Product Highlights

High Efficiency Evacuated Tube Solar Thermal Collector
Suitable for Residential and Commercial Projects
Steam-back and Drain-back Compatible Header Design
Cyclone Rated, Marine Grade Mounting Frame and Fasteners
Comprehensive 15 Year Limited Warranty*

* See limited warranty policy for complete details
Apricus evacuated tube solar thermal collectors are suitable for both residential and commercial applications. Collectors are available in 20 and 30 tube models.

**PRODUCT OVERVIEW**

**SPECIFICATIONS**

Apricus evacuated tube solar thermal collectors are suitable for both residential and commercial applications. Collectors are available in 20 and 30 tube models.

**ETC-20**

- **Dimensions (LxWxH) *:** 2005 x 1496 x 136 mm
- **Peak Output **:** 1342 W
- **Aperture Area:** 1.89 m²
- **Net Area:** 2.21 m²
- **Gross Dry Weight:** 63.5 kg
- **Fluid Capacity:** 550 ml
- **Flow Rate:** 2 L/min (max 15L/min)
- **Max Operating Pressure:** 800 kPa / 8 bar

**ETC-30**

- **Dimensions (LxWxH) *:** 2005 x 2196 x 136 mm
- **Peak Output **:** 2014 W
- **Aperture Area:** 2.84 m²
- **Net Area:** 3.35 m²
- **Gross Dry Weight:** 95 kg
- **Fluid Capacity:** 790 ml
- **Flow Rate:** 2.5 L/min (max 15 L/min)
- **Max Operating Pressure:** 800 kPa / 8 bar

* Height does not include mounting frame.

**CERTIFICATIONS**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Report Number</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS/NZS 2712:2007</td>
<td>100633</td>
<td>Australia and New Zealand</td>
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<td>ISO9001:2008</td>
<td>100633</td>
<td>Global</td>
</tr>
<tr>
<td>Solarkeymark</td>
<td>011-7S2323R</td>
<td>Europe</td>
</tr>
<tr>
<td>SRCC OG-100</td>
<td>10001909</td>
<td>USA</td>
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</table>
**SOLAR COLLECTOR COMPONENTS**

**Manifold & Header Pipe**
Insulated box housing the copper header pipe (heat exchanger) that the system fluid circulates through.

The header pipe is designed for both efficient heat transfer and reliability with only 4 brazing points. Brazing is 45% silver material for optimal strength and corrosion resistance.

The header pipe drains effectively making it compatible with steam-back and drain-back systems.

A thick layer of glass wool made from recycled glass insulates the header pipe to reduce heat loss and is able to withstand high temperatures.

**Evacuated Tube (ET)**
Evacuated tubes are made from two glass tubes that are fused at the top and the bottom. The space between the tubes is evacuated to form an insulating vacuum. The inner tube is coated with a special absorber material which absorbs 95% of sunlight, converting it into usable heat.

The contoured aluminium heat transfer fin holds the heat pipe close to the inner glass wall enhancing heat transfer.

**Heat Pipe (HP)**
The copper heat pipe absorbs heat from the glass wall and the heat transfer fin.

A small amount of water inside the heat pipe turns to steam at only 30°C rapidly transferring heat up to the header pipe. Liquid circulates through the header pipe carrying away the heat.

**Mounting Frame**
Frame components are made from high tensile and corrosion resistant anodized aluminium, with marine grade 316 stainless steel fasteners. The aluminium frame extrusions are designed to withstand extreme wind and snow loading with only 2 mounting rails, greatly speeding up the installation process.

A range of components are available to mount on almost any roof type and at various angles.
EVOLUTIONARY DESIGN

The ETC solar collector is the successor to Apricus’ flagship product, the AP evacuated tube solar collector. Tens of thousands of AP collectors have been installed worldwide over the past 8 years. Internal R&D, 3rd party lab testing and feedback from installers have resulted in a range of incremental improvements. The same overall dimensions have been maintained, so most ETC components maintain backward compatibility with AP collectors. Below are just some of the key improvements.

**Manifold Casing**

The manifold casing has been upgraded from an electroplated finish after folding, to PVDF coated aluminium sheets.

The 500m long rolls of the coated metal are produced in a fully automated state of the art production line. The rolls are cut into sheets, stamped and folded into manifold case shape.

PVDF is widely used for roofing and wall panels due to its excellent performance in harsh outdoor environments.

**Freeze Resistant Heat Pipes**

Many Apricus’ collectors are installed in cold regions and so freeze resilience is vital.

Apricus has developed a new generation of freeze protected heat pipes that have passed European (solarkeymark) testing as well as Apricus internal, more stringent, freeze cycle tests.

Cycles simulating over 10 years of harsh winters have been completed without freeze related damage.

**Header Pipe Connections**

Apricus has supplied collectors to Australia for more than seven years with DRZ brass flared compression fittings that provide an extremely reliable, leak free metal to metal seal.

This reliable fitting is now being implemented to all regions with the new ETC design. Adaptors are offered by Apricus that provide standard 3/4” M BSP/NPT thread or brazed/soldered connections to ensure worldwide compatibility. This format also provides a union connection between collectors connected in series.

**Mounting Frame**

The new mounting frame is made from high tensile 6005-T5 grade anodised aluminium alloy. The frame strength and mounting format has been certified as meeting Australian region D (316km/h) cyclonic wind loading requirements.

The anodised frame treatment combined with marine grade 316SS attachment plates, tube clips, nuts, bolts and washers make the collector extremely durable even in coastal installations.
CHOICE OF MATERIALS

Materials used in the Apricus ETC solar collector have been chosen to provide optimum efficiency while ensuring reliability, longevity and excellent end of life recyclability.

Silicone Rubber
HTV Silicone rubber is used for the manifold seals and tube caps due to its excellent stability through a wide temperature range and excellent UV stability.

Tube Attachment
Plastic tube caps that clip into the frame are widely used by many other brands, but they become brittle and degrade in UV radiation.
In contrast, Apricus ETC solar collectors use a high tensile 316 grade stainless steel clip that ensures the tubes are held firm long term even during extreme wind loads.

High Purity Copper
Apricus manufactures heat pipes in house using high purity C10200 grade copper combined with an ageing process that ensure long term vacuum stability and optimum heat transfer.
Using a lower purity grade copper such as C12200 reduces the cost of the heat pipes considerably but can reduce the longevity as impurities in the copper leach out over time (3-5 years) to form an air pocket in the bulb, compromising heat transfer.

Folded Aluminium Manifold Casing
Rather than using thick extruded aluminium for the manifold casing, the ETC collector uses folded 0.8mm thin high tensile PVDF coated aluminium alloy sheet. This provides a very strong, rigid casing that provides a total assembled manifold weight of only 9.2kg for ETC-30, half that of most competitors’ designs.
That extra weight makes life a lot harder for installers carrying the manifold up a ladder! Prototypes of an extruded manifold casing design were developed by Apricus in 2008, but rejected by installers in field trials simply due to the extra weight it added.

Evacuated Tubes
Apricus uses extremely durable twin-glass tubes with a high efficiency selective coating. Each batch of tubes undergoes random selection steel ball impact testing and 100% visual inspection. In addition Apricus tubes have passed Australian, European (Solarkeymark) and Swiss hail stone impact testing.

End of Life Recyclability
Ease of recycling was a key consideration when selecting the materials for the ETC solar collector, so ensuring minimal end of life environmental impact.
System Operation Overview

1. The ETC solar collector converts sunlight into usable heat, heating the liquid in the header pipe.
2. Once the temperature in the header pipe is measured to be hotter than the water in the bottom of the storage tank (T2), the pump turns on. The liquid is slowly circulated through the header pipe in the collector, heating by ~7°C during each pass.
3. Most systems are installed to use the water directly from the hot water cylinder. In some areas a coil in the cylinder can be used to protect against hard frosts or water quality issues. Gradually throughout the day, the water in the storage tank is heated up.
4. The temperature in the top of the solar tank (T3) is monitored and the solar system is shut down (or excess heat is dissipated) once a maximum temperature (~75°C) has been reached.
5. If the water is not already hot enough from solar input, the traditional heating heating system boosts the solar pre-heated water up to the required temperature. The booster is often an electrical element inside the solar cylinder, or it can be a wetback, central heating system or gas water heater. Since the water has already been heated by solar energy, less energy is required.
6. In New Zealand 75% or more of the annual domestic hot demand can be provided by solar energy.
STANDARD MOUNTING FRAME

- Apricus aluminium collector mounting frames have been independently reviewed by structural engineers and confirmed to be strong enough for wind gusts up to 316km/h. Conditions apply, so always check with Apricus NZ for engineering requirements.
- ETC collectors are supplied with a Standard Frame for flush mounting on a >20° pitched roof.
ANGLED MOUNTING FRAME

- Two Rear Legs and an X Brace are added to the Standard Frame to raise the rear of the collector.
- A range of leg lengths are available to achieve angles from $\sim20^\circ$ up to $\sim60^\circ$.
- Diagram below shows the pitched mounting frame and three Mounting Systems for various roof substrates.
<table>
<thead>
<tr>
<th>Component</th>
<th>Material Specifications</th>
</tr>
</thead>
</table>
| Evacuated Tubes    | **Material:** Borosilicate 3.3  
                        **Tube style:** Twin wall all glass  
                        **Dimensions:** $\varnothing 58\text{mm}$ outer tube; $\varnothing 47\text{mm}$ inner tube;  
                        1.8m length, 1.8mm outer tube wall thickness  
                        **Absorber Material:** Selective coating  
                        **Absorptance:** $>93\%$ (AM1.5);  
                        **Emittance:** $<8\%$ (80°C)  
                        **Vacuum:** $P<5\times10^{-3}\text{Pa}$;  
                        **Heat loss:** $<0.8\text{W/(m}^2\text{o}\text{C)}$ |
| Heat Pipes         | **Material:** High purity “oxygen free” copper (ASTM: C10200; DIN: OF-Cu)  
                        **Working fluid:** non-toxic liquid (Apricus’ proprietary mixture)  
                        **Maximum heat transfer capacity:** 220W  
                        **Operating angle:** 20-80°  
                        **Startup temperature:** ~30°C |
| Copper Header Pipe | **Material:** Copper (ASTM: C1100, DIN: ECu-58);  
                        **Brazing rod material:** BAg45CuZn (Potable water certified)  
                        **Maximum pressure:** 800kPa  
                        **Connection options:** 3/4”M BSP |
| Heat Transfer Fins | **Material:** High purity aluminium |
| Rubber Components  | **Material:** HTV Silicone Rubber (UV stabilized) |
| Mounting Frame     | **Material:** 6005-T5 Aluminium Alloy with Anodized Finish  
                        (Stainless Steel frame available upon special request) |
| Tube Clips         | **Material:** 316 Stainless Steel |
| Fasteners          | **Material:** 316 Stainless Steel |
| Manifold Casing    | **Material:** 3003 Aluminium with PVDF coating. |
| Manifold Insulation| **Material:** Glass Wool ($<0.043\text{W/mK}$)  
                        **Thickness:** Average >50mm |
LIMIT OF LIABILITY

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WARRANTY PERIOD

The “Effective Date” of warranty coverage is the installation date as recorded on the installation record form, purchase invoice date, or, if neither are available, the date of actual installation. Apricus to remedy any defects or malfunction, the End-User will be entitled to either a replacement of the Products, or refund of the purchase price, in Apricus’s sole discretion. However, Apricus will not elect to refund the purchase price unless it is unable to provide a replacement, and repair is not commercially practical and cannot be made within a reasonable timeframe. After a reasonable number of attempts by Apricus to remedy any defects or malfunction, the End-User will be entitled to either a refund or replacement of the product or its component parts. The remedies stated herein are the sole remedies for defects within the applicable warranty period.

WARRANTY POLICY

The “Effective Date” of warranty coverage is the installation date as recorded on the installation record form, purchase invoice date, or, if neither are available, the date of manufacture plus sixty (60) days.

<table>
<thead>
<tr>
<th>Components</th>
<th>Failure Type</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifold Box</td>
<td>Manifold Box Leaking</td>
<td>Ten years parts</td>
</tr>
<tr>
<td></td>
<td>Rubber Seal Cracking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manifold Case Colour Fading</td>
<td>One year parts</td>
</tr>
<tr>
<td></td>
<td>Manifold Case Coating Pitting or Peeling</td>
<td>Three year parts</td>
</tr>
<tr>
<td>Header Pipe</td>
<td>Leaking</td>
<td>Fifteen years parts</td>
</tr>
<tr>
<td></td>
<td>Brass Fittings</td>
<td>Ten years parts</td>
</tr>
<tr>
<td>Evacuated Tube</td>
<td>Complete Loss of Vacuum</td>
<td>Ten years parts</td>
</tr>
<tr>
<td>Heat Pipe</td>
<td>Not Transferring Heat</td>
<td>Ten years parts</td>
</tr>
<tr>
<td>Mounting Frame</td>
<td>Structural Failure</td>
<td>Fifteen years parts</td>
</tr>
<tr>
<td></td>
<td>Design, Installation Errors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effecting Operation</td>
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</tr>
<tr>
<td>Tube Caps</td>
<td>Structural Failure</td>
<td>Ten years parts</td>
</tr>
<tr>
<td></td>
<td>Cracking</td>
<td>Ten years parts</td>
</tr>
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</table>

WARRANTY EXCLUSIONS

This warranty shall be void and shall have no effect if:

General
a) The design or structure of the Products are attempted to be modified or altered in any way, including but not limited to attaching non-Apricus approved attachments or equipment to the Products;
b) The Products are not installed or repaired in accordance with applicable local codes;
c) The Products are not installed by qualified, suitably licensed persons;
d) The installer had not received Product installation training by an authorized Apricus distributor or Apricus;
e) The installation was not completed in line with the guidelines of the then current Apricus Installation Manual;
f) Failure due to vibrations or movement of the piping connected to the collector, such as when valve or faucet/tap is closed;
g) Misapplication of the Products or other acts of God;
h) Failure or loss of efficiency is due to lime-scale formation;
i) Product serial tag or other identification is defaced or removed;
j) Product is relocated from its original point of installation;
k) Collector is not commissioned and is left to dry stagnate for a period exceeding 14 consecutive days;
l) Any operation or environmental conditions that exceed documented design limits of the system components or materials.

Manifold Casing
a) Damage to the manifold casing during or after installation;
b) Failure to seal insulation up to manifold casing for rear port manifolds;
c) Piping connected to the inlet/outlet is not properly supported causing rubber seal to be pulled out of shape;
d) Gradual colour fade;
e) Damage due to attacks by insects or animals;
f) Piping connected to the inlet/outlet is “hung” off the collector.

Header Pipe
a) Leakage from any connection to header inlet or outlet;
b) Exposure of the manifold header pipe to pressure exceeding 0.8MPa/8bar/116psi;
c) Exposure to flow rates exceeding 15 L/min or 40gpm;
d) Freezing of the liquid contained in the manifold header pipe;
e) Leakage of the manifold header pipe as a clear result of metallic corrosion and not structural brake failure;
f) Poor heat transfer, excessive pressure drop, or blockage of header as a result of scale formation;
g) Installation of more than five end port manifolds in series without at least one suitably flexible connection that allows longitudinal expansion and contraction of the header pipe(s);
h) Piping connection on the inlet/outlet of the collector that restricts longitudinal expansion and contraction of the header pipe(s);
i) Piping connected to the inlet/outlet is “hung” off the collector;
j) Brass fitting has been over torqued, indicated by deformation marks on corners of the HEx of the nut, or otherwise fitting and the fitting is of incorrect use;
k) Spanner/wrench with teeth (rather than flats) has been used to tighten the fitting;
l) Non Apricus supplied nipple has been used with the flared nut;
m) Copper flare has been deformed from original manufacturer shape.

Evacuated Tubes
a) Heat pipes are not correctly installed full depth into header ports, indicated by deformation of the evacuated tube top plate;
b) Heat pipes are not running straight up and down the top side of the evacuated tubes due to excessive rotation of the evacuated tube during installation;
c) Collector mounting frame is installed in twisted (not squared or even) position putting stress on evacuated tubes;

Heat Pipes
a) Heat pipes are installed outside of the required 20-80deg installation angle;
b) Heat pipes have been bent or damaged causing rupture to the copper pipe.

Mounting Frame & Tube Clips
a) Failure attributable to any modification to the mounting frame components;
b) Failure when not installed in accordance with Apricus installation guidelines;
c) Failure of non-Apricus fastening components or the structure to which mounting frame is attached;
d) Failure due to wind loading when the mounting frame has not been installed in line with installation guidelines and local structural codes for high wind regions;
e) Failure due to wind loading in areas that experience >205km/h / 127mph where local structural engineering approval has not been obtained;
f) Failure due to excessive snow loading.

Tube Caps
a) Damage is due to attacks by insects or animals.

END USER OBLIGATIONS

In order to obtain performance of any obligation under this warranty, the End-User must:

a) First determine if the Product is within the applicable Warranty Periods. This can be determined by referring to the installation record form, or alternatively the original purchase invoice. If neither documents are available, the serial number and manufacturing date will need to be read off the Product serial tag. Some Products may be installed in a location that is not accessible to the End-User and so the information may only be obtained by a qualified service technician.
b) Contact the company who installed the original Product, or, if unknown or unable to be contacted, contact Apricus directly.

The following information may be required to determine if the Product issue is eligible for coverage under the terms of this Limited Warranty.

i) Information related to the manner in which the Product(s) were installed;
ii) The history of operation;
iii) Any repairs that may have been made;
iv) Evidence that the Product(s) were installed by a qualified, licensed contractor;
v) Evidence that the Product(s) were installed in accordance with the applicable Products Installation Manuals and any special written design or installation guidelines by Apricus for this project;
w) Evidence that the Products were installed in accordance with all applicable local building, plumbing and electrical codes.

CUSTOMER SATISFACTION

We believe you will be fully satisfied by the service you receive from the local Apricus representatives and from Apricus. However, because our aim is your complete and lasting satisfaction, Apricus adds another feature to your warranty’s protection. In the unlikely event that you feel service respondent to a warranty service request is not satisfactory, Apricus offers you an opportunity to air your complaint in an impartial and unbiased manner.

The opportunity to mediate any complaint made by an End-User is hereby extended to all End-Users. If you are a Consumer End-User, the provisions of the federal Mediation Act/Warranty Act provide that you may not file suit against Apricus until your claim has been submitted to Mediation for an informal dispute settlement and a decision has been reached.

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New Zealand