

TRANSFER

The Steinbeis Magazine



Professional application of innovation

Guaranteed quality, grain for grain

Automatic image analysis for checking cereal grains

Electric thunderbolts under the hood

New high-tech materials

Attracting interest – fuelling motivation

Pupil's laboratory in Singen

Are all metals created equal?

A Steinbeis study on the range of UHF metal transponders

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Editorial

Dear readers,

Whew! We made it! Spring's around the corner. Everything's budding in the garden. At some point the crisis will be over. And the economy is on the up. Just like last time. And the time before that – correct me if I'm wrong.

Suddenly, everyone's forgotten about the resolutions they made – to save money wherever possible, to seek out new products and technologies, and launch them (to reduce our dependence on others).

Now, we could leave it to the psychologists to describe this phenomenon – with profound insights and studies. But that won't solve anything. So let's apply a bit of common sense and look at it from a fresh angle. We can learn from the past: watch the markets carefully, be creative, be brave, cash in on our ideas, and translate our knowledge into actions, and we'll be fine. Because it's precisely this knowledge that makes us what we are, and sets us apart. But let's not forget to protect our intellectual property – there's nothing more annoying than an idea being used to the benefit of the competition.

Small and medium-sized enterprises have a tendency to underestimate how easy it is to protect their know-how – with patents and registered trademarks. While everyone here in Germany is still grappling with the key thrusts of the Bologna Process and bachelor programs, in China, scientists are quickly undergoing training at 750 universities. In 2007, 160,000 Chinese engineers registered worldwide patents, 30,000 more than their German counterparts.

So what happens next? We can't stop the flow of the tide, but we can use our ingenuity. With creative strategies, exciting developments, new teaching and learning methods, and clever concepts. Does this strike a chord with you? Then allow Steinbeis to provide you with inspiration, and let's enjoy the advent of spring.

Wolfgang Müller



Wolfgang Müller is head of the Steinbeis Transfer Center Infothek in Villingen-Schwenningen. Turn to page 14 to read about the work of the SIGNO network, where experts like Wolfgang Müller have set up a standard for evaluating patents.



Design study for a Besatz analysis device

In manual Besatz analysis, a sample of the cereal grain delivery is taken and sieved, roughly separating the contents into different fractions according to grain size. A laboratory worker then inspects these fractions visually and removes impurities manually. The results of this Besatz analysis help to decide whether to accept or reject the cereal delivery and how much to pay for it.

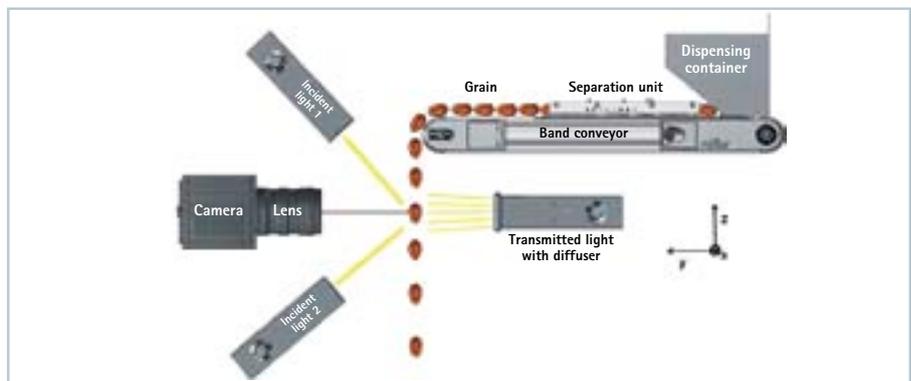
Automatic Besatz analysis is based on the principle of recording images of the individual grains and impurities as they fall, using a charge-coupled device (CCD) color line-scan camera. Line-scan cameras can record images non-stop at very high resolutions, making them ideally suited to a constant stream of free-falling grains. As the grains are constantly in motion, the second dimension to the image is created automatically. When recording color images, color line-scan cameras split the visible spectrum into three color channels: red, green and blue (RGB). To achieve optimum color resolution and dynamics, the device uses a three-line camera with a beam splitter to direct the light onto the three separate lines.

This setup requires a combination of three light sources – two to act as incident light and one as transmitted light. A short exposure time avoids motion blur as the grains fall, but this requires high light intensity. So the light source must have extremely high output, excellent homogeneity and clearly defined spectral emissions – as well as high efficiency,

Automatic image analysis for quality control of cereal grains

Guaranteed quality, grain for grain

Mills and silos use strict quality criteria to determine whether to accept or reject deliveries of cereal grains. However, the Besatz analysis – which determines the composition of the cereal – is still performed manually. The "QualiKorn" research project, part of the InnoNet program run by the German Federal Ministry of Economics and Technology, aims to automate this process. The project team includes a variety of research institutes, industrial enterprises and industry associations, including the Steinbeis Transfer Center for Quality Assurance and Image Processing in Ilmenau. The center provides the project with innovative new components for automated analysis, including cameras, controllers and light sources.



How automatic Besatz analysis works for free-falling cereal grains

optimum durability and a compact size. To meet these requirements as best possible, the project used state-of-the-art LED technology together with specially adapted cooling equipment and a new type of projection lens.

When it comes to detecting individual objects in the grain sample, imaging is merely the first step in the process. This is followed by segmentation of the images, which isolates the objects of interest (in this case, grains and impurities) and separates them from the image's blank background. This reduces the volume of data by around 95 per cent, as all irrelevant areas are deleted and not processed further. Next comes feature extraction, which determines the individual features of the photographed objects. This involves assessing the color, shape and texture of the grains and impurities to differentiate them from one another. Combining these different factors results in a feature vector made up of around 200 feature values. Support vector machine (SVM) methods are used to classify the pho-

tographed objects based on their feature vectors.

Using a data record consisting of 23 object classes, the project achieved detection rates of 81–99 per cent for the four main combined classes at a sample throughput of 50 g/minute. The system delivers images of all objects, the weight of the sample as a whole, the proportion of usable wheat and statistics on the sample's composition. This data can then be entered into forms provided by the companies (in this case, mills and silos) and saved. The company designlab-weimar has developed a provisional concept study for using the device once the project has been completed.

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Steinbeis researchers examine Second Life behavior with eye-tracking

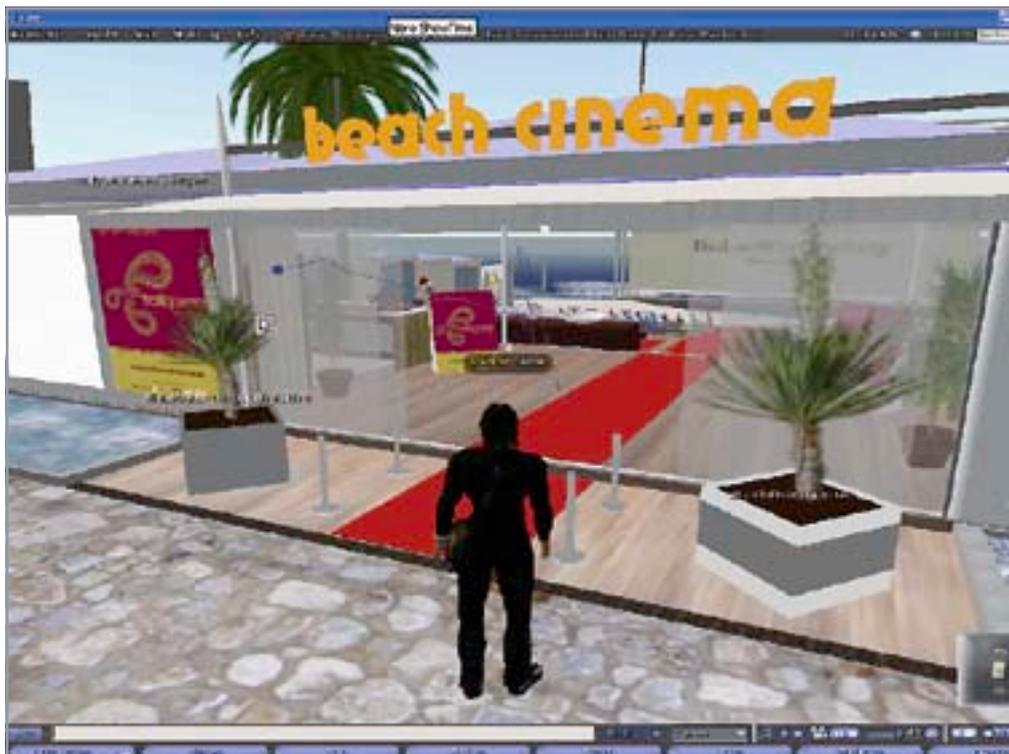
Perception in the world of virtual reality

Second Life has enjoyed tremendous popularity as a medium. People are likely to spend more and more time in such virtual worlds, privately and on business. A project team led by Prof. Dr. Volker Walter at the Heidenheim-based Steinbeis Transfer Center for Media and Advertising Research has examined how perception and visual orientation work in Second Life, and the issues it raises.

As part of an exploratory research project, the team analyzed how users find their bearings in virtual worlds. To do this they used an eye-tracking system which traces test persons' eye movements. On the same basis, the Steinbeis Transfer Center is now designing research processes which would allow companies to use Second Life as a communication channel and tailor the virtual environment to user needs. Already when creating representative offices or entire virtual worlds, it will be possible to shape the design and structural processes to arrive at the optimum virtual environment.

The study was based on qualitative methods centering on a usability test; it did not matter how many people had a specific usage problem or difficulties finding their way around, but rather what types of problems they encountered. During the study the test persons' eye movements were captured electronically while they visited a representative office in Second Life. The project team looked at a virtual beach cinema set up by MFG (the Baden-Württemberg media and film society). The cinema was still undergoing development, so it could use findings from the study for further design work.

To a certain extent, a user's perception in a virtual world means identifying with the figure representing them (the avatar) and working out navigation and menus. In "genuine" reality, users sense directly and see where they are in a room. In virtual reality there is continual reconciliation between "me", the avatar and the environment. This occupies a significant proportion of visual capacity.



MFG Baden-Württemberg's virtual beach cinema

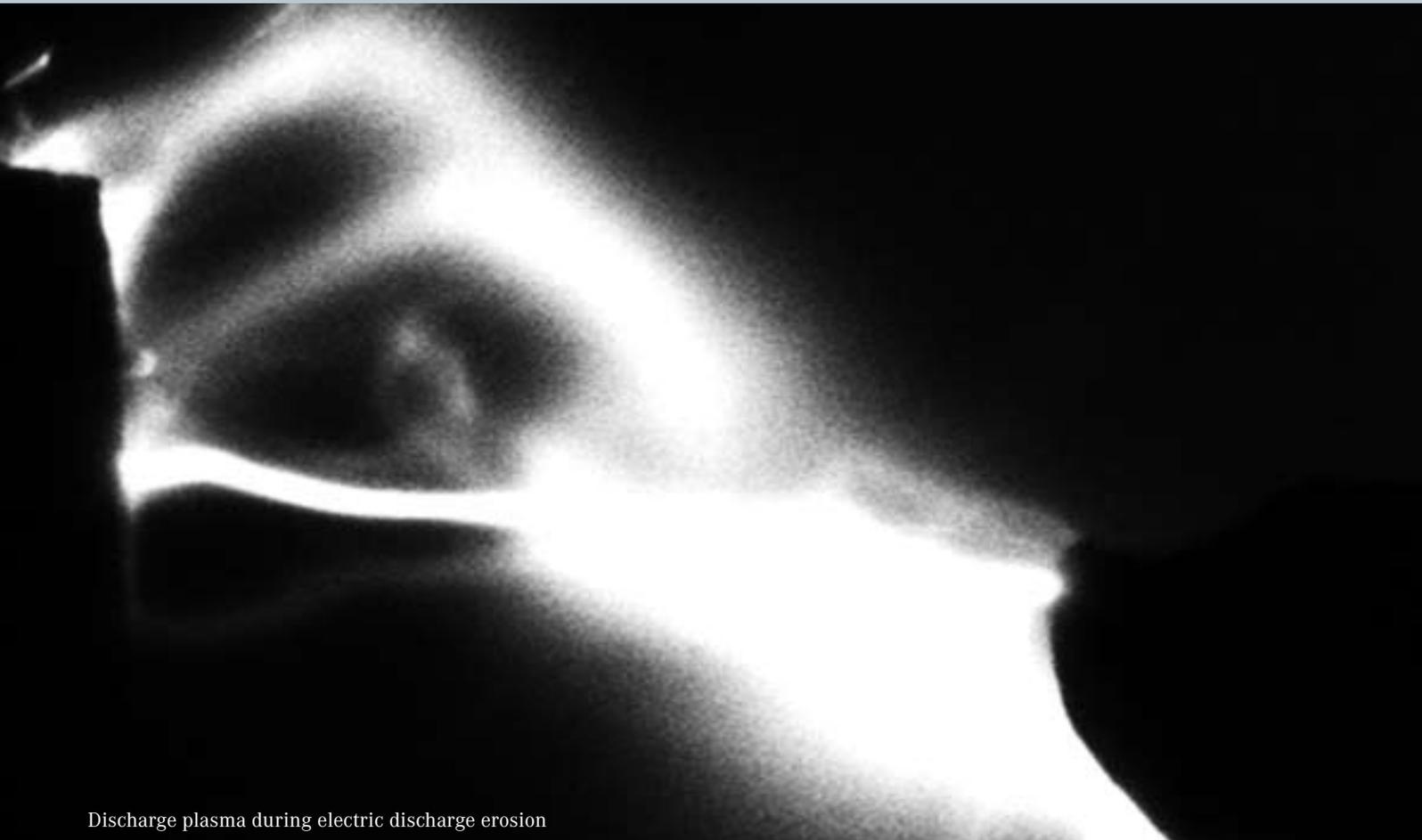
If it is not immediately obvious how an application works, users tend to revert to behavioral patterns from the real world. The reason for this is obvious: Even if virtual reality allows user to do things differently than in physical reality, if in doubt, the user still reverts to personal experience, and this is still shaped by real life. Only when users spend more time using the system, and do this more intensely, does learning become reinforced: Users start working out how different things are in the virtual world.

This makes it possible to work out general design rules for representations in virtual worlds. There are two ways of arriving at these rules. For tools such as websites, one has to define the purpose and goals of the design. If the goals are functional (help users

find information or get to know products), then the design should be based closely on real, functional aspects. This contrasts with Second Life visitors, who have more explorative goals and want to try things out, play, experiment, and experience precisely the things that don't work in real life. In such cases, programmers should deliberately avoid realistic functions to satisfy the playful needs of the user. Further findings of the study are available in a special publication, *Eye-Tracking in Second Life* (ISBN 3837051595).

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Discharge plasma during electric discharge erosion

New high-tech materials for stable switching systems in electric automobiles

Electric thunderbolts under the hood

In light of ecological considerations and the growing shortage of raw materials, non-polluting automobiles are becoming the focus of increased attention. In particular, electric automobiles are moving into the limelight. But before electric automobiles can compete effectively with their combustion-powered counterparts, a number of scientific challenges must be overcome by developing new technologies. Scientists across different disciplines are tackling these hurdles and researching new methods for lightweight construction, energy storage and the components of the automotive electronics systems. The Steinbeis Research Center Material Engineering Center Saarland (MECS) is researching high-resolution methods for inspecting localized damage to electrical systems.

One of the challenges the automotive industry currently faces is controlling and switching electricity in automotive electronics systems. Hybrid and electric automobiles must be able to handle large amounts of energy at high densities, which is only possible with a battery of several hundred volts instead of the conventional 12 volts. This high voltage places the vehicle's power cables, plugs and switch contacts under an extreme load, which existing automobile components are unable to withstand. This is particularly

problematic as automotive relays are often crucial safety components responsible for establishing electrical insulation in emergencies (by physically separating the switch contacts) to prevent electrical hazards. In the long term, the industry's challenge is to miniaturize these switch components, allowing a lightweight design.

During each switching operation, as in the case of a switching relay, an arc is generated as the result of a brief, sudden plasma

discharge. These arcs have a temperature of around 6000 °C and thus cause irreversible local damage to the material and the specially optimized microstructure of the switch contacts – creating an electric discharge crater.

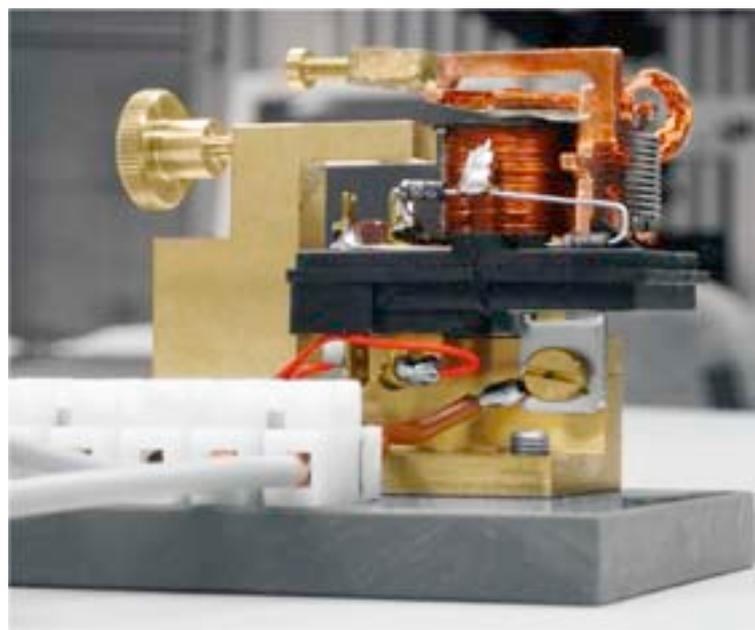
The components most affected by this are the contact materials responsible for establishing electrical contact. Together with factors like corrosion, mechanical stress and wear, these discharge bolts lead to irrevers-

ible failure of the switching devices in the long term.

To investigate this problem, the Steinbeis Research Center Material Engineering Center Saarland (MECS) in Saarbrücken, Germany, is using new high-resolution examination methods and novel materials. Researchers there are using state-of-the-art analytical equipment with the aim of understanding the causes of these damage processes in order to develop special high-performance materials ideally suited to high-voltage conditions. In partnership with the Department of Functional Materials at Saarland University, the team will conduct precise 3D structural and quantitative analyses of the materials in the nanometer range. As a comparison, the diameter of a human hair is around 50,000 nanometers.

The most promising examination methods are 3D nanotomography and the use of a 3D atom probe, which delivers images at an atomic level. These methods are similar to computed tomography in medicine. Instead of looking at the materials piece by piece, nanotomography uses a focused ion beam to break down the sample under investigation into slices mere nanometers in width. The 3D atom probe can even separate individual atoms to analyze their chemical properties and original position in the material. The resulting 3D breakdowns of the

individual sections or atoms can then be recombined using modern computing methods to give an exact 3D model of the material. The extremely high resolution offered by tomography combined with its different types of contrast make it possible to analyze the chemical composition of the material, its precise crystalline structure and the orientation of the crystals, and display these visually.



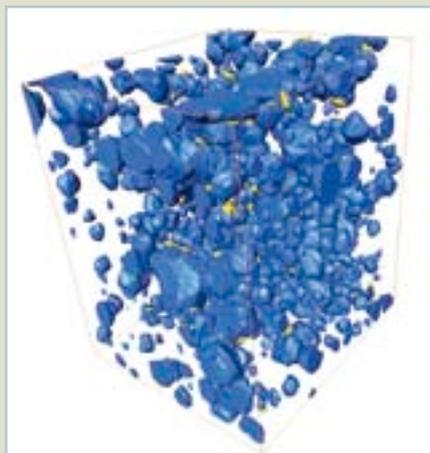
Test bench for electric discharge erosion

This new 3D insight into the material, its microstructure, nanostructure and even atomic structure allows a completely new approach to the analysis of damage mechanisms and to material production. This method also makes it possible to simulate and calculate the locally dominant properties of the materials (rigidity, electrical and thermal conductivity) using the "authentic" material data obtained via microstructural tomography. This allows scientists to take a new, three-dimensional, quantitative approach to a variety of challenges in materials engineering.

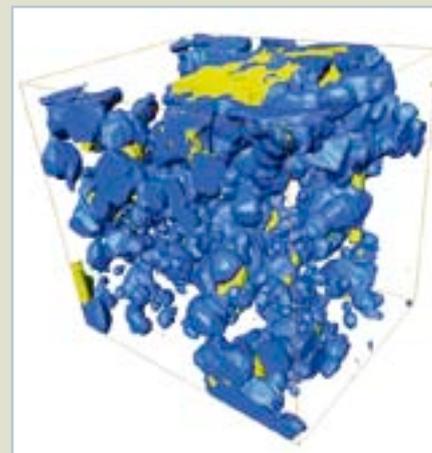
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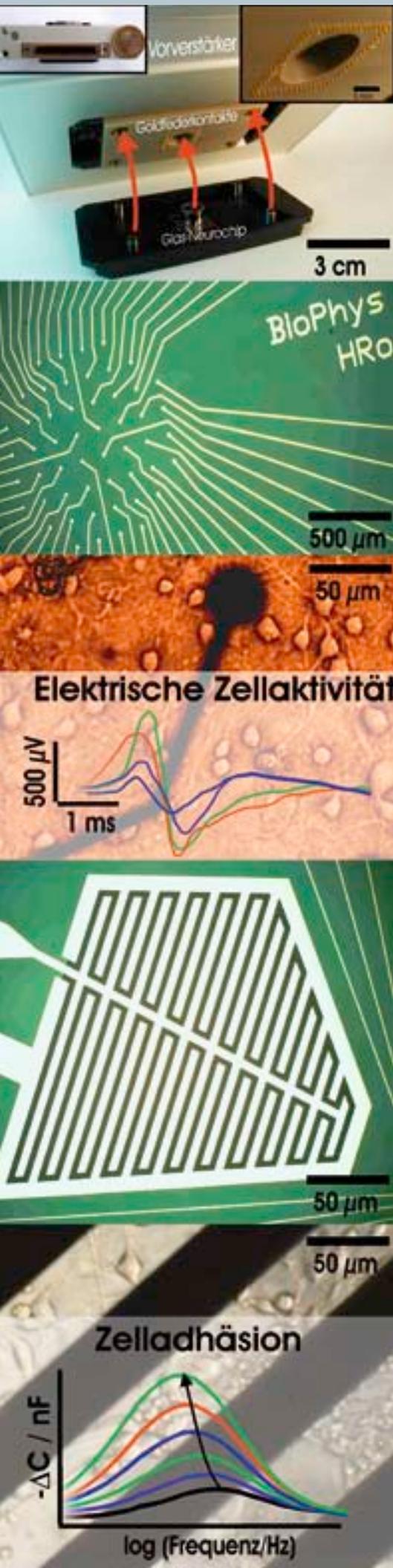
The images show a reconstruction of the 3D arrangement of oxide particles (in blue) embedded in the silver matrix (volume hidden) of a contact material in its initial state and switched state. The yellow areas are the micropores and nanopores generated in the material at high temperatures, which reduce both the local thermal and electrical conductivity by up to 50 %. The Steinbeis Research Center MECS has developed a test bench for electric discharge erosion to investigate contact materials.



Initial state



Switched state



Steinbeis and the University of Rostock develop a system for *in vitro* testing

Multifunctional glass neurochips: an alternative to animal testing

The toxicological testing programs of the OECD and the EU contain guidelines which apply to toxicological studies of both, known and newly-developed substances. In recent years, it has become increasingly clear that some substances pose a particular danger to children, and the vulnerability of the developing brain has become the focus of heightened attention. As a result, the OECD and EU now recommend that chemicals with known neurotoxic or teratogenic effects are tested for developmental neurotoxicity. The US Environmental Protection Agency (EPA) also recommends that pesticides should be tested for developmental neurotoxicity. The inclusion of tests for developmental neurotoxicity in the EU's REACH (Registration, Evaluation and Authorization of Chemicals) regulation is currently under debate. These tests will require approx. 30,000 chemicals to be tested for their potential toxicity.

Silicon-based "lab-on-a-chip" technology, developed in the 1980s and 1990s, was initially used in the development of micro-pumps, microvalves and similar applications. A broad range of applications followed soon, including bioanalysis and the optimization of microfabrication, microlithography and surface structuring technology for DNA separation and cell manipulation in electric fields. Today, the main biological and medical applications of this technology are in the fields of cell culture for biochemical analysis and clinical diagnosis (immunoassays, protein separation and analysis, and polymerase chain reactions (PCRs)). "Lab-on-a-chip" technology is also used in experiments which investigate the electrophysiological and metabolic properties of biological cells, so that suitable cells can be selected for substance screening based on their sensitivity. Combining cell culture with analysis systems creates a new tool that is quick, compact and powerful. This allows online recording of temporal variations in physiological data in dependence of the substances being tested.

From top to bottom: MOGS, MEA, an MEA electrode covered with neurons for detecting electrical activity, IDES for measuring cell adhesion

Scientists from the Steinbeis Transfer Center for Cell Manipulation and Monitoring Systems (CMMS®) and the Department of Biophysics at the University of Rostock have developed an innovative system for *in vitro* testing of vertebrate nerve-cell networks. This modular glass-chip system (MOGS) consists of a miniaturized, microstructured glass chip and a preamplifier. The glass chip is the central component, and consists of a 1 mm² multi-electrode array (MEA) with 52 platinum micro-electrodes on a glass support.

The chip has electrical contacts on all four edges, and the MEA input lines on the chip are arranged such that they are as far apart from each other as possible. The chip also includes an interdigital electrode structure (IDES) and a temperature sensor. A small glass trough ($D_{\text{inner}} = 8 \text{ mm}$; $H = 5 \text{ mm}$) contains the cell culture medium with the test substances. The glass chip is suitable for use with microscopes, and can be steam-sterilized and reused multiple times. Gold spring-pins serve as electrical contacts between the glass chip and a removable adapter board. The preamplifier has a flat shielded casing with a round opening for microscopic observation. Also during

electrical network activity measurements. The headstage can be easily connected to a commercial interface for digitalizing the measured values and allowing using suitable analysis software.

The neuron-covered MEA electrodes measure cellular electrical activity. While IDES impedance measurement registers cell adhesion and cell spreading as indicators of cell vitality, and also measures cell spreading on the IDES due to cell growth and proliferation. An integrated sensor monitors the temperature close to the cells and detects any temperature changes. As a next step, the project team plans to integrate additional glass-fiber sensors into the chip to measure acidification and oxygen consumption.

The MOGS can be used in basic research (i.e. for developing stem cell differentiation protocols) and in development and analysis (as a highly sensitive analysis system to detect specific toxic, neurotoxic and developmentally neurotoxic substances in the clinical, environmental, food and pharmaceutical sectors). The system is especially suitable for developing methods to replace animal testing. Metabolic and electrophysiological processes can be monitored online during differentiation of stem cells and neurons on the glass chip. By sowing murine primary cells from a donor organism in several chips simultaneously and processing them in parallel, as in a multi-well system, fewer donor organisms are needed for *in vitro* testing. The ultimate goal, however, should be to use cell culture lines (containing murine stem cells, for instance) to develop drugs

and investigate the mechanisms of action of chemical substances. MOGS is the first step in this important new direction.

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2009: a successful year for Steinbeis

Steinbeis concluded 2009 with excellent results. In keeping with the general economic situation, it was not possible to repeat the record turnover of 2008. However, with turnover at 118 million euros, 2009 Steinbeis enterprises sales were still 9 per cent higher than in 2007.

Especially Steinbeis research and consulting centers as well as the transfer institutes witnessed sales growth in their area. Business falling into the category of "Evaluation and Expert Reports" also enjoyed strong growth.

The Steinbeis Network encompassed 778 Steinbeis enterprises in 2009 (2008: 765), working in the business fields of Research and Development, Consulting, Evaluation and Expert Reports, and Training and Employee Development. Of these, 88 (82) new Steinbeis enterprises were founded in 2009, in Germany and abroad, set up by establishments of higher education, research centers, or individuals. Depending on the service emphasis, they are organized as Steinbeis Transfer, Research or Consulting Centers, as Steinbeis Transfer Institutes, or as legally in-

dependent companies. Each unit is managed autonomously by its manager and run independent as a "company within a company".

Business success requires committed and skilled people. In 2009, 5397 (5522) people worked on projects in the Steinbeis network. Of these, 1358 (1392) were full-time employees at 778 centers. 3284 (3338) people worked on a project basis as freelancers. 755 (801) professors supported Steinbeis with their skills and knowledge in 2009.

Apart from a variety of seminars and specialist events organized independently by Steinbeis enterprises in 2009, three centrally organized Steinbeis events took place. More than 1000 visitors came to the headquarters in Stuttgart's Haus der Wirtschaft to attend Steinbeis conventions and discuss

issues such as energy efficiency and global competence management, or attend the traditional Steinbeis Day. The series of events will be continued in 2010: the Electronics in the Automotive Industry symposium is on 27–29 April, and on 1 December, Steinbeis University is hosting the third Stuttgart Competence Day, this time looking at "Competence.Personality.Education." This year's Steinbeis Day (24 September), provides a forum for networking and meeting key players from the Steinbeis network.

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For information on central events visit:

 www.stw.de → Events

Pupil's laboratory at Friedrich Wöhler Grammar School

Attracting interest – fuelling motivation

How do you bring the natural sciences to life, with project work across different disciplines, in a way that motivates pupils to become closely involved in science and technology – and not switch off? This is the key issue being worked on in a new science skills centre at Friedrich Wöhler Grammar School (FWG) in Singen, in partnership with regional universities and businesses. The Steinbeis Transfer Center for Didactics of Technology and of Interdisciplinary Natural Sciences played a central role in developing the new concept.



Young scientists with a wind tunnel in the pupils' laboratory

How do you make a car as streamlined as possible? What effect does a rear spoiler have? How does the honey get from the honeycomb into the jar? What does the nanostructure of a water-resistant surface look like? This and many other questions are likely to be investigated by teams of pupils at Friedrich Wöhler Grammar School and neighboring schools in the new pupils' laboratory center for science and technology, or NwT. The building, which is currently being constructed by the town of Singen, will house a pupils' laboratory, the very latest science rooms and a modern library.

The natural sciences and technology (NwT) core subject was added to Baden-Württem-

berg's school curriculum in 2007/08. This key subject examines interdisciplinary topics from the viewpoints of the various sciences. The aim is to deepen pupils' understanding of the fundamentals of biology, chemistry and physics, as well as the earth sciences. They should also be encouraged to think and work more scientifically; the focus lies in experimental and project-based assignments.

Horst Scheu, head of the Steinbeis Transfer Center working on the project and headmaster of Friedrich Wöhler Grammar School, has been helping the pupils' laboratory off the starting blocks by working closely with firms and universities in Singen. In turn, they are inputting with ideas, skills, materials, and

even donations. An association called "Singen active location marketing" set up a team to coordinate the competence centre, which has also had several years' backing through partnership with the pupils' engineering academy SIA – a cooperative model for extracurricular training at schools, universities and business.

Friedrich Wöhler Grammar School is particularly proud of the projects it has realized to date. Wind tunnels and a glass beehive are just two of the installations that will be moved into the pupils' laboratory once the new building is completed. The equipment will allow pupils to conduct airflow experiments on energy efficiency, analyze

foodstuffs, and try out different observation techniques on the bee colony.

The list of planned projects is enough to make anyone want to go back to school: Horst Scheu is planning to introduce a scanning electron microscope for inspecting surfaces, a microbiology laboratory, and medical technology experiments. Naturally, all of these projects depend on the ongoing scientific backing of nearby universities and institutes.

The new NwT curriculum has anchored practical and project-based tuition in everyday teaching at Friedrich Wöhler Grammar School. By the latter half of this year the pupils laboratory will be open to pupils from all schools to conduct complex experiments that would be unthinkable at individual schools. The pupils' laboratory thus enriches the scientific and technical landscape of regional education.

Steinbeis Transfer Center for Didactics of Technology and of Interdisciplinary Natural Sciences

The center focuses primarily on technology projects likely to interest young people. This ranges from finding out more about technical careers to setting up work placements or integrating school activities at companies into educational planning – for example with school trips.

Apart from working on projects for and with pupils, the Steinbeis staff in Constance also advise companies and develop teaching methods. These methods come into use during guided tours of businesses, when planning work placements, and when presenting exhibits.

Horst Scheu

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Professionally planned tourism for communities along the historic “Raiffeisen Route”

Tourism on the trail of Friedrich Wilhelm Raiffeisen

In many cities and communities currently experiencing growth, tourism plays a not insignificant role. Other areas, however, fail to tap the full potential of their facilities when it comes to tourism. These parts of Germany face new challenges: to reposition themselves in the ever-changing landscape of tourism and leisure activities and to develop as a tourist destination. Fundamental to this process will be their ability to recognize tourism trends and weave them into existing resources and infrastructures. The Steinbeis Consulting Center for Regional and Communal Development is crafting a course of action for the Historic Raiffeisen Route.

Nestled between the cities of Hamm and Neuwied in Germany's Westerwald forest, the communities that dot the Historic Raiffeisen Route have understood how important repositioning is. The Steinbeis Consulting Center in Kaiserslautern has been commissioned to present a model of professionally planned tourism, one that will guide and inspire innovative tourism development throughout the region.

The Historic Raiffeisen Route runs through an area covered by the rural districts of Altkirchen and Neuwied, taking in places shaped by the influence of Friedrich Wilhelm Raiffeisen. Today, Raiffeisen is best known as a social reformer and the father of local cooperative banking. He was also a key contributor to the construction of this historic transportation route.

Professionally planned tourism will mean taking greater advantage of the legacy of Raiffeisen. To make use of the existing infrastructure and draft a plan that will be acceptable to all communities affected by the project, the Steinbeis consultants will analyze the supply and demand of tourist attractions. This will include a survey of owners of local accommodation, day trippers and overnight guests, and local residents.



The research will provide a clear picture of tourism's potential and pinpoint possible "unique selling points" to add value to the region and, ultimately, help market it. The aim of the project is to agree a plan containing key actions. Ideally, the plan will show how best to market the region to specific target groups and highlight improvements needed in the services offered. The plan will also demonstrate organizational changes needed to improve the nature of regional tourism.

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Keeping accidents off the streets with sensors and communication

The shape of sensors to come

Along with energy efficiency, road safety is one of the key strategic innovation issues in vehicle systems development. As the absolute number of accidents decreases, the relative number of injuries and fatal incidents with people outside continuously increases. For years, the spotlight has been on passive passenger safety systems. Conventional systems are available for detecting a car's surroundings using imaging; high hopes are also being held for "cooperative sensory systems", which offer a variety of inherent benefits. Based at the Baden-Württemberg Cooperative State University Lörrach the Steinbeis Innovation Center for Embedded Design and Networking (sizedn) has joined forces with automotive manufacturers to develop the safety sensor solutions of the future.

For years, modern top-of-the-range cars have been equipped with sensor systems that provide drivers passengers with images to enhance safety and driving comfort. These include driver assistance systems such as night vision, lane keeping assistants (LKA), lane change assist (LCA), traffic sign recognition and much more. The

systems are expensive, both because of the inbuilt cameras and the image processing – which becomes more and more complex, the more functions the system offers. Just one example: spotting the risk posed by pedestrians involves a whole host of issues affecting illumination and the car's immediate surroundings.

To make these systems viable in as many cars as possible, costs need to be kept low. As things currently stand, this will only be possible if image-processing hardware can be found. The PROPEDES project (Predictive Pedestrian Protection at Night) is a plan to develop a predictive night-time visibility system for cars that will protect pedes-

trians by networking images provided by sensors around the car (video/radar). The project is sponsored by the German Federal Ministry of Education and spearheaded by e|enova, a car electronics innovation consortium. The Lörrach-based Steinbeis Innovation Center is a member of the PROPEDES project consortium working alongside Daimler, Robert Bosch and ProDesign. The aim of the project is to identify the basic algorithms needed to process, evaluate and size images and subsequently transfer this information to hardware and software. The team also plans to develop and evaluate flexible FPGA video processors. Other tasks include programming FPGA-based development platforms using soft cores or embedded microcontroller cores and integrating these into the development process.

Sensors that also provide images bring a number of advantages, especially as they enable image data to be used in various ways, and can recognize all kinds of objects. This contrasts, however, to a string of intrinsic disadvantages, such as difficulties when objects are partly hidden, weak signals caused by passive reflections, and

high levels of interference under poor visibility. The biggest challenge, however, is how to categorize objects, i.e. how to put a recognized object into a meaningful group, or type of behavior (such as a pedestrian or cyclist).

One way to compensate for these disadvantages is to use cooperative sensor systems. Recognized objects receive a tag or active element. This makes it possible to exchange information via wireless systems so that at least the object's category can be transmitted. By drawing on secondary radar techniques used in aerospace technology, it is also possible to evaluate the properties of electromagnetic waves to make another estimate of an object's relative position. This enables the sensors to pinpoint the position and category of an object. A similar approach is already being used by WATCHOVER, an EU project in which the Steinbeis Innovation Center in Lörrach is also closely involved. This project already resulted in the first jointly-developed sensor, which subsequently became part of the sensor fusion (interconnection of all sensor data) in an on-board unit.

This project and the Bavarian Project Amulett – which has already made significant progress with wireless positioning – have given rise to a consortium that is part of Ko-FAS ("Cooperative Sensor Systems and Cooperative Perception for Preventative Safety in Road Traffic"). Sponsored by the Federal Ministry of Economics and Technology (BMWi), the consortium has set its particular sights on cooperative sensor systems.

In a sub-project called Ko-TAG, the Steinbeis Innovation Center is working with BMW Research and Technology, Continental Safety Engineering International, Daimler, the Fraunhofer Institute for Integrated Circuits, and Technische Universität München. This project involves researching transponder-based cooperative sensor technology for two primary applications: protecting vulnerable road users and providing vehicle-to-vehicle safety. The joint Ko-TAG project uses transmitter/receiver modules in vehicles which send queries to transponders. These are carried by other road users and answer with response codes containing detailed information. The question-response method provides vehicles with information such as the relative position of other road users near the car – and this makes it possible to calculate the probability of a collision.

A wireless tagging device for locating and communicating with other road users



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New SIGNO standard lends uniformity to patent evaluation

Patents are treasure troves on the horizon!

The patent has long stood for a “temporary monopoly” that protects intellectual property. For many businesses, patents provide a foundation for business growth. Enter legendary patent owner and entrepreneur Artur Fischer: His business's growth and success is, even today, inextricably linked to intelligent patent management and a belief that patents are equity in their own right. When the success of a patent is directly reflected in company success, it's easy to work out its value. On many occasions, however – e.g. a company sale, an investment, licensing, or patent sales – a patent does need evaluating. Bankruptcy also highlights just how important patent ownership is.



The team of expert behind the SIGNO expert report: Wolfgang Müller, Dr. Wolfgang Knappe, Andreas Deutsch, Prof. Andreas Zagors, Dr. Klaus Kobek, Dr. Dirk-Oliver Kühne (from left to right)

Patent evaluation encompasses many factors that are often difficult to assess. Sometimes they are even unknown. Who are the prospective licensees? What's happening in the market? Are there any new substitution technologies? Questions which often have no easy answers. That's why it is useful to be able to draw on evaluation standards that are simple, easy to understand and cost-effective – a luxury no-one had in the past. In fact, evaluations were often like gazing into

a crystal ball. This is where the new SIGNO standard comes in. Designed by experts, the standard puts patent evaluation on a level playing field.

Patents are treasure troves on the horizon; they need to be leveraged and then transformed into products that meet market demand. Companies that innovate and outpace the competition are more likely to succeed in the global marketplace. Added value in

the form of technology plays an important role, especially in the German economy. For research findings, new developments and inventions to be made commercially viable – more quickly and effectively – technology transfer between businesses, research, and trade and industry needs to be intensified.

One major reason why it is difficult transferring and exploiting intangible business equity is that it is hard to assess whether a new

technology will be commercially viable. Very often, the technology remains in development until it is ready to market. In the early stages, it's hard to predict the opportunities and risks presented by commercialization, or whether it is even technically feasible.

One way to clear this hurdle is to involve experts from a variety of disciplines in the evaluation process. After all, a sound assessment needs to draw on legal, scientific, technical and economic expertise. In practice, this has often translated into an expensive price tag, one that neither SMEs have the budget for nor matches the nature of the evaluation.

The current system – parallel approaches to evaluating intangible business equity in general, but also patents in particular – has consequences. It is not possible to compare results, and people don't trust the way the value was estimated, or the process, or the institutions that submitted the estimate. Ultimately, the evaluation itself is robbed of impact.

Enter the new SIGNO standard. This tool was designed to reinforce and simplify technology transfer between universities and companies, independent inventors and businesses, and businesses themselves. The SIGNO standard's main objectives, then, are to lend transparency and help make the evaluation process more uniform across the whole of Germany in a way that engenders trust.

The creators of the SIGNO standard realized it was essential for the tool to work within SME budgets and existing resources. The standard is a bit like a checklist and takes all key criteria into account. It also represents good value for money. It is versatile enough to allow for more detail and the scope of analysis and documentation can be matched to needs and budgets, and if necessary expanded.

At an event moderated by the Cologne Institute for Economic Research, experienced specialists from the SIGNO network gath-

SIGNO

Through the SIGNO program, the Federal Ministry of Economics and Technology aims to support universities, companies and independent entrepreneurs in securing the rights to their innovative ideas and applying those ideas to commercial ventures. As well as providing information on commercial trademarks for intellectual property, SIGNO promotes the more efficient use of scientific and technical information, and helps translate ideas into market-ready products. The SIGNO expert report on a patent's value addresses:

Rights: The prerequisite for an evaluation is the patent, a documented trademark. When is it registered in which countries? How are trademarks handled? Who owns the rights? So many questions that need answers.

Technology: An invention that doesn't work has no commercial value. As obvious as this statement seems, it does bear examination. That's why the SIGNO evaluation looks at many different aspects and issues. The beginning of the report should briefly describe the technology in context – where does it fit in? This should be followed by details on the development status, technical feasibility, probability of implementation as well as any work still outstanding.

Company: This factor examines the requirements the new development must meet when a company is driving implementation. In the limelight: the company in which new processes or products will be launched, or which is launching processes and products for others; spatial requirements; material and personnel requirements for the launch.

Market: During the commercial use phase, the anticipated surpluses in payments depend on other patented products on the market and what the competition is doing. Ideally, calculations for these predictions will be based on comparable empirical values – even if it appears that the novelty of the patented technologies will undermine calculations.

Potential value: There are so many constructs of economic value for interpreting the value of a patent, almost as many ways to define value, and even more ways to carry out the evaluations. The SIGNO standard pulls together the most common and important methods in theory and practice to help ensure that as many companies as possible use and adopt this expert report. For the time being, this is a method based on a license analogy and discounted cash value.

ered to discuss how to advance the standard and road-test it. The group included experts from a variety of organizations with a decades-long track record in patent and innovation management. They were thus highly proficient in evaluating technologies and trademark rights. They included the Steinbeis Transfer Center Infothek, the north German inventor forum EZN, IMG Innovations-Management, InTraCoM and the Fraunhofer Society.

The SIGNO expert report on a patent's value is divided into five key, standardized sections: rights, technology, company, market, potential value. The SIGNO evaluation method involves defining and substantiating tangible "usage scenarios" (covering all key influences), opportunities and risks. Although it focuses on content, the standard also places special emphasis on the auditing method used and the final result. Processes, how information is gathered (and

in what form), and even client relationships are logged. The deciding factor throughout: the expert's qualifications and experience. The SIGNO expert report on a patent's value is available through the Steinbeis Transfer Center Infothek.

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Training for tomorrow's managers and specialists

A master's degree – including SAP training

In a joint project with the School of Management and Technology at Steinbeis University Berlin, SRH Heidelberg and Munich's technical university, TUM, the German software giant SAP is now offering the SAP Corporate Master Program – a practical degree aimed at addressing the needs of future business.

The international degree is integrated into students' full-time employment within business and promises to foster and educate talented up-and-coming managers at companies and consultancies from a variety of sectors of industry. A common theme of the courses within the program is to certify students as qualified SAP consultants.

The universities involved in the master's program are responsible for the academic content of the degrees, as well as teaching and examinations, while SAP Education trains and examines students towards SAP certification.

The SAP Corporate Master Program is tailored to business needs and underpinned by well-

grounded academic learning, making it a welcome addition to the IT employment market. This unique program opens many doors to promising careers. As well as exposing students to live projects, the internationally recognized certification as an SAP consultant underscores candidates' qualifications. The SAP Corporate Master Program is an opportunity for companies and SAP partners to nurture future managers early – and gain loyalty.

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The Materials and Production Bachelor Degree rolls into action

All eyes on production, quality and management

In today's global economy, companies cannot survive without interdisciplinary thinking and a thorough technical understanding of a variety of topics: development, production, project management, logistics, the supply chain, and marketing. The engineering-based bachelor's in Materials and Production was launched by the Steinbeis University Berlin in January 2010, which graduates complete as a Bachelor of Engineering.

On the degree program, students are taught about key subjects, such as materials engineering, lightweight construction strategy, product development, production processes, manufacturing and automation technology, measurement technology and quality assurance, in tandem with management techniques, HR development and personnel management.

To supplement theory with applied examples, the program is supported by business partners such as Zeppelin, the measurement technology specialist, which shows measurement technology to students on live applications as part of their advanced options.

Students on the executive degree submit "transfer" papers, attend expert workshops, and go on study trips within Germany and abroad.

Berlin convention on 3 and 4
September 2010

Ethics, intrinsic value and sustainability in the financial system

The economic and financial crisis has affected many areas of society, calling for an honest and thorough examination of values, ethical issues and morals. This key issue will be tackled jointly by scientists and representatives from all areas of society at the first financial ethics convention, to be held in Berlin in September 2010. Prof. Dr. Dr. Sabine Meck and Prof. Dr. Jens Kleine (School of Management and Innovation (SMI), Steinbeis University Berlin), along with Prof. Dr. Frank E. W. Zschaler of the Catholic University of Eichstätt/Ingolstadt and Professor Frits van Engeldorp Gastelaars of Rotterdam's Erasmus University, are inviting people to take part in a critical, interdisciplinary discussion of ethics, intrinsic value and sustainability in the financial system.

The convention is targeted at academics and students just as much as representatives of everyday business, political and social practice. The following speakers are already known to be attending: Prof. Dr. Günter Endrueit

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(emeritus at Christian Albrechts University, Kiel), Prof. Dr. Thomas Pittrof (Catholic University, Eichstätt/Ingolstadt), Prof. Dr. André Habisch, Prof. Dr. Frank E. W. Zschaler, Prof. Dr. Max Otte (Worms University of Applied Sciences), Nikolaus Piper (Süddeutsche Zeitung), Karl Reichmuth (Reichmuth & Co. private banking, Lucerne), Prof. Dr. Peter Schallenberg (University of Paderborn), Prof. Dr. Nils Goldschmidt (Universität der Bundeswehr München), Dr. Dr. Eberhard Fedtke, attorney, and Dr. Harald Schmidt (Catholic University, Eichstätt/Ingolstadt).

Important representatives of business, society and the church will discuss a variety of issues in speeches and panel discussions, including:

- Ethical financial investments – a real possibility?
- Corporate governance within financial institutions – a failure?
- Earning money through sustainability – qualitative versus quantitative growth
- Moral hazard after the crisis – how can responsibility be re-established?
- Can an ethical attitude towards money be learned?

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Inauguration ceremony at the Steinbeis Business Academy Thorough education for Gernsbach and the surrounding area

The Steinbeis Business Academy's move from Kuppenheim to Gernsbach near Baden-Baden in January was marked with a special inauguration ceremony. The academy's links with the area were central to selecting the new location. A variety of guests from the world of politics, business and other areas were invited to view the new building and meet Steinbeis staff.

"Change and transition looks gladly on those who enjoy life" – with these opening words, Birgit Gaida, director of the Steinbeis Business Academy (SBA), welcomed her guests. This sense of change at the university is reflected in its new choice of building, which offers nearly two thirds more floor area. Prof. Dr. Peter Dohm, also an SBA director, believes that partnership with other educational establishments in the area holds strong potential, as has already been the case with other Chambers of Trades and Crafts, administration and business academies, and university clinics.

For Gernsbach, the arrival of the new academy boosts the town's image as a center of learning. "This is an opportunity for all of us," stated Dieter Knittel, the town mayor, explaining how much "soft" location factors matter. As Knittel says, Gernsbach now benefits from an educational spectrum ranging

"from nursery school to PhD". The director of the Sparkasse bank, Martin Seidel, welcomed the 25 new tenants on the first floor of his building. He is certain to have found "the right partner" and sees the injection of life in the building in Eisenlohrstrasse, which has been re-dubbed the Competence Center for Finance and Education, as a positive development. The SBA's move into the building went smoothly, without interrupting normal Sparkasse business.

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New bachelor's program for medicine students

BSc in Complementary Medicine

Steinbeis University Berlin is launching a new bachelor of science degree in 2010 for students of medicine. The 3-year BSc in Complementary Medicine will start with advanced options in Traditional Chinese Medicine (TCM).

The degree program was developed in cooperation with independent German and international medical practitioners, registered natural health professionals (German Heilpraktiker), experts, scientists, practicing professionals, and professional associations at Steinbeis University Berlin. The degree

is designed exclusively for individuals involved in therapeutic practice: Heilpraktiker, health professionals with sectoral approval to practice as a Heilpraktiker, and doctors. The primary aim of the degree is the ongoing provision and acquisition of treatments and therapeutic skills, as well as specialist

knowledge pertinent to treatment from the field of complementary medicine. "Complementary medicine" in the narrower sense includes specialties such as Traditional Chinese Medicine, homeopathy, osteopathy, chiropractics and naturopathy. Course content is being prepared for advanced options in these areas.

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200 people attend the second Stuttgart Competence Day

Bundled competence

The second Stuttgart Competence Day took place in November last year, building on the success of the first event in 2008 and welcoming nearly 200 guests to a day-long convention on "Talent.Competence.Management – local.global". The event opened its doors to experts from universities and business, who came to discuss the prevailing challenges of a society driven by skills and expertise.



After a welcoming address by the President of Steinbeis University Berlin (SHB), Prof. Dr. Dr. h. c. mult. Johann Löhn, the Director of the School of International Business and Entrepreneurship at SHB, Prof. Dr. Werner G. Faix introduced the day's topic: skills management, and conflicts on the global and local stage. The main issue was how society will cope with the challenges of the 21st century and recruit, retain, and network skilled employees.

Rainer Heck (IBM Germany) spoke about the special significance of global delivery in shaping global collaboration. Eleonora

Peis (Siemens) und Dr. Johanna Anzengruber (Siemens Corporate Technology), demonstrated the role played by skills management in the field of research and innovation at Siemens. Torsten Bittlingmaier (Deutsche Telekom) gave a thought-provoking insight into the world of "talent brokers". Dr. Wolfgang Achilles (Jobware online service) underscored the growing significance of talent pools in an era of the global war for talents. Prof. Dr. Marc Drüner (Professor of Innovation Management at SHB) showed the audience the phenomenal impact and possibilities of Web 2.0, illuminating the contribution made by Web 2.0 to global "open innovation".

Prof. Dr. John Erpenbeck (Professor for Knowledge and Competence Management at SHB) raised a number of eyebrows: According to him, there are no specific intercultural competences. Competence is the ability to act creatively in a self-disciplined manner in problematical situations where the outcome is still open – also absolutely crucial in situations dictated by intercultural "overlaps". This concept of intercultural overlaps was also demonstrated by Dr. Gerhard Keck (Steinbeis Transfer Institute (STI) for Growth Management at SHB), who looked at cooperation between German and Brazilian organizers of the World Cup in Brazil in 2014.

After a foray into skills management in MENA countries by Ahmed Elshahat Hassan (Society for Human Resource Management, Egypt) and Brazil by Prof. Dr. Nazem Nascimento (Universidade Estadual Paulista, São Paulo, Brazil) – where skills management is captured in the constitution and is truly Brazilian in its approach – Wilfried Telkämper showed how his training and development company (Internationale Weiterbildung und Entwicklung GmbH) fosters executive development on an international level.

The day drew to a close with Prof. Dr. Dirk Engelhardt (Professor for Logistics Management at SHB), Stefanie Kisgen (STI International Management), Prof. Dr. Peter Dohm (Steinbeis Business Academy) and Annette Schulten (STI Corporate and International Programs) highlighting once again how SHB nurtures the competence of various target groups with their respective priorities, through its project competence degrees.

The theme of the next Stuttgart Competence Day, scheduled for 1 December 2010, will be "Competence.Personality.Education" (location: Haus der Wirtschaft in Stuttgart). For the latest agenda and list of speakers, visit www.stuttgarter-kompetenztag.de.

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New ways to improve competitiveness

Lean management – from production to after sales

An MIT study published in 1990, intriguingly called "The Machine That Changed The World", forced carmakers worldwide to think carefully about fundamental issues relating to the organization of production and work distribution. The report challenged conventional approaches to mass production. Developed by the Japanese and coined by Womack, Jones and Ross, "lean production" was turning out to be much more efficient. According to Joachim Gund, MBA student at Steinbeis University Berlin who also works for the Institute for Innovation and Management (IIM), the fact that lean production is still on most manufacturers' agenda confirms that this groundbreaking approach remains relevant.

When they completed their study, Womack, Jones and Ross were convinced that the principles and methods of lean management would be effective in fields beyond manufacturing. Until now, this view has only partly been proven true: few companies could honestly be described as practicing interdepartmental "lean thinking" in the ways Womack and Jones predicted in the late 1990s. For many European and American carmakers, developing and introducing their own production system is already "state of the art", but they only partially succeeded in translating their achievements into indirectly affected areas such as sales, after sales, and research and development. In other words, manufacturers have yet to transfer lean production into the all-encompassing practice of lean management.

Until a few years ago, there was no need to do so. Since World War II, with a small number of exceptions, all companies have watched their sales improve year on year. So it is understandable that the focus always lay in production. But markets have changed radically in recent years. These days, companies compete on carbon footprints and engine efficiency. As a result, R&D departments now play a much more pivotal role in a company's survival.

The same applies to after sales – an increasingly important link in the automotive value chain. Especially in the used car business, after sales is becoming more and more cru-

cial. A decade ago, it was the product that stood firmly in the limelight, not the service that went with it. But as competition intensified, the goal posts shifted. For many large road haulage companies, for example, a comprehensive service network and the quality (and punctuality) of service unit support are central to the purchase of new vehicles. Customers see vehicle quality as a given; service criteria are gaining importance. Customer requirements have thus shifted: these days, the most important issue is the most productive use of vehicle time – companies only make money when the vehicle is fully operating.

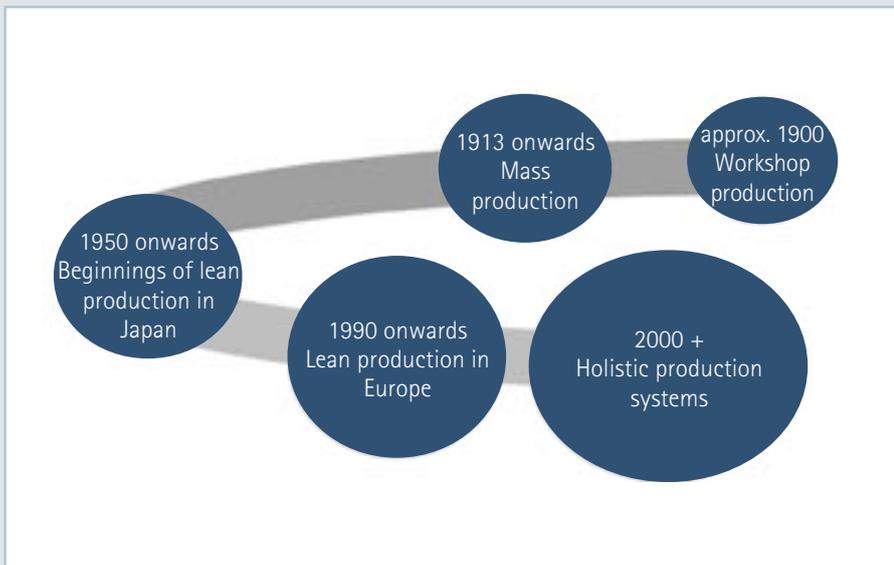
Compared to the old days, after sales in the automotive sector is viewed from an economical angle – as an essential source of turnover and profit. On a strategic level, after sales can be used as an effective marketing instrument, improving customer loyalty and positioning the brand. According to Leif Östling, CEO at Scania, one of his company's future challenges will be to ensure that trucks stay on the move, from the point of departure to the destination, and that drivers receive all the support they need to complete their task. To pursue this goal, Scania has made organizational changes in recent years: 40 per cent of the company's assets and human resources are now committed to sales, frontline selling, and service provision. This figure used to be a mere 10 per cent. Östling is clear about the path the company needs to pursue: designing trucks for com-

mercial use is now a given. In the future, the company will need to maximize customer benefits through improved services.

A number of car and commercial vehicle makers have set themselves similar objectives. To achieve them, they have introduced lean management principals and methodologies. The results of transfer projects in around 200 after sales units in Germany and other countries have shown that applying these principles and methods has a positive effect on productivity and thus indeed helps companies achieve their objectives. Experience also shows that the degree of transfer is much higher than is currently considered possible.

Despite this, transferring lean principles from production to after sales always poses a challenge. Inevitably, translating concepts and ideas from one department to another will lead to culture clashes. The key difference between the two cultures lies in the mindsets of the respective managers and workers. In production, in keeping with lean management principles, people tend to be proactive and thus stabilize processes. In after sales, people are more likely to tackle problems reactively.

On the one hand, this reactive approach can lead to late, incomplete or incorrect service provision, resulting in more work and dissatisfaction among staff. On the other, however, people enjoy the boost in self confidence



The development of industrial practice

– stemming from their ability to master all the problems encountered during the working day. The extra effort and associated costs are thus often ignored. Poor working practices are tolerated – until the next serious problem arises. This double-edged sword – staff are dissatisfied with the extra work and pressure, yet proud when they go home that they somehow solved the problem – poses a tremendous risk when the ultimate aim is to provide customers with the best possible service.

For many after sales departments, the ultimate aim justifies disproportionate time investment. After all, it is about the benefit to all customers, those who arrange appointments in advance just as much as those who unexpectedly need a service. Frequently, people perceive unplanned customers as the main cause of disruption in daily routines, so they are often portrayed as "the bad guys". As a result, people fail to see why processes therefore need improvement. Yet if processes were to be improved, managers and workers would start thinking differently. "Unplanned customers" would no longer be disruptive, they would be a profit-related use of capacity that helps secure jobs.

Analyzing processes and applying 5S-method in after sales departments – as part of the move to organize and standardize worksta-

tions – had the desired effect from the very beginning: managers and workers became involved and willing to work on transfer projects. Analyzing the processes made it possible to show clearly which overlapping areas required action. To do this, client and supplier-side process quality was evaluated. Using 5S-method made it possible to establish basic orderliness and cleanliness. This made improvements tangible and perceivable – for employees and customers. A continuous improvement process (CIP), one of the fundamental principles of lean management thinking, was then successfully implemented to eradicate problems pinpointed in overlapping areas. The outcome: an improved after sales process that frees up time for managers and workers to act more flexibly in dealing with customers, and stay calm when unexpected developments threaten to destabilize the process.

As part of his MBA degree at Steinbeis University Berlin, **Joachim Gund**, who works at the Institute for Innovation and Management (IIM), has been examining the issue of transferring Lean Management thinking and methods used in production into after sales in the automotive industry. Drawing on examples in after sales at a variety of manufacturers, Gund carried out transfer assignments to examine the applicability and feasibility of lean management thinking. His conclusion: matching the translation of lean management principles and methods specifically to after sales enables their implementation, resulting in long-term competitive advantage.

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Steinbeis TIB evaluates patents from numerous areas of technology

Innovative Automotive Electronics – patented

Over 80 per cent of all innovations in the vehicle involve automotive electronics, either directly or indirectly. Currently, automotive electronics are responsible for 30 per cent of a new vehicle's sale price, and this is set to rise to 40 per cent in the coming years. Even conservative estimates suggest that the market for automotive software is set to quadruple. As part of the vehicle's embedded electronics system, automotive software must fulfill tough real-time requirements which pose new challenges for automotive software developers. Steinbeis TIB Transfer Center for Technology Evaluation and Innovation Consulting selects and evaluates patents, including those in the automotive sector.

Today, automotive electronics play a key role in improving road safety. Safety features such as anti-lock braking systems (ABS) and electronic stability control (ESC) make it easier for drivers to control their vehicles. Systems which help improve road safety are increasingly the focus of public interest. The results of the NIRWARN project, funded by the German Federal Ministry of Education and Research, have aided the development of new lines of robust, reflection-free lenses (for night vision and advanced driver-assistance systems). As product features are subject to a growing number of requirements, this results in new applications for optical systems in automobiles.

However, more electronic systems in automobiles also mean more weight, and thus increased energy and fuel consumption. Potential on the consumer side must be tapped to keep the total power consumption constant despite the increasing amount of electronics. For many functions, it would be expedient to question whether the customer really needs them or benefits from them.

The service life of vehicle batteries in parked automobiles has also fallen drastically in recent years, due to the growing number of electronic systems which consume power in standby mode. Electronic control chips and memory chips require energy; for developers, this means enough energy must be available at all times, whatever the vehicle's operational status. In a new vehicle, the battery capacity is tailored to the level of electronics embedded in the particular model. In general,

developers are considering replacing the one-battery electrical system with a two-battery system, and to split the latter into two areas (such as a priming circuit and a supply circuit) depending on the application.

In modern automobiles, when the engine is switched off but the vehicle's embedded electronics are still consuming energy, an additional solar recharging system can be used to keep the on-board battery permanently charged. Installing a mobile, compact solar recharging system is easy and inexpensive, and the system can be easily adjusted to local environmental conditions. Unlike conventional systems, the patented solar recharging system can be fitted inside the vehicle. Because it is not exposed to the elements, the design and materials do not need to be weatherproof and can be kept simple.

The patent for this system is currently being evaluated by Steinbeis TIB. As expert partner to Alpha Patentfonds, the team members of the Steinbeis TIB select and evaluate patents with potential real-world applications. The Steinbeis TIB team includes over 40 specialists with expertise and in-depth professional experience in evaluating technology, markets and industries. In addition, Steinbeis TIB actively seeks out new technologies and innovations on an order basis.

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Photo: © istockphoto.com/MorePixels

Steinbeis-Europa-Zentrum fosters dialogue on emerging technologies and business cluster development in Europe

Join forces to shape the future

Business success in globalising markets increasingly depends on reliable strategic partnerships. Intensifying global competition, accelerating product life cycles, increasing complexity of converging technologies, growing demand for customized products and service: These are all drivers of an interconnected knowledge-based economy and society. Thus, businesses have to build their strategic capacities, capitalise on competitive advantages within business clusters and benefit from collaboration with partners in order to achieve sustainable competitiveness. The Steinbeis-Europa-Zentrum supports business clusters by developing and organising strategic capacity-building workshops.

In an ever-changing global environment, businesses only survive if they are able to meet new challenges in due time. With respect to sustainable regional development, economic as well as academic and political actors have to join their forces to think, debate and shape their future. The regional stakeholders contribute to a sustainable development of the regional economy if they use their individual core competences and align their strategies to jointly target promising international technological and market developments. In this respect, innovative business clusters as "local nodes of global knowledge flows" are an important source of new insight and technological development. They enhance the innovativeness and competitiveness of businesses, and thus have a significant impact on regional growth and social welfare. Hence, the Baden-Württemberg Ministry of Economics has installed its own department on business cluster policy and set up a cluster dialogue with regional stakeholders. In 2009, the Ministry presented its comprehensive business cluster strategy. It detailed a three-pronged approach: promote regional business clusters; build on state-wide networks in key strategic "target areas"; support the internationalisation of clusters. In fact, a German Federal Ministry of Economics and Technology study revealed that regional competence networks have plenty of work to do to become more accessible to the international community. Baden-Württemberg in particular – Europe's number one "innovation region" – greatly benefits from joint international research

and innovation ventures with other creative and highly innovative regions. Against this backdrop, the Steinbeis-Europa-Zentrum developed for the Baden-Württemberg Ministry of Economics a series of workshops titled "Technology and Business Cluster Trends in Europe". The workshops address ten interdisciplinary target areas of the Baden-Württemberg business cluster strategy, all of them promising seedbeds for emerging technologies:

- Applied satellite navigation
- Biotechnology
- Digital media & animation
- Filament-based materials
- Logistics
- Mechatronics
- Microsystem technology
- Photonics
- Security technologies
- Environmental technologies

The business cluster workshops are organized in association with regional and European partners supported by the Enterprise Europe Network. They are also moderated by the Steinbeis-Europa-Zentrum, one of more than 550 partners in the same network. The workshops aim to make participants more aware of the strategic importance of future developments in their field while providing a platform for innovation and technology partnerships that will stand the test of time. Together companies will identify global technology trends and emerging markets and turn these into regional opportunities.

As the backbone of the Baden-Württemberg economy, SMEs will also receive the support they need to take an active role to join forces to shape the future.

To date, four business cluster events have taken place, involving nearly 300 businesspeople, managing directors and senior executives from development, research and technology and also attracting representatives from universities, associations, chambers of industry and commerce and communities. The events have explored miniaturization, smart systems, applied satellite navigation, photonics, and mechatronics. The 2010 business cluster workshops will address filament-based materials, digital audio-visual media, industrial biotechnology, environmental technologies, and logistics. Participants have estimated the open dialogue and the future oriented, sustainable approach of the Ministry of Economics. This understanding has prompted the Baden-Württemberg Ministry of Economics to extend the workshops beyond 2010.

The workshops start with representatives of major companies (such as Carl Zeiss, Daimler, Robert Bosch and European Technology Platforms) and other participants discussing what the future holds for technology applications in their field. Lina Albers, branch manager at Enterprise Rhône-Alpes International, also helped the group look beyond national borders in three of the workshops. Rhône-Alpes – one of Baden-Württemberg's partners in the "Four Motors for Europe" al-



The cluster event in Stuttgart for applied satellite navigation

liance – resembles Baden-Württemberg in terms of business cluster activity, making the French region a feasible partner for a number of initiatives. As a next stage, vari-

ous opportunities and risks have been discussed, as well as tangible actions that can be taken to broaden Baden-Württemberg's competitive edge over the long term. For

example, Peter Kersten, a director at Telemotive, gave a speech on a new strategic initiative designed to set standards in e-mobility; the initiative emerged directly from the mechatronics experts network. The workshops also witness the launch of many regional and international collaborations. To coincide with the launch of the Micro-TEC Südwest business excellence cluster, Mikrosystemtechnik Baden-Württemberg announced it is to partner with the European Technology Platform (EPOSS) on Smart Systems Integration as well as Minalogic, a French business cluster.

A strong network for innovation in Europe: The Enterprise Europe Network Baden-Württemberg

Nearly 550 organizations and 4000 employees in over 44 countries are dedicated to promoting business development, especially among SMEs. The focus: support in helping to sharpen a company's competitive edge and bolster Europe's potential for innovation. Key services also address ways for SMEs to open up new markets and innovate, as well as assistance in applying to European funding programmes.

One of ten partners in the Enterprise Europe Network Baden-Württemberg, the Steinbeis-Europa-Zentrum coordinates activities that promote research, technology transfer, and innovation. Handwerk International Baden-Württemberg "synchronizes" the entire network of seven Chambers of Commerce and Industry as well as the Baden-Württemberg Ministry of Economics. This scope makes the network an excellent resource for companies, researchers, and scientists throughout Baden-Württemberg.

The network provides support with:

- **entry into new markets for SMEs:** SMEs can take advantage of services that are tied to the European single market. These services cover financing, EU regulations, guidelines, and support opening up new markets.
- **innovation initiatives for SMEs:** SMEs can learn about innovation-friendly programmes and guidelines laid down by the EU as well as specialized seminars centering on innovation. Services also focus on one-on-one consulting sessions with companies looking to sharpen their competitive edge by engaging in joint ventures outside Germany.
- **research cooperations within the 7th European Research Framework Programme:** SMEs receive assistance to participate in the 7th Framework programme and during the bidding process for European Commission funds as well as establishing the partnerships they require.

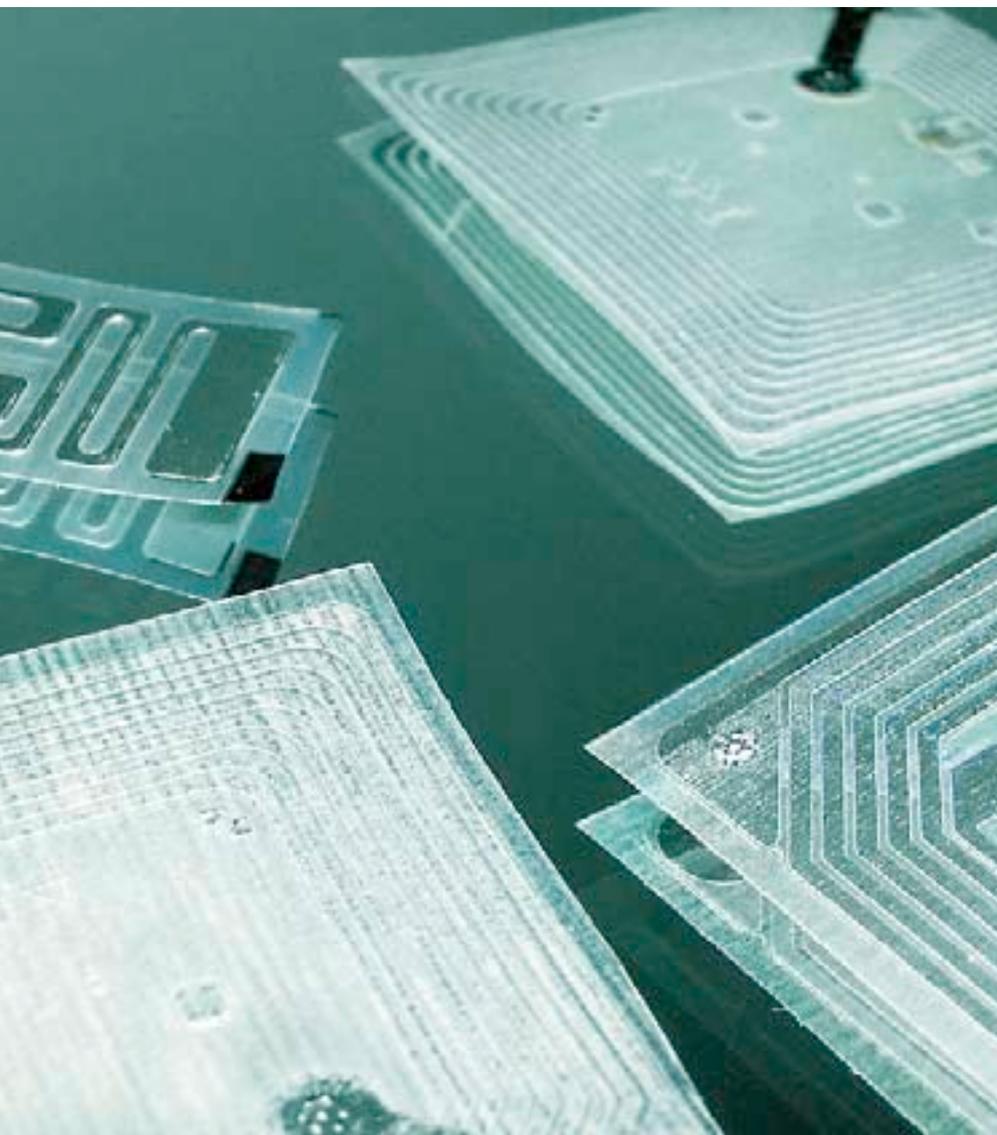
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A Steinbeis study on the range of UHF metal transponders

Are all metals created equal?

The Steinbeis My eBusiness Transfer Center faced this question when introducing radio-frequency identification (RFID) equipment at a leading manufacturer of cogeneration units for biogas plants. The company's warehouse stores over 2000 metallic parts for servicing and replacement. Using RFID technology, the company plans to reduce this inventory and switch to a stock-based warehousing system. But the reception range of the RFID transponders proved problematic due to the wide variety of metals. So the Steinbeis Transfer Center conducted a practical study to determine the reception ranges for different RFID systems and different metals.



A selection of RFID transponders

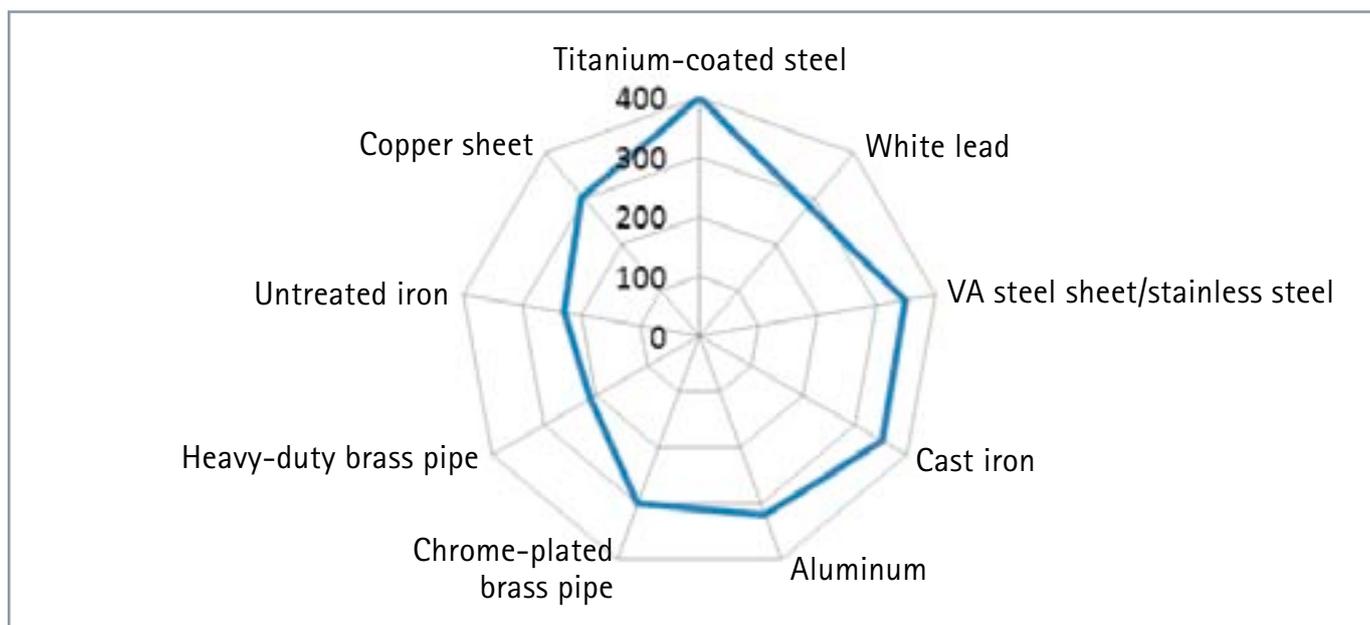
Using RFID transponders in a metallic environment has a major drawback: their reception range is considerably reduced. As conventional RFID labels and wet/dry inlays are unsuitable for use with metals, industrial enterprises have had to develop

special transponders compatible with metal surfaces – so-called “on-metal transponders”. The industry has developed a variety of possible solutions to this challenge in recent years.

Two of these approaches have been very successful: using the reflective qualities of the metal surface to boost the range, and placing the RFID transponder at a given distance from the metal surface to reduce distortion. The shape and size of the transponder's antenna are also a major factor. And when using RFID transponders on a metal surface, it is important to test which RFID reader has the longest range for a given transponder. Commercial RFID readers have a wide range of antenna shapes, battery sizes and transmitting powers.

In the study, experts from the Steinbeis Transfer Center My eBusiness used handheld RFID readers from a variety of manufacturers to detect a selection of metal-suitable RFID transponders of different shapes and sizes. The combined RFID systems were tested with nine different metals: titanium-coated steel, white lead, VA steel sheet/stainless steel, cast iron, aluminum, chrome-plated brass pipe, heavy-duty brass pipe, untreated iron and copper sheet.

The project team conducted the tests under realistic conditions, carrying out 10–15 readings for each RFID transponder in identical conditions. The type of metal or alloy proved to be the most significant factor in these tests. The team of Steinbeis experts was able to prove that highly magnetic metals had a considerable negative impact on RFID reception range. Consequently, untreated iron demonstrated the poorest average reception range of all tested metals. Aluminum, a lightweight, low-conductivity



Maximum range of various RFID systems for selected metals, in cm.

Using RFID transponders with metals

Possible solutions:

- **Increase the distance between the RFID transponder and the metal**

This approach involves using "flag tags", which are folded along a particular edge so that they are perpendicular to the metal surface. Foam tags use a similar principle: foam acts as a spacer between the tag and the metal surface. Hard-case tags can also be used, in which the RFID chip is encased in a resilient plastic layer (PVC, epoxide or similar), which protects the chip from outside influences.

- **Insert a non-conducting layer between the metal surface and the transponder**

Some RFID tags use a non-conducting layer between the metal and transponder, which shields the radio waves emitted by the transponder from the metal's reflecting and distorting effects. This can be achieved using a ferrite layer or a Licalloy film.

- **Compensate for distortions when designing the transponder**

The transponder can be designed so that distortions caused by metallic surfaces are compensated and effectively eliminated (via coupling between the tag and the metal surface). This even allows the metal surface to boost the tag's reception range.

metal, also fared poorly. As lead is diamagnetic and thus affects magnetic fields negatively, the reception range seen for lead was slightly better than that for iron. However, the conductivity of some metals – including copper, stainless steel and brass – was also seen to have a strong positive effect on reception range. In the case of the chrome-plated brass pipe, the additional anti-ferromagnetic layer created by the chrome plating boosted this positive effect, increasing reception range even further.

Using the optimum combination of RFID reader and transponder, the project achieved ranges of 210 to 400 centimeters for the different metals. Taking iron as an example, the team attained an average reception range of around 75 cm for all combinations of reader and transponder; the best reader-transponder combination resulted in a maximum range of 230 cm. By pairing up the readers and transponders as best possible, the team were able to "filter out" low ranges and small RFID transponders.

This study demonstrates that metal surfaces no longer pose a problem to the use of RFID technology in industry. Different types of metal have different reception ranges. When planning to introduce RFID systems

for metal items, companies must consider which metals the system will be used for, and which RFID reader-transponder combinations offer the longest reception range.

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Leadership seminar with horse sense

Horsepower for managers

The connection between leadership skills and horsepower may not be immediately obvious. But strike up a conversation with Heike Felbecker-Janho and Martina Zambelli, managers at the Steinbeis Consulting Center for Human Resources and Personality Development and you'll soon see how horses can test a manager's leadership skills. "Unlike employees, horses respond to the manager's personality, not to their titles or positions," Felbecker-Janho explains. "Leading horses can be trusted, they're reliable, gain respect, make clear decisions, know what they want, and are unfeigned. By handling horses, managers can learn these qualities for their own leadership tasks within the company."



The experts at the Steinbeis Consulting Center in Korntal-Münchingen, Germany, have been offering consultation and development courses for companies, teams, managers, project managers, junior managers, and individuals since 2007. One of their specialties: activities involving horses – their "horsepower seminars" (Seminare mit PS). They are surprisingly effective and provide lasting results.

The management team at a medium-sized IT company signed up for a seminar and confirmed just how effective the approach is. When they went on the course, the eight managers in the group were mostly new to management, worked internationally and each was responsible for their own multicultural team. Their bosses had clear goals for the seminar: build on management skills, individually and as a group, focusing on questions such as "What's the best way to lead my team?" and "What's the best way to lead the department together?" An additional objective was for the group to "merge" as a team. The Steinbeis experts suggested a tailor-made approach, based on their competences and years of experience with development processes for employees, teams and organizations. The result: a two-day

"horse activity" seminar, supervised closely throughout.

The contrast with "regular" management training was apparent from the very beginning: bursting with anticipation, the participants met on hay bales in a field on a sunny morning. The aim of the first day was to explore leadership individually. As the horses were introduced to the humans (and vice versa), the coaches gathered first impressions of the participants. These impressions were then used to fine-tune exercises and levels of difficulty (for example: which horses should work with whom). At first, some participants felt insecure or afraid of handling the unfamiliar, large animals. The Steinbeis consultants were there to lend support: there is a close link between leadership and trust.

After this introductory phase, it was time to start taking leadership. Team leader Jan started with a horse named Lucky. After a few meters, instead of following the leader, Lucky began munching the lush grass at the edge of the riding area. Christel Buwitt, the "horse whisperer" among the instructors, called out: "Jan, you're the boss. What do you do next?" Jan tugged at the reins and pulled Lucky away from the grass. "Not too hard, not too abruptly – and look, he understands you. Can you feel it?" Christel asked. "Now keep the contact going, he'll follow you." Jan beamed. When they reviewed the video, he could identify the exact moment he "lost" Lucky. But could Jan transfer this to

his job? How could he make sure he keeps "contact" with his team? Together with the Steinbeis coaches, Jan explored these questions further. Later, he discovered that another horse, Paschou, had to be walked differently. Increasingly, the participants gained in confidence during exercises and dared to follow their intuition. And it was a steep learning curve.

The first day in the field drew to a close with a buffet, a campfire and guitar music. The following morning started with a review of the previous day's events. Some participants had already started mulling over their impressions and experiences and had written them down. Steinbeis staff logged their insights to ensure they could be translated into everyday business.

The topic on the second day was leadership as a group. At first, they were unable to solve the first group task with the horses as they were not yet accustomed to working in this way. Everyone tried solving their own part of



Photos: Prof. Dr.-Ing. Gerd Siegmund

Horsepower for managers – How the seminar works:

- A horse responds immediately and instinctively. Participants receive intense, appreciative and honest feedback, discover unconscious behavior, and have an opportunity to practice new behaviors.
- Participants take home lasting impressions that translate lessons learned into new emotional responses which can be applied to the workplace.
- Observation and perception skills are honed.
- Participants dive into a foreign "culture" – an entirely new world where many routine solutions no longer work. They learn to handle new situations more confidently.
- Participants become more self-aware and relaxed, outdoors and with the animals.
- Participants develop their intuition and learn to trust it more.
- Parallels are drawn between horses in the herd and organizations and companies. These can then be applied to participants' work context.

During all seminars, the participants only guide the horses on a lead. No riding takes place.

the task as quickly as possible. Some stopped thinking about interactions within and between the groups. But many of the insights gained in the first exercise were applied to the following ones. Gradually, the participants learned to coordinate better, make plans as a group and keep an eye on the bigger picture. The instructors provided plenty of feedback, to each individual and to the group. And conflicts were solved. Everyone was happy – if not relieved – when the team successfully completed the difficult final task on the first attempt. Participants realized how important it is to "pull together" as a team for the department to succeed.

Six weeks after the seminar, the follow-up coaching process began and Steinbeis's Martina Zambelli visited the client for two days. This follow-up is crucial for clients and instructors, as some aspects of the seminar only start to take effect several weeks later. This gives rise to new questions. Each participant was given individual coaching to discuss where they stand, lessons learned, which lessons they had implemented so far, any unanswered questions, and possible next steps. Additional group discussions, of-

ten including the department head and the managing director, led to further goal-oriented changes. The participants and senior managers were extremely satisfied with both the seminar and the coaching results.

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NTG audits: easing access to financial backing

Adding certainty to investment decisions

After the global financial market crisis, the economic framework has shifted worldwide. Hard times have hit the real economy, now making it all the more important to ensure business is supplied with fresh capital – to keep healthy companies up and running, but especially to support small and medium-sized companies. As well as providing a useful tool to estimate credit risk, NTG audits should always be called on to assess the potential of technology, markets and patents.



Photo: © istockphoto.com/kzenon

The German network for market and technology audits (NTG) was established on behalf of the German Giro and Savings Bank Association (DSGV). Members of the German savings bank organization have already been able to use the NTG to assess financial backing options since 1996. Since 2005, it has been open to all clients. It is based on a modular auditing system only available through the Mannheim-based Steinbeis Transfer Center for Technology Evaluation and Innovation Consulting (TIB). The TIB uses the audit to assess the market and technology-based opportunities and threats of products and technology and the feasibility of introduction.

Financing fledgling, small and medium-sized business, or technological innovations, is a major risk to financial backers who normally have little security to speak of. The decision to provide investment therefore has to be carefully weighed up and covered for. Under such circumstances, the backer and the borrower can call on the network for market and technology audits, or NTG, at the Steinbeis TIB Transfer Center.

The TIB audit system is based on a variety of groups of questions, which can be used on a pick and mix basis to match customer requirements. Thus, an audit could take the form of a short assessment of a funding

proposal to an all-encompassing market, customer and competition analysis. There is also the option of evaluating technological trade mark rights. The TIB Transfer Center can call on a pool of 1300 experts to work on any given project from the Steinbeis Network, Fraunhofer Institutes, universities and consulting engineers. As the network is continually expanding and renewing itself, expertise can be provided on completely new topics.

To show how the NTG audit system works in practice, take the example of a medium-sized family-run automotive supplier with 50 employees, specialized in the manufacture of intelligent braking systems for trucks. Following a dip in market demand for commercial vehicles, company turnover slumped severely, forcing the company to turn to new areas of business. To develop a braking system for cars and enter the market, the company needs around five million euros.

Discussions with potential investors lead nowhere; the owner-manager is typically told that investments are much too risky at the moment and the technological standard of the braking system is difficult to assess. The firm's financial advisor at the bank says that backing could be provided if the company were to provide a thorough and impartial expert report. The owner-manager then invites the TIB Steinbeis Transfer Center to write an audit. A suitable expert is called in to supervise the entire auditing process. The manager of the automotive supplier is given the completed report, which is subsequently forwarded to the potential backer.

The auditor's expertise helps everyone involved in the process as it clearly highlights weak links in previous planning. The recommendations make it possible to adjust planning. The financial advisor at the bank can now use the impartial audit as a carefully considered assessment of the investment project. In the end, this medium-sized enterprise did indeed receive the funding it required.

According to a study carried out by banking group KfW in February 2010, businesses are likely to find credit tight this year. This is partly caused by a surge in demand for credit because of the increased level of production and investment activity. In contrast, banks are being more hesitant, given the

number of defaulters on loans and growing restrictions on the issuing of credit. As a result, competition among companies for increasingly scarce funding will intensify.

The NTG audit system offered by the Steinbeis TIB Transfer Center makes it easier to assess investment risks and eliminate weaknesses in business plans earlier in the process, thus paving the way for financial backing.

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New Steinbeis Enterprises

Abbreviations:

SCC: Steinbeis Consulting Center

SRC: Steinbeis Research Center

SIC: Steinbeis Innovation Center

STI: Steinbeis Transfer Institute

STC: Steinbeis Transfer Center

The following Steinbeis Enterprises have been founded as of end of November 2009:

Steinbeis Transferzentren GmbH an der Hochschule Ulm, Ulm

Director: Dipl.-Wirt.-Ing. August Musch

SRC Applied Research in Power Electronics, Rostock

Director: Prof. Dr.-Ing. Hans-Günter Eckel

SCC Electromobility and Drive Engineering, Gerlingen

Director: Prof. Dr.-Ing. Nejila Parspour

STC Vegetable Waste Treatment Technology and Sustainability, Weingarten

Directors: Prof. Dr. Georg Nuoffer-Wagner
Dipl.-Ing. (FH) Timur Elmas

SIC Center for Systems Biomedicine, Falkensee
Director: Prof. Dr. Thomas Meyer

SCC Advanced Web Technology, Stuttgart

Director: Prof. Dr.-Ing. Peter Thies

STI Projectdesign/Networked Cultural Work, Stuttgart

Director: Dipl.-Kulturgestalterin
Stefanie Seiz-Kupferer

STI Design, Management and Technology, Schwäbisch Hall

Directors: Dipl.-Verw.Wiss. Thomas Hilbert
Dipl.-Ing. (BA) Walter Beck, MBA

STI Convergence Management, Berlin

Directors: Prof. Dr. Frank Keuper
Dipl.-Betriebswirt (BA) Carsten Rasner

STI Excellence of Management and Innovation Intelligence (EMII), Filderstadt

Directors: Dipl.-Ing. (BA) Walter Beck, MBA
Dipl.-Ökonom Vassili Toropov
Dipl.-Oec. Constantin Pivovarov, MBA

STI Business, Engineering and Technology – Bulgaria, Filderstadt

Directors: Dipl.-Ing. (BA) Walter Beck, MBA
Prof. Dr.-Ing. Florin Ionescu
Prof. Dr.-Ing. Kostadin Kostadinov

STI Institute for Integrative and Transcultural Asian Medicine, Berlin

Director: Sonja Maric, M. A.

STC Material Technology, Tuttlingen

Director: Prof. Dr. Haid Mozaffari-Jovein

SCC Transport and Logistics, Flein

Director: Prof. Dr. Dirk Lohre

15 Talents SIBE GmbH, Herrenberg
Director: Dipl.-Verwaltungswirtin (FH)
Bettina Rominger, MBA

STC Safety and Security Engineering, Unterkirnach

Director: Prof. Dr.-Ing. Ulrich Weber

STI Training and Diagnostics of Suitability, Filderstadt

Directors: Dipl.-Ing. (BA) Carsten Stehle
Dipl.-Betriebswirt (BA) Gunther Wemmer

Steinbeis Consulting Services Ltd., Ankara

Directors: Tamer Öztin

Melih Aral

STC Hybrid Drive Technology and Simulation Technology, Köln

Director: Dipl.-Ing. Gunnar Lerch

STI Culture Transfer, Stuttgart

Directors: Prof. Cordula Beelitz-Frank
Prof. Heidemarie Kurtscheid

STI Culture Management, Stuttgart

Director: Ute Schüler, M. A.

SCC Corporate Development & Innovation, Weilrod

Director: Dipl.-Ing. (FH) Erna Marie Busch

STC Applied Tourism and Regional Research, Greifswald

Director: Prof. Dr. Monika Rulle

STC Medical Sensor Technology, Measuring and Signal Processing, Ilmenau

Director: Prof. Dr.-Ing. habil. Peter Husar

STI GSA Professional Speaker, Berlin

Director: Markus Hofmann

STC Optical Measuring and Automatic Optical Inspection, Rottendorf

Director: Prof. Dr. Gunther Bohn

SCC Innovations Management and Know-How Transfer NORD, Hamburg

Directors: Betriebswirt (VWA) Christopher Scharf
Dipl.-Kfm. Dorian Scharf
Dipl.-Ing. Hans Protschka

Patented piston system for monobloc aluminum aerosol cans

Get pumped!

Aerosol cans are part of modern life and indispensable for many applications: from industrial chemicals to premium fragrances. Single-chamber cans, where the payload, or liquid, comes into direct contact with the propellant, are the most commonly used variant. However, there is strong demand for dual-chamber cans, which separate the liquid from the propellant. The patented ZIMA piston system addresses this need, using a plastic piston in the aerosol can. The Steinbeis Transfer Center for Site Management and Business Development provides marketing support for the patent.



Aerosol cans with plastic pistons

After years of development and testing, the piston system can now be used for a wide range of applications. At the center of this innovative system is a plastic piston, which separates the liquid from the propellant. First, the liquid is filled into the top part of the can and the spray valves seal the can. Next, the propellant – sometimes nothing more than air – is compressed into the bottom section through a base valve. The patented swallowtail shape of the ZIMA piston forms a permanent seal, guarantees stable pressure throughout the life of the prod-

uct and ensures almost every last drop of the liquid can be dispensed. Because the piston creates such a tight seal, it is also ideal for spraying liquids with very low or very high viscosity.

The Steinbeis Transfer Center for Site Management and Business Development in Bad Krozingen, Germany, is developing a corporate strategy for manufacturing and marketing the patented ZIMA piston. The strategic focus is twofold: 1) Cost-efficient production of the various piston variants to certified standards, 2) Multi-stage marketing plans, down to individual sales channels. By referring to carefully matched key indicators and business reports, managers gain a precise, real-time overview of actuals versus targets. The benchmarks were based on the online version of the Steinbeis Balanced Scorecard developed at the Steinbeis Transfer Center for Site Management and Business Development. With each deviation, counteractive measures can be taken quickly.

Potentially, the piston system could be marketed through all companies in the aerosol

can industry. The Steinbeis experts are also approaching end clients directly across a variety of sectors.

The new piston forms make it possible to adapt this system to all types of cans and can-based systems on the market. The injection molding process meets all prevailing technical requirements. Various locations in Baden-Württemberg and Hungary are being examined as potential production sites. The piston can be manufactured from all conventional injection moldable plastics and can be used to dispense a wide range of substances.

The ZIMA system is also ground-breaking in environmental terms as it avoids more harmful propellants. Air is normally used as the "propellant", making it much easier to meet environmental requirements.

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The 2009 winners go on tour in California

Youth Start-Ups head to Silicon Valley

A trip to Silicon Valley – the prize that awaits every winning team in the nationwide Youth Start-Ups school competition. The prize is sponsored by Steinbeis. The 2009 winning team pulled ahead from over 4500 participants throughout Germany with an exceptional business plan and a demonstration of true entrepreneurial spirit in moving the economy forward. The four high school graduates' winning idea: the launch of a company to produce innovative shock absorbers called PiezoPower ShockAbsorber. The absorbers would be based on piezo-electric elements to convert energy created by pressure into electricity.

The final presentations were judged by a jury of 14 hand-selected experts from universities, banking institutions and industry. There were ten teams of finalists at the investors' trade fair in Wolfsburg. Ultimately, it was the professional touch and impressive cutaway model of its product idea that prompted the jury to select the PiezoPowerProducts team.

Dr. Nils Högsdal, managing director of TATA Interactive Systems, made all of the travel arrangements, so it was only fitting that he should accompany the winning Youth Start-Ups team on their tour of fascinating people and companies. The team had a full agenda, visiting Alcatraz, the former maximum-security prison, eating at the legendary Hard Rock Café in San Francisco, walking across the Golden Gate Bridge and along the Walk of Fame in Los Angeles, and visiting Hearst Castle, the fanciful palace of media mogul William Randolph Hearst.

While visiting Detecon, a corporate consulting company, the young entrepreneurs spoke with Dr. Eric Dulkeith, who shared his insight on the success of Apple, what lies ahead for the home telephone, and what's hot today and tomorrow, courtesy of the company's "trend radar". Tesla Motors, the first company to go into serial production on 100 % electric cars, gave the up-and-coming entrepreneurs an exclusive tour of their premises – complete with a "test sit" in one of their electrically-powered roadsters.

An excursion to Stanford University provided a glimpse of what the next generation of



The winning Youth Start-Ups team for 2009 and its chaperones in Silicon Valley

sharp American minds is up to. Then there was a tour of the Intel museum followed by a visit to another start-up, Talenthouse, a platform for young artists of every stripe. And what a surprise! The group bumped into a member of the 2006 Youth Start-Ups winning team – who is now in California on an internship! Visits to BPWorks (online workspaces and wikis), Force for the Future (business consulting geared to start-ups), Mochi Media (an Internet platform) and chats with Andrej Nabergoj (angel investor and COO of Noovo) gave the Youth Start-Ups team plenty of exciting food for thought.

The icing on the cake: On the last day of their trip to the US, the team were let in to

a place only a handful of people see every year – the Valhalla of automotive designers, the VW design studio in Santa Monica. It's also known as the "delivery room" for VW prototypes. The team went on a guided tour with Jae S. Min and Christoph Brockschmidt, two of VW's chief designers, and even got a glimpse of some new concept cars.

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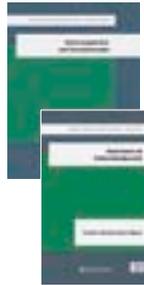
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New releases from Steinbeis-Edition

Reading – Learning – Understanding

Steinbeis-Edition publishes works mirroring the scope of the Steinbeis Network expertise. All titles can be easily ordered via our online shop, at www.steinbeis-edition.de.

The Transfer Documentation Reports (TDR) series features these new additions:



Protection models and a shared belief in security (Sicherungskultur und Schutzkonzepte)

Joachim Lindner
ISBN 978-3-941417-23-6
(German)

Awareness in the security sector (Awareness im Sicherheitsbereich)

Astrid Loos
ISBN 978-3-941417-24-3 (German)

CAx series – Volume 2

Optic simulation – Automatic waveguide design with LucidShape

(CAx Schriftenreihe – Band 2)

Optik Simulation – Automatische Lichtleiterauslegung mit LucidShape)

Thomas Andres
Alexander von Hoffmann (Publ.)
ISBN 978-3-941417-14-4 (German)

Engineers working on vehicle lighting need to be proficient with CAx applications. CAx skills allow engineers to quickly evaluate and make changes at any point during the development process.



As a complement to the software manufacturers' manuals, the CAx series is designed to help readers quickly get the hang of each CAx application through real-world projects. Drawing on the example of an optimization algorithm for waveguides, the second volume of this series illustrates how the macros for LucidShape (the light simulation software) are programmed. The work focuses on various waveguide principles, syntax, data types, automated descriptive geometry, the execution of simulations (supported by more

than one processor) as well as program-controlled analyses of light distributors.

6th Business Intelligence Symposium: Status Quo – Opportunities and Challenges (6. Symposium Business Intelligence: Status Quo – Chancen und Herausforderungen)

Institut für Business Intelligence (Publ.)
ISBN 978-3-941417-19-9 (German)



Business intelligence (BI) continues to evolve into a key success factor for strategic corporate managers with one eye on the horizon. To track developments, the Institute for Business Intelligence (IBI) examines the current status once a year.

Hosted by the IBI, the Business Intelligence – Status Quo: Opportunities and Challenges symposium is a chance to share experiences. Users, manufacturers, and representatives of higher education connect and discuss current BI issues. The symposium's themes are also captured in the annual conference proceedings. The latest symposium was held in December 2009 and addressed the added value of BI, the state of BI today, current developments, and best practice at companies actively using BI.

SiFo Study 2009/10 – Protecting Know-how in Baden-Württemberg (SiFo-Studie 2009/10 – Know-how-Schutz in Baden-Württemberg)

Sicherheitsforum Baden-Württemberg (Publ.)
ISBN 978-3-941417-20-5 (German)

A study entitled "SiFo Study 2009/10 – Protecting Know-how in Baden-Württemberg" reveals the true threat posed by copyright infringement and espionage. The study was

commissioned by the security body Sicherheitsforum Baden-Württemberg and the results were compiled jointly by the Ferdinand-Steinbeis-Institut and the School of Governance, Risk & Compliance at the Steinbeis University Berlin. Research-driven establishments are particularly at risk, but in reality, any company could be affected – a risk that is still greatly underestimated. Even worse: Many companies are insufficiently informed about the ways to shield their information. A particular highlight of this study: an evaluation of instances resulting in damage. The book provides telling insights into the cost of infringement and espionage as well as how the crimes were committed. The study is accompanied by a separate publication (ISBN 978-3-941417-21-2) on what to do, whom to turn to, and networks with more information on how to stop intellectual property theft.

RE-RELEASED!

Dorf Komm+

Invigorating communities in less space (Dörfer beleben – Flächen sparen)

LEADER+ Aktionsgruppe Hohenlohe-Tauber
Ingenieurbüro Klärle (Publ.)

ISBN 978-3-941417-02-1 (German)

The book is a collection of 18 plans for communities in the Hohenlohe-Tauber area of Germany. Experience and insight from individual studies are reformulated into recommendations and strategies for communities that want to plan for the future. These ideas look at multiple aspects of life and map out sustainable growth.

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