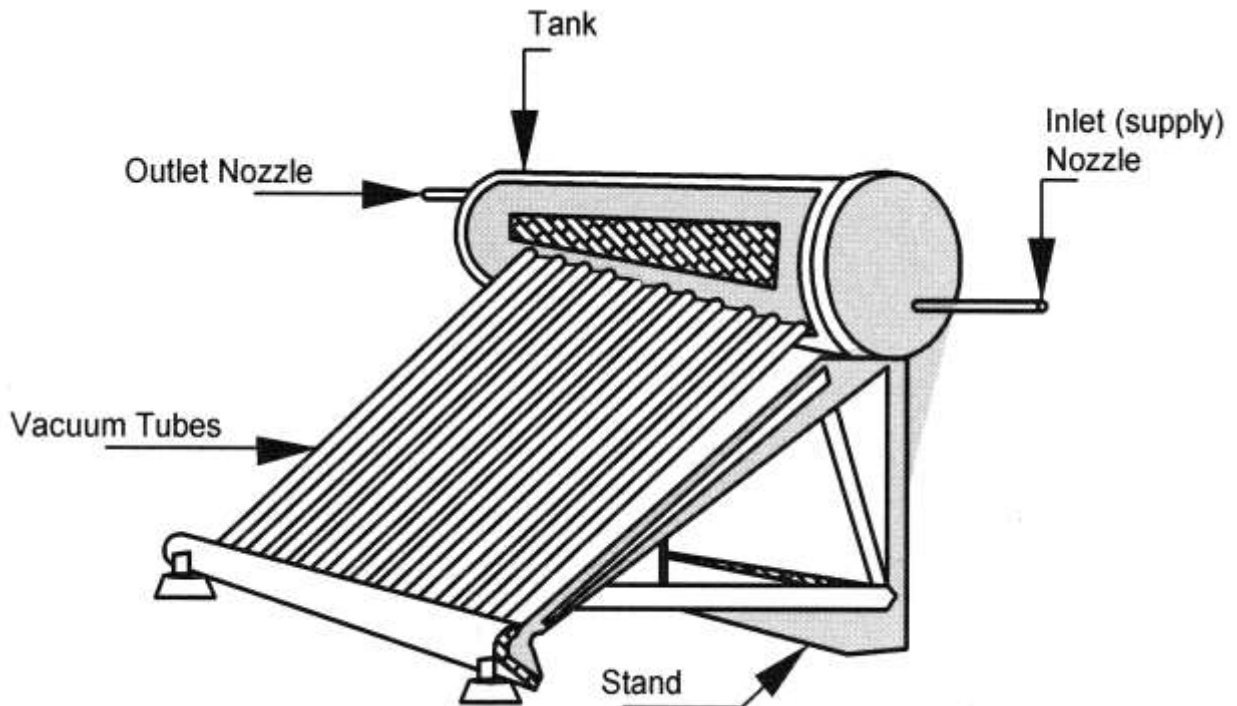


FIG. 1 Solar Water Heater System (SWHS)

➤ **Evacuated Tube Collector (ETC): -**

- All glass evacuated tubes in the solar water heating system shall conform to IS 16543

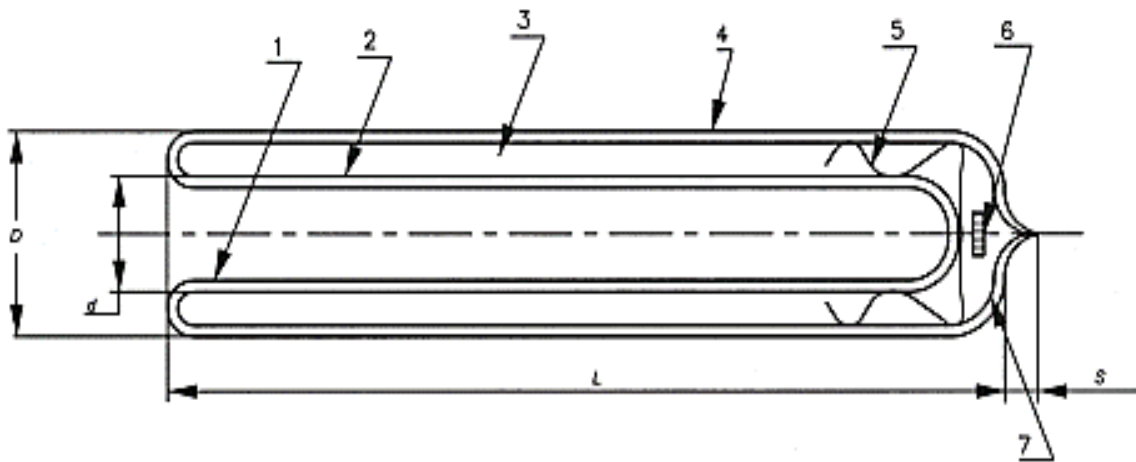


FIG. 2 STRUCTURE OF ALL-GLASS EVACUATED SOLAR COLLECTOR TUBE

Key

- 1 Inner glass tube;
- 2 Solar selective absorbing coating;
- 3 Vacuum jacket;
- 4 Cover glass tube;
- 5 Strut member;
- 6 Getter; and
- 7 Getter mirror surface

➤ **General Requirements: -**

- i. System will be well grouted/clamped with collectors installed so as to enable it to sustain the 150 Km/hr wind pressure of that area.
- ii. All the collectors will be south facing inclined at suitable angle to give best performance in winter
- iii. There will not be any shadow falling on the collectors from nearby structures or of other collectors in front or back row.
- iv. Hot water pipelines of any kind in colder regions will be fully insulated from the point of drawl of water from tank to delivery points. In other regional so care will be taken to avoid heat losses from pipelines.
- v. System will be installed nearest to the point to hot water usage to avoid longer pipeline & higher heat losses.
- vi. The workmanship & esthetics other system will be good and it's visible to anybody.
- vii. Air vent pipe, makeup water and cold-water tanks will be installed as required for smooth functioning of the system.
- viii. There won't be any leakage observed in the system from tanks/collectors/pipelines.

➤ **Warrantee: -**

Performance warrantee of 5 Years of Complete System. Free Replacement of Defective Components (especially Hot water Storage Tank) within warrantee Period. Breakage of ETC tube –Excluded.

➤ **Scope of work: -**

- a) Design of the system.
- b) Fabrication, supply and installation of suitable ETC collectors.
- c) Design, fabrication, supply and the installation of suitable support for the collectors, pipes, vales and other components and accessories.
- d) Design, supply, fabrication, installation of cold-water tank and insulated storage tank, cold water piping, insulated user piping, for system protection etc complete.
- e) Installation of Cold-Water Tank With min 50% more than System capacity with Stand and Cement Concrete Grouting.
- f) Civil work (grouting) of collectors, collector stands and all tank.
- g) Hydraulic testing and commissioning of the system.
- h) Removing of existing old SWHS system non-functioning with permission of respective authority of all sites and handover it to concern department. (Not applicable)
- i) Supply of manual for Operation and Maintenance to the Maintenance department of concerned beneficiary institute.
- j) Commissioning of the entire system.
- k) Training to the user for operation and maintenance of the system.

➤ **Indian Standards of Solar Water Heater: -**

Indian Standards	Title of Indian Standards
IS 16542 (2016)	Direct insertion type storage water tank for all glass evacuated tubes solar collector.
IS 16543 (2016)	All glass-evacuated solar collector tubes.
IS 16544 (2016)	All glass evacuated tubes solar water heating system.
IS 13129: Part 1 (2023)	Solar Heating – Domestic Water Heating Systems – Part 1 Performance Rating Procedure Using Indoor Test Methods.
IS 13129: Part 2 (2023)	Solar Heating Domestic Water Heating Systems – Part 2 Procedure for System Performance Characterization and Yearly Performance Predication.
IS 6911	Stainless Steel Sheet confirming to grade X02Cr19Ni10 or X02Cr17Ni12Mo2
IS 1079	Mild Steel Sheet conforming to IS 1079 with anti-corrosive coating.
IS 277	GI Sheet conforming to IS 277 with anti-corrosive coating
IS 1239	Medium class (B class) GI as per IS 1239 shall be used for piping