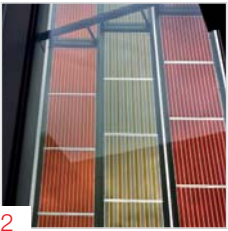


Exact!

Application stories from around the world

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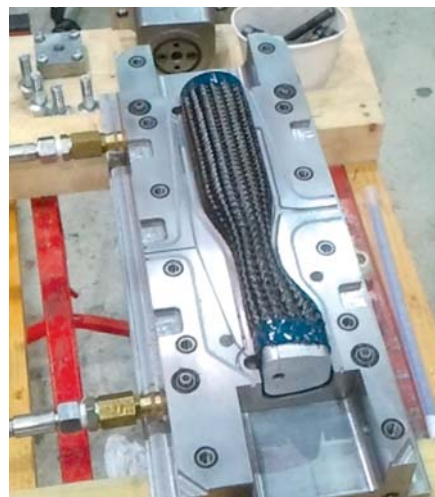
DOPAG compomix used in a research environment

The Institute of Aircraft Design (IFB) with 90 employees is part of the University of Stuttgart. Together with partners they search for innovative approaches for industries such as aerospace, automotive and machine construction.

The core competencies are in airplane design, lightweight construction, manufacturing technologies and wind energy. The fiber-reinforced composites (FRP) technology is researched regarding new calculation and production techniques.

Currently the suitability of FRP as a substitute for metallic structural parts of a car body is being researched. They are made in a two step process allowing quantities of several 10,000 pieces per year.

In the first step carbon fibers are woven around a male core which is then placed in a negative mold. This is where the automated injection of a highly reactive epoxy resin takes place. The material



which is specially formulated for such applications has been developed by the partner company SIKA.

To achieve the highest component properties it is essential to meet the mixing ratio of 100:24 between the resin and the hardener component at a constant temperature of 80° C.

Together with the Hilger u. Kern / Dopag Group a compomix 103M metering and mixing systems which perfectly meets these requirements was set up. Equipped with a follow-up pressure function the system allows a perfect surface finish without any uneven spots and a fiber volume ratio of up to 55%.

The following comments were made by project engineer Dipl.-Ing. Florian Gnädinger: "Due to the flexibility regarding the modularity of the system it turned out to be the optimal solution in a research environment. We can fully confirm the potential of this technology."



Hilger u. Kern / Dopag Group



More than just design



Pioneer in the dye solar cell production uses DOPAG eldomix metering and mixing system



The EPFL Convention Center in Lausanne will be the first public building in the world with a multi-coloured dye solar cell facade. The remarkable design in combination with the opportunity to produce renewable energy met exactly the requirements of the project. Furthermore, EPFL is the birth place of this technology which was invented by Prof. Michael Graetzel.

The translucent photovoltaic panels are manufactured by Soloronix in Aubonne, Switzerland. The company was founded in 1993 and was the first start-up company to acquire an EPFL license for the dye solar cell technology.

For more than 15 years now, Soloronix is supplying worldwide the components involved in the development and the fabrication of dye solar cells.

To ensure the production capacity for the 300 m² facade, the processes had to be optimised.

A single panel consists of two layers of glass equipped with 4 pre-made dye solar cell modules for the power generation.

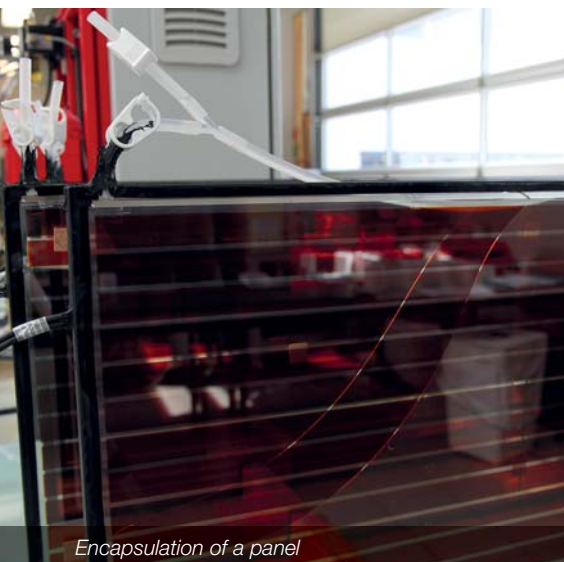
The encapsulation of the panel with a low viscosity, transparent 2K silicone is one of the critical processes as no air bubbles are allowed. Since the required quality could not be guaranteed by mixing the silicone manually, alternatives had to be found.

The optimal solution was found at DOPAG Switzerland. An eldomix 101 metering and mixing systems

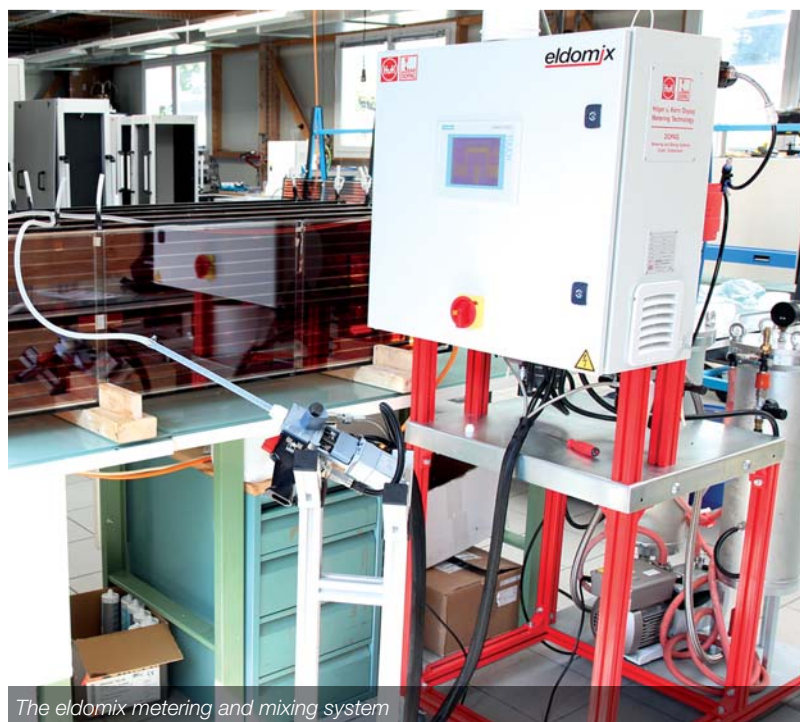
with 12 l material pressure vessels, gear metering pumps and a 2K valve. In addition the system is able to evacuate the material before it is processed avoiding any trapped air.

The eldomix system offers several adjustable parameters such as mixing ratio and flow rate. This enabled Soloronix engineers to research and find the best parameters for their application. As a result the encapsulation process of the photovoltaic panels was effectively shortened to just a few minutes.

The metering technology has convinced Romain Fabre, Project Manager at Soloronix, that the process reliability is ensured and operating the system is very simple.



Encapsulation of a panel



The eldomix metering and mixing system

Transmitting the power



Metering equipment from the Hilger u. Kern / Dopag Group used to produce sideshafts

 Shanghai GKN Drive Shaft Co., Ltd. (SDS) started his business in 1988. It was one of the first joint venture companies with foreign investors established in China for automotive components.

Meanwhile, more than 3600 employees at different locations within China produce high end automotive part such as propshafts, sideshafts and much more. With more than 14 million sideshafts produced per year, SDS has a leading position in the production of these automotive parts in China.

Sideshafts are used for the dynamic connection between engine and driving wheels, transmitting power and allowing steering angles. Each sideshaft has two constant

velocity joints – a fixed joint at the wheel end and a plunging joint at the gearbox end, connected by an interconnecting shaft.

During the assembly process of sideshafts it is necessary to apply grease as well as adhesives in different process steps.

The newest technology produced for car models such as the Passat, Golf or Touran requires an adhesive bead onto the cap of the sealing system which is then bonded to the joint. This requires a high reliability of the bead length and diameter.

These sealing systems are required to keep the lubricant inside the joint and to prevent dirt, and moisture or any other contaminating substance

from getting into the joint. Focussing the requirement to save workspace the local DOPAG sales manager Johnson Hu suggested using a compact dispensing system to apply the pasty 1K polyurethane.

A DOPAG P80-SV drum pump is feeding the material to a membrane dispensing valve mounted on a XYZ table. After placing the components into a fixture the dispensing unit then applies the appropriate volume of the adhesive.

This solution fully complies with the requirements of SDS to have an easy to operate metering system. In addition it has proven to be an important advantage to have short delivery times for spare parts if they are needed.



Applied adhesive bead



DOPAG P80 drum pump feeds the dispensing system

Herding filter technology



DOPAG eldomix 603 metering and mixing system used for the production of plastic filter elements



In April 1977 Walter Herding founded the company Herding GmbH filter technology in Amberg, Germany.

Today the company employs 250 people and has eight subsidiaries and partnerships in nine countries.

The success story for the company began in 1980 with the invention and patent application for a surface filtration solution using rigid body filter elements. These filters have a longer life time than comparable conventional textile or paper filters.

Highly qualified employees put Herding into a position to supply the complete filtration systems to customers from just a single source.

This includes the whole range of services such as requirements analysis, consulting, customised design, installation, commissioning and maintenance of the filter systems.

The products from Herding GmbH filter technology are used in various markets like the automotive industry, food industry or in cement plants. They already comply with future environmental requirements.

The base body (rigid body) consists of sintered polyethylene (PE). The surface of the filter is formed by a microporous and hydrophobic PTFE coating which is firmly embedded in the base body.

During the assembly of the filter unit a PE heading section is bonded onto the end of the base body to stabilise and fix the whole filter element.

Previously the dispensing of the adhesive took place by means of a XYZ table which has now been replaced with a 6-axis robot. This new solution enables a more flexible application and a doubling of the flow rate.

A DOPAG eldomix 603 metering and mixing system is used to process the high viscous, thixotropic and abrasive material in a fixed mixing ratio at a constant process temperature.

After the adhesive is dispensed onto the PE head the manual fixation to the base body takes place. The cycle time of the entire process is less than 10 seconds.

Comments made by Herding Operation Manager Wolfgang Raabe were that "The Hilger u. Kern / Dopag Group was known as a reliable and competent supplier of metering and mixing equipment. The speed of response to requests as well as the professional preliminary tests at the technical centre in Mannheim have confirmed that the Hilger u. Kern / Dopag Group was the right choice."



Material dispensing onto the PE head



6-axis robot with a dispensing unit



Local support



HELLA Shanghai Electronics Co., Ltd. takes advantage of local support



HELLA is one of the world's top 50 automotive suppliers. Around the globe, HELLA has approximately 28,000 employees, 5,000 of whom work in research and development.

HELLA Shanghai Electronics Co., Ltd. (HSE) is a development and manufacturing centre for HELLA in China and Asia Pacific for research & design activities and manufacturing of automotive electronics.

The main products of HSE are automotive electronics and electronic components, including body control modules, remote keys, memory seat modules and much more.

An expansion of the laboratory,

workshop and warehouse of HSE was completed in 2012, with a total area of 11,600 square meters.

This expansion also included the optimisation of a semi-automatic production of electronic control units for the anti-lock braking system type 8.6 to meet the required production capacity of more than 160,000 pieces a year.

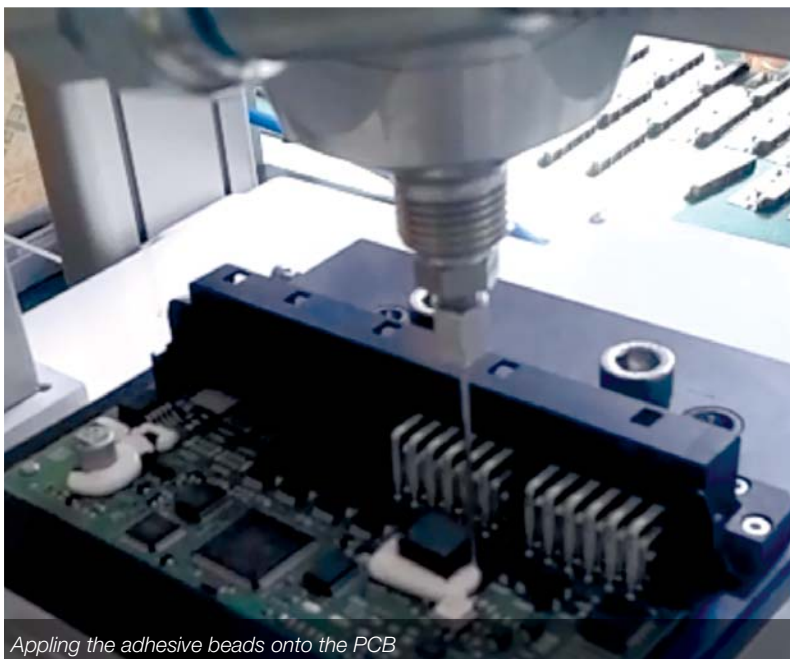
During the assembly of the printed circuit board different beads of a pasty one component silicone adhesive needs to be metered and dispensed to pre-defined areas to fix the components.

It was when the performance of the previously installed competitor systems did not meet the requirements of HSE, that Hilger u. Kern

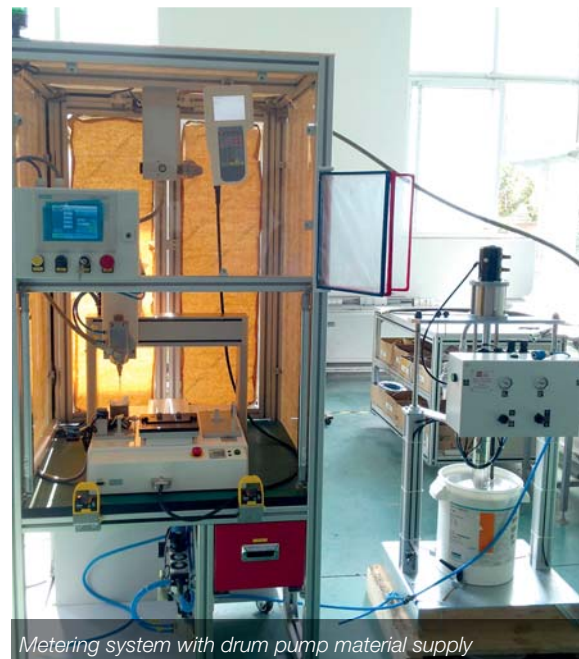
Shanghai got involved to find the appropriate metering equipment for this application and came up with a solution containing a P30 drum pump to supply the adhesive to a membrane dispensing valve which is mounted on a XYZ table.

A material pressure regulator is used to avoid over pressure of the material during dispensing. The production of the electronic control units run with a cycle time of 106 seconds per unit.

The performance of the metering system helped to improve work efficiency by more than 30% and in addition the maintenance for operators is very easy. But even more important for Jason Zhang, Project Engineer at Hella Shanghai, was the local support of the Hilger u. Kern / Dopag Group.



Applying the adhesive beads onto the PCB



Metering system with drum pump material supply

Market news



Mr. Beck, as Global Wind Energy Market Manager, where do you see the development of the wind market in the short and medium terms?

It's no secret that the wind industry has endured serious challenges in the short term. Reduced demand and overcapacity have hit Asia Pacific particularly hard. In the USA, the lack of a long-term energy policy has driven players out of the market. Although demand in Europe is steadier, the companies based there have also suffered through reduced profits and the need to cut cost. Still, Henkel views wind energy as a very important market for years to come. Most major economies have aggressive, long-term targets for the installation of wind power. Countries that were once on the "sidelines", such as Japan and Korea, are now making serious moves into wind energy. Henkel has been committed to renewable energy and sustainability for a long time, but the drivers behind wind energy further strengthen our interest and investments in that area.

From your point of view, is there a technological development in the manufacturing of rotorblades? If so, what is Henkel's response?

Wind blades will become bigger and longer in the future. Different materials will be used, as manufacturers constantly search for the best balance of performance and price. The industry would like to move away from a craftsman-like approach toward a more automated one. Upside potential for quality improvement is significant. The challenge for automation is the amortisation of so much fix costs.

Still, I see a slow march in that direction. For example, customers are trying to find cost effective ways to deliver adhesive directly from the dispensing equipment to the blade, rather than delivering it via buckets.

Henkel takes a holistic view when looking at the future of blade manufacturing – that means working closely with its customers and equipment partners, such as Hilger u. Kern, and sees a strong future in the (semi-) automated application of its GL certified polyurethane structural adhesives. Polyurethane can deliver a much faster cure time, along with lower exothermy and better fatigue properties. With new equipment solutions, even greater time savings can be achieved, while reducing scrap for our customers.

What current and future challenges do you recognise for suppliers in the production process?

System suppliers will also need to thread the needle of delivering performance at a reasonable price. Assuming we move towards more automation, adhesive must be precisely and reproducibly dispensed in very large amounts. The robot, metering equipment and pumps must be up to this challenge, and most importantly, without faulting or failing.

How do you see the co-operation with the Hilger u. Kern / Dopag Group?

Our co-operation in the wind blade market has been very good. There are opportunities to expand co-operation, specifically in the areas mentioned above – increased automation and quality for our customers, while reducing scrap. Working together we can help our customers reduce the total cost to produce a blade, while maintaining competitiveness for years to come.

Henkel operates worldwide with leading brands and technologies in three business areas: Laundry & Home Care, Beauty Care and Adhesive Technologies.

Founded in 1876, Henkel holds globally leading market positions both in the consumer and industrial businesses with well-known brands such as Persil, Schwarzkopf and Loctite.

Henkel, headquartered in Düsseldorf / Germany, has some 47,000 employees worldwide and counts among the most internationally aligned German-based companies in the global marketplace.



Rich Beck:

- Born in New Haven, Connecticut, USA
- Married, 3 children
- 11 years at Henkel
- Global Wind Energy Program Director
- Based in Shanghai, China

Editor

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Marketing Communication

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