Steinbeis

Steinbeis Foundation's Transfer Award

Löhn Award

2004–2019

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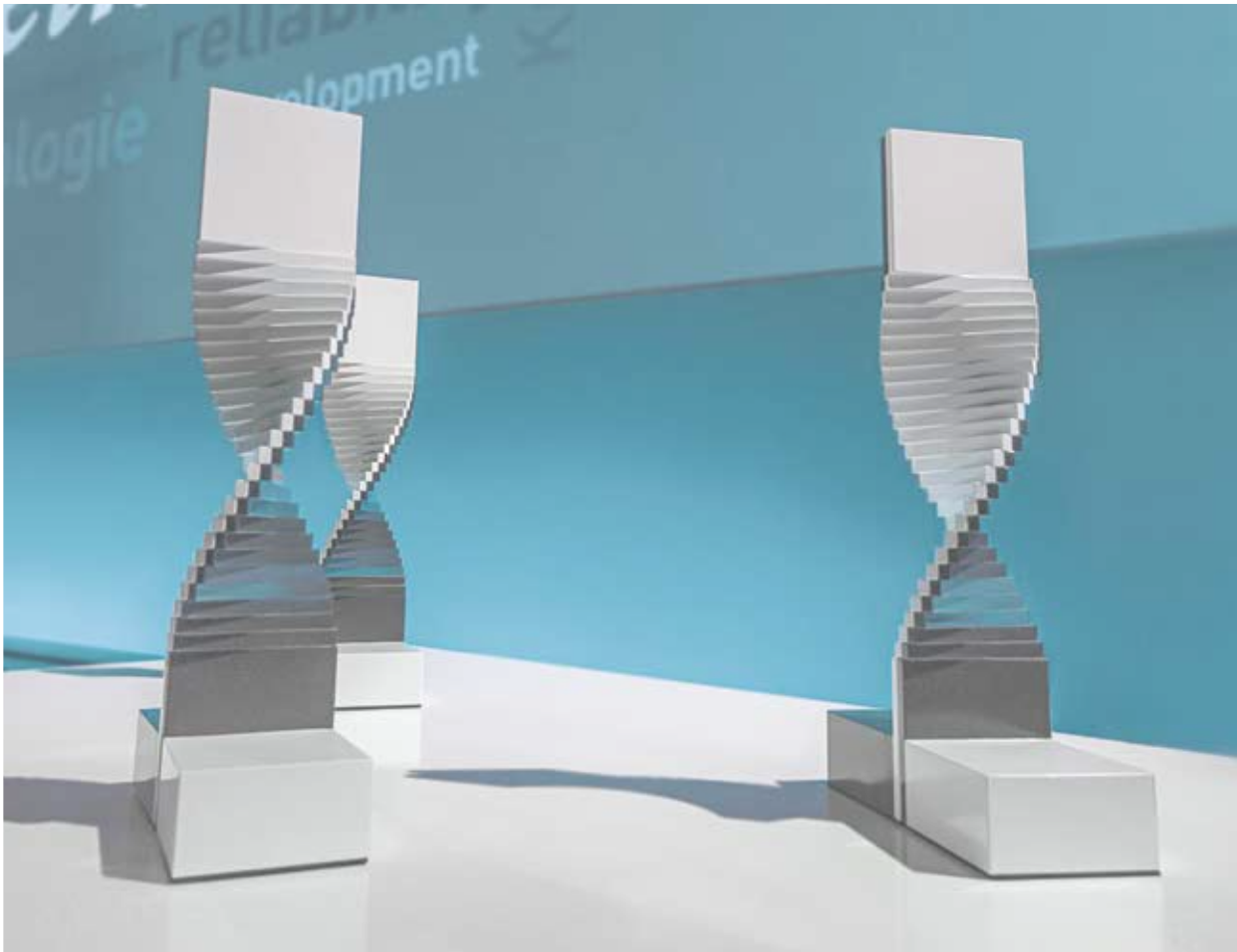
Content

Foreword

Steinbeis Foundation's Transfer Award



History and Purpose of the Steinbeis Foundation's Transfer Award

The Steinbeis Foundation's Transfer Award – Löhn Award was initiated and first conferred in the year 2004 by the Steinbeis Foundation in honor of the unique achievements of Prof. Dr. Dr. h. c. mult. Johann Löhn.

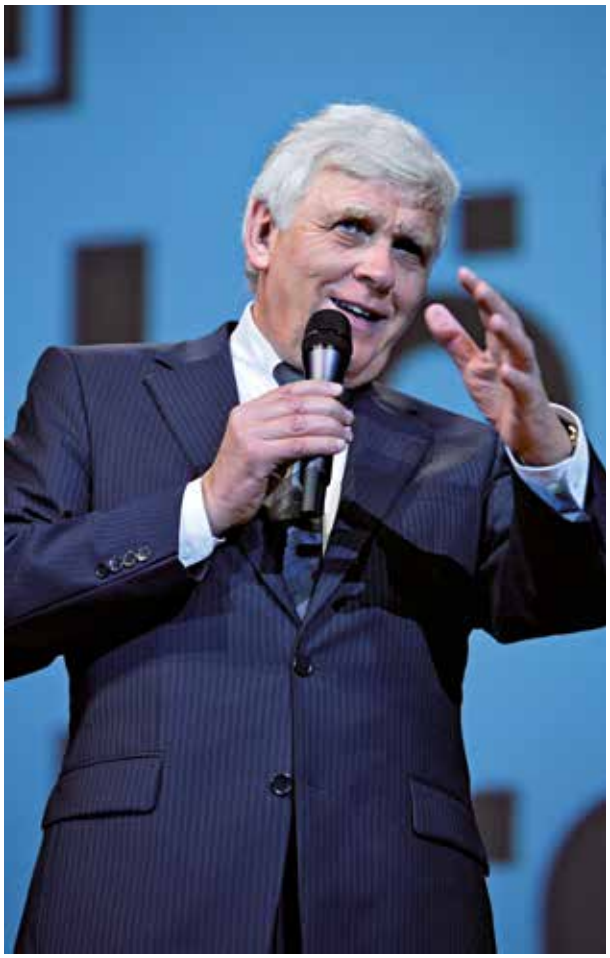
With its network of transfer oriented centers, the Steinbeis Foundation facilitates competitive knowledge and technology transfer across the entire gamut of modern technology and management expertise. The Steinbeis Transfer Network is made up of about 1,000 Steinbeis Enterprises as well as Enterprises operating under franchising arrangements or minority shareholdings in more than 60 countries. Its portfolio of services encompasses Research and Development, Consulting and Expertise plus Vocational Training and Professional Development for companies of all sizes and sectors. In this way, Steinbeis promotes the effective and efficient cooperation of scientific institutes and industry, by making knowledge and technology sources accessible via the competitive market approach.

The Steinbeis Foundation's Transfer Award – Löhn Award is conferred in recognition of outstandingly successful projects focusing on competitive knowledge and transfer technology. The success of a project is measured against two key criteria: the quality of the transfer process and the discernible transfer potential. Such success is reflected in the commercial value to all project partners participating. Alongside such transfer projects, particularly worthy projects, achievements and services may also be singled out for special honors as long as they fulfil the criteria transfer process, transfer potential and transfer success. The award winners are presented with a two-piece sculpture and prize money that they can put to use in future transfer projects.

The sculpture designed by Prof. Detlef Rahe (Steinbeis Transfer Center i/i/d Institute for Integrated Design, Bremen) for the Löhn Award symbolizes the Steinbeis concept of transfer and the unique technology transfer system developed by Johann Löhn and successfully implemented within the Steinbeis Corporation since 1983. The fundamental criteria for success at the heart of the L°° (Löhn Method) "systematic approach and simplicity" are reflected in the two complementary pieces of the sculpture, which mirror the "multi-dimensional duality" of a successful transfer process involving two independent partners working together for mutual benefit. The key elements of the Steinbeis model of precision, simplicity and complexity, networking and decentralism are reflected in the design and workmanship of the sculpture conferred as part of the Löhn Award.

This publication is an annual series documenting the award-winning projects and special honors conferred for the Steinbeis Foundation's Transfer Award – Löhn Award of a particular year.

www.loehn-preis.de



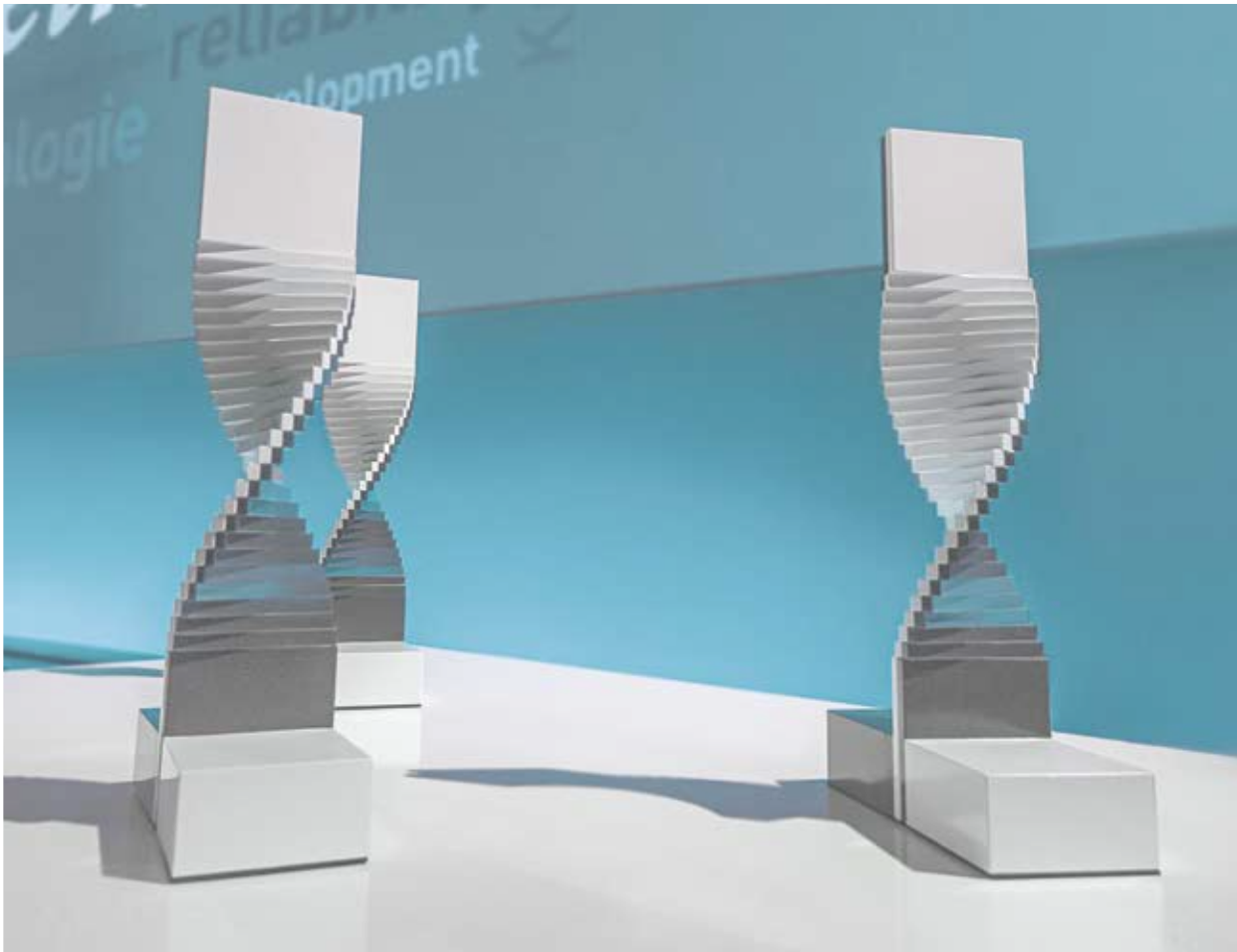
Nothing is More Successful than Success!

Prof. Dr. Dr. h. c. mult. Johann Löhn was the founder of the current Steinbeis Foundation (StW). Between 1983 and 2004, as Chairman of the Board of Directors, he developed the foundation by applying his own methods and his model of transfer centers into a global knowledge and technology transfer corporation that is now active in every state of Germany. Since 2004, Johann Löhn has been the honorary trustee of the Steinbeis Foundation.

Johann Löhn was born in Holvede-Halvesbostel in 1936. After completing an apprenticeship with German Rail, a physics degree and a doctorate at the University of Hamburg followed by various posts at the university and within the industry, in 1972 Johann Löhn was appointed Professor of Information Technology at Furtwangen University of Applied Science (the FHF, known today as Furtwangen University). In 1973 he took up the role of Deputy Vice-Chancellor and in 1977 was appointed Vice-Chancellor. In this role he headed up the 1982 Working Party for Technology Transfer under the auspices of the Baden-Württemberg Research Commission. Based on his experience and his exposure to the management of so-called technical consulting services at the FHF, Johann Löhn developed what was to become the first integrated model aimed at transferring technology into business, based on stand-alone, commercial methods.
In 1983, Johann Löhn was elected Chairman of the Board of the Steinbeis Foundation. In the same year, he was appointed by the Baden-Württemberg Minister-President at the time, Lothar Späth, as Baden-Württemberg Government Commissioner for Technology Transfer – a role that Johann Löhn performed in parallel with his Steinbeis Foundation responsibilities, and which he retained until 2006. As Chairman of the Board, Johann Löhn tapped into the infrastructure offered by the existing non-profit organization constituted under civil law, which had as its main task the oversight of 16 Technical Consulting Services (TBD) located at the state's applied universities. By the end of 1984, Johann Löhn had already founded 12 transfer centers (now Steinbeis Enterprises) in addition to the 16 TBDs, through which the professors of the applied science universities transferred their know-how and technologies in accordance with private-enterprise principles and as "enterprise within the Steinbeis Network". Today each individual Steinbeis Enterprise is the successful catalyst for specific technology transfer from all kinds of universities to private companies, and also facilitates every other form of knowledge transfer. In 1998, Johann Löhn founded the private Steinbeis University in Berlin (SHB). The SHB, presided over by Johann Löhn until 2018, offers students and companies work-related and practical study programmes leading to state-recognized qualifications based on the project competence principle. Its educational portfolio ranges from practical training diplomas, bachelor and master qualifications through to doctorates. Johann Löhn is a member of various supervisory boards. He has received many honors for his achievements, including the Order of Merit of the State of Baden-Württemberg for his commitment to making Baden-Württemberg a technology leader.

Award Winners

Overview



Award Winners

2004

Carl Zeiss Industrielle Messtechnik GmbH Karl Schepperle	Steinbeis Transfer Center Quality Assurance and Image Processing Prof. Dr.-Ing. habil. Gerhard Linß, Dr.-Ing. Peter Brückner
Charles River GmbH Dr. Jörg Geller	Steinbeis Transfer Center In-Vitro Pharmacology and Toxicology Prof. Dr. Albrecht Wendel
dm-drogerie markt GmbH & Co. KG Daniel Schmälzle	Steinbeis Transfer Center Innovation > Development > Application (IDA) Prof. Klaus Gremminger
MAHLE International GmbH Dr. Alfred Elsäßer	Steinbeis Transfer Center Mechatronics Prof. Dr.-Ing. habil. Prof. h. c. Eberhard Kallenbach
Voith Turbo GmbH & Co. KG Prof. Dr.-Ing. Tillman Körner, Carsten Polifke	Steinbeis Transfer Center New Technologies in Traffic Engineering Prof. Dr.-Ing. Günter Willmerding
Special Award Prof. Dr.-Ing. Walter Kuntz	Steinbeis Transfer Center Microelectronics and Systems Engineering Steinbeis Transfer Center Medical Electronics

2005

Heidelberg Engineering GmbH Dr. Gerhard Zinser	Steinbeis Transfer Center Biomedical Engineering and Applied Pharmacology in the Ophthalmology Prof. Dr. med. Rudolf F. Guthoff
Koenig & Bauer AG Dr.-Ing. Frank Junker	Steinbeis Transfer Center Production Technology and Waste Handling Logistics Prof. Dr.-Ing. Ulrich Günther

Award Winners

2006

Sensovation AG
Stefan Bickert

Special Award
Prof. Dr.-Ing. Eberhard Birkel

Steinbeis Transfer Center Medicinal Biophysics
Prof. Dr. Rainer H. A. Fink, Dr. Martin Vogel

Steinbeis Transfer Center Technology Consultancy
at the University of Applied Sciences Esslingen

2007

Special Award
Senator E. h. Dr.-Ing. Wilhelm Schmitt

Special Award
Prof. Dr.-Ing. Jürgen van der List

Steinbeis Foundation, Member of the Board of Trustees (1991–2006)
(Vice-Chairman of the Board of Trustees 1998–2006)

Steinbeis Transfer Center Microelectronics

2008

OHB Orbitale Hochtechnologie
Bremen-System AG
Prof. Dr. Manfred Fuchs

SGL Technologies GmbH
Werner Guckert
Saint-Gobain Rigips GmbH
Dr.-Ing. Winfried Spickermann

WAFIOS AG
Volker Kalkau, Peter K. Waiblinger

Special Award
Prof. Dr.-Ing. habil. Prof. h. c.
Eberhard Kallenbach

Steinbeis Research Center Optimization, Control and Adjustment Control
Prof. Dr. Christof Büskens

Steinbeis Transfer Center
Plastics and Composites Technology
Prof. Dr.-Ing. Christian Kipfelsberger

Steinbeis Transfer Center Quality Assurance and Image Processing
Prof. Dr.-Ing. habil. Gerhard Linß, Dr.-Ing. Peter Brückner

Steinbeis Transfer Center Mechatronics

Award Winners

2009

EyeSense GmbH
Dr. Peter Herbrechtsmeier, Dr. Achim Müller

Municipality of Bad Peterstal-Griesbach
Bürgermeister Johann Keller

PSD Bank Berlin-Brandenburg eG
Bernhard Soeken, Tim-Enno Janssen

Special Award
Prof. Dr.-Ing. Nikolaus Kappen

Special Award
Prof. Dr. rer. nat. Dr.-Ing. E. h. Max Syrbe

Steinbeis Research Centre
International Vision Correction Research Centre (IVCRC)
Prof. Dr. med. Gerd Auffarth

Steinbeis Consulting Center Regional and Communal Development
Prof. Dr. habil. Gabi Troeger-Weiß, Dr.-Ing. Hans-Jörg Domhardt

School of Management and Innovation (SMI)
Carsten Rasner, Prof. Dr. Dr. Helmut Schneider

Steinbeis Transfer Center Computer Applications

Steinbeis Foundation, Member of the Board of Trustees (1983–2011)
and Chairman of the Board of Trustees (1991–2011)

2010

Genzyme CEE GmbH
Dr. Thomas Fritz

Stadtmüller GmbH
Uwe Stadtmüller

Siemens AG Generatorenwerk
Henry Werner

Steinbeis Transfer Center for Biopolymer Analysis,
Protein Chemistry and Proteomics at the University of Constance
Prof. Dr. Dr. h. c. Michael Przybylski

Steinbeis Transfer Center for Production and Organisation
Prof. Dr.-Ing. Herbert Emmerich

Steinbeis Transfer Center Drive and Handling Technology
in Mechanical Engineering
Prof. Dr.-Ing. habil. Eberhard Köhler

Award Winners

Special Award Prof. Dr.-Ing. Klaus Boelke	Steinbeis Transfer Center for Technical Consulting at the University of Applied Sciences Heilbronn
Special Award Prof. Dr.-Ing. Hermann Kull	Steinbeis Transfer Center for Systems Technology / Automotive
Sony DADC Austria AG Dr. Werner Balika Watlow Plasmatech GmbH Martin Wallinger	Steinbeis Transfer Center Plastics Center Prof. Dr.-Ing. August Burr
Institut Dr. Foerster GmbH & Co. KG Thomas Himmler	STASA Steinbeis Angewandte Systemanalyse GmbH Prof. Dr. Günter Haag
NT TOOL Corporation Junichi Iwase	Steinbeis Transfer Center Quality Assurance and Image Processing Prof. Dr.-Ing. habil. Gerhard Linß, Steffen Lübbecke, Dr.-Ing. Peter Brückner
Special Award Prof. Rudolf Voit-Nitschmann	Steinbeis Transfer Center Aerodynamics, Aircraft Engineering and Lightweight Construction Steinbeis Flugzeug- und Leichtbau GmbH
Special Award Prof. Dr. Werner Bornholdt	Founder and director of the Steinbeis Transfer Center New Products (1988–2010)

2011

Award Winners

2012

PHYWE Systeme GmbH & Co. KG
Dr. Michael Mehlhorn

Steinbeis Transfer Center Embedded Design and Networking
Prof. Dr.-Ing. Axel Sikora

Atotech Deutschland GmbH
Bernd Schmitt, Christian Thomas

Steinbeis Research Center
Material Engineering Center Saarland (MECS)
Prof. Dr.-Ing. Frank Mücklich, Christian Selzner

CeramTec GmbH
Paul Silberer, Florence Petkow

Steinbeis Transfer Center Technical Communication – Paracam
Prof. Dr. Michael Bauer

Special Award
Sachihiko Kobori

Steinbeis Japan Inc., Tokio

Special Award
Prof. Dr.-Ing. habil. Eberhard Köhler

Steinbeis Transfer Center
Drive and Handling Technology in Mechanical Engineering

2013

Daimler AG
Dr.-Ing. Stephan G. Klose
Holder GmbH Oberflächentechnik
Jochen Holder, Dr. Markus Schütz
Ingenieurbüro Peter Schrems (IPS)
Peter Schrems

Steinbeis Transfer Center Corrosion and Corrosion Prevention
Prof. Dr.-Ing. Reinhold Holbein

Behr GmbH & Co. KG
Dr. Achim Wiebelt

Steinbeis Transfer Center for Heat Management in Electronics
Prof. Dr.-Ing. Andreas Griesinger

Fraunhofer Institut für Bauphysik IBP
Dr. Judit Angster
Werkstätte für Orgelbau Mühleisen GmbH
Konrad Mühleisen, Karl-Martin Haap

Steinbeis-Europa-Zentrum Karlsruhe
Prof. Dr.-Ing. Norbert Höptner, Dr. Jonathan Loeffler
Steinbeis Transfer Center Applied Acoustics
Prof. Dr. András Miklós

Award Winners

2014

Special Award Prof. Dr. h. c. Lothar Späth	Former Minister-President of Baden-Württemberg (1978–1991)
Volkswagen AG Stefan Braun	Steinbeis Transfer Center Applied Production and Joining Technology / ARGOS Systems Engineering, Prof. Dr.-Ing. Dieter Liebenow, Harald Musa
Daimler AG Christian Elsner	Steinbeis Transfer Center Laser Processing and Innovative Manufacturing Technology Prof. Dr.-Ing. Roland Wahl
Special Award Prof. Dr. Joachim Goll	Steinbeis Transfer Center Software Engineering

2015

VISUS GmbH Peter und Moritz Fanti	Steinbeis Transfer Center eyetrial at the Centre of Ophthalmology Prof. Dr. med. Barbara Wilhelm, Dr. med. Tobias Peters
Hottinger Baldwin Messtechnik GmbH Dirk Eberlein, Klaus Lang	Steinbeis Transfer Center energy-efficient power electronics for electrical drives and power storage systems Prof. Dr.-Ing. Johannes Teigelkötter
Daimler AG Markus Höfling	Steinbeis Interagierende Systeme GmbH Dr. Oliver Bühler, Dr. Daniel Ulmer
Special Award Prof. Dr. habil. Hans Jobst Pleitner	Steinbeis University Berlin

2016

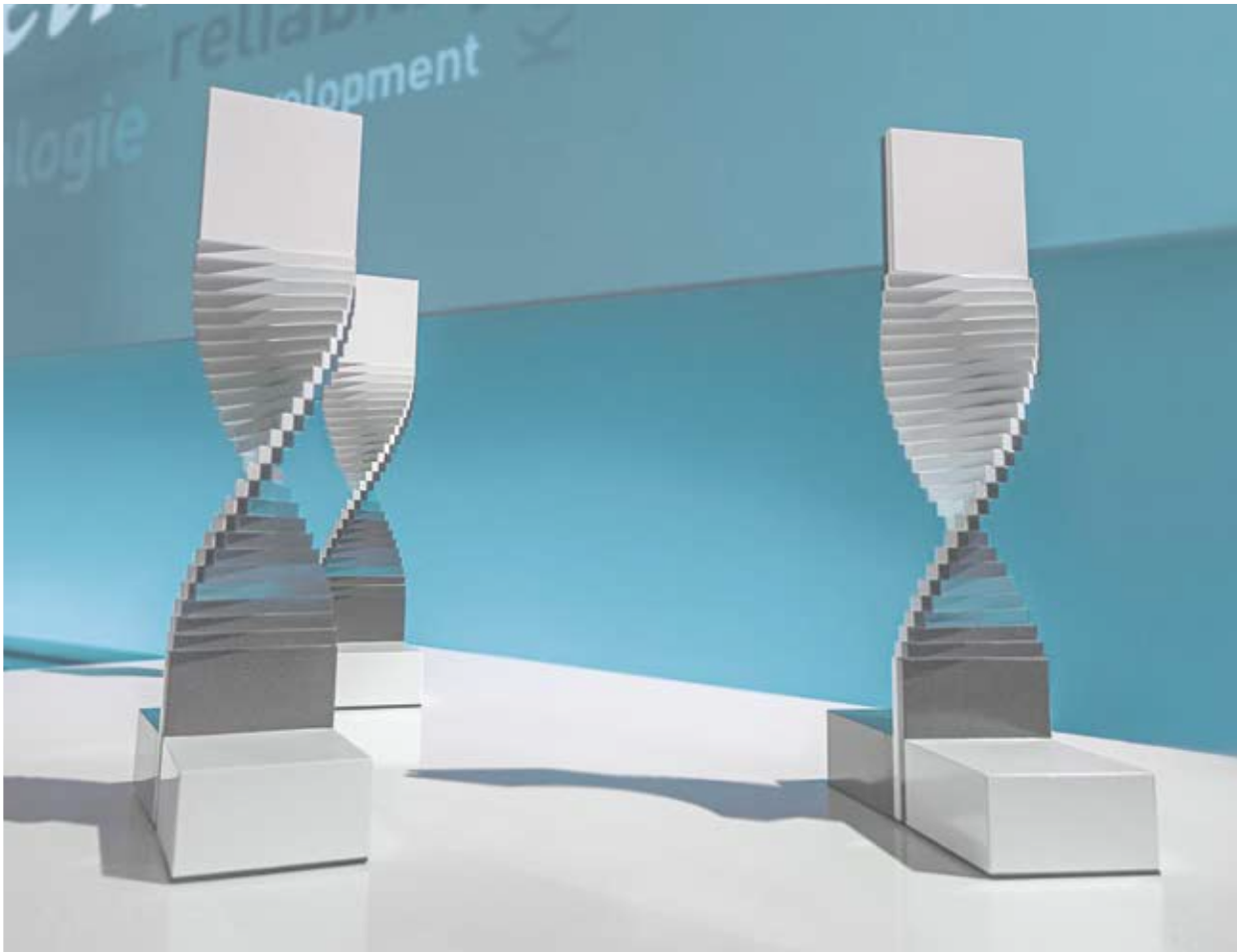
Sonderpreis Prof. Karl Schekulin	Steinbeis-Transferzentrum Verfahrensentwicklung

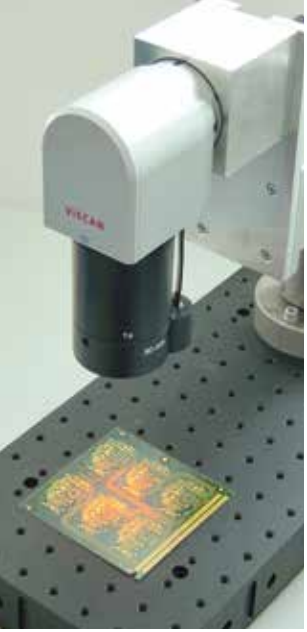
Award Winners

2017	Prym Consumer Europe GmbH Dr. Stefan Grasmugg	Steinbeis Research Center Automation in lightweight construction processes (ALP) Mirko Spieler, Prof. Dr.-Ing. Wolfgang Nendel
	SEW-Eurodrive GmbH & Co. KG Dr. Olaf Simon	Steinbeis Transfer Center Material Development and Testing (WEP) Prof. Dr.-Ing. Norbert Jost, Prof. Dr.-Ing. Gerhard Frey
2018	Bosch Rexroth AG Dr. Andreas Selig Festo AG & Co. KG Simon Wiedemer Sercos International e. V. Peter Lutz	Steinbeis Embedded Systems Technologies GmbH Christian Hayer, Manuel Jacob Steinbeis Transfer Center Systems Engineering Prof. Reinhard Keller
	Daimler AG Peter Hailer	Steinbeis Transfer Center Traffic Engineering.Simulation.Software Jakob Häckh, Prof. Dr.-Ing. Günter Willmerding
2019	Optik-Elektro Huber GmbH Thilo Huber	Steinbeis Transfer Center Production and Organization Prof. Dr.-Ing. Herbert Emmerich
	Koenig & Bauer Coding GmbH Sandra Wagner	Steinbeis Research Center Design and Systems Prof. Erich Schöls, Prof. Ulrich Braun, Sebastian Gläser
	TE Connectivity Germany GmbH Dr.-Ing. Michael G. Leidner Dr.-Ing. Helge Schmidt	Steinbeis Research Center Material Engineering Center Saarland (MECS) Prof. Dr.-Ing. Frank Mücklich, Dr.-Ing. Dominik Britz
	Fiber-Tech Products GmbH Franziska Pfalz Medicke Metallbau GmbH Marcus Medicke	Steinbeis Innovation Center FiberCrete (FC) Dr.-Ing. Sandra Gelbrich

Award Winners

2004





Carl Zeiss Industrielle Messtechnik GmbH, Oberkochen
Steinbeis Transfer Center Quality Assurance and Image Processing, Ilmenau

ViSCAN: Light-Based Precision Measurement

What do the following have in common: intricate printed circuit boards, highly sensitive micromotors, soft valves used in precision instruments, microscopic moldings? The answer is they are all extremely difficult to measure. Enter a new video camera, the ViSCAN, capable of taking images of highly complex objects from a variety of angles before automatically transmitting measurements to a computer.

In close cooperation with Carl Zeiss Industrielle Messtechnik GmbH, the Ilmenau-based Steinbeis Transfer Center Quality Assurance and Image Processing developed a video optical probe going by the name ViSCAN – a tiny camera capable of capturing 25 images a second. By adapting and controlling lighting levels electronically, ViSCAN makes it possible to completely automate photographic settings. A key requirement of the Steinbeis brief was that it should come up with a well thought through, logical concept, use modern software and tap into image measurement expertise. Steinbeis engineering experts pieced together an extremely light-weight construction encompassing a camera, precision lens and lighting. A key advantage of ViSCAN is that it uses a sensor changer rack for automatically changing measuring instruments. This makes it possible to switch conveniently between optical and tactile probes on one and the same coordination measurement device, and pool computations on the same software (Calypso).

The video optical sensor has been combined with a Zeiss incremental articulating probe holder to make it possible to capture images from all angles. It also saves time and avoids switching between change-parts, a process highly prone to error. Now, it is possible to measure complex components more accurately, efficiently and importantly: more quickly. With ever shortening times-to-market and lengthening lists of components, the mini-camera has become a key success factor.

Award Winner 2004

Charles River GmbH, Sulzfeld
Steinbeis Transfer Center
In-Vitro Pharmacology and Toxicology,
Constance

In-Vitro Pyrogen Test to Replace Animal Testing

A particular problem with intensive care patients is that pyrogens can enter the bloodstream whenever they receive an injection, making them even weaker. Pyrogens are substances capable of inducing acute, highly dangerous fever, organ failure and potentially: toxic shocks. To make sure medicines are totally free of pyrogens, the pharmaceutical industry has been using in-vitro testing for years.

In contrast to infections caused by living pathogens, with pyrogens you also have to deal with the dead remnants or fragmented chemical structures of bacterial pathogens. They manage to side-step normal sterilization processes, thus posing major risks to humans. However, the havoc wreaked by pyrogens comes not only from injections. They can also enter the body through modern technology, in materials such as replacement hips and implants, or even through the air supplied by conditioning systems, setting off serious fever. There may still be strong demand for the type of guinea pig testing used to date to identify pyrogens, but it has come under a great deal of scrutiny for ethical reasons. As a result, the University of Constance-based Steinbeis Transfer Center In-Vitro Pharmacology and Toxicology joined forces with the US company Charles River Laboratories to develop an alternative testing method, and bring it to market.

The result was the human In-Vitro Pyrogen Test (IPT) which simulates human beings' high temperature in a test tube, making it possible to detect the full range of known pyrogens in medicines.

In Germany alone, the new method prevents 80,000 animal tests a year. It also makes life for patients safer. Steinbeis has high hopes for its work with Charles River, which has been awarded the license and appointed preferred partner. Soon it is hoped to test air quality by using in-vitro pyrogen tests. Theoretically, the approach has even greater market potential, beyond the testing of medicines.

Award Winner 2004

dm-drogerie markt GmbH & Co. KG, Karlsruhe
Steinbeis Transfer Center
Innovation > Development > Application (IDA), Karlsruhe

dm-drogerie markt Puts POS Data Online

An everyday situation at a dm drugstore: count stock, a sales assistant scans in barcodes from cans of shaving foam, returns to the back-office and transmits data to the stock-keeping system. These days it's all done using mobile computing, eradicating errors, saving time and making the whole process much easier to handle.

The German drugstore dm-drogerie markt has more than 1,500 branches throughout Europe and is seen as an innovative retail trading company. The company stocks up to 12,000 drugstore articles so it is keen to keep stock-keeping processes – such as counts, correction and item searches – as simple as possible. To help them, the Karlsruhe-based Steinbeis Transfer Center Innovation > Development > Application (IDA) worked together intensively with dm to optimize data interchange between computer systems in each outlet and the mobile scanning devices. New software was developed for a PDA-based capturing device, a type of minicomputer with built-in barcode scanner and wireless connection. In future sales staff will use upgraded online capturing devices to read data straight from the point of sale and elsewhere in the outlet before transmitting it directly to the branch server. Errors are less likely and processes more streamlined, freeing up workers to serve the customer.

In spring of 2005 the mobile scanners will go into first-stage piloting before being rolled out across all 1,500 branches. However, dm is not stopping there: together with the Steinbeis Transfer Center Industrial Data Processing one of the software specialists' main areas of focus at the moment is research into PDA-based voice recognition systems. One day, sales staff could actually do away with the stylus input pen; scanners could become even more ergonomic, taking retailing one step closer to the future.

Award Winner 2004

MAHLE International GmbH, Stuttgart
Steinbeis Transfer Center Mechatronics,
Ilmenau

Valves Improve Performance and Environmental Friendliness

Mid-range car drivers sometimes fantasize about turbochargers. As it often stops at that, they might like the sound of a new high-tech gadget in the engine compartment: a small, electronically controlled air clock valve with some major benefits. It allows the car to deal with more adventurous city driving, cold motors spark up more quickly and fuel consumption is lower.

Until now, throttle valves have been used to regulate engine air intake, soaking up unnecessary amounts of energy. Working together with MAHLE, a global automotive company, researchers at the Steinbeis Transfer Center Mechatronics in Ilmenau have developed a state-of-the-art, electronically-controlled air clock valve with built-in economy drive. The valve restricts the air supply under half load without having to close the throttle valve, thus reducing fuel consumption and easing the burden on the environment. The air clock valve is situated in the manifold injection nozzle between the plenum chamber and combustion chamber. It can open and close up to 200 times a second. The same valve can also be set to increase motor performance at lower RPMs (revolutions per minute). Opening and closing speeds are then adjusted to create a pressure wave within the intake system, forcing additional air into the cylinder and increasing engine output.

However, the most distinctive feature of the Steinbeis air clock valve is the drive. On the first stroke, a featherweight oscillator stores energy, only to release on the next. Two small magnets and an 'intelligent' electronic system dictate the stroke rate. As a result of the joint project, MAHLE and the Steinbeis Transfer Center Mechatronics have achieved a distinct competitive advantage in know-how. This particular project also resulted in three joint electronic patents and two joint patents in magnetic actuation. Further cooperation is planned for the production of solenoid-actuated air clock valves. Within years, MAHLE expects to go into mass production and start supplying customers with complete systems with intake modules.

Award Winner 2004

Voith Turbo GmbH & Co. KG, Crailsheim
Steinbeis Transfer Center
New Technologies
in Traffic Engineering, Ulm

Intelligent Simulation of Passenger Bus Transmissions

Passenger buses have totally unique driving patterns: the average kilometer takes in three stops, each time setting off, accelerating, and braking again; one moment on open throttle, the next coasting in neutral – a challenge for any motor and transmission. To tailor transmission units to future requirements, automotive companies use expensive simulation programs.

The makers of automatic gearboxes fine-tune their gearshift programs to keep gasoline consumption to a minimum. Operators also expect low maintenance costs and extended durability. To meet these expectations and do justice to individual requirements, manufacturers carry out pre-production simulations on each and every component. On-screen displays map out the expected level of load on switch mechanisms enabling engineers to optimize transmission and estimate stress.

Back in the 1980s, together with its Voith AG division (sales: 3.3 billion euros; workforce: 24,000), Voith Turbo GmbH & Co. KG, a leading producer of drive technology, decided to join forces with the Ulm-based Steinbeis Transfer Center New Technologies in Traffic Engineering to work on the development of a sophisticated simulation program specially tailored to the needs of automatic passenger bus transmission units. Subsequent projects led to ongoing program upgrades and adaptations. At the click of the mouse, Voith's VASOP system (a power train optimization program) identifies which couplings, gear wheels and shafts are subjected to the most load. It also identifies the best weight, wheel, axle and engine ratios for each type of passenger bus. Long-term simulations can be carried out on overall life-times, fuel savings, replacement materials, optimum gear selection, gear change timings and drive coupling set-ups, all of which can then be optimized for long-term use.

The software used with VASOP has proved so successful it has now been integrated into the whole Voith Turbo development process. For Voith, "tweaking" one of its drives with an upgraded or totally new transmission program is now inconceivable without the simulation program. The output and data provided by VASOP is also put to use in other company departments. For instance, Voith collects and evaluates gear data worldwide – a key stage in the development of future automatic transmission units.

Award Winner 2004

Prof. Dr.-Ing. Walter Kuntz (1938–2008)
Steinbeis Transfer Center
Microelectronics and Systems Engineering, Furtwangen
Steinbeis Transfer Center Medical Electronics, Freiburg

Appreciation for Pioneer Work in Technology Transfer

The Löhn Award panel dignified outstanding efforts and merits of Prof. Dr.-Ing. Walter Kuntz with a special award. He founded the first Steinbeis Transfer Center under the roof of the new Steinbeis Foundation in 1983. He managed the Steinbeis Transfer Center Microelectronics and Systems Engineering in Furtwangen and the Steinbeis Transfer Center Medical Electronics in Freiburg. He clarified two significant elements of successful Steinbeis technology transfer with his career and development of his two Steinbeis Transfer Centers. Compatibility and efficiency of research and education with transfer entrepreneurship and flexibility of the rising complexity of technologies with a range from electronics, microelectronics up to nano technology.

The successful "technology transfer à la Steinbeis" needs transfer competent and willing "heads". Walter Kuntz was a stark outrider – namely since the beginning of the new Steinbeis Foundation in 1983. Already when he was a "pure" scientist he developed his outstanding transfer abilities. He didn't only focus on scientific publications and patents. An important element of his activity was the concrete appliance of scientific awarenesses – both in a practice related education and in the industrial appliance. Walter Kuntz founded the first specialized Steinbeis Transfer Center of the Steinbeis Foundation with the "Transfer Center Microelectronics". In 1988 he set a further milestone with the foundation of the Steinbeis Transfer Center in Freiburg. This Steinbeis Transfer Center is acting in the field of medical electronics.

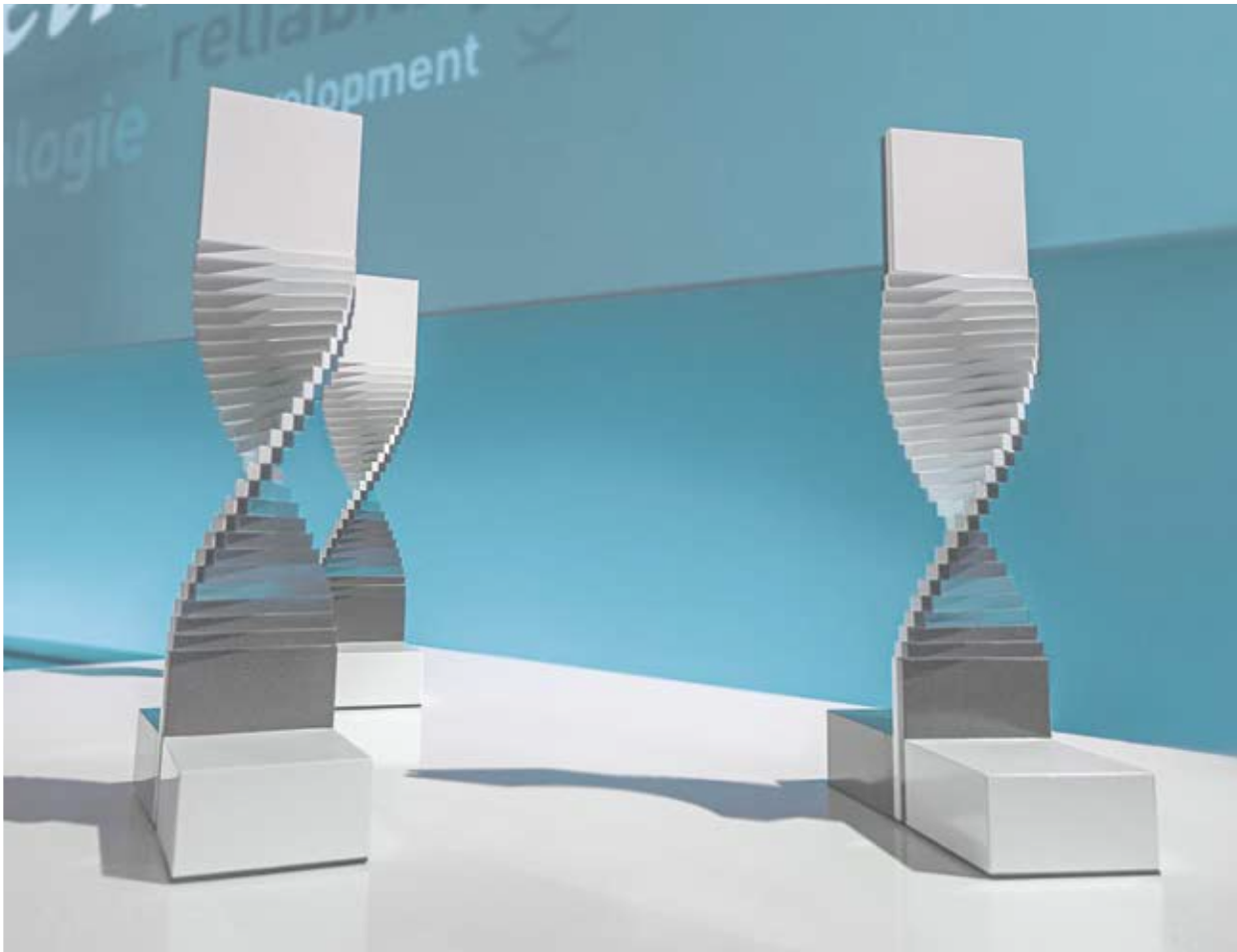
The Steinbeis Transfer Center Microelectronics and Systems Engineering in Furtwangen realized projects in the area of microelectronic circuits, data transfer, miniaturization, programming, safety and reliability engineering.
At the Steinbeis Transfer Center Medical Electronics were electronic and software projects in the field of medicine realized. These included the following solutions:

- applications for the automated production of inlays, crowns and bridges in dental medicine,
- heart rate telemetry systems,
- applications for the automated production of contact lenses,
- battery-powered surgical drill,
- electrosurgical devices with microcontrollers,
- data analysis in diagnostic sonography.

Special Award Winner 2004

Award Winners

2005



Heidelberg Engineering GmbH, Heidelberg
Steinbeis Transfer Center Biomedical Engineering and Applied Pharmacology in the Ophthalmology, Rostock

Confocal Laser Scanning Microscopy of the Anterior Eye Segment with the Rostock Cornea Module RCM and Heidelberg Retina Tomograph HRT II

In order to quickly and safely portray the anterior eye segment including the lens, a new type of laser scanning microscope has been developed which is based on the Heidelberg Retina Tomograph HRT II. In order to achieve this, the Heidelberg Retina Tomograph HRT II was combined with an attachable objective system, the so-called Rostock Cornea Module RCM.

If in a laser scanning ophthalmoscope the refracting media of the eye (that with this device form part of the laser focussing system) are replaced by a high grade objective system, the laser focus (with a diameter of less than 1 µm) can be moved into the anterior eye segment. This results in a fast, high resolution digital confocal laser scanning microscope for in-vivo examinations of the cornea. The successful realization of the described microscope adaptor system for a laser scanning microscope concept required the existence of a commercial laser scanning system in a compact design. Having compared several manufacturers, the company Heidelberg Engineering GmbH was chosen as the project partner. This company showed itself to be outstanding not only due to its considerable openness towards innovative ideas but also because it has a worldwide sales and training system which uses HRT II as the basic laser microscope unit. In relation to the selected objective combination and the internal z-scan of the HRT II, object imaging is possible with a depth range of up to 50 µm in the 3D option and with a depth resolution of 1 µm. The exposure time per image amounts to 0.024 sec. Documentation of dynamic processes in the tissue (e. g. blood flow in vessels) is thus possible. It is also possible to record image sequences of 100 images in up to 10 sec. This procedure of cornea contacting without pressure is monitored via a small CCD color camera. The contact process guarantees a set distance between microscope and cornea. This enables an optical pachymetry. All microstructures of the cornea, including the epithelium, nerves, keratocytes and endothelium of the Conjunctiva bulbi of the eye, as well as skin, tongue and oral mucosa can be quickly and safely imaged and analyzed. For the first time ever, the depiction of dentritic cells, the so-called Langerhans' cells, is possible in vivo. The usage of dry objectives with this microscope in non-contact processes also enables the depiction of the natural lens and the after cataract on an IOL for the first time ever. A significant advantage with this device is its digital nature which facilitates simple data archiving. The microscope has also been used successfully in other specialized areas such as ear, nose and throat medicine and dentistry.

Award Winner 2005

Koenig & Bauer AG, Radebeul
Steinbeis Transfer Center Production Technology and Waste Handling Logistics, Dresden

Systematic Streamlining of Factory Operation (Analysis, Evaluation and Design of the Product – Technology – Factory Complex)

Constant product innovation and continuous process optimization are the fundamentals of lasting commercial success. Success of this kind depends upon a holistic methodology for analyzing, evaluating and designing the "product – technology – factory" complex and for implementing the results. The Koenig und Bauer AG (KBA) plant in Radebeul and the Steinbeis Transfer Center Production Technology and Waste Handling Logistics (STPE) in Dresden join forces to meet these exacting standards applying an identical principle: "from technical issues to times – from times to costs".

At its Radebeul plant, KBA manufactures sheetfed offset presses in all formats. Within this market segment, it commands a leading position in the global marketplace. The printing press industry is under constant pressure to innovate. To manage this trend actively rather than simply reacting to it, KBA carries on a continuous and systematic program of innovation and optimization throughout all areas of the business.

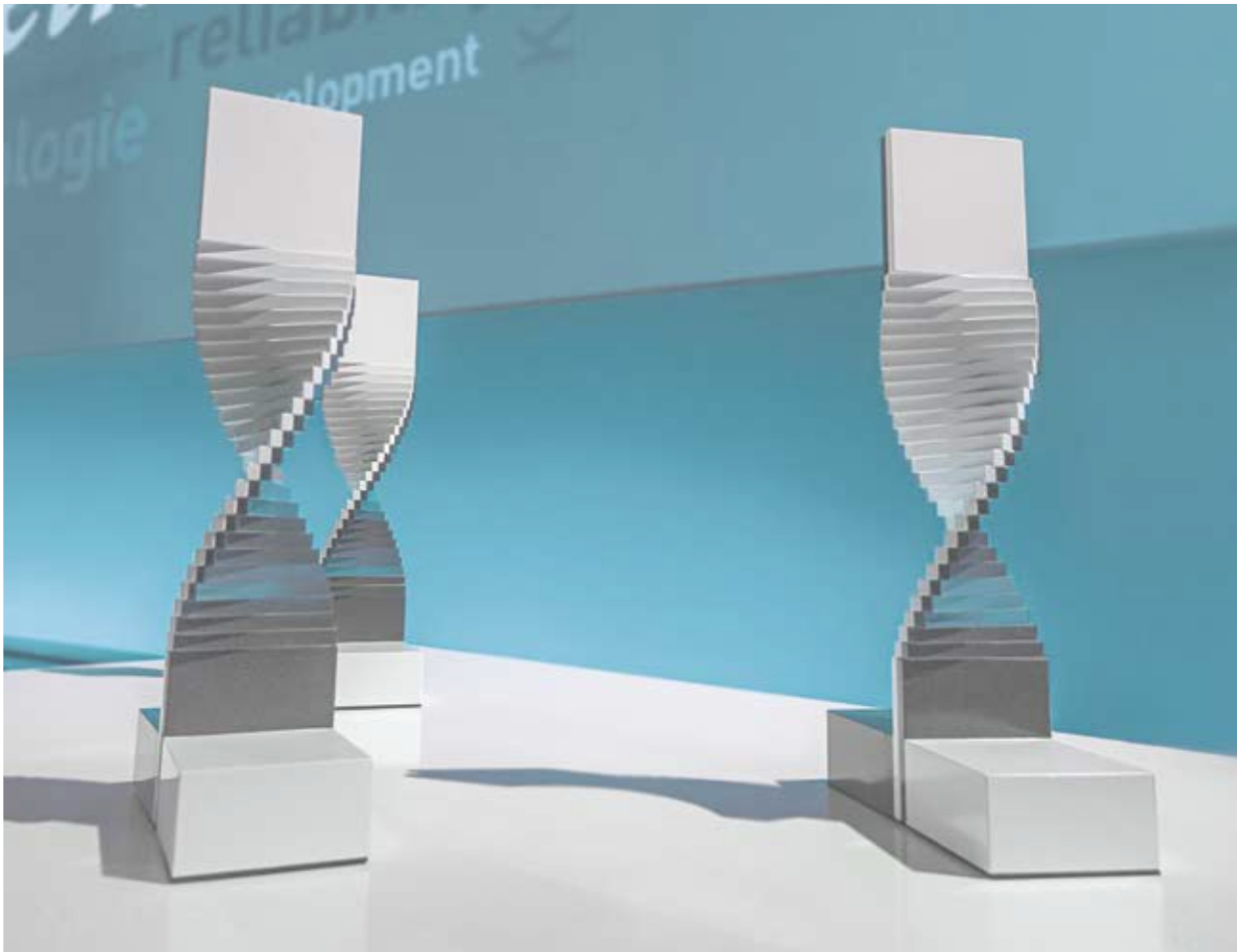
Naturally, the company enlists external consultants to support these processes. However, KBA soon recognized that separate projects with a series of different partners often fail to achieve the maximum impact due to the lack of synergies between business areas.

Thanks to its capability to deliver technically sound and commercially applicable outcomes, STPE's input perfectly matched KBA's requirements. This was the underlying premise for a partnership which has endured since the year 2000 and successfully implemented projects in many different departments of the company. A broad range of issues has been addressed, from time and motion studies for various stages of printing tower component production, pre-assembly, final assembly and staff assignment planning, to analysis and optimization of tool deployment and technical parameters for machining processes in production, to benchmarking in diverse areas and the redesign of the shipping department. An ever-growing appreciation of the company's processes and their interrelatedness now supports the current project, the design of a new production plant, its integration into the company's layout and the organization of the corresponding technological processes.

Award Winner 2005

Award Winners

2006



Sensovation AG, Radolfzell
Steinbeis Transfer Center
Medicinal Biophysics, Heidelberg

Miniaturized Fluorescence Imaging Module for Medical Diagnostics

Award Winner 2006

Fluorescent dyes enable diseased cells to be identified in a very specific and timely manner. This makes the technology highly beneficial for medical diagnostics. Up until now, however, limited use has been made of this approach, particularly in developing countries, because such imaging systems are large, sensitive and expensive. The compact FluoMi imaging module overcomes these barriers.

The use of fluorescent dyes in medical diagnostics for detecting diseases such as AIDS is currently limited primarily to centralized laboratory use. Carrying out the immunological processes and evaluating the fluorescent dye preparations requires elaborate and expensive infrastructure and specialist technicians. The development of economical biochips has enabled considerable simplification of these immunological processes over the past few years. However, in order to be able to use biochips on patients at the direct "point of care" (POC) – given the poor medical infrastructure in many countries – the development of new analysis systems is essential. More robust and more compact systems are now required that automate the analytical processes, are simpler to operate and can be produced at a greatly reduced cost. Sensovation AG, with the support of Steinbeis Transfer Center Medicinal Biophysics, Heidelberg, has developed just such an economical, miniaturized fluorescence imaging module. The experts of this center were the ideal transfer partners for the project – due to their outstanding skills at the interface of medicine, physics and biology. This gave them the necessary capability to solve the technically complex challenge of miniaturization in close collaboration with Sensovation AG.

The microscope module called FluoMi uses a completely novel optical design to display fluorescent imaging of a sample on a specially adapted, high-resolution CCD sensor. FluoMi can be directly embedded within a portable device to form the core of a mobile diagnostic system. Together the two partners developed strategies and concepts that allow for relatively large tolerances of individual components and enable calibration at a systematic level to be carried out after the module has been embedded. This is the only way to produce FluoMi within the defined budget constraints. The newly developed product has already aroused considerable attention at international conferences and has the potential to become a major economic success for Sensovation AG due to the broad range of possible applications in medicine, food technology and hazardous material imaging.

Prof. Dr.-Ing. Eberhard Birkel
Steinbeis Transfer Center Technology Consultancy
at the University of Applied Sciences Esslingen,
Esslingen

Pioneering Achievements in the Technical Consultancy Service

The Löhn Award panel has decided to honor the outstanding achievements of Professor Dr.-Ing. Eberhard Birkel of the Technical Consultancy Service, the body he headed for 37 years with great authority, dedication and success.

Eberhard Birkel was born in Stuttgart and studied mechanical engineering at the city's university. He began his career with Daimler-Benz AG as a development engineer for process development and joining technology. In 1963, he took up the position of head of the planning department and building control office at the State College of Engineering (now Esslingen University of Applied Sciences).

In 1969, the first five Technical Consultancy Services were established at higher education institutions in Esslingen, Aalen, Karlsruhe, Mannheim and Offenburg. They were headed by Eberhard Birkel, a position he held until stepping down in 2006. The Steinbeis Foundation was subsequently founded in 1971 to integrate the Steinbeis Consultancy Services. They were the forerunners of the modern-day Steinbeis Transfer Center, which emerged as spin-offs of the Steinbeis Consultancy Services.

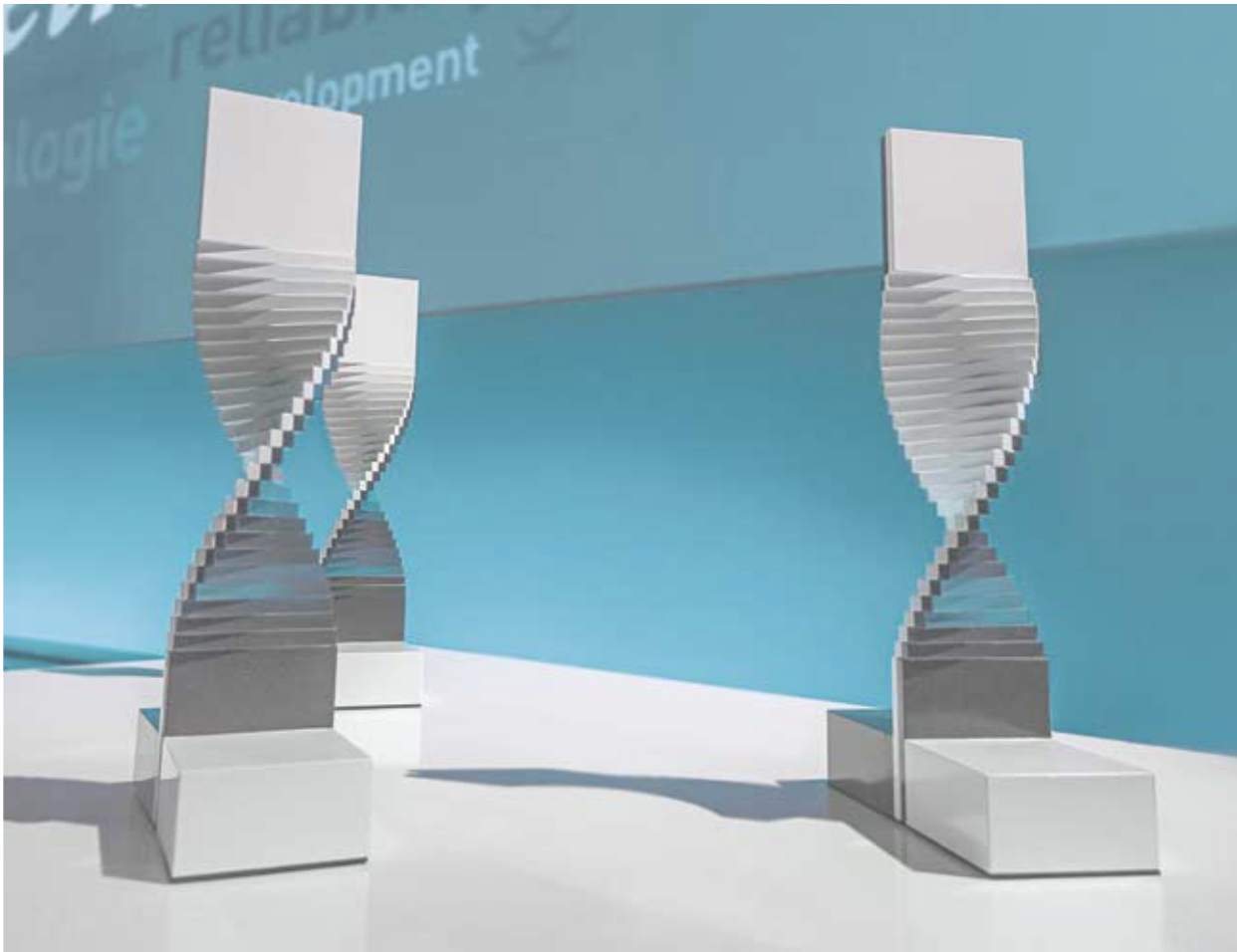
Steinbeis is unique in developing solutions to a multitude of small problems using all manner of technologies; a wide range of highly specialized technologies are utilized, and large-scale projects are also undertaken. The image of the versatile professor – like Eberhard Birkel – was made possible by the specialist Steinbeis Transfer Centers, and remains extremely important today.

Eberhard Birkel was a leading light in the Steinbeis Consultancy Services management structure, coordinating over 10,000 projects during his tenure. Every year, between 30 and 60 professors worked for his Technical Consultancy Service, joined by the same number of staff from the universities, and by students. Whenever successful professors worked at the Steinbeis Consultancy services, the Steinbeis Headquarters Office provided the Service with a separate specialist center. In Esslingen, this approach resulted in many direct and indirect spin-offs in the form of Steinbeis Transfer Centers. One major contribution of the Steinbeis Consultancy Services management was to divert turnover to the devolved Steinbeis Transfer Centers simply because their success enabled them to do so. Having sustained such a level of success over a long period, Eberhard Birkel has earned this special recognition of his achievements.

Special Award Winner 2006

Award Winners

2007



Senator E. h. Dr.-Ing. Wilhelm Schmitt
Steinbeis Foundation, Member of the Board of Trustees
(1991–2006)
(Vice-Chairman of the Board of Trustees 1998–2006)

Acknowledgement of Personal Commitment to Steinbeis

The jury for the Löhn Award has decided to acknowledge the commitment of Senator E. h. Dr.-Ing. Wilhelm Schmitt as a member of the Steinbeis Foundation Board of Trustees over many years.

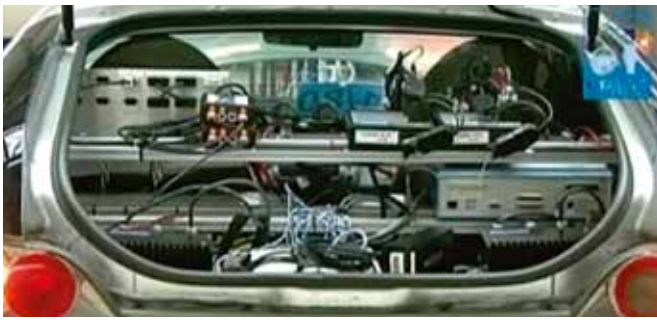
Wilhelm Schmitt is a man who, in addition to his professional commitment and success, has also honorably devoted himself as personally liable partner at Freudenberg & Co., Weinheim, to many tasks and actively shaped them. Wilhelm Schmitt has also applied his extensive knowledge of international business and his talent for developing visions of the future, demonstrating commitment in numerous honorary offices and committees.

For fifteen years, from 1991 to the year of his retirement, 2006, he was a regular member of the Steinbeis Foundation Board of Trustees and, in addition, assumed the role of member of the Committee in 1998. With his excellent entrepreneurial skills, he made valuable contributions, both in the area of markets and technology, and in the area of finances, constantly supporting the work of the Steinbeis Foundation in a committed, valued manner.

In addition to his work for Steinbeis, Wilhelm Schmitt as Chairman of the Board of Trustees (1991–2003) and chairman of the university council (2000–2006), was particularly involved in the promotion of the university in Mannheim, which appointed him “Honorary senator” in 1997. In his own, very special way, he led the university forward. The Steinbeis Foundation also benefited from his extensive knowledge of national university policy, his background having included a period as head of the German conference of university chairmen.

Special Award Winner 2007

Prof. Dr.-Ing. Jürgen van der List
Steinbeis Transfer Center
Microelectronics, Göppingen



Constantly Promoting Practical Relevance via Innovative Projects

The Löhn Award judges have honored the outstanding work and projects of Professor Dr.-Ing. Jürgen van der List at the Steinbeis Microelectronics Transfer Center (TZM) in Göppingen with a special award. Between 1995 and 1997, Jürgen van der List was deputy vice chancellor at Esslingen University of Applied Sciences. This was followed by a period as vice chancellor between 1997 and 2007. In 1991 he founded the TZM and has been instrumental since then in the development and expansion of the TZM in Göppingen.

"Practically focused studies that aim to qualify young people for a career in the engineering field can only succeed if those teaching such courses maintain a link to real practice and to companies through innovative projects." This was the motivation that led Jürgen van der List, together with Professor Dr. Heinz Osterwinter, to set up the TZM in 1991 at Esslingen University's newly established Göppingen site, where in his position as Dean he had been involved as long ago as 1988 in the early development of the Microelectronics Faculty. The two men leading the TZM were later joined by Professors Dr. Bernhard Schwarz and Dr. Rainer Würslin and company CEO Edgar Grundstein Dipl.-Ing. (FH).

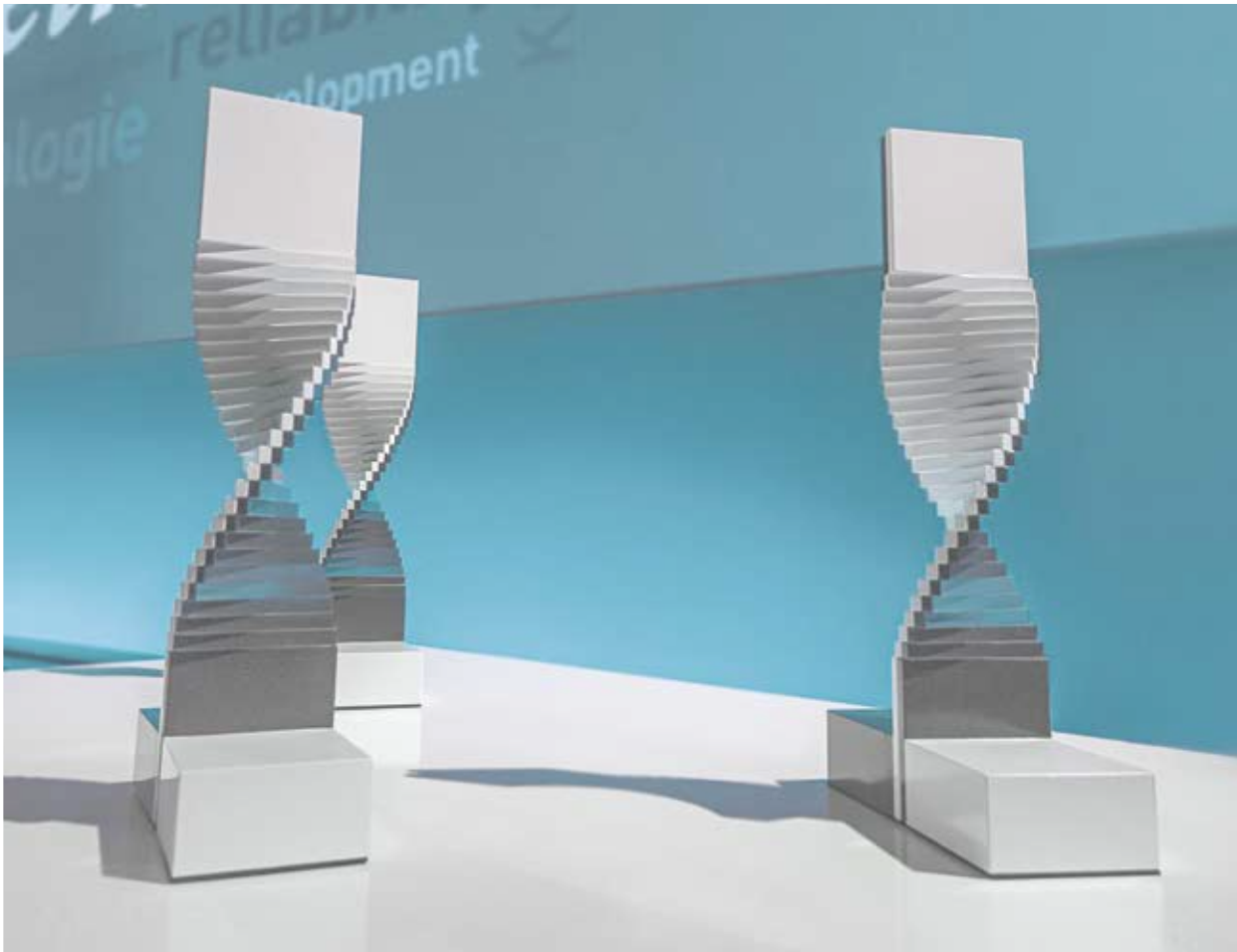
Both the newly equipped laboratories at the university and the expertise of the recently appointed professors provided an attractive environment for local businesses engaged in development work. Economic success soon followed making it possible to acquire a plot of land in 1997 right next to the university. Today, the center can look with pride on its own premises, constructed in 2002, and now employs a workforce of 120. Sixteen years after its foundation and with ISO certification achieved in 2001, it is now one of the largest centers within the Steinbeis Network and has evolved into a professional and highly reliable partner to many companies in the region and throughout the world.

While the TZM initially spread its net very widely in the field of electronics development, nowadays the main focus is on the area of "automotive bus systems – especially FlexRay" and on special software developments. In the last few years, it has generated superb quality and achieved great success by developing, producing and marketing its own products in the form of analytical and testing tools for the industrial development of FlexRay bus systems.

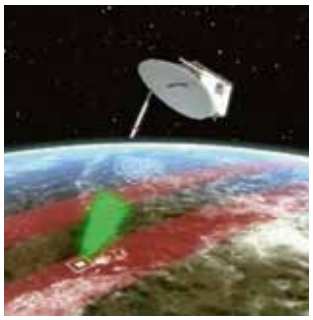
Jürgen van der List and his colleagues at the Steinbeis Transfer Center have rendered outstanding service in the area of technology transfer through their consistently excellent results and a large number of successful transfer projects in particular with small and medium-sized enterprises.

Award Winners

2008



OHB Orbitale Hochtechnologie
Bremen-System AG, Bremen
Steinbeis Research Center
Optimization, Control and Adjustment
Control, Grasberg



Mathematical Optimization of Satellite Resource Management Systems

Special satellites are currently being developed for the purpose of observing the Earth from orbit. Typical areas of application are weather reconnaissance, environmental observation, mapping and geology. As a European network for analytical and forecasting services in the areas of emergency management, land observation and ocean monitoring, the GMES (Global Monitoring for Environment and Security) initiative was established by the European Commission and the European Space Agency. The services of GMES are intended to provide support for crisis management, for example in the event of environmental disasters, and to simplify land surveying. Observation data from space are expected to play a key role.

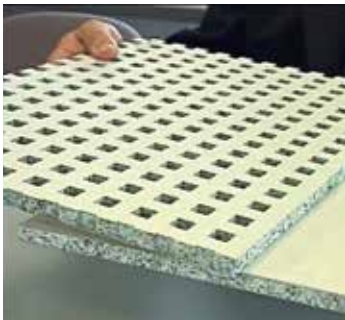
In close collaboration with OHB-System AG, the Steinbeis Research Center for Optimization, Control and Adjustment Control has developed mathematical software designed specifically for the optimization of satellite resource management systems. The focus is on orbit parameters of each satellite in a constellation being optimized for various target areas. This includes taking into consideration different observation areas for different types of sensor, communication with earth stations, the requirements of various target areas and system response times.

Additionally, the operating schedules of the satellites are automatically optimized mathematically for each orbit in terms of priorities of target areas, various observation modes, time delays between the taking of images and earth station contact, the position of earth stations and of several activation and deactivation points. Here, factors such as the limited storage space for images, the position of the sun, limited battery power and restrictions on reactivation are taken into consideration.

As yet, there has been no commercially-produced product available that has even come close to being suitable for use for the above tasks for the automatic optimization of satellite constellations and operating schedules. There is only one such product in existence, from the USA. However, by comparison with these satellite tools, it has key disadvantages. With this new software, it is possible for the first time to determine the maximum observable surface accurately and automatically. Previously, it had frequently taken weeks or months to find acceptable solutions.

Award Winner 2008

SGL Technologies GmbH, Meitingen
Saint-Gobain Rigips GmbH, Düsseldorf
Steinbeis Transfer Center Plastics and
Composites Technology, Naila



Graphite-Modified Gypsum Plasterboard

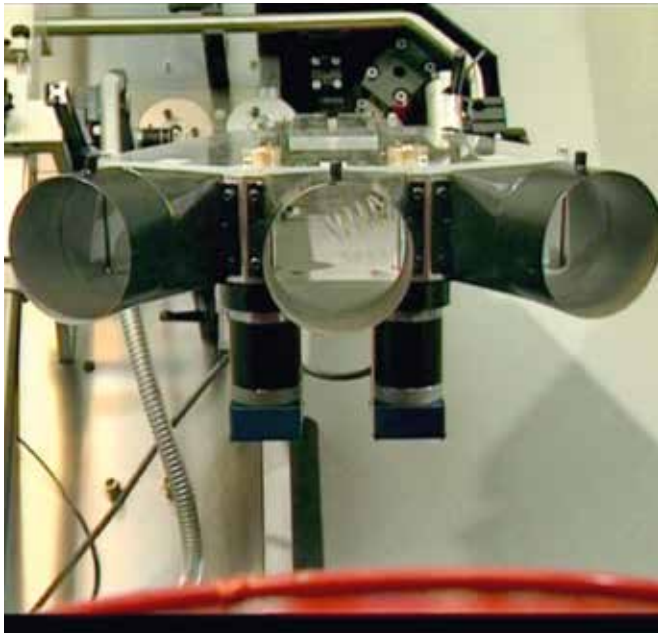
Award Winner 2008

Worldwide, some 8 billion square metres of gypsum plasterboard are used in building services engineering. For decades, the demand for these crucial components within the construction sector has been increasing steadily. Users value the high cost-effectiveness of gypsum plasterboard in drywall construction, the high finish quality of the constructions and the climate-controlling impact of the gypsum plasterboard as a result of its capacity to absorb and release water. However, as yet, the low heat conductivity of this plasterboard and level of protection from electromagnetic radiation have not been satisfactory.

Through the collaboration of the Steinbeis Transfer Center Plastics and Composites Technology, based in Naila, with the companies SGL Technologies GmbH and Saint-Gobain Rigips GmbH, a new, graphite-modified gypsum plasterboard has been developed which has eliminated these fundamental drawbacks that have persisted for decades. This new generation of gypsum plasterboard marks a milestone in terms of heat conduction and electromagnetic protection, without affecting the positive fundamental qualities of the plasterboard.

A distinct feature of graphite-modified gypsum plasterboard is its heat conductivity, which is the same as that of water, the most important temperature medium, at 0.52 W/mK. The protection it offers against electromagnetic radiation is around 60 dB, i. e. the effect of existing electromagnetic radiation in the range of 0 to 10 GHz is reduced to almost a millionth.

In view of these innovative properties of graphite-modified gypsum plasterboard, it is anticipated that it will be used widely in the areas of climate control and protection against electromagnetic radiation in housing construction both nationally and internationally as well as in industrial construction. It has already been put to use, particularly in energy-saving buildings and private homes. The BMW-Welt facility in Munich is just one example of its use in a building of public interest.



WAFIOS AG, Reutlingen
Steinbeis Transfer Center
Quality Assurance and Image Processing,
Ilmenau

Springing into Action

In almost every area of our daily life, they ensure the right movement of mechanical parts: springs. We encounter them, for instance, as an extension spring in a drawer or as a compression spring in the switch used for stairwell lighting. In a car alone there are some 8,000 springs. Quality and accuracy are therefore considered an integral element of the production process.

WAFIOS AG in Reutlingen is a world leader in machinery for wire and tube processing, which also includes spring coiling machines. In collaboration with the Steinbeis Transfer Center Quality Assurance and Image Processing in Ilmenau, engineers from both companies developed an innovative, userfriendly image processing system for full quality control in spring production. The system tests each of up to 600 springs per minute for dimensional features such as length and diameter. For this purpose, an image of the spring is taken directly prior to cutting. While the spring falls, the special analysis software has approx. 50 ms time to measure these features in the image and compare them with the control and tolerance limits.

If, for example, the spring is longer, the software intervenes in the process and corrects the spring length automatically so that the next spring is of the right length again. On reaching the tolerance limit, this spring is rejected via a special ejector unit. This highly specialized system is also easy to use for the machine operator. He can create a new quality control test automatically each time a spring has new dimensional features using an analysis button and requires no special background knowledge of the image processing system.

Integrating the hard- and software completely into the existing environment represented a considerable challenge. However, this was achieved with a short time frame by the staff of both companies.

Award Winner 2008

Prof. Dr.-Ing. habil. Prof. h. c.
Eberhard Kallenbach (1935 – 2016)
Steinbeis Transfer Center Mechatronics,
Ilmenau

A Pioneering Bridge-Builder

The Steinbeis Foundation jury honors the outstanding achievements of Prof. Dr.-Ing. habil. Prof. h. c. Eberhard Kallenbach, head of the Steinbeis Transfer Center Mechatronics, with a special award. This Steinbeis Transfer Center (STC) at the Technical University of Ilmenau was one of the first established in the region that was formerly East Germany. Since 1992, Eberhard Kallenbach has devoted himself with great success to the transfer of technology – from the university setting to industry. His Steinbeis Transfer Center focused on the areas of electrical drive elements (actuators), special electromechanical drives, electronics technology and magnet technology.

Beyond this, Eberhard Kallenbach was not only building bridges between science and industry. Indeed, with numerous transfer projects and a commitment to teaching and research, he was also contributing to the convergence of East and West and to business development in the region.

The Steinbeis House in Ilmenau, established in 2005 at the initiative of Eberhard Kallenbach and now home to several Steinbeis Enterprises, bears testimony to the success of many transfer projects, as well as it is contributing to the promotion of Thuringia as a center for technological innovation and industry. Eberhard Kallenbach has created opportunities for well-qualified young people in the region – something not to be underestimated and a huge personal achievement. He also demonstrated his sense of social responsibility in his daily work with his staff – he was a person with an entrepreneurial spirit who had nevertheless remained modest and who worked with patience, far-sightedness and prudence.

In 2001, Eberhard Kallenbach supported the spin-off of an additional company evolved from the Steinbeis Transfer Center – Innomas Innovative Magnetsysteme GmbH. The company, which initially received crucial support from the Steinbeis Transfer Center Mechatronics, is now a successful operation in its own right. Moreover, he was actively involved in the establishment in 2006 of the VERDIAN center of excellence, of which he was chair, funded by the Federal Ministry of Education and Research for the region of Thuringia. The center is an amalgamation of ten companies from the region, specializing in networked integrated magnetic direct drives.

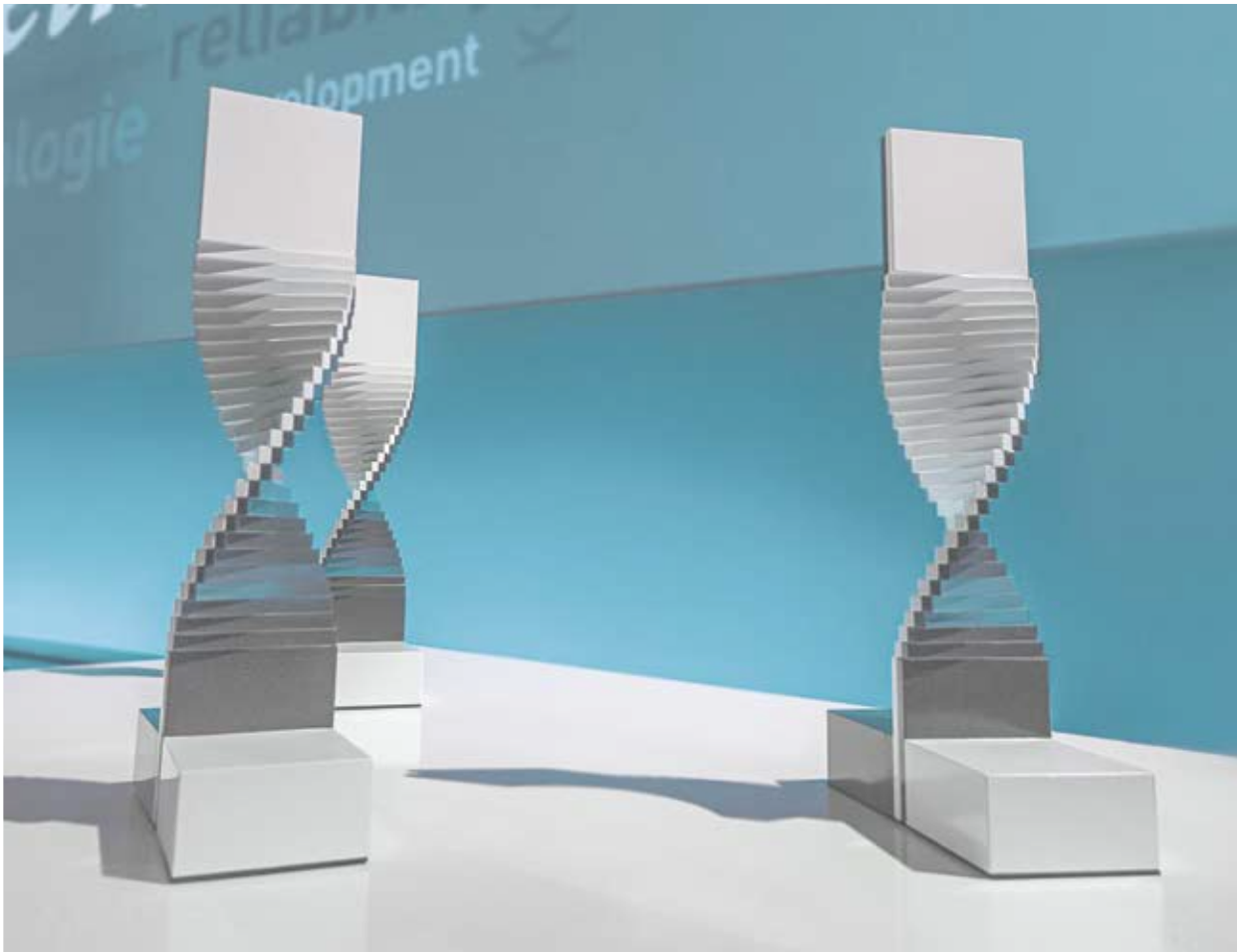
Eberhard Kallenbach was both a committed Steinbeis expert as well as an outstanding university professor, whether as Ph.D. supervisor, author of numerous books on specialist subjects, assessor for the German Research Foundation or as a member of the Saxon and German Academies of Sciences.

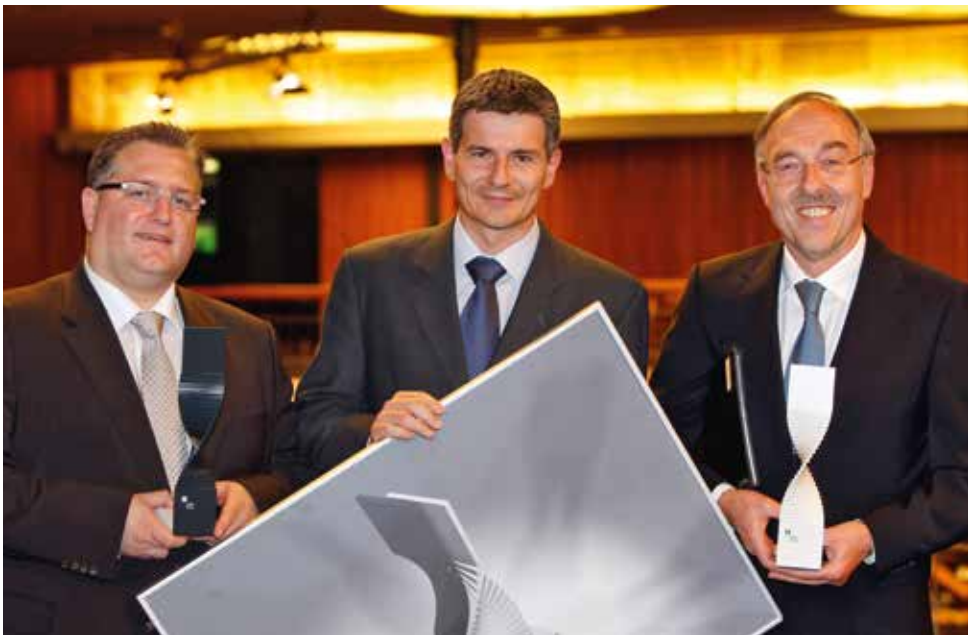
He received the Steinbeis Transfer Award for the first time in 2004 for a transfer project carried out by his Steinbeis Transfer Center together with MAHLE International GmbH.

Special Award Winner 2008

Award Winners

2009





EyeSense GmbH, Großostheim
Steinbeis Research Centre
International Vision Correction Research
Centre (IVCRC), Heidelberg

Mini Implant Sensor for Non-Invasive Testing of Blood Sugar in Diabetes

Diabetes mellitus affects about 250 million people worldwide. Self-monitoring of blood sugar levels is a key aspect of managing this condition. The sole method used to date has been an invasive process of applying a drop of blood to a sensor strip on a blood sugar monitoring device, which many patients find painful. This often leads to limited compliance and is counterproductive to encouraging a cooperative attitude to patient management of the condition.

EyeSense GmbH, at its Bavarian location in Großostheim, has developed a hydro gel implant – containing fluorophores – as the carrier system, which is implanted under the conjunctiva of the eye. The benefit of this location as a monitoring point is its excellent implant tolerance and the fact that the mini sensor is surrounded by conjunctival fluid, which facilitates blood sugar analysis. Depending on the concentration of glucose, fluorescent light of different intensity is emitted by the biochemical implant sensor, which is optically and non-invasively detected and evaluated via a small photometer held in front of the eye without actually touching it.

As part of a Löhn Award-winning transfer project, laboratory experiments were initially carried out by the IVCRC Steinbeis Research Center at the University Eye Clinic in Heidelberg to determine the optimal monitoring position between the sensor and photometer. At the same time, the implant was checked by EyeSense for compatibility with frequently applied local medications. As part of a Phase II study, clinical evaluation then began in August 2008 under the auspices of the IVCRC. The process was then successively improved by means of a regular exchange of information between all involved. The IVCRC Steinbeis Research Center initiated the development of an injector for optimal insertion of the implant. At the same time, EyeSense worked on reducing the size of the implant and rounding off the edges. The findings of the first study cohorts are very promising. They indicate a good correlation between the readings of the mini sensor and the reference method and also point to a high level of tolerance for the implants.

The future goals of the collaborative venture are further evaluation and development of the implant, with the aim of producing a reliable and sustainable method of sub-conjunctival blood sugar monitoring and bringing it to market.

Award Winner 2009

Municipality of Bad Peterstal-Griesbach
Steinbeis Consulting Center
Regional and Communal Development,
Kaiserslautern

Local Development Concept for the Municipality of Bad Peterstal-Griesbach

Few socio-political issues are currently discussed as frequently as demographic change and its consequences. Communities in rural areas in particular are already feeling the effects of falling population numbers and ageing populations.

The municipality of Bad Peterstal-Griesbach (Ortenaukreis) has decided to confront the effects of the changed demographic structure on housing quality and quality of life at an early stage – and to structure future local development actively and with foresight.

The Steinbeis Consulting Center Regional and Communal Development at the Kaiserslautern University of Technology was commissioned to develop a local development concept for the municipality of Bad Peterstal-Griesbach, which is currently experiencing a period of demographic, social and economic structural change. Based on surveys of the population, businesses, holidaymakers and recreational visitors, a model and targets have been created for the future development of the municipality. In addition, specific measures and projects have been developed, and proposals submitted for a local project management.

The municipality received numerous concrete project approaches in a catalogue of measures. These ranged in scope from project proposals in the fields of housing and life quality, through transport and supply infrastructure to recreation and leisure. The projects are grouped into measures that are to be implemented in the short, medium and long term, and into cost-intensive and low-cost schemes.

The content of the development concept was formulated with the involvement of the public through events, surveys and expert debates.

Success depends very much on the expertise of the advisory team from other national and international development projects and on the demonstration and discussion of innovative approaches to solutions.

Using the local development concept as a basis, the collaboration between the municipality of Bad Peterstal-Griesbach and the Steinbeis Consulting Center Regional and Communal Development will continue, so that the measures derived from the development concept can be put into effect over the coming years in close cooperation with the inhabitants and local bodies. The concept also gives the municipality an opportunity to attract subsidies for putting the project ideas into effect.

Award Winner 2009

PSD Bank Berlin-Brandenburg eG, Berlin
School of Management and Innovation (SMI) at the Steinbeis University Berlin, Berlin

Improved Success in Communication at PSD Bank Berlin-Brandenburg eG

Award Winner 2009

Customer magazines are becoming increasingly important as communication tools. Despite this trend, no empirical evidence has yet been submitted on the impact potential and impact parameters of customer magazines. In view of the greater demand for effectiveness and efficiency of corporate communications, the shortfall in knowledge about customer magazines is to be viewed as a considerable disadvantage.

PSD Bank Berlin-Brandenburg eG is a regional cooperative bank, set up as a direct bank, with a head office in Berlin. The bank uses the customer magazine "GELD + GEWINN" as a central communication tool for the purpose of maintaining its close dialogue with customers. In view of the importance of the magazine for the corporate success of the bank, a project has been conducted to optimize the use of "GELD + GEWINN", in collaboration with the SVI Foundation Chair for Marketing and Dialogue Marketing of the School of Management and Innovation at the Steinbeis University Berlin.

In a field trial, the influence of optical and haptic activation (high / low) and also the presentation of the content (editorial / promotional), the delivery date (Monday / Friday) and shaping of product group involvement (high / low) was reviewed. Eight test versions were produced from the combination of characteristics of the object-related parameters (visual impression, tactual impression, content). A total of 32,000 customer magazines manipulated in this way were sent by post. Three to four days after delivery, 30 recipients randomly selected from each of the total of 32 test groups were surveyed. Accordingly, about 1,000 test subjects were included in the study.

On the basis of the results, the SVI Foundation Chair developed a manual which will lead to impact-optimized utilization of the customer magazine with simultaneous cost savings. As part of the collaboration, findings have now been obtained for the first time which make it possible to extend statements on the effectiveness and impact parameters of customer magazines beyond the magazine in question.

(1944–2015)
Prof. Dr.-Ing. Nikolaus Kappen
Steinbeis Transfer Center Computer Applications, Esslingen

Innovative Computer Networks in the Development and Production Field

Prof. Dr.-Ing. Nikolaus Kappen received the Steinbeis Foundation's Transfer Award – Löhn Award in special recognition of his outstanding achievements as director of the Steinbeis Transfer Center Computer Applications.

Nikolaus Kappen studied electrical engineering at the University of Stuttgart and completed his doctorate at the Institute for Control Systems at the University of Stuttgart. Nikolaus Kappen began his professional career at AEG Telefunken in Frankfurt / Main, as head of the department for production automation. He was vice dean of Esslingen University, director of technical computer science courses and also responsible for the management of the Embedded Systems Laboratory.

Nikolaus Kappen founded the Steinbeis Transfer Center Computer Applications at Esslingen University back in 1986. Since then the enterprise with its many employees has successfully provided support to OEM clients and subcontractors in the automotive industry in the greater Stuttgart region. His customers have benefitted from the experience Nikolaus Kappen and his numerous employees have gained over the years in the design and management of a diverse range of computer systems, used in the development and production area, as well as from their competences in the area of software development for technical purposes, from micro-controller applications through to virtual 3D simulation systems.

Furthermore, Nikolaus Kappen was active in the development of tools for network maintenance of testing stations for vehicles and generated simulation systems for in-vehicle MMI applications (such as navigation, communication, audio and video devices).

His outstanding achievements within the Steinbeis Network and his dedicated work as a university professor made him a very worthy recipient of this award.

Special Award Winner 2009

Prof. Dr. rer. nat. Dr.-Ing. E. h. Max Syrbe (1929–2011)
Steinbeis Foundation,
Member of the Board of Trustees (1983–2011)
and Chairman of the Board of Trustees (1991–2011)

Trailblazing Research Management

The jury conferring the Steinbeis Foundation's Transfer Award – Löhn Award has honored the outstanding personal contribution to knowledge and technology transfer of Prof. Dr. rer. nat. Dr.-Ing. E. h. Max Syrbe, a long-standing member of the Board of Trustees und Chairman of the Board of Trustees of the Steinbeis Foundation, with a special award.

Max Syrbe was born in Leipzig in 1929 and studied physics in Frankfurt / Main. On completion of his doctorate in 1953 in applied physics / control systems he worked for BBC in Mannheim for 14 years, initially as a development and project engineer and later as director and departmental head of Electronics. In 1968 he took the helm of the Institute for Oscillation Research (ISF), which in 1970 was renamed the Karlsruhe Fraunhofer Institute IITB.

In 1966 Max Syrbe was appointed to the senate of Fraunhofer Gesellschaft and in 1983 he became its president. He retained this role until 1993. He was credited with initiating the concept that ensured the further development of Fraunhofer Gesellschaft. Max Syrbe insisted on success-based research contracts for private industry and public administration as the basis for Fraunhofer becoming the leading organization for applied research in the Federal Republic of Germany. In 1975, the Department of Computer Sciences at the University of Karlsruhe appointed Max Syrbe an honorary professor. Since 1983, Max Syrbe has been a member of the Steinbeis Foundation Board of Trustees and chairman of the Board of Trustees since 1991.

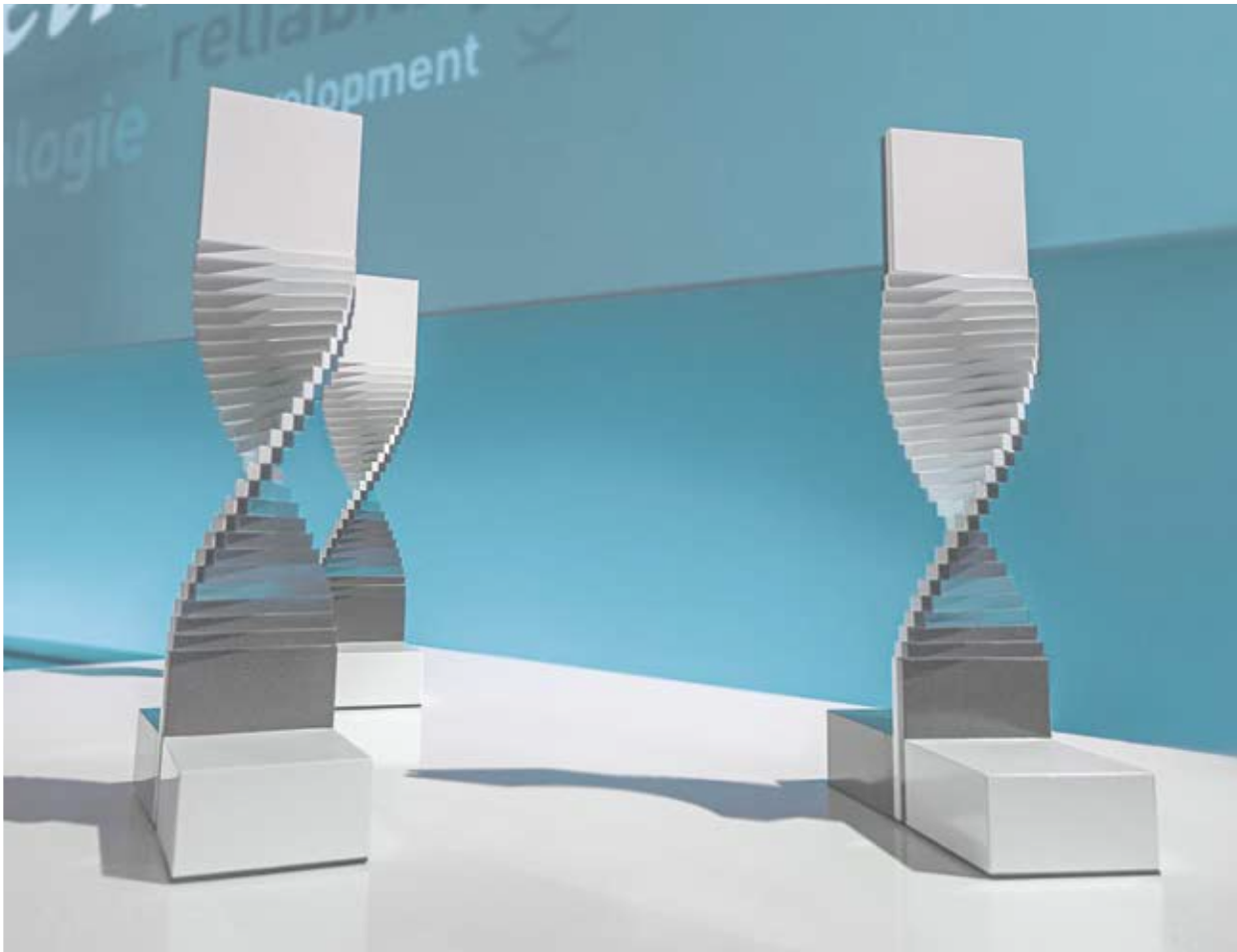
As well as research policy and research management, Max Syrbe's scientific work has focused primarily on automation and human engineering – especially man-machine systems. Max Syrbe has been awarded the Fraunhofer Sculpture, the highest honor bestowed by Fraunhofer Gesellschaft. He was also an honorary doctor of the Department of Engineering Sciences at the University of Duisburg-Essen and an honorary senator of the Albert Ludwig University of Freiburg. Furthermore, Max Syrbe has been awarded the Grand Cross of the Order of Merit of the Federal Republic of Germany as well as the Order of Merit of the Federal State of Bavaria.

In special recognition of his achievements, Max Syrbe received the Steinbeis Foundation's Transfer Award – Löhn Award.

Special Award Winner 2009

Award Winners

2010



Genzyme CEE GmbH, Constance
Steinbeis Transfer Center for Biopolymer Analysis,
Protein Chemistry and Proteomics at the
University of Constance, Constance

Clinical Diagnosis of Lysosomal Storage Diseases in Central and Eastern Europe

Lysosomal Storage Diseases (LSDs) are a group of largely inherited metabolic disorders triggered by a deficiency in lysosomal enzymes. Metabolism is impaired as a result, causing severe symptoms such as organ enlargement and cardiac muscle atrophy, which if left untreated can often be terminal, including children. Of the 60 or so LSDs that are currently known, a few can already be treated using the enzyme replacement therapy, which has high success rates where diagnosis is confirmed. However, since fast and accurate diagnosis has so far been a major problem, affected individuals often die before treatment is possible.

The Steinbeis Transfer Center for Biopolymer Analysis, Protein Chemistry and Proteomics at the University of Constance has developed two biochemical methods for diagnosing LSDs: fluorescence spectroscopy and mass spectroscopy. These methods were validated for clinical diagnosis in conjunction with Genzyme CEE GmbH in Constance and the Biomass Spectrometry Laboratory at the University of Timisoara in Romania. A fast and reliable method of diagnosis is the dried blood spot (DBS) method, which involves determining the quantity of reaction product and thus the activity of LSD enzymes in the blood. This is particularly valuable for central and eastern European countries, where until now there have been no efficient diagnosis methods available.

The first stage of the transfer project, which was awarded the Löhn Award, involved refining the two biochemical methods and then improving diagnosis by HPLC tandem mass spectrometry so that it could be used to simultaneously diagnose multiple LSDs. The second step was to establish mass spectrometric diagnosis in the laboratories in Constance and Timisoara and to validate it using samples from clinics and from unaffected individuals.

The methods developed for the highly specific diagnosis of LSDs can be used internationally and in large-scale screening, as well as to follow up treatment. The goal of the project partners is to develop further methods on this basis to identify storage diseases that so far have proved impossible to diagnose.

Award Winner 2010

Stadtmüller GmbH, Osterburken
Steinbeis Transfer Center for Production
and Organisation, Pforzheim

New Laser Welding Technique for Rotationally Symmetric Components

Thanks to changes in climatic conditions, the air-conditioning and ventilation industry has seen rapid growth in recent years. Its range of applications is wide – from air-conditioning homes, offices and public buildings to refrigerating and freezing food.

Stadtmüller GmbH, a midsize enterprise based in Osterburken, Germany, supplies rotors and protection guards for ventilators and air-conditioning units to this industry. A leading supplier in the field of industrial wire forming, the company manufactures its products solely in Germany. The nature of production is both highly customer-specific, with many products, types and variants, and highly automated, including numerous individual process steps. Consequently, the company has to invest substantially in many specific types of equipment and tools. Although the process is highly complex, the market nonetheless tends to demand extremely fast product delivery, as a considerable share of sales is generated from project-based business, which is difficult to plan.

Working closely with Stadtmüller, the experts at the Steinbeis Transfer Center for Production and Organisation in Pforzheim developed new welding techniques based on laser technology to enable the protection guards to be fully welded in one operation. Crucially, what this means in operational terms is dramatically reduced cycle times, along with lower costs and simplified internal production logistics and control. At the heart of the new technology lies a special type of laser welding, in which a laser beam is used to weld rotationally symmetric components that are joined at just one point or along one line, in such a way that guarantees precision. This type of laser welding uses a very fine laser beam transmitted through a mating part to generate a micro-weld in the contact area. When the two mating parts are pressed together at the same time that this occurs, they move relative to each other, thereby increasing the joint cross-section. This means that components with gaps can now be welded using laser technology. Another key development is the design and setup of a roboter-based laser welding cell including integrated offline-programmed scanning optics and active tolerance compensation. Traditional laser welding systems are not suitable for implementing this new solution.

The two organizations are currently collaborating on refining the technique as part of a funded joint project and developing it to production standard.

Award Winner 2010

Siemens AG Generator Plant, Erfurt
Steinbeis Transfer Center
Drive and Handling Technology in Mechanical Engineering,
Chemnitz

Innovative Bending Machine for Induction Conductors Used in Large-scale Generators

Award Winner 2010

Located in Erfurt (Germany), the Siemens generator plant is acknowledged as one of the world's leading facilities for the design and manufacture of turbogenerators with a power output of up to 300 MW. Against the backdrop of ever-increasing competition, the production plant was eager to introduce new technological solutions aimed at further optimising its manufacturing processes. Within this context, the main focus was on the production of conductors, a particularly labour-intensive part of the overall process.

In cooperation with the Steinbeis Transfer Center Drive and Handling Technology in Mechanical Engineering, the company came up with an innovative manufacturing method and a new operating system that revolutionize the complex production process for conductors, consisting of axial and tangential conductors.

The individual tangential conductors – 15 to 24 in total – are made of electrolytic copper and are up to 64 mm in width, 8.0 mm in thickness and 1.7 m in length. The conductors are soldered on to the axial conductors (up to 7 m in length) on both sides. The radius of the tangential conductor package corresponds to the rotor radius of the generator, i. e. up to 0.5 m. The maximum package thickness is 160 mm.

Using the conventional technique, the conductors are bent by hand with the help of circular tools, both individually and stacked on top of each other, to form a conductor package that makes up a complete half-coil. Applying this manual method, the overall processing time required to make a conductor package for a half-coil is 145 minutes. Based on many years of experience, the manual production technique involved aligning and inspecting the items several times during the overall procedure. This approach was in stark contrast to the state-of-the-art technology applied by the company in other areas of generator production. The aim: to streamline this section of manufacturing by introducing entirely new bending / forming technology. One of the key challenges was to eliminate the springback associated with the material itself while also ensuring that the surface was in no way damaged by the process and the conductors retained their prescribed length rather than expanding as a result of the rolling procedure.

Owing to the innovative, patented bending process and the newly installed bending machine, the complete conductor package for a half-coil can be produced in a single step. The overall processing time was scaled down from 145 to 27.5 minutes.

Prof. Dr.-Ing. Klaus Boelke
Steinbeis Transfer Center
for Technical Consulting at the University
of Applied Sciences Heilbronn,
Heilbronn

Enthusiastic Problem Solver

The Löhn Award jury awarded Prof. Dr.-Ing. Klaus Boelke a special award in recognition of his many years' outstanding contribution to the area of technology transfer.

Klaus Boelke began studying in 1962 at the University of Stuttgart, where he successfully completed his degree in electrical engineering with automatic control engineering. Remaining faithful to the university, he continued his studies there and was awarded his doctorate in mechanical engineering by the department for control technology in 1977.

Klaus Boelke began his professional career as head of department at the BEHR radiator factory. One of his tasks in this role was to automate air conditioning in cars. In 1981, Klaus Boelke responded to a call from the University of Applied Sciences Heilbronn and ended up lecturing there for 24 years as professor in the department for production and logistics, passing on his enthusiasm for technical issues to his students. Klaus Boelke has been "unretired" since 2005, and lectures at the Cooperative State University in Mosbach.

In 1995, Klaus Boelke became head of the Steinbeis Transfer Center (STC) for Technical Consulting at the University of Applied Sciences Heilbronn, which has been functioning as a technical consulting service within the Steinbeis Network since 1971 – one of the first centers to be established. Together with his fellow professors from a wide range of specialist fields, Klaus Boelke has built a technical consulting service that has become a long-standing, innovative and reliable consulting and development partner to businesses, particularly regional and national car manufacturers.

Klaus Boelke has progressed from an expert in his subject field to become a "specialist generalist". Approach him with any problem, and he can locate the right person to solve it. His unselfish sense of commitment and friendly, positive dynamism means he has a magnetic effect on all who meet him.

Steinbeis thanks Klaus Boelke for his successful contribution as head of the Steinbeis Transfer Center for Technical Consulting at the University of Applied Sciences Heilbronn and his enduring commitment to technology transfer.

Special Award Winner 2010

Prof. Dr.-Ing. Hermann Kull
Steinbeis Transfer Center
for Systems Technology / Automotive,
Esslingen

Consummate Engineer by Conviction

Prof. Dr.-Ing. Hermann Kull received a special award from the Steinbeis Foundation for his outstanding contribution to engineering and for his role as head of the Steinbeis Transfer Center for Systems Technology / Automotive.

Hermann Kull studied electrical engineering and information technology at the University of Stuttgart. He embarked on his academic career as an assistant in the department for power electronics at the same university. After completing his doctorate, Hermann Kull worked for many years in industry. Since 1988, he has been professor of information technology at Esslingen University of Applied Sciences.

In 1995, Hermann Kull founded the Steinbeis Transfer Center (STC) for Systems Technology / Automotive, which he runs successfully to this day. The STC offers customers and project partners from the automotive industry a range of services including technical consulting and development services in engineering, e-learning and software development, as well as training courses. His collaborations with leading car manufacturers and automotive suppliers in the field of fuel injection control systems for diesel engines have been particularly successful. He has also worked in new subject fields such as exhaust aftertreatment and diagnosis systems. Recently, Hermann Kull successfully gained IS0 9001:2008 certification for his STC.

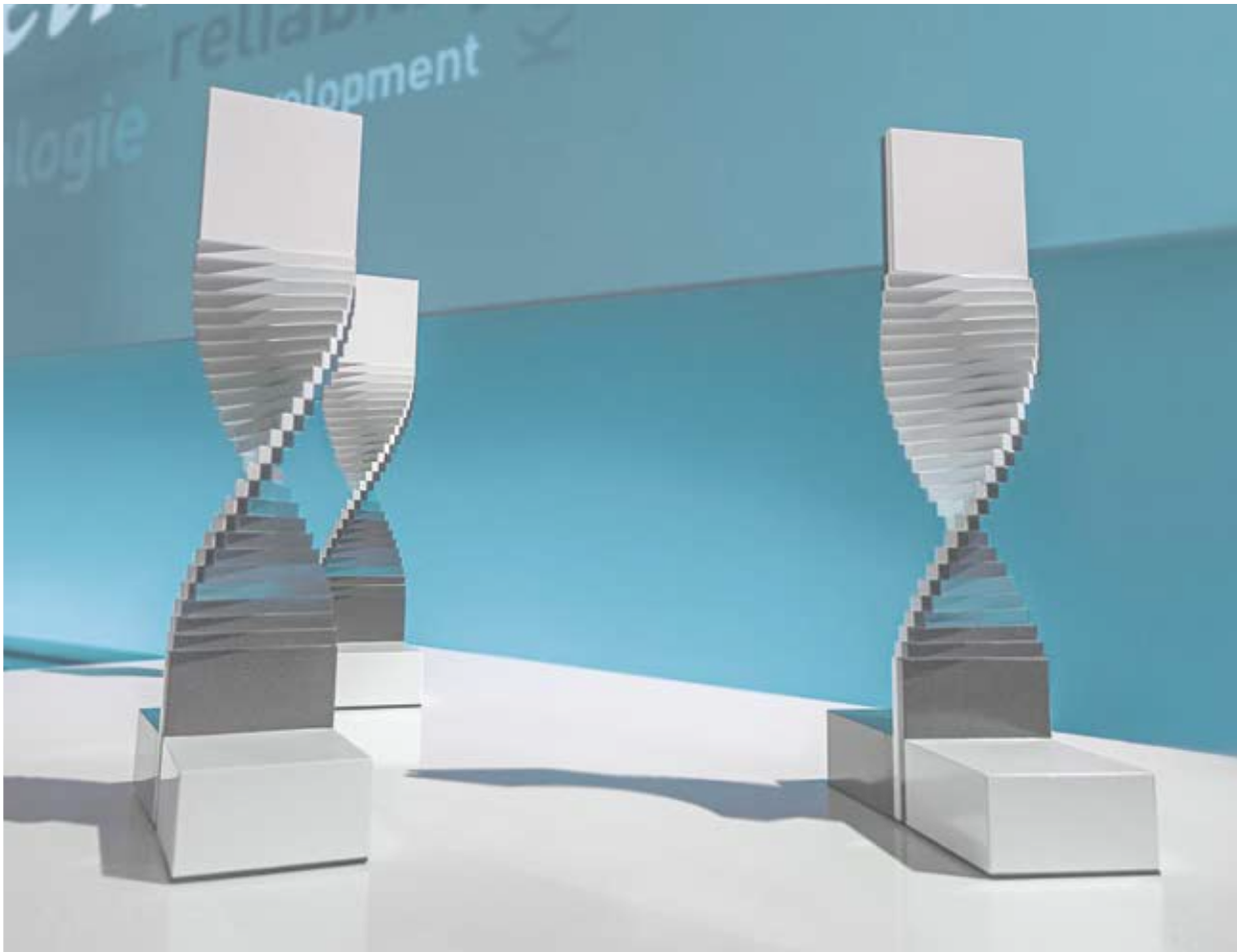
Given the remarkable growth of his Steinbeis Transfer Center, Hermann Kull has also had to handle critical and complex business challenges. Meeting these challenges head on, he has managed to maintain the continued success of his company.

Steinbeis awarded Hermann Kull the Steinbeis Foundation‘s Transfer Award – Löhn Award in recognition of his longstanding service in the Steinbeis Network and his commitment as a university professor.

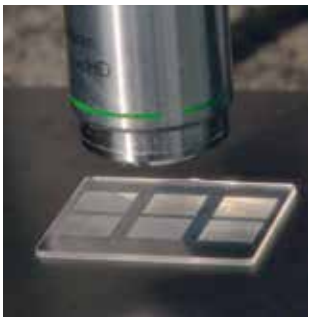
Special Award Winner 2010

Award Winners

2011



Sony DADC Austria AG, Anif (Austria)
Watlow Plasmatech GmbH, Kuchl (Austria)
Steinbeis Transfer Center Plastics Center, Bretzfeld



High Dynamic Variotherm Technology for the Production of Microfluidic Components

The application of microfluidic components in medical technology is increasing extremely. There is high demand for a cost-effective mass production process for those components, because they are mainly disposable products, for example due to risk of contamination. Similar to the production of optical media like CDs and DVDs – also being micro structured plastic components – the injection molding of thermoplastic molding material is suitable here. However, there are high quality requirements for the component regarding micro structured replication and its inner morphology. In order to fulfill these requirements, the injection molding technologies that have been used so far are not sufficient.

The Steinbeis Transfer Center Plastics Center in Bretzfeld has already been dealing with the molding of functional surface structures in the area of micro- and nanotechnology on the surfaces of macroscopic plastic components for over ten years. It was detected that especially the temperature of the shaping mold wall plays a decisive role for the production of high quality minimal structured plastic components. For that purpose different temperature systems for the specific influence of the temperature of the shaping mold wall in an injection mold had been researched. With these systems the high dynamic variotherm injection molding of thermoplastic molding material which is indispensable for the minimal structural replication is made possible. Together with the Watlow Plasmatech GmbH in Kuchl (Austria), a manufacturer of thermally sprayed electrical heating systems, the high dynamic variotherm temperature modules as well as the necessary control systems were developed.

More than 20 years ago the Japanese group Sony decided to establish the Sony DADC Austria AG for the production of CDs in Anif close to Salzburg. Today the company is the biggest European disc manufacturer. With more than two centuries of experience in mass production of micro structured plastic components, Sony DADC is now also offering this service to customers outside of the entertainment industry.

In a joint transfer project of the above mentioned partners the high dynamic variotherm technology which was developed by Watlow and the Steinbeis Transfer Center Plastics Center was introduced at Sony DADC in Anif for the production of micro structured components in medical technology.

Award Winner 2011

Institut Dr. Foerster GmbH & Co. KG,
Reutlingen
STASA Steinbeis
Angewandte Systemanalyse GmbH,
Stuttgart

DATA2LINE® – Automated Process for the Detection of Unexploded Bombs as Part of the Explosive Ordnance Disposal

The reliable identification of metallic objects on the basis of magnetic field measurement data is an essential part of the explosive ordnance disposal, especially the removal of unexploded bombs from past wars. Every 30 minutes a person gets hurt or killed by a mine or unexploded bomb around the world. More than 60 countries are fighting against the explosive heritage of armed conflicts. In Germany every year thousands of tons of ammunition and bombs from both world wars are being discovered.

For the localization of explosive ordnance high-resolution magnetic field measurement methods are used amongst others. That way the underground in relevant areas is examined for every construction project. The institute Dr. Foerster is one of the leading companies for the entry, evaluation and analysis of magnetic field measurement data and offers a globally acknowledged instrument for the entry of this data, the FEREX®-Magnetometer. Until now the signatures of the suspicious objects have been selected manually in the magnetic field data and then evaluated individually.

Through the process which was developed together with STASA Steinbeis Angewandte Systemanalyse GmbH the reliability of detection of unexploded bombs has significantly improved and has largely been automated. Thus the danger of overlooking a dangerous object is significantly decreasing. With the geo-referenced measurement data you can identify the exact position with the depth data and orientation angle as well as a volume classification of the unexploded bombs. In order to achieve that different filter processes were combined with a physical dipole model. A new pattern recognition process which was purpose developed for this task provides a reliable identification of objects that are very close to another.

With the developed software DATA2LINE® the specialists in charge are able to analyze and document the pollution of larger areas much more effectively and exactly. This helps to increase profitability, but also to reduce the risk potential when realizing construction projects. The developed process is also used in archaeology in the future and currently extended for this purpose.

Award Winner 2011

NT TOOL Corporation,
Takahama City (Japan)
Steinbeis Transfer Center
Quality Assurance and Image Processing,
Ilmenau

Intuitive Software for a New Optical Tool Presetter

The increasing number of computer-controlled applications in industrial production is a difficult task for many workers when they have to master software interfaces that are complex and confusing. The consequence can be operating errors and a lack of motivation. Today Optical Tool Presetters (OTP) are software-controlled and used for contactless measurement and presetting different tools. They are used directly in production, especially in the auto industry and their suppliers.

The excellent transfer project is the first joint project of the Japanese company NT TOOL Corporation from Takahama City and the Steinbeis Transfer Center Quality Assurance and Image Processing, Ilmenau. The project aim was the concept, development, implementation and attainability of series-production readiness of a touchscreen-capable, intuitive software for an OTP. The main focus was on the minimization of the necessary number of clicks from the beginning of the measurement until the result, connected with a new design.

The innovative software interface of the OTPs has the distinction of a clear structure and reflects in five so-called palettes exactly the five most important steps of the operator. All information that is important for the respective step is only available when it is needed; the insignificant information is blanked out. When the operator is done with all necessary adjustments of a work step, the software opens the next palette automatically with the following step.

Furthermore the transfer project made an internship at NT TOOL in Japan possible for the involved students. For them it was a milestone during their studies, but also an important personal experience. Their stay has built an important bridge for the Steinbeis Transfer Center Quality Assurance and Image Processing and NT TOOL and simplified communication.

Award Winner 2011

Prof. Rudolf Voit-Nitschmann
Steinbeis Transfer Center Aerodynamics,
Aircraft Engineering and Lightweight Construction, Stuttgart
Steinbeis Flugzeug- und Leichtbau GmbH, Stuttgart

Pioneer in Aircraft and Lightweight Construction

Prof. Rudolf Voit-Nitschmann studied aerospace technology at the University of Stuttgart. Then he worked as a scientific assistant at the Deutsches Zentrum für Luft- und Raumfahrt (Germany's national research center for aeronautics and space) from 1977 until 1980. In 1980 he became the head of development and was responsible for the construction of a light aircraft at the company Gyroflug GmbH of which he became the technical director in 1984. For the first time he succeeded in licensing an airplane in fiber composite construction according to FAR 23 at the German Federal Office of Civil Aviation and the American Federal Aviation Administration.

After a leading position at the Grob Luft- und Raumfahrt GmbH, he changed to the company Dornier Luft- und Raumfahrt GmbH in Friedrichshafen and worked among other positions as a chief engineer in Toulouse. In the end he was the senior head of the department of structural design and technology in Friedrichshafen and Oberpfaffenhofen.

In January 1994 he was appointed professor for aircraft construction at the University of Stuttgart. There he took over the project management position for the solar airplane project icaré. His fields of activity include in research and teaching aircraft design, construction and light construction in fiber composite construction. His main interest in research is the design of unconventional aircraft configuration. The main focus is here on efficient, environment-friendly configurations which operate electrically. In the past few years he developed one of the most efficient electric aircrafts with the significant participation of his Steinbeis enterprise at the institute for aircraft construction together with e-Genius.

In 1995 he founded the Steinbeis Transfer Center Aerodynamics, Aircraft Engineering and Lightweight Construction. The Steinbeis Flugzeug- und Leichtbau GmbH emerged from that Steinbeis Transfer Center in 2008. The SFL-GmbH offers clients and partners from the aerospace industry development services for the design and development and the licensing of aircrafts in fiber composite construction. His other main focus is on the development of high-flying, unmanned aircrafts. In this connection the research topics and projects at the university and the transfer projects complement with each other ideally. Among his clients are big groups like EADS, ASTRIUM, but also several medium-sized enterprises such as the sailplanes manufacturer Schempp Hirth.

His scientific accomplishments in the aircraft development have been appreciated with numerous awards. Rudolf Voit-Nitschmann is an active pilot and can besides his theoretical knowledge refer to an extensive practical experience with sailplanes, motor gliders and motorized airplanes.

Despite the numerous projects Rudolf Voit-Nitschmann has always kept his identification with Steinbeis. In situations that required exceptional steadfastness and reliability he held the Steinbeis flag exceptionally high when facing strong headwinds. He has been and is a deeply loyal partner.

Special Award Winner 2011

Prof. Dr. Werner Bornholdt
Founder and director of the Steinbeis
Transfer Center New Products,
Villingen-Schwenningen (1988–2010)

Passionate Innovator

„Innovation is when the market shouts Horray!“ Prof. Dr. Werner Bornholdt was born in 1945. After he studied, postdoctoral and after several years as a management consultant, he was appointed professor at the University of Furtwangen in 1984 in order to take part in the best possible interlocking of research, teaching, practice and consulting in Baden-Württemberg. He taught and researched there until 2010 in the faculty of Product Engineering / Industrial Engineering. His focus is on project management, product marketing, strategic marketing, technology and innovation management, rhetoric and sales psychology. He has the distinction of an integrated approach which says that technology (extend feasibility), marketing (satisfy needs) and management (ensure success) always have to interact, with the result that students respected and liked him.

In 1988 Werner Bornholdt started his career at Steinbeis with founding the Steinbeis Transfer Center New Products in Villingen-Schwenningen as a service center for technology transfer between science and medium-sized enterprises. The transfer center deals with consulting and expertise for medium-sized enterprises and innovations, the training and coaching of entrepreneurs, promoters of trade and investors in the subject management and marketing of new products. Furthermore it collects, evaluates and transmits information and accompanies technology transfer. In 2010 Werner Bornholdt passed on the direction of the center to his successor.

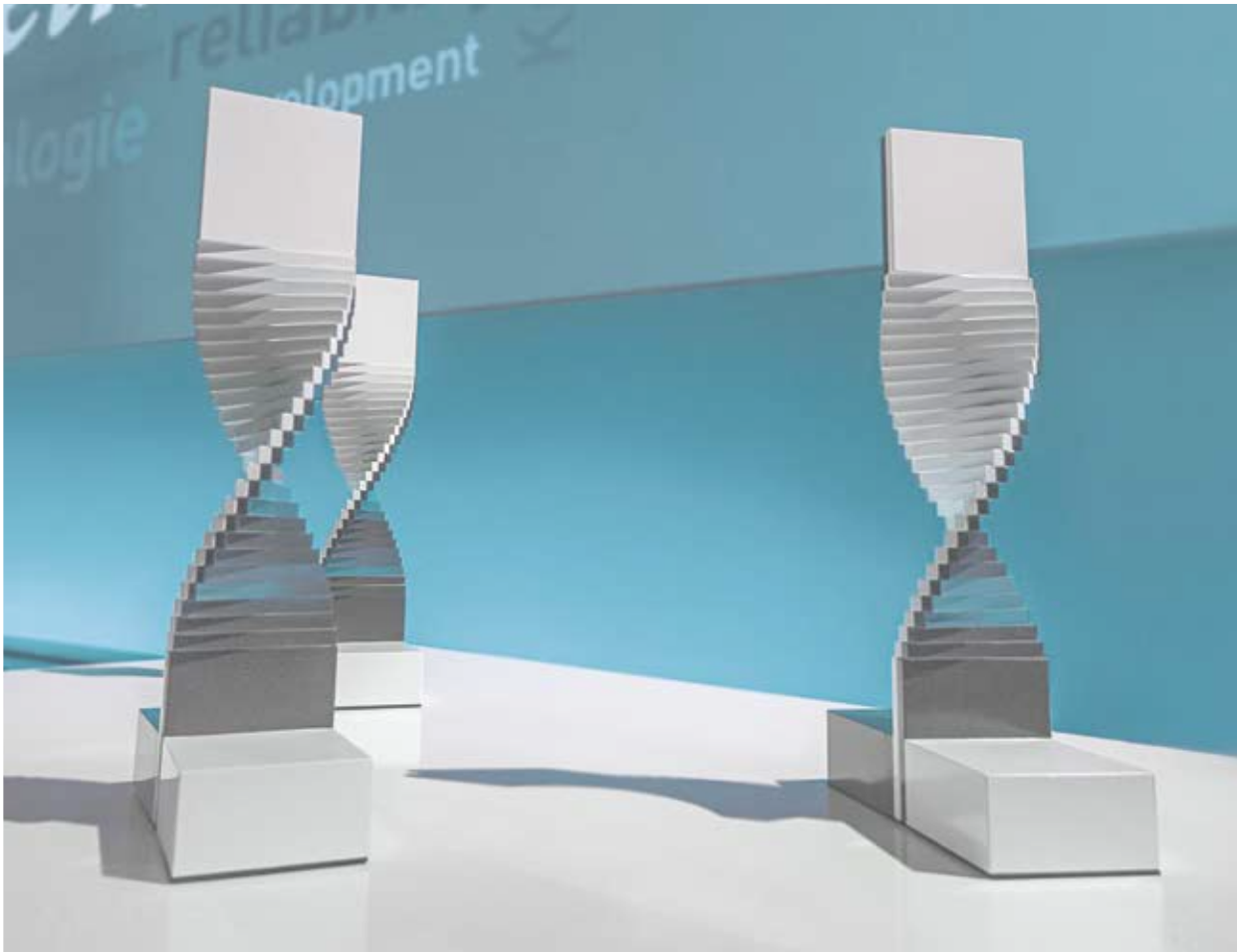
At the same time of the foundation of the Steinbeis Transfer Center, he started to share his extensive know-how as a lecturer at universities and in seminars for the industry and lending business. Among other universities there was also the Steinbeis University Berlin. He was also able to give impulses with his integrated approach there. As a result, in 2006 he was appointed Professor h. c. at the Budapest Business School where he also taught. Publications document his expert knowledge.

Werner Bornholdt has been and is particularly valuable for Steinbeis, because he integrated the “vertical” projects in a holistic approach. His Business-Check with the Steinbeis competence star is for many consultants a standard tool.

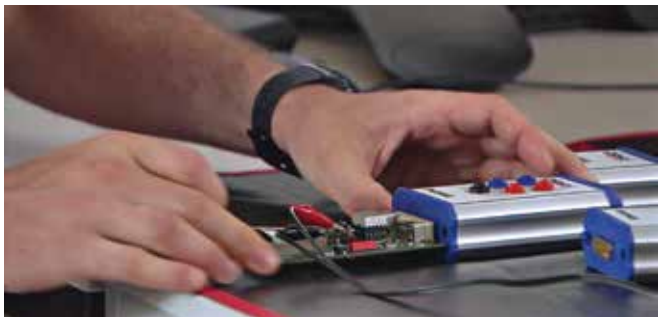
Special Award Winner 2011

Award Winners

2012



PHYWE Systeme GmbH & Co. KG,
Göttingen
Steinbeis Transfer Center
Embedded Design and Networking,
Heitersheim



Wireless Sensor Linkage for Didactical Measurement Technology

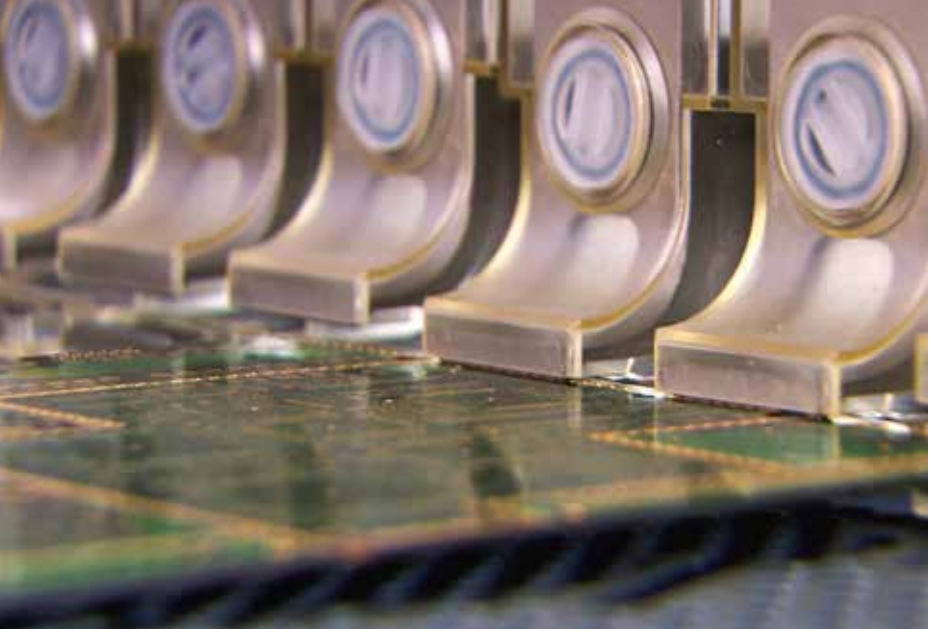
The transfer and storage of physical parameters have increasingly become a part of instrumentation and measurement technology and added to local logging and preprocessing. In recent years several wireless and wired transmission protocols that meet the individual requirements of the specific application have been developed for this purpose. Here objectives are technical parameters such as data rate, stability, security, real-time capability, scalability, energy efficiency, autonomy and adaptivity of the network management as well as commercial parameters like costs, strategic long-term availability and standardization. In the past few years especially different wireless transmission protocols have entered the market. These transmission protocols allow a handling that is flexible and as far as possible installation-free, i. e. ad-hoc. Today these protocols have already been applied in many areas of consumer electronics, but also in industrial and process automation. In this context the management with efficient and user-friendly operating units, like smart phones and tablets, has become increasingly significant.

In response to this, the PHYWE System GmbH & Co. KG decided to use these technologies also for their application area of didactical measurement technology and establish it as an integral part of their solutions for the scientific and technical training at schools and universities. For 100 years PHYWE has developed devices, experiments and solution systems for schools and universities of science and applied sciences (materials science, medicine …) and for applications preparatory to research or close to research. The company has a leading position in this area around the world. This position was consolidated with the implementation of the Cobra4 product family and PHYWE succeeded in connecting this modern kind of data logging that is reflecting the zeitgeist with curricular contents world-wide and thus strengthened the interest of scientific study contents, especially the interplay with real experiments, of the teachers and learners.

The Steinbeis Transfer Center Embedded Design and Networking (stzedn) has implemented several developments on the so called Embedded Connectivity in its first ten years since Prof. Dr.-Ing. Axel Sikora founded it with its strong and professional development team. In the framework of several subprojects the stzedn has successfully designed and implemented significant elements of the system development of the new Cobra4 product family for PHYWE. Besides a completely new micro-controller- and wireless transceiver platform on the basis of the IEEE802.15.4 standards, a flexible, stable and user-friendly complete system had been developed. The system succeeds in combining low cost and high energy efficiency with a very high performance.

Currently the partners are working on a second product generation.

Award Winner 2012



Atotech Deutschland GmbH, Feucht
Steinbeis Research Center
Material Engineering Center Saarland
(MECS), Saarbrücken

Controlled Self-Healing Process for Electrical, Extremely Stressed Galvanic Systems of High-End Circuit Board Production

The omnipresent spread of electronic systems in our everyday life (computers, smart phones, flat screens, intelligent automobiles etc.) and the constant competition for more efficient and at the same time smaller systems challenges the whole electronic sector more and more.
A central component is the circuit board which presents the decisive “nervous system” of electronic devices. The circuit board ensures with its complex and three-dimensional “nerve cords” the electronic connection of all individual components and at the same time the removal of waste heat.
The production of these circuit boards requires a thin, but homogenous copper-plating on the flat surface. In this process only least tolerances in thickness and evenness are permitted. At the same time the thin and homogenous coating of even larger circuit boards for the increase in efficiency is demanded.
The extremely high energy density for the fast galvanic deposition of copper layer seals the electrodes in the production plants. This happens through the so-called electroerosion which is the destruction of material through electricity or arcs. Arcs are a special form of electrical discharge and can be found in nature, i. e. lightning.
Scientists of the Steinbeis Research Center Material Engineering Center Saarland (MECS) based in Saarbrücken have addressed this issue together with the world-wide operating company Atotech Deutschland GmbH.

The aim of the joint project was to find material components and geometries which are able to withstand the extreme stress in the production plants fastly and thus lead to longer maintenance cycles and low maintenance. During the project an innovative solution was found. The solution is based on a controlled self-healing of the existing material system and an application for patent has also been filed.
The transfer solution is an excellent example for “out of the box“ thinking. This was only possible through the interdisciplinary cooperation partnership between Atotech and MECS.

Award Winner 2012

CeramTec GmbH, Plochingen
Steinbeis Transfer Center
Technical Communication – Paracam,
Salach

BIOLOX® App and BIOLOX® Motions: Consulting and Training of Surgeons with Interactive Media for the Handling of Ceramic Hip Joints

With the latest new media, smart phones and tablets, the possibilities of digital publishing have increased once more. According to the guidelines of the respective operating system, apps for the devices have to be created within their own programming environment. This means at least twice the effort for the producers of the contents. Adding internet and desktop solutions, the companies meet their in-house limits quickly when trying to send their messages with the lowest possible divergence loss to the digital world.

The CeramTec GmbH, world market leader for ceramic hip joints, faces the challenge to inform 50,000 surgeons about the characteristics of their high performance ceramics called BIOLOX® and about the specific operation techniques as well as to train them so that they can use these techniques. The company is not able to reach this audience sufficiently with classical media.

That is why CeramTec developed the BIOLOX® App together with the Steinbeis Transfer Center Technical Communication – Paracam at the University Aalen. Numerous animations, operation movies and further media show the correct implantation of the BIOLOX® component. All animations as well as the interactive interface were developed by the Steinbeis Transfer Center Technical Communication – Paracam. The special thing is that the Steinbeis team developed a platform-neutral workflow which makes it mostly possible to create smart phone-, tablet-, web- and desktop applications out of a programming environment. This is a cost effective and time-saving way which comes close to the so-called cross-media and single-source publishing.

The award-winning development of the BIOLOX® App met the expectations of the project partners to a large extent. Thus they are working on a beta version of a second app which can offer completely new possibilities for the visualization and simulation of hip joints. Motion sequences of people are recorded in a studio with a motion-capture system and then transferred to a virtual skeleton. With the interactive 3D-presentation it is possible to recognize special strain and critical conditions of artificial hip joints directly. This is very helpful for orthopedists whose patients are increasingly younger and more active.

Award Winner 2012

Sachihiko Kobori
Steinbeis Japan Inc.,
Tokyo (Japan)

Steinbeis Quality in the Japanese Market

Sachihiko Kobori was born in Tokyo in 1951 and has been the president of Steinbeis Japan Inc. since 1999. After he studied Economics and received a Bachelor of Arts, he completed a vocational training as a researcher at the Environmental Planning Institute in California, USA.

In 1976 he spent one year as an assistant director at the Miami Beach Redevelopment Agency and coordinated multi-disciplinary consultant teams.

From 1977 to 1992 he worked as a researcher at Oceanautes Inc. and developed novel ocean-based GIS introducing quantification theories between fisheries' data and environmental attributes. Since 1992 he has been the senior managing director of Oceanautes Inc.

From 1982 to 2000 he was the assistant representative of the Ministry of Economic Affairs of Baden-Württemberg in Japan. In 1994 he became the representative in Japan for the Steinbeis Transfer Center International Technological Cooperation and in 1996 for the Steinbeis Foundation. He held these positions until 1996 and 1999.

Besides teaching at the Steinbeis University Berlin, Sachihiko Kobori has also been lecturing Project Management at the Kyushu University Career Development Center and at different companies.

Sachihiko Kobori runs Steinbeis Japan Inc. which presents the global Steinbeis network as the headquarters of networks of Japanese experts. As a consultancy, Steinbeis Japan Inc. provides a range of services in new business development, project management, international business development and technology transfer as well as in regional development and project economy. Over 30 German, US and Asian companies are supported to solve management issues and technical subjects in Japanese market.

The Kobori family is connected to Steinbeis from its beginnings on. Sachihiko Kobori´s father Kiyoshi Kobori, had already been active as representative of Baden-Württemberg in Japan during the time of Lothar Späth as prime minister of Baden-Württemberg. The successful cooperation between Steinbeis and Sachihiko Kobori is not only based on a high professional quality of work, but also on a high trust-based personal relationship.

Special Award Winner 2012

Prof. Dr.-Ing. habil. Eberhard Köhler
Steinbeis Transfer Center
Drive and Handling Technology
in Mechanical Engineering, Chemnitz

Machines Are His Passion

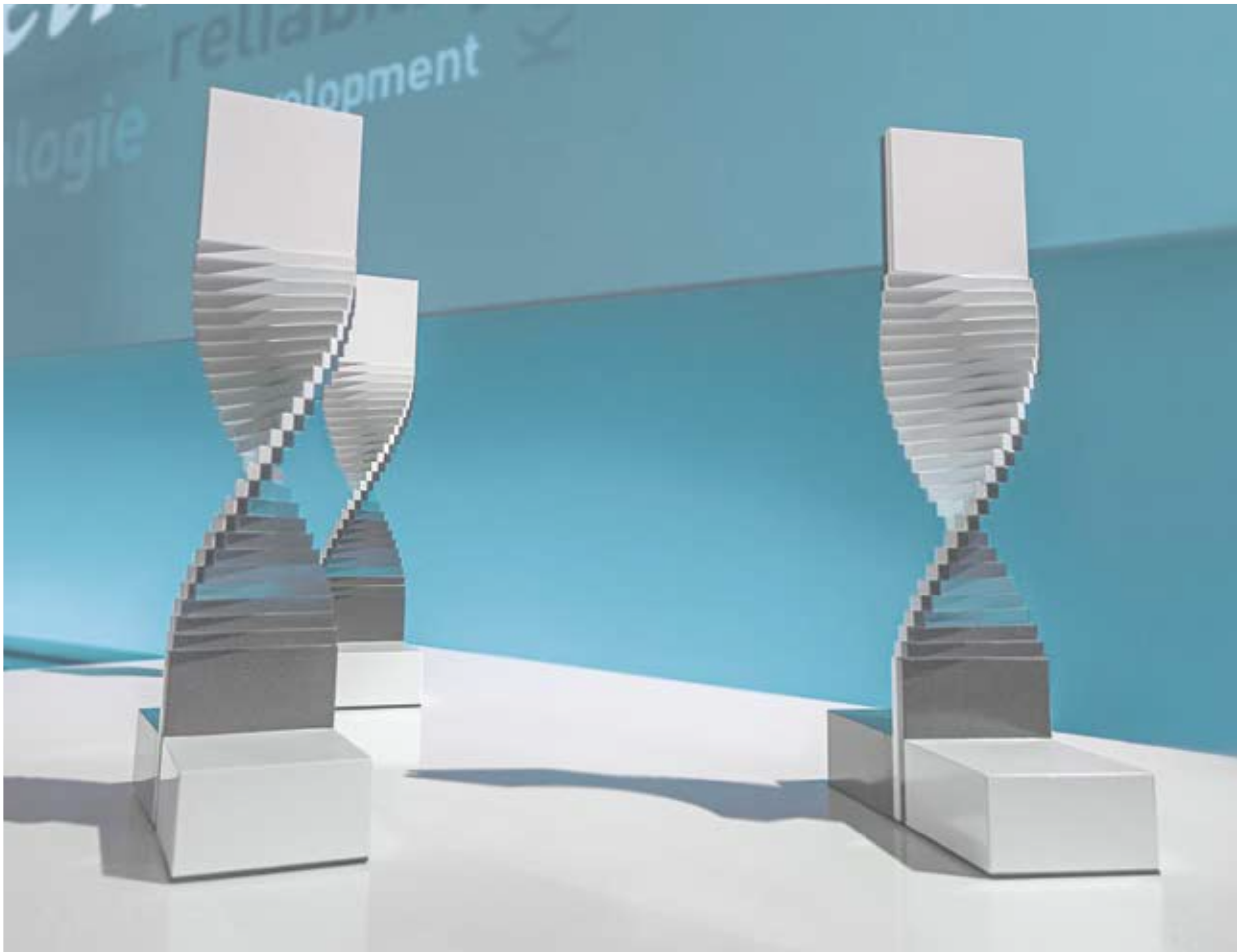
The jury of the Löhn Award acknowledges the long-time and outstanding achievements in technology transfer of Prof. Dr.-Ing. habil. Eberhard Köhler with a special award. The trained machinist and welder completed his studies at the then TH Karl-Marx-Stadt (today TU Chemnitz) in the field of study "Construction of Machines and Devices of Mechanical Engineering" successfully with the degree "Diplom-Ingenieur" in 1960. In 1974 he earned his Dr.-Ing. In 1960 Eberhard Köhler started his career as a design engineer at the VEB Separatorenbau Hainichen where he was responsible for the construction of centrifuges and packing machines. After three years he became the technical director and deputy plant manager there. Subsequently he managed a research center of the Berlin Vergaser- und Filterwerke until he went back to his alma mater, the TH Karl-Marx-Stadt, as a research assistant in 1969. In 1977 he was promoted to scientific chief assistant at the chair for processing machines construction. Eberhard Köhler received the teaching qualification in 1984 and was appointed university lecturer for processing machines construction one year later. After that in 1989 he was appointed professor. From 1989 to 1991 Eberhard Köhler managed the field textile machines construction. In the following two years he was deputy director of research for textile and leather technology. After his habilitation he became vice dean for research at the TU Chemnitz before he was appointed professor for the field of construction of mechanical engineering. In the mid-1990s Eberhard Köhler founded and managed the institute for general engineering and plastics technology at the TU Chemnitz. In 2001 he became dean of the engineering faculty. He held this position until 2003. Subsequently he was vice dean in the same faculty until his retirement in 2005.

Eberhard Köhler started his Steinbeis career in 1990 as a project manager. In 1991 he founded his own Steinbeis Enterprise, the Steinbeis Transfer Center Drive and Handling Technology in Mechanical Engineering. After that he founded the Steinbeis Research Institute Processing Machines and Systems and the Steinbeis Innovation Center Drive and Handling Technology in Mechanical Engineering in 2004 and 2008. In 2010 Eberhard Köhler was awarded the Löhn Award with his Steinbeis Transfer Center together with his project partner, the Siemens AG Generatorenwerke Erfurt, for the development of an innovative bending machine for conductors for generators.

Eberhard Köhler is a brilliant and recognized expert in his field. He created and expanded his Steinbeis Enterprises with an outstanding expertise and is part of the Steinbeis Network with heart and mind.

Special Award Winner 2012

Award Winners
2013



Daimler AG, Stuttgart
Holder GmbH Oberflächentechnik, Kirchheim / Teck
Ingenieurbüro Peter Schrems (IPS), Münster
Steinbeis Transfer Center Corrosion and Corrosion Prevention, Friedrichshafen

Innovative Method Reduces Testing Time for Zinc Coating Systems

Zinc flake coatings protect metal components used in the automotive industry from corrosion. During series production, time-consuming corrosion testing is necessary to assure coating quality, and this can take up to three months. This leads to costly delays in recognizing changes in coating quality and identifying the necessary corrective measures. The Steinbeis Transfer Center for Corrosion and Corrosion Prevention, located in Friedrichshafen and at the Ravensburg-Weingarten University of Applied Sciences, teamed up with Daimler AG, Holder GmbH Oberflächentechnik and Ingenieurbüro Peter Schrems (IPS) to develop an innovative testing method for accelerating the assessment of zinc flake coatings and their capacity to prevent corrosion.

Short-term testing involves subjecting a component to voltage in a measuring cell to simulate corrosion stress during operation. The course of the test signal is quality-specific and can be supplemented with other analytical methods of evaluation as needed. Thanks to a new, stand-alone potentiostat developed by IPS and the Steinbeis team, featuring software that automatically analyzes measurement results, companies will no longer require specialist staff to interpret data. The method was proven effective under laboratory conditions set up in cooperation between the coating specialists at Holder and Daimler, which tested a standard zinc flake coating. Reliable and reproducible results were available just four hours after testing began. These results will make it possible to react much more quickly to changes in quality, as well as initiate necessary corrective measures. Due to a higher measurement rate, processes can be executed in a smaller window of time, reducing costs for time-intensive testing during series production.

The most recent challenge is to implement this method in running production processes using a measuring cell attached directly to the component. The method, awarded with the Steinbeis Foundation's Transfer Award – Löhn Award, is sure to unleash tremendous potential for application in quality management for other coating processes and surface technologies once the necessary modifications have been made.

Award Winner 2013

Behr GmbH & Co. KG, Stuttgart
Steinbeis Transfer Center for
Heat Management in Electronics,
Walddorfhäslach

Pioneering Measuring System for Characterizing Thermal Interface Materials

Thermal stresses have a significant effect on the service life of electronic systems. Optimized heat management can go a long way in regulating the temperatures of components where thermal effects are critical, thereby lengthening the lifespan of the overall electronic device. New technologies, such as the electric drive in motor vehicles, are changing the demands for heat management. As a result, the heat paths in complex systems must be analyzed and optimized. This includes everything from the heat source to its environment. Frequently the contact surface between tangent solid objects forms a thermal bottleneck. The Steinbeis Transfer Center for Heat Management in Electronics, based at the Baden-Württemberg Cooperative State University (DHBW) in Stuttgart, and Behr GmbH & Co. KG, worked together to develop an innovative, highly precise system for measuring interface materials. Using the system, materials of a defined contact pressure or test thickness can be classified in terms of their thermal characteristics.

The battery in an electric vehicle is a practical example of this. In many cases, the temperature of the battery is regulated with a cooling plate. Here, it is crucial that the individual battery cells are thermally coupled well with the cooling plate. This can be achieved with a suitable thermal interface material placed between the battery and the cooling plate. The newly developed device allows researchers to precisely analyze both the thermal characteristics as well as the flow properties of the samples under exposure to thermal and mechanical stresses – a first for the industry. The innovative measuring system thus serves as a sound basis for the development and optimization of new materials for the heat management of electronic systems.

Since its founding in 2002, the Steinbeis Transfer Center for Heat Management in Electronics has amassed an extensive pool of expertise in the area of heat management in electronics and Behr GmbH & Co. KG is a systems partner to the international automobile industry. As a leading equipment manufacturer for personal automobiles and commercial vehicles, the company is considered a global specialist and pioneer of vehicle air conditioning and engine cooling. This project gave both project partners a chance to demonstrate how innovative technologies, and consequently a competitive edge, can emerge from the ideal dovetailing of science and industry. In special recognition of its exemplary transfer work, this partnership received the Steinbeis Foundation's Transfer Award – Löhn Award.

Award Winner 2013

Fraunhofer-Institut für Bauphysik IBP, Stuttgart
Werkstätte für Orgelbau Mühleisen GmbH, Leonberg
Steinbeis-Europa-Zentrum, Karlsruhe
Steinbeis Transfer Center Applied Acoustics, Stuttgart

Traditional Organ Building Meets Modern Science

The fascinating combination of sound, architecture and technology defines the organ with all of its facets. Traditional craftsmanship meets science with the organ as one of the most versatile musical instruments worldwide. The organ research faces the challenge to bring this craftsmanship in the high-price segment together with cutting edge science and new technologies. In eight European research projects, coordinated by the Steinbeis-Europa-Zentrum (SEZ), Werkstätte für Orgelbau Mühleisen GmbH, Steinbeis Transfer Center Applied Acoustics, Fraunhofer-Institut für Bauphysik (IBP) and SEZ collaborated successfully. It was intended to improve planning and dimensioning the traditional wind system, the part of the organ which crucially affects its sound.

An organ is not a mass product but a unique instrument with a unique sound and should be specially optimized for its later location. Scientific methods help the acoustic research to build the organ in a way that its sound is optimally tuned to the particular room acoustics thus showing its fullest advantage.

Besides optimizing the existing wind system, the project partners aimed to create new wind systems either by improving the mechanical control mechanism or by developing an electronic control system in order to ensure failure-free operation. Together with the Steinbeis Transfer Center Applied Acoustics, Fraunhofer IBP examined the mechanical and acoustic characteristics of the most important elements of the wind system in their laboratory. With the construction of mechanical and electronically controlled outlet valves, organ builders now are able to control the behavior of the wind pressure more precisely. Newly developed software makes it possible to design and optimize traditional as well as new wind systems. Moreover, it helps to improve the sound quality and reduces the production costs by 15 to 20 %. A physical model forms the heart of the software by describing the fluid mechanical processes in the wind system and the interaction of the individual components. Organ-building companies have already applied the newly developed system successfully. The combined results of all research projects have had remarkable influence on the research organ at Fraunhofer IBP. Orgelbau Mühleisen, Fraunhofer and Steinbeis have created a glass instrument serving scientific research – globally unique. For this long-term development cooperation they are awarded the Steinbeis Foundation´s Transfer Award – Löhn Award.

Award Winner 2013

Prof. Dr. h. c. Lothar Späth
(1937 – 2016)
Former Minister President of
Baden-Württemberg (1978–1991)

Entrepreneurial Visionary and Pioneer of Steinbeis

The Löhn Award jury honored the outstanding achievements and merits of Prof. Dr. h. c. Lothar Späth as a co-founder and pioneer of Steinbeis with a special award. Together with Johann Löhn he developed the Steinbeis model 30 years ago and he did it with enthusiasm and a political and entrepreneurial vision.

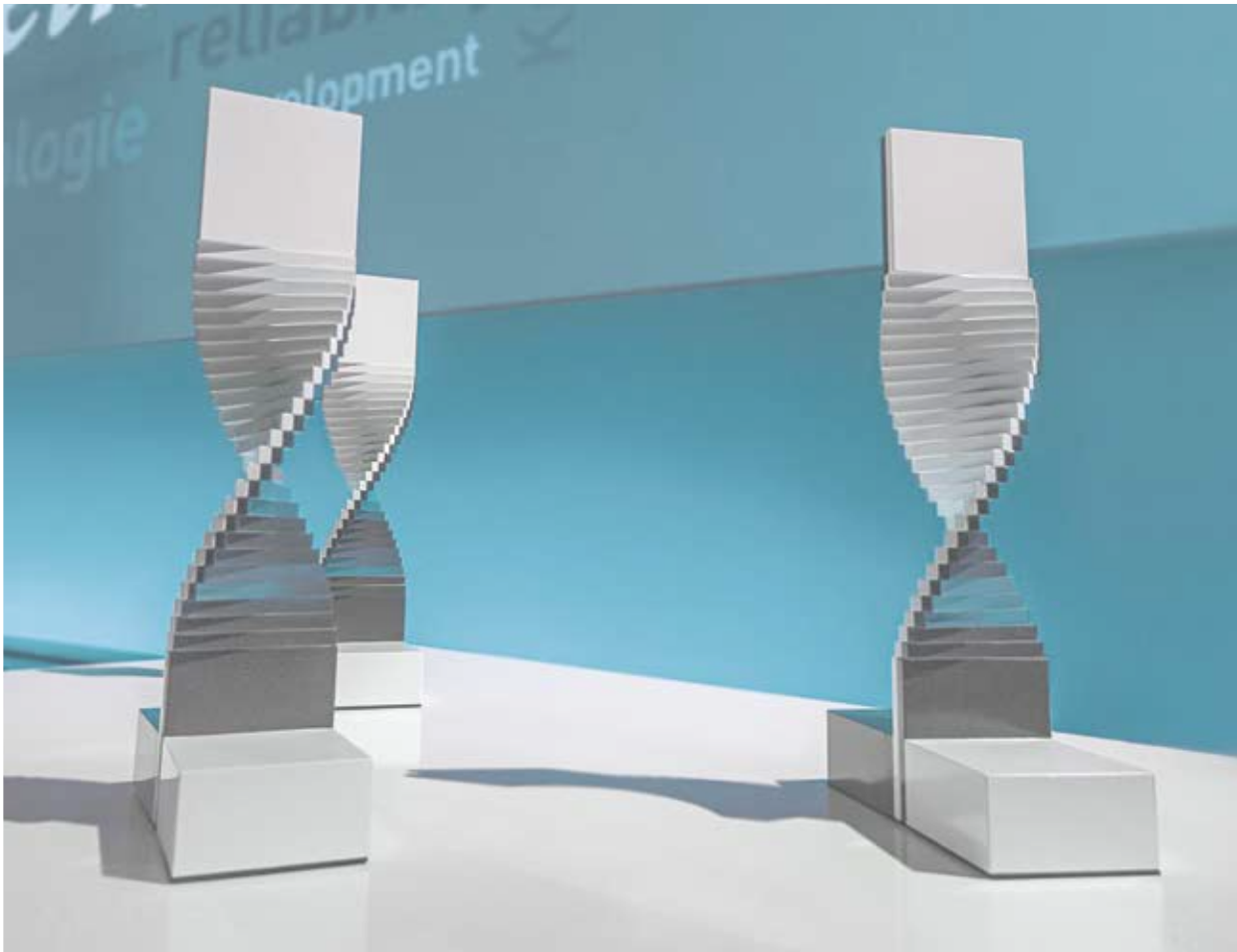
After having finished his apprenticeship in public administration, Lothar Späth was councilor for finance and mayor in Bietigheim-Bissingen. For many years he was active as a board member and managing director of companies in the property developer and construction industry, also he was a member of different supervisory boards and advisory councils. From 1972 until 1987, Lothar Späth was chairman of the CDU party in the state parliament of Baden-Württemberg and from 1979 until 1991 he held the CDU Baden-Württemberg chairmanship followed by his appointment to honorary chairman. In 1978, Lothar Späth was elected Minister of the Interior and shortly after Prime Minister of Baden-Württemberg. He was in office until 1991. Afterwards, Lothar Späth went back to the private sector where he firstly became managing director, then chairman of the executive board and lastly chairman of the supervisory board of today´s Jenoptik AG. As from 2005 he was chairman of the managing board of the investment bank Merill Lynch for Germany and Austria. For a long time he contributed his expertise to several supervisory boards and advisory councils and especially to non-profit institutions.

During his time as Prime Minister, Lothar Späth felt the time is ripe for political action to cope with the state's changing business landscape, much of it shaped by mid-sized companies. Though it seems self-explanatory today, his technological foresight met with skepticism and criticism. Yet Späth was not deterred, commissioning Johann Löhn – then-principal and head of the Technology Consulting Service Centers at the Furtwangen University of Applied Sciences – to head up a committee on "technology transfer". The committee's findings laid the groundwork for establishing a new position: a Government Commissioner for Technology Transfer (GCTT). Johann Löhn quickly started pinpointing what the GCTT should accomplish. Lothar Späth appointed him GCTT and chairman of the Steinbeis Foundation. Thus the Steinbeis model was born.

Lothar Späth confirms, „Instead of getting bogged down with overcomplicated ideas, we wanted to get people excited about our ideas and put them into practice – that was something we both firmly believed in. Even after my term as Minister President of Baden-Württemberg, I still stayed in touch with Steinbeis. These days, Steinbeis runs successfully of its own steam and is the gold standard of technology transfer." Lothar Späth´s strategic farsightedness, his concrete actions and his personal support laid the foundation for the Steinbeis model. Therefor Steinbeis would like to thank Lothar Späth with the Löhn Award 2013 as a special award, ensuring that we will continue building upon these keystones.

Award Winners

2014



Volkswagen AG, Wolfsburg
Steinbeis Transfer Center
Applied Production and Joining Technology /
ARGOS Systems Engineering, Oldenburg

Adaptive Control of Welding Processes

The automated production faces various challenges arising from fluctuations in measurements of vendor parts. Especially for joining processes in automobile manufacturing the position and fit of the work pieces that are to be connected have to be within narrow bounds in order to meet the high quality standards. The quality of the components is tested and optimized on a regular basis. Parameters of the automated processes have partially to be adjusted manually, thus making this procedure inefficient.

In order to reduce such manual intervention to a minimum, the welding process applied to the car body construction of the Volkswagen model Touran (Wolfsburg plant) is observed in a manufacturing cell by the quality management system ARGOS. ARGOS is a modular system developed by the Steinbeis Transfer Center. It interacts as a "cyber physical system" (CPS) ensuring an adaptive monitoring of a production process with its physical components.

The experts of the Steinbeis Transfer Center at the Jade University of Applied Sciences in Wilhelmshaven work in the field of "Industry 4.0". They deal with the cross linking of process systems concerning production and quality supervising information processing. CPS interact "machine-to-machine" via embedded and network-based technologies. The integration of physical objects, like sensors and devices, into digital processes lead to a flexible coupling of systems which did not have common interfaces before. Depending on the task, the software ARGOS is able to evaluate the process and sensor parameters and can process them goal-oriented by using sensor networks. Additional internal sensors ensure this evaluation and discrepancies can be compensated in real-time via actuators.

With this application, which was implemented together with the Volkswagen AG, welding parameters as well as quality relevant properties of the component geometry are monitored and analyzed. If discrepancies are detected, the production process will be automatically adjusted through control and regulation algorithms in order to ensure a high-quality welding seam. Manual adaptations of the process parameters are no longer necessary.

The technical realization as well as the implementation and testing of the system during the ongoing production process was a challenge for the experts and could only be handled through the excellent cooperation and communication between the participating project partners.

The potential of the application, which is awarded the Steinbeis Foundation´s Transfer Award – Löhn Award, is enormous, because now not only welding engineering processes can be monitored and adapted, but also numerous other production processes in the future.

Daimler AG, Stuttgart
Steinbeis Transfer CenterLaser Processing and
Innovative Manufacturing Technology,
Pforzheim

Laser hardening of Camtronic Camshafts

In automotive manufacturing the environmental friendliness of vehicles is evaluated and regimented on the basis of concrete consumption and emission data. Manufacturers have to meet these requirements through increasingly complex technological systems, which need to work safely and reliably in all operating states regardless.

The engine control represents an approach with considerable potential. The innovative Camtronic system expands possibilities to influence the optimization of the combustion process through a load-dependent valve lift adjustment via a camshaft carrier with two moveable cam pieces. Depending on the driving profile, a reduction of fuel consumption of about 3.5 %–10 % is possible.

Due to functional reasons the cam pieces of the Camtronic system are designed as a tubular component and comparatively thin walled. As a result, conventional processes for Hardening reach their application limits because of its exercised strong heat load and the resulting component warping. The properties of laser Hardening are virtually predestined for highly-stressed components with high functional integration, because, for example, compared to the induction Hardening with comparable Hardening depth it exercises a lower heat load on the component by up to 90 %.

The decision of the Daimler AG und the Steinbeis Transfer Center Laser Processing and Innovative Manufacturing Technology to develop the laser Hardening on cam pieces together is based on positive experiences gained from former projects and the fact that the Steinbeis experts at the Pforzheim University already had sound know-how on regulated laser beam Hardening.

The implemented transfer project included proceeding fundamental feasibility studies as well as a precisely adapted process development for the application of laser Hardening on the Camtronic cam pieces. The cooperation also contained implementation work for the introduction of the procedure into large-scale production, including a processing concept for the subsequent production plant, the support on the realization of suitable Hardening optics as well as the evaluation of the optics and other important plant components.

Subsequent to this project, which is awarded the Foundation's Transfer Award – Löhn Award, the cooperation between the partners Daimler AG and Steinbeis is going to be continued with new applications for laser beam Hardening in order to tap further potential with this new technology.

Award Winner 2014

Prof. Dr. Joachim Goll
Steinbeis Transfer Center
Software Engineering,
Esslingen

Committed Professor and Successful Entrepreneur

Prof. Dr. Joachim Goll receives a special award from the Steinbeis Foundation for his long-standing and excellent achievements in knowledge and technology transfer for the Steinbeis Network.

Joachim Goll studied physics at the University of Stuttgart and then completed his Ph.D. at the 1st Institute for Theoretical Physics. He started his professional career at SEL, today's Alcatel-Lucent Deutschland AG. There he held various positions including system planer and programmer, director of the software engineering department and director of system software. In 1992, he was offered a professorship at the University for Applied Sciences, Esslingen. Besides teaching he was responsible for establishing and running the software engineering study program. He also initiated joined projects with students, teachers and the university as well as the model of free holiday courses. His publications on the introduction of the programming languages Java and C have become standard reference works for students by now.

In 1991, Joachim Goll started working at Steinbeis as a member of staff of the Steinbeis Transfer Center Communication Technology at the University of Applied Sciences, Esslingen. Three years later he founded the Steinbeis Transfer Center Software Engineering in Esslingen. The Transfer Center has developed extremely successfully since and established itself as a competent and reliable partner for individual IT solutions in the automation technology and automotive industry. Customers are supported with modern technology and processes regarding the conception and development of software as well as in terms of operating with Linux systems and networks.

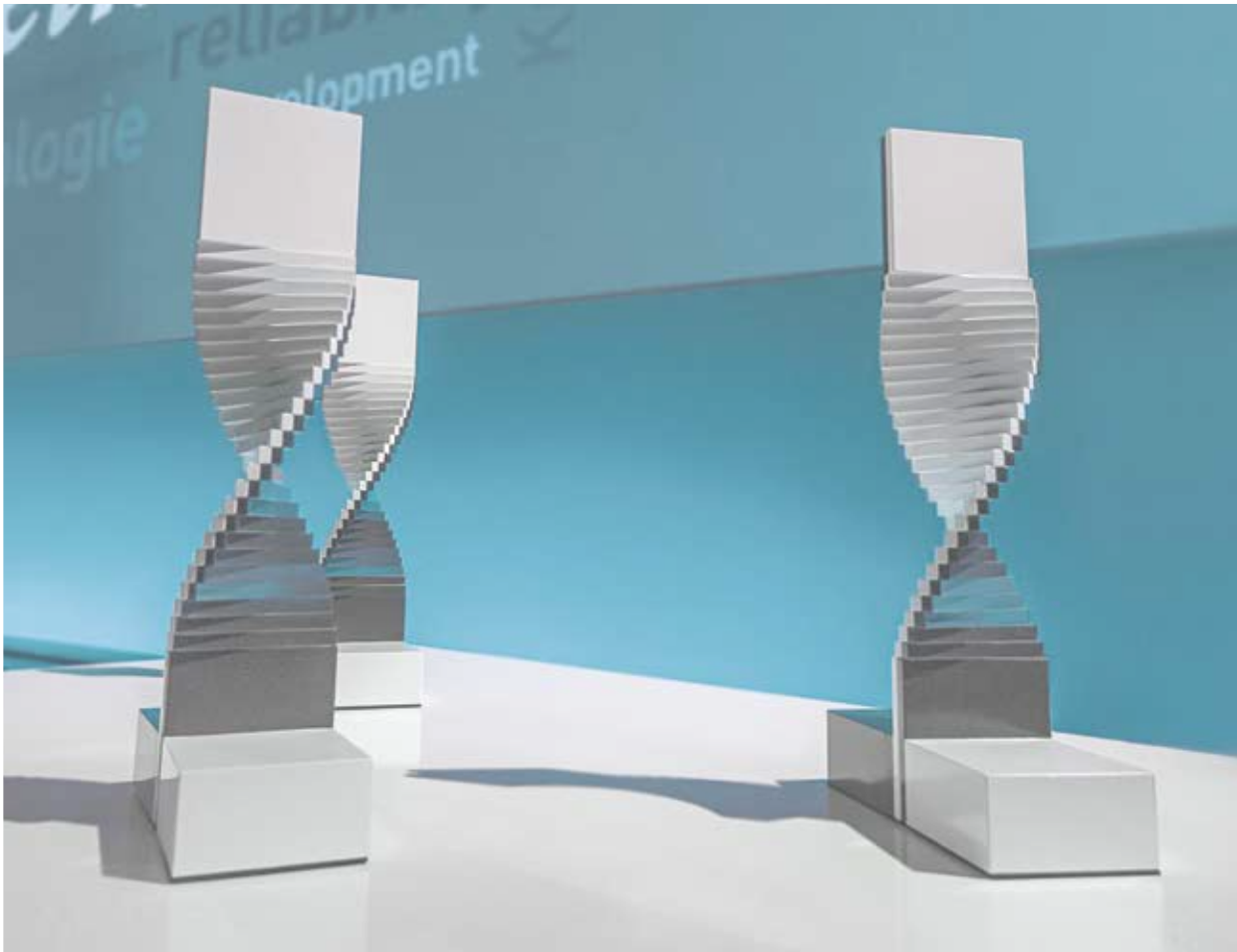
Emerging from the Steinbeis Transfer Center and accompanied by Steinbeis, Joachim Goll founded additional enterprises together with the staff of the Transfer Center.

With his Steinbeis Transfer Center at the interface with the University of Esslingen, Joachim Goll has managed to set an example for the successful and concrete implementation of knowledge and technology into practice. Precisely through the proximity to the University of Applied Sciences and an appealing working climate, he wants to be an attractive employer for graduates with their knowledge of current technologies and offers them the possibility of an extra occupational qualification up to a master´s or doctor´s degree.

Steinbeis would like to thank Joachim Goll for his constant constructive and trustful cooperation as the director of the Steinbeis Transfer Center Software Engineering and his successful commitment in concrete knowledge and technology transfer.

Award Winners

2015



VISUS GmbH, Herrenberg
Steinbeis Transfer Center eyetrial at the
Centre of Ophthalmology, Tübingen

LUVIS – Standardized Conditions for Contrast Sensitivity Testing

Contrast sensitivity testing is carried out using contrast sensitivity charts – special eye test charts on which the letters don't diminish in size, but show a gradually reduced contrast against a white background. Used to test vision for driver's license requirements as well as in clinical trials of new treatments for eye conditions, this important type of testing is an everyday practice in ophthalmology clinics.

An initial difficulty was that establishing uniform lighting conditions for contrast charts proved impossible. The project team at the Steinbeis Transfer Center eyetrial, based at the Centre of Ophthalmology at the University of Tübingen, discovered in its study that homogenous illumination of contrast sensitivity charts was not possible with standard room lighting of any kind. Although the standard DIN EN ISO 8596 governs the lighting conditions to be used when testing photopic contrast sensitivity, it could not be fulfilled for either driving-related testing or clinical drug trials. After consulting experts in driving-related ophthalmological issues, the team tested a technical solution and decided to develop the LUVIS illumination system.

In order to further coordinate and develop a marketing strategy, the Steinbeis team early on established contacts to companies that supply measurement devices to occupational physicians, eye doctors and pharmaceutical companies. This resulted in successful collaboration with VISUS GmbH in Herrenberg, a supplier of products for eye tests and visual training. The first LUVIS prototype was developed that same year and went into series production the following year. LUVIS ensures the standardized illumination of top-illuminated test charts used in photopic contrast sensitivity and other vision testing, resulting in absolute measurement values and uniform light density across the entire chart surface. As a result, all drivers are examined fairly under identical testing conditions. In patient studies for new therapies, LUVIS ensures identical measurement conditions at all international trial locations. No similar product was on the market when the study was first started, and this remains the case today.

Both project partners are set to receive the Steinbeis Foundation's Transfer Award – the Löhn Award – for their successful collaboration. An area for future collaboration between the Steinbeis Enterprise and VISUS has already been pinpointed: the miniaturization of the illumination cabinets and charts. This is particularly of interest in occupational medicine, where small, portable devices are very advantageous.

Award Winner 2015

Hottinger Baldwin Messtechnik GmbH, Darmstadt
Steinbeis Transfer Center energy-efficient power electronics
for electrical drives and power storage systems,
Aschaffenburg

Raw Data Analysis and Precise Efficiency Measurements for Electric Drives

To keep energy consumption down in industry, in traffic and in the home, we are seeing increasing demands to make electric drives more energy efficient. Determining the extent to which electrical machines and power converters can be made more efficient involves high-precision measuring devices, measurement techniques and analysis processes.

The Steinbeis Transfer Center for energy-efficient power electronics for electrical drives and power storage systems at Aschaffenburg University of Applied Sciences joined forces with Hottinger Baldwin Messtechnik in Darmstadt to draw up specifications for these measuring devices and the associated data analysis. Responding to high customer requirements, the project partners aimed to simultaneously record and process electrical and mechanical readings in real time.

To measure energy efficiency in relation to specific applications and obtain meaningful data, the project partners used a measurement approach employing load points that change over time. The Steinbeis team started by optimizing the current measurements used in measuring electrical power for drives fed by power converters. Highly accurate load resistances were developed and tested. Based on the electrical data and mechanical dimensions, these resistances were then adjusted precisely for the Genesis HighSpeed data recorder series produced by HBM. The accuracy of these resistances lies at 0.02% within the relevant frequency range.

In addition, analysis methods were developed to define further important parameters for electrical machines and drives. For example, it is now possible to calculate the air-gap torque of a three-phase machine as a time-dependent curve with HBM's Perception software using raw current and voltage measurements. The calculated air-gap torque makes it easy to evaluate the dynamic properties and accuracy of the drive control.

A demonstration unit was developed to illustrate to interested experts how these measurement methods and analysis processes work. The unit is a complete drive test bench featuring a test and load machine as well as frequency inverters and all necessary sensors. Reducing the weight and size of the unit until it could be checked as airline baggage was quite a challenge.

Thanks to the successful collaboration between Steinbeis and the partner company, the product was put on a fast track to new industries and markets. It is this collaboration that has been recognized with the Steinbeis Foundation's Transfer Award – the Löhn Award. Many of the results of this transfer project have been presented in scientific publications and talks, and they will also be included in the doctoral dissertations of two research fellows at the university. Both partners look forward to further interesting joint projects in future, in the field of efficiency optimization.

Award Winner 2015

Daimler AG, Stuttgart
Steinbeis Interagierende Systeme GmbH,
Esslingen

Innovative Test Environment and Software Tools for Modern Driver Assistance Systems

With the development of collision reduction and avoidance systems, there has been increasing demand for resources to lab-test driver assistance control units based on various driving maneuvers. Extensive testing of the software algorithms is difficult in the vehicle as it is only possible in challenging driving scenarios that place considerable stress on the driver. Since the series development of ESP® control units, the automated testing of driver assistance systems in Hardware-in-the-Loop (HiL) testing environments (virtual simulations of the real world) has established itself within the automobile industry.

The Daimler Company, represented by Mercedes Benz Cars Research and Development in Sindelfingen, thus commissioned Steinbeis Interagierende Systeme to design and implement a system allowing to run a vehicle control unit for a driver assistance system on a standard PC and to test it based on virtual driving.

The cooperation resulted in a prototype ten years ago. Since then, the test system and method – called "Mini-HiL" – have been used for the series development of driver assistance systems that can monitor the vehicle's environment. The complexity of the test environment – particularly the required simulation – can thus be captured so that the test platform can be appropriately prepared with a minimum of time. For generations, the increasing number and complexity of vehicle functions has provided for a growing test volume. Keeping the maneuver-based test language applicable and simple while still meeting the broad demands on the test environment is a constant challenge.

Daimler and the Steinbeis team jointly developed the test tools at the University of Tübingen and the Universities of Applied Sciences of Esslingen and Karlsruhe. The collaboration involved forward-thinking project work, trademark and intellectual property protection, and thesis and dissertation work. The Steinbeis Foundation's Transfer Award – the Löhn Award – is being bestowed upon the project partners for their development and transfer achievements.

Award Winner 2015

Prof. Dr. habil. Hans Jobst Pleitner
Steinbeis University Berlin

A Model for Lived Values in Science, Transfer and Society

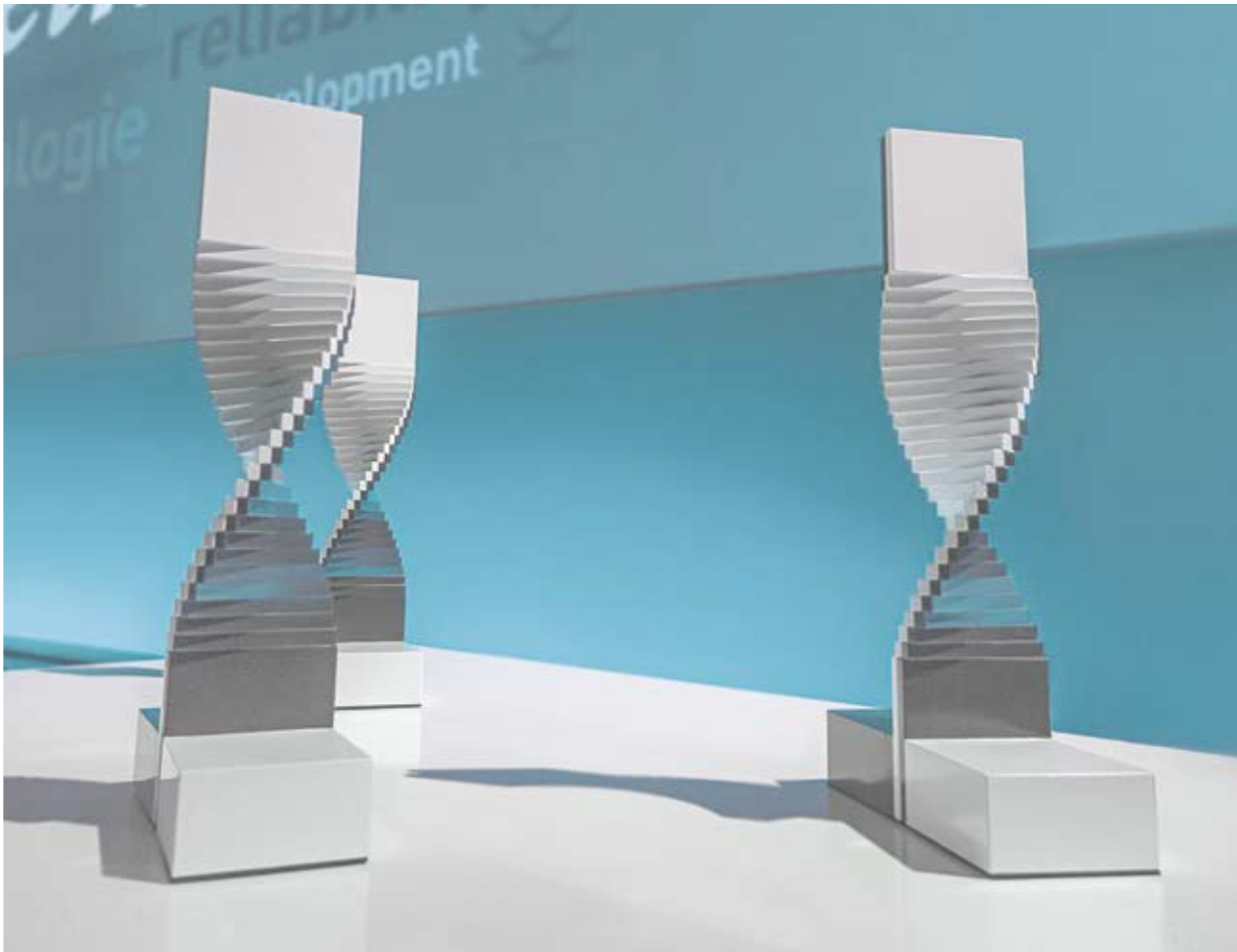
After having completed an apprenticeship as an industrial management assistant at Siemens and its German subsidiary, the Deutsche Grammophon record label, Hans Jobst Pleitner went on to study business administration at the University of Münster and the Graduate School of Business, now the University of St. Gallen – School of Management, Economics, Law, Social Sciences and International Affairs (HSG). Deciding on an academic career path, he stayed at St. Gallen and was awarded his doctorate in 1972, becoming an adjunct professor at the university that same year. Three years later, he became director of the Institute for Industry (IGW, Institut für gewerbliche Wirtschaft), now the Swiss Research Institute of Small Business and Entrepreneurship at the University of St. Gallen (KMU-HSG). At age 45, he wrote his habilitation thesis. From 1985 to 2000, he served as a tenured professor of general business administration with a focus on small and medium-sized enterprises (SMEs) at the University of St. Gallen.

Hans Jobst Pleitner made significant contributions to the establishment of Steinbeis University Berlin (SHB). As director of the IGW, he opened doors for the founding of the St. Gallen Management Seminar in Germany, which was one of the key academic programs at SHB. He also actively supported and influenced the development of SHB's first programs of study. All of this was achieved thanks to his cooperation with Steinbeis, a very unusual course of action at the time. After receiving the status of professor emeritus at the University of St. Gallen in 2000, he became a professor for entrepreneurial management at SHB.

Over the last 15 years, Hans Jobst Pleitner has offered SHB exemplary dedication. In addition to his extraordinary commitment to teaching and advising students, he has shown devotion and support in the development of the project competence doctorate, which has been the main focus of his endeavors in recent years. He will retire his services to Steinbeis at the end of 2015. With this special award, Steinbeis would like to thank Hans Jobst Pleitner for his exceptional contribution to the success of SHB, while acknowledging his lifetime achievements in two-way knowledge transfer between academia and SMEs.

Special Award Winner 2015

Award Winners
2016



Prof. Dipl.-Ing. Karl Schekulin
Steinbeis Transfer Center
Process Development,
Reutlingen

Outstanding Achievement in Knowledge and Technology Transfer

Prof. Dipl.-Ing. Karl Schekulin receives this year's special award of the Steinbeis foundation's transfer award for his long-term outstanding achievements in knowledge and technology transfer.

Karl Schekulin started his career as an engineer in process development at Daimler Benz AG in Stuttgart. He then moved to Switzerland where he had the position of chief engineer at the Inter AG before returning to Nürtingen in Swabia to work as a research engineer at the company Gebr. Heller Werkzeugmaschinen. Other stages in his career followed at AEG Elektrowerkzeuge in Windenden as well as in the United States, lastly as director of manufacturing and engineering. In 1977 he was appointed professor for design at the University of Applied Sciences Reutlingen. His field of expertise were machine elements and design systematic. But by no means had he turned his back to the companies. Soon he worked as a freelancer for Steinbeis, first for the Technical Consulting Service of Reutlingen University before founding his own Steinbeis Transfer Center Abrasive Manufacturing Technologies (today Steinbeis Transfer Center Process Development).

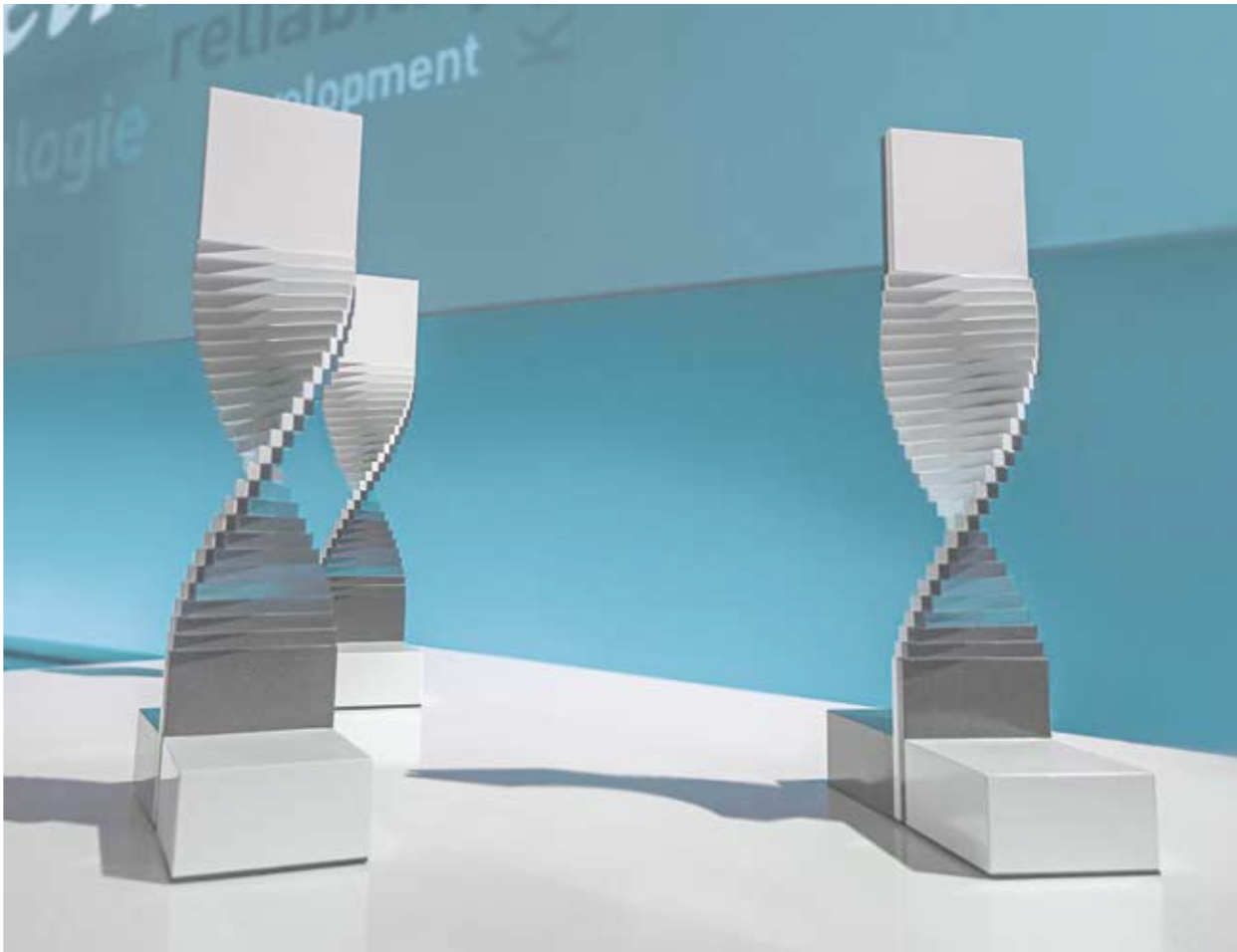
In his Steinbeis Enterprise he predominantly developed new production processes for various industrial fields. Five-axis cnc sink erosion for example that evolved into a worldwide standard procedure or pulsed electrochemical sinking with clocked direct current. He concentrated on water jet cutting, especially with the development of innovative laser manufacturing processes like dispersion where carbide and diamond parts are being incorporated in the remelted surface. His numerous scientific publications are proof for his innovative strength. What was first dismissed as laboratory gimmick, now leads to high-quality machined workpieces for the aerospace industry. Aviation inspired Karl Schekulin to the extent of fulfilling his dream of holding a commercial pilot license. Until today he regularly flies himself.

Since having retired at Reutlingen University of Applied Sciences fifteen years ago, Karl Schekulin still pursues all different kind of Steinbeis projects with commitment, inventive spirit and his special sense for innovation. Steinbeis would like to thank Prof. Karl Schekulin for more than three successful Steinbeis decades with this year's special award.

Special Award Winner 2016

Award Winners

2017



Prym Consumer Europe GmbH, Stolberg
Steinbeis Research Center Automation in lightweight construction processes (ALP), Chemnitz

Complex Automation Replaces Manual Systems in the Production of Circular Knitting Needles

There is growing demand for solutions with a “handmade” label and although this trend continues unabated, it is by no means a short-term phenomenon; if anything this is a long-term development. According to Prym Consumer Europe GmbH, based in Stolberg, the target group for handmade solutions is shifting and the average age of potential customers is now significantly lower than it used to be.

As part of a joint development project between Prym and the Chemnitz-based Steinbeis Research Center Automation in Lightweight Construction Processes (ALP), an elaborate automation system has been developed for producing round knitting needles. What was previously an entirely manual process is now fully automated, from fundamental material composition to component development, design, and production itself. Not only is the new process highly adaptable, it also makes it possible to address a variety of customer requirements.

The extensive experience of the experts at the ALP research center played a pivotal role in the development initiative, especially when it came to the automation of plastic processing in connection with flexible materials.

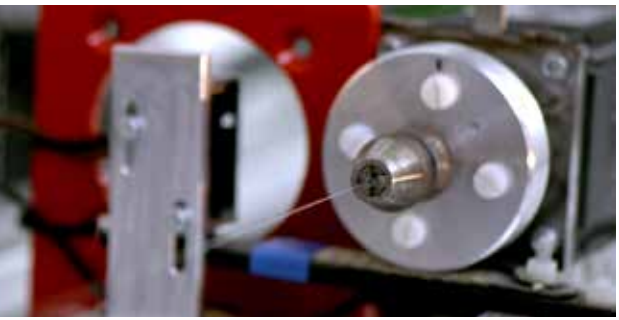
Transferring insights from pure research at the Institute of Lightweight Structures at Chemnitz University of Technology, the ALP offered the ideal vehicle to apply know-how to the company project.

The end product is also highly innovative and it has already allowed Prym to win the Red Dot Design Award for the redesigned external properties of their product, the ergonomic handling of the knitting process, and the introduction of premium quality steel wire to replace the previously used plastic wire. The project also enabled the ALP to raise its own profile in the long term when it comes to automating such applications.

It was only possible to implement the project thanks to close collaboration between the specialists working in industrial tool design, manufacturing processes, and product development. Winning the Transfer Award for the project is a testament to the outstanding achievements of Prym and the ALP research center in working alongside Chemnitz University of Technology to transfer research findings into serial production processes.

Award Winner 2017

SEW-Eurodrive GmbH & Co. KG , Bruchsal
Steinbeis Transfer Center Material
Development and Testing (WEP),
Wiernsheim



Optimizing Production Technology for Wiegand Wires Used as an Energy Source

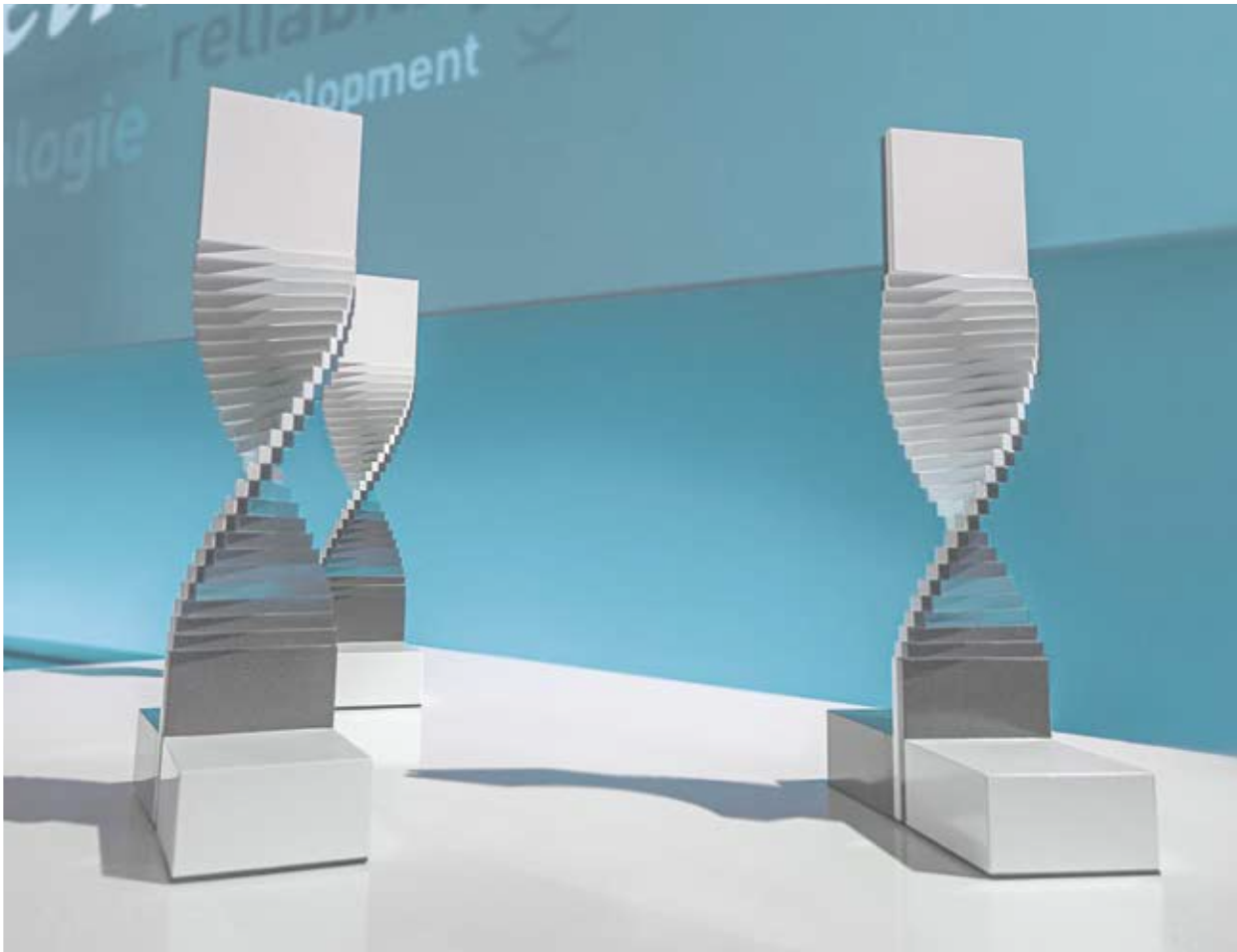
For many years, the Bruchsal-based company SEW-Eurodrive GmbH & Co. KG has been looking closely at Wiegand sensors, which are non-contact revolution counters that are self-sufficient in terms of energy requirements. One unique feature of Wiegand sensors is that they go beyond emitting signals and can actually be used as an energy source. They work by using energy-rich impulses, which are independent of the actual number of revolutions but are enough to run ultra-low power electronics. For example with electric motors, this makes it possible to measure axle revolutions without any external power input. At the heart of the sensor lies a Wiegand wire, which was originally patented by John Wiegand in 1978. Made of thin metal consisting of a ferromagnetic alloy, when a Wiegand wire is subjected to special cold forming processes it can adapt properties, allowing it to spontaneously change its magnetic axial orientation.

Working with the Steinbeis Transfer Center Material Development and Testing (WEP), the team at SEW-Eurodrive has successfully developed quality analysis methods that allow the firm to significantly improve energy yields, simultaneously optimizing the manufacturing process and delivering results that are entirely reliable. Using a specially developed preparation technique, the Steinbeis experts were able to map the different magnetic zones of wires and for the first time their results have been published in the world of research. Further experimentation was carried out with carefully prepared material samples to systematically analyze microstructures deep down inside Wiegand wires in order to yield insights into the complete range of properties (mechanical, thermal, magnetic). It was important to gauge the overall picture, but this was only possible by combining a large number of material testing techniques, all of which were offered by the WEP through the material testing labs at Pforzheim University.

The project partners have been working continuously on the initiative for some time and their increasingly close alliance has now been rewarded with the Steinbeis Foundation`s Transfer Award – Löhn Award. As a result of the collaboration, Wiegand wires can now be produced in unprecedented quality, offering every potential to revolutionize the angular position sensor market in the near future.

Award Winner 2017

Award Winners
2018



Bosch Rexroth AG, Lohr am Main
Festo AG & Co. KG, Esslingen
Sercos International e. V., Süßen
Steinbeis Embedded Systems
Technologies GmbH, Esslingen
Steinbeis Transfer Center
Systems Engineering, Esslingen

Diagnostics platform for communication systems used in automation technology

As industrial production becomes progressively networked, it is relying more and more heavily on modern communication systems. Against the backdrop of the smart production visions associated with Industry 4.0, it is becoming increasingly important to find different ways to make systems more enduring, more suitable to real-time functionality, and easier to dovetail with internet protocols. The complexity this is fueling is presenting developers and the operators of such systems (and their components) with more and more challenges, especially when it comes to optimizing, verifying, and pinpointing the root causes of errors when things go wrong.

To simplify error detection and the analysis of industrial communication systems, the Steinbeis Transfer Center for Systems Engineering joined forces with Steinbeis Embedded Systems Technologies (Steinbeis EST GmbH, based in Esslingen) as part of an alliance with Sercos International (Süssen), Bosch Rexroth (Lohr am Main), and Festo (also from Esslingen). Together, the alliance members developed an advanced platform for diagnosing such systems. The platform is based on a modular approach, originally developed for analyzing the communication standard Sercos. The system, coined Sercos Monitor, makes it possible to conduct a detailed analysis of the different communication protocols used in automation technology. These include Ethernet-based protocols, INTERBUS, the sensor/actuator interface IO-Link, and a number of other company-specific protocols.

The platform provides users with a tool for configuring, plotting, and evaluating communication data on standard PCs via an interactive user interface. It can also be used as an automatic tool for running assessments across a number of protocols in order to understand network components. The challenge in developing the platform lay in establishing a common foundation that would be suitable for analyzing different communication systems, spanning a variety of factors such as network topology, cycle times, and data throughput. Components would also need to meet a broad spectrum of requirements not just regarding usability, but also when it comes to the control interfaces used in automatic operation.

The project resulted in a widely applicable diagnostics tool for communication systems in the field of automation technology, and the solution is already being used for troubleshooting purposes on machinery. It is also being applied to automated testing and training at Esslingen University of Applied Sciences. The expandable architecture of the platform and broad support from system users lay a particularly strong foundation for future partnership projects involving joint developments.

The project has been honored with the Steinbeis Foundation Transfer Award – the Löhn Award – in acknowledgement of the success of the joint venture and the degree of communication across different companies.

Award Winner 2018

Daimler AG, Stuttgart
Steinbeis Transfer Center Traffic
Engineering.Simulation.Software,
Niederstotzingen

Real-time control of car drive chain test beds for realistic vehicle testing

Vehicle drive chains are subject to a variety of demands, typically requiring major time and financial investments in order to meet requirements regarding driving performance, emissions, durability, and fuel consumption. To keep development cycles as short as possible, companies use computer and test bed simulations, as well as test drives. With test drives, actual driving data is generated and this is useful for providing a foundation for simulations. From a control engineering point of view, it can be extremely difficult to replicate measured driving cycles on a powertrain test bed. This is because different elements within the powertrain can have extended downtimes and are non-linear. The previously applied techniques for drawing on data measurements to control test beds took a great deal of time to set up parameters, and often this resulted in deviations in the test bed setup and thus unrealistic findings.

To solve this issue, Daimler, based in Stuttgart, asked representatives of powertrain development and the company's powertrain testing facility to work with the Niederstotzingen-based Steinbeis Transfer Center (STC), Traffic Engineering.Simulation.Software, with the aim of developing a test bed control system for powertrain technology. Previously, Daimler had used simulation software called winEVA, which was also developed by the STC and worked well for generating collective load data.

To finally solve new issues, the experts selected a combination of "control" and "regulation." For the test bed control part of the equation, real-time simulations of the drive chain are carried out using winEVA under testing conditions. Adjustment variables, gas pedal settings, and wheel rotation speeds can then be transmitted to the testing facility. Reactions on the test bed are then compared to the simulation model, and any differences between test bed behavior and the simulation model are used to make adjustments to this model.

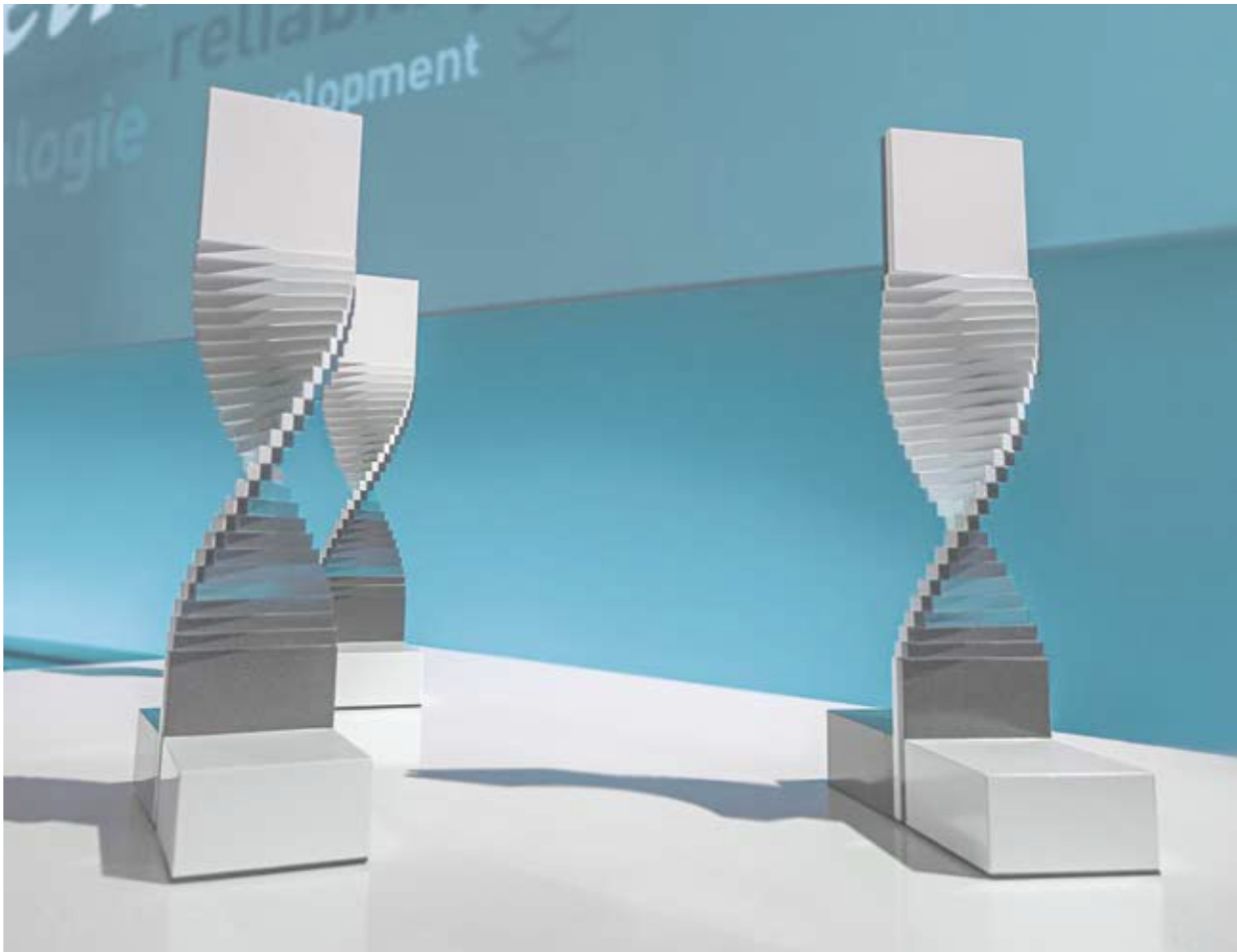
This fundamental approach has been fine-tuned and updated many times over the years, such that it is even possible to use control technology to manage highly dynamic, purely electric drive systems, as well as 4x4 drivetrains involving complex four-wheel drive strategies.

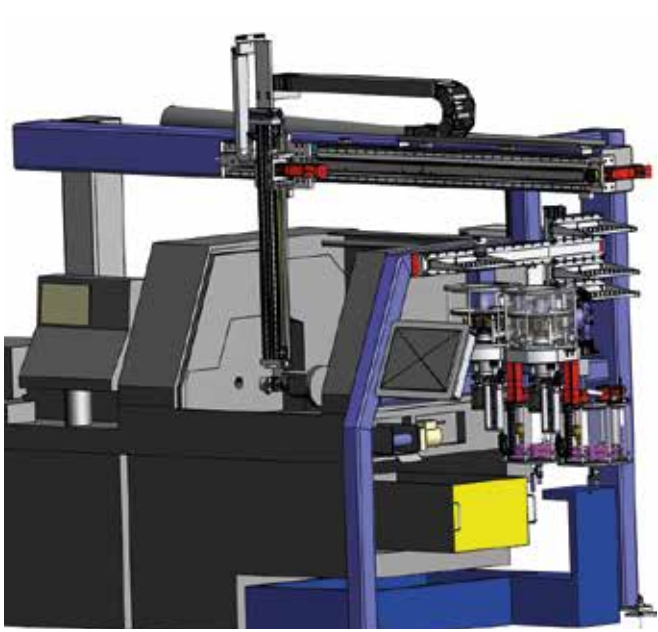
The project partners have been honored with the Steinbeis Foundation Transfer Award – the Löhn Award – in recognition of the innovative and forward-thinking nature of the project and the manner in which the development partnership continues to build on the success of the collaboration.

Award Winner 2018

Award Winners

2019





Optik-Elektro Huber GmbH, Mühlacker
Steinbeis Transfer Center Production
and Organization, Pforzheim

An Innovative Production System for Manufacturing Highly Complex Components with Vulnerable Surfaces

There is a strong trend toward miniaturization and higher levels of integrated technical functions in products used in many fields of technology. This goes hand in hand with a need for ultimate quality and functionality, especially in sensitive areas such as the aerospace industry and medical technology.

Huber, an optical electronics company from Enzberg near Mühlacker, is specialized in the production of small batches of highly complex mechanical parts used in these industries. For example, it produces components used in valves required to operate impeccably at temperatures as low as -100°C. It is not possible to use elastomer seals at such temperatures and as a result metal functional surfaces are needed to achieve the right seals, which typically involve tightly positioning metal on metal. This is only achievable if surfaces offer minimal levels of roughness and ultimate precision.

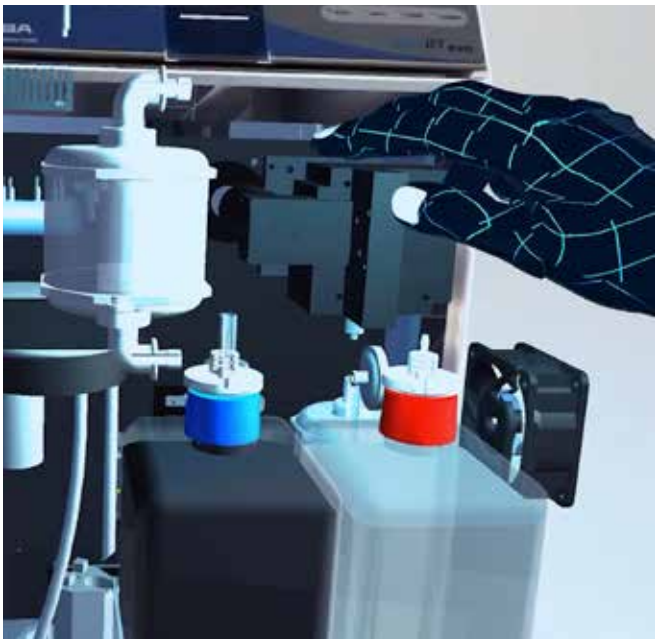
To meet such requirements, Huber joined forces with the Pforzheim-based Steinbeis Transfer Center for Production and Organization to develop a new process that would help eliminate the possibility of a variety of processes negatively impacting surfaces – from machining to final packaging before shipping.

Their fully automated solution revolves around an autonomous manufacturing cell that processes components individually in order to avoid potential damage inflicted on surfaces by parts accidentally bumping into to one another – without having a detrimental impact on the overall process. At the heart of the unit lies a new kind of cleansing system which allows factors with an influence on cleansing to be taken into account (temperature, cleansing time, mechanical support, and chemical use). The system works in such a way that despite having to use extremely environmentally friendly cleaning agents, all required processes can take place in parallel to component machining. This safeguards ultimate quality standards at minimal cost.

In addition to developing the technology behind the system and setting it up, the project also involved planning a commercialization strategy to extend the new technology's potential field of application; this strategy is now being systematically implemented. The project has allowed both partners to demonstrate how an overarching approach to problem-solving and close collaboration between science and business can result in innovative technologies and concepts capable of securing competitiveness in the long term. Achieving this through the project has been honored by the Steinbeis Foundation Transfer Award – the Löhn Award.

Award Winner 2019

Koenig & Bauer Coding GmbH,
Veitshöchheim
Steinbeis Research Center Design
and Systems, Würzburg



Kyana – Predictive Maintenance Using Digital Twins

As artificial intelligence (AI), enhanced digital imaging, and new ways of interacting between systems continue to merge, this is paving the way for innovative product extensions – ideas that could be extremely useful in areas such as training, monitoring, and maintenance. Systems that can run checks on themselves reduce the need for service technicians to work on site, which not only improves machine availability but also makes it possible to operate systems much more economically.

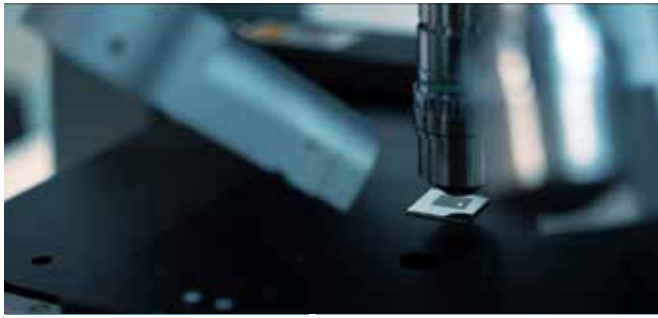
As part of a partnership with Koenig & Bauer Coding, the Steinbeis Research Center for Design and Systems in Würzburg has developed Kyana, a digital extension to a labeling system called alphaJET. The alphaJET solution is a high-speed, ultimate-accuracy continuous inkjet printer that sprays codes onto products, simultaneously drawing on variable data directly on the production line. Kyana is an AI-based software solution that communicates through voice commands and uses augmented reality (AR) to depict the complex internal mechanisms of printing systems using clear, interactive images. In the future, Kyana will work like a smart assistant capable of taking on a variety of tasks from training, to controlling devices, explaining maintenance processes or servicing procedures, and spotting material wear and consumption levels early. In parallel to this, over time the system learns how to analyze all kinds of external influences and draw on this information to ensure it maintains high printing quality and maximum availability.

By using AR, Kyana assumes its own persona. This expanded visual presence makes it easier to understand hardware and how it works. By using digital overlays, the system allows users to look at precise details inside the printing system. Combined with speech output, this simplifies maintenance work and repairs. The extended AI functionality also makes it possible to equip systems with a virtual hand, which can save a lot of legwork by using a digital twin when a device requires remote maintenance. Ideally, this should make it possible to address faults more quickly and avoid long and expensive journeys for service personnel.

This solution offers huge potential, also by analyzing acquired data and thus providing valuable resources for future applications, and this has earned the innovation the Steinbeis Foundation Transfer Award – the Löhn Award. The strong mutual trust between the two parties involved in the partnership is laying the ideal foundation for this potential.

Award Winner 2019

TE Connectivity Germany GmbH, Speyer
Steinbeis Research Center Material Engineering Center Saarland (MECS), Saarbrücken



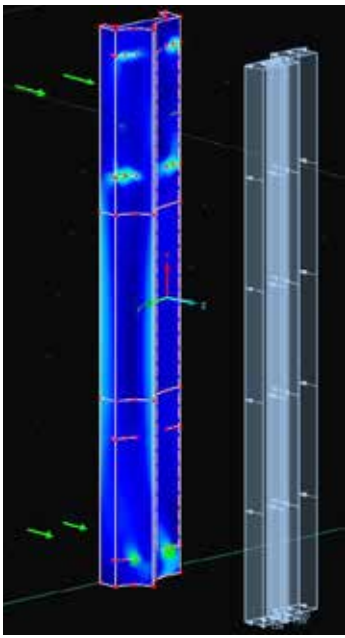
A New Generation of Electrical Contacts – Optimum Performance Thanks to High-Speed Laser Structuring

As nature already knows, all surfaces are structured geometrically on a variety of different scales and thanks to evolution, they are perfectly matched to perform the required function. Until now, technical surfaces have been expressed in terms of roughness, which highlights how many opportunities must have been overlooked over the years.

Enter Material Engineering Center Saarland (MECS), the Steinbeis Research Center, which has developed an innovative laser-based structuring method for quickly and efficiently treating almost any kind of surface. After many years of collaboration with TE Connectivity Germany, a global market leader in the field of electrical connectivity, the center's approach has proven to be a disruptive innovation. How did the partnership come into existence? The number and complexity of onboard electronic systems contained in modern cars is intensifying, such that the average vehicle is now fitted with more than 2,500 electrical contacts, through over 250 connectors. The current visions of future car functions, such as those required for autonomous driving, are posing more and more challenges to industry. Of crucial importance in this respect are factors such as low contact resistance and the need to minimize the required insertion force of the increasing number of connectors found in cars.

A patented technique called direct laser interference patterning (DLIP) makes it possible to significantly improve the contact properties of electrical connectors and thus manage increasing levels of electrification in cars. The long-standing partnership between the Steinbeis Research Center Material Engineering Center Saarland and TE Connectivity is an ideal example of successful transfer – from initial, fundamental work carried out in the laboratory to optimizations made to specific products, and the construction of a pilot plant used in the high-speed laser structuring of electrical connectors suitable for use in serial production in industry. This successful example of project collaboration has earned both parties involved in the partnership the Steinbeis Foundation Transfer Award – the Löhn Award.

Award Winner 2019



Fiber-Tech Products GmbH, Chemnitz
Medicke Metallbau GmbH, Glauchau
Steinbeis Innovation Center
FiberCrete (FC), Chemnitz

BetoLamina®-Cast: The New Fiberglass-Reinforced Building Concrete for Complex Creative Facades

Building covers around actual building envelopes are typically made out of “curtain wall” elements. Architects are increasingly turning to concrete for such facades, due to its pleasant appearance, its design flexibility, and its excellent material properties. On the downside, however, concrete is heavy as a construction material due to integrated steel reinforcements and the need to shroud these to protect against corrosion.

As a result, there is demand for concrete that does not contain steel. This is for use in modern curtain wall facades and not only should the concrete deliver the required mechanical properties, it needs to have thin walls, offer plenty of design options, and deliver high-quality surfaces. This takes ingenious material concepts, innovative mounting technology, and a reproducible production strategy. Strong demand for such solutions led Medicke Metallic – an end-to-end provider of premium-value building envelopes – to travel to Chemnitz. In partnership with Fiber-Tech Products and FiberCrete, the Steinbeis Innovation Center, it developed a new kind of fiberglass-reinforced building concrete as part of a joint research project. The name of the new concrete: BetoLamina®-Cast, which also comes with special technology for producing and mounting thin-walled facades. One of the partners’ main priorities was mapping the overall sequence for the process, from mixing the formula required for the concrete to logistical considerations and on-site assembly.

The first development BetoLamina®-Cast was used in was a new office building called the Wilhelm Kaiser Hof in Cologne, which required a “freestyle” facade measuring approx. 5,000 sqm. The facade contains vertical elements at different angles (pilaster strips), which cast unexpected shadows that change continuously depending on the angle of light. All requirements were met for the facade in terms of the smooth surface, premium exposed concrete, a sophisticated matte appearance, weathering resistance, and robustness. Sharing insights from fundamental research at the Institute of Lightweight Structures at Chemnitz University of Technology with FiberCrete (the Steinbeis Innovation Center) offered the ideal vehicle for applying know-how to this project. The Steinbeis Foundation Transfer Award – the Löhn Award was bestowed upon this project in acknowledgment of the close collaboration between the different partners and the successful transfer of research findings into practice.

Award Winner 2019

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The platform provided by Steinbeis makes us a reliable partner for company startups and projects. We provide support to people and organizations, not only in science and academia, but also in business. Our aim is to leverage the know-how derived from research, development, consulting, and training projects and to transfer this knowledge into application – with a clear focus on entrepreneurial practice. Over 2,000 business enterprises have already been founded on the back of the Steinbeis platform. The outcome? A network spanning over 6,000 experts in approximately 1,100 business enterprises – working on projects with more than 10,000 clients every year. Our network provides professional support to enterprises and employees in acquiring competence, thus securing success in the face of competition.

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