

This specifications document follows the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM). Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This document specifies a SolarWall® Two-Stage solar air heating system for roofs (referred to as SolarDuct®) that uses solar energy as fuel to heat or ventilate indoor spaces. The SolarDuct system is roof mounted. These solar products are manufactured by Conserval Systems Inc in the United States and Conserval Engineering Inc. in Canada.

APPLICABLE UNDER SECTIONS:
23 56 00 SOLAR ENERGY HEATING EQUIPMENT
23 56 13 SOLAR HEATING COLLECTORS
07 42 13 METAL WALL PANELS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Solar air heating system that uses solar energy to heat and ventilate indoor spaces. System is comprised of 2-Stage vent-slit-perforated modular rooftop system with non-perforated corrugated polycarbonate glazing.

Specifier Note: Revise paragraph below to suit project requirements. Add section numbers and titles per CSI *MasterFormat* and specifier's practice.

- B. Related Sections:
1. Sealants: Division 07 sealant sections.
 2. Connections to Ventilation Fans, bypass dampers, Operating Schedules: Division 23 HVAC sections.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Section 01 42 19 - Reference Standards may establish the edition date of standards. This article does not require compliance with the standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section.

1.02 REFERENCES

- A. ASTM International (ASTM):
1. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 2. ASTM D638 Standard Test Method of Tensile Properties of Plastics after weathering in accordance to ASTM G155.
 3. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics ASTM G155.

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements:

Specifier Note: Insert total fan air volume cfm to be heated by solar energy or insert air volume per unit area of solar heating system below. (Typical range for single stage solar heating system is 1 - 10 cfm/ft². See 10-Part Specifications document for application.)

1. Solar air heating system shall be certified and rated by SAHWIA as a 2-stage system and bear the *Solar A Mark* Certificate to demonstrate that the system has been tested and the performance is independently verified.
2. Solar air heating system shall be SRCC OG 100 certified as a 2-stage system. Specified flow rate must be within the range of the tested parameters.



3. Supplier of solar air heating system must be ISO 9001:2008 certified by an accredited registrar.
4. Air Intake: Provide a SolarWall 2-Stage solar heating panel system that will provide heating for [] cubic feet per minute (m³/h) of fresh air per square foot of solar panel, or, provide a solar air heating system designed to handle a total of [] cubic feet per minute (m³/h) of fresh air.
5. Solar collector array to be connected to [] fans delivering heated outside air to the building in accordance with Section 23 HVAC

Specifier Note: If loads are not indicated on the drawings, insert below.

6. Structural: Provide a panel system that will safely withstand dead and live loads [Indicated on the drawings] [].

Specifier Note: Article below includes submittal of relevant data to be furnished by the Contractor prior to construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Section [01 33 00 - Submittals Procedures] [].

1.04 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Section [01 33 00 - Submittal Procedures] [].
- B. Product Data: Submit product data, including manufacturer's Specifications sheet, for specified products.
- C. Shop Drawings: Submit installation drawings that show the arrangement and orientation of panels. Include details of stand-off components, panel joints, flashing and trim for closures.
- D. Samples:
 1. Submit color chart of manufacturer's range of standard colors for specified finish.
 2. Submit color chip of color to be selected.
- E. Performance Certificate:
 1. Submit *Solar A Mark* certificate from Solar Air Heating World Industries Association (SAHWIA)
 2. Submit SRCC Certificate for 2-Stage system
- F. Quality Assurance:
 1. Submit ISO 9001:2008 Certificate of Registration
- G. Paint Warranty
- H. Polycarbonate Warranty

Specifier Note: Article below should include prerequisites, standards, limitations and criteria that establish an overall level of quality for products and workmanship for this section. Coordinate article below with Division 01 Quality Assurance Section.

1.05 QUALITY ASSURANCE

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided.

- A. Regulatory Requirements: In accordance with Section [01 41 00 - Regulatory Requirements] [].
- B. Supplier Qualifications: Minimum of 10 years documented experience in both the design and manufacture of building integrated solar air heating systems; and past experience in designing comparable sized 2-Stage projects.
- C. Solar A Mark: Quality assurance mark governing building-integrated solar air heating systems.
- D. ISO 9001:2008 Certified: Quality management system for supplier of solar air heating system.
- E. Optional Site Inspection by Manufacturer: Ensure conformance to installation specifications.

Specifier Note: Article below should include special and unique requirements. Coordinate article below with Division 01 Product Requirements Section.

1.06 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 01 Product Requirements Section.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

- C. Storage and Protection: Store materials horizontally on a flat pallet in a dry, clean and shaded location protected from exposure to harmful environmental conditions.
- D. Handle metal and polycarbonate panels with care to avoid scratches, edge damage and puncturing.

Specifier Note: Coordinate article below with Conditions of the Contract and with Section 01 78 36 - Warranties.

1.07 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit in accordance with Section [01 78 36 - Warranties] [] for Owner's acceptance manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
 - 1. Warranty Period:
 - a) System: 12 months from the date of installation or 15 months from the date of shipment, whichever comes first.
 - b) Exterior Panels: 12 months from the date of installation or 15 months from the date of shipment, whichever comes first.
 - c) Paint: 40 years for silicon modified polyester.
 - d) Polycarbonate Panels: 10 years against loss of light transmission due to yellowing. 10 years against hail damage.

PART 2 PRODUCTS

Specifier Note: Conserval manufactures high performance metal materials that resist the effects of solar UV radiation. Thermal insulation capabilities of SolarWall offer energy savings in service temperatures from -40 to 250 degrees F (-40 to 121 degrees C).

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal, and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 SOLAR ENERGY HEATING EQUIPMENT; SOLAR HEATING COLLECTORS; METAL ROOF & WALL PANELS

Specifier Note: Paragraph below is an addition to CSI *SectionFormat*. Retain or delete paragraph below per project requirements and specifier's practice.

- A. Manufacturer: (Choose one) [Conserval Systems Inc. in USA] [Conserval Engineering Inc. in Canada]

Contact:

Conserval Systems Inc. 4242 Ridge Lea Road, Buffalo, NY 14226 Telephone: (716) 835-903 Fax: (716) 835-4904;

E-mail: info@solarwall.com; website: www.solarwall.com.

Conserval Engineering Inc. 200 Wildcat Road, Toronto, Ontario M3J 2N5 Canada; Telephone: (416) 661-7057; Fax: (416) 661-7146; E-mail: info@solarwall.com; website: www.solarwall.com.

- B. System:
 - 1. **SolarDuct® Two-Stage:** Comprised of a 2-Stage modular rooftop system where air is heated twice. First stage; air is heated as it passes through the vertical unglazed perforated transpired solar collector. This heated air then passes into the Second Stage, where it is heated again to further increase the temperature rise. The Second-Stage is comprised of sloped vent-slit-perforated metal transpired solar collectors that are covered by corrugated polycarbonate glazing that is not perforated. The panels and glazing are mounted onto galvanized/galvalume metal triangular supports and designed to capture solar heated air in a modular rooftop system.

Specifier Note: Select profile, location, type, metal and color below. Color must be a "hot color", not "cool color" formulation to maximize solar absorption. Minimum order quantities may apply for non-standard or non-stock colors or gauges.

- C. Metal Panel Profile Type:



1. Mounting Location: [roof]
2. Heating Stages: [two-stage]
3. Metal: [Galvanized steel, 26 gauge, ASTM A653 and ASTM A755]. Please contact Conservall for 24 gauge.
4. Configuration: [Standard roll-formed corrugated metal panels with high & low flats].
5. Standard Finish: [Silicon modified polyester (SMP) with inorganic and ceramic pigmentation]. Please refer to SolarWall Color Chart or contact Conservall for optional custom colors and solar absorptivity of each color.
 - a. Standard 26 Gauge “Hot Colors”: [Black] [LSR Dark Brown]
6. Solar Reflectance (SR) value: [Black to have SR of 0.06 or less or Solar Absorptivity of 0.94 or greater] [LSR Dark Brown to have SR of 0.06 or less or Solar Absorptivity of 0.94 or greater]. “Cool color” formulations that reflect the sun are not acceptable. All other colors to have SR value of 0.25 or less or Solar Absorptivity of 0.75 or greater.

D. Polycarbonate Glazing:

1. Configuration: [Corrugated polycarbonate panels with high & low flats]
2. Standard UV Protection: [Permanent, co-extruded ultra violet protective layer to block out 99.9% of harmful UV rays and prevent yellowing]. Post-applied coating or films of dissimilar materials are unacceptable.
3. Light Transmission: [\geq 89%, ASTM D1003]
4. Building Code Evaluation Approvals: [ICC (International Code Council)], [CCMC (Canadian Construction Material Center)].

2.02 ACCESSORIES

- A. SolarDuct Components: Provide galvanized steel components to support the panels in a manner as recommended by the manufacturer.
- B. Flashing: Provide prepainted flashing materials to match the metal and finish of the solar panels.
- C. Fasteners: Provide corrosion resistant self-drilling screws and rivets as recommended by the manufacturer. Exposed fasteners must be finished to match the panels.

2.03 FABRICATION

- A. Factory Finishing:
 1. Silicon modified polyester (SMP) with inorganic and ceramic pigmentation. Please contact Conservall for Kynar® availability.

2.04 PRODUCT SUBSTITUTIONS

- A. Substitutions: No substitutions permitted.

PART 3 EXECUTION

Specifier Note: Paragraph below is an addition to CSI *Section Format*. Retain or delete paragraph below per project requirements and specifier's practice.

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation drawings and instructions.
- B. Coordinate with mechanical to ensure SolarWall system is connected to fan inlet and ventilation system.
- C. Coordinate with controls or building automation system to ensure sequence of operation of solar heater, fans and associated dampers

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that substrate conditions [For substrates that have been previously installed under other sections] are acceptable for product installation in accordance with manufacturer's instructions.

3.03 PREPARATION



SolarDuct™

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

END OF SECTION