Example name: Solar Fence

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For installations

BISTS Location: can be placed anywere
Climate Type: -
Building Use:*residential/commercial*

Level of BISTS integration
Rush classification 3
Reijenga classification 3

Ox New Build
Ox Refurbishment
O Other: ……

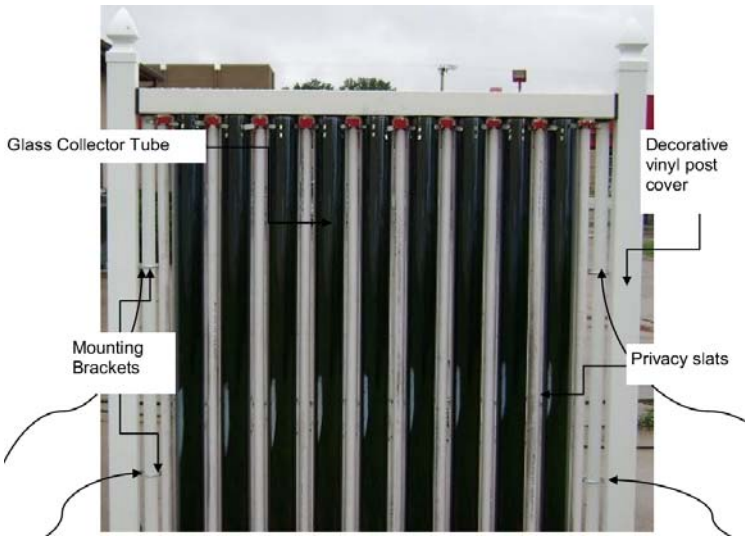


Fig. 1: High Efficiency Solar Water Heater, mounted in a fence configuration with optional privacy slats installed [1]

Type of BISTS:

Active

Function(s):
O Air heating
Ox Water heating
O Combi-system
O Cooling/ventilation/shading
O PV/T
O linked to another system (e.g., heat pump)
O Other:
……

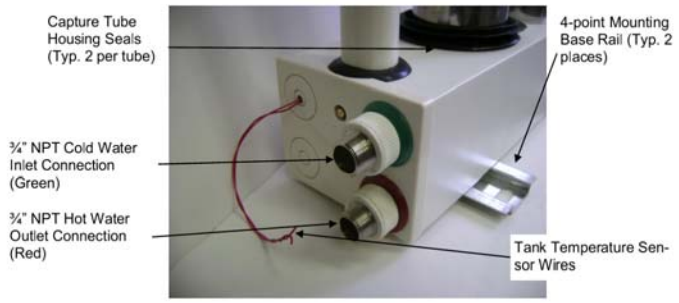


Fig.2 Solar Collector Base setup showing 1 of 4 bolting positions [2].

Building element:

O Facade
O Roof
Ox Other: fence, balcony raillings ……..

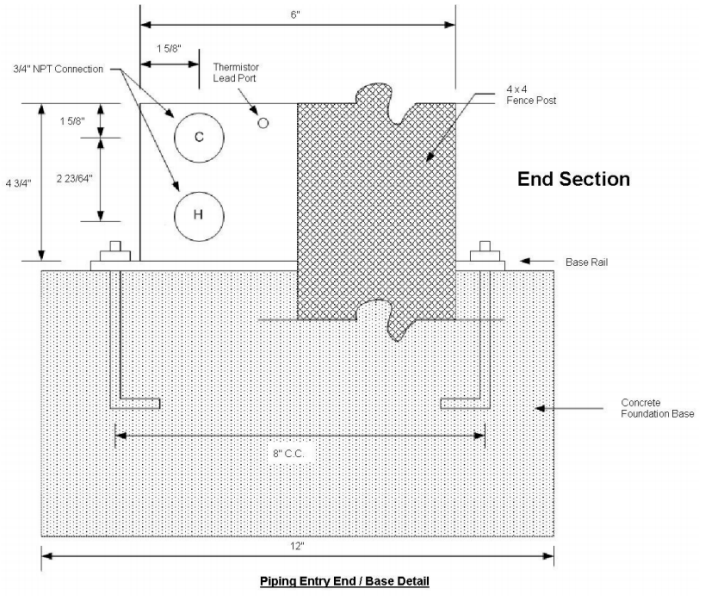


Fig. 3: End View Detail of Collector Base showing optional Mounting [2]

BISTS characteristics:

JetSolar Fence (JSF) is a solar pool heater that blends into the landscape instead of being mounted to the roof. JSF was designed to be installed into an existing fence or used to hide the equipment pad, anywhere there is sun exposure. The water vessel is made of high-grade marine stainless steel; there is a manifold that runs the length of the unit, and heating tubes are welded to the manifold, where they are covered with a glass evacuated tube. The direct pool water is pumped in the lower corner of the unit; the water then flows through each heat collection tube, and heated water flows back out. Both the inlet and outlet are located together for ease of plumbing.
With the evacuated tubes used in JSF, output is not dependent on outside temperatures like unglazed collectors, (rubber mat), which do not work unless the ambient temperature is higher than the swimming pool temperature. Because of the cylindrical shape of the evacuated tubes, the sun is perpendicular to the surface of the glass most of the day. This means that the JSF produces heat output all day long. Because the tubes are vacuum sealed; wind, and cold temperatures have virtually no effect on the efficiency. The heater will even work at below-freezing temperatures.
Best practice dictates location in an area with greatest solar exposure and limited shading from buildings, structures, trees, and other objects of shading.
It is also recommended that the shortest length of piping should be applied to facilitate an efficient installation. Increased piping lengths may be applied in order to locate in an area of greatest solar exposure without significant impact on performance with appropriate insulation.

Stage of Development:Responsible:

O	Idea/Patent	……..
O	Prototype	……..
O	Demonstration	……..
Ox	Integral building element	JetSolar ……..
Ox	Commercially available	JetSolar ……..

BISTS description and context

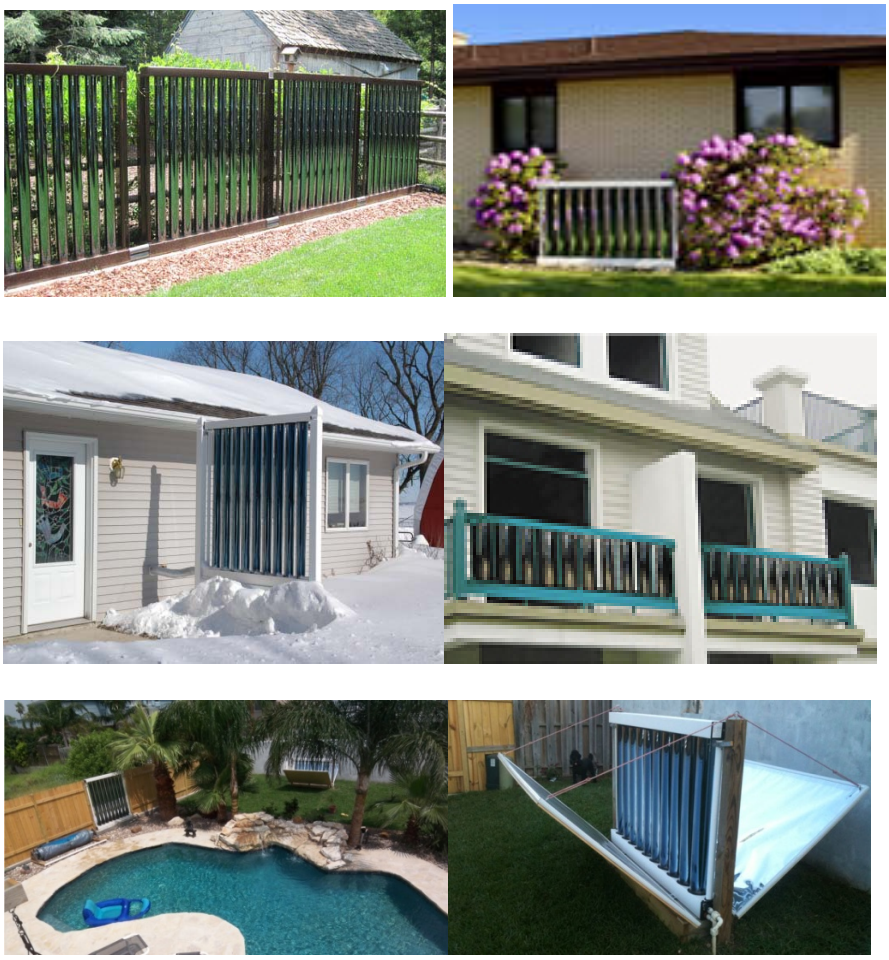


Fig. 4 Different cases of use, [2]

System viability

Modelling and simulation tools developed/used

BISTS Performance data Based on: O Estimation O Detailed simulation *Specify software(s) used* O Measurement/testing O Long-term monitoring *tick all that apply* **Performance parameters** For integrated systems: key performance indicators - *Solar savings fraction: %* *Light transmittance: %* *Solar transmittance:%* *Total solar energy transmittance: %:* *Solar heat gain factor: %* *Building fabric U-values: W/m^{2}K* *Noise, fire, etc ratings* *Other:* For separate collectors: performance rating coefficients - (EN12975, a0,a1,a2), ASHRAE, etc Other:	*Graphs for collector efficiency, seasonal energy gains, diurnal/seasonal solar fraction, etc.*
Additional information:	
Sources and references: [1] Solar heating product installation guide, http://jetsolarpanels.com/wp-content/uploads/2011/10/Solar-heating-product-installation-guide.pdf [2] http://jetsolarpanels.com/solar-fence/	

INSTRUCTIONS

Please fill in as much information as possible.

Tick where appropriate.

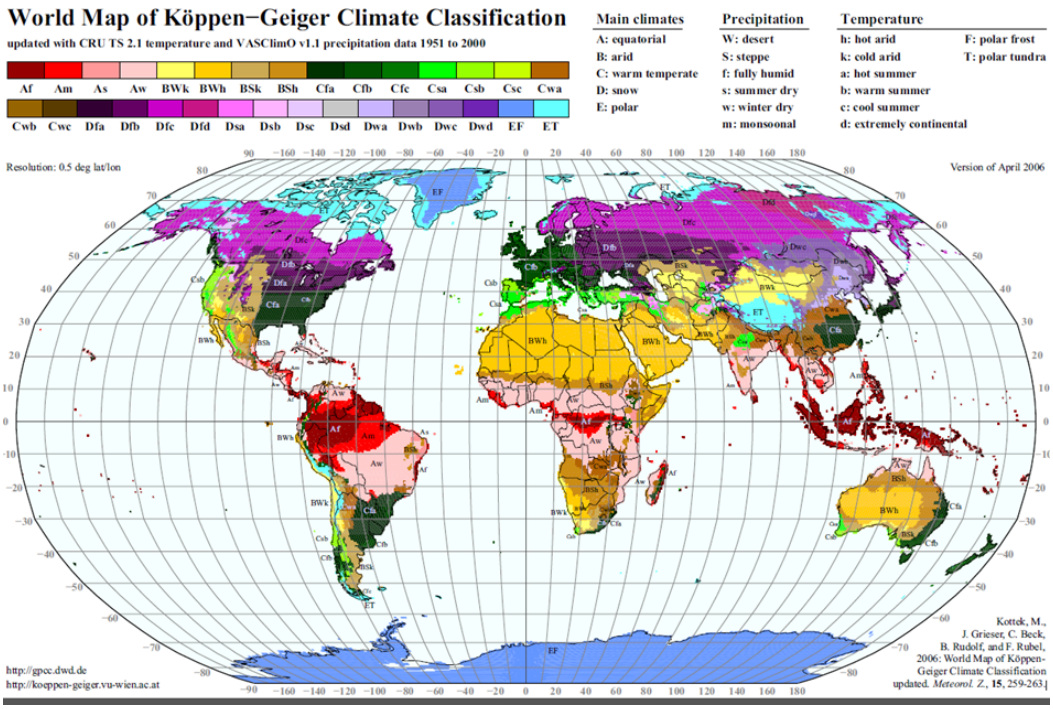
Text in red is suggested guidance. Insertinformation in provided space, removing red text as appropriate

If possible, use metric values.

If necessary, supply additional information on separate sheets

Reference listing

Köppen climate classification



(Kottek, M.,J. Grieser, C. Beck,B. Rudolf, and F. Rubel,2006: World Map of Köppen-Geiger Climate Classificationupdated. Meteorol. Z., 15, 259-263.)

Reijenga classification

The integration of PV systems in architecture can be divided into five categories:

1. Applied invisibly
2. Added to the design
3. Adding to the architectural image
4. Determining architectural image
5. Leading to new architectural concepts.

(Reijenga, TH and Kaan, HF. (2011) PV in Architecture, in Handbook of Photovoltaic Science and Engineering, Second Edition (eds A. Luque and S. Hegedus), John Wiley & Sons Ltd, Chichester, UK)

Rush classification
The architectural/visual expression of building services systems are identified as:

Level 1. Not visible, no change
Level 2. Visible, no change
Level 3. Visible, surface change
Level 4. Visible, with size or shape change
Level 5. Visible, with location or orientation change

(Rush, RD. (1986) The Building systems integration handbook Wiley, New York, USA)

Collector test standards

BS EN 12975-2 2006 'Thermal solar systems and components solar collectors - Part 2 test methods'
ASHRAE Standard 93-2010 'Methods of Testing to Determine the Thermal Performance of Solar Collectors'
ASHRAE Standard 95-1987 'Methods of Testing to Determine the Thermal Performance of Solar Domestic Water Heating Systems'