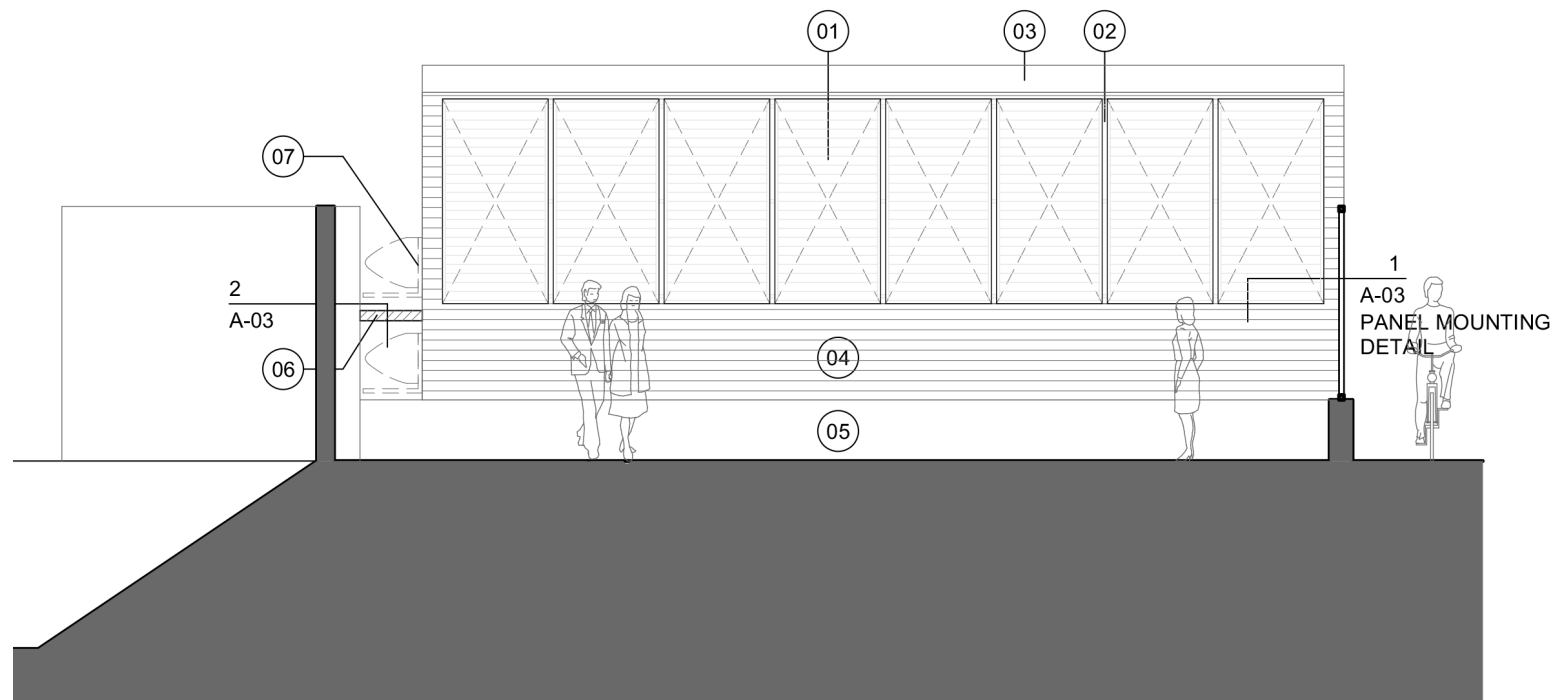


Emsworth Sailing Club Outdoor Swimming Pool Energy Upgrade Project



Lester Korzilius
Art + Architecture

January 2023

Overview

Location

Emsworth Sailing Club
55 Bath Road
Emsworth PO10 7ES

Background

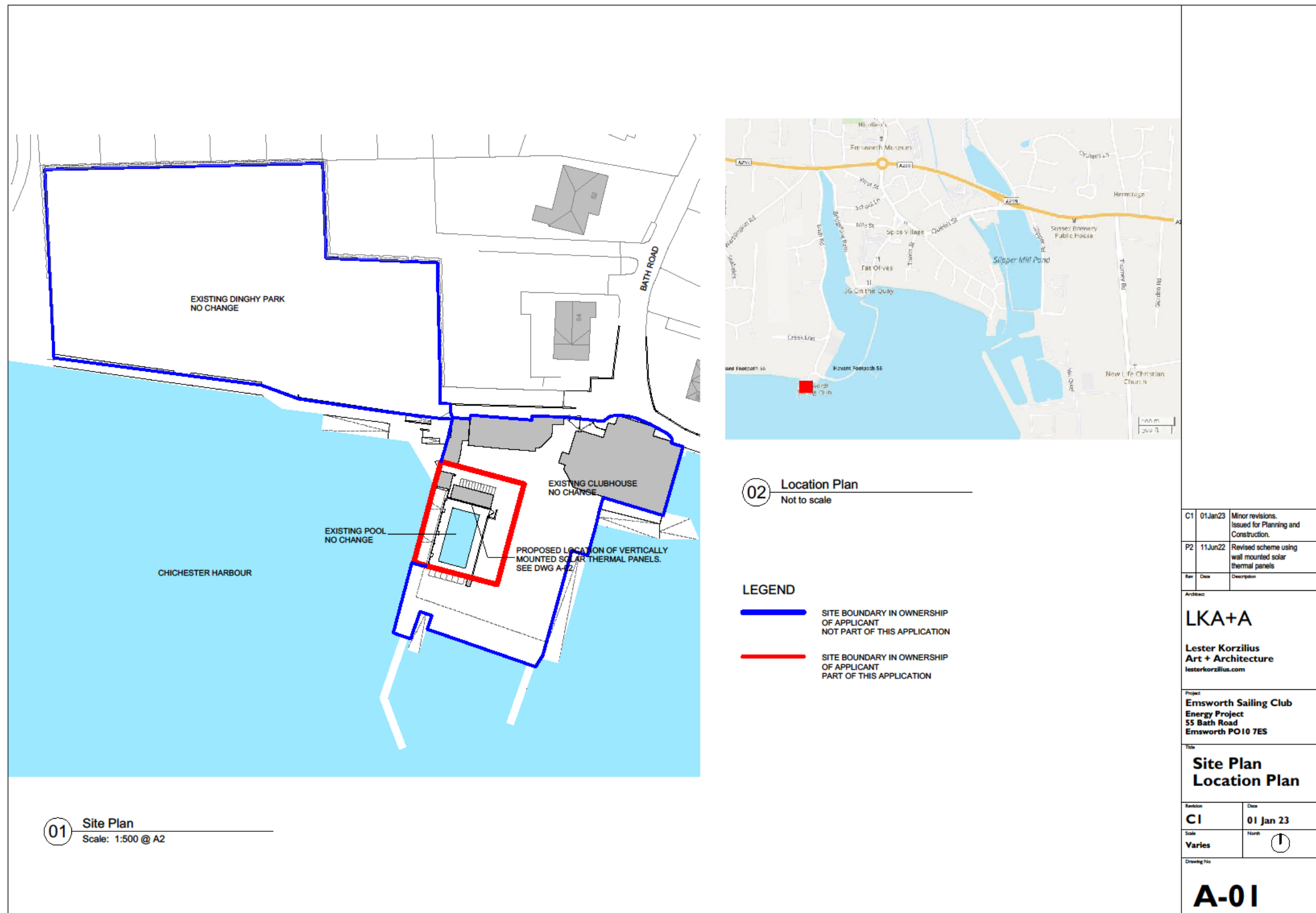
The Emsworth Sailing Club desires to increase the energy efficiency of the club and towards this end would like to add solar thermal panels to provide a partial level of heating for the existing outdoor pool. This is part of an overall energy upgrade to the club that includes changing existing light fixtures to LED lights, the introduction of sophisticated heating control systems, and the upgrade to the insulation of portions of the building envelope.

The proposal is to install a series of vertical solar thermal panels on the existing south-facing wall of the sail shed that is immediately adjacent to the outdoor pool. This is an ideal location relative to the existing pool equipment.

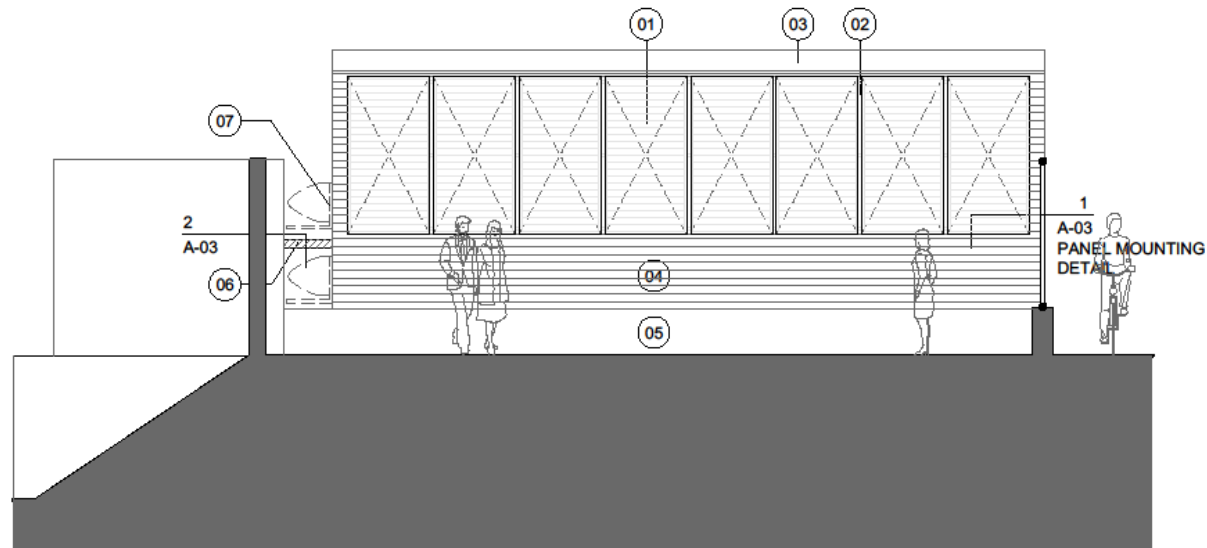
The solar thermal panels proposed are a matt black colour and are designed for coastal environments. There are a number of similar installations near to the Emsworth Sailing Club and visible from Chichester Harbour.



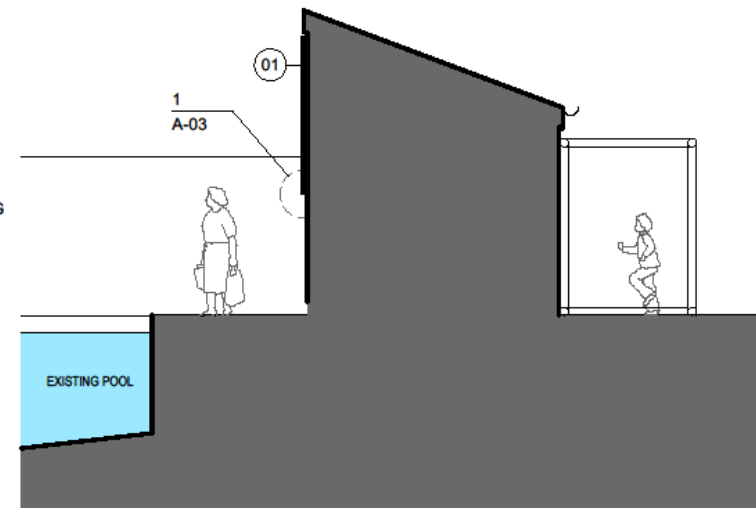
Site Plan & Location Plan



Sailing Shed Proposals



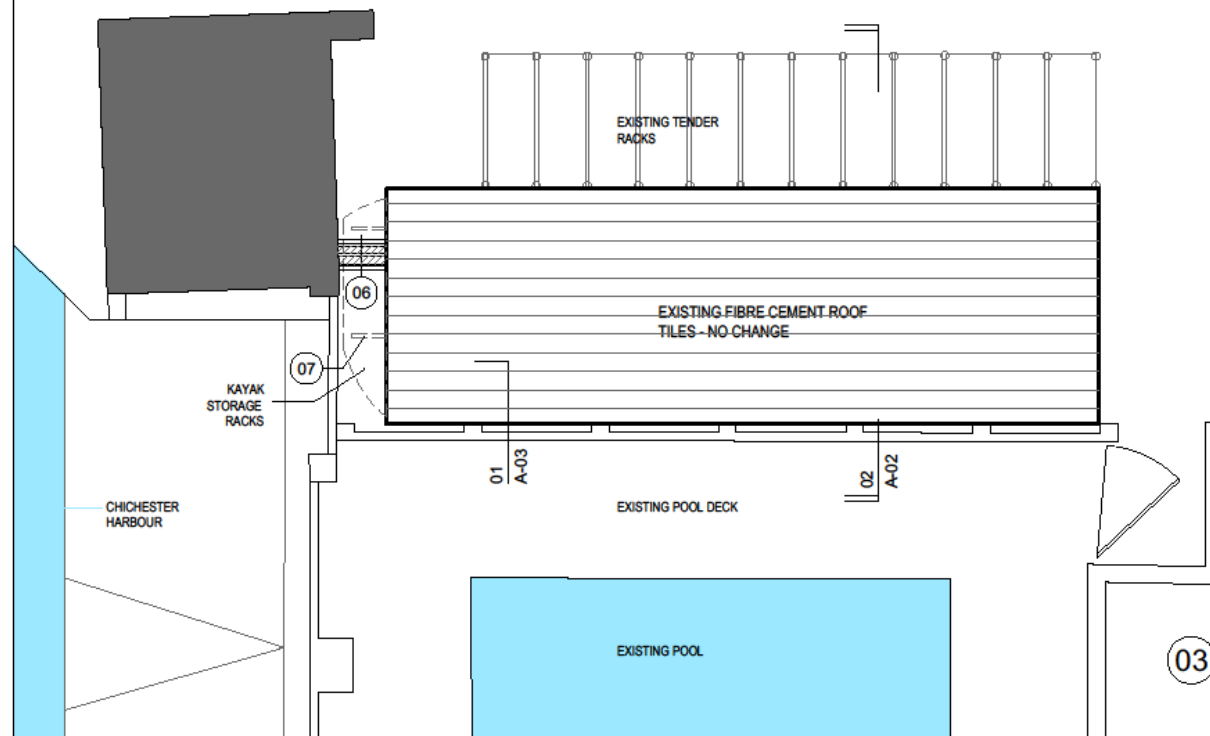
01 South Elevation
Scale: 1:50 @ A2



02 Cross Section
Scale: 1:50 @ A2

NOTES

- 01 SOLAR THERMAL PANEL
COLOUR = BLACK
KSA - 2009 x 1040mm
QTY = 8
SEE DETAIL FOR MOUNTING
PROFILE
- 02 PIPING GAP BETWEEN PANELS
ASSUMED 50mm
- 03 EXISTING OPEPE
FASCIA
- 04 EXISTING OPEPE HORIZONTAL
T&G CLADDING.
- 05 EXISTING BRICK PARAPET WALL
IN FRONT OF SHED
- 06 2 NO 100mm DIA BLACK HDPE PLASTIC
PIPES BETWEEN BUILDINGS - THESE ARE
CONDUITS FOR SOLAR THERMAL PANEL PIPING.
PIPES TO BE INSTALLED HORIZONTALLY.
COORDINATE LOCATION ON SITE AND WITH
ENERGY INSTALLER.
SEE DETAIL 2/A-03 FOR TIMBER PROTECTION
AROUND PIPES.
- 07 ADJUST HEIGHT OF EXISTING
KAYAK RACKS TO SUIT NEW
CONDUIT INSTALLATION.



03 Roof Plan
Scale: 1:50 @ A2

C1	01Jan23	Minor revisions. Issued for Planning and Construction.
P2	11Jun22	Revised scheme using wall mounted solar thermal panels
Rev	Date	Description

Architect

LKA+A

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lesterkorzilius.com

Project
Emsworth Sailing Club
Energy Project
55 Bath Road
Emsworth PO10 7ES

Title

Revision CI	Date 01 JAN 23
Scale 1:50 @ A2	North 

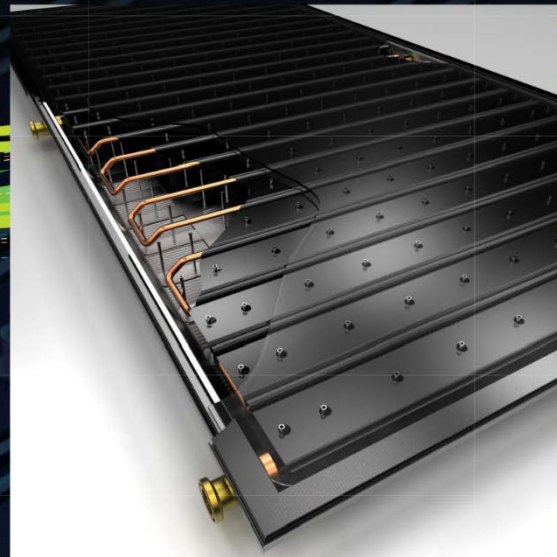
Drawing No

A-02

Technical Details

KSA Sea Sand Resistant Solar Engineering (Maximum 224°C or 374°F)

- ✓ Special solar glass, consisting of thermally pre-stressed, hardened white glass, tested in accordance with ISO for hailstone resistance
- ✓ Stagnation temperature Maximum 224°C (at standard testing conditions -30°C, 1000W/m², IAM = 1.5). This stops overheating and the need for a heat dump
- ✓ Mechanical connection between the absorber plate and heat transfer pipework in the panel (No welding, soldering, brazing, etc.). The absorber is folded around the panel pipework
- ✓ One piece construction (Al Mg) of the trough and frame (mechanical joints) combined with a compression, vacuum proof design means long panel lifespan
- ✓ Evacuation connection to create and maintain vacuum. The panels can be evacuated and re-evacuated from inside property without having to access the roof
- ✓ Surrounding frame with integral groove to seal the collector to roof join
- ✓ High temperature resistant elastic support elements to absorb and transmit atmospheric pressure from the pane of glass to the membrane at base of the housing
- ✓ Patented connection clamp for pressure sealed link up to adjacent collector and system piping without soldering or welding
- ✓ Absorber with plated, highly selective, aluminum oxide coating in thin layer technology for low loss light-heat conversion with quick transfer of heat to heat transfer pipe.
- ✓ Surrounding vacuum sealing ring made of superior heat resistant and age resistant material. The sealed panel protects the absorber from sea salt & sand/dust corrosion as well as improving the efficiency of the panel
- ✓ Meandering heat transfer pipe consisting of compression proof copper piping



The KSA Sea Sand Resistant

Vacuum panel is a world leading flat plate, vertically mounted collector without collection pipes, intended for applications in systems equipped with circulating pumps.

It consists of a one piece forged metal casing to which safely solar glass is fixed by means of a frame made from non-corrosive aluminium profile.

Stamped from a single Al-Mg sheet, the absorber fins have a high selective conversion layer which fold around the meandering copper pipe. The flanged connection pipes are connected to the hydraulic circuit by patented connection clamps. The collectors can be connected in series, up to 10 panels in total.

Krypton can be used as a replacement of the residual gas inside the collector to enhance weather performance.



www.hotsolarwater.com

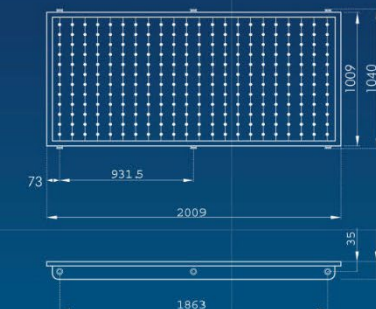


Specifications

Cover glass:	4mm safety solar ESG white glass
Connection:	Patented connection clamp.
Casing:	Non-corrosive Al/Mg sheet.
Thermowell:	4mm or 6mm Ø sensor.
Header tube:	Cu 18 x 0.8mm
Absorber tube:	Cu 10 x 0.5mm
Thermal insulation:	Vacuum 100 Pa
Conversion layer:	Selective coating
Hydraulic circuit:	Meandering
Solar absorptivity: $\alpha_{M1.5}$	Min. 0.95
Thermal emissivity: ϵ_{820C}	Max. 0.13
Optical efficiency:	90.00 ± 1%
Operating temperature:	Above 100°C
Stagnation temp:	224°C or 374°F
Recommended operation:	4.5 bar
Maximum operating pressure:	6 bar
Total liquid capacity:	1.60 Litres
Recommended transfer fluid:	Water - Glycol
Recommended mix ratio:	50 / 50 (%)
Recommended flow rate:	20-120 (Lh ⁻¹)

Dimensions

Width x Height x Length:	1040 x 2009 x 74mm
Gross area:	2.031 m ²
Weight:	45.3kg
Fluid weight:	1.6kg
Combined weight:	46.9kg
Absorber surface:	1.70 m ²



The casing

- created from a single sheet of non-corrosive Al/Mg sheet, no welds
- sea-water resistant

The Absorber

- made of corrosion-resistant aluminium
- corrosion-proof and pressure-proof copper piping for fluids

The glass covering

- safety glass for security against breakage, tested for hailstone-resistance
- maximum light-transmitting properties in excess of 90% due to high degree of transparency

Modular construction in line with architectural requirements

- attractive appearance due to integrated collection piping
- straightforward collector erection even for attic conversions

Energy and environmental protection

- The KSA panel saves the energy required for its manufacture in approximately 2 years.

Quality

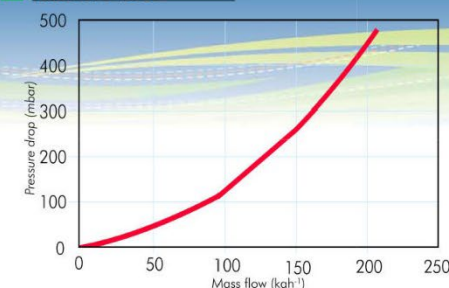
Thermosolar panels are a mature technology, manufactured to the highest standards in our state of the art plant

Thermosolar panels are particularly suitable for integrated roof installations where the panel would become an integral part of the building. Thermosolar panels can also be installed on-roof and on racks or A-frames with a wide range of fixing kits available to our installers.

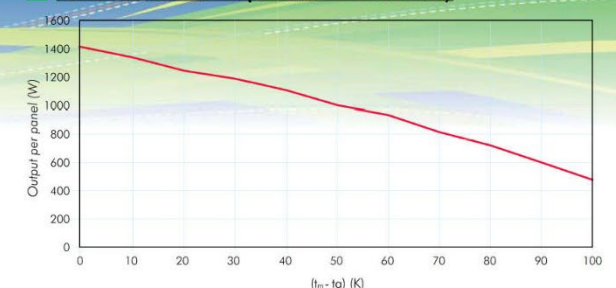
With a life expectancy of around thirty five years and requiring limited maintenance, the panel is both an attractive and high quality renewable energy solution for water heating, space heating, pool heating and air conditioning in combination with chillers. They will significantly reduce bills and at the same time substantially save carbon emissions.

Thermosolar technology are used in over 69 countries, providing clean, carbon free energy to a wide range of requirements including homes, schools, factories, sports stadia and swimming pools.

Pressure loss



Performance curve ($G_{norm} = 1000 \text{ W/m}^2$)



Thermosolar KSA Sea Sand Resistant
Solar Keymark Certification Ref: TSU 002 - 20/D (Vertical Panel)

Thermosolar

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E-mail: enquiries@hotsolarwater.com

www.hotsolarwater.com

Installation Images of Proposed Solar Thermal Panels



Mounting Detail of Proposed Solar Thermal Panels

