

# impulse

Issue 2020

Employee and business partner magazine  
[ensingerplastics.com](http://ensingerplastics.com)



## Coronavirus

Successfully negotiating the crisis

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**A little story for Christmas**

The reviews currently being written are re-examining the year's dominant topic from all angles. I am daring to attempt an article which doesn't feature that word beginning with 'c'. We don't want to miss out on a bit of drama and magic at Christmas time, however.

The temperature is just below 40 degrees, it's a cloudless sky, and the family are irritable. After a six-hour drive, they finally reach the motorway exit in the suburbs of Bordeaux. Before heading towards the coast to their holiday accommodation, the attentive father of the family wants to quickly fill up with fuel. The first petrol pump isn't working, which is met by the family with grumbling as it heats up quickly in the car with the engine off. Fortunately two teenagers come to his aid, guiding the stressed-out driver to a working pump. When the father notices, on paying, that his credit card has been stolen from his trouser pocket, the two teens have already disappeared. Quick – phone and cancel the credit card. But while the victim of the theft is kept on hold for five minutes, 900 euros are withdrawn from three cashpoints.

A few months previously: it is rainy, dark and cold. Kitted out like an arctic explorer, the father of the family goes by bike to the last football home game in front of spectators. It happens in the park: his robust outdoor trousers get caught in the bicycle chain and, owing to the e-bike's impressive torque, are dragged into the workings. The football fan ends up like a tortoise on its back, underneath the heavy bicycle,

unable to free himself from the unfortunate situation. Long minutes pass, then a jogger runs by. Only after several calls for help does he come back to the place of the incident. The teenager is uneasy about being alone in the park, in darkness. But he doesn't go away. He helps. It takes a long time until the trouser leg has been liberated from the chain. The jogger is now shivering with the cold. But he stays for another ten minutes until, with a joint effort, the chain is back where it is supposed to be and the journey can be resumed. As they bid each other goodbye, the teenager says that helping someone goes without saying.

But it doesn't go without saying. Both stories are true. If I hadn't experienced the help in the park, I might have been more cautious at the filling station in Bordeaux. The moral of the story? It's clear to me. This crisis-ridden year has shown us ugly sides, but also lots of things that are heart-warming. The world is not bad, and neither are people. Let's give miracles a chance. Next year as well.

With this in mind, I'd like to wish you a wonderful Christmas period. Make sure you have plenty of rest and relaxation, and stay healthy.

Yours,

Roland Reber

# Ralph Pernizsak completes the Management Board

**April of this year saw Ralph Pernizsak join the Management Board. This gives him – together with existing Managing Directors Klaus Ensinger, Dr. Oliver Frey and Dr. Roland Reber – responsibility for Ensinger GmbH and the Ensinger Group.**

Ralph Pernizsak has been Head of the Shapes Division for six years. He will continue to perform this task alongside his role as Managing Director. In July, he also became Head of the Injection Moulding Division and has functional responsibility for technology and innovation in the Ensinger Group.

**Many years of experience in Asia**

After completing his studies in aerospace

technology at the University of Stuttgart, Ralph Pernizsak began his career as a product manager with the automation specialist Festo. The company posted him to Tokyo, where he took up various managerial positions. On changing to the technology and service company Technotrans, his area of responsibility expanded. After a total of six years in Japan, Pernizsak directed the group's Asian business from its base in Hong Kong before returning to Germany in 2011 to head up a business unit at Technotrans. At the beginning of 2014 came his switch to Ensinger.

Ralph Pernizsak lives with his family of five in Herrenberg. Being an enthusiastic mountain biker, nearby Schönbuch is a paradise for him.



Ralph Pernizsak, Managing Director of Ensinger GmbH and the Ensinger Group.

Questions, suggestions, different opinions? Write to us at [impulse@ensingerplastics.com](mailto:impulse@ensingerplastics.com)

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## >>> From Linz to Wels – Ensinger TECARIM is on the move

The subsidiary Ensinger TECARIM is moving premises, but staying in Upper Austria. From January 2021, the company will no longer be manufacturing its products in Linz; instead it will do so at a new business park in Wels, the second biggest town in the state.

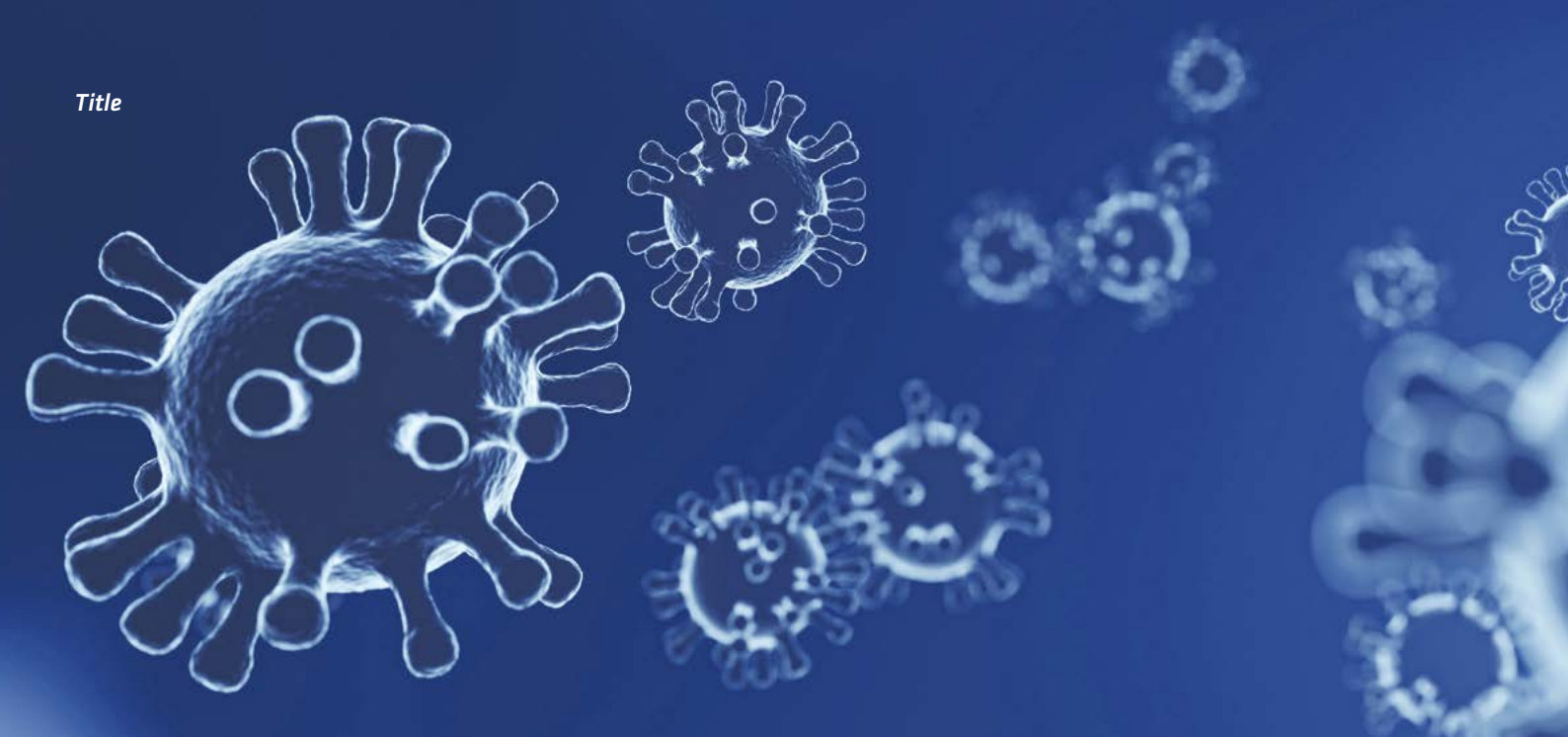
TECARIM became part of the Ensinger Group in 1996. The team, led by Managing Director Ortwin Knaipp, is engaged in the development, manufacture and sale of stock shapes, composites and moulded articles made from the plastic Nyrin. The extremely robust and wear-resistant products are suitable for applications exposed to very high stresses.

Moving to a different location was necessary because there are plans to build residential properties at the old address soon.

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4600 Wels  
Austria

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## The way through the coronavirus crisis

**Our economy hasn't experienced such a severe slump for many decades. The Coronavirus crisis has brought home to all of us just how fragile our global economic system is, and how easily the foundations on which our wealth is based can be shattered.**

**When, at the start of spring, it seemed inevitable that the industry's investment activities would decline in the course of the pandemic, the management and the general works council signed a company agreement approving short working time at the German locations. The model they agreed means that Ensinger can react quickly and flexibly to changes in capacity utilisation. Up to now, we have been able to maintain business activities and deliverability in all divisions without any significant restrictions.**

### Task Force

Above all else, our main priority is the health of our employees. A cross-location COVID-19 Task Force was set up at Ensinger at the end of February. The team, which defines the rules and instructions for handling the Coronavirus pandemic, comprises representatives from management, the areas of HR, TM, QM/Occupational Health, the works council and Corporate Communications, as well as managers and specialists from the three production sites in Germany. Lead by Sven Heidinger (representative: Markus Schroth), the members of the Task Force meet to discuss the situation via Skype at least three times a week and to analyse new medical and scientific findings, adopt specific preventive measures in consultation with company doctors and to communicate to the workforce the decisions that are made.

### Prevention plan

The hygiene prevention plan that was derived from statutory requirements and recommendations from the Robert Koch Institute were summarised in a factory standard in August. In addition to

the catalogue of measures, this document also contains a decision matrix for handling suspected and actual cases of infection at Ensinger. However, such is the dynamic of the pandemic that any suspicion of infection with the SARS-CoV-2 virus must be responded to quickly and on a situation-specific basis together with the health authorities. Of course, the Task Force is also available on weekends.



Coronavirus has become part of our everyday life, both privately and in business. In the Ensinger production areas, the code of conduct aims to minimise risks to health by means of safe distances, protective masks and reduced contact as well as by forming production cells. In the now less-densely populated offices, just like in our home offices, we are using virtual formats for discussions with our business partners. But everyone who works with and for Ensinger is missing face-to-face contact, not to mention anniversary and Christmas parties and those other occasions that contribute towards our solidarity and corporate culture.

### International cooperation

This year has once again shown how important individual employees are for a company when it comes to successfully steering through a crisis. This was especially true at the start of the first wave, when the exponentially rising rates of infection all over the world led to a sharp increase in demand for medical equipment. In association with external partners, Ensinger participated in projects aiming to make larger numbers of plastic components available for medical products. The divisions and sites of the corporate group worked closely together on many of these activities, sometimes even internationally. If one location suddenly didn't have enough production capacities, for example for producing components for breathing apparatus for COVID-19 patients, the production quantity was distributed to other Ensinger plants.

### Light at the end of the tunnel

Compared with other companies, we have had only a few cases of COVID-19 at Ensinger. This fact has helped us to overcome the economic challenges resulting from the pandemic. With short-time working, cost-cutting measures and cautious investment, we can compensate for the decline in sales in individual business areas, some of which have been very large.

Evidence currently suggests that the broad-based plastics industry is emerging from the Coronavirus crisis less damaged than was initially feared. Even the management of the Ensinger Group is cautiously optimistic: "If we approach 2021 in the same way as we have done this year, we will continue to cope very well with the crisis. The good news about possible vaccines gives us the hope of seeing light at the end of the tunnel in the New Year," predicts Dr. Roland Reber in his management letter to all employees.

### Support from "myEAP"

The Coronavirus pandemic and the prolonged phase of short-time working go hand in hand with a good deal of uncertainty for many of our colleagues. Both in our everyday work and in our personal sphere, there can be situations that cause us stress, lead to exhaustion or place a strain on our physical and mental well-being.

The Ensinger Assistance Program "myEAP" offers competent support. The external advisory service is available by telephone around the clock. The professional team consists of experts in

the fields of medicine, psychology, education, social work, family and law. Each advisory session is free of charge and confidential for all Ensinger GmbH employees and their first-degree relatives.

If you have not yet received your "myEAP" brochure and access data, please contact your HR Business Partner.

meinEAP  
IM GRÜNEN BEREICH BLEIBEN

## How can I protect myself and others?

Coronaviruses are released into the air when we cough, sneeze, talk and breathe. They are transported in larger droplets and in very fine particles, aerosols, that float in the air.

If droplets containing the virus come into contact with the mucous membrane of healthy people, they can become infected. A face mask that covers your mouth and nose chiefly prevents the transfer of large droplets but also reduces the emission of aerosols. The mask protects the wearer from larger droplets from their counterpart. However, most masks do not provide much protection for the wearer from aerosols. That's why we also need to keep our distance and keep spaces ventilated with fresh air.

As a rule of thumb: the fewer contact situations we have, the less time we spend in enclosed spaces and the more distance we keep from each other, the more I protect myself and other people from a COVID-19 infection.

Even with a mask you should cough or sneeze into the crook of your arm.





# Capacity adjustment at the injection moulding plant

The Rottenburg-Ergenzingen site is the German development and production site for the injection moulding division. Even last year, the falling demand from the automobile production sector – the most important customer for injection-moulded parts made from high-performance plastics – had already resulted in a significant drop in sales and order volumes. “The coronavirus pandemic has further exacerbated the structural crisis in the automotive sector. To help counteract this, Ensinger is having to make capacity adjustments at the site”, is what the division’s Managing Director Ralph Pernizsak told employees at the end of June. “Thanks to the broad positioning of the family-run business, we are able to safeguard several jobs through transfers to other departments. Sadly that doesn’t apply to all positions, and we are having to lose some of our core workforce”, said Pernizsak. Eleven employees from the division have been offered voluntary redundancy and more than 20 have taken up the offer of switching to comparable vacant posts at the headquarters in Nufringen.

“Protecting jobs is the most important aim behind this capacity adjustment. The injection moulding division’s ability to deliver will not be affected by these measures”, emphasises Ralph Perniz-

sak. “We are working furiously to strategically reposition the site, and in the medium term want to reduce our dependence on the automotive sector.” On the basis of a completed preliminary project, the senior management – supported by the CIP team and EVI facilitators – decided on short-term measures for increasing efficiency and defined three long-term goals for the Ergenzingen site:

1. In the areas of Sales and Marketing, the injection moulding plant will become more interlinked with other divisions of the Group
2. Clearly structured workflows will accelerate the decision-making in response to customer requests
3. The production strategy is being developed against the backdrop of the desired cost minimisation, and will be implemented soon

With these changes to the culture and organisation of the injection moulding division Ensinger is also breaking new ground. The work packages are being discussed in short ‘sprint meetings’ and then worked on in teams. This flexible approach helps with rapid implementation and involves lots of employees in the transformation process.

## >> India: Moved to Mumbai

Our Indian subsidiary has moved its headquarters from Pune to Thane just outside Mumbai:

**Ensinger India Engineering Plastics Pvt Ltd.**  
2205, 22nd Floor, SOLUS Building,  
Hiranandani Estate  
Thane West – 400607  
India

## >> Italy: New postal code

At Ensinger Italia in Busto Garolfo, the last two digits of the postal code have changed. The new address is:

**Ensinger Italia S.r.l.**  
Via Franco Tosi 1/3  
20038 Olcella di Busto Garolfo  
Italy

# A warm welcome ...

## Employees who have joined Ensinger GmbH from January to end of November 2020

### Nufringen

#### Compounds

Jannik Mau  
Dominic Rudolph

#### Finance & Controlling

Judith Grimm  
Nadine Hemmer

#### HR

Marcel Kurz  
Marina Pavlovic  
Kathrin Steinle

#### Industrial Profiles & Tubes

Marius Graf  
Tim Marquardt

#### insulbar

Michael Johann Herbst  
Gabriele Enrico Uslenghi

#### IT

Jens Dettinger  
Philipp Frank  
Volker Hohl  
Daniel Messner  
Nils Niemann

Evgenij Stickel  
Tobias Vögele  
Michael Wende  
Stefan Willmer

#### Shapes

Marcus Dengler  
Arbnor Halimi  
Milos Maksimovic  
Marcel Nast  
Benjamin Saur  
Isabel Vollmer  
Evelyn Widmaier

#### Tooling

Julian Schweitzer

#### Apprenticeship:

#### IT Specialist

Gero Strotbek

#### Mechatronics Technician

Jannik Schölch

#### Industrial Management Assistant

Fabian Fenchel

#### Process Mechanics

Endris Feka  
Marius Haag  
Leon Keuler  
Enes Öcal

#### Tooling Mechanics

Marco Aichele  
Nikolai Herz  
Erkan Melendiz

#### Bachelor programme:

#### Business Informatics

Katharina Balg

#### Industrial Engineering and Management

Tom Nothacker

### Cham

#### Composites

Daniel Grauer

#### insulbar

Tanja Elkner  
Denis Kuschtscha

Martin Späth  
Christian Zoller

#### Machined Parts

Stefan Barbu  
Tim Brahmer  
Luisa Breu  
Markus Riederer  
Dominik Sporrer  
Sandro Steubl  
Marius Willmann  
Florian Zeitler

#### Technical Management

Moritz Haider

#### Administration

Melanie Breu

#### Apprenticeship:

#### Machining Mechanics

Stephan Baumann  
Jonas Gmach  
Lukas Kagermeier  
Jonas Lankes  
Kevin Lankes

# With the best thanks ...

## This year the following employees celebrate their company anniversaries at Ensinger GmbH:

### 25

### Nufringen

Ioannis Argiriadis  
Klaus Ensinger  
Rainer Haag  
Waltraud Lehmann  
Beate Losert  
Christian Roehm

Andreas Schittenhelm  
Ute Selle  
Kuldip Singh  
Marco Tell

### Cham

Rainer Bernhard  
Christian Deml  
Christian Denk  
Manfred Ederer  
Juergen Heumann

Max Kiefl  
Margit Marchl  
Alois Niebauer  
Guenther Obermeier  
Georg Oswald  
Maria Platzer  
Hans Rank  
Manfred Rueckel  
Michael Silberbauer  
Christian Spiessl  
Franz Stamm

Thomas Staudner  
Martina Steinkirchner  
Andreas Strasser  
Alfons Vogl  
Josef Wanninger  
Herbert Weidinger  
Wilhelm Wenzlick  
Harald Zabochnik

### 40

### Nufringen

Salvatore Mura  
Ingeborg Tobolla

### Cham

Johann Ederer  
Norbert Wegerer



## Degree course in Germany, placement overseas

For three years, her studies at the Cooperative State University (DHBW) alternated with periods of practical work at Ensinger in Nufringen. This summer, Evelyn Widmaier successfully completed her Bachelor's degree and is now a graduate of Industrial Engineering and Management. Before her final examination, Evelyn Widmaier had the opportunity of an internship in the United States. Here is her report:

At the beginning of this year I had the chance to work on a project at the American subsidiary Ensinger Inc. in Washington, Pennsylvania. My task – together with my colleague Katelyn Oleskey who works at the site – was to optimise the existing layout of the production hall. Katelyn is also an industrial engineer and consequently is often deployed in areas where there is a need to generate improvements or plan and implement projects. The construction of a new warehouse on the plant site in Washington had freed up a lot of space in the production hall. The aim behind the redistribution of the areas was to optimise the workflow between the departments. There was also a desire to improve safety by setting up key traffic routes. Ulti-

mately, we succeeded in developing a concept which everyone was satisfied with because it significantly increases the efficiency of the value added chain. Although the nine weeks at my disposal didn't allow me to be there for the implementation of the layout, a benchmarking visit in Grenloch allowed me to get to know a second US site. Thanks to colleagues at the premises taking me under their wing, I was able to see lots of Pittsburgh and the surrounding area during my free time. Going to top golf games together, enjoying a cosy Super Bowl evening, as well as several cooking and baking events gave us lots of opportunities to swap experiences and traditions. I would not have missed this period of time abroad,

especially because the project at Ensinger in the USA also taught me a lot about my field.



Evelyn Widmaier (left) and Katelyn Oleskey (right).

# Operational Excellence at Ensinger

At the works meeting in June 2019, Klaus Ensinger emphasised the importance of Operational Excellence (OPEX) within the company. OPEX, as a functional initiative, is being directly promoted by the Management Board. Firstly the following question arises: What actually is Operational Excellence? There are numerous definitions.. The OPEX team, founded a year ago (consisting of Dr. Oliver Frey, Thomas Dressler, Klaus Mauderer and Christian Wöldecke) decided that Operational Excellence, for our company, can best be described with the

following sentence:

**“Ensinger is an organisation that achieves lasting improvements through the targeted use of tools and approaches which measurably and consistently increase efficiency.”**

Or to put it more simply:

**“Doing what we do but better”.**

In response to this, the OPEX team defined over several workshops how this

aspiration can be made a reality in the company: An essential aspect of this is the systematic control of processes by means of key figures. Good groundwork for this has been done with the Ensinger Business Review, and this must now be built upon. In addition, the team are supporting selected projects which have high potential for increasing efficiency – for example, by members of the OPEX team acting as project managers or team members. Future issues of impulse magazine will regularly feature reports on OPEX progress and results.

## Wilfried Ensinger prizes 2020

Evelyn Widmaier has been awarded the Wilfried Ensinger prize for her achievements during her studies at the Cooperative State University (DHBW) and during the practical periods in the company. Two trainees have also been recognised for their excellent examination results: In Nufringen, toolmaker Julian Schweitzer was awarded a Wilfried Ensinger prize, while in Cham this honour went to Marius Willmann, a cutting machine operator. Congratulations!

## Two steps further: Environmental and energy audit successful

by Markus Schroth, Quality Management, Head of Health, Safety and Environment

In the last week of September, the three production sites of the limited company were successively audited in line with the new standard on energy management ISO 50001, 2018 edition. A second focus was the first-time certification of the sites of Cham and Nufringen in line with the international environmental management standard ISO 14001. The introduction of ISO 14001 was prepared for well through internal audits, workshops and team discussions – something not to be taken for granted in difficult circumstances such as the pandemic and staff working on short time. This makes us all the more delighted that the certificate has been granted. Optimisation of corporate performance in the fields of energy and environment can only succeed if we collectively define key figures

and achieve further improvements through the ongoing implementation of measures. Indeed, this improvement cycle was emphasised by the DQS auditors – something that makes us a little bit proud and motivates us further. It is easy to illustrate the improvement over the years using the example of energy-related performance: We as a company determine the CO2 reduction achieved through a variety of measures, for example purchasing shares in green electricity and conserving kWh as a result of on-site improvements. Expressed in figures, for the years 2018 and 2019 this means a reduction of 6,710 tonnes of CO<sub>2</sub>, equating to 536,800 trees which would be needed to absorb this quantity of CO<sub>2</sub>.

## Relief effort for refugees in the Ukraine



Ensinger employees donated articles of clothing, shoes, blankets and toys. Olga Meier, Kaljopa Stafidova, Edith Holzberger (Wilfried and Martha Ensinger Foundation) and Irene Riedel (f. l. t. r.) helped with the sorting and packing in Nufringen.

Several tonnes of donations for refugees in the Ukraine were collected during the fourth relief effort by the Wilfried Ensinger Foundation. Employees from Nufringen, Ergenzingen and Cham once again brought clothing, toys, blankets and even complete beds to the collection point, where volunteers packed up the donations. At the end, the pallets just fitted on the semi-trailer that left Nufringen on the way to Kiev, where the donations were distributed by partner organisation of Osteuropahilfe. According to figures from the United Nations, there are several hundreds of thousands of internally displaced people in the Ukraine.

ensinger-stiftung.de/en





# Prepreg facility commissioned

Organosheets and plates round off the thermoplastic composite material portfolio

Since 1966, Ensinger has been active in the field of engineering polymers. Today, the corporate group's range of products and services covers the entire value added chain - from compounding and extrusion, injection moulding and stock shapes through to finished components. In the business area of thermoplastic composites, Ensinger added some years ago plates and components made from fibre-reinforced thermoplastics, predominantly for applications in the medical market.

Now the Ensinger Group has invested further in the field of composite materials; at the Cham site (Bavaria), a new facility has been commissioned for the production of thermoplastic prepregs. Ensinger's range now encompasses thermoplastic, continuous fibre-reinforced semipregs and prepregs, organosheets and compression moulded composite plates from a wide range of material combinations.

## Fabric-based semipregs

Among the composite materials being produced by Ensinger at the new facility in Cham are thermoplastic semipreg materials (TECATEC CP). These single layer semipregs made from carbon or glass fibre fabrics are coated with thermoplastic matrix materials. The materials here range from engineering polymers such as polycarbonate and polyamides, to high-performance plastics such as PEI, PEEK and PEKK. Alongside stock materials, its in-house compounding allows Ensinger to also address most customer requests.

## Fabric-based prepregs

Also new to the portfolio are thermoplastic prepreg materials (TECATEC IP). These are fully impregnated and consolidated, single layer plies made from carbon or glass fibre fabrics. With these prepregs, the full range of matrix polymers is available. In addition, Ensinger offers customised

matrix and fibre combinations, fibre architectures or matrix materials on request.

All semipreg and prepreg products from Ensinger can be processed further into organosheets, thermoplastic composite parts or stock shapes.

## Organosheets from composite materials

Thermoplastic organosheets are multi-layer, fully impregnated and consolidated fibre composite materials produced from carbon fibre or glass fibre fabrics and a variety of matrix materials. The organosheets (TECATEC OS) from Ensinger consist of several layers of prepreg or semipreg material, which are stacked according to the customer's specification and then consolidated to form a laminated organosheet with a thickness of up to 5 mm. The organosheets offered on coils or as plates can be used for thermoformed parts or for the straightforward manufacture of thicker parts.

## Advantages of the thermoplastic matrix

Continuous fibre reinforcements, e.g. from carbon fibre, enable high rigidity and strength with extremely low weight. The thermoplastic matrix offers many advantages over conventional thermoset (epoxy) matrices, including high impact strength, chemical resistance and thermal stability. A further advantage of the thermoplastic matrix is the thermoformability of the stock shapes and the resulting shorter process times compared with thermoset fibre composite materials. By selecting a suitable matrix material, a wide range of customer requirements can be met. In addition, thermoplastic composites offer a green option to customers. Unlike thermoset composites, thermoplastic composites can be recycled, be this in the form of component recycling or further use of production waste.

# Composite plates: lightweight, stiff and strong

## Continuous fibre-reinforced thermoplastics

For applications where the mechanical requirements are too high for unreinforced or short fibre-reinforced plastic stock shapes, continuous fibre-reinforced thermoplastic plates offer an excellent alternative. Thanks to the continuous fibre reinforcement, usually a woven fabric of glass or carbon fibres, they have mechanical properties otherwise achieved only by metallic materials. At the same time, they are significantly lighter than most metal-based alternatives.

Through the use of thermoplastic matrix materials, the plates nevertheless have the same advantages as unreinforced plates made from thermoplastic materials: high impact strength, constant properties over a broad temperature range, chemical resistance and high elongation at break. Plates made from continuous fibre-reinforced thermoplastics can be processed into finished parts of outstanding quality with minimal tolerances.

## 3 new materials

Ensinger has widened its portfolio of composite plates to include three new materials:

### TECATEC PPS CW50 black

- Excellent high-temperature resistance
- Very good chemical resistance
- Very good dimensional stability over a broad temperature and humidity range
- Carbon fibre reinforcement increases stiffness and strength

### TECATEC PEI GW50 natural

- High continuous service temperature (170 °C)
- Good electrical insulation
- Fire, smoke and toxicity retardant (FST)
- Glass fibre reinforcement increases the mechanical properties while keeping costs down

### TECATEC PC CW50 black

- Outstanding appearance thanks to crystal-clear, transparent matrix
- High impact toughness
- Carbon fibre reinforcement increases stiffness and strength

## As light as plastic, as stiff and strong as metal

The new composite plates have densities between 1.5 and 1.8 g/cm<sup>3</sup>, giving them a similar specific weight to unreinforced or short fibre-reinforced plates. Nevertheless, the reinforcing fibres increase their mechanical properties dramatically to a level similar to metal. Compared with unreinforced polymer plates, continuous fibre-reinforced plates achieve values that are 5 times higher for both tensile strength and Young's modulus.

## Low linear thermal expansion

Continuous fibre-reinforced thermoplastics exhibit extremely low coefficients of thermal expansion (CTE). This property is of great importance for applications in

The thermoplastic composite-plates can be obtained from Ensinger in thicknesses of 0.5 mm to 95 mm.

which the parts are subjected to temperature fluctuations over a broad range and where high precision is required.

## Outstanding mechanical properties

The thermoplastic matrix gives the plates high impact toughness, with the value significantly higher than in plates with a thermoset matrix such as epoxy or phenolic resins. Moreover, the high elongation at break of the thermoplastics ensures tough, non-brittle fracture behaviour.

## Fields of application

Fields of application for continuous fibre-reinforced thermoplastics include the aerospace industry, mechanical engineering, the automotive industry and the sports equipment sector. In particular for the manufacture of prototypes and small batches, stock shapes are of interest as an affordable option for making small quantities.

## Further information

[ensingerplastics.com/composites](https://ensingerplastics.com/composites)

## Sales contact

[composites@ensingerplastics.com](mailto:composites@ensingerplastics.com)



Christian Deml on the new production line in Cham.



# Polyimide materials: Sintering techniques for extreme demands

Interview with Dr. Gernot Nuss, Head of Development Ensinger Sintimid

■ **Five years ago, Ensinger moved the headquarters of its Austrian subsidiary from Lenzing to Seewalchen/Attersee. The site is where subsidiary Ensinger Sintimid manufactures stock shapes and finished parts from polyimide materials (TECASINT product line). Production of the P84 polyimide powder (TECAPOWDER) still takes place in nearby Lenzing. Dr. Gernot Nuss, Head of Development, supports both divisions. Talking to Doris Gahleitner, Marketing Coordinator at Ensinger Sintimid, the engineer explains his role.**

*In Seewalchen, polyimides are processed with the aid of sintering techniques. What is special about this process?*

At Ensinger Sintimid we use the HCM process (Hot Compression Moulding) to manufacture the rods, sheets, short tubes and finished parts. For this the polyimide powder, usually together with fillers and special additives, is sintered at high pressure and temperatures up to over 400 °C. Where plastics are concerned it is unusual for high-temperature polymers to be processed using conventional powder metallurgy and ceramic techniques.

*What makes the polyimides stand out?*

The different types of the product line TECASINT have extremely high long-term thermal stability – the functional temperature range is from -270 °C to +300 °C. Even when briefly heated to 350 °C these materials do not melt or soften.

*What are the target markets for TECASINT?*

The chief markets are high-end applications in the mechanical engineering sector, for example ball bearing cages which are designed for speeds of up to 500,000 RPM. Other fields of application are aerospace technology and the semiconductor industry.

*How do you influence product development in the field of polyimide powder, i.e. TECAPOWDER P84?*

We are constantly trying to improve our products where possible. To do this we analyse the process technologies and working processes or launch projects in which we focus specifically on individual topics, for example on optimising the mix quality. I also contribute to important modernisation projects such as the digitalisation of powder production. A large part of my responsibility consists of the monitoring and compliance of the REACH regulations, because the health of the customers and employees is top priority.

*How do the P84 products differ in general?*

The TECAPOWDER product range is also becoming ever wider. The various products differ in the chemical composition of the polymer or stand out for specific particular size distributions. This means that we can offer each customer the right P84 polyimide powder for their applications.

## Short vita



After his studies in technical chemistry and a dissertation completed with excellent marks in the field of inorganic chemistry, Dr. Gernot Nuss gained his first professional experience at the University of Graz. After his assistantship, he worked at Internorm International as a material and extrusion expert and was a member of the innovation management team. He joined Ensinger Sintimid as a developer in the field of TECASINT in 2015. Gernot Nuss has a five year-old son and is a gifted guitarist. His hobbies include photography and cooking.

# Improving the performance of lithium batteries

High-temperature polyimide TECAPOWDER P84 improves the electrochemical properties

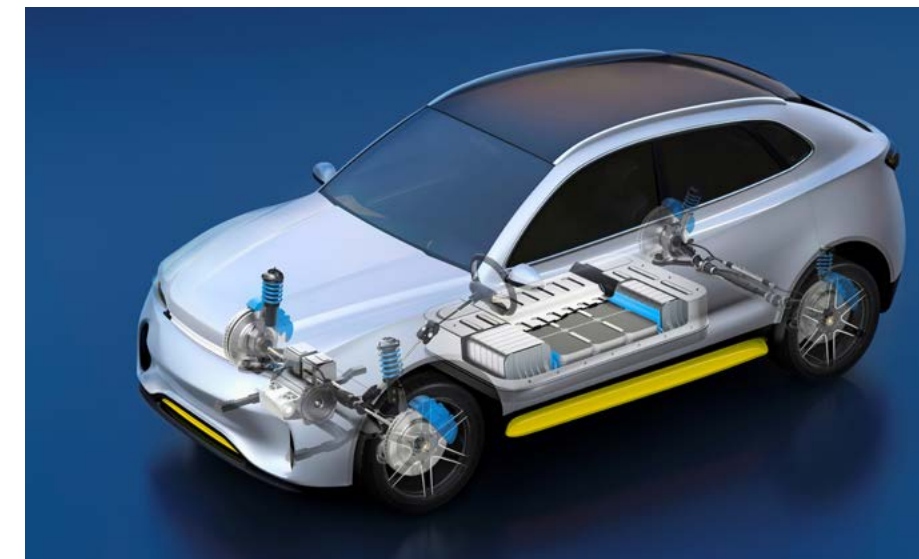
■ **Demand for electric vehicles and energy storage systems is rising. A key factor when it comes to competitiveness vis-à-vis combustion engines and acceptance of the systems is the battery technology. Progress in the field of electrical performance is considerable. For example, the energy density of lithium-ion batteries has almost doubled within the past ten years.**

Manufacturers of electric vehicles face the challenge of developing innovative batteries with improved charging and discharging rates. The decisive factors in a long service life – even after several charging cycles – are the adhesion and thickness of the coating. Here, highly adhesive, soluble high-temperature polyimides are used as binding agents.

Acting as an electrode binder, the fully imidized polymer TECAPOWDER P84 improves the performance both of batteries with lithium ions and those with lithium-ceramic technology. The high-performance plastic processed by Ensinger Sintimid in Lenzing (Austria) is a thermally stable, co-polyimide-based binding agent and can bind with highly polar solvents. As a result, TECAPOWDER P84 improves the performance of anodes, cathodes and separators in batteries.

Studies have confirmed that highly adhesive, soluble P84 co-polyimides, when used as binders in heavy-duty anodes on a Si/C basis, in particular improve the electrochemical properties (cycling performance and rate capabilities) but also simplify the anode preparation process.

Compared with other polymeric binding agents such as polyvinylidene fluoride (PVDF) TECAPOWDER P84 is not flamma-



ble, non-meltable, is a good insulator and stands out for good adhesion to metals.

## Property profile

- High thermal resistance
- Good wear resistance at elevated temperatures
- Very good creep resistance
- High compressive strength
- Very high glass transition temperature
- Excellent mechanical properties
- High purity
- Good plasma erosion
- Low outgassing

In battery manufacture the polymer can be applied in dissolved form or using a dry-coating technique. Ensinger offers TECAPOWDER P84 for the production of high-performance lithium batteries in lots of different variants, from solution-quality granules through to fine powder.

## Grades

TECAPOWDER P84 SG: Granules for the production of polyimide solutions

TECAPOWDER P84 fine mesh grades: for use in dry-coating processes

Ensinger Sintimid has been processing non-meltable polyimides for more than 30 years. Production in Lenzing is ISO-certified.

## Further information

[ensingerplastics.com/p84-powder](https://ensingerplastics.com/p84-powder)

## Sales contact

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# Tübingen University Hospital honours Wilfried Ensinger

## Donations to research into and treatment of rare diseases

Tübingen University Hospital founded the first Germany-wide Centre for Rare Diseases (ZSE Tübingen) ten years ago. The ZSE now looks after over 5,000 patients a year. Before the ZSE was founded, Germany did not have an institution for treating rare illnesses. The number of enquiries was overwhelming right from the start. A therapy research centre was opened in 2013, also thanks to a generous donation from Wilfried Ensinger and his wife, Martha. The company founder was awarded the Leonhart Fuchs Medal, the highest honour granted by the Tübingen Medical Faculty, in February of this year. Wilfried Ensinger explained how, during his active time as an entrepreneur, he based his investment decisions on figures. At the time, he spontaneously provided the sum of money for the ZSE with his wife's approval. He was "convinced that the research centre was a good thing. They can be proud of what they have created from nothing: that's a piece of entrepreneurship," said Wilfried Ensinger, praising the initiators. A second Leonhart Fuchs Medal was awarded to Eva Luise Köhler. The wife of former German Federal President Horst Köhler has

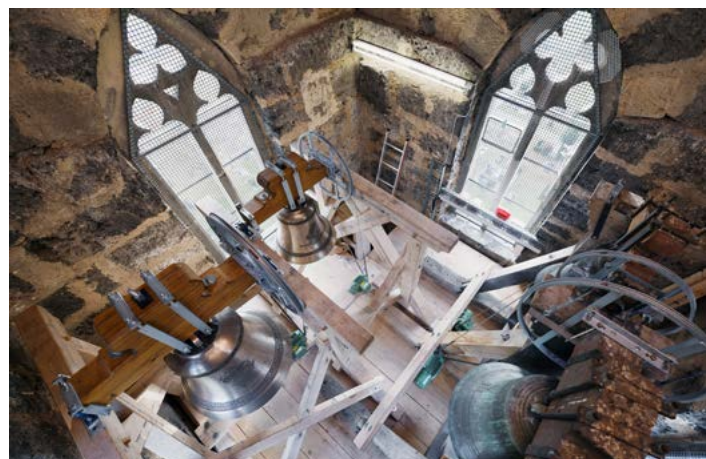
been the patron of the Alliance for Chronic Rare Diseases (ACHSE) in a voluntary capacity for 15 years.



As thanks and in recognition of their services in founding and setting up the Centre for Rare Diseases (ZSE Tübingen), Wilfried Ensinger (2nd f. l.) and Eva Luise Köhler (centre) received the Leonhart Fuchs Medal. The highest award of the Medical Faculty was awarded by the speaker of the ZSE, Prof. Olaf Rieß (left), Dean Prof. Dr. Ingo Autenrieth (2nd f. r.) and Department Head Ulrich Steinbach (right).

# In remembrance of Martha Ensinger

## New bells for Rottenburg's Sülchenkirche



The Martha bell and the Meinrad bell complete the peal in the Sülchenkirche. The two old bells (right half of image) date back to the years 1682 and 1727.

The two new bronze bells that will ring out in Rottenburg's Sülchenkirche weigh 500 and 180 kilos respectively. The larger bell, which Wilfried Ensinger sponsored in memory of his late wife, Martha, is engraved with a quotation from the first Corinthian letter: "And now there remain faith, hope, and charity, these three: but the greatest of these is love." The smaller bell, also sponsored by the company founder, is dedicated to Saint Meinrad. The renovation of the belfry was completed this year. The peal now consists of four bells whose chimes are in perfect harmony. Wilfried Ensinger says that church life still means a lot to him at 84. "My faith is my innermost conviction; it has helped me in difficult times and gave me strength."

# insulbar innovations at BAU

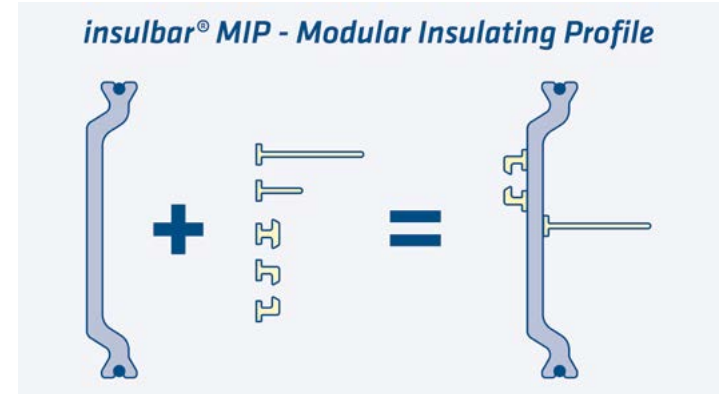
Improving the energy-efficiency of windows, doors and façades while conserving resources

"As a leading trade fair, BAU remains an important meeting point for the industry – even if the coronavirus means we can only come together online", says Matthias Rink, Sales Director at Ensinger. "Between 11 and 15 January we will be using our virtual showroom to present highlights from our portfolio along with two innovations. In addition, we will be available in the live chat facility to personally answer all questions to do with the thermal break of metal systems." Existing and potential customers can already register via [showroom.insulbar.com](http://showroom.insulbar.com) to arrange appointments.



During the coronavirus crisis, proper dialogue with customers in an atmosphere of mutual trust is still very important to Ensinger – the plastics specialist is inviting customers to its digital showroom.

For the first time, Ensinger will be presenting insulbar RE-LI, which conserves valuable resources in two ways. The insulating profile combines the outstanding environmental footprint of unmixed recycled polyamide with the greater insulating effect of foamed material. Compared to conventional polyamide bars, consumption of fossil fuels and CO2 emissions drop by around 90 %, and water consumption by almost 75 %, in its production phase. In addition, the lambda value is significantly improved thanks to the foamed design of the material.

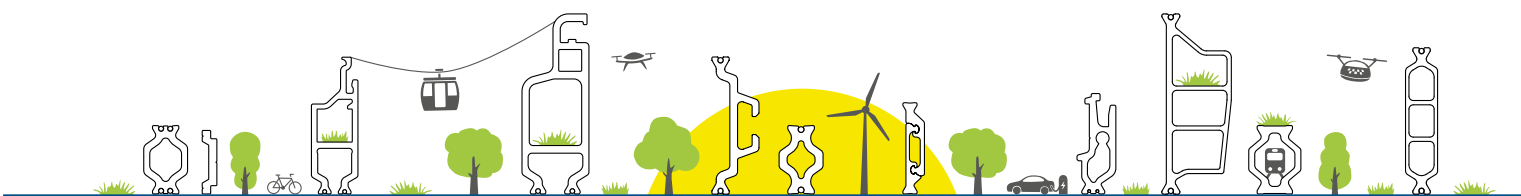


## Sustainability and efficiency

A further innovative concept in the form of insulbar MIP (Modular Insulating Profile) will be showed and discussed. This is a 'construction kit' for insulating bars for which a patent has been filed. It allows basic profiles and functional zones to be combined without the need to develop new tools each time. The intention is to use this modular concept to produce a wide variety of profile geometries even more quickly and easily in the future.

Ensinger's showroom is all about sustainability and conserving resources. All insulbar product solutions contribute to green construction and to the attainment of climate goals. It is not only the core benefit of insulbar, the thermal break in metal frames of windows, doors and façades, but also the materials used, e.g. unmixed recycled polyamide in the case of insulbar RE and RE-LI, which pay into this 'account'.

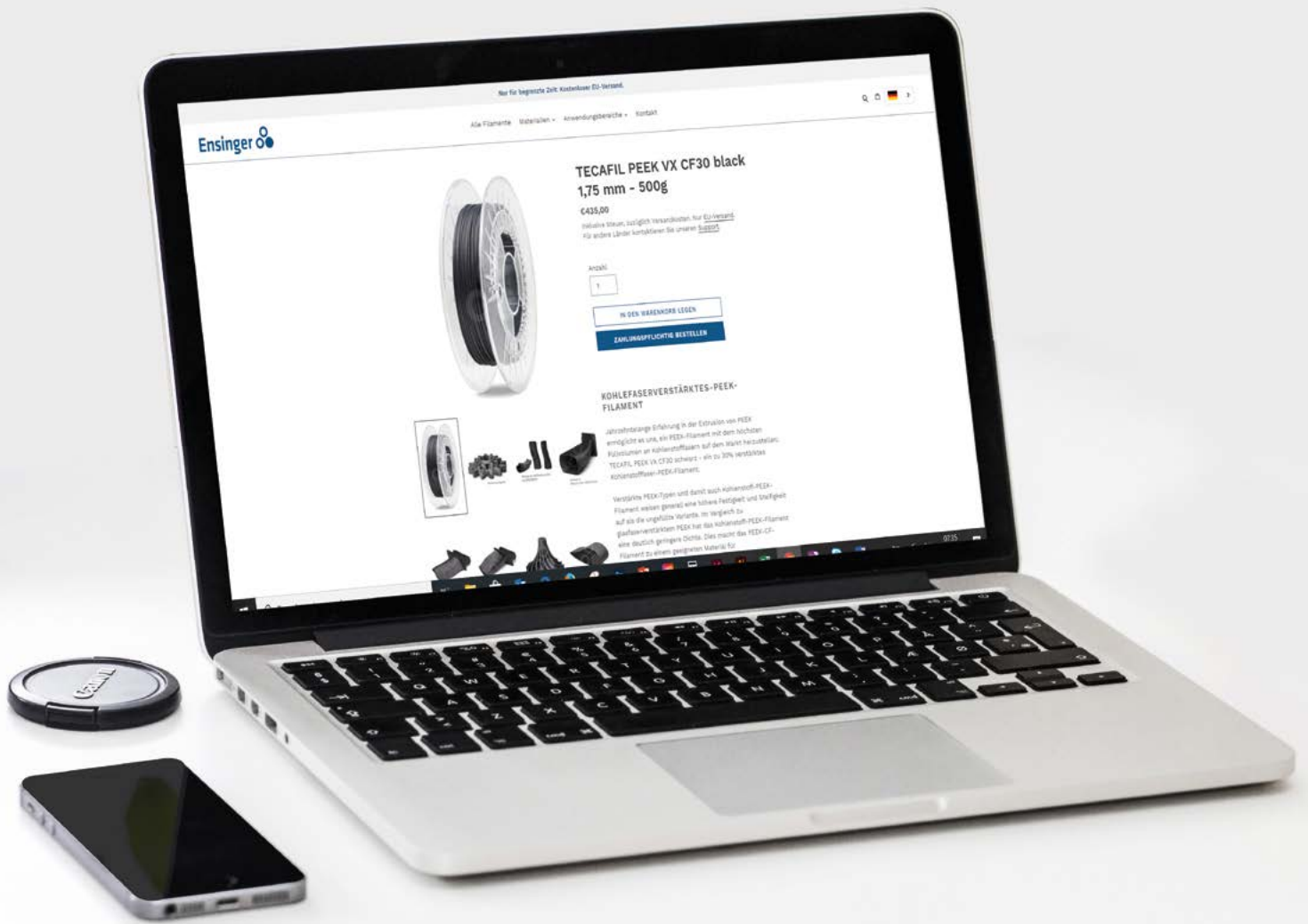
**Ensinger is exhibiting:**  
January 11 - 15, 2021  
[showroom.insulbar.com](http://showroom.insulbar.com)



think tomorrow. think green. think insulbar.

for a better future





## Online filament shopping

Ensinger was quick to see the potential of additive manufacturing and now offers a large selection of high-quality filaments under the brand name TECAFIL. Some of these were developed in close cooperation with 3D printer manufacturers.

But how can a material portfolio present itself clearly and market itself easily in a rapidly growing, transparent market? The solution: an online shop which is open to all business and private customers in the EU. A small team consisting of two divisions (Shapes and Industrial Profiles & Tubes), supported by four Service Centers (IT, Finance & Controlling, Legal Affairs and Marketing), was able to launch the new web shop in record time. Through a pragmatic approach it was possible to clarify the tasks connected to direct sales – such as

delivery and payment processes or packaging optimisation – just as rapidly as the legal aspects. After just three months, the interdisciplinary project to which – for once – the term “agile” really does apply, was successfully completed.

By going to [filaments.ensingerplastics.com](https://filaments.ensingerplastics.com) anyone interested will find Ensinger’s wide range of materials: high-temperature plastics from PEEK to PVDF, engineering plastics from PA6 to PET-G as well as diverse glass- and carbon fibre-reinforced filaments. Soon, further market-specific modifications such as flame-retardant or biocompatible filaments will be complementing the portfolio. Data-sheets, parameters for 3D printers and comprehensive advice round off the online shop