

Poised for growth



The 203 m² air collector system made by German manufacturer Grammer Solar is part of the current energy conservation measures at the German Federal Foreign Office in Berlin, Germany.

Photo: Grammer Solar

The international solar air collector industry is optimistic about the future. The demand for solar-heated air is rising, as is the number of manufacturers and collector models. The integration of air collectors into international standards for solar collectors will soon be complete.

The demand for solar ventilation for commercial sites is huge,” says Hans Jørgen Christensen, the founder and Chief Executive of Danish air collector manufacturer SolarVenti A/S. Almut Petersen, who is the Director of Sales at German air collector manufacturer Grammer Solar GmbH, says that new potential applications for air collectors are providing a noticeable boost to their share of the collector market. Over the past few years, the air collector market has been about 1 % of the total worldwide collector market, according to the analysis of Austrian research institute AEE Intec, which collects this data every year on behalf of the International Energy Agency.

The upswing in the market is clear. At the Intersolar Europe trade fair in Munich a whole range of new products and industry newcomers from the solar air collector segment turned up. Two years ago, 13 of 31 companies we contacted participated in our market overview (see S&WE 9/2010, page 60) but this year 16 of the 49 firms we contacted took part (see table).

SolarVenti has positioned itself to meet the increased demand for commercial solar ventilation systems. The company, which had previously been active only in the residential market, has now developed an industrial model which it presented for the

first time this summer. Depending on where it is located in the collector field, the tub-shaped 2 m² collector is available as a basic, start or end module. “In a large-scale system the modules are installed on a mounting rack and can be combined into rows a maximum of 20 metres long. All of the rows of collectors are connected at a central point with the existing ventilation system,” Christensen explains. The collectors comprise a perforated aluminium tub, a black 2 mm thick polyester felt absorber completely covering the perforated surface, and a 10 mm thick polycarbonate cover with UV protection and an aluminium frame.

Unlike large-scale systems which usually draw air in at the end of each row of collectors, SolarVenti uses a collector with a completely perforated rear wall. That results in lower pressure losses and enables the absorber to act as an air filter. A further plus is this self-cleaning function of the polyester felt, which is sterilized by heating up to between 90 and 100 °C when the system is idle. The manufacturer says that the collector’s maximum output is 600 W/m². Depending on the application, the annual thermal yield is between 350 and 550 kWh/m².

Canada’s EnerConcept Technologies signed a licensing agreement last year to use the SolarVenti patent in its industrial Luba GL air collector model. The Luba also takes in air through a fully perforated

aluminium rear wall and features a black felt absorber. "This design has enabled us to develop a collector which is significantly lighter and less expensive than the previous model while at the same time attaining a thermal performance which is nearly as good as its predecessor," says company Head Christian Vachon. According to the Canadian Standards Association (CSA), the system has a performance factor of 1.06. For each different type of collector, the CSA specifies a separate performance factor. The organisation explains how it arrives at the figure: "The energy rating of each collector is divided by the corresponding highest energy rating of the collector in that technology group." If the value is greater than 1, it means that the collector is better than the reference value for the highest energy rating.

For its well-known transparent Lubi façade system, EnerConcept developed a new selective coating which is applied directly to the wall of the house. Thanks to the coating, the performance factor of the new Lubi Select increased to 1.29 from the 1.2 achieved by its predecessor model. Vachon also sees a clear upward trend in the air collector market and has reacted with two strategic choices. First, the company, which up until now has limited its activities to the commercial, public, and industrial sectors, will expand into the residential sector starting this autumn. Second, its presence in the European market will get a boost in future from a new branch office which is currently being established in Wiesbaden, Germany, and from a cooperation agreement with GoGaS Goch GmbH & Co. KG in Dortmund, Germany. The latter is focused on the industrial sector and the former will be a subsidiary focusing on the commercial and public sectors.


New manufacturers, new models

As established manufacturers expand, droves of new players and products are pouring into the market. One example is Germany's Airwasol GmbH & Co. KG,



The new industrial models produced by Danish manufacturer SolarVenti provide heating and ventilation for a trade school in Hadsten, Denmark.


Photo: SolarVenti



SOLIMPEKS
Solar Energy Corp.

- Albania
- Algeria
- Argentina
- Australia
- Austria
- Belarus
- Belgium
- Bosnia
- Brazil
- Canada
- Chile
- China
- Czech Republic
- Denmark
- Ecuador
- Egypt
- El Salvador
- Estonia
- Finland
- France
- Georgia
- Germany
- Greece
- Guatemala
- Hungary
- Iran
- Iraq
- Ireland
- Italy
- Japan
- Jordan
- Korea
- Kuwait
- Latvia
- Lithuania
- Luxembourg
- Malaysia
- Mexico
- Moldova
- Montenegro
- Morocco
- Norway
- New Zealand
- Norway
- Poland
- Russia
- Saudi Arabia
- Slovenia
- Spain
- Sweden
- Switzerland
- Taiwan
- Tanzania
- Turkey
- Ukraine
- USA
- Vietnam

the sun rises in the east



Solimpeks is now one of the largest solar thermal companies in the world with locations in all of the key target markets. We are continuously growing and contributing to this valuable renewable energy industry.

www.solimpeks.com.tr

Market overview of solar air collectors

Company	Product	Sectors	Year of launch	Gross collector area [m ²]	Weight [kg]	Max. air temperature increase ΔT [K]	Recommended air flow [m ³ /m ² h]	Type of systems	Type of collector	Absorber air flow
Airwasol, Germany	TST-air 2000	commercial	2012	approx. 2.0	< 18	> 80	50	open/closed	glazed	under
Cona, Austria	Cona CCS	commercial	1999	2.03	50	5 - 50 ¹	20 up to 100	open/closed	glazed	under ²
Conserval, Canada	SolarWall, SolarDuct	commercial	1990	building integrated	n/a	up to 55	1.7 up to 17	n/a	unglazed / partially glazed	n/a
Dunster House, Great Britain	Off Grid Solar Air Heater	residential, holiday homes	2012	1.5	25	30 - 40	up to 133	open	glazed	over and under
EnerConcept, Canada	Luba GL	commercial ³	2011	2.57	40	20	150	open	glazed	through and over
Eziñç, Turkey	EZ-HK1 Air Collector	residential	2011	2.0	47	n/a	60	n/a	glazed	n/a
Futura Solar, USA	Sawtooth Solar Daylighter	commercial	2005	roof area	n/a	28	n/a	open to interior	glazed	over
Grammer, Germany	TopSolar	residential, commercial	1996	2.0	45	40	30 up to 60	open/closed	glazed	under
Kollektorfabrik, Germany	Sun-Storm	residential, commercial	2011	9.18	180	45	1 up to 2.5 ⁵	open/closed	glazed	under
OM Solar, Japan	OM solar panel AC-09150J	residential, commercial	n/a	n/a	30	50	300 up to 720 ¹⁰	open	glazed	under
SolarVenti, Denmark	SolarVenti C	residential, commercial	2002	1.4	12	25 ⁶	100	open	glazed	through
Sole, Greece	Airsol 20	residential, commercial	2011	2.13	36	40	n/a	open/closed	glazed	over and under
SolTech, Sweden	SolTech Flex	residential, commercial	2010	2.34	7	10 - 20	up to 85	open	glazed ⁷	under
Sunsiaray, USA	Northern Comfort tm.	residential, commercial	1983	3.18	56.7	n/a	113	closed	glazed	under
Termotend, Italy	TermoFlow	mainly residential and agriculture	2008	2.0	14	40	40	closed	glazed	through
Your Solar Home, USA	SolarSheat	residential, commercial	2004	1.0 / 1.9 / 2.2	30 / 40 / 45	22	up to 88	closed	glazed	under

¹ depending on composition of solar field, solar radiation and mass flow; ² the absorber also acts as a heat exchanger and has a surface area five times that of the collector surface to optimise the transfer of heat from the aluminium to the air flowing through the system; ³ residential starting in autumn 2012; ⁴ South Africa and Europe in preparation; ⁵ 20 °C; based on the gross area; ⁶ in winter; ⁷ glazed by a transparent high quality PVC screen; ⁸ sputtered blue selective surface; ⁹ on customer request; ¹⁰ in m³/h

which is included for the first time this year in our market overview. The company was founded in 2012 as a spin-off of Kollektorfabrik GmbH & Co. KG, Germany. Over the past few years, along with the vacuum tube air collector Sun-Storm, a new and innovative collector design has taken shape at Kollektorfabrik which Airwasol will develop into a product for series production and introduce to the market in 2013.

The British company Dunster House Ltd. is also included in our overview for the first time this year. Its 1.21 x 1.25 m² PV-powered air collector, which the company produces at a manufacturing plant in Poland, was developed for heating and ventilation in weekend

and garden houses, as well as small buildings. Meanwhile, the Turkish manufacturer of water-based flat plate collectors, Eziñç Metal San. Tic. A.S., has expanded its portfolio since last year, adding the EZ-HK1 air collector. "For the moment we are buying OEM air collectors, but depending on the level of interest and market situation, we are planning to outsource or produce ourselves," says Kutay Ülke, Export Manager at Eziñç.

Austria's Cona Entwicklungs- & Handelsgesellschaft m.b.H. specialises in solar drying. Some 120 different products are dried in Cona systems, but the highest energy yield comes from

	Material of absorber	Colours of absorber	Mounting system	Testing standards	Quality label	Markets
	stainless steel and aluminium	blue ⁹	façade / roof	aim is the new EN 12975	none	worldwide
	aluminium	black	roof integrated	prEN 12975	n/a	Austria, Germany, Latin America
	steel or aluminium	20 colours available	wall / roof	CSA 378	CSA / Solar A Mark	worldwide
	aluminium	blue	wall / roof	not tested	n/a	worldwide
	felt	black	flat roof	CSA 378	CSA approved	worldwide
	n/a	n/a	façade / roof	not tested	none	worldwide
	n/a	n/a	roof integrated	NAICS	certificate for occupancy	USA ⁴
	aluminium	black	façade / roof / free standing	prEN 12975-2	RAL quality label	worldwide
	glass (vacuum tube)	blue	façade / roof / free standing	EN 12975-1,2	none	Europe
	steel	black	roof	JIS, BL-bs	n/a	Japan
	polyester felt	black	all types	prEN 12975-2	CE	worldwide
	aluminium	blue ⁸	façade / roof	EN 12975-1,2 / Ashrea 93	pending Solar Keymark and SRCC	Europe, Mexico
	silicone treated nylon fabric	black	façade	not tested	none	Nordics and Spain
	copper	blue ⁸	roof, wall, roof integrated	SRCC	SRCC	USA, Canada
	special metal alloy	silver	façade	CE and RoHs	none	Europe, Tunisia, Syria
	Kynar	black	façade / roof	SRCC, CSA	SRCC, CSA	USA, Europe and Canada

Source: company data

solar drying of biomass. Biomass drying stores solar energy in the summer for use in the winter. The collectors, which can be combined into large solar arrays, have been tested at both the Fraunhofer ISE and at the Austrian Institute for Technology (AIT). The absorber also acts as a heat exchanger and has a surface area five times that of the collector, which does a particularly good job of transferring heat from the aluminium to the air flowing through the system.

Another newcomer to our overview is the Swedish manufacturer SolTech Energy Sweden AB, which offers both a modular façade system and a roof integrated system. SolTech Alfa uses an absorber made

NOVASOL
Solar Thermal Systems

German requirements...
...at Spanish prices!

“the Solar energy smartPhone”

The new collector Novasol VTTI is inspired by cutting edge smartphone design. Its clean lines, high durability, great performance and maximum aesthetics combine to offer quality, economy and beauty.

thermosiphonic systems
NOVASOL COMPAC

New factory
We can produce according to your needs

www.novasol.es
Herán Hesse, 5, Nave C. Pol. Ind. Guadalupe, 29004 MÁLAGA (SPAIN)
Tel.: (00 34) 952 17 22 59. Fax: (00 34) 952 24 16 12. sales@novasol.es



Austrian company Cona is specialised in the field of solar drying. Its air collectors, which can be combined to create large collector fields, are being used here to dry fruit at a facility in Uzbekistan.

Photo: Cona

from a silicon-treated nylon fabric covered by special glass roof tiles. The manufacturer attaches great importance to both flexibility and aesthetics. "Solar collectors have reached a sufficiently high efficiency that other factors, such as application and aesthetics come more into play," says Henrik Båge, who works in business development at SolTech Energy.


US manufacturer Futura Solar, LLC also plans to start production of a roof integrated system in the near future. Its Sawtooth Solar Daylighter is structural, practically replacing the roof. Air collectors are a key component of the overall system, which also includes windows and a PV system. Manufacturer Sunsiaray, also based in the USA, has been around since 1983 and is included in our overview for the first time. Its highly efficient 3 m² collector modules feature Tinox/copper absorbers and are designed for residential, as well as commercial and public sector use.

New international standard includes air collectors

The integration of air collectors into international standards for solar collectors is nearly complete. "The necessary methodical work has been completed, and the components of the tests have been formulated and turned in," says Korbinian Kramer, Head of TestLab Solar Thermal Systems at Germany's Fraunhofer ISE. "What happens now is the iteration process with the national and international committees. That is a particularly painstaking process with this draft because we are working with ISO and CEN as part of a joint working group led by CEN TC 312. According to the current official timeline, the standard is slated for publication in January 2014. By then we will have considered every known variant of the air collector."


The industry sees that as a positive development because, says Almut Petersen of Grammer, "more standardised air collectors will be implemented in the market." For years, Grammer's collectors have been tested based on the standard for liquid-based collectors. The tests give customers confidence in the company's products and are at least partially responsible for the fact that the southern German company's collectors have been heating the German Federal Foreign Office in Berlin since the end of last year. The 203 m² air collector installation at the Foreign Office is one part of an energy conservation contract with the German Energy Agency (dena) and YIT Germany GmbH.

A total of nine collector fields, each comprising nine JumboSolar GLK collectors connected in series, can heat up to 18,000 m³ of fresh air every hour, which corresponds to a nominal capacity of 136 kW. "Our JumboSolar collectors are a very attractive alternative for large-scale solar thermal systems because they use a much simpler technology than water-based systems," says Rudolf Ettl, Head of Solar Air at Grammer Solar. "The systems in Berlin were simply connected to the existing ventilation system. A further benefit is that the system can harvest energy even at low temperatures, heating 0 °C air to 10 °C."



TYFOROP - Your Specialist
for Heat Transfer Fluids - Solar Fluids
for all Thermal Installations

TYFOCOR® BRANDS
environmentally friendly & biodegradable



www.tyfo.de • info@tyfo.de

since more than 30 years



A 130 m² installation built by Kollektorfabrik GmbH & Co. KG on a building at the Freiburg location of Pfizer Deutschland GmbH. The high-efficiency collectors employ the vacuum tube principle.

Photo: Pfizer Deutschland GmbH

Quality mark for air collectors

Canadian manufacturer Conserval Engineering, Inc and its French subsidiary SolarWall Europe Sarl also have news worth reporting. Conserval has not only launched a new high-temperature façade system and a hybrid heating and cooling system on the market, but the Solar Air Heating World Industries Association (SAHWIA), which Conserval established in 2009 is also gathering steam. The manufacturers' association named a new director in July and has developed its own quality mark for air collectors, the Solar A Mark. "There are three North American manufacturers and two EU manufacturers who have joined or have recently applied to become members of SAHWIA", says Executive Director Cecile Tabarot. "We expect many more manufacturers and members will join in the next 2 to 3 months."

For a fee, the Solar A Mark quality and performance certificate ensures that a collector has been tested in a recognised testing facility in accordance with a valid standard, such as CSA F378 in North America or the new EN12975 standard in Europe. Furthermore, the manufacture is required to accept SAHWIA's code of ethics. "Solar A Mark also includes site-built or building integrated systems which require an additional process to ensure that the panels are properly integrated into the building and heating system," Tabarot explains. "Most existing product certifications are designed to certify products made in a factory which are then shipped to a jobsite. These certifying marks are generally not designed for building integrated installations where the final assembly of the solar collectors takes place on a building and not in a factory. Solar A Mark addresses this omission in current standards and offers consultants, clients and building owners a quality assurance that procedures are in place to ensure the solar system is integrated into the building in accordance with the solar design and installation drawings."

Stephanie Banse

