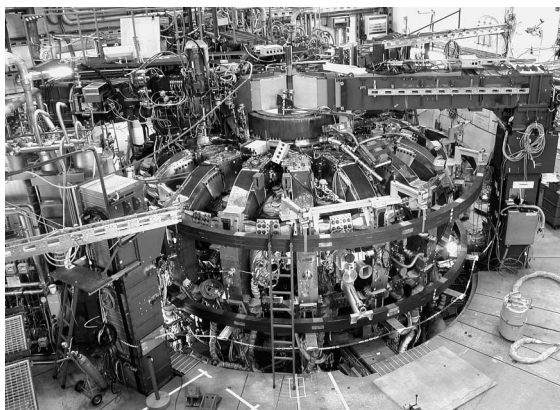




## HYDROGEN – The Energy Source of the Future

### ENSINGER's high performance plastics in the Jülich fusion reactor TEXTOR

*One thing is certain – the supply of fossil fuels such as petroleum, natural gas or coal is limited. New sources of energy that can permanently supply the world's growing population with electricity must be opened up. Many scientists have a dream: to achieve the fusion of hydrogen nuclei here on Earth, and to harness the unleashed energy. But the researchers have not yet reached their goal, because the development of a fusion reactor is more complicated than they first thought. ENSINGER has been using its skills in support of the Jülich Research Centre's project, several of the company's high-performance plastics being used in the fusion reactor TEXTOR.*



The Jülich fusion experiment TEXTOR during the current modification phase. The associated experiments were dismantled for installation of new reactor components. The actual atomic fusion reactor is now visible. © Research Centre Jülich.

Within the past twelve years, scientists have succeeded in creating the physical prerequisites for the success of controlled nuclear fusion. The temperatures of 100 million degrees Celsius that are required for nuclear fusion are no longer an issue. There are already fusion reactors that can even come close to the magical "break-even point" for a short time. Almost as much energy is generated

through the fusion of the nuclei as was originally supplied from outside. But what happens during nuclear fusion? A mix-ture of the two hydrogen isotopes deuterium and tritium is heated to 100 million degrees Celsius. In the plasma state that then prevails, the single electrons no longer orbit around their nuclei – electrons and nuclei move around in the combustion chamber at high speed

independently of each other. In the plasma, free nuclei can now collide with other nuclei. Because of their high speed, or rather energy, the particles fuse, and a new helium atom is born. What is also generated is a neutron – and above all enormous quantities of energy. After all, 1 kilogram of hydrogen is equivalent to 10,000 tonnes of coal.

#### ENSINGER's high performance plastics prove themselves in the fusion reactor TEXTOR

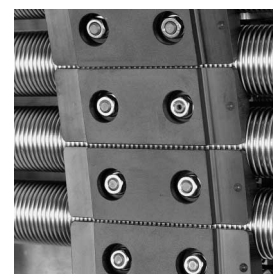
Research on nuclear fusion in Germany is organised co-operatively in the "Research Association for Nuclear Fusion", part of the Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V. The Research Centre in Jülich, with its research equipment TEXTOR, is a member of this association. One of the investigations that the scientists there are carrying out is how the highly-stressed walls of the combustion chamber and the hot plasma get along together, because when the boundary layer of the plasma, which is still at one million degrees, meets the walls, situations can arise that are damaging to both. The plasma is inside an imaginary, invisible cage consisting of powerful magnetic field lines. The magnetic field is established by a flow of current that is led from the outside through thick, copper wires into the interior of a total of 16 large electromagnetic coils.

At present, 16 additional coils are mounted spirally on the inside of the plasma combustion chamber (a toroidal vacuum vessel). These coils serve to stabilise the enclosure of

the plasma. At the same time, they allow continuous dissipation of an enormous amount of heat. The coils are supplied with electricity through coaxial, high-vacuum ducts, in which the ENSINGER high-performance plastic TECAPEEK is used. Two essential material characteristics were decisive in this choice. Firstly, this high-performance plastic has very good electrical insulating qualities. Secondly, it can be used even in a high vacuum. In addition, TECAPEEK can be milled at high speed, even in high-volume parts.

The 16 coils in the combustion chamber are attached to 32 stainless steel brackets by clamps made of ENSINGER Polyimide. The precise mechanical manufacture (3-D) of the clamps gives the coils the desired spiral arrangement in the space along the magnetic field lines of the main magnetic field. Given the vacuum and extremely high temperatures in the interior of the fusion reactor, the materials must meet extreme demands. The advantage of this Polyimide is that it is low in exhalation in a vacuum, has high long-term stability, and is thermally very stable. For this adaptation of extreme diagnostic systems and equipment to the experiment, separation of electrical potential is required. For this purpose, rings made of a Polyimide (VESPEL®) are used on standard CF connections.

High-performance plastics by ENSINGER hold their own even in the high technologies of the future. The researchers may not yet have succeeded in generating large quantities of energy from "burning" hydrogen – but everything points to the fact that they will succeed.



The clamps for the electric coils that create the magnetic field were made from temperature-resistant, vacuum-suited SINTIMID PUR HAT from ENSINGER.

## New Company Premises at Main Nufringen Location

### ENSINGER employees move into new building in January 2002

If you had walked through some of the departments in the ENSINGER headquarters in Nufringen at the beginning of this year, you would have been confronted with an unusual scene – cartons stacked everywhere! Employees whom you would normally only see in suits and ties casually dressed and pushing heavily loaded trolleys along the corridors. Waste paper piled high everywhere. There could be no mistake – the move was on. And the destination was the new, 2,800 square metre company building that had been built at ENSINGER's Nufringen headquarters.

Modern and functional – architecturally, the addition blends very well with the ENSINGER complex. With the new building, the semi-finished products division has gained 1,600 square metres, and annealing has an additional 700 square metres. The central technology room has been enlarged, too. One reason for the extension of semi-finished parts production is to ensure a volume sufficient for long-term demand. Another



The new company building at Nufringen headquarters

Sabine Laupitz (Internal Service, Semi-finished Products) at her new desk.



reason is that the additional space also takes account of technical developments aimed at rationalising semi-finished parts production and at the same time improving the consistent, high quality of the products. The ENSINGER product range includes semi-finished products in almost all thermoplastics. Rods, sheets and tubes are offered in small size increments, and specially modified plastics are manufactured to customer requirements. ENSINGER is in a position to provide customers with almost five hundred different modifications of plastics.

Two central aspects of the concept for the new building were safety and environmental protection. The fire-protection measures, for instance, were further enhanced by the construction of a new central sprinkler system. In addition, a water reservoir with a capacity of 700 cubic metres

ensures sufficient water in case of fire. The ventilation systems with heat recovery help to save energy, and a separate pollutant suction system creates ideal working conditions for the production staff. In addition, the connection of cooling water to the existing circulation system reduces the use of fresh water to a minimum.

The new ENSINGER building also contains offices – on the top floor, spread over 500 square metres. Although the new surroundings for Technical Marketing, Semi-finished products and Export departments were somewhat unfamiliar for ENSINGER employees at first, they have all settled in very well in the mean time.

Building work, which took about ten months, was carried out mainly by regional companies. The overall planning, electrical wiring, heating, ventilation and plumbing were ordered from architects' and engineers' offices. ENSINGER themselves drew up the production layout.

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## Editorial



Dear Reader,

The PISA study is the most large-scale investigation into scholastic performance ever. Pupils from 32 countries took part in the test, which was run by the OECD (Organisation for Economic Co-operation and Development). The results are well known:

the German pupils brought up the rear of the international competition. This has led to heated debates in Germany on the pros and cons of reforming the school system. Germany still has excellently trained, skilled workers, and an educational system that does justice to the needs of the economy. However, there is no getting round the fact that the level of

schooling in other countries – especially in Asia and South America – has risen tremendously, and that the educational lead in this country is getting smaller and smaller.

Something must be done. However, from the standpoint of the economy, attention must not be focussed on the level of education of school-leavers alone. Because the qualified further education of employees is more important than ever, if a company is to be successful. The once rigid job descriptions and trades in companies have been in a state of flux for some time now. The market, or more specifically customers, need much more comprehensive support, and associated knowledge – familiarity with the sector, project organisation, quality systems, new processes – must be continually established and disseminated within the company.

Employees' tasks are changing. "Lifelong learning" is not just a buzzword – "lifelong learning" has become a factor in a company's success. At ENSINGER, qualification of employees has been on the agenda for a long time. A few years ago, we introduced systematic education planning, which has been implemented every year. This formed the basis of requirement-oriented training in our company. The next step was the introduction of internal training activities by Mr. K.-J. Rebmann (Manager, Personnel and Organisation Development). The great positive response from employees showed us that we were on the right road. Building on this, Mr. Rebmann has worked out a complete programme, which is now being introduced: the ENSINGER Academy. The programme of courses has been tailored quite specifi-

cally to the needs of our company and our employees, and comprises many different courses. Each position in the company has specific courses allocated to it, and managers and their employees together select the courses for the next period. This way, the complete spectrum of the subject matter is taught over the years.

I am convinced that this system is the most suitable for continual further education of ENSINGER employees, and wish us all every success in implementing it.

Best regards

Klaus Ensinger

## „Kennedy“ Project of the ENSINGER Injection Moulded Division

### Process optimisation to reduce end-to-end times

Short development and production times, fast processing of orders and on-time delivery – to gain a real competitive edge, you have to define your goals precisely, and above all implement them rigorously. And that is precisely what has been going on in the ENSINGER Injection Moulded Division since last summer. The aim is to shorten the end-to-end times for new orders (that is, the time from receipt of the order to the start of volume production) through direct project acceleration. Intensification of controls and inspections, the creation of end-to-end documentation and the achievement of meaningful project completion are also part of the "Kennedy Project".

By the way, the project received its name from the former President of the USA, J. F. Kennedy. And with good reason. After all, his motto "First things first" describes the core of this project in one short phrase: to be successful, one must make the individual activities within a process chain as efficient and as transparent as possible.

The Swiss industrial consultants pro-transfer, located in Basle, are training and advising the Injection Moulded Products Division. Their philosophy is to "help people to help themselves". They do not recommend ready-made, blanket systems or concepts. Instead, the employees in the Injection Moulded Division learn about the associated project and process work that enables them to work on current projects and processes as part of their daily work, and to materially improve them. Examples of the methods used are control-circuit methodology, project and process management techniques, and models supporting communication and teamwork.

"We have taken a close look at our entire process chain to find out where exactly we must exert leverage to speed up the projects," Product Division Manager Karl-Heinz Kugele explains. It is important here to ascertain how much potential for savings in end-to-end time there is in design or tool-making, for example, the Division Manager continues. To do this, seven project groups have been formed within the division, devoted to such topics as order processing, screening, customer contacts or design. Under the guidance of the business consultants, the groups ascertain which processes can be optimised. The next step is to work out concepts for solutions, and to look for the best opportunities to implement these in actual practice. The last step in the systematic control circuit is the evaluation of the results. "To check how successful the implemented measures have been, we have installed measurement and standard values that make it possible to evaluate whole processes. We are on the right road, and our customers will benefit from the 'Kennedy Project' to a high degree," Kugele sums up.

## PercuTwist: Innovative medical instrument for intensive care

### Product in ENSINGER TECAPEEK MT blue

Rüsch GmbH, an internationally active company located in the southwest German Kernen, has developed a patented medical instrument for tracheotomy – the PercuTwist Dilator – using the ENSINGER high-performance plastic TECAPEEK MT blue. Rüsch GmbH, since 1989 part of American Teleflex Inc., employs about 3000 people.

Tracheotomy – this is the medical term for what is commonly known as cutting the windpipe.

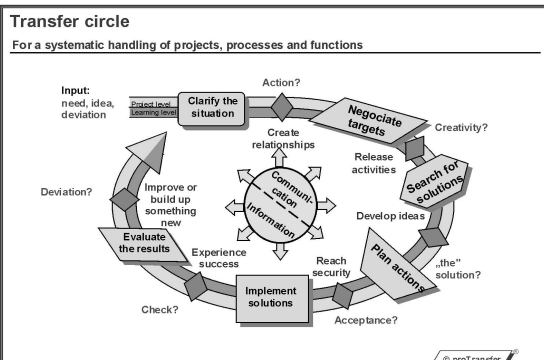
Tracheotomy is one of the oldest surgical operations there is: it was known as a life-saving operation in cases of asphyxiation even in classical times. Today, many of the patients who require artificial respiration during intensive care are treated with this operation.

Rüsch GmbH has now put a new, patented product for tracheotomy on the market – the PercuTwist Dilator. When the PercuTwist Dilator is inserted in the windpipe, the patient can be respirated through the windpipe. The advantages of the product lies in the novelty of the process itself. The opening of the windpipe is effected from the outside by means of a self-cutting thread. This is the least disruptive method possible for the patient. There are none of the otherwise common complications that can be expected with traditional tracheotomy. The new hydrophilic coating of the thread eases insertion in the windpipe, and thus reduces the force required – which gives greater accuracy and control. Rüsch GmbH offers doctors and hospitals a kit that includes all the instruments needed to carry out a tracheotomy, in addition to the PercuTwist Dilator itself.



PercuTwist Dilator made of TECAPEEK MT blue

At the stage of development at which the decision had to be made on the material from which to manufacture the PercuTwist Dilator, Rüsch GmbH decided in favour of the ENSINGER high-performance plastic TECAPEEK MT blue. Because this high-performance plastic is the obvious choice of material for medical technology products. Its physiological compatibility in direct contact with the human organism, wounds and body fluids is a point in its favour, as are its excellent chemical resistance to disinfectants and its good electrically insulating properties. It can also be sterilised with hot air, superheated steam, ethylene oxide or gamma-rays. In the manufacture of medical equipment in particular, the highest precision is required. In the case of the PercuTwist Dilator, two characteristics are essential: the thread must be both sharp-edged and absolutely burr-free. In this case, ENSINGER has again succeeded in developing a reproducible and therefore process-secure technique.



The systematic control circuit

## Competitions Solutions

How well do you know your fairy tales...?

In our last issue, we were looking for creative customers and employees who could answer our questions on fairy tales. The response was overwhelming! We received several e-mails and postcards daily. We were particularly pleased that our customers took such an active part in the quiz. One third of the entrants had the correct answers, but we must admit that the quiz was not that simple. The luck of the draw finally went to Arndt Dörper, who was delighted to receive the ENSINGER-sculpture of "The little lateral thinker" by Otmar Alt. We are sure that it will find a worthy place in his department, Injection Moulded Products Project Management in Nufingen.



Ralf Butterer hands Arndt Dörper the ENSINGER-sculpture "The little lateral thinker" by Otmar Alt.

For all participants who are eagerly awaiting the correct solutions, here are the titles of the fairy tales with the corresponding summaries.

1. Surgical operation saves family – The Wolf and the Seven Little Goats
2. Quartet scares off criminals – The Musicians of Bremen
3. Youth wastes his fortune – Helpful Hans
4. Plebiscite prevents confiscation of baby – Rumpelstiltskin
5. Murderer in Grandmother's house – Little Red Riding Hood
6. A good head of hair makes a rendezvous possible - Rapunzel
7. Noblewoman lives in miners' commune – Snow-White and the Seven Dwarves
8. Pay by achievement - Frau Holle
9. Use of birds to improve food quality – Cinderella
10. Slight hand injury leads to mass hypnosis – Sleeping Beauty
11. Crafty middle-distance runner – The Hare and the Tortoise
12. Intelligent nobleman teaches his bride lessons - King Drosselbart
13. Green ruler seeks asylum - The Frog King
14. Old lady hungry for a boy - Hansel and Gretel

## Ski Excursions 2001

### Nufingen: 43 ENSINGER employees in Schruns/Austria

Early on the morning of the 8th of December 2001 was the moment we had been waiting for: 43 ENSINGER employees set off on the "Ski Excursion 2001" to Schruns, Austria. Some of them took the event very seriously, and fortified themselves beforehand in a pub not far from the works, so as to be able to board the bus without further ado. But where was the organiser?! After many telephone calls, it transpired that his trusty vehicle had given up the ghost on the motorway, just short of the Schönbuch Tunnel! Hardly had we arrived in Schruns than 33 courageous skiers had

"swarmed out" on the slopes. The 10 non-skiers threw snowballs, or simply enjoyed the winter landscape. In the late afternoon, after a lovely, more or less active day of skiing (and fortunately without injuries!) the group headed for home. On the way, we rounded off an eventful day with a good meal together at a restaurant this side of the border. The return journey was quieter than the outward trip, because even the most daring of skiers get tired some time. Some even went to sleep on the lap of the person in the next seat; but strangely, even such an eventful day is sometimes not enough to get on first-name terms, and thus to come closer in the normal, day-to-day situation. Perhaps next year!



### Cham: 15 ENSINGER employees in Mühlbach/Austria

It was a great weekend – we had all kinds of weather, from sunshine to

snow to wind. But that kind of thing cannot daunt an ENSINGER team. We all had a lot of fun, there was enough snow, and we all returned home without mishap.

## Time to take a step forward!

### Own ACADEMY qualifies employees in social, personal and job competence

"Time to take a step forward" is the motto by which the newly founded ENSINGER Academy will start off in the business year 02/03. The "freshly" printed academy brochure contains tailor-made educational building-blocks. Material on methodological ability, such as presentation, discussion leadership and negotiation techniques, are combined with seminars on personal skills, such as leadership, self-management and time-management. The third area is characterised by technical training. IT, English, the ENSINGER accounting system, work safety, and verbal technical information are typical examples. Karl-Josef Rebmann, Manager of Personnel and Organisational Development, and initiator of the new concept, speaks of it as "a pioneering step in the form of

strategically directed, global personnel development" – strategic in the form of a qualification matrix, which forms a precise training programme for different groups of employees for middle and long-term development. The objective is to qualify employees and managers for present and future demands, and to offer them help in their daily tasks. Opportunities for qualification resulting from employee surveys are being implemented in a new way. The employment of both internal and external instructors ensures continual optimisation. Employees have already been trained on specific topics in recent years. "Everything under one roof" is a further step forward – not only for Managing Director Klaus Ensinger.



Karl-Josef Rebmann (Manager of Personnel and Organisational Development) and Mirjam Hörting (Personnel employee; training co-ordinator and organiser) proudly hold the new academy brochure.

## COMPETITION

### „How well do you know your geography...?“

In an increasingly internationally active company like ENSINGER, it is important to know your way about the globe. So this time, the competition is on the subject of geography.

Just write the answers on a postcard, not forgetting the sender's address, and sent it to **Julia Bieber (BA-Student), Personnel and Organisational development** in Nufingen, before the 30th of April 2002. And of course you can do it by e-mail, too: [j.bieber@de.ensinger-online.com](mailto:j.bieber@de.ensinger-online.com)

It's worthwhile taking part: the senders of the correct solution will take part in a draw for a dinner voucher to the value of € 60,00!

1. What is the capital of Iceland?
2. What country borders on Gabun, Zaire and Cameroon?
3. On which island is the capital of Indonesia located?
4. What is the island to the south of India called?
5. What is the name of the world-famous rock in the Australian desert?
6. Which lake separates Bolivia and Peru?
7. Of what country is Asunción the capital?
8. Which river in China is also known as the "Yellow River"?
9. What do you call the island to the south of Melbourne?
10. To which archipelago do the islands of Ibiza and Formentera belong?

## Donations go to „Heim-statt-Tschernobyl e.V.“



Ms. Schill is pleased with the donation to the association "Heim-statt-Tschernobyl e.V." Beside the trainees are, on the extreme left of the picture: R. Butterer (Personnel Manager), M. Hörting (Personnel department), H. Lehmann (Training Manager). Extreme right: K.-J. Rebmann (Manager, Personnel and Organisational Development), I. Brodt (chairperson, Works Council), Ms. Schill and J. Skarke (Youth and Trainee Representative).

The proceeds of this year's trainee Christmas activities, the handsome sum of € 1687,26 were in aid of the voluntary initiative "Heim-statt-Tschernobyl" e.V.

Trainees had been made aware of this project by BA student Sebastian Schill, whose mother plays an active part in "Heim-statt-Tschernobyl". Mrs. Schill also accepted the cheque for the proceeds, and took the opportunity to give a talk on the work of the initiative locally.

"Heim-statt-Tschernobyl" offers more than 2 million people in the heavily contaminated area around Chernobyl practical, innovative support, and helps them ultimately to

escape from the effects of the super-MCA. With the help of donated money, for example, the initiative assists families in resettling from the contaminated area to clean regions in the north of Ukraine. Based on past experience with building in clay, houses are built there by self-help co-operatives. This allows another goal of the initiative to be followed: organic building, innovation and rethinking, and the propagation of these through exemplary action. This also includes the erection of alternative energy-producing plants like the 250 kW windwheel, which is soon to be followed by a second one. The proceeds from the sale of electricity are in turn used in the building of more relocation homes, and thus make the Ukrainian partner ÖkoDom independent of German aid. Of course, not only technical assistance takes the limelight – the people themselves are most important. "Heim-statt-Tschernobyl" therefore takes care of both leisure activities for families still living in the area of Chernobyl, and international relations and reconciliation between Ukrainians and Germans.

*Julia Bieber, BA-Student*

## Jubilees

Hearty congratulations to those celebrating jubilees in the first quarter of 2002



Jubilee in Cham: Mr. Andreas Alsasser (right) congratulates Ms. Monika Kagerer (left) on her jubilee.

Celebrating 10 years with the company: Stefan Mai, Doris Schlotterbeck, Annette Haag, Karin Firse, Monika Kagerer, Helmut Marquart and Ralf Butterer.

## A hearty welcome

to ENSINGER for the new employees who have joined our team since 1st December 2001 (status of 28th February 2002)

Stefan Friedrich	Employee, Maintenance/Repair, Service Centre Raw Materials
Frank Kirchner	Sector Manager, Service Centre Sales/Marketing
Christoph Schmidt	Laboratory Technician, Die-casting Product Division
Oliver Ezel	Finals Student, Service Centre Raw Materials

**We wish you a good start at ENSINGER!**

## What does she do...?

### Else Riethmüller

For Ms. Else Riethmüller, then Else Mayer, the 07th of May 1975 was a decisive day in her working life. She started work with us at ENSINGER GmbH on that day. In the course of the many years that have elapsed since then, she has done a great variety of work. First, she polished round rods, sometimes deburred round parts, and was always there to help in an emergency. So she often helped out in the packaging/dispatching department. Before you could say "Jack Robinson", she was working full time in this department, responsible for the packaging of small parts and their preparation for dispatch. After more than 20 years with the company, she moved to the Division Injection Moulded Products, more precisely, to the Further Processing department within the Division Injection Moulded Products. She is still working there now, and, like her colleagues in the department, is responsible for further processing and improvement of injection moulded products. Everyone has a special task, and in the case of Ms. Riethmüller this is deburring, punching, inspecting and testing finished injection moulded

parts. She ensures that our products are delivered in the customary quality. After all, she is the interface between ENSINGER and the customer. Of course, standing in for each other is the order of the day in the department, and so Ms. Riethmüller also has practical experience of tasks like drilling or sinking. Ms. Riethmüller is also very active in her free time. When time permits, she enjoys doing various kinds of needlework, and she loves travelling. She combines the latter with her hobby, fell walking. But she has even left her traces in Moscow and St. Petersburg...



## Successful Completion of Training

### Nufringen

Andreas Pfeffer and Stefanie Joos have passed their final exams as toolmakers, Andreas Pfeffer with excellent results. We would like to thank Mr. Lehmann, their instructor, for his commitment, and congratulate the two young people on their success in the final exams.



### Cham

At the presentation of the certificate Mr. A. Alsasser and Mr. M. Lang-lechner had the pleasure of congratulating the successful young tradesman Manuel Schuster on his good performance in the trade of milling mechanic – turning technology.

### Obituary

*We mourn for our employee and colleague of many years*

#### Mr. Wolfgang Wolpert

*who died on Tuesday, the 8th of January 2002 after a long illness.*

*Mr. Wolpert had been active in our company as an electrician since the 10th of August 1981. We knew him as a responsible, honest employee.*

*Our sympathy and condolences go out to his family and relatives.*

*We will always remember Mr. Wolpert.*

## Impulse-Interview

### 5 Questions to Dr. Heimo Bieringer



Dr. Heimo Bieringer has worked for ENSINGER GmbH since 1994. A native Austrian, he is Manager of Technical Marketing in Nufringen and Managing Director of ENSINGER-SINTIMID GmbH, located in Lenzing, Austria. Bieringer studied chemistry at the universities of Vienna and Mainz, specialising in the physical chemistry of plastics.

What advantages does the technical high-performance plastic as opposed to other materials have, what does the ENSINGER sculpture *The little lateral thinker* symbolise or are there any new trends visible in the plastic sector – impulse has spoken about this with Dr. Heimo Bieringer.

*Where do you see the advantages of technical high-performance plastics, as opposed to other materials?*

Plastics for human use are still relatively young, compared with metals or ceramics. The development of new applications is therefore growing rapidly. The driving force is, for example, to better conserve our raw materials, to increase productivity, or to improve our quality of life. For the most part, these require the use of plastics with quite specific characteristics.

*Are there any new trends visible in the plastics sector?*

The development of new technical plastics, even commercially available ones, is in stagnation at present. The trend today is towards exploiting low-priced, standard plastics with suitable additives. The use of plastics in medical technology stands in contrast to this. Here, particularly high demands are made, and it is here that products with special combinations of characteristics are to be expected in future.

*ENSINGER now has 36 sales and manufacturing locations world-wide. How important is global presence for a company*

*that manufactures technical high-performance plastics?*

That way, we can improve the degree of service to our customers, many of whom are themselves active world-wide. So we are in a position to deliver quickly and cheaply. The high standard of our Quality Management system guarantees the customer continuity in the characteristics that he desires. We can quickly recognise and fulfil customer requirements. "Global thinking" is the catch-word everywhere – including ENSINGER GmbH. In May of this year, our firm established GEN. The acronym GEN stands for Global ENSINGER Network. The main object of this initiative is to intensify the utilisation of world-wide synergies to continuously improve service to the customer. The future will see increased co-operation in the areas of sales, marketing, application technology, and material flow at an international level.

*ENSINGER markets the high-performance plastic VESPEL® (manufactured by DuPont) in Germany and the United Kingdom. What is special about this plastic?*

VESPEL® plastic has characteristics that you will not find anywhere else, even with high-quality thermoplastics. Many of the applications of VESPEL® are therefore positioned between metals and ceramics. Its foremost characteristic is its heat resistance, which is why it is often used as a material for friction bearings, with examples ranging from simple cake-mixers to aircraft engines.

*The K 2001 in Düsseldorf saw the first presentation of the ENSINGER sculpture "The little lateral thinker" by artist Otmar Alt. The sculpture consists of a total of 42 high-tech plastic parts in different qualities of material that are specific to different sectors of industry. What have ENSINGER and "The little lateral thinker" got in common?*

Off the cuff, I'd say that, for me, the sculpture symbolises the capability of ENSINGER GmbH to work out unconventional solutions, offer them to the customer, and demonstrate new ways of doing things. Fortunately, ENSINGER have a lot of experienced "non-conformists" among their employees, who do their best day by day to make this work. *The little lateral thinker* of Otmar Alt is also a symbol for our philosophy Ask. Think. Succeed. He stands for our Engineering expertise and high-tech plastics.

## ENSINGER manufactures rack for LuK

### High-precision parts made TECAMID

Racks are used in a so-called gearbox actuator developed and assembled by the global automotive supplier LuK. In a conventional manual-gearshift vehicle, gearbox actuators replace the mechanical gear-shift linkage that connects the gear lever with the gearbox. The gearbox actuator relieves the driver of the task of engaging and selecting the gears, and the manual-shift vehicle can be operated optionally in automatic mode or Tiptronic mode. One of the elements connecting the electric motor and the vehicle's gearbox is the rack. This part must be capable of transmitting high forces in either direction. Because of the internal construction of the gearbox actuator, the shift mechanism requires a compensating connector. This is the area between the two ball-and-socket joints of the rack, which is made of the structural plastic TECAMID 66 GF25 TF10 mod. This glass-fibre reinforced, semi-crystalline polyamide is remarkable for its extreme hardness and dimensional stability. This low-wear plastic can be used at constant operating temperatures of up to 110°C, and is therefore particularly suitable for heavily loaded and heat-stressed parts. The ball-and-socket joints are die-cast directly on to the component in one production cycle, thus joining the connector to the rack. The use of two-part technology reduces the

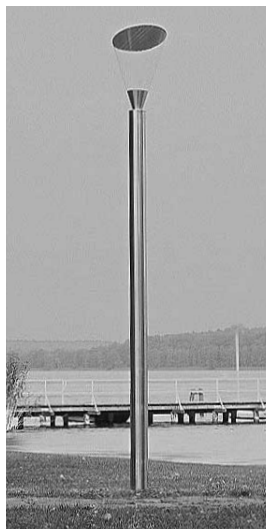


Rack for LuK: The two ball-and-socket joints made of TECAMID GF25 TF10mod. were cast directly on to the parts in a single production cycle by ENSINGER, using two-component technology.

number of process steps to a minimum, because the joint between the connector and the rack does not have to be elaborately assembled, and no locking parts are necessary. In addition, the specific ENSINGER configuration reduces the number of components in the actual functional elements, the rack and the connector. And because the ball pivot and the rack are aligned, no additional transmission links are needed. So LuK and ENSINGER have succeeded in producing a design that is extremely robust and at the same time very reliable.

## TUCAN: A Street Lamp with a Profile

### Primary reflector made of TECANAT



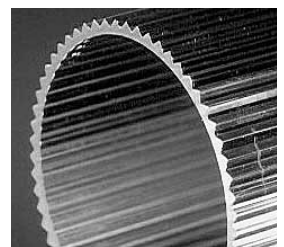
TUCAN Street Lamp

A street lamp that is innovative in design and economical of all resources: that's what uwe braun gmbh in Lenzen on the Elbe have put on the market. TUCAN is the name of the lamp that was designed by the office of Eckes:Design GbR – and which won them the Design Prize of the State of Brandenburg.

Looked at from the outside, TUCAN appears to consist of two parts: the 3.5 meter stainless steel post, 15.9 centimetres in diameter, and the 76 centimetre high cone made of polycarbonate with a stainless steel cap. All the electrical and electronic components, such as the fluorescent tube and the igniter, are inside the lower part of the lamppost. So maintenance is easy, because these parts can be replaced at ground level, without a ladder or platform. The light source at the foot of the post throws the light upwards. To keep the light rays from being absorbed by the stainless steel mantle, uwe braun gmbh looked for a light-conductive construction that would, on the one hand, reflect the light upwards into the cone, and on the other hand merge easily with the styling. The solution was found. A prismatic tube from ENSINGER, made of the amorphous, transparent engineering plastic TECANAT, was fitted inside the stainless steel post. This plastic is dimensionally stable, and shows excellent resistance to impact and deformation. It can be used at constant temperatures of up to 120°C, and is hardly susceptible to creeping. The TECANAT tube was extruded to the finest tolerances by the ENSINGER Industrial Profiles and Tubes Division – it is located directly over the light source and reaches up

to the cone of the lantern. The light rays are guided to the outer surfaces of the TECANAT tube by total reflection, and shine on the underside of the sloping cap of the cone. Here, the light is almost completely freed of dazzle, and shines downwards through the mantle of the cone at an angle of sixty degrees. The light falls only in a precisely circumscribed area, and the surface of the cone is only five degrees warmer than the immediate surroundings, so fewer insects are attracted and burnt than by traditional lighting.

In TUCAN, development has produced a street lamp which, with its modern, simple styling, merges well in housing estates and natural surroundings, and at the same times takes environmental aspects into account.



Prismatic tube made of the high-performance plastic TECANAT

## Practical at Putnam Precision Moulding Inc.

### Or Travellers' Tales



The engineering team in New York (l. to r.): Pete Erwin, Works Student Andreas Raap and Roger Wood

Well, this wish was very soon granted by the ENSINGER company. In the course of my studies, I had the privilege of doing a practical for ENSINGER USA at PUTNAM PRECISION MOLDING INC. (PPM) – a subsidiary of ENSINGER INDUSTRIES. I am happy to be able to look back on half a year in which I made good friends and got to know very pleasant colleagues, but also became familiar with the American side of the plastics industry. It's true what they say – it's another world! Not only geographically, but economically, too!

The little town of Putnam lies between Boston and New York in the State of Connecticut on the east coast of the USA. During my first drive on US roads – from the airport in Boston to Putnam – I'm afraid the colleague who picked me up didn't

get much conversation out of me. Impressed by the gigantic trucks on the highway and the beautiful landscape with its lakes and its fields surrounded by old stone walls, I felt like a latter-day conquistador of the New World. Or was it just that initial linguistic barrier?

Putnam Precision Molding Inc. is a die-casting company that specialises in inserts and high-temperature plastics such as PEEK, TORLON, or AURUM. PPM have more than 29 die-casting machines of 40 to 500 tonnes mould clamping force. They also have a product line of their own, Plastock. For this, toothed wheels, rings and belts are manufactured in

various sizes. At present, the company employs about 60 people.

I can heartily recommend a stay in the USA to anyone, be it as part of their studies or for personal enrichment. All the more when a company like ENSINGER offers you the opportunity! You enhance your personality, improve your English, and quite simply widen your horizon. The first time I saw the factory sheds of PPM Inc., the roofs and lawns were covered with snow. All too soon it was summer, and time to leave and bid farewell to the colleagues whom I can count among my friends since my short stay.

Andreas Raap

In my case, the story tells of an impressive six-month stay in the USA. Four years ago, when I started studying plastics technology, I dreamed of one day living and learning in the USA for a prolonged period!

## ENSINGER Inc., USA

### Award for e-commerce web site

Competition in the US magazine WebSphere Advisory [www.shopforplastics.com](http://www.shopforplastics.com) – that's the e-commerce web site address of the American ENSINGER subsidiary, which is located in Washington, Pennsylvania. ENSINGER Inc. wanted to launch a transactional e-commerce storefront to let their partner-distributors buy products via the Web. The goal was to maintain its channels of distribution and circumvent any competitor that had a small foothold in the U.S. plastics distribution market from coming up with a direct sales strategy using the Internet. ENSINGER Inc. also wanted to publish regularly updated inventory levels on the site and make sure every transaction had full accountability at each level of the process to adhere to ISO 9002 certification standards.

S. Mitkoff in the TECHNOMIX GmbH semi-finished parts store

buyers contract price levels. Inventory uploads and order status are updated throughout the day. ENSINGER Inc. wanted the site to offer more to its customers than even the friendliest customer service representative could. So, it wanted to add as many functions to the site as possible without putting off the less-savvy computer user. It appears it succeeded because many ENSINGER customers have switched from using the 800 number to placing orders online. In addition, even those customers who don't purchase products via the site still use it to obtain technical information. The obvious benefit is the cost savings, both in terms of telecommunications and personnel. In the first 13 months (during which time there was a five-month beta phase), ENSINGER Inc. did more than US\$1 million in online transactions. Over the past few months, as the economy has begun to contract, online sales have increased for ENSINGER.

## Trip to Bulgaria

### Björn Uhlken visits the Technomix company

In the middle of last December, Björn Uhlken (Export) was packing his bags again. After visiting Greece, he was continuing in a north-easterly direction. Bulgaria was the destination on this time. Plovdiv, to be more precise. Here, about an hour's drive from the capital city of Sofia, Uhlken paid the Technomix company a three-day visit. The company, which markets together with his qualified team of engineers, semi-finished products, has been an ENSINGER dealer since 1999. Managing Director Stefan Mitkoff and his three employees looked after their guest round the clock. Uhlken thus received a detailed impression of the Technomix company, and visited several customers in southern Bulgaria. "Many formerly state-owned companies are being privatised in Bulgaria right now. A lot of energy is being put into the effort to fulfil the economic criteria required for

acceptance in the EU", says Uhlken. Our man in Export described the hospitality that he had been given as



The TECHNOMIX team (l. to r.): I. Petrov, N. Ivanova, B. Uhlken (ENSINGER), D. Scheitanoff, S. Mitkoff



S. Mitkoff in the TECHNOMIX GmbH semi-finished parts store

overwhelming. "The people there are friendly, helpful and very open. I'm really looking forward to my next visit!"

## Karl-Martin Hess receives VDI-K Cube of Honour

### Award for outstanding service

Engineer Karl-Martin Hess has received the VDI-K Cube of Honour! At the annual VDI conference for material processing technology, which took place at the end of November 2001 in Baden-Baden, he was awarded the title for "Colouring of Plastics". The VDI Association for Plastics Technology honoured Hess' years of service in the development of the Council for Material Processing Technology, founded in 1974, in which he was active from 1989 to 2001 and served as chairman since 1994.

Hess, who studied mechanical engineering with emphasis on plastics technology at the Technical University in Stuttgart, has worked at ENSINGER since 1985. Hess' duties are many-sided. As manager of the Service Centre for Raw Materials and Technical Services,

he advises the ENSINGER divisions on questions of raw materials, and is responsible for the development, specification and modification of new plastics formulae. His area of responsibility also includes plant planning and installation, and maintenance of systems and operating supplies.



Karl-Martin Hess at the presentation of the VDI-K Cube of Honour

## QSF-B Certificate

### Product Division Mashed Finished Parts is certified supplier

The ENSINGER Product Division Mashed Finished Parts, located in Cham, is QSF-B certified! QSF stands for "Quality Assurance Requirements" and is a certificate issued by the Federal Association of the German Aerospace Industry (BDLI). QSF-B certification includes an AECMA-EASE audit, and here the ENSINGER division was able to score 18.2 out of a possible 20 points. This means that it is classed as an A supplier with the AECMA-EASE. The entry as a certified supplier in the central database of the 50 leading aerospace companies will take place shortly.

For designers and purchasers in the aerospace industry, the QSF-B certificate is an important "seal of approval." When a company or the division of a company receives this certificate, its products and production processes are sure to conform

to the high quality requirements of the BDLI. The ENSINGER Product Division Mashed Finished Parts was audited by the European Aeronautic Defence and Space Company (EADS), Augsburg.

