

# SOLAR THERMAL COLLECTORS

## PART 1 – GENERAL

### 1.01 SUBMITTALS

- A. Shop Drawings: Indicate manufactured assembly's system and control schematics, solar collector installation, layout, weights, mounting and support details, and piping connections.
- B. Product Data: Submit data on specialties, including manufacturers catalog information. Indicate chemical treatment materials, chemicals, and equipment. Submit certified pump performance and NPSH curve. Submit performance ratings for solar collectors, rough-in details.
- C. Manufacturer's Installation Instructions: Submit mounting and other structural requirements.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Field-Reports: Indicate start-up of treatment systems and include analysis of system water after cleaning and treatment.

### 1.02 CLOSEOUT SUBMITTALS

- A. Execution Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Spare parts lists, procedures, and treatment programs.

### 1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with Code standard.
- B. Maintain one copy of each document on site.

### 1.04 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum two years documented experience, and with service facilities within 100 miles of Project.
  - B. Installer: Company specializing in performing Work of this section with minimum three years documented experience and approved by manufacturer.
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#### 1.05 PRE-INSTALLATION MEETING

- A. Administrative Requirements: Preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this section.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Product Requirements: Product storage and handling requirements.
- B. Accept and store solar collectors and valves in shipping containers and maintain in place until installation.
- C. Protect piping from debris and other foreign matter by using caps on piping connections.

#### 1.07 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.08 WARRANTY

- A. Execution Requirements: Product warranties and product bonds.
- B. Provide ten (10) year manufacturer warranty for collectors.

#### 1.09 MAINTENANCE SERVICE

- A. Execution Requirements: Maintenance service.
- B. Provide monthly technical service visits for one year starting with date of substantial completion to perform field inspections and make water analysis on site. Detail findings in writing. Submit two copies of report after each visit.

### **PART 2 – PRODUCTS**

#### 2.01 SOLAR COLLECTORS

- A. Manufacturers:
    - 1. Oventrop OV 5 evacuated tube collector
    - 2. Vacuum tube solar collectors, with a total absorber surface area of 38.75ft<sup>2</sup>. The collector construction shall consist of vacuum tubes based on the heat pipe principle, single pass copper heat exchange manifold
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box, non-degrading thermal insulation and stainless steel mounting rails.

3. Each collector shall have a total gross area of 22.28 ft<sup>2</sup> (8 tube model) or 44.67 ft<sup>2</sup> (16 tube model).
  4. The height of each collector shall be 83" (2110 mm), and the width shall be 38" (960 mm) [8 tube model], or 76" (1920 mm) [16 tube model].
- B. The collectors shall be designed for operating at:
1. Minimum angle of inclination 25°, maximum angle of inclination 90°
  2. Maximum pressure operating capacity of 87 psig (6 bar)
  3. Maximum stagnation temperature of 302°F (150°C).

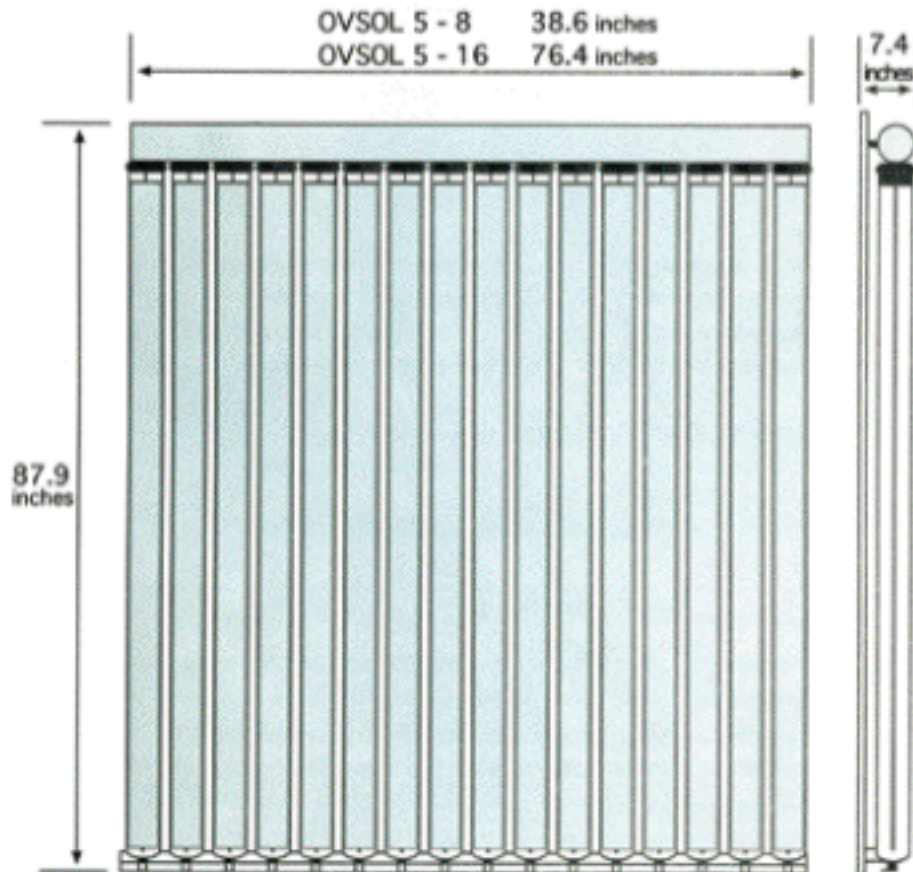
## 2.02 VACUUM TUBE COLLECTORS

- A. The collector shall consist of either 8 or 16 tube vacuum glass tubes made of borosilicate glass. Each tube contains an aluminum absorber plate, coated with a aluminum nitrate selective surface, bonded to a copper heat pipe tube. The aluminum nitrate selective surface shall have a coefficient of absorption of 0.92 and a coefficient of emission of 0.08.
- B. The heat pipe tube shall be connected to the condenser tip via a copper riser connection. Each individual tube shall be placed with the absorber selective surface (blue side) facing out toward the sun.
- C. Absorber is convex, selective surface (blue side) facing out.
- D. The condenser tip of the heat pipe shall be connected into the copper heat exchanger (manifold) with a dry connection facilitating removal and installation of the individual tubes without draining the system heat transfer fluid. The heat exchanger shall be a single pass copper design, which completely encloses the condenser port.
- E. The collector connection shall incorporate an integrated temperature sensor well on the return side of the collector.
- F. The heat exchanger enclosure housing shall be constructed of aluminium, and shall incorporate foam insulation surrounding the heat exchanger.
- G. The vacuum tubes shall be attached to an stainless steel rail support. Each individual tube shall be held in place with a stainless steel clip, which connects the tube to the support rail.
- H. The collectors shall be joined together using compression couplings. This shall allow up to 64 tubes to be joined together in one collector array. The collectors shall be connected to the system piping with 22mm x \_" copper pipe adapters.
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- I. The collectors shall be designed to connect directly to the mounting hardware for a flush mount on a sloped roof, or a rack system. All mounting hardware shall be supplied by Oventrop.

**Collector Dimensions and Technical Data**

**Dimensions of OVSOL 5 8 or 16 tube collectors**



**Technical Data:**

OVSOL 5 - 8: 87.9L x 38.6W x 7.4D inches

OVSOL 5 -16: 87.9L x 76.4W x 7.4D inches

Gross collector area: OVSOL 5 - 8 22.28 sq. ft.  
OVSOL 5 - 16 44.67 sq. ft.

Net absorber area: OVSOL 5 - 8 19.37 sq. ft.  
OVSOL 5 - 16 38.75 sq. ft.

Gross weight: OVSOL 5 - 8 110 lbs.  
OVSOL 5 - 16 220 lbs

Inclination angle: 25° to 90°

Typical operating temperature: 158 - 248°F

Stagnation temperature: 375°F

Pressure drop per module  
at 26 gal/h: .17ft/hd

Aluminum nitride absorber

Vacuum grade: 10 mbar