


# Bertrandt*magazine*

No. 1 • July 2003



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Renault Mégane – Boot space lining  
BMW 7 series – Outer door handle  
DaimlerChrysler – Truck light test rig  
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## Editorial

“Nothing endures but change,” said George Berkeley back in the 1800s. If we look at our lives and the way we work now, this saying seems more pertinent than ever. As a development partner we certainly operate in an industry characterised by constant change. For example, the market for development services experienced dynamic change in the 1990s. Where engineering service providers once acted as an extended workbench, today they are responsible partners to the manufacturing and supplier industry, decisively characterising the motor industry with their achievements and innovations. Bertrandt has used this change positively and views the new market demands as an opportunity. Today, with our 3,100 employees, we are one of the leading development service providers in Europe - with our overall objectives being to offer our customers first-class services and to be a reliable partner. To facilitate the change in external perceptions of our business, we have decided to give our customer magazine a facelift. A more modern style and a broad range of content will attract readers and give them a deeper insight into the Bertrandt world. From ‘bert’ comes ‘Bertrandtmagazine’, which will be published twice a year in three languages.

Please take the time to read about Bertrandt Engineering Network's services and don't hesitate to send your feedback to our editorial team so that we can work towards improving the magazine for you. To reiterate what George Berkeley said, “Nothing endures but change.”

Best regards  
Dietmar Bichler



## The Opel Zafira OPC – powerful sportvan with distinct forms. Bertrandt wins order to develop the exterior sports kit.

The Zafira OPC captivates at first sight: Dynamic lines support the sporty appearance, suggesting driving fun and superior performance. Clear the way for the sportvan, for those of you who don't just want driving to set their pulse racing. The proof of this is confirmed by some of our colleagues who have already experienced the effect of its dramatic curves.

## Opel Zafira OPC

### ► Scope of the project

In the summer of 2000, Zender Industrieprodukte GmbH received an order from Opel Special Vehicle GmbH (OSV) to develop the complete exterior sports

Technikum Ehningen,  
Bertrandt Cologne,  
Bertrandt Rüsselsheim,  
Bertrandt Tappenbeck

kit for the Zafira OPC. For its part, Zender chose Bertrandt to be its expert development partner for the project. The components involved include the development of the front and rear bumpers, wheel housing plates front and back, trim and the sill and tailgate plates. Between June and November 2000, data was scanned, the surfacing and data control model (DCM) generated and the components designed at Bertrandt. Bertrandt Rüsselsheim acted as the interface for all involved – Zender, Opel International Technical Development Center Special Vehicle Engineering (ITDC SVE), ITDC Design and three other Bertrandt branches.

### ► Digitalisation in Tappenbeck

The go-ahead for Bertrandt came mid-June 2000. Bertrandt Tappenbeck scanned in the clay model created by Zender. To do this, the Tappenbeck team worked with GOM-Atos, a highly-sensitive photo-optical scanning system. The data obtained was passed on to colleagues in Cologne.

### ► Surfacing at Bertrandt Cologne

The entire surface development of the components took place at Bertrandt's branch in Cologne using ICEM-Surf software. Within six weeks, the surfaces on the Tappenbeck colleagues' points cloud were created. Since the zero data from the scan can deviate and cannot always be implemented as a tool, Bertrandt Cologne polished the surfaces to ensure feasibility and quality. After a lot of going to and fro between the engineers and designers, the surfaces of the vehicle were brought in line.

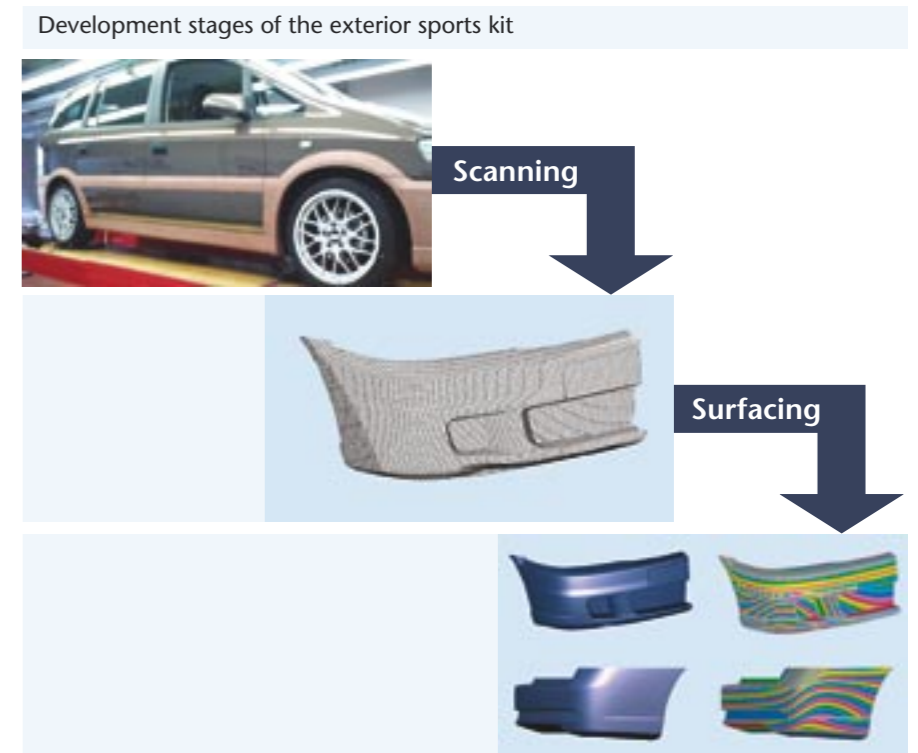
### ► Component design and supplier management in Rüsselsheim

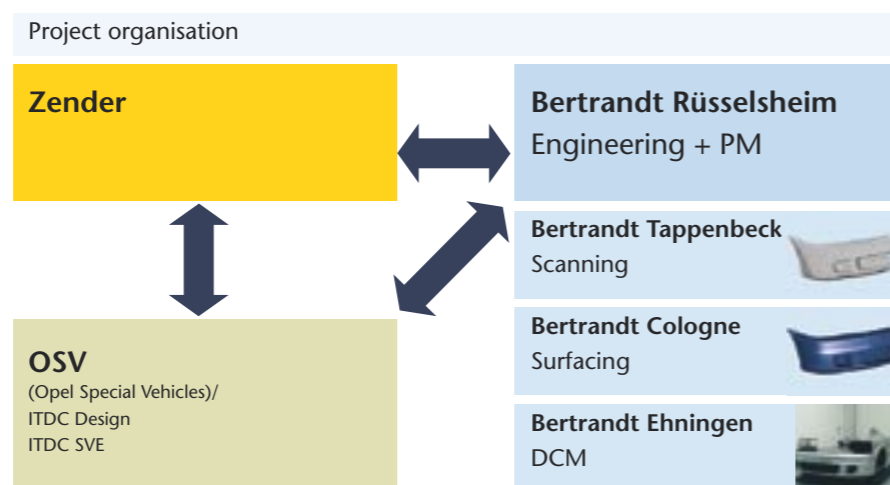
Using the surface data, the tool-based design of the components and connections on the vehicle was carried out at Bertrandt's Rüsselsheim branch. In this way, the Bertrandt branch in Rüsselsheim was the interface for the magic triangle, OEM - supplier - development partner, for the duration of the project. Co-ordination of the Bertrandt branches, the Opel areas of Styling and Special

Vehicle Engineering and Zender took place from this site. At joint project meetings, the current status of the various areas was always assessed and the next stages of the project discussed.

### ► Data control model from Ehningen

The Ehningen model builders produced the data control model from the data obtained from the surface development and the first connection designs. The DCM served as the basis for the design freeze which took place in September. Thanks to the rapid generation of the DCM, the Rüsselsheim branch was able to use the tool-based development of the data and meet the planned handover date of the approved component data to Zender at the end of October. In November, Bertrandt officially completed the project with the production of the drawings. Due to the good co-operation between the project partners, the prototype was presented at the Geneva Motor Show in March 2001.





### ► Summary and outlook

The interface management of the Zafira OPC project took place across several Bertrandt branches. The successful running of the project confirms that the Bertrandt Group works as a network internally and can guarantee the customer the best possible output based on the specialist knowledge of the various

branches. Bertrandt would like to thank Zender and Opel for their co-operation and the company looks forward to working together on the next project. Due to the success of the Zafira OPC, Opel is offering a styling kit as a facelift for all engine variants – designed and developed with Bertrandt. ■

In an interview with the editor of *Bertrandt magazine (Bm)*, Dieter Körner, Head of Product Development at Zender Industrieprodukte GmbH, talks about the partnership with Bertrandt on the Zafira OPC projects and the future importance of project and development partnerships.

*Bm:* Mr. Körner, when placing the contract for the development of components for the exterior sports kit for the Zafira OPC, you chose Bertrandt as your partner. What were the main reasons for your choice?



*Dieter Körner:* This decision came about as a result of many years of working with Bertrandt. Originally, we collaborated on rails for Ford. Collaborating on some joint projects, we got to know Bertrandt Cologne and we have grown up together over the years. It's extremely important to have a reliable partner in the development area with whom we can swap ideas, initial-

## “In a fair partnership we live off each other.” Interview with Dieter Körner, Head of Product Development at Zender Industrieprodukte GmbH

ly with regard to know-how and then later, from person to person. We've also been working together on projects from other clients in the meantime. It works well, since Bertrandt is at home in the German and European motor industry.

*Bm:* What did you think about the cooperation in this project, in particular, considering the involvement of several Bertrandt branches?

*Dieter Körner:* We benefited from the “all-round, stress-free package”. Bertrandt not only produces designs, but also generates the models. Working with four sites was not a problem. A central contact is always available to us who ensures coordination on site at Bertrandt. So, for the entire duration of the project, we always worked with the relevant specialist which is precisely how we want it where details are concerned.

*Bm:* In your opinion, does the partnership have room for improvement?

*Dieter Körner:* For us as the customer, the bottom line is a very harmonious partnership. The communication between the partners is good, the information flows. And that's what matters.

*Bm:* Mr. Körner, do you think that partnerships should take on a more important role on the project level?

*Dieter Körner:* In my opinion, it's getting more and more difficult

for sole players. Orders are becoming more and more complex and cannot be taken on individually. In future, we'll need a cooperative of suppliers. A network of specialists who complement each other as partners and improve the running of the project. That applies from a technical and commercial point of view. In this respect, partnerships are very much something to aim for.

*Bm:* In your eyes, what is a fair partnership?

*Dieter Körner:* Besides the business aspect, a good partnership is based on interpersonal relations. You get a good feeling for one another and you are willing to do more for them. In a partnership, each player must mutually accept and jointly support an issue in order to achieve the best possible solution. However, in a fair partnership I also see an interplay. The old relationship of customer and supplier has gone. If you're the customer today, you may be the supplier tomorrow and vice versa. An exchange of roles takes place. These days, system suppliers or development partners are a lot closer to the car driver than before. The game might well shift and then the partnership will show its true value. In a fair partnership we live off each other and to this extent the collaboration is desirable and worth working towards.

*Bm:* Mr. Körner, thank you for the interview and for your honesty. ■

# Renault Mégane



**Cross-border collaboration: Borgers and Olbrich develop the boot space lining for the new Renault Mégane with Bertrandt.**

Systems supplier Borgers-Olbrich, specialists in textile lining, have chosen Bertrandt France to be their partner in the development of the boot space lining for the new model of the Renault Mégane. The reason behind choosing the Bertrandt's French branches was due to the good experiences the supplier had with Bertrandt Cologne on a past project.



Storage space in the boot of the Scénic.

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**Bertrandt Bièvres  
Bertrandt Strasbourg  
Bertrandt Cologne**

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► **Background to the project**

The German-based Borgers-Olbrich Group is known for its specialist knowledge in the field of textile linings such as in the development of the boot space for the new Renault Mégane II (5-door and 3-door).

The development of these vehicles which is tied to a tight schedule has entailed constant attendance at Renault's 'Technocentre', the centre for concept studies and development, in Guyancourt near Paris – and also required fluent French and extensive knowledge of the work of the car producer.

As a consequence of these conditions and to be able to meet Renault's wishes, Olbrich, Borgers' tool manufacturer and developer, has assigned a French development partner to fulfil these requirements. As a result of Olbrich's good ex-

perience with Bertrandt Cologne on a previous development partnership, the choice fell to Bertrandt's French branch in Bièvres.

► **Scope of the project**

The work involved in developing the boot space can basically be divided into two main areas.

1. Concept development: involves feasibility studies on developments in the design area, the definition of geometric shapes taking into consideration the specification criteria and geometric limitations, the definition of the interfaces in collaboration with Renault and the system suppliers, together with the planning and realisation of the data generated.

2. Renault also brought Bertrandt into the further technical development of the project, including interfaces, quality management and the assembly process, who then worked with the development of the boot space linings until production-ready.

## Renault Mégane



The new Mégane Cabriolet.

### ► Division of work between Paris, Strasbourg and Cologne

Bertrandt Bièvres was then moved on to working on the lining circumferences for the Renault Mégane. Due to the tight schedule, the Bertrandt branches in Strasbourg and Cologne were also integrated shortly afterwards.

At the start of 2001, work began with the development of interior concepts for the entire model range. The concept development for the Cabriolet, the Scénic and the Grandtour then took place in Paris.

To keep to the narrow deadline and to ensure 100% quality, the Strasbourg and Cologne branches took on tight

development timeframes for a short time. The linings for the saloon were developed in Strasbourg while the preliminary studies for the Grandtour were conducted in Cologne. The development of the Grandtour circumferences could then be moved back during the project in France in the spring of 2002 where they were then completed. Bertrandt France is currently supporting the kick-off for the last vehicle in the new Mégane II model range: the extended Scénic.

### ► Summary

The cross-border collaboration between various partners required a great

degree of flexibility on the part of all those involved. Bertrandt sees these projects as an enrichment in many respects. For example, on the linguistic level: discussions were held in English or French to ensure that those involved in the process understood the same criteria and solutions. An interpreter was supplied for the Italian partner only.

An additional challenge was the technical work which was approached by the Germans, French and Italians in three different ways. This, too, had to be coordinated and brought to a successful conclusion. Another aspect was the extensive know-how which Bertrandt

## Renault Mégane



gained in the manufacture of textiles and related technologies.

On the other hand, Bertrandt was able to take its knowledge to Renault. Excellent reactions and the interlinking of the various Bertrandt teams in Europe contributed to the success of the partnership with Borgers and the satisfactory conclusion of the project.

Bertrandt would like to thank the teams from Borgers and Olbrich in France and Germany for the confidence shown in the company during these projects and for the very good working relationship which built up during this time. ■



### Development stages in the field of linings:

- Feasibility studies
- Concept development
- Design and development having regard for some parts, international specifications, rules, standards and product specifications
- Interface management
- Project management, including monitoring of data and plans, feasibility checks, risk monitoring, project progress checks and database archiving
- Quality management, e.g. standardisation
- Technical documentation in all development phases
- Prototypes and testing

# BMW 7 series outer door handle



Door apron and handle recess lighting enables more comfortable and safer access to the vehicle.



Following an 18-month development period, the department for locking systems at Bertrandt's branch in Cologne has unveiled the outer door handle for the new BMW 7 series saloon. The innovative handle was developed in collaboration with Bertrandt's client, Huf Hülbeck & Fürst GmbH & Co. KG.

## Bertrandt Cologne

The handle has many technical refinements. One of the challenges for the team was posed by the height compensation caused by special installation criteria. By using a gear, it transfers the rotation of the locking cylinder to a paddle which meshes into the lock nut.

### › Door apron and handle recess lighting

A special feature is the apron and handle recess lighting designed for Huf to fit within a very narrow fitting space, and realised using fibre-optic waveguide technology. BMW came up with the original idea for this equipment variant which enables more comfortable and safer access to the vehicle. The idea was that, after the lock has been deactivated by remote operation, the area in front of the door is illuminated. The task for the project team was to integrate a light-emitting body in the form of a fibre-optic waveguide, designed to illuminate the door apron and the handle recess, into the door handle. German company, Hella, and the light technology department at Bertrandt's branch in Cologne, were involved in the devel-

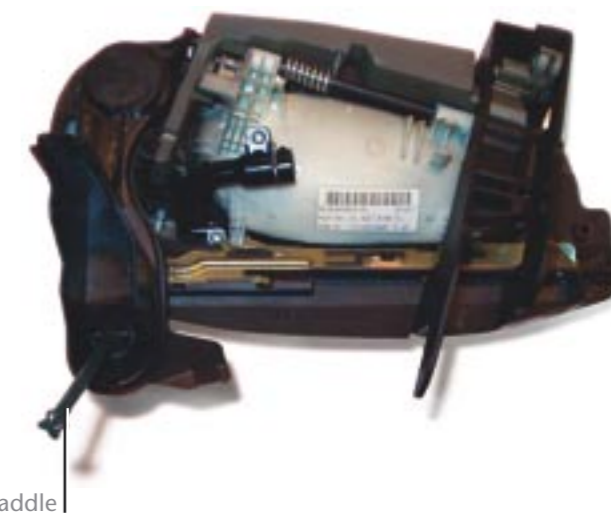
opment, which took place in close collaboration with BMW engineers. The main waveguide lights up the apron and branches to the recess which is illuminated on activation of the key. The biggest challenge was to fit the light-emitting body and the branch into two specifically designed openings. The light-emitting body also had to be embedded in a housing to protect against dirt and spray.

### › Installation tests

The housing encases the light-emitting body within an upper shell and a lower shell with the relevant catches and seals. Following installation tests, a screw-in movement was chosen, which would allow a smooth turning action when fitting the light-emitting body and its housing to the rear wall of the shell. In their end positions, the housing and the light-emitting body push against two domes such that they can be fixed at these points. It also had to be considered that the whole unit – comprising of the handle with pre-assembled light-emitting body – could be fitted to the door with a turning action. Since Bertrandt supported the development of the handle and the light-emitting

body, the Cologne branch acted as the interface for the exchange of information between Hella Innenleuchten Systeme and Huf Hülbeck & Fürst GmbH & Co. KG.

Many of the discussions between the project managers from the three development partners involved took place at Bertrandt in Cologne. ■



Light-emitting body and housing: Protected from dirt and made functional through innovative development work.



The functional handle of the BMW 7 series with door apron lighting as one of its finer details.



The Technikum Ehningen develops and builds truck light test rig. Test rig tests in Tuttlingen and Finland.

## Truck light test rig

In late summer of 2000, the test department was asked by DaimlerChrysler to build a light test rig for truck headlamps. This test rig was needed to run a benchmarking exercise of different headlamps from different manufacturers in order to determine the optimum illumination of the road and compare performance.



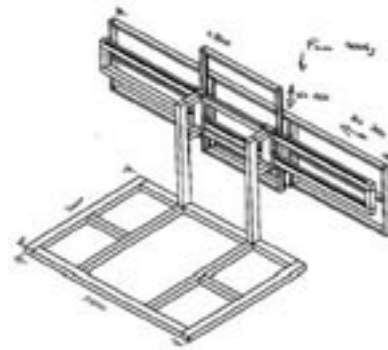


## Truck light test rig



### ► Requirements concerning the test rig

To allow a proper comparison to be made, it was necessary to adapt various headlamp pairs to the test rig simultaneously. The test rig also has to allow for different vehicle heights, made necessary by the different heights of commercial vehicles. For example, there is the normal road truck used for local transport, but also a low liner for long distance volume transport and the site truck which is very high, to guarantee maximum ground clearance. Consequently, headlights are installed at different heights and also at different distances, depending on the manufacturer. Another requirement was fully automatic control to allow operation outside the truck. Bertrandt supplied DaimlerChrysler with a completely equipped cab as the basic platform for



First diagram of the test rig.

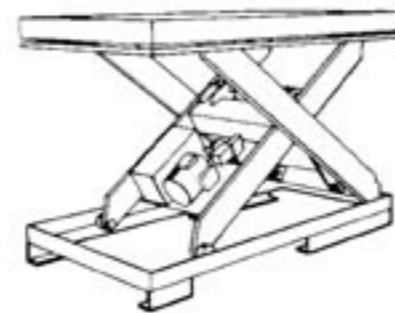


Diagram of the telescopic lifting platform

## Truck light test rig

the test rig. So that the height of the cab could be adjusted, and therefore the various vehicle types represented, Bertrandt employees decided to use a telescopic lifting platform. This meant that the test rig could be raised by up to one metre. A standard Actros flatbed truck chassis was used in the first stage to transport the machinery weighing a total of 2.5 tons. With the aid of an additional adapter, the truck could be driven under the raised test rig and then lowered again with the aid of winches, making the test rig a mobile facility.

### ► First test and modifications

After a development period of three months, the truck light test rig was finally ready for use in November 2000. The height could be adjusted and six headlamp pairs could be fitted and tested at the same time. The programmable control unit was integrated in switch cabinets in the cab – ready for the first test – at an airport in Tuttlingen, which was monitored by Bertrandt. After this first use on site, the test rig was expanded again. For example, the aim was to simulate the conditions experienced by a truck driver, i.e. correct seat height and instrument lighting, usable screen-wipers, secondary heating, electric windows – all the functionalities of a cab. The test rig was also developed further so that twelve set positions could be started up automatically at the press of a button. The positions were divided over three headlight pairs.

### ► Use in Finland

The next test took place in Finland. A custom-made low loader was used to transport the rig, which has interior lighting, work areas, sockets and a separate power supply. The test rig was equipped for winter operation – down to  $-40^{\circ}\text{C}$ .

The test rig, low loader and a convoy of other trucks went to Finland in the care of two Bertrandt staff in December 2001 in order for light tests to take place on an airport apron. A safety check and a few small adjustments were made and the headlamp pairs

provided for this test were mounted on the test rig.

**An important precondition for the test is an unbroken, white surface, as provided in Finland.**

The results are more accurate if no edge phenomena such as bushes or ditches disturb the vision. The tests were carried out in close liaison with the DaimlerChrysler superstructure/test department, EL/A-V. The tests were successful and the results obtained provided conclusive information on the improvement potential.

### ► Knowledge

Two permanent Bertrandt employees and seven temporary employees were allocated to the project. Since the test rig is unique and no standards exist, it also serves as a good example for revealing intelligent solutions down to the smallest detail. For example, the exact alignment of the vehicle is guaranteed with a rifle sight. Another challenge was to find components that operate reliably at temperatures down to  $-40^{\circ}\text{C}$ . The test rig is returned to Bertrandt from time to time in order for additional functionalities to be installed. In addition to the test results obtained for DaimlerChrysler, this project has also enabled Bertrandt to develop further its expertise in the manufacture of special test rigs. In particular, the information obtained about cold conditions can be transferred to associated areas. ■



▲ A total of six headlight pairs can be mounted on the test rig in parallel.

▲ The telescopic lifting platform raises the machinery weighing 2.5 tons.

▲ The test rig is transported on the specially made low loader



# technology and design

The successful combination of technology and styling

“What’s design all about?” This question puzzles people the world over, whether doing the daily shop in the supermarket or selecting the right mobile phone. Design is undisputedly one of the most important features of a good product. And when the subject changes to motors, everyone has a different idea of what design, appearance and styling is all about.



The Bertrandt Technikum design team in Ehningen sees design as the search for optimum solutions - in terms of use and the emotional demand for individuality, image, status and personality. For designers at Bertrandt, this means taking co-responsibility for the best possible service in the interest of the customer “from sketch to final”.

An example would be the new ambulance by maker of special vehicles, Binz, developed together with Bertrandt designers. In developing the ambulance, technology and design were successfully combined.

#### ► Requirements analysis

The development of a vehicle starts with basic research into the necessary features. Throughout the process, the end customer is kept firmly in mind. In the case of an ambulance, these first analyses are particularly relevant, since the functionality for the ambulance staff and the emotional effect on the patient are extremely important. The required flexibility in use also places high demands on the assembly, so practicality lay at the heart of the project from the outset.

For this project, the developers and designers from Binz and Bertrandt moved right away from the classic idea of a

steel structure to a sandwich construction of reinforced fibre. In addition to the reduction in weight and manufacturing costs, this also permitted new freedom in expressing the form of the vehicle.

#### ► Design and styling

An ambulance represents the combination of two concepts: rapid assistance and security. Consequently, the basic idea of the design is the analogy with a flying angel. The design suggests the idea of this symbolic figure via the shape of the window contours. The “healing” wing stretches symbolically over the person lying within. The idea is that the high side wall of the vehicle conveys the feeling of protection and safety. Such a dynamic idea symbolises rapid assistance.

The attributes of a traditional ambulance have also been incorporated. The beacon light required by law was

## Styling at Technikum

fully integrated within the outer skin. In addition to high-quality optics, this also provided benefits aerodynamically and a reduction in the noise level. Another example of the innovative design are the additional taillights in the rear spoiler of the ambulance. The designers opted for LED lamps in this instance as they require less fitting space and also facilitate the integration of several functions in one lamp.

#### ► Implementation

During the 12-month development phase, the engineers often took unconventional paths where design and technology were concerned. Except for the first concept sketches, the use of CAD and CAS software was deliberately chosen. All outer surfaces were created digitally which enabled a par-

allel assembly and styling test and design verification to be generated on the monitor. Reverse engineering, in which clay models are produced, was dropped from the agenda. Throughout the process lively discussions between engineers and designers took place. These are vital to the process if a functional and top-quality product is to be the end result.

#### ► Summary

Design is a lot more than simply the dressing up of existing structures. The knowledge of past experience and general interrelations forms the basis of total product development. It is very much characterised by creative people who can look beyond the usual parameters. Design not only makes things beautiful, but also useful. ■



In co-operation with the project development laboratory of the Department of Physical Technology at Jülich Technical College, Bertrandt Cologne has been developing the Ergoseat.

The motivation behind Bertrandt's branch in Cologne was to improve both comfort and passive safety and to make new inroads into the area of seat development. The project began in spring 2000 and was based on a systematic study of various dummies, varying greatly in specification depending on use. This work was supported by the project development laboratory of the Department of Physical Technology at Jülich Technical College. The aim was to develop a backrest as variable and adaptable as possible.

► **The background**

Even apparently ergonomically designed backrests tend not to fit the occupants adequately. Particularly short or tall people are especially affected since their upper body length cannot be taken into consideration properly from a design point of view. The result is that, among people with long upper bodies, their heads are positioned a long way from the headrest. The rule tends to be that the closer the headrest is to the head, the better support it gives to the head in a critical rear-end crash. The results speak for themselves.

► **Ergoseat I**

After reaching a concept decision, the following principle to adapt the seat variably to the needs of the user was chosen.

The lower section of the backrest (lordosis) – coloured grey in the diagram – moves linearly 50 mm upwards. The upper area (shoulder/head support) moves 150 mm upwards and, in combination



**Ergoseat I**

5% female



95% male



**Ergoseat II**



5% female



95% male



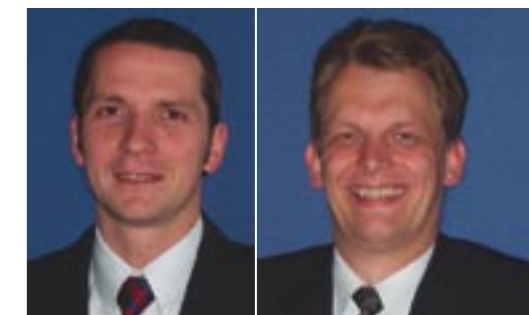
with that, forwards to keep the gap between the head and headrest constant. This principle has the advantage that a conventional seat substructure can be used, making it an adaptive backrest.

► **Ergoseat II**

To reduce the number of components and achieve a height-optimised seat position for the occupant of the vehicle, the backrest concept was expanded into an integrated seat system. In this concept, the lower backrest section (lordosis) remains fixed. The seat - coloured turquoise in the diagram - moves 50 mm downwards. This means that only a height adjustment of 100 mm is necessary for the upper rest area (shoulder/head support). The combined movement of the upper backrest forwards and upwards has been retained.

► **Presentation at the IAA 2003 in Frankfurt**

The reaction to this innovation at previous customer presentations has been very positive. For this reason, the Bertrandt Ergoseat II is being presented to those in the industry at the IAA to demonstrate Bertrandt's expertise in developing genuinely innovative products. We look forward to your visit to the Bertrandt Stand A 07 in Hall 3.1. ■



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## Material processing with laser beam at ZR

For some years now, the range of services offered by the Bertrand Group has been broadened by the laser centre operated by ZR Bertrandt, one of its subsidiaries. As part of the automotive development process chain of Bertrandt, the metalworking arm ZR, is responsible for the manufacture of pre-series metal prototypes and tools, ranging from components up to small series.

**At the laser centre at Zapadtko and Ritter GmbH & Co. KG (ZR), three-dimensional laser cutting is used to achieve fast processing times when making prototypes and also producing series parts.**

### ► Focus on laser cutting

Laser cutting is the main material processing operation. 3D laser cutting equipment is used to cut steel and aluminium parts of every finish, quality and thickness 3-dimensionally, precisely, without any problem. Fast processing times and also the ability to handle curved surfaces are other significant advantages when producing metal parts. ZR has four installations in a production area measuring approximately 800 square metres (gantry or cantilever) with a cutting power of 2000 Watts each. They can machine components

with a chucking area of up to 4500 x 2500 mm and a component height of 800 mm.

All the installation systems are directly connected to the programming stations. Consequently, changes or corrections to the cutting programs can be made at the installations or at the relevant programming stations. The programming systems used are CATIA and TEBIS. Interfaces with customers' CAD systems and data transfer by ODETTE or e-mail assure the transmission of design data. ■



Table sizes of the laser installations	
OPTIMO 1	3200 x 2250 x 540 mm
OPTIMO 2	4500 x 2500 x 800 mm
RAPIDO 1+2	3200 x 1525 x 510 mm

### Fixtures made by Work Holder Production

Fixtures made by Work Holder Production are needed to secure metal components in the installations. ZR makes these fixtures according to customer specification both with reference to reproducibility and resilience of the material, in Work Holder Production housed at the laser centre. These interfaced machines guarantee short through-put times.



For further information, please contact Klaus Battling, Head of the laser centre, Phone: +49 7946 9105-128 or e-Mail: klaus.battling@de.bertrandt.com

## The FMEA as a Quality Assurance method

In order to reduce development times and cut costs, it is particularly important to market intelligently designed and tested components.

At Bertrandt, experience has shown that Quality Assurance is a worthwhile investment as a part of the product development process. That is why, in addition to the development and design of components, modules and derivatives, the Bertrandt Group also offers Quality Management, right throughout the process from initial concept, up to and including the start of production and series monitoring.

Failure Modes and Effects Analysis (FMEA) is now an established, tried and trusted, preventive quality assurance method, forming an essential part of quality pre-planning and helping to guarantee that weaknesses are detected at an early stage. The aim and benefit of the FMEA is preventing defects rather than merely correcting them and so costs associated with rectification work can be reduced and quality improved. Consequently, the FMEA should be prepared as early as possible during the development stage in order to be able to include possible risks at precisely the right time.

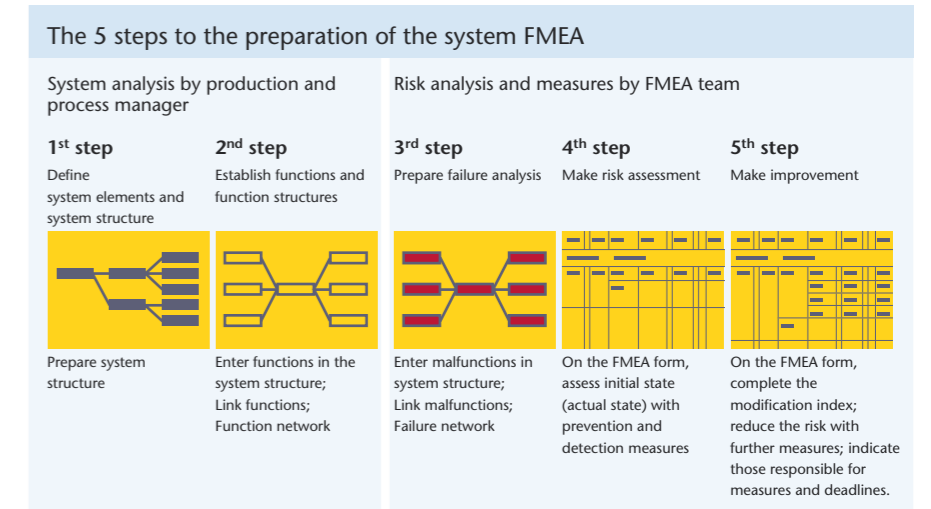
A distinction is made between a Product FMEA (also known as a Design FMEA) and a Process FMEA. Software from APIS and PLATO is used to document the FMEA.

### ► The methodic structure of the FMEA

The FMEA is divided into five different stages (see diagram). It starts with system analysis (Step 1), moves to function and failure analysis (Steps 2 and 3) before risk assessment (Step 4) and optimisation (Step 5).

The individual failure modes are evaluated via the factors "seriousness, probability of occurrence and probability of detection". Each of the three factors can achieve a value of between 1 and 10, so that the highest possible risk priority index (RPI) is 1000. The higher the RPI, the greater the need for action. This is

**An important module in the early stages of product development.**



defined by the action to be taken and the person responsible for that action. The action to be taken within a predetermined time ensures that the desired improvement is achieved. There may be several optimisation loops, depending on the RPI value.

### ► Benefits of FMEA: "Zero defect target" becomes feasible

Quality Assurance is also becoming increasingly important with reference to the costs incurred or image damage caused by product recalls. For example, changes to tools and equipment can be reduced drastically by integrating the QA methods available at an early stage and then continuously throughout the development process.

In order to be able to achieve the highest possible benefit from the FMEA, experts from various sectors (e.g. Design, Development, Testing, Production, Quality Assurance, Service etc.) form the FMEA team during the concept phase of product development. This interdisciplinary co-operation encourages an exchange of experiences and can trigger synergistic effects.

When the FMEA moderation has been completed, the documented results are presented to the customer. Any final errors are then corrected before the FMEA is finally approved.

As a result of world-wide globalisation, Quality Assurance is playing an ever more important role in daily efforts to open up new markets. As a development service provider, we support our customers in marketing perfect quality products quickly. We will tell you about other Quality Assurance methods in future issues of the *Bertrandt magazine*. ■

Bertrandt sees potential for further improvements in product development with the introduction of ENOVIA.LCA.

## Product Data Management challenge

In the last few years, Bertrandt has systematically built up the integrated product development process. As part of this process, internal procedures and also the complete vehicle development processes were analysed and the tech-

one of the main development systems for Bertrandt. The company opted in favour of ENOVIA.LCA (LifeCycle Applications) from Dassault Systèmes as the technology for implementing and supporting the processes. Bertrandt wants to use the advantages of software from a single source and also the many years' experience of Dassault as a software manufacturer of CATIA, DELMIA and ENOVIA. Another integration partner is IBM, the technology group (Business Consulting Services – BCS), which is a market leader in implementation and consulting in the PLM sector.

When, in August 2002, the software products of "ENOVIA Lifecycle Applications" - ENOVIA.LCA for short - was granted official "Global Availability" status by the manufacturer, Dassault Systèmes, the first LCA software and system components had already been in the test stage at Bertrandt since the previous year.

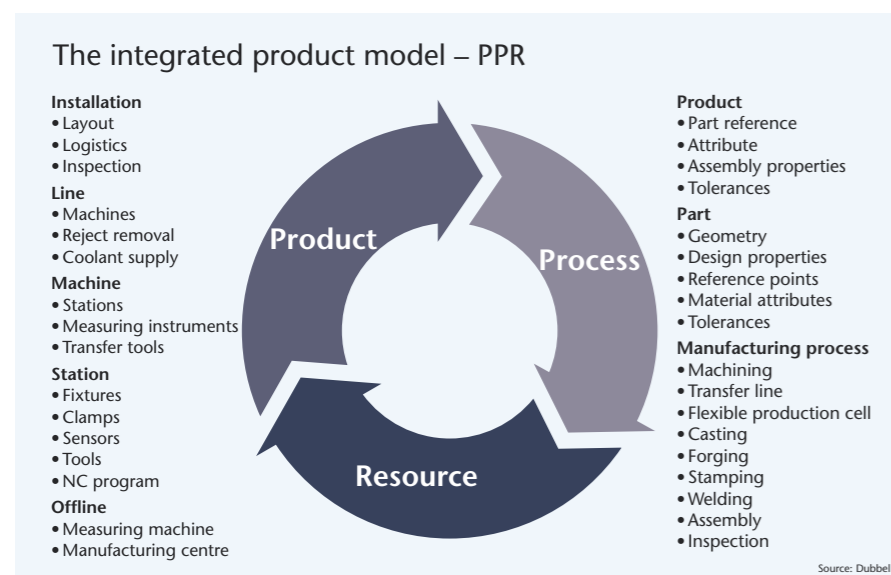
## Product Lifecycle Management System ENOVIA.LCA

The aim of using the Product Lifecycle Management System is to improve the efficiency of the handling of integrated products, such as complete module and derivative developments as part of a professional project management approach. "The integrated PLM system solution from IBM and Dassault Systèmes allows us to simulate each aspect as part of the overall development process. Before the production of a vehicle actually starts, design, function and support and also production processes can be analysed," says Bernhard Zechmann, who is Head of CAx strategy and is also responsible for the introduction of ENOVIA.LCA at the Bertrandt Group. "With ENOVIA, we are in a position to use process improvements and an even more reliable change management system, which improves the development and production processes at an early

stage and shares this knowledge with our customers in a CATIA working environment, also taking various quality aspects into account."

As a technical information, organisation and data management system, ENOVIA.LCA covers the complex requirements for a company-wide integration platform for all development applications that generate and use data. The processes upstream and downstream of development are also simulated in a product-process-resources model. The process-controlled co-ordination increases transparency of

## Integrated process chain – Product Lifecycle Management with ENOVIA.LCA at Bertrandt

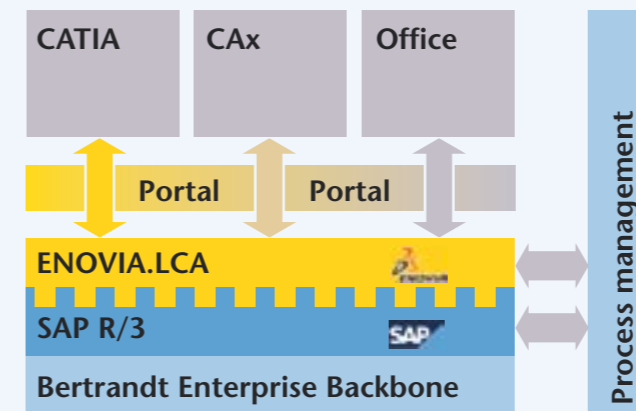


The digital-product-process resources model combines all the geometric, functional and technological information of a virtual product.

nologies used were examined in more detail. The aim was to set up a Product Lifecycle Management (PLM) system based on existing solutions in order to develop both processes and technology on a standard user platform in the future.

For example, various PLM systems on the software market were analysed according to process and system requirements. Particular attention was paid to the integration capability of the Enterprise Resource Planning (ERP) system, SAP R/3 and also the CAD software CATIA V4 and V5 used at Bertrandt. Occupying approximately 650 workstations with around 800 users, CATIA is

## Bertrandt subsidiaries

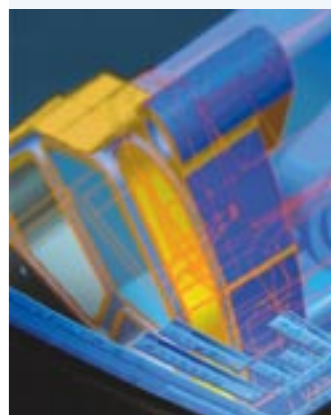


current projects, ensures the continuous transfer of project know-how and improves the use of resources. "There are also advantages for our customers in terms of higher quality of machining and result," says Bernhard Zechmann. Bertrandt sees itself well armed for the future to continue to improve the use of advanced technologies – such as complex development and production processes and internal economic planning and logistic processes. Following the successful start of the pilot project in October 2002 at Ehningen, the roll-out of the system throughout the Bertrandt Group will now take place in stages. ■

Product Lifecycle Management (PLM) from the point of view of digital engineering. Linking of product and process data management with the aid of ENOVIA and SAP on a standard user platform.

In addition to the CAx systems Unigraphics, I-Deas, Pro/Engineer and ICEM, Bertrandt is also using some 650 CATIA workstations in the company at the moment. All the software systems used by customers and suppliers – for example, for digital mock-up, calculation, simulation and electrical/electronic areas – are available within Bertrandt.

The cover picture gives an impression of CATIA V5.



### Innovative services from Bertrandt

The EU scrap car guidelines of September 2000, implemented in Germany as the Scrap Car Act, have had a huge impact on car producers. The statutory harmful substance bans often entail considerable costs for the producer. Despite the various exceptions to these substance bans, the Act requires a new way of thinking which must be put into action early in the development and design phase. This way of thinking must also incorporate additional requirements of the Act which are concerned with the reuse, recycling and utilisation quotas for cars or the duty of the manufacturer to provide information on the reusable and recyclable content of its cars and components.

#### ► Eco<sup>2</sup>-Design at Bertrandt

At Bertrandt, these services for automotive manufacturers and suppliers are summarised under the name of Eco<sup>2</sup>-Design. They have already been brought into line with existing law. "Eco<sup>2</sup>" stands for ecological and economical engineering services.

Because a car is a very complex product, the whole product lifecycle from development to reuse must be taken into consideration.

That's why Bertrandt resolved to offer its customers extensive services in Eco<sup>2</sup>-Design early on. By spring 2002, an interdisciplinary cross-branch team had been formed. Over several intensive training days, staff from the various branches were able to familiarise themselves with both the legal requirements and their consequences.

#### ► Requirements and implementation

The provisions set out in the Act require manufacturers and their suppliers to provide information on the make-up of their components. The International Material Data System (IMDS, see [www.mdssystem.de](http://www.mdssystem.de)) has in this respect established itself as the international standard. On behalf of the manufacturer, suppliers are required to reproduce the specifications of their components for the database. The material data sheets can be generated for complete components, semi-produced products or materials. Security of data is assured by the allocation of authorisation levels. The system enables the material data of a complete vehicle to be illustrated.

For Bertrandt, maintaining the IMDS is not only important where the cus-

tommer is concerned, but also when taking on product responsibility for major projects.

Observation and conformity with the harmful substances ban starts early at the planning stage for new developments. Where existing series are concerned, those components affected by the ban must be identified. If clear identification is not possible, the relevant components must be analysed in the laboratory. Bearing in mind the exception rules, substitution options are available permitting the use of suitable substances.

To meet the requirements of the dismantling and recycling legislation, it is important to ensure universal and environmentally-conscious product development as early as possible in the process chain. The stipulated re-

cycling quotas can be met by provided dismantling plans which are drawn up for all vehicles as well as recycling concepts which are drawn up for the various components. Inspections are carried out later using dismantling recycling analyses.

#### ► Eco<sup>2</sup>-Design conference to be held on 3 July 2003 in Ehningen

Even taking the above into account, there remains a host of questions unanswered in the industry. For this reason, and to provide our customers with the relevant know-how, Bertrandt is arranging a one-day conference. It will be called: "Eco<sup>2</sup>-Design: the automotive industry's answer to the provisions of the scrap car regulations". Speakers from the worlds of politics, industry and research will present necessary in-

formation as it currently stands and initiate the exchange of information.

The conference will take place on 3 July 2003 at Bertrandt in Ehningen. The talks will range from the current situation and outlook for the legal requirements through practical insights into various manufacturers with a focus on light-weight construction, material and harmful substances plus product responsibility, to ecobalancing across the entire product lifecycle. Bertrandt will give two talks from the point of view of a development service provider. The day will conclude with a tour of Bertrandt Technikum in Ehningen. ■

### Ecological and economical grading

- Assembly and dismantling tests
- Dismantling plans, dismantling investigations, creation of dismantling manuals
- Material flow balancing, ecobalancing, material flow management
- Substance ban list
- Disposal- and recycling concepts
- Recycling analyses
- Creation of material databases
- Costs and yield calculation for the entire product lifecycle (Life Cycle Costing)

In view of the universal ecologic and economic product life cycle of a car or component, Bertrandt offers the complete range of services in the Eco<sup>2</sup>-Design field in partnership with such organisations as the IPA or external service providers.

### Environment and recycling-based product creation

- Recycling-based design of vehicles and parts
- Material investigations
- New design of parts with regard to manufacturer-specific and statutory Recycling requirements
- Generation of recycling and reuse concepts
- Universal environmentally-based product development (Design for Environment)
- Inclusion of the provisions of the scrap car-law (formerly the EU-scrap-guidelines)

### ► Programme

#### Product responsibility in the automotive industry – requirements and the need for action

- Dr. Helmut Schnurer (German Federal Ministry for the Environment)  
**Influences of the scrap car regulations on the automotive industry**  
Overview of the implementation of the legal provisions and outlook

- Klaus Ruhland (DaimlerChrysler AG)  
**The need for action in the automotive industry following the new scrap car rules**  
Influences and trends on design and strategies for meeting the reuse provisions

#### Product responsibility in the automotive industry – trends and strategies

- Dr. Siegfried Schäper (Audi AG)  
**Implementation of the scrap car regulations**  
Effects of the provisions of the scrap car regulations on light-weight construction and material selection

- Gerhard Wörle (BMW AG)  
**Ecological optimisation in product development**  
The ecobalance – an efficient instrument for meeting product responsibility

#### Automotive industry solutions – documentation and avoidance of certain materials and substances

- Hans-Walter Heidorn (VW AG)  
**Current and future demands for material data**  
Estimates and the first experiences of a car producer

- Harald Schenk (OPEL AG)  
**Effect of the EU scrap car guidelines from the perspective of a producer**

- Peter Scholz (Bertrandt Rüsselsheim)  
**Solutions and support opportunities at Bertrandt AG**  
Practical example of the support provided by OPEL AG in the harmful substances problem

- Prof. Joachim Schmidt (Braunschweig/Wolfenbüttel technical college)  
**Dismantling study**  
An instrument for environmentally-conscious and recycling-based product development

#### Solutions of the automotive industry – product lifecycle management

- Sven Haug (smart GmbH)  
**The ecological product responsibility of a development service provider**  
Transfer of product responsibility through OEM supplier regulations

- Michael Walther (Bertrandt AG)  
**Assumption of total responsibility for the new development of a vehicle**  
Practical example – smart crossblade – meeting product responsibility through Bertrandt AG

- Dr. Martin Hieber (Fraunhofer IPA)  
**Implementation of life cycle management (LCM) in product recycling**  
Methods and practical examples from DFE, LCM, recycling networks



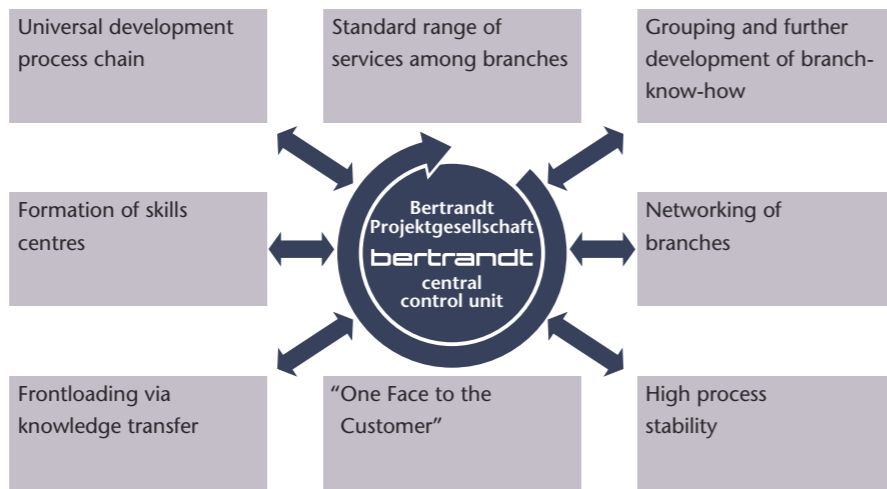
**Eco<sup>2</sup>-Design conference to be held on 3 July 2003 in Ehningen**



From the left:  
Dr. Bert Welzel  
Raimund Busse  
Andreas Meyer-Eggers  
Thomas Lück  
Thomas Rossié

Bertrandt AG																						
Engineering				Hardware				Bertrandt Projektgesellschaft				Administration										
Branches				Ehningen				Ehningen				Branches										
Shells	Doors / covers	Interior / battens / design	Exterior	Electrics / electronics	Powertrain / chassis	Vehicle integration	Engineering services	Model construction	Rapid technologies	Testing	Vehicle build / Manufacturing supplies	Quality management	Project management	Simulation / safety	Complete vehicle / technology	Production planning	Logistics / startup management	Partner management	Finance	Human resources	Facility	Information management

The services areas which make up the Bertrandt Engineering Network



Successfully managing complex projects

Your BPG contacts for each of the areas

Project management:

In the development of vehicles, project management has a co-ordinating and controlling role and is responsible for the entire project both internally and externally. It involves pursuing project goals such as schedules, quality, degree of maturity and financial requirements and ensuring these goals are met.

Raimund Busse, Phone +49 7034 656-5353  
Thomas Lück, Phone +49 7034 656-8134  
Andreas Meyer-Eggers, Phone +49 7034 656-5514

Successfully managing complex projects

The awarding of major development initiatives by car producers and systems suppliers to engineering partners such as Bertrandt is done on the basis that the partner has extensive expertise in the handling of demanding, extensive projects.

To underline Bertrandt's expertise at developing integrated vehicles, the full range of services offered by all branches are now concentrated into one project company, Bertrandt Projektgesellschaft mbH, acting as a central control unit. The entire know-how and all aspects of the complete development of vehicles have been controlled and co-ordinated by this central control unit from its site in Ehningen since October 2002. Together with the Bertrandt branches, experience in areas of project management, complete vehicle development, technical calculation, vehicle safety plus logistics and supplier management are combined and subject to constant further Development. The new company takes over the overall control of complex modular and complete vehicle projects and, through continuous project management, guarantees the high process stability which is imperative for a successful outcome to this type of project. ■

Questions to ...

Jürgen Michels, Member of the Board of Bertrandt AG and Managing Director of Bertrandt Projektgesellschaft mbH

Bm: Herr Michels, what were the reasons behind founding Bertrandt Projektgesellschaft (BPG)?

Jürgen Michels: The change in, and expansion of, our activities towards large, complex projects such as derivative development pushed us in this direction.

Bm: The unique feature about Bertrandt is its decentralised organisation. In this new structure, what part do the local branches play with respect to the customer?

Jürgen Michels: The decentralised sites remain an important part of our key to success, in large projects as well as in smaller ones. They form the network co-ordinated by BPG for such projects. The individual branches provide the development resources and operate the product development process in the form of work packages. The combination of the capacity and specialist knowledge of several branches through BPG makes the whole range of services even more attractive to our customers. That's why, of course, the confidence built up over the years has top priority.



"The confidence built up over the years has top priority."

Bm: How far did the BPG idea extend so far?

Jürgen Michels: The complex projects we're talking about typically last several years. BPG is only 7 months old. However, it is already showing positive effects. For BPG, we have chosen people from our ranks who have all the relevant project experience and who can pass this on. We're on the right path.

Bm: Please summarise the advantages of BPG in one sentence?

Jürgen Michels: With BPG we have made a central control unit which follows all the processes of a complex project from the drawing up of a quotation to project acceptance, and which can represent the Bertrandt Group externally. ■

Complete vehicle development:

The complete vehicle area is responsible for the integration of modules into a complete vehicle. This area includes simulation and passive safety, for example, as well as total test solutions such as function assurance and vehicle physics.

Thomas Rossié, Phone +49 7034 656-4544  
Dr. Bert Welzel, Phone +49 7034 656-5284

Prototypes/logistics and supplier management:

The control of all physical parts and means of production necessary for product development or a subsequent small series is handled by the prototypes/logistics and supplier management area: from tool control through parts and vehicle logistics at the development stage to the production and assembly of components or the production of small series in partnership.

Thomas Lück, Phone +49 7034 656-8134

## 10 years Ginsheim-Gustavsburg

It's a case of having the right gear.

Volker Schier, branch manager, talking to a customer.

This nostalgic gem delighted visitors.



### Customer event provides insight into company capabilities. The Ginsheim-Gustavsburg branch celebrates 10 years in the business.

The Bertrandt Ginsheim-Gustavsburg branch celebrated its tenth birthday in May 2003. Peter Dorling, a Member of the Board of Bertrandt AG, and Branch Manager, Volker Schier, welcomed around 150 representatives of big-name automotive industry customers to specialist lectures and talks at a wine growers' buffet.

During his speech, Volker Schier looked back on ten successful years. As an operations branch of Bertrandt Ingenieurbüro GmbH Sindelfingen, the office started out in 1992 as a design department and a team of four employees at the Rüsselsheim site. In response to the positive acceptance shown by the regional motor industry, the current engineering office was subsequently opened in 1993. In April 2001, the company moved to a new building in the commercial area of Ginsheim-Gustavsburg, where 225 members of staff now

work and where separate project offices for system suppliers are also available. "A consistent focus on the needs of our customers and a high level of quality has always been important," said Mr Schier. The range of services offered has been gradually expanded and today it includes areas such as component development and specialist subjects such as electrics/electronics, quality management and drivetrain through to complete vehicle development. Thanks in part to its close geographic proximity, optimum co-operation with main customer, General Motors, and its system suppliers and subcontractors in the region has been made possible, stressed Mr Schier. The team has also worked in co-operation with Bertrandt subsidiary, Sweden AB, on projects for Saab and some staff are currently working on a project at Fiat in Italy. As part of a symposium, Bertrandt showed its customers its development expertise by holding specialist lectures using, as one of its examples, the total development of a niche vehicle. Further topics under focus came from the areas of vehicle safety and ecological total responsibility in vehicle development. ■

## Successful appearance

### A successful appearance at the "small IAA" fair Bertrandt Tappenbeck at the second component manufacturers' fair at CongressPark Wolfsburg.

The second component manufacturers' fair was held in Wolfsburg in March of this year. Bertrandt demonstrated its range of capabilities to the visitors.

The commitment of the staff at Bertrandt Tappenbeck has finally paid off: 1,000 visitors arrived at the stand of Bertrandt's development partner to find out more. Technical discussions were held with customers and any potential job applicants received detailed literature on the company. Bertrandt Tappenbeck attracted a great deal of attention with its smart crossblade and, in addition to this "eye catcher", the company also introduced itself in a five minute film and at two points of information.

#### ► High attendance

On the first day of the fair, more than 8,000 visitors passed through the gate. 24,000 people visited in three days, compared with just 11,000 over the four days of the first component manufacturers' fair in December 2001. The third day was also a "job fair". Many school children and students and also experienced people visited the Bertrandt stand. On that day, visitors not only had access to engineers, but also to people in the personnel team. Press feedback was also positive: the

The smart cross-blade, a real eye catcher on the Bertrandt stand.



"Wolfsburger Nachrichten" reported that "Bertrandt had also brought along additional personnel people to the job fair."

Bertrandt Tappenbeck was delighted with the level of interest shown at the fair and it intends to be back at the next component manufacturers' fair in the autumn of 2004. ■

Bertrandt has had a subsidiary at Tappenbeck since 1995. The range of services includes technical documentation and concept processing and also design, calculation/simulation, electrics/electronics and virtual product monitoring, from design to installation. Production planning and also a workshop and test centre round off the facilities the company has to offer. Starting with a graphics and design department of 14, Bertrandt Tappenbeck now employs about 260 people. The Bertrandt Group offers development services for components, modules and derivatives under one roof. The range of services also includes mini-series manufacture in partnership.

## Open day at Bertrandt Neckarsulm

### Innovative services, new ideas, good relations Bertrandt welcomes customers to the new Neckarsulm site.

Mayor Volker Blust, and Gürsel Sen at a presentation of plastic art by Daniel Wagenblast.



Bertrandt Ingenieurbüro Neckarsulm opened the doors at its new site in Trendpark, Neckarsulm on Friday, 11 April 2003 with an open day held in glorious sunshine. Customers including Audi and Porsche, together with systems suppliers, were given a snapshot of the services offered by the Neckarsulm branch and the Bertrandt Group as a whole.

Ringed by the Audi RS6, the A3 and the smart crossblade, Chairman Dietmar Bichler thanked the many guests for coming and presented a brief forecast for the further development of Bertrandt. "Despite the current economic conditions, we can see good development potential which we will exploit to the full," reported Mr. Bichler. Gürsel Sen, Managing Director and host, explained the decision to choose the 'Trendpark' industrial area as the new site. "Its proximity to our customers is in line with the company's philosophy, which has proved to be an important element in our success," commented Mr Sen. He thanked all the participants for ensuring the construction phase had run so smoothly. Mayor of Neckarsulm, Mr. Volker Blust, welcomed the company and expressed his pleasure at the development of the industrial area, heralding Bertrandt

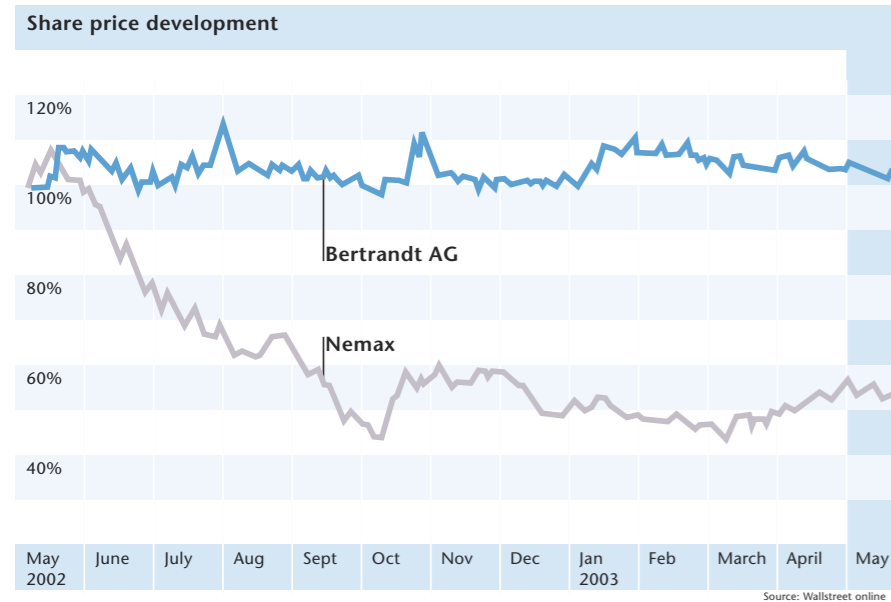
both as an example to other companies and as an important employer in the region.

Michael Neisen, Managing Director of Bertrandt Neckarsulm and Gaimersheim, enthusiastically talked through the various stages of the project as the visitors toured the new building for the Audi A3 5-door. The afternoon soon disappeared with the help of a hot and cold buffet and good conversation.

With its 90 staff, Bertrandt Neckarsulm works in the field of interiors, shells, lightweight bodies, assemblies movable roofs, bumpers and automotive electrics. At its test centre, parts ranging from bumpers to whole components, are pushed to their limits. The mutually complementary range of services is co-ordinated by an efficient project management team. ■



## Shares according to the Prime Standard



Compared with the "Neue Markt", the Bertrandt share has shown a positive trend in the last twelve months.

### Bertrandt lists its shares according to the Prime Standard

In February 2003, Bertrandt AG was licensed for the Prime Segment on the Frankfurt Stock Exchange. As an international company, Bertrandt wants to remain attractive to investors both in this country and abroad.

The Prime Segment listing means that investors are kept regularly informed and up to date about the development of Bertrandt AG. The listing on CDAX Automotive will remain. In spite of a difficult stock exchange environment, the Bertrandt share has remained stable. In the last few months, the share has remained constant between 16 and 17 Euro. ■

## Corporate calendar

02.07.2003	Presentation of Bertrandt's range of services, Supplier stock exchange Audi AG, Ingolstadt
03.07.2003	IKOM college milkround, IKOM Munich
03.07.2003	Eco <sup>2</sup> -Design conference, Bertrandt AG, Ehningen
04.07.2003	Investor meetings London
11.07.2003	Engineering career day, Stuttgart, Haus der Wirtschaft
15.07.2003	Investor meetings Frankfurt
16.07.-17.07.2003	Product lifecycle management at Bertrandt AG, EDM-Forum, DaimlerChrysler AG, Sindelfingen
22.07.-23.07.2003	Presentation of Bertrandt's range of services, Ford Werke AG Merkenich
August 2003	Quarterly report to 30 <sup>st</sup> June 2003
13.09.-21.09.2003	International automotive exhibition Frankfurt, Bertrandt-Stand A07, Hall 3.1

## [ Bertrandt in brief ]

### +++ Donation:

Ralph Jacoby, Member of the board and Karin Lentz, Personnel Manager, handed over 23,500 Euros, raised by Bertrandt employees, to the Mittelschule (Middle School) "Am Wallgraben" in Grimma, whose classrooms suffered serious flood damage. +++

### +++ Dividend:

At the General Meeting of Bertrandt AG in February 2003 in Sindelfingen, the shareholders accepted the proposal of the Board's Supervisory Board to pay a dividend of 0.15 Euro per share for the financial year 2001/02. +++

### +++ Company Contact fair:

Bertrandt regularly attends fairs and contact events for students, graduates and also experienced engineers. At the Company Contact Fair at Hamburg University, director Dietmar Bichler, and several company managers gave students information on recruitment and employment opportunities at Bertrandt. +++

### +++ Accreditation:

The test laboratories for environmental simulation at Ehningen, Gaimersheim, Munich and Rüsselsheim have been successfully accredited according to internationally recognised standards. In this respect, Bertrandt has been certified to perform both its own test methods and test methods devised in co-operation with customers independently. +++

### +++ Internet:

Bertrandt's internet page has been revised as part of the introduction of the Group's new image. The redesigned Homepage went on-line in June. +++

### +++ New premises

Bertrandt UK's Dunton premises have moved to new premises which allow the subsidiary to offer an extended range of services in the areas of concept, styling, pattern making and metal prototypes. The data transmission system has been extended and is used as an interface with customers. +++

### +++ Girls' Day:

Girls' Day gives young women an insight into the technical professions. Bertrandt Tappenbeck, Germany, opened its doors on 8<sup>th</sup> May and told 20 schoolgirls about recruitment opportunities open to them. +++

### +++ Motorsport

The Bertrandt team made a successful start in the Fiesta ST Cup. Although Ralf Martin won, Jürgen Rother from Bertrandt came a respectable tenth. +++

### +++ Half-year report:

After the first six months in the financial year 2002/03 (01.10.02 to 30.09.03), the turnover of the Bertrandt Group reached 106 million Euros and the operating result was 2.1 million Euros. +++

## Portrait Daniel Hurcombe

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**Daniel Hurcombe**

### **Managing Director of Bertrandt UK**

Daniel Hurcombe joined Bertrandt in Cologne as a freelance in 1998. At 31, despite being the youngest director at Bertrandt, he's already proved he has extensive experience in the automotive industry.

In 1993, after graduating in Computer-Aided Product Design from the University of Wolverhampton, he began his professional career at Dalton Farrow Engineering where he got a first taste of the automo-

tive industry. In his first role, he was mainly involved in the installation of production belts for the Land Rover Freelander programme. In 1996 he moved across the Channel to Germany where he joined the Ford Focus project at the former Pico Tooling AG. His job included the compilation of branch layout plans, cycle time analyses and clamping device and fastener plans. After a quick trip back to the UK, Daniel started at Bertrandt in Cologne, where he was appointed resident engineer for various customers of the development partner, Bentley. In this way he got to know the client extremely well, and worked there on the development of concepts and feasibility studies for new vehicles.

Back in England, Daniel was appointed team leader at Bertrandt in Leamington Spa. Heading a team of twelve, he was mainly involved in looking after Jaguar, with duties that included the further development of current projects plus body-in-white crash and safety upgrades.

In January 2000, he was promoted to head of the Leamington Spa branch which he managed through a very turbulent time – when BMW split from Rover. Despite the somewhat difficult conditions in the British motor industry, Daniel and his staff were able to report outstanding achievements for Bertrandt UK. Within three years,

sales increased fivefold and the number of employees almost doubled from 80 to approximately 150. Today, Daniel is Managing Director of the two Bertrandt UK branches in Dunton and Leamington Spa, and sees his goal as being to assure and cultivate long-term, stable customer relationships in order to promote the Bertrandt company in the UK.

The services offered by Bertrandt UK include the development of components and modules right through to complete vehicles.

Daniel, who has been a passionate snowboarder for 12 years, lives with his partner Sarah and their daughter Mollie, aged three-and-a-half. To relax, Daniel likes to head off into the countryside for a spot of fishing, with permission from his wife, of course. ■

Learn to drive ideas at Bertrandt

[www.bertrandt.com](http://www.bertrandt.com)



## At your service

### Bertrandt – 20 offices in Europe and the USA

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	<b>Detroit</b>	<b>Dunton</b>	<b>Ehningen</b>
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