





# **Camel Solar**

Our philosophy is very simple at Camel Solar. The target of our solar thermal collectors is to have the highest coefficient of efficiency, maximize the energy produced by solar collectors, and consequently reduce operational energy costs.

The "clean energy" future will be a composition of technologies based on renewable energy sources such as solar, wind, water and biomass, which all play an increasingly important role in the new global energy economy.

Camel Solar brings you some of the most advanced solar thermal systems available on the market today through innovation, research and development.

We are experts in the renewable energy industry and have extensive experience designing and manufacturing top of the range heating and cooling technology.

We work closely with designers, developers and architects to focus on functionality, efficiency and style.

**Consumer Benefits** 

- · Green energy source
- Sustainable and renewable
- Self-sufficiency
- Reduced energy bills
- Government incentives
- Require very little maintenance
- Reduced noise pollution
- Modern design features
- Higher Energy Performance Certificate (EPC) rating

**Product Features** 

- Patented selective coatings
- · Patented absorber technology
- New innovations in welding techniques
- Seamless and aesthetic design
- Cost-effective
- Easy to install
- Competitively priced
- Simple and reliable technology
- Automatic and controlled heat settings to work with existing systems

Camel Solar's thermal systems harness the

maximum solar radiation to power both commercial

and domestic buildings.





Camel Solar's patented formulas improve absorption and insulation to give the most effective results at affordable prices. Camel Solar's products can be used for different energy and building requirements, maximising the potential of renewable energy.





## Applications – Commercial and Domestic

- Swimming Pools
- Leisure centres
- Hotels and spa facilities
- Offices
- Schools
- Factories and Retail
- Residential Developments
- Breweries
- Dairies

## **Factors to Consider**

- Annual solar radiation
- Number of people relying on the solar thermal system
- · Patterns of hot water usage
- Available space
- Roof/façade inclination
- · Custom solutions available

The products are much more than functioning solar collectors, they are aesthetic design features.

Professionals can calculate how best to obtain the results you need at an affordable price, so that more people can access solar energy than ever before.

#### Solar Energy

Sunlight is by far the largest carbon-free energy source on the planet. Harnessing solar radiation can provide costeffective, self sufficient energy and also significantly reduce CO2 emissions.

More energy from the sun strikes the Earth per hour than all other energy consumed on the planet each year, and all the known Earth reserves of coal, oil, natural gas, and uranium combined are more than 10 times smaller than the energy received from sunlight each year.

Solar energy is unique compared with other renewable energy sources as it can easily provide heat or electricity.

#### Solar energy can be harvested in two ways:

- 1. Solar thermal collectors transform solar energy into heat
- 2. Solar PV modules directly convert the solar radiation into electricity.

The UK receives approximately 900-1200 kW/hrs solar energy per square meter of land area each year. Using thermal collector systems, there is enough solar radiation in the UK to provide 50%- 60% of its domestic hot water requirements for a whole year.

There is enough direct and diffuse solar radiation to provide heating on cloudy days. In winter, solar energy can relieve the load of boilers or heat pumps, reducing the overall cost of energy bills through stored water. Camel Solar's advanced technology systems have been developed to optimise solar energy insolation, absorption and transmission; making this renewable energy source a viable alternative.





# **Case Studies**



Location: England, (East Sussex) Name Of project: Parrot House Type of project: Domestic swimming Pool Size of Pool: 11m x 6m x 1.5m = 99m3 Size of Storage: 250 litres Panel Type: Flat Plate Collector Installed Equipment: 25 Flat Plate Collectors

The Swimming pool is heated from April to October by the solar thermal system which produces 30kw



#### Location: Macedonia

Name Of project: Sport Center Trajkovski Type of project: Swimming pool Complex Size of Pool: 33m x 25m x 2m = 1650m3 Panel Type: Evacuated 15 tube Equipment installed: 190 Evacuated Tube Collectors

The swimming pool is heated throughout the year by the Solar thermal system which produces 250-300kw



Location: Macedonia Name of Project: Apartment complex Soravia Type of Project: Domestic hot water Size of Storage: 14000 litres Panel Type: Evacuated 15 tube Equipment Installed: 80 Evacuated Tube Collectors

The apartment Hot water is heated throughout the year by the solar thermal system which produces 100-120kw



## Enhanced Capital Allowance Scheme

## What is the ECA?

Capital allowances enable businesses to write off the capital cost of purchasing plant and machinery, for example equipment such as Solar thermal, against their taxable profits. They take the place of depreciation charged in commercial accounts.

The Enhanced Capital Allowance (ECA) scheme allows businesses to claim capital allowances against the taxable profits of the period of investment. This applies to investments in equipment that is energy saving or more energy efficient than existing equipment.

The scheme generates financial savings for businesses and encourages the business to be more sustainable and energy efficient thereby reducing its impact on the environment. This scheme is in place is to help businesses meet government Energy and CO2 targets by 2020.

The product needs to be on The Energy Technology List (ETPL) to gain the full ECA. Products not on the ETPL will only receive up to 20% tax relief.

### **Benefits**

- Tax Relief of up to 100% of the investment
- Financial benefit can be greater for a company or individual investor depending on how much corporation tax they pay and if they pay income tax
- Businesses paying corporation tax at 28% can expect a return of 28p for each pound invested
- Reduced payback period
- Generates cash flow
- Reduced operational energy costs
- More sustainable
- Green piece of mind







Solar thermal collector composed of a aluminum flatplate, with 9 copper pipes ultrasonically welded to an aluminum full-plate absorber.

- The absorber has a high efficient PVD selective coating to maximize efficiency.

- Welding between the pipes offers the best coefficient of heat transmission. Removing welding lines eliminates deformation waves that could occur on the absorber, ensuring a high quality finish.

- Special silicon is used to seal the glass panels, enhancing its attractive appearance.

- Soldered with copper collective pipes and placed in compact aluminum frame boxes, the facade collector retains the majority of heat.

- Tempered glass, with its iron-free, anti-reflective and low-soiling composition, has anti-dust and anti-corrosion properties.

- Innovative design to absorb maximum radiation potential The Façade collectors are designed for industrial and domestic integration and have been reviewed by contractors, architects and designers, to assure the highest quality design.







- 1 Aluminium Back Frame I 2 Silicone Seal
- 3 Thermal Insulation I 4 Absorber Full Plate
- 5 Glass | 6 Absorber Tubes



Aluminum frame	
Material	Aluminum
Color	Anodized
Depth	85 (mm)

Cover - Low iron glass	
Glass thickness	3.2 (mm)
Dimension (length/wide)	2100x1000 (mm)
Transmission	92(96 %-option) of solar radiation
Security glass	Yes

Insulation - Rockwool	
Heat conductivity	0.045 (W/mK)
Gross density	50 mm 50 (kg / m³)

Technical data	
Overall area	2.1 (m <sup>2</sup> )
Absorber area	1.8 (m <sup>2</sup> )
Header tubes	$\phi$ 22 x 0.8 (mm)
Absorber tubes	$\phi$ 8 x 0.4 (mm)
Connections	<i>φ</i> 22 x 0.8 (mm)
Dimension:	
Length	2100 (mm)
High	85 (mm)
Wide	1000 (mm)
Overall collector weight	34 (kg)
Absorber capacity	1.7(l)
Absorber: Aluminum sheet 0.5 mm ultrasonically welded	PVD selective coating
Absorption	95%
Emission	5%
Max. working pressure	10 (bar)





The Flat Plate is composed of a special façade fullplate absorber, coated with high quality, selective PVD.

- It is ultrasonically welded with copper heat pipes. The completed absorber is placed into an aluminum anodized frame-box and insulated with rockwool before being covered with tempered glass.

- The sealing between the casing and glass is made from a special silicone, for minimal heat loss and a sleek finish.

- The Flat Plate can be used for areas that receive direct sunlight and can optimise the transmission and efficiency of thermal energy collected within them.





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 Aluminium Frame I 2 - Silicone Seal I 3 - Thermal Sidewall Insulation I 4 - Thermal Insulation
Copper Tubes I 6 - Glass I 7 - Aluminium Back
Absorber



Aluminum frame	
Material	Aluminum
Colour	Anodized
Depth	85 (mm)

Cover - Low iron glass	
Glass thickness	3.2 (mm)
Dimension (length/wide)	960x1960 (mm)
Transmission	91.6% of solar radiation (96% is possible with AR + Low soiling coating)

Insulation - Rockwool	
Heat conductivity	0.045 (W/mK)
Gross density	50 mm 50 (kg / m³)

Technical data	
Overall area	2.00 (m <sup>2</sup> )
Absorber area	1.83 (m <sup>2</sup> )
Header tubes	<i>φ</i> 22 x 0.8 (mm)
Absorber tubes	$\phi$ 8 x 0.4 (mm)
Connections	$\phi$ 22 (mm)
Dimension:	
Length	2000 (mm)
High	85 (mm)
Wide	1000 (mm)
Overall collector weight	32 (kg)
Absorber capacity	1.6(l)
Absorber: Aluminum sheet thickness 0.5 mm ultrasonically welded with Cu tube ,	PVD selective coating
Absorption	95%
Emission	5%
Max. working pressure	10 (bar)





Solar Evacuated Tube collectors are created with a new U-type tube vacuum.

- The tube collector is made up of 10-15 evacuated glass tubes with a highly efficient, selective coating that covers the inner glass tubes increasing insulation and absorption.

- The vacuum further increases efficiency by locking in heat. The absorbers are constructed using patented U-type copper pipes that are ultrasonically welded.

- The heat from the U-type pipe is collected in the manifold which is insulated with high-density rockwool contained within an aluminium anodized collecting box.

Available in standard lots of:

· CS Vacuum – 10

· CS Vacuum – 15

or tailor made solutions available.







1 - Aluminium Manifold I **2 - Rubber Seal** I 3 - Thermal Sidewall Insulation I **4 - Absorber** I 5 - Glass Tube Double Wall Vacuum I **6 - Hot Supply Manifold** 7 - Cold return Manifold



		CS VACUUM 10	CS VACUUM 15
Number of vacuum tubes		10	15
Absorber area	m2	0.808	1.212
Dimension of vacuum tube	mm	1800x58	1800x58
Absorption	%	more than 92%	More than 92%
Emission	%	less than 6% (80°C)	less Than 6% (80°C)
Length/Width/High	mm	1988 x 950x155	1990 x 1323x155
Manifold connections	mm	Ø22x0.8 copper pipe	Ø22x0.8 copper pipe
Max. fluid pressure	bar	10 bar	10 bar
Installation angle	0	0-90°	0-900
Absorber type		U-copper pipe	U-copper pipe
Frame (stand support)		Aluminum	Aluminum
Heat conducting metal sheet	mm	Aluminum 1690x57.5x0.12 ultrasonically welded	Aluminum 1690x57.5x0.12 ultrasonically welded
Insulation		Rock wool	Rock wool
Weight	kg	31.6	44.9
Stagnation temperature at 30°C and 1000 W/m2		250°C.	250°C.





The Window Façade has seamless connections, patented coatings, copper tubes and aluminum flat plates.

- The transfer of heat from plates to tubes is optimized through a combination of conductivity and convection currents. This method of heat transference works well for the positioning of these panels.

- The complete full-plate absorber is soldered with copper collective pipes and placed in existing windows or new Al frames in window or roof space.

- Behind the window module is rock wool and the decorative plate, for efficiency and style.

- The glass is fully transparent or prismatic. It is tempered, iron-free and anti-reflective. The low-soiling coating on the glass is anti-dust and anti-corrosive. The optical characteristics of the glass result in self cleaning properties.

- These solar thermal collectors are designed to be integrated and fully functional, letting solar radiation through utilizing the heat energy from the sun.







1 - Aluminium Manifold | **2 - Rubber Seal** | 3 - Thermal Sidewall Insulation | **4 - Absorber** | 5 - Glass



Aluminum frame	
Material	Aluminum
Color	Anodized
Depth	29 (mm) can be tailored if requested

Cover - Low iron glass	
Glass thickness	3.2 (mm)
Dimension (length/wide)	1960x960 (mm)
Transmission	96 % of solar radiation
Security glass	Yes

Insulation - Rockwool	
Heat conductivity	0.045 (W/mK)
Gross density	50
Site insulation	20 mm 100 (kg / m³)

Technical data for 1.88 m2 standard window module.	
Overall area	1.9 (m <sup>2</sup> )
Absorber area	1.8 (m <sup>2</sup> )
Absorber tubes	$\phi$ 8 x 0.4 (mm)
Connections	$\phi$ 8 x 0.4 (mm)
Dimension:	
Length	1960 (mm)
High	29 (mm)
Wide	960 (mm)
Absorber capacity	0.8(l)
Absorber: Aluminum sheet 0.5 mm specially ultrasonically welded	PVD selective coating 0.5 (mm) thickness
Absorption	95%
Emission	5%
Stagnation temperature	195 (°C)
Max. working pressure	10 (bar)
Heat transfer medium	Heat transfer medium



# **Solar Keymark**

Camel Solar have received the Solar Keymark certification and Camel Solar products are listed on the Solar Keymark international database. This is the European label for quality.

# **Building Regulations**

- All new domestic and commercial properties must obtain an Energy Performance Certificate (EPC) rating.

- Energy inspectors calculate the EPC rating by detailing the energy efficiency and environmental impact of a property.

- The higher the rating, the more energy efficient the property is. The key elements considered in calculating efficiency are: windows, walls, roof, floors, main heating, heating controls, secondary heating, hot water and lighting.

- The installation of solar thermal collectors increases efficiency and improves EPC ratings on properties, reducing fuel bills, meeting modern building requirements and improving the features of the building. - The social responsibility to integrate solar panels can be seen by government incentives and feed-in tariffs, to encourage consumers to consider this efficient form of energy generation.

- Approximately 28% of the UK's CO2 emissions come from domestic homes and around 49% of the energy demand of the EU comes from the heating and cooling sector. Solar energy is effective not only for the home, but also for the planet.





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# **Renewable Heat Incentive**

## What is the RHI?

The renewable heat incentive is a payment scheme established for those generating heat from a renewable source of energy. The RHI has been set up in the UK by the government to help us become more sustainable through reducing our energy bills but also helping the government to meet their CO2 emission targets for 2020.

- Reduced dependence on Fossil Fuels such as oil and gas, both of which are becoming increasingly expensive year-on-year.

- For commercial installation you will be paid up to 8.5p/kWhr for the hot water and heat you generate using the Camel Solar thermal system.

- The RHI payout will last for 20 years from the day that it is registered and will be constantly monitored with inflation.

# Will this shorten the payback period and cover installation costs?

- The RHI does help reduce the payback period making it more attractive to consumers.

- We estimate at Camel Solar that many consumers will gain enough return from the tariffs to cover their installation costs within an estimated period of 5-10 years.

Investing in Camel Solar thermal and other energy saving products can significantly reduce a company's energy bills, through reduced operational costs and incentives. This also reduces a company's Climate Change Levy, creating savings year upon year.





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