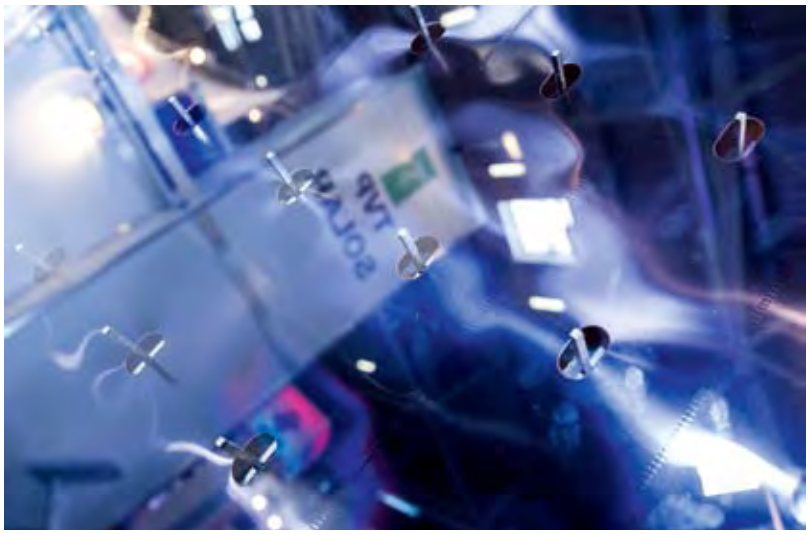
Exploring new paths

Whether bionic absorbers or evacuated flat plate collectors – this year's Intersolar Europe was dominated by new collector concepts.

There's still room for more. If one thing was evident at this year's Intersolar Europe, then it was the variety of ideas used in the solar thermal industry when working on new collector concepts. It then came as no surprise that all three Intersolar Awards in the Solar Thermal category went to collectors this year. The first winner was the parabolic trough collector manufactured by Soltigua – Laterizi Gambettola Srl from Italy. The remaining two awards went to the collector with transparent thermal insulation produced by Tigi Ltd. from Israel (which had already been covered by SUN & WIND ENERGY last year – see S&WE 7/2011, page 60) and the evacuated flat plate collector by TVP Solar SA from Switzerland. We will report on concentrating collectors, air collectors and vacuum tube collectors in coming issues. In this issue, we will focus on flat plate collectors and all other important components, such as storage tanks, stations, controllers and heat transfer fluids.

Flat plate collectors: expanded vacuum applications

With innovative collector designs, new applications have opened up for solar thermal energy, such as solar cooling, process heat generation and combined heat and power (CHP). One collector that is particularly at home here is manufactured by **TVP Solar SA** from Switzerland. The high-vacuum flat plate collector reaches peak yields by avoiding convection losses inside the solar collector. In this way, it is still able to work at almost 50 % efficiency at temperature differences of 200 °C between the collector and the surrounding area. "In contrast to concentrating systems, our flat plate collector can also utilise diffuse irradiation," comments TVP Solar founder and Managing Director Piero Abbate on a further advantage of the MT Power collector. TVP Solar has come up with several technological developments in order for the collector to maintain the high vacuum. For example, an



Even at 200 °C, the evacuated flat plate collector from TVP still yields almost half of the solar energy.

Photos (10): Wilhelm Breuer

innovative flexible glass/metal seal made from anorganic material does not allow any oxygen particles to penetrate from the surrounding area. The getter – which maintains the high vacuum throughout the service life of the collector by absorbing diffused atoms – should be particularly effective.

If the vacuum malfunctions, then a visual point in the collector changes colour. TVP Solar intends to use processes from the production of plasma screens when manufacturing the collectors. The company plans on starting mass production in the coming year.

The Spanish company **SRB Energy** is banking on ultra-high-vacuum technology. The collector – which was presented for the first time in 2010 (see S&WE 8/2010, page 78) – is now available in three different versions. As a simple flat plate collector, it can reach stagnation temperatures of 320 °C. It can reach 400 °C with an additional cylindrical concentrator, and over 500 °C when used with a concentrator system comprised of eight flat mirrors. SRB Energy is owned by the Spanish Segura Group, an automotive supplier with 500 employees in Spain and Hungary.

Thanks to the combination of eight vacuum tubes in one flat plate collector housing, the Chinese company **Changzhou He Jia Solar Energy Co. Ltd.** promises high levels of efficiency on its HFC-2 collector. Whilst the design only offers a comparatively modest optical efficiency rate, it does reduce heat losses. According to the company, the stagnation temperature of the collector measures 289 °C. To protect against overheating, the company has installed a curtain made of Teflon-coated glass fibre underneath the glass cover in the solar collector. If the storage tank water reaches a certain temperature, then an individual controller starts the motor in order to extend the curtain.

Solar Tec SA from Switzerland appeared in Munich for the first time this year. The system provider has its own collector production facilities, and normally sells collectors to dealers. However, according to staff member Alessandro Achermann, the company could also manufacture products for other providers as an OEM manufacturer. Solar Tec collectors are comprised of a pressed aluminium tray containing a