

OTTO

International edition

profile

The magazine of OTTO-CHEMIE for trade, commerce and industry

2nd

**Sandwich construction
- a new view from the
sealant perspective.**

An expert report by
Rolf Koschade.

**Luxury, thy name
is bathroom.**

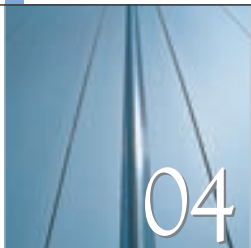
A private spa instead of a wet cell.

**The value behind
the words.**

The OTTO information system.

This 2nd international edition of OTTOprofile presents a choice of articles from the German OTTOprofile editions 04-06.

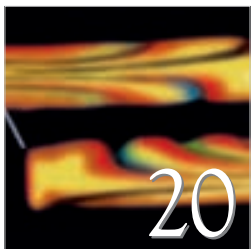
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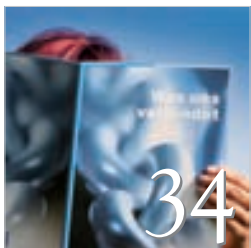
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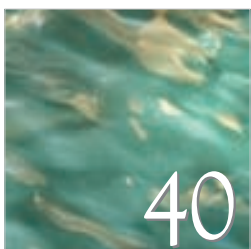
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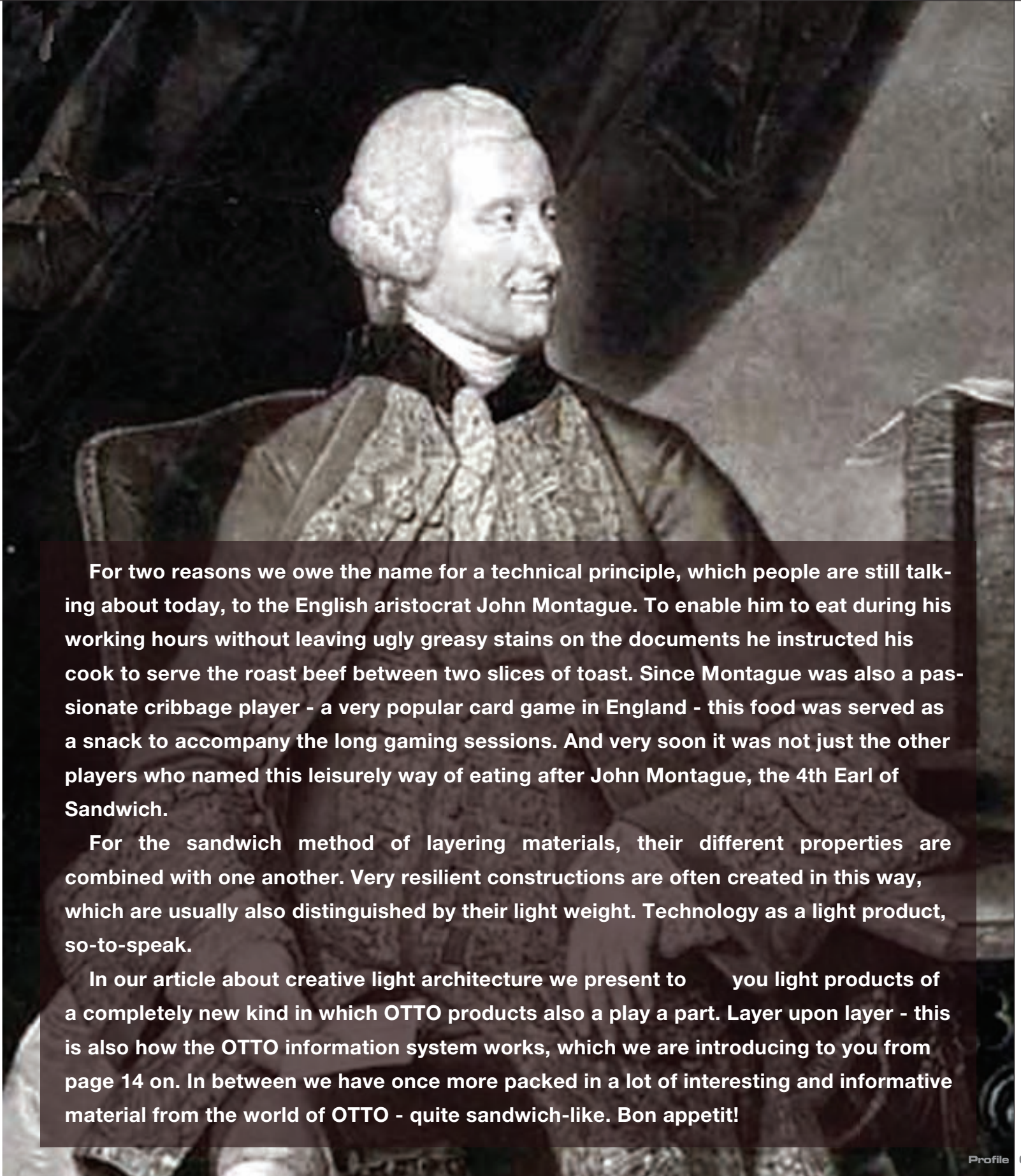
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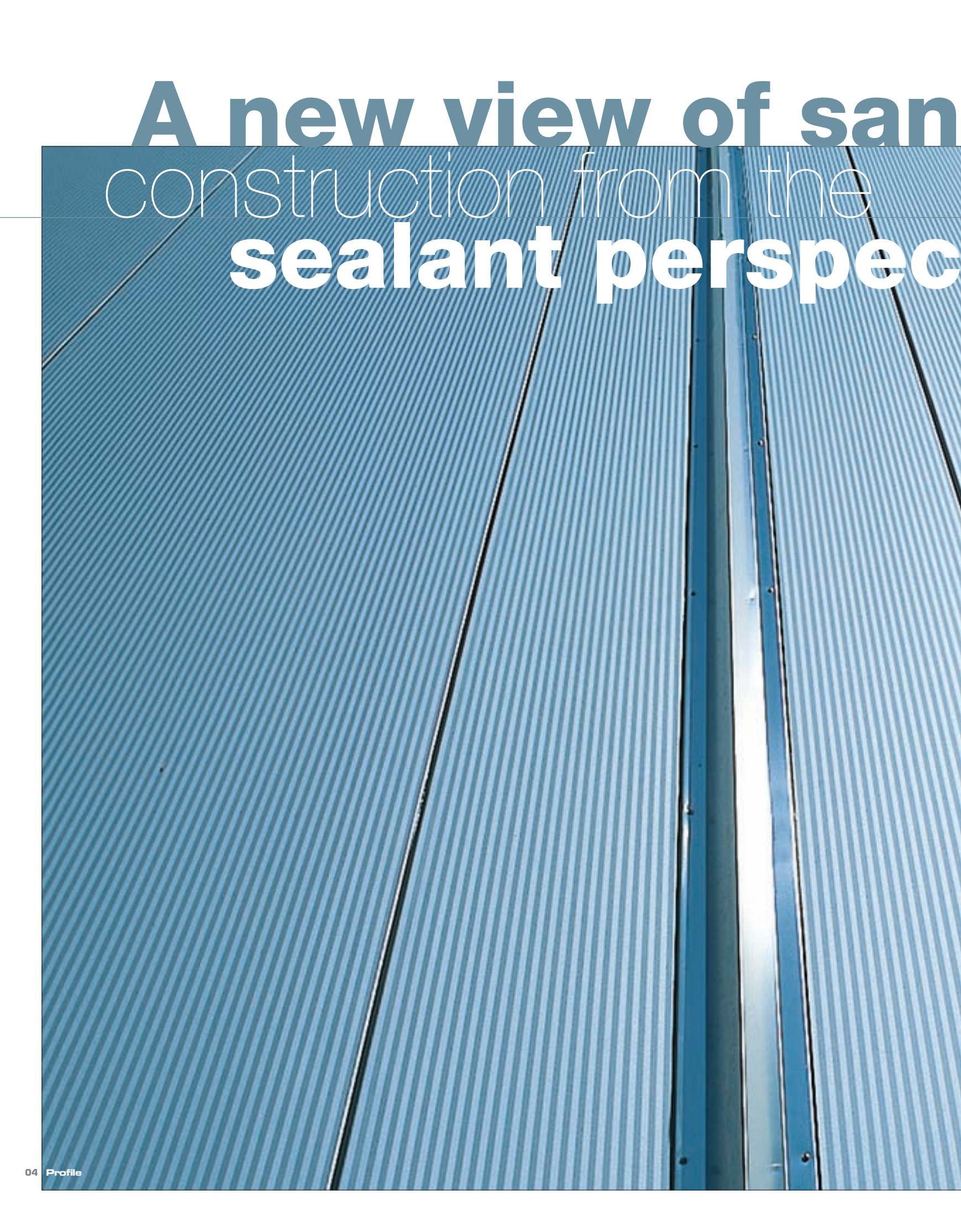
Layer for layer.



For two reasons we owe the name for a technical principle, which people are still talking about today, to the English aristocrat John Montague. To enable him to eat during his working hours without leaving ugly greasy stains on the documents he instructed his cook to serve the roast beef between two slices of toast. Since Montague was also a passionate cribbage player - a very popular card game in England - this food was served as a snack to accompany the long gaming sessions. And very soon it was not just the other players who named this leisurely way of eating after John Montague, the 4th Earl of Sandwich.

For the sandwich method of layering materials, their different properties are combined with one another. Very resilient constructions are often created in this way, which are usually also distinguished by their light weight. Technology as a light product, so-to-speak.

In our article about creative light architecture we present to you light products of a completely new kind in which OTTO products also play a part. Layer upon layer - this is also how the OTTO information system works, which we are introducing to you from page 14 on. In between we have once more packed in a lot of interesting and informative material from the world of OTTO - quite sandwich-like. Bon appetit!



A new view of san construction from the **sealant perspec**

dwich

tive.

What is sandwich construction really?

How has it developed; what significance has it gained?
What does sandwich construction have to do with OTTO?
And where does this term come from which we all know as "fast food" in the world of gastronomy?

This article by our guest author, Rolf Koschade, gives some answers.

About the author:

Rolf Koschade (59) studied civil engineering and law in Munich. He works as an industrial engineering planner, and in engineering consultancy and product development. Rolf Koschade has written numerous articles on planning and information for civil engineering. In addition to articles in specialist journals, he has also published books on the following topics: "Scaffolds", "High access technology" and "Sandwich construction".



"Sandwich construction" was indeed derived from the edible "sandwich".

The term was appropriate for a pithy description of the basic principle of a sandwich element. In construction engineering since around the end of the Fifties "sandwich element" is used to designate a composite material made primarily from three layers.

As a rule the outside layers consist of a thin, metallic material such as sheet steel and the embedded core layer consists of a heat insulation material, usually polyurethane hard foam, an insulation material with the currently lowest heat conductivity of all known insulation materials.

The sandwich effect.

If you lay an insulating board and two thin metallic outside layers loosely on two supports, the individual elements, especially the metallic outside layers will deflect visibly under their own weight. By means of the sandwich technology in which these two metallic outer layers are non-positively foamed together with the polyurethane hard foam core insulation, a lightweight construction element with excellent load-bearing action is created.



Loose layers bend under their own weight alone.



Foamed layers of a sandwich element provide load-bearing properties and inherent stiffness by means of the shear strength of the bond between the insulating core and the outer layers.



Highly symbolic comparison between sandwich construction and a Lego kit: Administrative building in the Legoland park near Windsor, Great Britain (1996). Architects: Wimberley, Allison, Torry & Goo

Milestones in this development: Boosted by aerospace.

Compared to the traditional building materials made from wood, brick, concrete and steel, the slender sandwich technique is a relatively new form of construction. However, meanwhile it possesses over half a century of experience and, owing to its numerous advantages, it enjoys an extremely successful development which has put it in a prominent position in the market.

It began in 1937, when the German chemist, Professor Otto Bayer¹⁾ and his team discovered the principle behind the formation of polyurethane and hence created an important basis for developing the PUR sandwich technology. To begin with Otto Bayer meets with great scepticism from his closest colleagues. He asserts himself and after many technical problems he ultimately succeeds in producing polyurethane foam. Another 10 years of development pass before it is possible to manufacture "tailor-made polyurethane materials".

The Second World War brought new technologies owing to lack of resources. There was the need to build planes (bombers) that were increasingly light in weight, faster and more stable. The sandwich technology brought an innovative new bracing technique into play, which was clearly superior to the existing, conventional types of reinforcement. It achieved the highest degree of effectivity regarding the ratio between "stiffness and weight", which was so important in aviation and later also in space technology.

However, in aviation other sandwich materials such as plywood were used for the covering layers with a core layer of balsa wood. The reasons for this were rooted in the necessity to save resources exacted by the 2nd World War. A famous example is the successful production of 7,781 Mosquito fighter planes produced in sandwich construction.

Apart from use in military objects, polyurethane hard foam materials were not used on a large scale in the building industry until it became possible to formulate foams with extremely low thermal conductivity yet good mechanical properties. This progress involved working out a process technology that permitted the mechanical production of foams and largely took the place of the uneconomical process of foaming by hand. The first sandwich elements were either manufactured by means of adhesion or by the filling in the foam core between the two outerlayers.

This development process of "composite materials" took place at the beginning of the Fifties and lasted until the mid-Sixties. The term "sandwich components" also appeared for the first time in the few specialist books in the Sixties and increasingly replaced the term "composite materials".

The extremely low heat conductivity of polyurethane hard foam and the development of foaming machines opened up the way for applications throughout the entire cooling chain. This is how sandwich technology started out on its path to success: coolhouse and freezer house construction, refrigerated vehicles, refrigerated containers and refrigerated furniture. Owing to the reconstruction of Germany and the "economic miracle" the enormous demand arising in the cooling chain area caused the especially economical sandwich construction to emerge. While a conventionally built coolhouse amortises itself after 20 years, with coolhouses with a sandwich-style design it was possible to start making a profit after just two years.



¹⁾ 1937: The principle of how to form polyurethane is discovered by Otto Bayer (* Nov. 4, 1902 in Frankfurt am Main; † Aug. 1st, 1982 in Burscheid)



The reaction phases of hard polyurethane foam: When the two-component mixture is foamed up the volume increases around 25-fold.



Lightweight sandwich components for the military aviation industry in the 2nd World War like those made from wood materials for the Mosquito fighter planes.



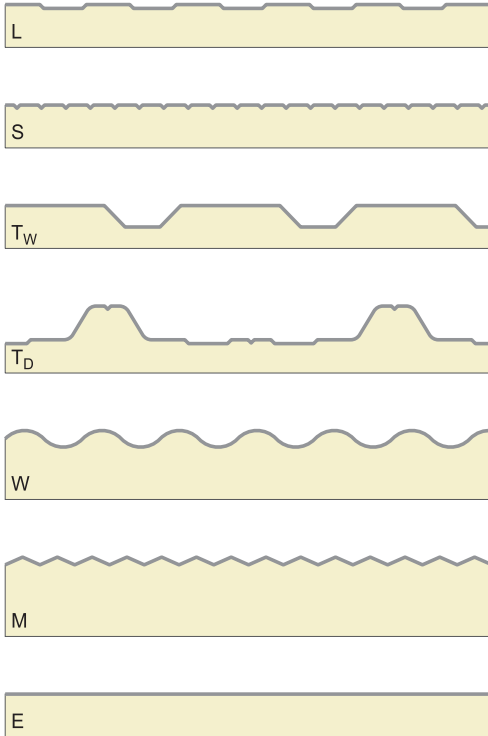
1953 The first refrigerated furniture, cooling chamber doors and refrigerated vehicles are manufactured from sandwich elements.



Macro shot of the cell structure of the core insulation material, PUR hard foam, of sandwich elements: The extremely low heat conductivity results from the numerous very small cells filled with air.

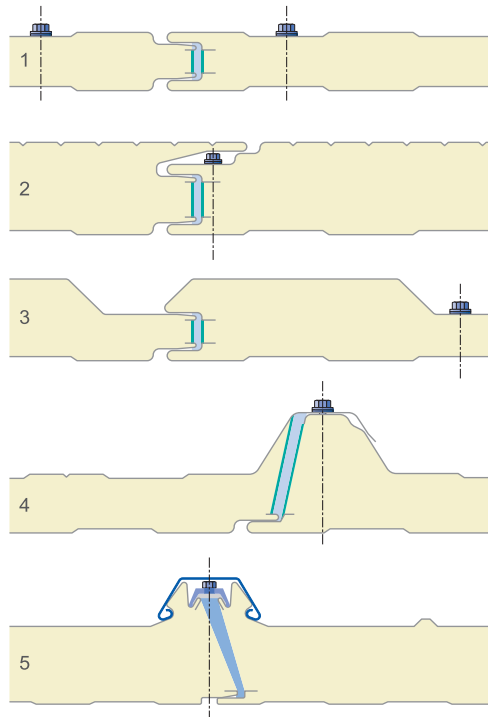


The development from a commercial industrial product to a sophisticated architectural element.



Surface structures of sandwich elements:

L: ruled, B: beading, TW: trapeze-profile wall element; TR: trapeze-profile roof element; W: waves; M: micro-ruling; P: plane;



Joint geometries of sandwich elements: 1: a narrow shadow gap with visible fastening; 2: narrow shadow gap with concealed fastening; 3: without joint, to match the trapeze profile - with visible fastening; 4: without joint, by overlapping the high beading; 5: concealed fastening of the roof element

The importance of sandwich construction for the market.

Almost unnoticed by most architects and planners, sandwich construction has developed into a particularly economical form of construction, which today meets very high architectural demands. While many sectors in the building industry have moved close to their all-time low in the past few years at a disturbing rate of -5 to -10%, sandwich construction shows annual growth of +5 % and even more. Already at the turn of the millennium, each year some 64 million square metres of roof and facade elements were being manufactured and installed in Europe. In the past eight years this figure has doubled to around 130 million square metres. This astronomical figure is easier to imagine if one compares it to known units. The following comparisons show that the term "astronomical" is appropriate: In the case of a motorway measuring approximately 27 metres in width, this area is equivalent to 4.8 million km, i.e. 120 times the circumference of the earth or more than 12 times the distance from the earth to the moon. At a built width of usually 1 metre, the full length of a year's production of sandwich elements, for example, is roughly equivalent to one thousandth of the distance to the sun (approx. 147,100 million km).

What are the reasons for this Europe-wide sandwich construction trend? This form of construction evidently offers advantages that are convincing more and more owner builders and architects. This article deals succinctly with the most important characteristics of modern sandwich construction. The subject is dealt with in detail in the reference book, R. Koschade: Sandwich Panel Construction, 3rd edition, iS-Mainz, 2007. On approximately 400 pages with over 500 illustrations and numerous tables, it gives a detailed presentation of sandwich construction with industrially prefabricated sandwich elements consisting of metallic outer layers and a polyurethane hard foam core.

New generation sandwich elements.

Thanks to the bonded anti-corrosive metallic outer layers with the factory-installed core insulation made from polyurethane hard foam, sandwich elements enjoy a useful combination of mechanical and structural-physical properties. Besides, they are very unproblematic to assemble. Thanks to continuous progress with profiling, in joint techniques and design, the potential applications and techniques have been improved for specific purposes so that today a completely new generation of construction elements with long-living properties is available. Different types of profile (trapeze profiles, beaded, ruled, micro-ruled and plane elements), and a variety of materials for the outer layers (steel, stainless steel, aluminium and copper), surface structures and topcoats provide architects today with a broad spectrum of design options.



Component systems, moulded parts, doors and windows.

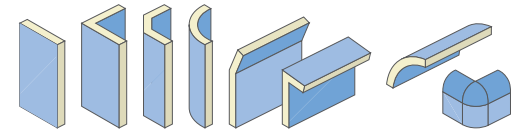
The leading sandwich manufacturers in Europe have developed over a period of several decades from producers of individual components to providers of complete modular systems. In the last two decades especially the requirements of architectural design have contributed towards determining this development. The catalogue of building components initially oriented towards economic efficiency expanded to include sandwich systems and construction accessories that facilitated an aesthetic architecture, rich in design elements. Substantial moulded parts, such as arch and corner elements for roofs and facades, complement the sandwich systems to form modular systems that enhance variety in architecture.

The development of the functions of sandwich elements has also continued. Today systems are available with integrated structural elements, such as windows, light elements, air vent pipes, aeration elements, attic construction components, rain gutters, doors, gates, solar technology etc. In most cases sandwich manufacturers also have an extensive production range of metal components, special profiles and moulded parts in matching colour shades that can be combined with sandwich systems.

Load-bearing behaviour - sandwich effect.

A practical comparison with the familiar material wood makes the benefit of sandwich technology clear: A 3-metre long solid wood floor, as is for example used in scaffolding as the stage with a concentrated load of 1.5 kN a thickness of approx. 50 mm to meet the requirement for a maximum sag of 20 mm. And it has to be bonded in multiple layers to meet this requirement. At a stage width of 500 mm this amounts to a weight of 45 kg.

By contrast, under the same conditions a sandwich element that is 50 mm thick only sags by 16 to 17 mm, and it only weighs 18 kg. The sandwich element saves 60 % in weight. This weight advantage has a positive effect on transportation, assembly and the dimensioning of the supporting structure.



Special moulded parts today create greater latitude for sophisticated architecture.



Further development into a modular system; technical and optical optimisation of the sandwich elements.

Design, technique, economics and ecology.

Statements such as: "Sandwich construction cannot be used to achieve sophisticated design" either belong to the Sixties or to the realm of prejudice. In the Nineties the buildings by creative architects all over Europe proved the scope for creative design permitted by sandwich construction if its potential is exploited consistently. Here are five buildings with a variety of uses selected to represent a huge number of examples of architecture from all over the world:



Between 1996 and 1998 13 exhibition halls were erected in sandwich construction on the former airport site in Riem near Munich for the Neue Messe München. The rounded, white aluminium-coloured sandwich constructions echo the aerodynamic shape of aircraft wings.



In 1996 the entire facade of "Malpensa 2000", Milan's new airport, was built as a sandwich construction. The wall elements, with a total area of 50,000 m², have an external aluminium covering shell in pale elfin yellow, spruce and cream.



To give the 276,000 m³-huge and up to 46 m high ROTEB waste incineration plant located in the direct vicinity of a residential quarter in Rotterdam a human "face", the Dutch architect Maarten Struijs created a facade with curved, silver-metallic sandwich elements and rounded corners. The building erected between 1993 and 1994 reflects the sunlight over the course of the day and creates a constantly changing play of light and shadow.



XLAB, the interdisciplinary experimental laboratory at the University of Göttingen constitutes the architectural realisation of an educational idea that aims at bringing forward young scientists in the disciplines chemistry, biology, physics and informatics. This innovative and graphic educational approach is also reflected in the architecture of the building. It received the GALILEO Architecture Award in 2007.



The company building of EFAFLEX (2004), which won the GALILEO Architecture Award in 2007. A new company building had to be built for the EFAFLEX company, a reputable manufacturer of fast-running rolling shutter gates located in Bruckberg/Bavaria. The company logo is a leaping cheetah. A link between the building and the logo suggested itself here. The building is divided inside into offices (sales and administration) with high demands in terms of the quality of the rooms and a hall for storing the gates and preparing them for delivery.

Heat and moisture protection.

For the buildings presented here a high degree of heat protection without expensive, complicated building constructions was required. The core insulation of the sandwich elements, which is made from PUR hard foam, furnishes the required heat protection even with relatively low wall thicknesses. With thicknesses ranging from 60 to 200 mm it is possible to meet all the requirements of the energy saving regulations. An interesting aspect in this context is that even if heat protection is raised 100%, with sandwich construction the overall costs of materials and assembly rise by only about 10%.

Owing to the slender design, compared to conventional methods of building, significant amounts of floor space are saved, while the building volume remains the same.

Innovations provide additional functional and architectural options. One example is the combination of solar modules with sandwich elements, which are available on the market in different designs.

Sealed tight with OTTO sealants.

For heat and moisture protection, for energy efficiency and the quality of the room climate, air tightness and protection of the building shell against driving rain are equally important. The technique for joining modern sandwich elements today facilitates a quality, which is up to 100 times as tight as with high class window constructions. Sandwich elements are sealed tight against water vapour diffusion owing to its metallic outer layers. And, if need be, the joints between the elements can be sealed by means of the appropriate sealing systems. This is the reason why sandwich construction has also proved its worth so well in cooling and refrigeration technology. It is, therefore, particularly important for construction and connection joints to be executed so that they are tight and durable for these applications. The same applies to the cleanroom sector.

Apart from the actual sealing process, harmlessness in the sense of hygiene and optical criteria is also crucial. Hence, high quality sealants are required with technical properties and methods of application that meet this high requirements profile. With specially modified silicone, acrylic and polyurethane sealants OTTO makes a significant contribution towards ensuring that the sandwich constructions are completely tight.

Protection against weathering and corrosion.

Protection against weathering and corrosion greatly influence the service life and freedom from maintenance of buildings. Over the past decades, corrosion protection for metallic outer layers of sandwich elements has been so well perfected that today a service life of at least one to two generations can be assumed, depending on the location.

Fire prevention.

If constructive fire prevention and the applicable fire protection requirements and safety regulations are consistently observed, the sandwich construction method counts as one of the safe and proven building methods. As a rule the entire element is flame resistant, not least of all thanks to special OTTO sealants.

Noise protection.

It goes without saying that lightweight components have less sound insulation than heavy ones. However, this does not mean that noise protection has to be foregone with lightweight construction methods. Sandwich elements with a thickness of 60 mm have a rated sound insulation R'w of approximately 25 dB. This noise insulation rate suffices for numerous applications in industrial building and hall construction. In noise-sensitive ones the planning engineer can achieve the noise protection required in each case by seizing appropriate construction measures, using advantageous building materials and components.

Economic efficiency.

Free choice of the supporting structure (wood, steel, aluminium, reinforced concrete) permit the planning engineer to make allowance for the regional circumstances and for the wishes of the developer. Thanks to the lightweight, yet very stable elements, the supporting structure can be dimensioned economically. For many building projects productivity and a short construction phase have top priority. With sandwich construction the collective benefit of a high degree of prefabrication, efficient raster planning with large-scale building components, lightness in weight and fast assembly have a very positive effect.

A numerical example can demonstrate this: The Argos business centre in Stafford, Great Britain, an industrial building measuring 384,000 m³ and 8 m in height, and a 48,000 m² roof area was completely erected within five working weeks, including the supporting structure. The simple assembly principle can also bring tangible cost and time savings for conversion and extension measures.

Ecology.

Based on a conservative estimate of the potential energy saving with a sandwich element, over the service life of one generation at least 40 times the manufacturing energy used in the form of heating energy and at least twice the investment costs for the sandwich construction can be saved.

The resources and capital saved are accompanied by a great reduction of the type of emissions that are incurred from the combustion of heating oil or other organic fuels. Furthermore, when their service life as sandwich elements ends, the materials metal and PUR hard foam can be recycled economically and for the benefit of the environment. In the case of polyurethane hard foam, in addition to energy recycling, energy is recovered at a rate of approximately 34% of the entire manufacturing energy for thermal use. Materials are also recycled, which has brought the building industry interesting products with new materials properties.

All in all sandwich construction - owing to the symbiosis of design, technology, economics and ecology - has developed into a very interesting alternative for modern, energy-efficient architecture.

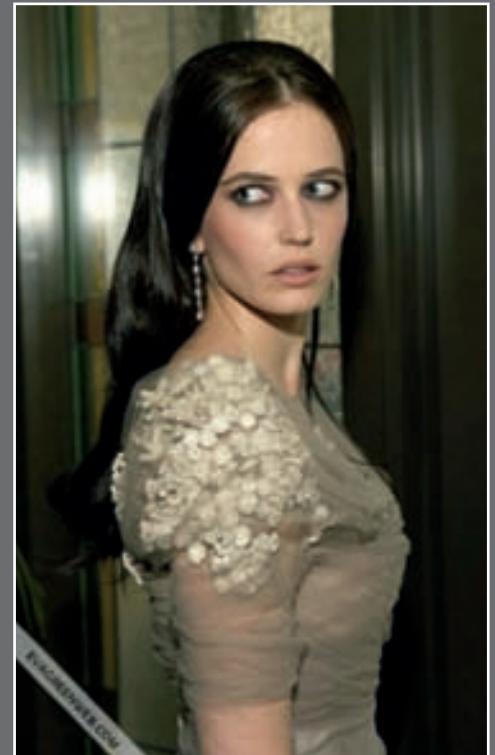
Author: Rolf Koschade

The author and OTTO wish to thank the following companies: ROMA-Dämmsysteme, ThyssenKrupp Steel AG and GALILEO - Kreatives Bauen mit Sandwich for their friendly support with picture material relating to sandwich construction.

AND THE OSCAR® GOES TO

Fabulous clothes made from silk and silicone.

The red carpet at the Oscar® Awards is the perfect opportunity for fashion and jewellery designers to present their creations to the general public and to arouse an interest in them. At the Oscar® Awards 2007 Eva Green proved that silicon sealants look good on the red carpet. As a top model and actress, most recently to be seen in James Bond 007 – Casino Royal, she wore a most unusual robe. Jewellery designer Tzuri Gueta, who last worked for Givenchy, plays with silicones from OTTO in his creations. The dress worn by Eva Green on the occasion of the Oscar® Awards was spectacular and anyone who dares to take a closer look can guess which material the work of art is based on. Primarily because of the large selection of colours the designer works with OTTOSEAL® S 100. Here the silicones are pressed through the silk and form reliefs and patterns reminiscent of corals. However, it is not only textiles that are enhanced by using silicone; accessories and unique items of jewellery have been designed by Tzuri Gueta using silicones from OTTO. He has evidently discovered people's taste because his works are to be admired in many museums, including, for example the world famous Museum of Modern Art (MOMA) in New York.



The initial contact with Tzuri Gueta occurred through the OTTO importers in Israel, the artist's home country. When he established his studio in Paris and had made a name in the international fashion industry with this world-wide trade-marked technology, the contact with Fridolfing in Bavaria endured. This was of course primarily through the OTTO field service personnel in France. This is because the strong colours he requires in small quantities for his silicone creations are a genuine OTTO speciality. So this is how silicones are at last enjoying the international attention and flashlights they deserve.

Web tip WWW.TZURIGUETA.COM

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A SHARP LOOK INTO SPACE.

OTTO reaches for the stars.



The Atacama desert in Northern Chile is not only extremely dry; it is also extremely cold. It lies in the shade of the Andes and in the West it borders on the Pacific. This means little rain and a great deal of fog and cold on the coast. Yet it is precisely because of this climate that there are several large observatories on the mountains. This is because the air here provides optimal conditions: thin, dry and very still. Nowhere else is it possible to obtain such a clear view into space as here. The European Southern Observatory is present on the Cerro Paranal mountain with the "Very Large Telescope". This astronomically large telescope consists of four individual telescopes, each with a diameter in excess of 8 metres. Sensational observations have already been made with them, which have facilitated new explanations of the Big Bang. Once more, specialities from OTTO were needed for the expansion joints in the concrete facade. OTTOSEAL® S 110 not only compensates the movements in the facade joints caused by daily temperature fluctuations from plus 50°C to below 0°C without any difficulty. It also looks elegant at the same time: in the special colour "fawn" OTTSEAL® S110 fits in perfectly with the desert ground there.

Web tip

WWW.ESO.ORG

PUTTING COLOUR ON THE ROOF.

Top performance at the very top.

There are tiles and tiles. These days design and aesthetics are a factor even for roofs. Thank heavens. It goes without saying that first and foremost economy and environmental compatibility are at stake. However it is the colour of these special roof tiles that plays an increasingly important role for developers.

This requires the right adhesive: One that meets the high demands, but can also provide the colours to match. No problem for OTTO. The adhesive, OTTOCOLL® SP 6048, withstands weather conditions on the roof such as frost, hail, snow and rain excellently. And, what's more, in the right colour.

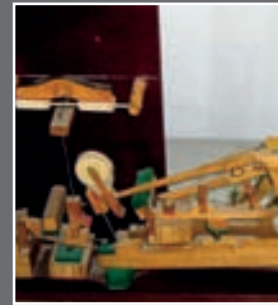
Then the roof is all of a piece, too.

Web tip
W

WWW.CREATON.DE
WWW.HERRKERAMIK.DE



PEARLING SOUNDS FROM CHINA.



Where OTTO ensures the right sound.



The Pearl River Piano Company in Guangzhou, China, produces around 85,000 musical instruments each year, including about 17,000 pianos and grand pianos. Building a piano requires maximum concentration and precision, because if just one tiny part does not fit perfectly, it will inevitably be audible. The combination of a wide variety of materials poses a very special challenge. The hammers, moved by the keys to hit the strings are of primary importance for a perfect sound. They are made of wood covered with a layer of felt. The two extremely different types of material must form a firm bond. This also constitutes very high demands on an adhesive that has to unite wood and felt. It must not foam and must bond very compactly and without air bubbles. Currently experiments are being performed with the OTTOCOLL® P 520 VP 6081 2-component PU adhesive involving the OTTO partner in China, Andy Zhang.

In the footsteps of Marco Polo.



Marco Polo, the son of a Venetian family of merchants, was the first person to send detailed and adventurous reports to the West about the Middle Kingdom.

China has lost nothing of its fascination even until today. And it still lures business people from all over the world - by its size and population alone. OTTO has also put out its feelers towards China and gained a lot of experience of the Chinese mentality.

Ever since the year 2000 OTTO has been closely linked in friendship and partnership with an independent sales partner, MAPURA GmbH and its subsidiary, Shanghai PURA Development & Trade Ltd. in Shanghai. Over the years several hundred thousand cartridges of single and two-component PU adhesive systems have been supplied for high quality aluminium windows and various special silicones for industrial production. Just as in Germany, OTTO in China also relies on marketing comparatively high-priced and - above all - high quality products that are difficult to imitate.

No risk from Chinese production.

The OTTO business strategy of not setting up production of its own in China and pushing forward distribution via local specialists in close collaboration, has proved its worth very well indeed. The clear division of responsibilities: OTTO for the high quality of the products and Shanghai PURA for qualified customer consultancy and support on the spot has proved the right way of entering and expanding the market reliably and successfully. One of the main problems of many German companies in China, intercultural competence and communication, has been solved optimally by OTTO in this way. The partners to contact in this cooperation are primarily Bernhard Pflüger at MAPURA and Andy Zhang on the Chinese side. Shanghai PURA Ltd. is one of the leading companies in China for high quality adhesive and sealing systems for window construction. Most of the major window manufacturers in China belong to their select clientele. And beyond the frontiers of China projects have already been implemented using products from OTTO in, for example, the United Arab Emirates, Russia, Korea etc.



China as a launching pad into future markets.

As a complement to window construction, the field of industrial production in China has also been actively built up. Especially the production of electronic components and finished products is an optimal branch of industry for the special products from OTTO. China is already one of the world's leading economic regions for the manufacture of solar modules. Here, too, special products from OTTO are being used increasingly. After a good eight years' experience of doing business in China OTTO can look back with pride and approach the new opportunities on the Chinese market confidently with its partners, MAPURA GmbH and Shanghai PURA Ltd., and continue successfully. So the way has therefore been paved for future market opportunities, whether they be in the Chinese market as such or in the form of exports to other countries via Chinese products.



Charming differences between the cultures.

The fascination China holds for Pflüger includes many different aspects. In an interview he described to OTTOprofile the most striking things he has noticed especially as a German. One was, for example, the enormous rivalry among the Chinese, both in business and in private. Each man forges his own destiny and is drilled from childhood to get the best out of himself (or herself). This is surely the basis for the industriousness and economic success that in Western thinking sometimes appears aggressive. And the "Chinese system" is overwhelming, which from a German point of view is seen as total chaos. There appears to be no organisation at all like we are accustomed to in Germany. For example, as soon as a spontaneous idea crops up that should be discussed people immediately start phoning around hectically. In actual fact, says Pflüger, the system functions quite well as long as people accept each other, permit latitude and do not interfere with each other's way of working.



Acquired tastes from dog to snake.

And then there is the question of food. One does not want to be impolite if there is snake or dog on the menu; but some westerners do get a queasy feeling in their stomachs. Since the Chinese set very great store by fresh food, one can select ones meal while it is still alive, which probably serves to increase the appetite only for dyed-in-the-wool lovers of Chinese food. As a discreet ambassador between the cultures, Andy Zhang, the Chinese partner, has already realised that European taste is a little different and it is hard to convince guests of what is good for them. Maybe he had this wise insight while enjoying a Bavarian white sausage, which as we all know is not to everyone's taste. ■

We are



GEORG OTTER | shift foreman Production | warehouse foreman | born in: 1935 | At OTTO from January 1974 to 1998 **HEIDI WIMMER** | secretary to techn. director | born in: 1945 | At OTTO since September 1974 **JOSEF MAYER** | head of Dispatch | born in: 1955 | At OTTO since August 1976 **KARIN STEINMASSL** | trainee in the IT-department | born in: 1989 | At OTTO since November 2006

OTTO - 35 years in Fridolfing

OTTO!

Again last year OTTO had a reason to celebrate. The company has been located in Fridolfing for 35 years now. In the last issue of OTTOprofile Jürgen Lohre, managing partner, described the beginnings of OTTO in Munich and the first steps in Fridolfing. The move was made in the autumn of 1973. Of course, new buildings alone were not enough. They also had to be filled with life. With employees who would put their stamp on the company in future. On these pages you can read that Jürgen Lohre not only has a knack for business but also for people. And more or less exactly how they talk by nature. OTTOprofile in conversation with employees who were there from the very beginning and with those who have their future at OTTO before them.

GEORG OTTER I have been with OTTO practically from the very first hour here in Fridolfing. After all, when the hall was built in 1973 I was employed as an electrician with the contracted building company. For example we had to fetch the machinery from the previous location in Munich and set them up and connect it up

in Fridolfing. Then I had an inspiration "This could become my new job". So I spoke to Mr. Lohre. I was supposed to start in February 1974. My then employer, the building company, thereupon handed me my papers at Christmas 1973. Thank heavens! Mr. Lohre said: "OK, then get started right now."

HEIDI WIMMER I first read about OTTO in the newspaper. That was in September 1974. An advert for a job as a typist. At the time I was looking for a part-time job. Unfortunately the job being offered was for 40 hours and that wouldn't have been possible for me because



OTTO - 35 years in Fridolfing



1973 1981 1988 1990

my daughter was still quite small. I phoned up all the same and first of all received a refusal. But, believe it or not, a few days later Mr. Lohre called and I was engaged.

For 20 hours a week. We sealed it with a handshake. As was customary in those days.

GEORG OTTER From electrician to "mixer".

That was more or less the first job I did at OTTO. But in actual fact we did everything, sometimes even going to fetch the material. I can still remember that I often drove to Passau to get raw materials.

Yes, that's how it was! At that time we used to produce about 500 cartridges a day. We already had machines, too. One for mixing, one for filling and a roller.

JOSEF MAYER Actually I am a qualified electrician and I applied for a job advertised in the newspaper. In October 1976 I drove to OTTO and at the beginning I was convinced Mr. Otter was the boss, because he looked so terribly grumpy. Then came the interview with Mr. Lohre and everything went very fast. Introduced myself and was engaged immediately! Those were the days. At the time I had no idea what the company actually produced. OTTO was still very little known then. I was the "Jack of all trades", from cleaning the machinery to clearing up. And, of course, for dispatching the first cartridges. To begin with there weren't very many, only one, two parcels a day.

With the aid of a loan from Mr. Nath in 1973 Jürgen Lohre purchased 3.000 m² of building land in Fridolfing. The size of the new hall 15x30 m.

GEORG OTTER I remember that Dr. Nath, the owner, came to Fridolfing in the first year. On a Tuesday, as always. That was Nath day. We were busy outside shovelling gravel; there was no proper road yet and we were redoing the access way. Mr. Nath got out of his car and said "Haven't you got anything to do today?" (laughs).

We really tried out a lot of things with silicone in those days. When I think back at how long it took before it functioned properly. And we sometimes had an engineer here who then taught us how to mix correctly and how everything gets better and more beautiful. That's how we gradually produced our first genuine silicone.

In 1975 including Jürgen Lohre, five employees worked at OTTO. That year for the first time OTTO achieved the much longed for turnover threshold of one million DM. 35 years later we can look proudly on 285 employees and also a corresponding turnover in euros of course.

HEIDI WIMMER The first major customer was Swiss, GYSO. They were already ordering pallets. That was in '76 or '77. At that time the other customers were mainly small and medium-sized craft enterprises. All customers were recorded on filing cards. The discounts which each of them received were also noted on these. And each invoice was entered there, so that the turnover was known. But I was not the only one who had a lot to do during this time. The products continued to be further developed and the machines in production seldom stood still. The first innovation was the transition from VITROFLEX A to VITROFLEX M.

GEORG OTTER O yes, the mixing! You really needed to have the feel for it. If you mixed it too little the mass became too stiff. And if you mixed too much it was too liquid, in spite of the exact recipe. Often seconds are crucial for the right consistency.

JOSEF MAYER You had to look inside the sight glass and observe properly. Develop a feel for it. That was a matter of practice, practice and practice again. Until you knew when the right lustre was to be seen. Then the product was ready. Today all that is all done automatically.

GEORG OTTER When we tried out a new product our boss, Mr. Lohre, was always there and always helped us with it. He didn't want to miss it and immediately put on the white coat over his clothes!



1994 1 996 1 999 2007

JOSEF MAYER Yes, Mr. Lohre was a real allrounder. Sales and production, customer contact and of course the management of the entire company; where do you find a boss who does all that? I think he really enjoyed standing by the machine and seeing if the product turns out right. But for us too the work was not divided up like it is today. In the mornings we worked together in production and for filling. Thereafter the machine was cleaned and after lunch we packed up the cartridges. The boxes were then picked up by the freight forwarders, or we drove them to the post office ourselves.

In 1976 the first permanent field service worker was engaged. At the time Ralf Tabel threw himself into the work and, with many personal contacts and, of course, outstanding products turnover was greatly increased. "The daily presence at the customers' is crucial for gaining new customers!" according to Jürgen Lohre, and success bears him out. In the meantime there are 40 field service workers operating in Germany and Europe and there are innumerable OTTO partners all over the world (e.g. in China, refer to page 14).

HEIDI WIMMER When the first traveller started work there was really lots to do. Things started moving really fast.

And the office work got more and more. Soon I wasn't alone in my office any more. In 1977 Mr. Bippus came to us as a book-keeper. Then a sales manager, Mr. Macco. Yes, the OTTO family grew and grew.

GEORG OTTER OTTO family, that is a good cue. In my case it is really true. Meanwhile both my son Gerhard and my granddaughter Daniela work at OTTO. A family company - for me, too. (laughs)

HEIDI WIMMER That's true, it sounds good. But it's great that there are always new and young ones moving up. I remember well that in 1978 we had the first apprenticed commercial clerk.

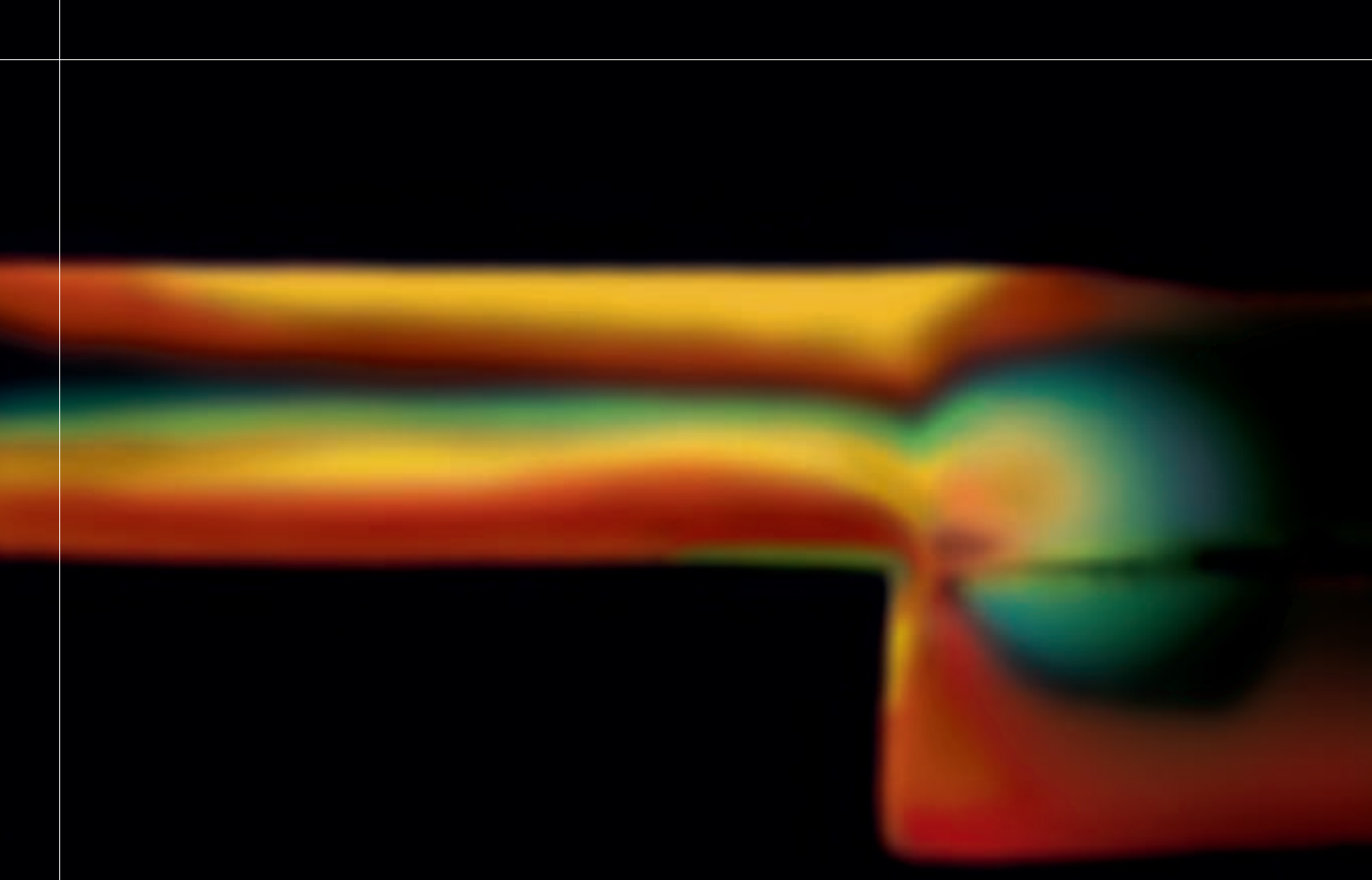
KARIN STEINMASSL There are eight of us apprentices at OTTO. The majority work in the commercial field, one in Production for chemicals and plant engineering and I am the first IT apprentice. I have been here at OTTO since November 2006. I'm from Fridolfing so it was clear that I would apply for a job here. My first interview with Mr. Bippus and Mr. Biller made me pretty nervous. But just a few days later in keeping with OTTO tradition, I received a phone call and the job. Already on the second day there was a safety training and a tour of inspection through Production and Storage. And - very important - all apprentices have to work in different departments for a few weeks as well. It is so that everyone knows what is done where. So I became acquainted with the procedure in Production. That was very interesting.

HEIDI WIMMER You are still just getting started. I'm gradually getting into the final spurt. Retirement is due in one or two years. But I will surely miss all of this. (Her eyes become a little watery.)

GEORG OTTER I've been in retirement for several years now, but I continued working from home for OTTO; for 3 to 4 years. That made my farewell less harsh. But we have never completely lost contact with OTTO. For example it is often a topic of conversation at supper because my whole family has connections with OTTO.

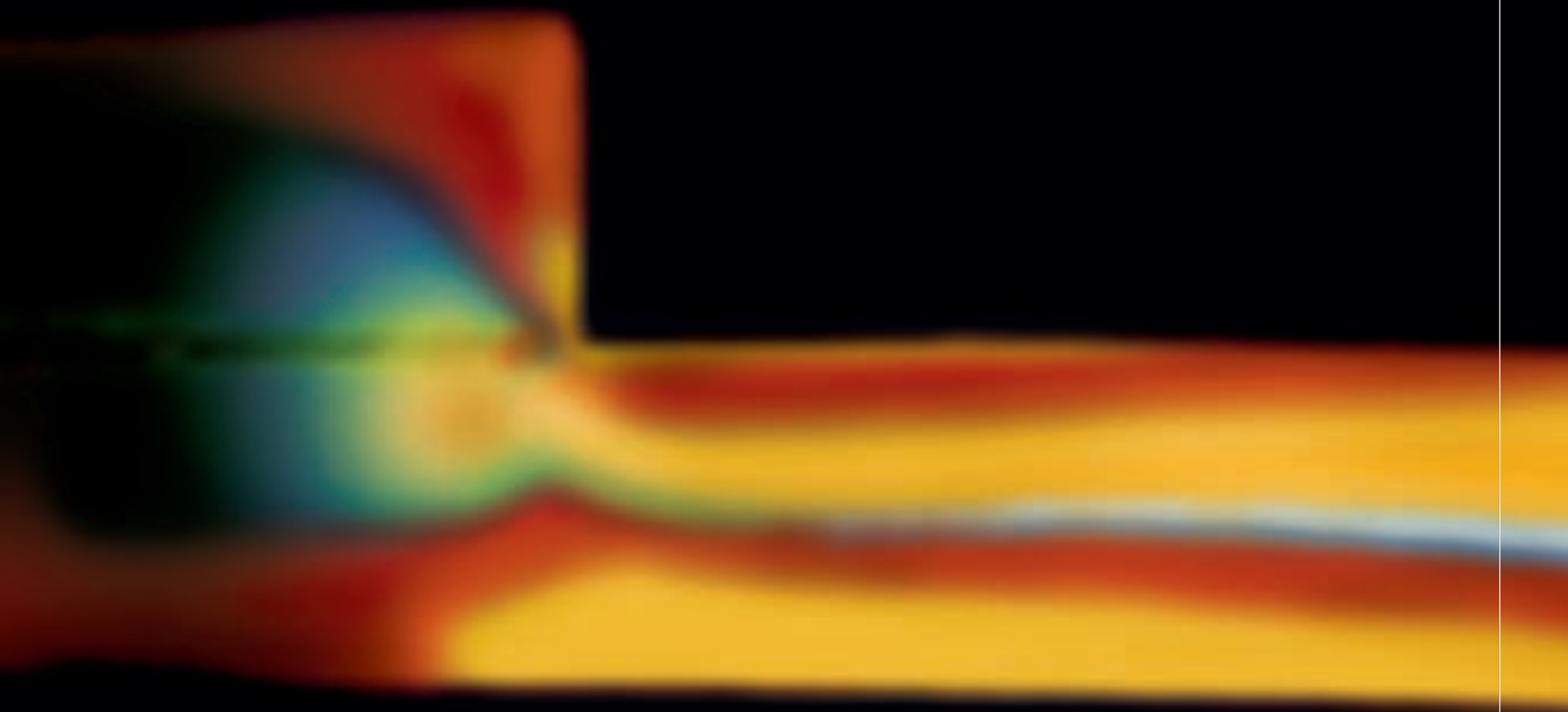
KARIN STEINMASSL Another thing that is typical of OTTO: The turnover escalope! If in a given month we have achieved the targeted turnover there is an escalope for lunch. That's really nice and you realise that we all belong together and have contributed towards this result.

And we get the turnover escalope quite frequently, which is an indication of a brilliant future. And it keeps on going! We are looking forward to the next 35 years in Fridolfing.



Always

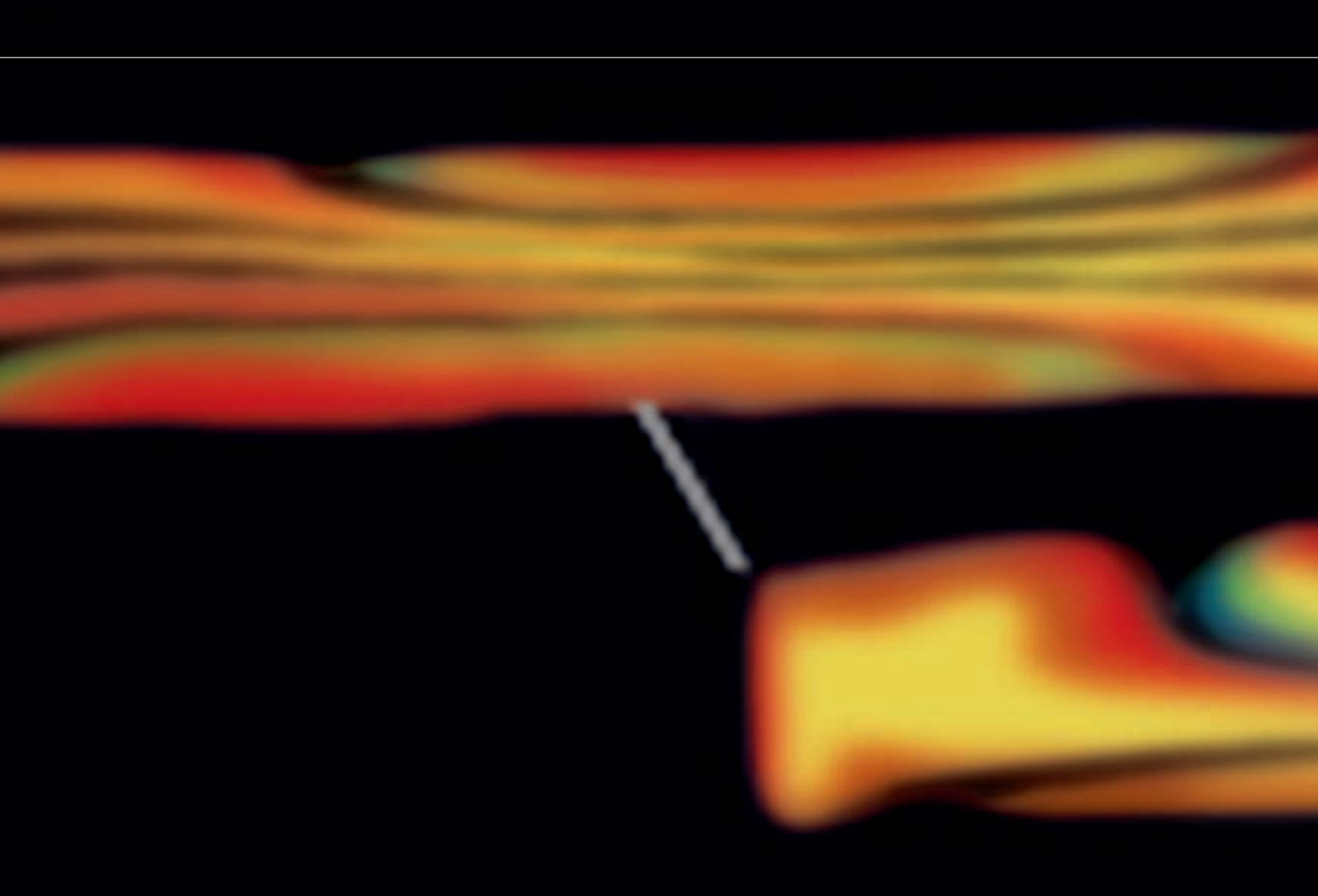
**stay nice
and elastic**



Optimal component properties thanks to the right adhesive.

Compared to other joint techniques, such as welding, adhesive bonds have the disadvantage that owing to the nature of their plastics, they show less stability. Hence, by choosing the "right" adhesive and a design that bonds well, the design engineer must ensure that the load exercised on the bonded area can be "put away" without any problems over the entire product service life after bonding.

In the picture: Stress peaks with a structural bond with "hard" adhesive.



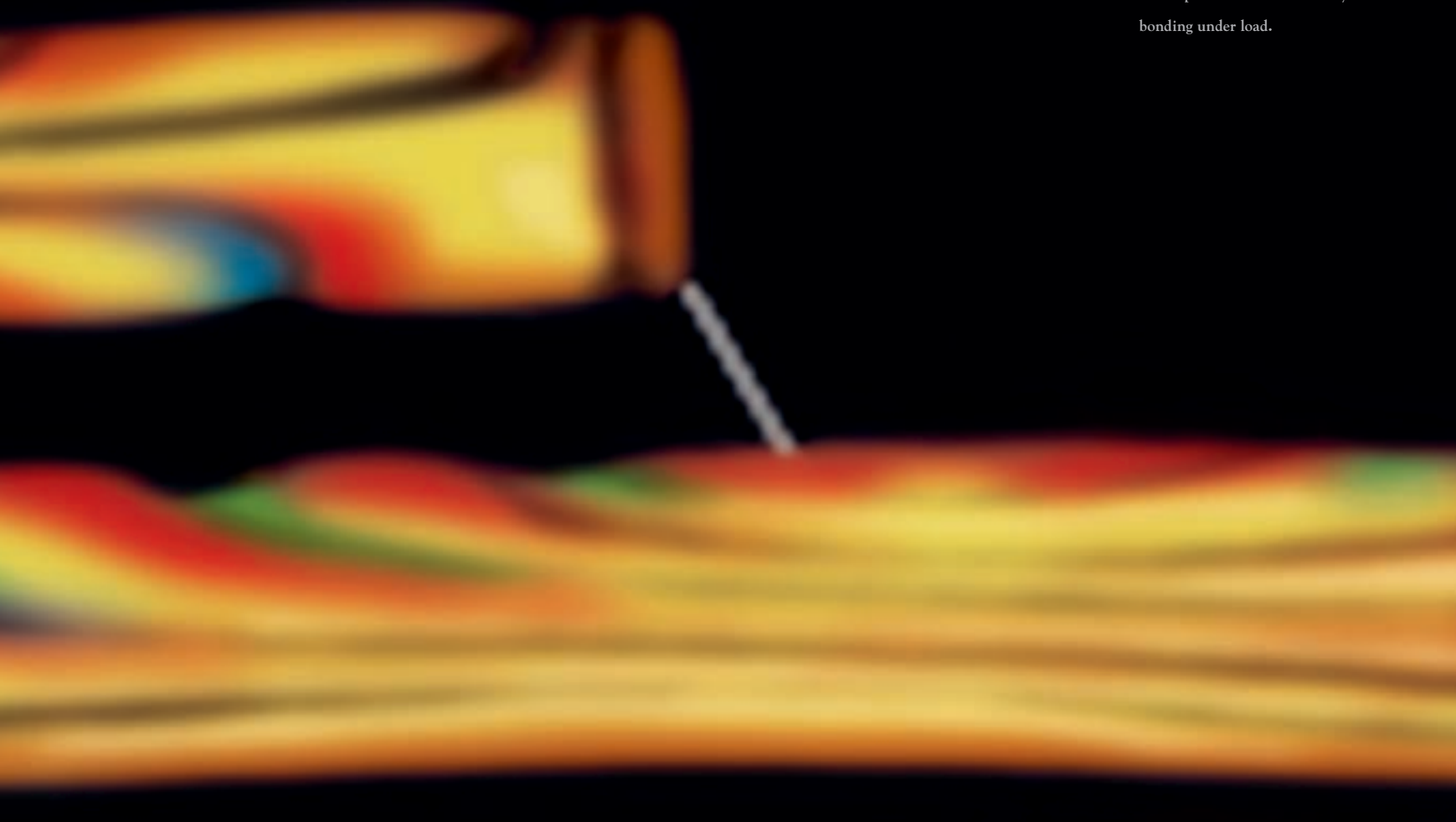
Hardness does not always live up to its bonding.

When searching for maximum strength of the adhesive bond, as a rule those adhesives are selected that are nominally capable of transferring maximum forces. These are usually established in the course of a tensile shear strength experiment. However, high-strength adhesives have a crucial disadvantage: Their thin, hard and brittle adhesive layers can be stretched less. This means that under a dynamic load or if there is internal tension owing to temperature fluctuations, the bond is more liable to break open. Elastic bonds with greater adhesive layer thicknesses offer another advantage in addition to this: Mechanically they use the entire bonding area optimally and therefore put an even strain on the component.

The optics bring it to light.

So-called photoelastic methods can be used to make force effects and force lines photographically visible, hence facilitating comprehension of the effect of adhesives on components. In the example photo depicted above one can see the even force lines over the entire overlapping area. They verify the full utilisation of the bonding surface on single-shear bonded joints. In practice this means that the increased bonding surface indeed results in a greater capacity for load transmission by the elastic adhesive-bonded joint.

With a "hard", highly cross-linked structural adhesive the hairlines clearly show (image on pages 20-21) that with thin bonded layers measuring only tenths of millimetres stress peaks at the ends of the adhesive layer, meaning that the entire surface is not being used. Although this type of structural adhesive shows very high strengths (up to 40 MPa), an elastic thick layer bond with significantly less strength (approx. 5 MPa) is better able to process the loads that occur under real conditions. This is simply because it transmits forces over the entire length of the overlap instead of causing peak stress to arise at a few points, as can be seen from the picture above.



Adhesives with a bridging function.

Another advantage of elastic adhesives such as silicones, polyurethane or hybrids, is that as thick layer bonds they can bridge over relatively large cracks. Fluctuations of a few millimetres in the thickness of the adhesive layer are no problem for these adhesives. For example, it is not easy to plank welded subconstructions owing to the

mechanical strain that occurs, but this can be completely taken over by the face bond. Costly and time-consuming straightening of welded constructions or large sheet metal parts is not necessary at all with elastic bonding.

Author:

Christian Lammel, PhD
Engineering
Managing Director
IFF GmbH, Ismaning

OTTO and religion

THE BAHAI WORLD CENTRE IN HAIFA.

The Bahàì faith is probably the youngest of the world religions. It reaches back into the 10th century to its founder, Bahauallah. After his death this eldest son, Abdul Baha was appointed to head the parish. At the beginning of the 20th century he undertook many journeys in European countries, in the US and Canada and made it known all over the world. The next leader, the grandson of Abdul Baha began to extend the so-called holy sites on Carmel mountain in Haifa, Israel. Today the Bahàì teachings have some six million followers and it is the geographically most widespread religion following Christianity. The Bahàì World



Centre is now the landmark of the city of Haifa. This administrative and spiritual world centre contains some holy sites of the Bahàì. Including the shrines in which the mortal remains of the founder and his relatives are kept. The sophisticated design of the garden complex and its buildings draw many pilgrims and visitors from all over the world. In the land of natural stone OTTOSEAL® S 70 is used in many impressive buildings. Including the world centre of the Bahàì. Shalom!



CLEVER: THE READY-MADE BATH FROM PRAGUE.

Mass-produced quality wet cells.

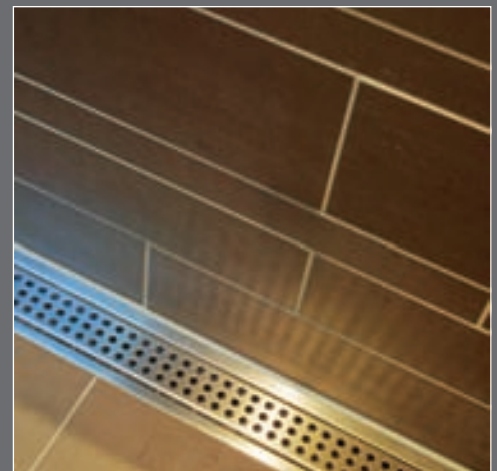
Building and fitting a bath according to conventional methods requires a lot of time and work. Bricklayers, plumbers, tilers, plasterers - in all 10 different trades have to be involved. The alternative to conventional building is prefabricated building. This is advisable especially where the same bathrooms have to be installed in large numbers within a short space of time, in



hospitals and senior citizens' residences for example, but also in hotels and residential estates and office buildings.

Many of these "off the conveyor belt" bathrooms are manufactured, ready for installation in the factory at HP SAN in Prague. After design and planning they go straight to Production. To begin with the outer shell is built, - formwork construction. For this purpose the Czech workers bend steel trellises into the desired shape, shutter them and then fill them out with pouring concrete join them together after it sets.

The individual components are sealed by means of OTTOCOLL® P 305. OTTO is also used on the inside. The two premium products OTTOSEAL® S 100 and S 70 are for pointing tiles and slabs of the "mobile" bathroom. When the wet cell is finished and already looks like a perfectly normal bathroom, it is packed up and built into a wide variety of buildings all over Europe as a complete unit. When the complete block is subsequently lifted to the desired storey by crane, an OTTO sealant is again used: OTTOSEAL® A 205. Up to 40 bathrooms are produced every day at HP SAN. And at a top quality standard since the first delivery was made in 2001.



A private spa instead of a wet cell.

Luxury,
thy name is **bathroom.**



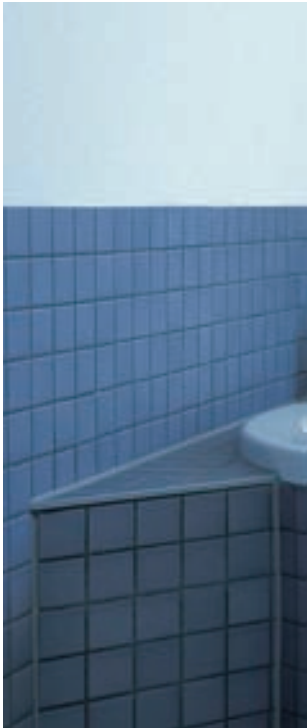
Protracted stays in spas, which towards the end of the heyday of large spa towns served almost only social purposes, putting health objectives in second place, are no longer an option for most people today for reasons of time. Precisely the class of people that earns the necessary money does not have time for a three-week stay in a spa. This role is increasingly being assumed by private bathrooms. These can be used for a short spa-type holiday on weekends or in the evening. Steam baths, saunas, whirlpool tubs or wellness showers are no longer a rarity in bathrooms. The wet cell, which serves the sole purpose of cleaning the body, is clearly a thing of the past.





High tech and top design.

When the bathroom is developed into a relaxing and cosy place, which is even integrated into the bedroom in some cases, the requirements imposed in terms of technology, convenience, design and materials also rise. Natural stone, complex mosaics and tiny glass tiles pose challenges for tradesmen, as do design wishes demanding that the bathtub should no longer be visible or glass partitions to replace the classic shower cabin. These new technologies and design ideas also have an impact on the materials used for sealing, which also have to be perfectly coordinated as a system.



New requirements that sealant systems must meet.

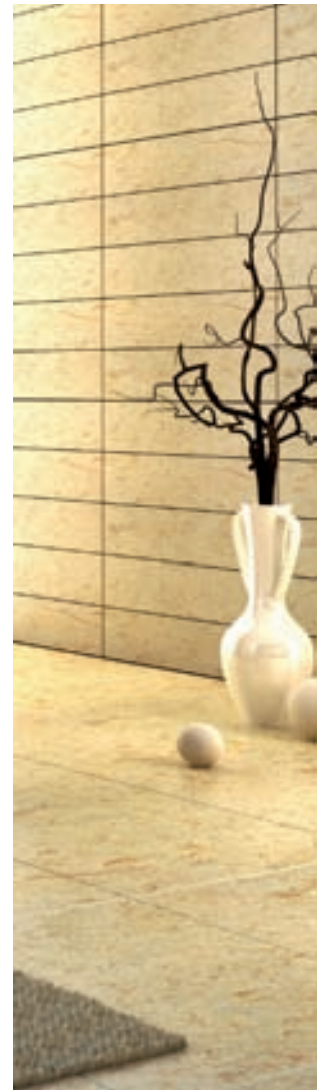
Not only must sealants act neutrally towards the different building materials, they also have to compensate physical differences, such as expansion under the effect of heat. Here the term "state of the art", as demanded in invitations to tender, gains visible relevance. Poorly executed jointing, for example where the sealant was applied incorrectly with adhesion on three sides, soon show ugly cracks which - even worse - permit moisture to penetrate the substrate. Incorrectly structured floor seals, e.g. on-the-level showers, are particularly critical. This is because in this case the water damage is not noticed until the structure of the building has already been permanently damaged. Therefore OTTO not only supplies complete sealing systems, it also provides the corresponding information leaflets and training for craftsmen.

A personal touch thanks to natural stone.

A marble bath used to be a symbol for luxury. Today natural stone in the bathroom is almost the normal thing. Their natural character highlights the personal touch and style of the proud owner. The choice of natural stone - from marble and granite to limestone in a wide variety of colours and geological compositions - is not only very diverse, it is also comparatively low in price. This is possible thanks to imports from, for example, China or Brazil. Anyone who favours short supply paths will decide on sorts that are quarried in the vicinity. The Solnhofen limestone for slabs for example, an extremely dense limestone that often also contains interesting fossils. These fossils gave the slab limestone from Solnhofen its international reputation. No wonder, all ten of the specimens of Archaeopteryx known to date were found in the stone quarry there. Even though one is unlikely to receive an Archaeopteryx for one's bathroom, small snails or ferns are no rarity.

Picture sources:
"Leben mit Naturstein: Bäder" by Willy Hafner
"Bäder - Wellness-Oasen für das Zuhause" by Harald Schmur.
 Published by CALLWEY Verlag.





Protection by means of correct application.

Natural stone does not only have good features. Depending on the type it requires significantly more attention in terms of laying and care. Although for jointing natural stone silicone is again the top choice, many silicones however contain softeners that contain oil. These are downright soaked up by the fine capillaries in the stone. This causes ugly dark stains at the edge of the slabs which are almost impossible to remove and ruin the noble impression, especially of light-coloured stone.

Then all one can do is to relay all the slabs with edge area stains. However, it is possible to prevent this. By applying OTTOSEAL® S 70. This OTTO silicone is available in 30 standard colours and different surface structures. On request it can also be produced in any other colour that matches natural stone. The application and recommendation of specialist joint silicone is a matter of honour for craftsmen and the family!

The future of the bathroom has already begun.

Already today designers, manufacturers and building material developers are experimenting with the bathroom for tomorrow. In addition to greater technical possibilities, e.g. by means of computer controls, these trends are marked by social changes, increasing demands for convenience, aesthetic wishes and - quite simply - the pleasure in new things. Whereas in the past people were wary of coloured tiles, holidays in the Mediterranean region are now reflected in the bathroom. Bright glass ceramic mosaic created in graphic shapes by Bisazza are in particular demand for luxury bathrooms. Bisazza collaborates with designers with international reputations, such as Marcel Wanders, Paola Navone or Anr e Putman, who have a knack of reinventing the bathroom theme over and over again with surprising results. Such tile collections as "Urban Safari" by Bisazza define futuristic living environments that continue into the bathroom. Quite apart from the sophisticated design, fitting the bathroom with the small tiles poses quite a different challenge for the tradesman than laying big ones.





Two new old acquaintances: concrete and cement.

In bathroom design concrete and cement have not really been a focal point until now. But now they have been given a second chance.

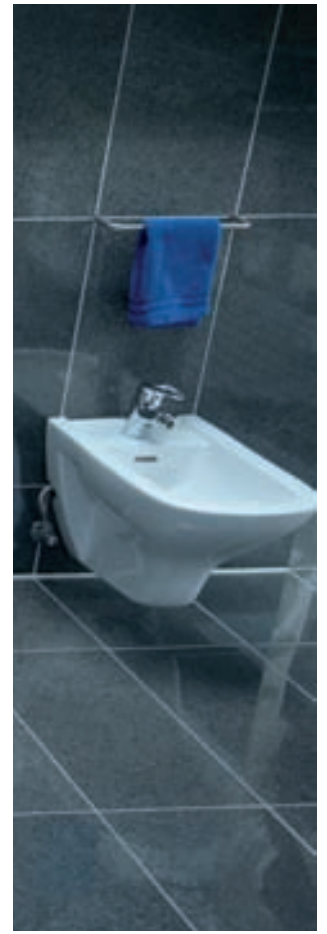
Cold? Grey? Boring? Cement tiles with floral décors and a gently shimmering shine invalidate prejudices, expressed when the word "cement" arises. Once they have been laid, oiled and polished, they are reminiscent of noble directors' villas or have the charm of sunny Spanish fincas.

To a layperson concrete also sounds hard and rough to begin with. But young designers who work with the material enthuse about the design potential and the flexibility facilitated by this material when designing bathrooms. Reinforced with fibres and steel, concrete can be cast in a wide variety of shapes and therefore the wishes of the developer or architect can be met exactly. Ground, oiled and polished they are reminiscent of a very regularly shaped natural stone. Anything from the wash basin to the bath tub is possible. A lightweight core prevents structural engineering problems, e.g. in old buildings. And the costs are comparatively low.

Alluring lights.

Ever since physics lessons we all know that water is capable of directing light around curves. With the aid of LED technology it is now possible to make the water in the tap shine. Fittings are now available from Hansa, which are not just unique in shape; they are also very special on the inside. The light is mixed here too - in accordance with the water temperature. Blue for cold and red for hot. And to enable this effect to be seen well, the taps have been designed in rectangular form and open at the top.





Flowers on walls and floors.

Ceramics expert Thomas Hellmann

from Saint Gobain Germany on the current trends.

What are designers and manufacturers bringing onto the market in 2009 in terms of tiles and stoneware; what are the trends and what new developments are there?

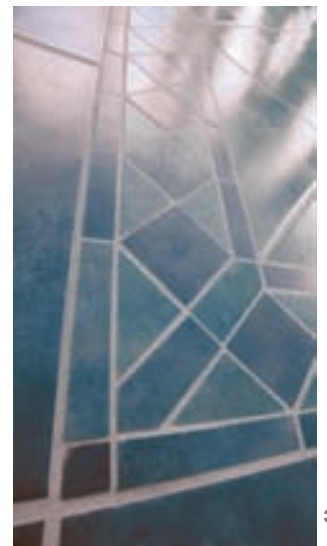
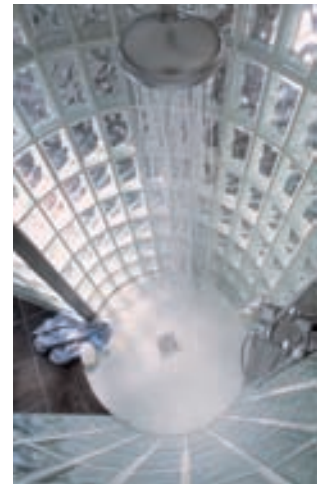
OTTOprofile spoke to the expert, Thomas Hellmann from Saint Gobain Germany and asked about trends in ceramics on walls and floors.

Like clothing, ceramic products are increasingly subject to fashion trends. And the equivalent of the great fashion in Paris or Milan, is the Cersaie in Bologna for ceramics. Above all the trend towards floral patterns and twined décors is striking. Furthermore there is a preference for large rectangular tiles. And stoneware is being used increasingly for walls. The loft style in minimalistic colours, such as black, anthracite and basic shades is still "in". However silky surfaces and sandstone shades take away some of the harsh austerity of this type of style. 90 x 90 and 40 x 80 formats are observed to be used particularly frequently.

Ceramic tiles, that look like wood.

While glass decorations recede completely into the background, tiles with sophisticated glazing and fully patterned are clearly gaining ground. The design ranges here from "Neobaroque" to floral decorations. Limited haptic effects ranging from fabric to leather, and above all imitation woods in rectangular formats are extremely interesting. They lend the hard materials a surface that appears soft. Still trendy: metal looks, which can be imitated with increasing perfection.

Just what designers have been waiting for: new glazing techniques such as the Inkjet or Kerajet methods. They make it possible to glaze the entire area of very structured surfaces, thus producing images in relief that appear three-dimensional. Overall, the experts from Saint Gobain Germany consider ceramics on a par with other products for decorating the home. Hence in this area there is an increasingly fast adaptation to new fashions and trends.



Funny that when one thinks of Greece and OTTO one first thinks of 3,000 year-old ruins and antique statues that ought to have the nose, arms or other parts of the body stuck on. A football fan will think of Otto Rehagel who turned the Greek national team, total outsiders, into European champions and caterpulted himself into football paradise. And those with an extensive knowledge of history know that King Otto, a Bavarian and a Wittelsbacher, once sat on the Greek throne.



Photo: Pinamaus / aboutpixel.de



Photo: photocase.com © D. Schoenen



© pinamaus / PIXELIO



@ N.Vollmert / PIXELIO

However, the story of OTTO, the adhesive and sealant specialists from Fridolfing, in Greece began quite differently. It was at the end of the Eighties. Prior to it a change had taken place in the Greek building industry. The general growth due to large-scale building projects both in the commercial and private sector and higher quality requirements formed the basis for the foundation of a company which intended to focus on special products in the building sector from that time on in the historical centre of the North Greek town, Thessaloniki. These were products that met the growing demand for aesthetic quality and permanence in very specialised areas of the building industry. In short: Quality was in demand and the two founders, Kostis Filippidis and Kostas Tzanas wanted to react to it. In 1989 Tasos Filippidis joined the company, and is now the Managing Director of "K&A Filippidis Co – PROFORMA". The name of the company implies that customer wishes are reflected on in advance. In 1992 the still young company, which was later to become a close partner of OTTO, began a new chapter in its history. The first shop was opened in the centre of Thessaloniki and by means of hard development work the company soon became successful and gained a good reputation especially in the Greek food industry, which carried out many renovation projects. In 1997 the company moved into a building competence centre and became associated with the already well established Athens company, ACM-Ger. Kokkinos & SIA OE. This cooperation resulted in growing sales figures, particularly in industrial and commercial construction. In 1999 the two companies decided to expand their business by selling quality products to smaller specialist builders' merchants all over the country.

It began at the BAUTEC in Berlin.

This decision was received very positively by the market and in 2000 at the BAUTEC trade fair in Berlin the contact with OTTO came about. This contact sharpened the quality profile of the two Greek companies even more. Encouraged by their business success, they ultimately became reorganised as a public limited company: PROFORMA SA – FILIPPIDIS EXPERT CONSTRUCTION MATERIALS SA.

Together with the best merchants the company launched a series of promotional and training seminars for users, engineers and planners to propagate the use of silicones and other joining and sealing materials in everyday use on the market. At the same time the participants are shown that quality is the name of the game, especially for simple constructions.





Building culture for over 3,000 years: OTTO in
Greece.

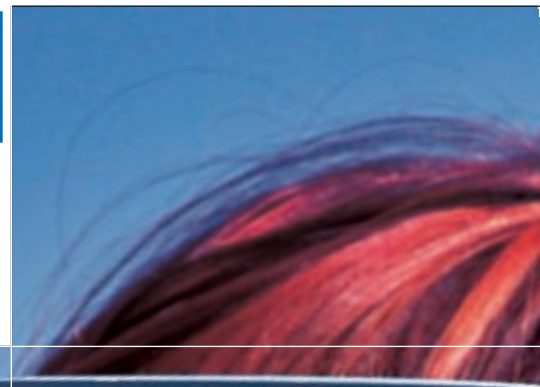
**Counteracting short-term trends
with sustainable values.**

These seminars and participation in the best known trade fair in Greece for building materials, the INFACOMA, had a lasting impact on the profile of the company and led to the OTTO partner becoming very important to its customers. Today PROFORMA produces 500 CDs twice a year with photos of applications and information about new products. And, finally, the company translated the entire OTTO catalogue into Greek so that it now only has to be updated each time.

Now that OTTO products are well known in Greece the OTTO partner is optimising its already fast delivery services, primarily by modernising the warehouse, which is now fully air-conditioned, in order to provide ideal conditions for the sealants and adhesives.

In a market, in which prices are an increasing argument, high product quality and competent service are the factors with which PROFORMA holds high the values which make OTTO successful and which have proved to be stable variables. As stable as the buildings of the ancient Greeks, which still today bear witness to a unique building culture. ■

The **value** behind
the **words.**



**OTTO
CHEMIE**

Sealants • Adhesives

Hermann Otto GmbH · Krankenhausstraße 14 · D-83413 Fridolfing

A hand is holding a blue sign with white text. The sign is held against a blue background. The text on the sign is "The things that bond us together". The hand is on the right side of the sign. The background is a clear blue sky. There is a faint, out-of-focus image of a person's face in the background, overlaid on the sign.

**The things
that bond us
together**

The OTTO information system

Company bosses sense that the satisfaction with the product alone no longer guarantees customer loyalty. The only way to stand out against the competition is to be unique through services and information. And by regarding the customer as a genuine partner and keeping their successful work in mind. OTTO works on this every single day.

With its adhesives and sealants OTTO offers a broad range of highly specialised products for a very wide variety of applications in industry and on the building site. To be able to use these products correctly for their specific purposes, thus ensuring the desired quality of the end product, the customers need detailed information from OTTO. Information about how to use the products and about the interactions with other products, behaviour caused by physical and chemical influences, environmental behaviour, work preparation and recommended areas of application.

The five-level system for broad yet profound information.

A five-level system of writings and data sheets ensure that the customer finds the right OTTO product for its application and is able to handle it.

1 The company brochure and "OTTOprofile", which appears once a year inform the customers about the world of OTTO and its premium quality standard by means of interesting examples from all fields. Both, the company brochure and the customer magazine, enable a glimpse beyond the limits of the customer's own application and particularly for new customers, engenders the necessary trust for the cooperation.

2 The second level presents the product range in two catalogues for applications in building and in industry.

3 The OTTO professional guides on the third level were conceived as practical help for preparing and processing the adhesives and sealants.

4 At the fourth level the customer obtains information relevant to the specific product and can therefore decide on the OTTO solution that fits the purpose exactly.

5 And finally, the technical data sheets contain the collected facts pertaining to each product with tips on processing, standardisation, chemical and physical properties and further information for a perfect result.

In addition to the printed materials, OTTO also offers detailed information on the Internet. Training courses on the most important subjects and individual consultancy supplement the system, leaving no questions unanswered.

LEVEL 1



LEVEL 2



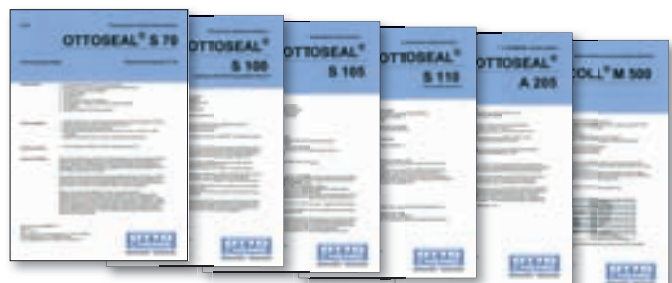
LEVEL 3



LEVEL 4



LEVEL 5



All the colours at a single glance.

One special example of the customer friendliness of the OTTO information system is the handy colour fan for the two premium sealants, OTTOSEAL® S 70 and S 100. At a glance the specialist craftsman can see all the standard colours available and can coordinate the right shade straight away with the materials to be joined and bonded.



The colour chart success story

Over 20 years ago the idea for the colour charts was born and ever since then they have been putting across the OTTO company philosophy on just a few square centimetres: the fulfilment of individual wishes, personal commitment and local presence. It started in 1987 with 200 colour charts for OTTOSEAL® S 100. Meanwhile over 50,000 colour charts for 16 products leave the factory each year.



Sample cards for adhesives

And also in the case of adhesives so-called sample cards are used to demonstrate that with OTTO (almost) anything sticks and holds. An impressive presentation of the variety of materials that the three OTTOCOLL® adhesives, Allflex, Topfix and Rapid, can deal with.



THE DEFENCE AGAINST FLU EPIDEMICS.

Vaccines from Dresden for Central Europe.



GlaxoSmithKline Biologicals in Dresden is one of the major serum and vaccine producers in the German-speaking region. Primarily the influenza vaccine, Fluarix, is produced here. Even the US Defence Department counts among the customers of this GlaxoSmithKline subsidiary. Work started on the extension of the production site for influenza vaccines around 2 years ago. Cleanrooms make special demands on sealants in order to satisfy the high safety requirements, product protection and protection from the environment. The sealant must be suitable for use in cleanrooms and ventilation channels from the point of view of hygiene resilience, abrasion resistance and compatibility with the special disinfectants and cleaning agents and must not serve diverse micro organisms (moulds and bacteria) as a culture medium. Requirements that OTTOSEAL® S 64 is capable of fulfilling. The cleanroom silicone was manufactured for the company in a special colour for sealing connecting joints on the ceiling, wall and floor and for worktops.



Production of influenza vaccines:
The hatching eggs are inoculated with a solution containing the virus.

Web tip

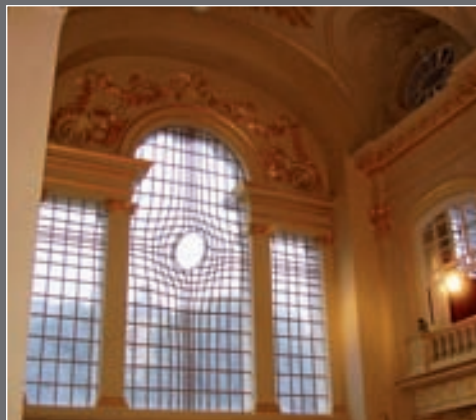
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LONDON CALLING.

Church windows in dire straits.

In London, the capital of Great Britain, there are many churches. One especially beautiful and traditional now had to be restored. The church of "St. Martin-in-the-Fields" on Trafalgar Square was built in the 18th century according to the plans of the architect James Gibbs and was considered an architectural novelty. Initially harshly criticised, the architecture was soon being imitated, particularly in the US.

The objective of the restoration was to allow more light into the house of worship and to approach the original baroque design. Towards the top a middle floor was removed to restore the original height and to better let the light in from the West. The stained glass windows, which had been destroyed in the First World War, were created anew according to the original plans by Gibbs, the then architect.



And wherever there are glass windows, OTTO is not far afield - including on Trafalgar Square in the middle of London. Inside the church of St. Martin-in-the-Fields OTTO products were used to create a suitable seal for the handblown panes of glass in the shot-peened stainless steel frame construction. OTTOSEAL® S 110, was used in combination with OTTO Primer 1216 for this kind of rebate seal in order to improve adherence to the steel. St. Martin-in-the-Fields is certainly worth an excursion next time you visit London. Not only because of the famous classical concerts, but now also because of OTTO.



RUSSIAN ROMANTICISM.

Sharks as pets.

Nothing is impossible is what Mr. Spranger said when he and his company received an interesting order: A shark pool for a town chalet in Moscow measuring 6 metres in length. No problem for the Spranger company in Plauen, which has been specialising in large aquariums for over 20 years. However, it is rather unusual for a private fish-lover to wish to buy a pool of this size. Generally speaking customers for this type of aquarium are zoological gardens, entertainment companies or clubs.

Russian standard.

The size of the pool was limited by the structural engineering and architectural circumstances of the building and took its orientation from the normal and maximum possible transport dimensions. The pool was built in the frame mode of construction. Approximately 3 tons of very high alloy and expensive high-grade steel was used. The Plexiglass for the aquarium in 100 mm-thick windowpanes from Röhm in Darmstadt were of supreme quality. Naturally important: the right silicone. In this case the 2K silicone, Novasil® S 47. From OTTO of course! Transportation presented a special challenge to the design engineers. The gigantic pool was to be transported into the building on a day in February in Moscow. So, besides the transport vibrations and the enormous lengthwise expansion and shrinkage – the temperature represented an additional risk.

Sharks between the stove and the bathtub.

As an exciting partition between kitchen and bathroom the aquarium in a Moscow villa now attracts the attention of the house owner and his guests. However, it would probably take a while to get used to it to be able to relax in the bathtub. This is because the new inhabitants of the aquarium are hammer sharks.

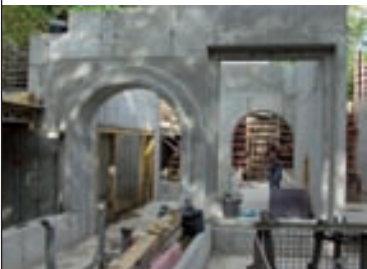
Web tip

WWW.SPRANGER-KUNSTSTOFFE.DE





In Ulm, around Ulm and **beneath Ulm.**



While the concrete is being cast.



... the half-shells are given the right shape over two weeks under the influence of temperature.



A low-platform trailer places the preassembled segments in the concrete foundation.



Completely dry underwater at Ulm zoo.

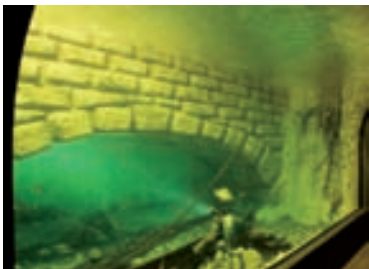
The idea of creating a large aquarium at Ulm Zoo, which is located close to the Danube, in the form of an artificial Danube riverbed with a walk-through Plexiglass® tube, giving visitors the sense of being directly on the bottom of the Danube as they walk through the tubes, has been around for ten years.

However, not until now owing to the modern options in aquarium construction, has it been possible to implement the idea. Building began on the new Danube aquarium in January 2007. Heinz Fritz, a company from Herbrechtingen and an OTTO customer of long standing received the contract for building the Plexiglass® tubes. Large-scale aquarium projects have already been realised with Fritz in the past, for example in Wilhelmshaven or in Linz. For the tunnel in Ulm the specialists from Fritz shaped two tunnel elements out of Plexiglass®. They are six metres long and the height in the middle is over two metres. The Plexiglass® elements are ten centimetres thick and weigh around five tons each. To shape the panes into a tunnel element out of flat panels, the latter had to be reshaped in a prefabricated shell by means of an exactly defined temperature programme over a two-week period.

Sealing with 550 kg of special silicone.

For many years Fritz has been using the specially developed two-component aquarium silicone Novasil® S 47 from OTTO to seal the elements. 550 kg of silicone were used to seal the entire tunnel. Sealing the large-scale aquariums is always one of the most important and most difficult work steps when building a tunnel. A small leak would inevitably cause the tunnel to flood because the entire water level is significantly higher than the Plexiglass® tubes. Meanwhile the tunnel has been completed and can be walked through and viewed at the zoo in Ulm.

As the visitors pass through the tunnel only native freshwater fish swim through the over 300,000 litres of water in the 1.3 million-euro aquarium. This gives rise to the perfect illusion of taking a walk on the bottom of the Danube.



The fascinating underwater world.



Conductors of **light.**





Each year the Café del Mar, a café situated on the sea coast in Sant Antoni de Portmany in the Cala des Moro bay on Ibiza, becomes the venue for an exceptional spectacle: From 5 p.m. on often thousands of visitors gather on the terrace and the surrounding rocks to experience the legendary "Ibiza Sunset" accompanied by relaxing music. The setting sun is usually bid farewell with great applause, as if it were a theatre production.



The light from the setting sun in Provence or Tuscany, which lends the landscape a strange, melancholy character with long shadows and warm colours, has fascinated and inspired many, not just artists like Vincent van Gogh or Michelangelo.



The twilight hour and alpenglow are further examples of plays of colour of the sun, which cast a spell over people in all regions of the world and influence the mood.





Setting the scene for an attitude to life.

The art of using the emotional power of light has a long tradition on the stage. However for setting the scene in private and commercial buildings it is comparatively new. That is if one disregards King Ludwig II who had a grotto built in next to his office in the fairy tale castle Neuschwanstein, which he had illuminated by Osram. Today light designers are occupied with the subject of light as a design factor in architecture. And in some cases they develop breath-taking details beyond the bounds of DIN standards, which have the sole purpose of providing good light for working.

For this purpose light gaps are positioned between the wall and the floor or wall and ceiling, which make the rooms appear higher. Spotlights integrated into the wall and the indirect light illuminates the ceilings with shadow-free light, creating a pleasant atmosphere. Skilled light design gives even more expression in particular to structures, materials and colours of indoor rooms, but also to works of art such as paintings, reliefs or sculptures. Or light itself is styled into a sculpture as is the case, for example, with curtains of light.

Outdoor spotlights installed in terrace floors, the flooring or rocks can orchestrate areas of water, trees and plants impressively. And an ordinary driveway can be transformed into a noble entrée with the help of light design like that distinguishing many an ancestral mansion. Besides creative design ideas, innovative technologies also extend the potential for light design. Halogen spotlights, watertight housings for outdoor use or bus systems with which concerts of light can be conducted intuitively and in some cases automatically.

Perschl & Perschl – figures of light from Waging Lake.

The Perschl brothers from Waging Lake have made all aspects of light design from the actual design to the technology their life-task. It is only the location in South Eastern Upper Bavaria that appears provincial. Their competence in all aspects of light has made the Perschl brothers desirable partners to architects, interior designers and private owner-builders throughout Germany and even in Italy and France. It all began in their parental home, where Ludwig and Robert Perschl a self-employed light technician and acrylic glass processor launched the joint company, P&P Lichttechnik. Several moves later and with a team of twenty employees they advise, plan, design and construct and mount them for customers from a wide variety of fields and posing very diverse requirements. Doctors' practices, hotels, restaurants, shops, public and private buildings - there is hardly any field in which the Perschls have not worked.

No wonder, for word of their professional advice, their creativity, their customer-oriented flexibility and the high quality of execution got around fast and often resulted in follow-up orders. At the 1,100 m² company premises not only are the ideas dreamed up and implemented, they also serve as an impressive showroom for demonstrating the skills of the medium-sized company.

Concepts tailored to meet individual wishes.

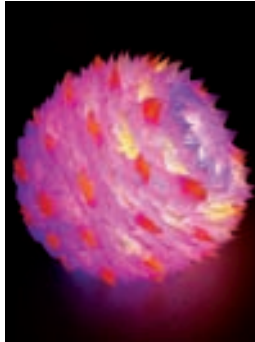
Ingenious concepts and the extensive company design and production department enable P & P Lichttechnik to respond flexibly to all customer wishes. In the company workshops lamps and luminaires are manufactured in very diverse designs. Whether it be stainless steel, brass patina, nickel, silver or even gold leaf: Depending on the desired style, the surface options are unlimited. Obviously, when the light specialists from Waging choose adhesives and sealants, only the best is good enough. OTTO products from the neighbouring village, Fridolfing, are chosen not only because of their excellent adhesive properties, but in particular because they withstand even the toughest requirements in terms of temperature or weathering.

The generously dimensioned P&P Lichttechnik warehouse accommodates not only lights out of their own production, it also houses a broad selection of products from over 250 manufacturers. Furthermore, the Perschls are also specialised in the manufacture of built-in floor spotlights, built-in wall and ceiling luminaires and outdoor lighting. Specifically for these on the new company building and the outdoor areas which have been specially designed for the purpose, there are numerous very attractive and in some cases very colourful examples to be admired, which have already inspired quite a few developers and architects to new ideas.



Beings of light, colour and silicone.

Jürgen Reichert



Beings of light - shine from within and seem to consist of light. The sight of them alone lends thoughts wings and awakens memories of underwater worlds, of blossoms swaying in the summer wind and of gently glowing planets. And then it becomes a matter of feeling: Sometimes the beings are soft and rubbery, sometimes warm and bristly.



This is the art of Jürgen Reichert. He makes silicone shine. These beings of light, in fact lamps or light objects, generally consist of little more than silicone. This silicone is dyed and then finds its way through the imagination of the artist to become a being of light. Of course, depending on the shape, a variety of "frames" are used to afford stability. For the small, round objects this is often an air balloon to which the silicone is applied. Rather like the way confectioners decorate cream cakes. After the silicone has cured, the balloon is removed.

Jürgen Reichert is primarily inspired in and by nature. He is crazy about all kinds of organic forms and structures. He then attempts to echo these. Silicone is the best material for this that one could possibly wish for. Supple yet stable. Using specially developed techniques Jürgen Reichert is able to obtain leaf-like structures and by means of the colouring he often creates an incredibly lively impression.

Beings of light for indoors and outdoors in the form of a standard lamp or chandelier, for decorations in the pond or even as seats and bar tables. Jürgen Reichert from Aachen has succeeded in bringing imagination into everyday life.

By the way: The silicones Jürgen Reichert uses come from OTTO. After all, in art, too, quality is indispensable. OTTOSEAL® S 50 crystal clear is used and, for the coating objects, OTTOSEAL® S 70 and S 28. ■



We are OTTO.

Again in 2008 OTTO had something to celebrate: For many years now the company has been at the Fridolfing location in Bavaria. But that was not the beginning. Maybe there are one or two of you who still remember the beginnings of the company's history, which Jürgen Lohre, the managing partner, described in the last international edition of OTTOprofile.

And in the present issue again you will find out a bit more about days gone by in the history of OTTO, this time from the point of view of loyal employees of long standing. An exciting story!



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Closing date will be March the 31th, 2009. As a hint: If you read the article „We are OTTO“ starting on page 16 carefully, answering the question will be a breeze.

How long has OTTO been operating at the Fridolfing location in Bavaria?

- A) 50 years
- B) 35 years
- C) 15 years

Fill in the right answer on the attached fax sheet and send it to **0049-8684-908-549** or by regular mail to **Hermann Otto GmbH, Krankenhausstr. 14, 83413 Fridolfing, Germany.**



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