For Ensol always sun is shining

ENERGETYKA SOLARNA
ensol Sp. z o.o.

Racibórz / Poland

TÜVRheinland® Precisely Right.

SOLAR KEYMARK

INNOWACYJNA GOSPODARKA

UNIA EUROPEJSKA EUROPEJSKI FUNDUSZ ROZWOJU REGIONALNEGO

ENERGETYKA SOLARNA
ensol Sp. z o.o.
ul. Piaskowa 11
47-400 Racibórz
Poland

Company

Almost twenty years experience in the installation and solar industry large production potential as well as human and technical resources, but also deep concern for the environment and constantly rising energy prices inspired us in 2006 to start production of solar devices.

Since the very beginning the activity of ENSOL has been oriented towards the manufacture of flat solar collectors, assembly sets as well as towards completing and selling solar fixtures and complete solar systems.

Company

The total surface of Ensol collector installed in 2006-2012

Surface: 85000m^2
Maximum power: 65 MW

Facts & figures

Wide range of collectors

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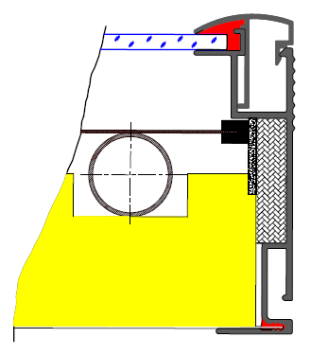
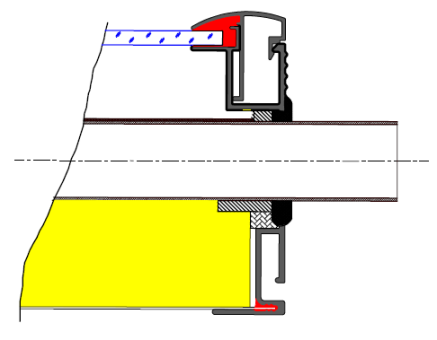
Construction of a flat collector

Possibility of making large-surface solar collectors 4,0, 5,23 i 10,41 m2 in one frame by using special, patented profile.





Optimal activity a solar collector consists maximum absorption of the radiation and minimize heat loss.

ES2V / 5.23

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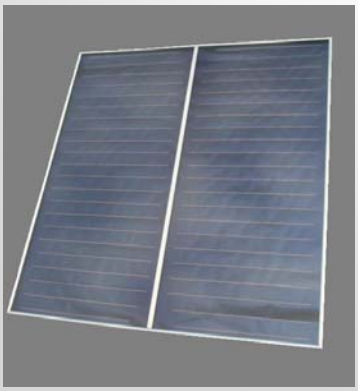
5.23 m2 flat collectors for vertical mountage with meandric Cu absorber



gross surface	**5,23** m^2
absorber surface	**4,91** m^2
active surface	**4,71** m^2
optical efficiency	**82,1** %
a_1	**3,276** $W/(m^2K)$
a_2	**0,025** $W/(m^2K^2)$
Height	**2356** mm
Width	**2220** mm
depth	**85** mm
Wieght	**94** kg
construction	**absorber: Cu meander**
Market versions	**ES2V/5,23S** silver collector

ES2V / 10.41

10.41 m2 flat collectors for vertical mountage with meandric Cu absorber

gross surface	**10,41** m^2
absorber surface	**9,82** m^2
active surface	**9,42** m^2
optical efficiency	**82,1** %
a_1	**3,276** $W/(m^2K)$
a_2	**0,025** $W/(m^2K^2)$
Height	**2356** mm
Width	**4220** mm
depth	**85** mm
Wieght	**184** kg
construction	**absorber: Cu meander**
Market versions	**ES2V/10,41S** silver collector

The first large-collector with aluminum absorber

High quality and efficiency Low price €/W

ES2V / 4.0

4.0 m2 flat collectors for vertical mountage with meandric Al absorber

gross surface	**4,0** m^2
absorber surface	**3,73** m^2
active surface	**3,73** m^2
optical efficiency	**80,1** %
a_1	**3,280** $W/(m^2K)$
a_2	**0,017** $W/(m^2K^2)$
Height	**2007** mm
Width	**1994** mm
depth	**85** mm
Wieght	**69** kg
construction	**absorber: Al meander**
Market versions	**ES2V/4,0 AL** silver collector

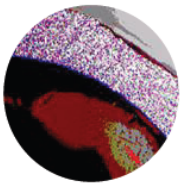
www.hydro.com/solar-tubes

HyLife™ Solar is a particularly corrosion-resistant alloy that we have developed for the solar thermal market.

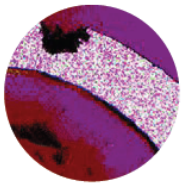
The alloy composition of HyLife™ Solar enhances the life expectancy of the aluminium tubes in two ways. This can be seen in the images below, which are the results of a SWAAT test. The SWAAT test is an accelerated salt spray test and a common corrosion test in the automotive industry.

First, an external corrosion attack is in character very different from the traditional "pitting corrosion" of aluminium. The corrosion is spread laterally over a larger area and isn't focused in depth.

Secondly, the corrosion resistance is significantly increased. The top image shows the result of a 3103 alloy after only eight days. Compare this to the bottom image, which is the result of HyLife™ Solar after 41 days. This simulates several years of harsh outdoor conditions.



HyLife™ Solar Alloy after 41 days in SWAAT (0.4 mm wall)



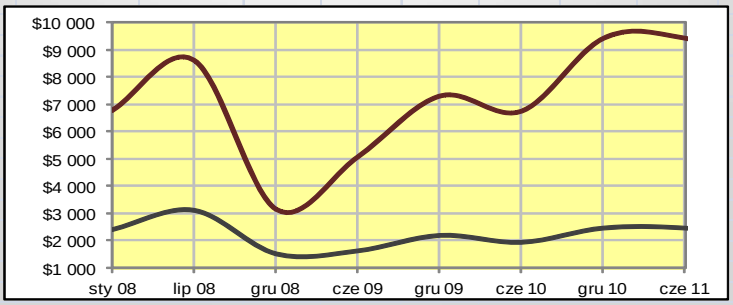
EN 3103 alloy after 8 days in SWAAT (0.4 mm wall)

Hydro recommends using HyLife™ Solar for solar thermal systems. With HyLife™ Solar tubes in a correctly designed solar thermal system, there is no risk of corrosion. Designing a system correctly means that the system needs to be a closed system (hermetically sealed) that contains a heat-transfer fluid containing an inhibitor. Most commercially available heat-transfer fluids contain inhibitors. Filler materials for brazing should be AlSi based and not contain zinc. Also, one should use aluminium or stainless steel fittings in hot areas, i.e. at the absorber, and not brass which contains zinc. This is because zinc introduces corrosion in a solar thermal system at high temperatures. It is good practice to cover joints between aluminium and "red metals" such as copper or brass with a heat-shrinking seal to avoid any external corrosion.

Advantages of aluminum absorber collector

Better price collector absorber AL for Cu is obtained by:
- significant difference in the purchase price of aluminum in comparison to the price of copper,
- the possibility of simpler forecasting and costing due to lower aluminum price fluctuations on the market

		sty 08	lip 08	sty 09	lip 09	sty 10	lip 10	sty 11	lip 11
Copper	[USD/ton]	$6 790	$8 642	$3 155	$5 080	$7 325	$6 760	$9 448	$9 445
Aluminum	[USD/ton]	$2 400	$3 100	$1 520	$1 630	$2 190	$1 940	$2 460	$2 455



Advantages of aluminum absorber collector

- Collector price reduction was achieved without compromising performance, skeptics believed that as a result of the transition from copper to aluminum absorber drag down performance (it was suggested that copper is a better conductor), while acceptable efficiency is achieved by the use of selective eta plus coating on aluminum sheets with suitable thickness, connection sheet with flow tubes with right HyLife™ Solarparameters, adjust right parameters in ultrasonic connecting process (sheet +flow tubes) and proper determination of nominal flow of the heating medium

- Lowering the price of the collector without compromising efficiency is achieved by using the same sheet AL absorber area of greater thickness than Cu in order to ensure the same parameters of heat conductivity

- Also, the thickness of the flow tubes HyLife ™ Solar is designed to provide the same parameters as in the thermal conductivity like in copper absorbers

- Using aluminum HyLife ™ Solar with suitable composition to avoid corrosion, parameters of aluminium enable you to easily use in aggressive environments containing sea salt, known problems with aging of copper absorbers in coastal climate can therefore be limited,

- The use of only aluminum for the production the absorber is avoided problems arising from the use of materials with different thermal elongation (for example, aluminum, copper), leading to the creation of unwanted stress, collectors with absorbers combinational showed cracks due to this problem,

- The use of 100% aluminum collector also has environmental effect, the collector is made of one material and this makes it easier to carry out recycling, collectors with combined absorber require the separation of aluminum sheet from aluminum flow tubes

Examples of large solar installations

Poland – Ełk City

Swimming pool

174xES2V/5,23
Surface: gross 910m^2 / aperture 820m^2
Maximum power: 673 kW

Poland – Poznań City

Hospital

203xES2V/5,23
Surface: gross 1062m^2 / aperture 957m^2
Maximum power: 785 kW

Poland – Poznań City

Poland – Racibórz City

Multifamily buildings

Realized
15 buildings x 16xES2V/5.23 = 240xES2V/5.23
Surface: gross 1255m^2 / aperture 1131m^2
Maximum power: 929 kW

Projected
60 buildings x 16xES2V/5.23 = 960xES2V/5.23
Surface: gross 5021m^2 / aperture 4524m^2
Maximum power: 3714 kW

Poland – Racibórz City

Poland – Racibórz City

Poland – Warsaw City

The first installation of the large collectors with ALUMINIUM absorbers

Multifamily buildings

14xES2V/4.0AL
Surface: gross 56m^2 / aperture 52m^2
Maximum power: 42 kW

Poland – Warsaw City

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