

# Bertrandt*magazine*

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Ford Focus C-MAX – From Styling through to Series  
Bentley Continental GT – Bumper Development  
Opel Vectra Caravan – Development Partner of Interior Sections  
Bertrandt Engineering Network – Interior Development



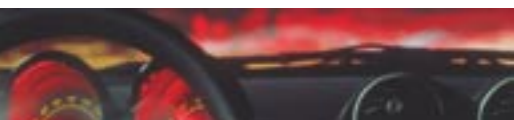
4 More Space and more Functionality



8 Spirit of Bentley



10 A whole New Dimension



18 Title: Added Value Enhancement for Vehicle Interiors

- 4 **Projects**  
 Ford Focus C-MAX From Styling through to Series • Bentley Continental GT Bumper Development •  
 Opel Vectra Caravan Development of Special Interior Sections •  
 Audi A3 Sportback Development of Special Interior Sections with Portrait Bertrandt Spain S.A. •  
 Ford Visos Multi-contour Seat Concept Study

18 **Bertrandt Engineering Network**  
 Interior Development Process as a Complex Integration Task

22 **Range of services**  
 Special Security Vehicles • Testing & Trials •  
 Data Management for Vehicle Power Network Simulations • Seating Training

28 **Bertrandt internal**  
 International Supplier Trade Fair • 30 Years Bertrandt • University Marketing • Trade Fairs •  
 Corporate Calendar • Portrait • Bertrandt Subsidiaries • Masthead



## Editorial

Car industry experts regard vehicle interiors as one of the major value added factors for the industry worldwide. As the interior is now responsible for 30 percent of the cost of the car, the trend obviously continues to develop. The interior plays an increasingly important role in differentiating a vehicle from its competitors.

The impact of the use of materials and special technical features on the automotive sector in order to add value can already be seen in the design and development phase of a vehicle interior. At an early stage, we began developing extensive expertise in vehicle interiors across all the areas of the Bertrandt Group. We can now use our internal network to make this expertise available to OEMs and systems suppliers in order to meet their requirements, regardless of where they are located. We can supply data to our customers which they use to create the components that characterise their brand.

In order to fulfil more complex requirements for vehicle interiors, we are constantly monitoring the market and continue to develop our skills by creating innovative solutions, such as the Ergoseat. This also applies to the fields of electronics, mechatronics and software, which are closely linked to the development of vehicle interiors. Around 300 of our employees work on the technical developments of the future. This is par-

ticularly important for vehicle interiors, as the number of electronic components is expected to grow significantly as a result of the new comfort features and infotainment applications being incorporated. By covering the entire integrated development process chain from the design and concept stage through development, simulation and safety features up to testing and ensuring that prototypes meet functional and legislative requirements, will we be well positioned to modify the interior packages offered on the market on behalf of our customers.

Our leading article gives you an overview of the interior development process as a complex integration task, accompanied by several reports of practical applications. In addition, this latest issue of the *Bertrandtmagazin* contains articles describing our extensive range of services, including design, exterior development and data management.

Take a look at the varied world of Bertrandt and our work on helping to develop cars that will ensure our personal mobility in the future.

Dietmar Bichler

## More space and more functionality

► **Design and exterior development**  
During the designing phase, a number of different 1:1 scale interior models (so-called "halfbucks") were produced on the basis of Ford's design specifications. These models were of very high quality and provided input for management in the next stage of the development process, which involved making decisions about the final production design.

All the visible surfaces of the exterior and interior of the Focus C-MAX were developed by a team consisting of up to twelve Bertrandt engineers from Cologne and Dunton, who worked closely together with the relevant departments within Ford. The CAD system ICEM-Surf was used during the process. In addition, was Bertrandt involved in the contract to supply the exterior sur-

faces of the bumpers, grilles and door sill trims for the sports package. The effective cooperation between the teams involved in the project had benefits beyond the development of the Ford Focus C-MAX. As a result of the high quality of the surfaces developed for Ford in Cologne, Bertrandt was asked to participate in other projects related to the vehicle exterior.

# Ford Focus C-MAX

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Bertrandt Cologne  
Bertrandt UK

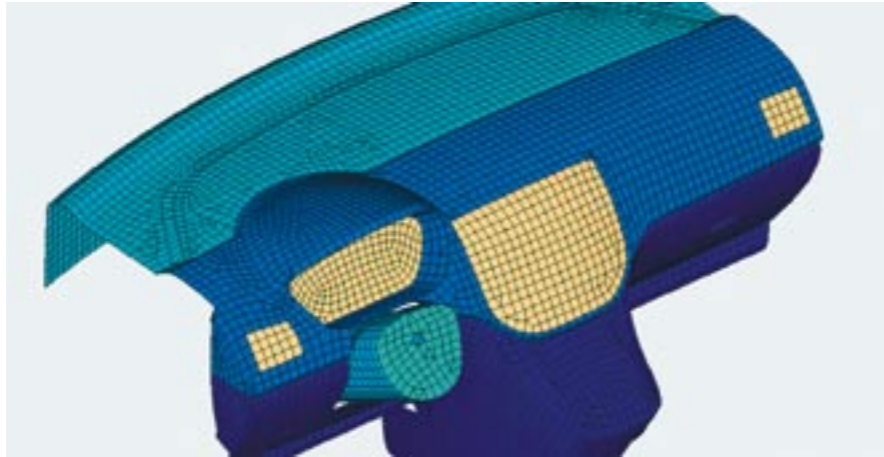
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At the start of the development process for the Ford Focus C-MAX, Bertrandt, as an engineering partner of the Ford Motor Company and its suppliers, had the opportunity to provide the high-quality services across a variety of disciplines. These had already characterised its involvement in the Mondeo and Fiesta projects, from styling right through to production release, production start and production monitoring.





## Ford Focus C-MAX



Cross national cockpit development – everything of the best.

### ► Bodywork development

The contribution made by the Bertrandt engineers to the development of the bodywork included the bodywork structure in the front area of the car, doors and tailgate, door handles and lock systems as well as interior trim. Bertrandt worked directly with Ford on the bodywork structure, doors and tailgate. The clients for interior trim, chassis and lighting were other Ford suppliers. The tasks carried out by the Bertrandt engineers ranged from project management and component development right through to support for production start-up as well as the monitoring of the production process at the Saarlouis plant.

### ► Cockpit development: industrialisation management

The cockpit development process demonstrates the versatility of Bertrandt's services. In order to meet the client's requirements as effectively as possible, a team of specialists from Bertrandt UK and Bertrandt Cologne was formed. As the client had moved into offices on the Bertrandt site, efficient communication between all those involved in the project was guaranteed. Industrialisation management was a particular challenge. Because of the high levels of complexity, the Bertrandt engineers developed and implemented an innovative and effective component

numbering and ordering strategy ("feature-based releasing").

The aim was to find a method of simplifying component numbering that took into account all the aspects of the development process chain, such as updating the "Ford Program Description Book" and the "Global Engineering Release System" and "Verification of Bill of Materials". The system had to run in parallel with the existing component database in the Saarlouis supplier park, so that both the Ford Focus and the Ford Focus C-MAX can be produced on the same production line.

In addition, Bertrandt provided claim management support for another supplier.

### ► Electrics/Electronics

The Bertrandt engineers were able to contribute the necessary expertise for developing and integrating the electrical and electronic systems and components. In addition, did they run a CAN training session designed specially for the customer.

### ► Overview

The variety of demands made on the Bertrandt Engineering Network during the course of this project, which Bertrandt met successfully for the customer, demonstrates the development service provider's wide-ranging and substantial expertise. Bertrandt is looking forward to continue the application of its expertise for the benefit of its customers in future. ■

## More space and more functionality



Generous vehicle space and functional details distinguish the Ford Focus C-MAX interior.

### Scope of the Ford Focus C-MAX project in brief

#### Body-in-White:

Bodywork structure:

- Front of the car – inner panels and wings
- Cowl and windscreen surround

#### Doors/tailgates/lock systems:

Door platform strategy  
Specifying the hinge axis  
Exterior door handle and tailgate handle

#### Interior:

Roof liner  
Door and side trims  
Boot trims  
Carpet  
Parcel shelf  
Cockpit and central console  
Rear seat system concept

#### Transmission:

Heat shields

#### Chassis:

#### Lighting:

Headlights  
Rear lights  
Interior lighting

#### Design:

Clay modelling

#### Surface design:

Complete surface development

#### Start-up management:

Plant Vehicle Team

#### Electrics/Electronics:

“People who take a lot of pleasure in their innovative work on cars.” This is how Body Development Department Manager Jan-Peter Scheele describes the people in his team. Three years ago it was a “one man band”, but it has now grown into a group of 15 enthusiasts that has demonstrated its capabilities many times already, for instance on projects for the VW Group. The development of the bumpers for the Bentley Continental GT was a special challenge, and after completion the young team was designated “Preferred Development Partner” for the Body and Hardware areas.

## A Strong Team for a Strong Partner

*Linked by the  
“Bentley Spirit”*

### The Bentley Continental GT project in brief

#### Exterior:

Front and rear bumpers

Radiator grille

Structural modules from draft design to series production

#### Vehicle construction work:

Sample measurement rig

#### Documentation:

PDM “body” sheets

#### Supporting Services:

FMEA

Tolerance Analysis

#### Rapid technologies:

Laser-sintered components as part-area models



### Bertrandt Wolfsburg, Bertrandt Neckarsulm, Technikum Ehningen

#### ► Project management at Bertrandt Wolfsburg

A project team was set up in Bertrandt’s Wolfsburg office as the best possible way to satisfy the client’s needs. This is the focal point of the activities coordinated by Jan-Peter Scheele. Together with Dynamit Nobel Kunststoff GmbH and colleagues at Bertrandt Neckarsulm, these experts began to tackle their cross-border project in Spring 2001.

#### ► Taking the impact out of bumper development

During the project, which involved complete development work on the front and rear bumpers from concept to series production, the Bentley factory in England became a “home from home” for various Bertrandt engineers. The language barrier was quickly overcome, and even English cooking, though something of a peculiar taste for the German palate, failed to dampen the project team’s spirits.

Bertrandt’s engineers were able to contribute their extensive plastics know-how at the product design and industrialisation stages. For the first time, partly parametered solid models with a very high level of technical manufacturing detailing were produced, with the result that subsequent modification loops were kept to a minimum. Another advantage was that the VW Group’s established process know-how was available for transfer to Bentley as a new client.

#### ► Satisfying wishes – passionately and completely, with no compromises

The British staff’s strong identification with its brand is another highly positive factor. A Bentley is a personal matter – for the developers, the shop-floor workers, the salespeople, and of course for the fortunate driver of such a fine car. Bentley’s aim is quite simply to satisfy the customer’s every wish. The team from Wolfsburg and Neckarsulm understood this “Bentley Spirit” and devoted all its innate skill and subtle approach to

enhancing the appearance of this exclusive car. Together with Senior Engineer Steve Laurie and Phil Hancock, the “Bumper Development” project was brought to a successful conclusion, as confirmed by the Bertrandt Wolfsburg team being appointed “Preferred Development Partner” in the Spring of this year.

Thomas Klingner, the Exteriors Team Manager, concludes as follows: “Bentley trusted us one hundred percent, and we delivered! Our team’s expertise, combined with ideas and a flexible approach, formed part of the secret. The team members imposed the highest standards on their own work and devoted themselves wholeheartedly to the task. This was a project carried out ‘by people for people!’” ■

An outstanding result – Jan-Peter Scheele and Thomas Klingner were content.



## A whole new dimension of Opel with Bertrandt

Thanks to its combination of elegant design, powerfully dynamic performance and a 2.83 metre wheelbase, driving Opel's new Vectra Caravan is a sheer pleasure. Based on the long wheelbase of the Signum platform, the load-length of the new estate has been extended and the rear of the vehicle completely redesigned. Bertrandt was commissioned as a key design supplier for selected project sections.



### Bertrandt Rüsselsheim

#### ► The project and its demands

The order included the development of the interior tailgate panel and load space side panels, as well as the sill panelling.

The side panel design was to provide for a system for flexibly adjusting the load space size, which had to be considered when development started.

What is more, is that it had to be compatible with package components such as the electrical system, body, cargo volume, black box, compartment for first-aid kit and warning triangle as well as access to rear lamps, the RZM (rear zone module) fuses, and the trailer hitch. The fold-away trailer hitch, which can be unlocked from the vehicle trunk, was used for the first time in the Vectra Caravan.

The interfaces to other specialist areas, like the vehicle body, electrical system, insulation and seats, fell primarily within the remit of Opel as a large number of different suppliers were integrated in this project.

#### ► Side panel design

Developing the side panel for the FlexOrganizer system, the integration of which was designed by Bertrandt, proved a particularly demanding challenge. A system was envisaged with two parallel rails on either side of the side panel into which various elements, such as dividers, net partitions, or hooks could be inserted.

Given the arrangement in the left hand side of the cargo area, it made sense to place the two rails 310 mm apart from each other. As the partitions

were designed to be fitted vertically or horizontally, the engineers integrated additional fixing eyelets in the rails at distances of 77.5 mm.

In order to absorb the forces generated during driving, the visible plastic rails were reinforced on the back of the panel with a steel rail attached via holders screwed to the body of the vehicle.

As a result it is now possible not only to fit three rods and a net which can be put to a multiplicity of uses, for example, but also to arrange cargo in a number of different configurations (L, V, A shaped for example) ensuring that loads never slip.

#### ► Rear window frame design and rear panelling

Thanks to close cooperation with the designers during the development of the rear window frame it was possible to make this element as one piece rather than in several components as originally planned. This became apparent after an analysis of the first styling design revealed that, by making just a few changes to its form, it would be possible to create a one-piece solution without having to go back to the design drawing board. The surfaces were consequently optimised and the one-piece solution implemented.

What is more, is that the new solution also proved to be more economical. Bertrandt's early involvement in the development of the interior tailgate panel meant it was also able to influence the design of the lock package. Bertrandt engineers designed a lid which almost entirely covers the lock – compared with previous models an innovation not previously feasible to

### Scope of the OPEL Vectra project in brief

#### Interior:

- Interior tailgate panel
- Side panel, including integration of the FlexOrganizer system
- Sill panelling
- Lock cover

#### Production planning:

- Optimisation of assembly order for the tailgate panel

# Opel Vectra Caravan

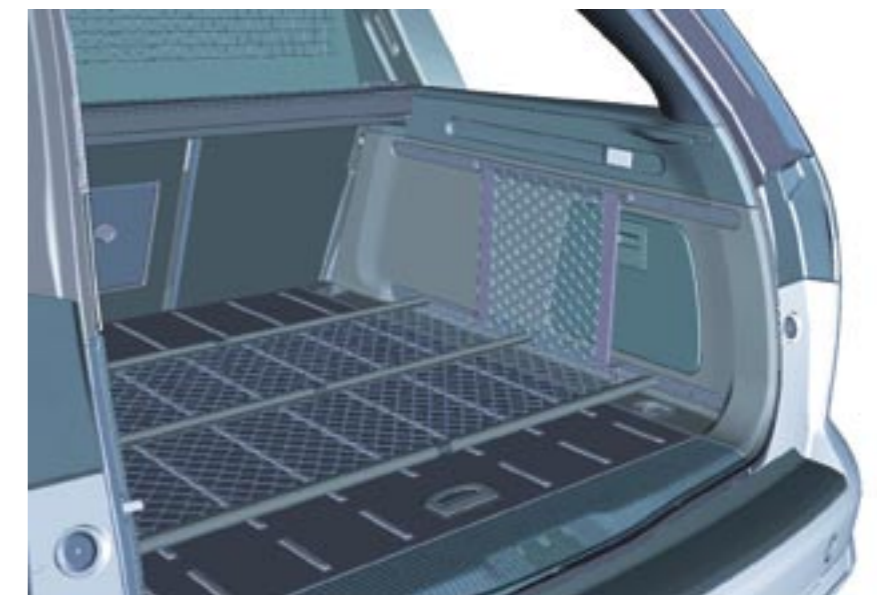


Rear side panel with integrated FlexOrganizer system:

Opel gets your load space into shape with its innovative FlexOrganizer system. With various nets and foldable dividers the load space can be adapted according to the customer's needs creating space for different sized or even fragile cargos.

this extent. This development resulted in a significant quality improvement in optical terms as the lock cover, which is usually visible for the customer, is now hidden away.

This innovation was also made possible by a change in the assembly sequence initiated by Bertrandt: the tailgate panel is now fitted after the lock has been assembled, which does away with the extra space needed for adjusting screws. ■





**Bertrandt Spain and Ingolstadt collaborate on the development of the Audi A3 Sportback interior**

The new Audi A3 Sportback promises even greater driving pleasure and an exceptionally spacious feeling. This should not come as a surprise because Spanish temperament and technical expertise from two countries are unified. During the development of the vehicle interior, engineering service provider Bertrandt showed how cross-border development can become a reality.

**Scope of the Audi A3 Sportback project in brief**

- Interior:**  
Greenhouse  
FMVSS 201U functional specification  
Concept development:
- Door trims
  - Lower trim components
  - Boot trims

**Component testing:**  
Head impact tests

# Audi A3 Sportback

reguera site, which is working on behalf of Seat and is located next door to the Seat plant in Martorell. This meant that the customer was given the best possible project support.

► **Development in Germany and Spain**

Bertrandt, a partner in the development of selected areas of the interior of the new Audi A3 Sportback, started work at the beginning of 2002. The Bertrandt engineers were able to draw on the skills and experience they had acquired during the development of the complete interior for the second generation of the Audi A3, which differed from the original model.

► **Mixed project team**

For Bertrandt Ingolstadt, this meant turning its long-term regional development partnership with Audi into a cross-border, group-wide collaboration. This project organisation allowed the skills from the sites in Ingolstadt, Neckarsulm and Esparreguera to be pooled together on behalf of the Audi brand group. The goal was to form a mixed project team of experienced engineers, half from the Bertrandt German sites and half from its Spanish company. The new structures and procedures were carefully tested and the differing approaches of the members of the international team were taken into account. This project organisation helped make it possible to transfer Bertrandt's long-term experience on Audi projects to the Espar-

► **English as the project language, plus CAD**

For the functional development in the FMVSS 201U field, there was a transfer of expertise from Bertrandt Ingolstadt to its Spanish counterpart. English was the language used in Bertrandt's internal meetings, and initial fears of communication problems proved to be unfounded. Both German and English were spoken in dealings with the client, and discussions also took place around the drawing board or the CAD screen, because technology speaks a language of its own that every engineer understands. Around 40 Bertrandt employees were involved in the project and collaborated with the relevant departments at Audi to bring the product to production readiness in autumn 2003.

► **A true European**

The result has been evident on the streets since September 2004: the Audi A3 Sportback. The experience of everyone involved in the project has demonstrated that the cross-border collaboration has produced highly successful results. Bertrandt is looking forward to the next project that will allow further collaboration. ■



# Bertrandt Spain S.A.

In Esparraguera, 40 km from Barcelona and next door to the Seat Martorell plant, the headquarters of Seat, the Audi Group company that specialises in producing cars with a more sporty character, you will find Bertrandt Spain S.A. The Bertrandt engineers offer a wide range of design, prototyping and engineering services to their main customer Seat and its system suppliers.

Bertrandt has been present in Spain for four and a half years. In February 2000, the company bought an 80% majority share in the well-established company Novel Lahnwerk Engineering S.A., which was founded in 1996 by Alberto Pallejà und Alberto Novel. Following its launch, the company began a period of strong growth and became one of Spain's leading service development providers.

Its core skills include CAD development, prototype construction and engineering services. Its highly-qualified and versatile engineering department is used to meeting a wide range of customer requirements, including providing mechanics to build press vehicles, project management support and data input for technical documentation.

The specialists in the prototype department build prototype products that they also take right through to small-scale production. The bodywork department can produce individual components and complete assemblies.

In the development department the focus is on doors, tailgates and bumpers for vehicle exteriors. As far as vehicle interiors are concerned, the engineers are experts in the development of door, pillar and boot trims as well as cockpits. In collaboration with other Bertrandt sites, Bertrandt Spain S.A. can offer all the services of the Bertrandt Engineering Network. ■



The contact for customers is Gerrit Schmidt, who has been Managing Director of the Spanish company since 1st October 2003 and has been at Bertrandt for six years (see the portrait on page 34).

# Ford Visos Multi-contour Seat



Ford Visos.

## Network develops innovative concept study

The Bertrandt sites in Cologne and Wolfsburg and the Technikum Ehningen collaborated to produce a very special seating system for Ford Werke AG in Germany: the Multi-contour Seat for the Ford Visos.

Ergonomic considerations are becoming increasingly important in the design of car seating systems. With this in mind and with the aim of producing a seat that could be adjusted to suit a specific driving experience, Bertrandt developed the Multi-contour Seat for the Ford Visos on behalf of Ford Werke AG, and in close collaboration with the Ford Research Centre in Aachen and Alfmeier Präzision AG. The project was launched in December 2003 with the objective of presenting a functioning prototype to the public at the Geneva Motor Show in March 2004. A set of design data formed the basis for the work, together with a 1:1 scale model that had been milled out of hard foam and a requirement specification describing the different adjustment options for the seat.

► **Ford in Dunton had overall responsibility**

The positive features of the project included the clear allocation of tasks, carefully defined interfaces and the collaboration between all the companies involved throughout the entire course of the project.

The Ford Technical Centre in Dunton, England, had overall responsibility for the Ford Visos show car, the exhibition stand and the styling. As a result of the positive collaboration between the designer, Paul Campbell, and the project managers, Alexander Ehrmann und James Kellerman, it was possible to adapt the design directly where this became necessary for technical reasons.

► **Ford Research Centre in Aachen defined the functionality**

Ford's Aachen Research Centre was responsible for defining the functionality of the Multi-contour Seats and coordinating with the supplier Alfmeier Präzision AG. As part of a pilot study, Dr. Karl Siebertz from the vehicle interior technologies department worked with Jeroen Lem to develop the technical basis for the new seat using a standard production seat. Dr. Siebertz was one of the people responsible for initiating this innovative project and acted as a positive driving force throughout the development process.

► **Alfmeier produced the comfort systems and electronic controls**

Alfmeier Präzision AG, which specialises in the development of seating comfort systems, produced the pneumatic comfort components and the accompanying electronic controls. Alfmeier proved once again to be an experienced partner, able to supply prototype components and systems within a short timeframe. (Alfmeier had previously provided support for Bertrandt during the development of

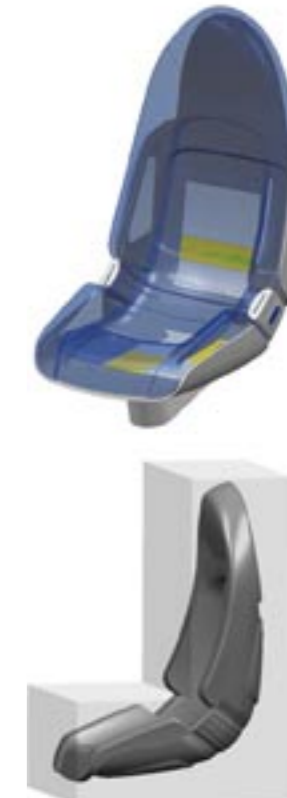
the Ergoseat which was on show at the IAA in 2003).

► **Bertrandt developed the seat structure, fittings and prototype parts**

The services provided by the Bertrandt Group during the first stage of this project included the development and assembly of the seat structure. The development work took place at Bertrandt's Cologne site, which was also responsible for the overall project management within the Bertrandt Engineering Network. This is where the structure was designed, taking into account factors such as strength, function, optimised installation space, ergonomics, design adaptation and seat cover fastenings.

As a result of the tight schedule, the engineers at Bertrandt developed a multi-component, carbon fibre, laminated seat structure that was quick to produce. The tools needed to make the structure and the foam components, together with the trim and the foam blanks, were manufactured in the prototype construction department at the Technikum Ehningen, part of the Bertrandt Engineering Network. The carbon fibre parts were produced in collaboration with a company from the racing world which specialises in lightweight structures.

The seat fittings, including the foam parts, trim and covers, were developed at the Cologne site in close cooperation with Bertrandt's upholstery department in Wolfsburg. This included the production of the surface of the covered seat and the creation of solid models of the foam parts, taking into account the additional curve needed to compensate for the tightness of the cover. The styling requirements for ergonomics and comfort adaptation covering all percentiles from 5% female to 95% male were applied in particular to the foam. In the case of the foam and the cover



- ▲ CAD model of the entire seat.
- ▲ Foam model used to produce milling data.
- ▼ Prototype: structure and foam.
- ▼ Seams in the headrest.





## Ford Visos Multi-contour Seat

fixings, the comfort adjustment system had to be taken into account. The trim shop at Wolfsburg was responsible for reworking the design of the foam components, manufacturing the covers and assembling the finished seats. As part of the production of the upholstery a range of design loops were incorporated directly into the foam and the trim. The foam was reworked manually and the covers adapted to fit around it. As a result of the comfort settings, the cover had to be able to accommodate significant changes in the contours of the seat, without becoming permanently stretched, because the contour changes caused creasing. The comfort adjustment system was embedded directly in the foam in order to avoid any unwanted pressure points and to allow the adjustment mechanism as much room as possible to expand. The cooperation between Thomas Kohlberger, Bertrandt's specialist upholsterer, his team, Ford and Alfmeier at this stage was extremely productive and produced successful results.

► **Positive response at the 2003 Geneva Motor Show**  
A total of four prototype seats were developed in parallel and put on display to the general public and the industry at the Geneva Motor Show. The innova-



tive seats aroused significant interest amongst both groups of visitors. Because of the positive health benefits for end users, it is to be hoped that the seat will one day be mass-produced. ■

The Multi-contour Seat was highly praised by visitors to the Geneva Motor Show.

### Scope of the Ford Visos Multi-contour Seat project in brief

**Design:**  
Reworking of the design of the trim, foam and covers

**Interior: Seat system**  
Development, packaging and assembly of the seat structure  
Creation of surfaces for the entire seat  
Development and manufacturing of the seat fittings, including solid models of the foam parts, seat cover prototyping and upholstery development

**Rapid technologies: rapid prototyping**  
Trim and foam blanks

**Tool design and construction:**  
Construction of tools for the seat structure and foam parts

## Innovations in vehicle interiors

The Ford Visos is a concept study used to demonstrate a range of innovations in vehicle interiors, involving a wide range of high-tech components. One special feature is the seat, which has a number of settings to meet the requirements of any driver.

### ► Comfort mode

If the vehicle is set to the comfort mode, the entire interior adapts to reflect this. Together with the calming effect produced by colour changes in the instrument panel displays, the main changes can be found in the seat. In comfort mode, lateral support for the upper body and pelvis is reduced to the minimum necessary for comfortable travel. In addition, lumbar support is improved using a 6-way pneumatic adjustment with optional massage func-

tion and an anti-fatigue back muscle stimulus which uses the pneumatic "Active Motion System".

This allows the user to choose individual support settings for the lower part of the back by adjusting the height, size and shape of the lumbar support, resulting in an orthopaedically correct back position.

The massage function helps to counteract muscle fatigue and prevents pressure points from forming.

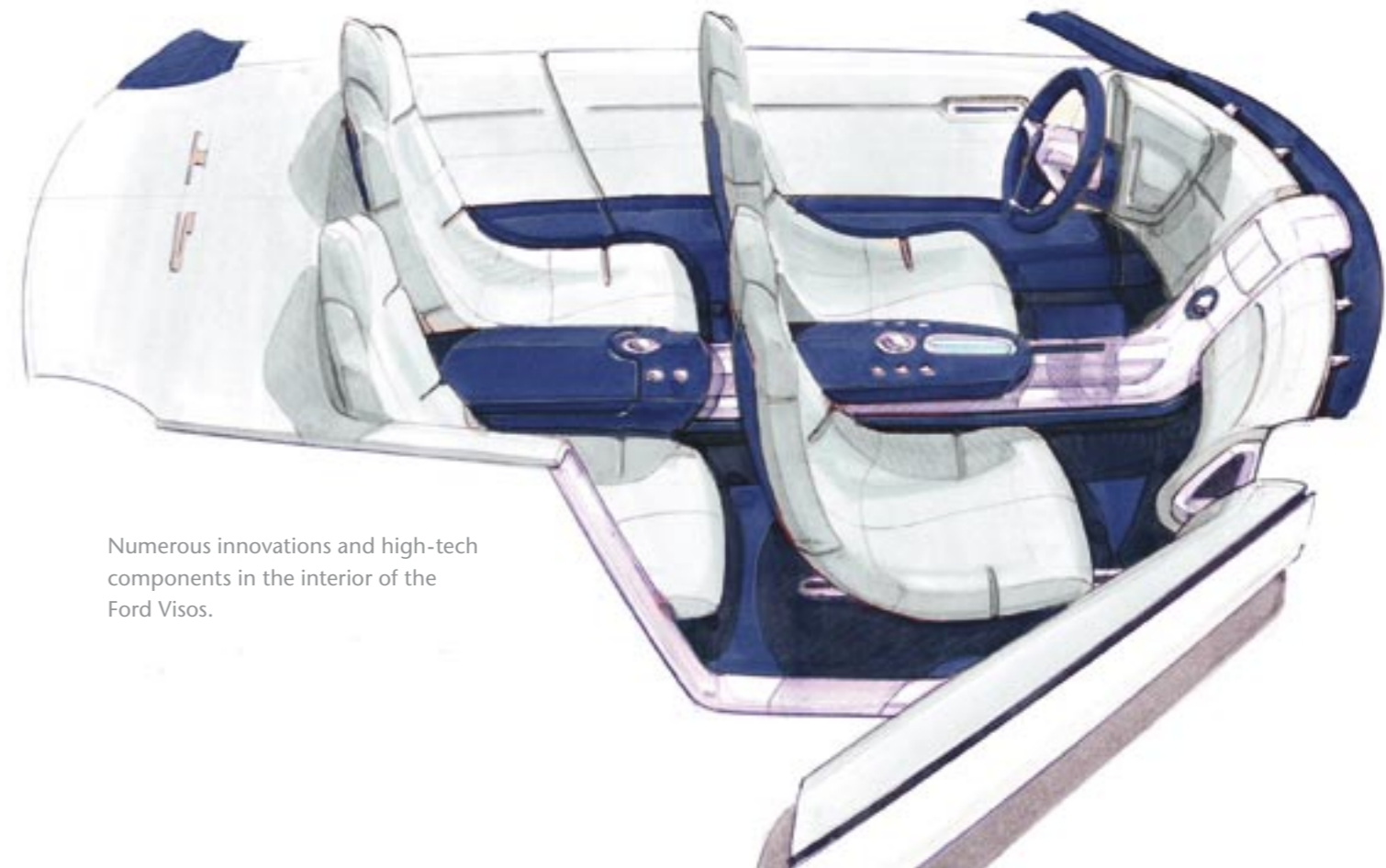
In addition permanent stimulation from the seat cushions gently moves the spine using air bladders. This means that the discs are not subjected to point loads on one side, which also helps to prevent painful muscle cramps.

The interaction between these systems and the options described will help to prevent driver fatigue.

### ► Sports setting

If the driver chooses a sporty driving style, the colour of the background lighting of the instrument panel changes, the steering wheel is moved closer to the driver and the seat is adjusted to a sporty setting.

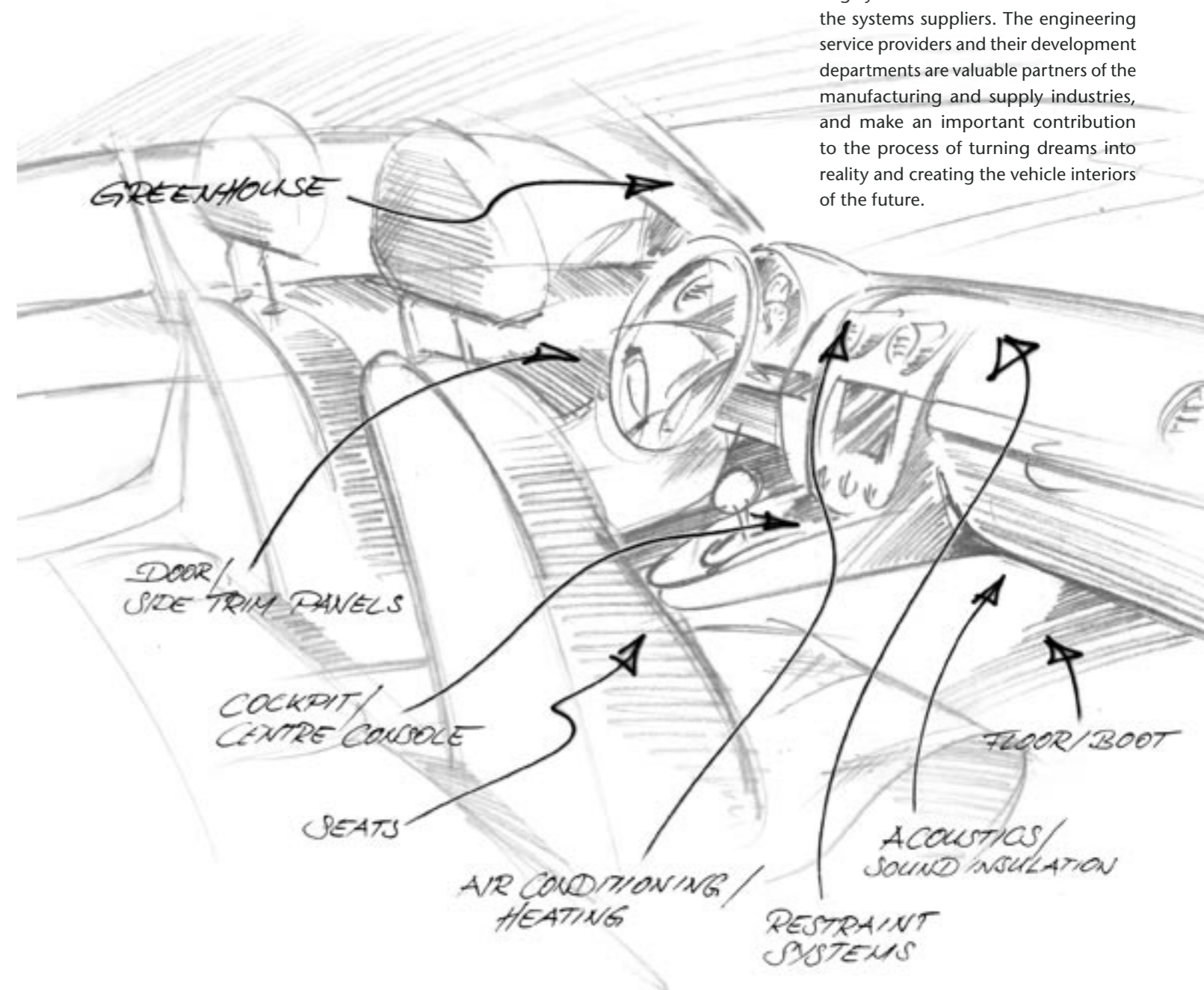
The lateral support on the seat cushion and seat back rest for the pelvis and the upper body is altered using the inbuilt air bladders in order to counteract increased lateral acceleration. In addition is the air completely removed from the cushions which stimulate the back muscles, resulting in a slightly lower seat position and increased support for the front of the thigh. The massage function is disabled in sports mode.



Numerous innovations and high-tech components in the interior of the Ford Visos.

## Added Value Enhancement **Interiors**

The vehicle interior plays a central role both in the manufacturer's development process and in the end-customer's decision to buy the car. As a result, attractive interior designs are no longer the sole preserve of luxury vehicles, but can increasingly be found in cars at the middle and lower end of the market. Around a third of the cost of developing a car is spent on the interior. This means that the process of adding value has been largely transferred from the OEMs to the systems suppliers. The engineering service providers and their development departments are valuable partners of the manufacturing and supply industries, and make an important contribution to the process of turning dreams into reality and creating the vehicle interiors of the future.



**Vehicle**

**Interiors**



# Vehicle

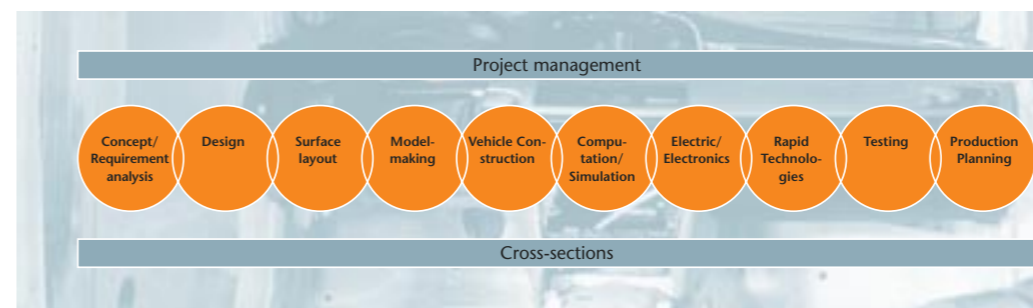
# Interiors

## Interiors

*The interior development process is a complex integration task*

In order to guarantee maximum quality and value, the standards for surfaces, gaps and tolerances in the development of interior components and modules are very high. The complex and challenging development process requires high levels of expertise and close cooperation between a wide range of different specialist areas. As a result of many years of experience of a wide range of different interior projects, Bertrandt has developed extensive specialist knowledge. Its interiors department

brings this knowledge together across the different Bertrandt sites and makes it available to customers in consolidated form. This allows the Bertrandt Engineering Network to develop complete vehicle interiors or individual modules in an end-to-end process. Together with external partners from industry and the research community, the Bertrandt engineers are stepping off the well-trodden paths to find new and innovative solutions and make them available to customers.



► **Project management**  
The Bertrandt Projektgesellschaft GmbH (project company), whose activities cover the entire Bertrandt Group, is responsible for central control and project management. A comprehensive quality management system and carefully defined processes ensure that projects are managed effectively and efficiently for maximum customer benefit. ■

## Cross-sections of the interior development process

### Dimensional Management



The Dimensional Management process, which runs in parallel with the development activities, helps to ensure that the joints and transition points of modern interiors are optically satisfactory and that the various modules have the correct functional dimensions for easy assembly.



Andreas Seidel  
Bertrandt  
Technikum

### Design



Design brings the essential features of an interior to life by making them visible and tangible. It prompts people to look at the vehicle, to touch it and to find out what it has to offer.



Volker Sieber  
Bertrandt  
Technikum

### Safety



The large number of legal regulations governing the safety of a car's passengers mean that high levels of development expertise are required for the design of active and passive systems.



Mathias Krüger  
Bertrandt  
Projektgesellschaft

### Vehicle Electrical System



The Vehicle Electrical System is the equivalent of a network of veins and arteries. The wires wind their way almost unnoticed through the vehicle's interior. They carry information, control different electrical functions and supply them with power.



Erhard L. Dörr  
Bertrandt  
Ingolstadt

### Prototyping



Prototypes of the interior are used at different stages of the development process. We can meet every requirement in the rapid technology field right through to close-to-production components for crash studies.



Rudolf Scheuring  
Bertrandt  
Technikum

### Computer Simulation



During the functional development of the interior, it is essential to ensure that the objectives for passenger protection, durability, low vibration levels and air-conditioning are met at an early stage. The driving force behind this process is Computer Simulation.



Dr. Bert Welzel  
Bertrandt  
Projektgesellschaft

### Testing



Faults such as creaks, groans, bubbles or uneven joints are not tolerated during the testing process. Every function and material is thoroughly tested.



Bernd Mogwitz  
Bertrandt  
Munich

### FMEA



FMEA is the key method for transforming fault correction into fault prevention.



Thomas Martens  
Bertrandt  
Wolfsburg



Alf Heidrich, manager of interior/design services department at Bertrandt Technikum, gives an overview of the potential of the vehicle interiors market for a development service provider such as Bertrandt AG.

### Three questions for Alf Heidrich

**Bm:** According to the latest studies, systems suppliers will become the driving force behind the new technology trends in vehicle interiors. What is Bertrandt as a development service provider and "ideas pool" doing to prepare for this change?

Alf Heidrich: In my opinion, it's not only important for Bertrandt to meet the demands of developing modern vehicle interiors, but also to use its creative and innovative abilities to push out the limits of design and exceed customer expectations. This involves a number of factors including technical and formal concept ideas, the development of technical features, their integration in the overall interior and modular concepts.

**Bm:** Some experts say that interior integrators will have significant growth potential in the future, because they will profit from the trend for awarding contracts for complete interior modules. What opportunities does Bertrandt have to exploit this development?

Alf Heidrich: We cover the entire development process chain and specialise in the functional development of interior modules. By consistently integrating our creative development departments in the Bertrandt product creation process and by complementing our

services through cooperation with systems, manufacturing and assembly partners we can introduce and implement new ideas in the early stages of a project and benefit from natural synergies. In my view this type of approach and increased involvement in the preliminary development stage will allow us to exploit our opportunities to the full. Development service providers often play an independent role as far as the technical input to the initial phase of a project goes.

**Bm:** The latest comfort trim and infotainment applications are resulting in a significant increase in the amount of electronic components in vehicles. Can you identify synergies between different specialist areas within the Bertrandt Engineering Network?

Alf Heidrich: I think there are synergies between our electronics and vehicle electrical system departments, in particular with regard to the development and integration of these components in the vehicle interior. The components have a growing influence on the design, ergonomics, functionality and packaging of the modules. The different departments within the Bertrandt Group will become even more closely interlinked in future in order to be able to fully integrate the electronics aspects of interior module developments during the design and concept stage. One decisive factor is the seamless interaction between our design, interiors, electronics, simulation and safety departments. We will benefit from our rapid decision-making processes and from the wide range of services in the Bertrandt network. Our integrated services will allow us to develop complete interiors, including electrical and electronic features, under one roof and to take them right through to production readiness. ■

## Developing Special Security Vehicles



### A feeling of safety

Car manufacturers have identified a growing need for special security vehicles with different levels of protection. Engineering service providers such as Bertrandt AG are adapting to the increased demand and offering a complete range of services for the development of special security vehicles.

#### ► Different levels of protection

The reason behind the increase in demand is the current tension on the world economic and political stage. Areas where there is a great deal of interest in special security vehicles include Latin America. The huge gap between rich and poor, in particular in conurbations such as Mexico City, which has up to 30 million inhabitants, has caused significant demand for vehicles with protection level B4, which provide protection against almost all common hand guns, such as those used in armed hold-ups or carjackings.

In more dangerous situations, vehicles with protection level B6 and B7 provide protection against explosive charges, hand grenades and bullets fired from army rifles. This type of vehicle is used primarily by politicians or in crisis areas. Buyers have the choice of a number of different levels of protection ranging from a thief-proof car to a high security vehicle.



Highest standards for ballistics tests.



#### ► The OEMs' response: development and small-scale production with partners

The car manufacturers are responding to customers' requirements by producing a number of different special security vehicles with a wide range of different protection levels on a small scale. Manufacturers are also putting an emphasis on ensuring that the vehicle is not immediately recognisable as a security vehicle. In order to be able to react quickly and flexibly to current market requirements, OEMs in this segment are increasingly using external development and production partners. Companies with practical experience of security vehicles are in a strong position in this respect, because years of experience are needed to be able to design an armour system.

#### ► Special demands on development

The differences between developing a security vehicle and a normal car include, for example, knowledge of ballistics and its special characteristics, such as its impact on the exterior and bodyshell of the vehicle. Engineers must be familiar with protective materials such as bulletproof glass, specially developed protection systems for the security cell and special techniques for bonding the different armour materials. There are also specific criteria for testing the vehicle. The tests and certification must meet the high standards of Germany's official ballistic laboratories. This experience combined with the choice of appropriate materials, which will depend on the space available, the weight distribution, the cost and the production processes, is a basic requirement for a secure armour system such as those offered by Bertrandt. ■

### Special vehicle protection system from Bertrandt Munich and ZR Bretzfeld



In May 2003, BMW commissioned the Bertrandt site in Munich to develop a protection system for the BMW X5 4.4i Security. In close collaboration with the appropriate departments within BMW, Bertrandt produced a security vehicle and tested it for certification in accordance with the "BRV 1999" security guidelines. In parallel, the team prepared prototypes for a range of different tests. The specialist bodywork company Zapadtko + Ritter in Bretzfeld was responsible for tool development and component production. Following certification by the official ballistics laboratory in Munich, press vehicles for the BMW stand at the 2003 international motor show in Frankfurt were built.

The BMW X5 Security on a motor show stand.

Since the end of last year, Bertrandt, as general contractor, has been supplying the BMW plant in Mexico with the complete ballistic protection system and the accompanying special equipment. In Mexico, the standard production vehicle is being converted to a security vehicle. Customer reactions to the X5 security vehicle at various motor shows have been very positive. BMW's top of the range vehicle is certain to meet the high expectations set for the production model. The Bertrandt team is pleased about the positive start of production and of course about the encouraging feedback from the various BMW departments on Bertrandt's work.

#### Special protection services:

- Design of protection systems to meet customer requirements, taking into account current standards and guidelines and using the latest materials and production processes
- Construction of concept vehicles and carrying out preliminary ballistic tests
- CAD-based development of protection systems and management of the vehicle certification process in collaboration with the ballistic laboratories
- Development of special electrical equipment (for example attack alarms or intercom systems)
- Documentation of protection systems using CAD data and drawings, preparing assembly and repair instructions
- Long-term testing of functional and protective components under a range of different climatic conditions
- Preparing quality guidelines for ballistic components. Choosing suppliers and carrying out quality audits of the suppliers
- Manufacturing ballistic protection systems and functional components (for example more powerful electric window systems)
- Creating logistics and transport concepts, coordinating suppliers and the supply of spare parts
- Building prototypes through to small-scale production



## Bertrandt receives "Self-agreement" from Renault

### Cross-border Cooperation on Testing and Trials

Bertrandt's French subsidiary, together with the Technikum Ehningen in Germany, has received internal Renault approval to carry out specific types of tests. New test rigs allow the service provider to cover a total of 27 of the testing standards required by Renault.

◀ Tensile strength and tear resistance tests: before and after testing.

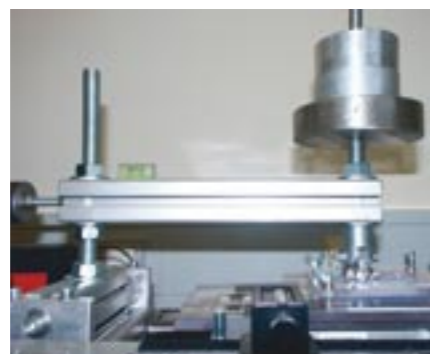
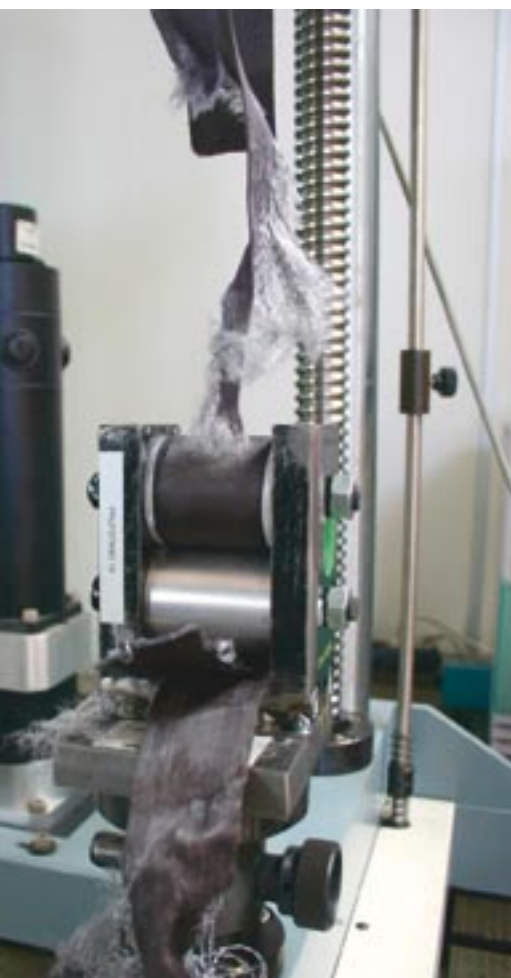


The Renault "self-agreement" is an authorisation granted by the car manufacturer to allow tests to be carried out according to Renault standards. Following a careful investigation of the equipment available at the Technikum in Ehningen and of the qualifications of the testing staff, Bertrandt was authorised to carry out tests for Renault and its suppliers, as well as to provide testing results in a standard format.

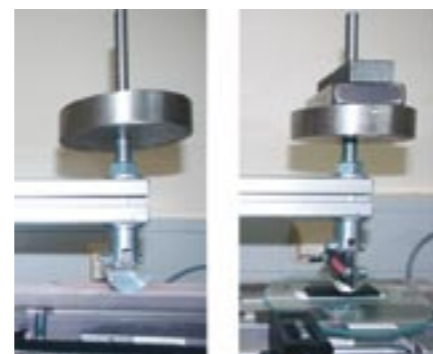
Using the test rigs, which were developed and constructed partly by Bertrandt's specialists, a comprehensive series of surface tests can be carried out. These include tests for:

- abrasion and scratch resistance
- tensile strength and tear resistance
- heat, moisture and impact resistance

These tests are complemented by the Bertrandt Group's full range of testing services, including safety tests, such as pedestrian and passenger protection, test drives, climatic tests and a number of dynamic tests. ■



Abrasion tests with several samples.



Parts are evaluated in standard illuminant conditions.

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# Data management for vehicle power network simulations

An essential prerequisite for the successful use of physical models, simulation environments and simulations to ensure the stability of a vehicle power network, is the creation of an integrated process, starting with model creation and going right through to the evaluation of the simulation. One particularly important factor is to archive the data which is generated. A data management

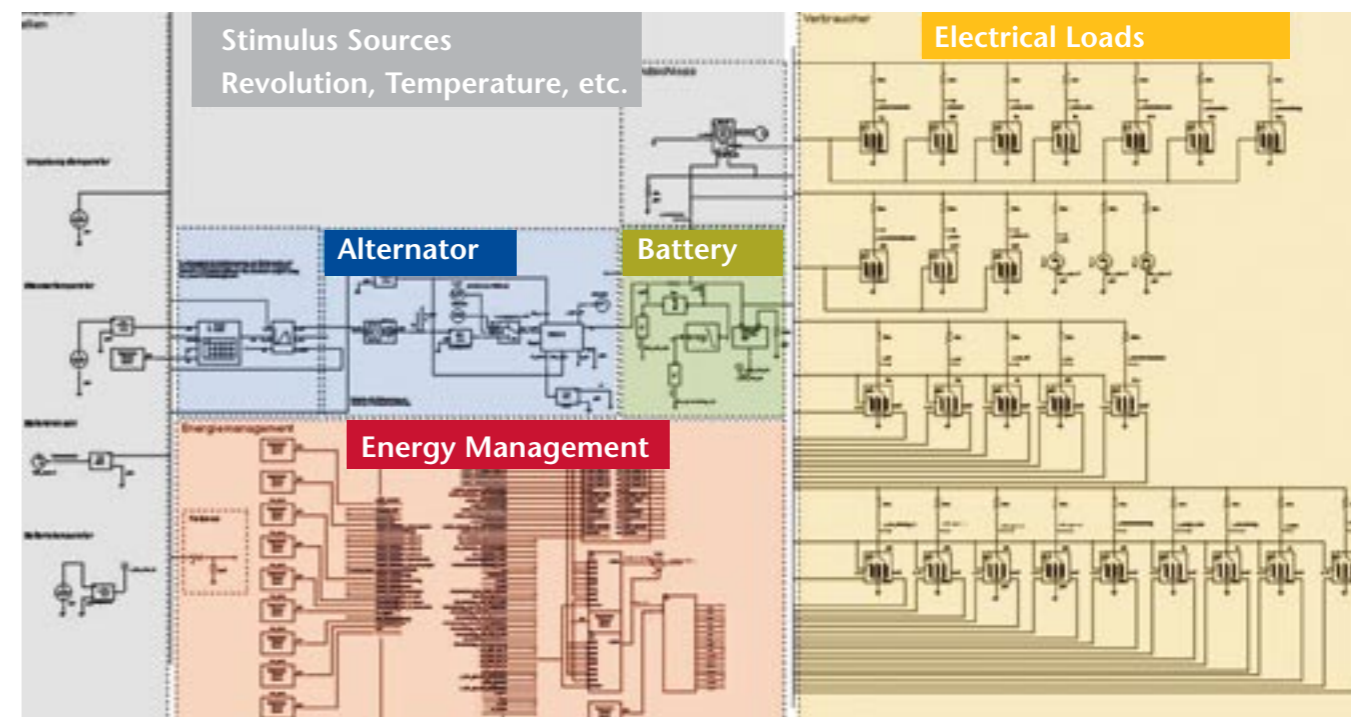
system is needed which manages all the data in a data warehouse and makes information available to different user groups. VW, Audi and the Bertrandt Ingolstadt site worked together to define and establish a process for simulating power networks. Together with integrated software support, the deployment of a shared database is of particular significance.

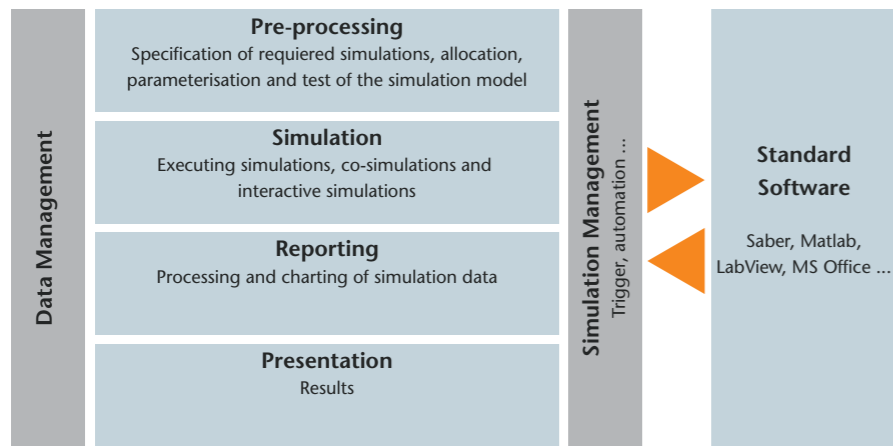
### ▶ Simulations for power network development

Simulation is the ideal development tool for establishing the stability of a power network, the charging level of the battery and the distribution of energy to the different consumer systems. In particular, do they allow the performance of the vehicle under different environmental conditions to be tested. Variations in the driving cycle, the ambient temperature and the consumer systems can easily be reproduced.

The major benefit is that the best possible results can be obtained in the early stages of a project for a vehicle which does not even yet exist as a prototype. This allows demands for a shorter "time to market" to be met.

Simulation model of a physical power network in Saber.





Process for implementing power network simulations.

### ► The process for power network simulations

The process for power network simulations can be broken down into four steps:

- Pre-processing
- Simulation
- Reporting
- Presentation

The pre-processing stage involves producing specifications for the simulations. The specifications include all the information required for the modelling and configuration activities. The simulation models are set up, configured and tested, based on the specification.

The Saber simulator is used to simulate the physical power networks. In addition to systematic serial simulations, co-simulations (using Matlab/Simulink, for example) and interactive simulations (using LabView front-ends, for example) are carried out.

In the evaluation phase, the raw data from the simulation is processed and presented in a suitable form. In addition to running mathematical operations (minimum/maximum calculations, averaging, integration...), the tasks include presenting the data in the form of graphs in particular.

Finally, selected evaluations are put together in presentations which document the results of the simulation.

### ► Adding simulation management and data management to the process

In order to create an efficient, integrated process for power network simulations, two elements, namely:

- simulation management and
  - data management
- are included in the procedure described above.

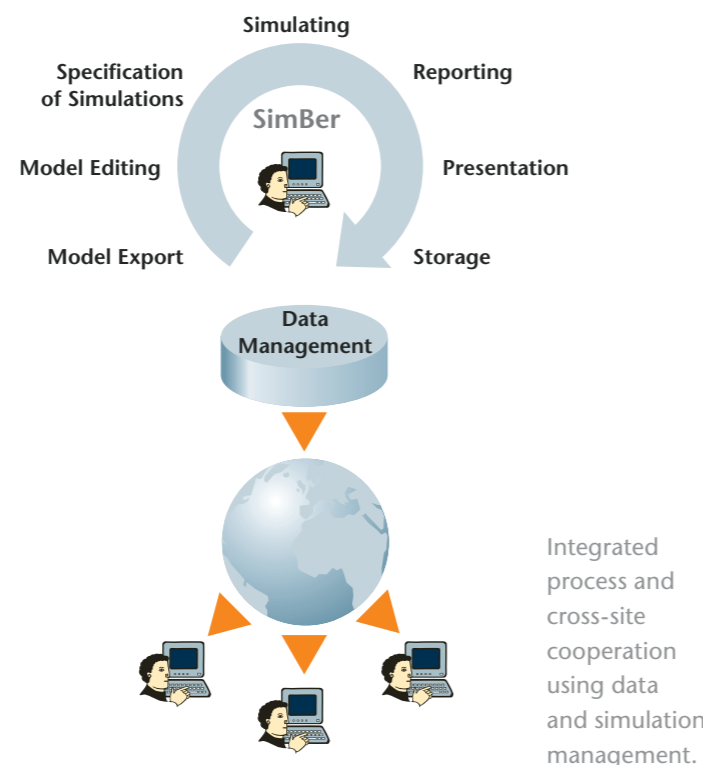
Simulation management means putting suitable software tools in place to provide support for the process. The SimBer tool was developed in collaboration with Audi, Volkswagen and Bertrandt. Amongst others it is responsible for the following tasks:

- configuring simulations

- automated implementation of simulations
  - co-simulations and interactive simulations
  - automated creation of evaluations and presentations
- The focus here is on linking the standard software packages needed to run the simulation (Saber, Matlab, LabView, MS Office, ...).

The data management system is responsible for managing all the data generated during the process in a data warehouse. It makes the appropriate information available to a variety of user groups with different interests. The simulation models, evaluations and presentations which form part of the data management system must be available to everyone involved in the process, regardless of their location. The data in the data management system must be archived automatically, in order to guarantee data consistency.

With data and simulation management, it is possible to create an efficient, integrated process and to ensure that everyone involved in the process can work together effectively, regardless of where they are based.



## Data management for vehicle power network simulations

### ► Data management implementing MSC.VirtualInsight

MSC.VirtualInsight is a central database for simulation models. It is used by Audi in its bodywork development department under the name "CAE Bench". The use of MSC.VirtualInsight in the management of power network simulations was the result of the introduction of a new discipline called "PowerNet".

The MSC.VirtualInsight data model is designed for managing simulation



MSC.VirtualInsight: Curve Workbench.

data and reflects the "Pre-processing – Simulation – Reporting – Presentation" process chain.

A typical MSC.VirtualInsight view depicts the Curve Workbench. This view allows users to carry out a rapid evaluation of simulation results.

A comprehensive reporting function is available for creating presentations. It allows all types of post-processing information (curves, pictures, documents etc.) to be combined.

### ► Connecting to the data management system

In order to produce an end-to-end process, it is important to ensure that the simulation models and data imported into MSC.VirtualInsight are consistent and complete. This can only be achieved using an automated procedure.

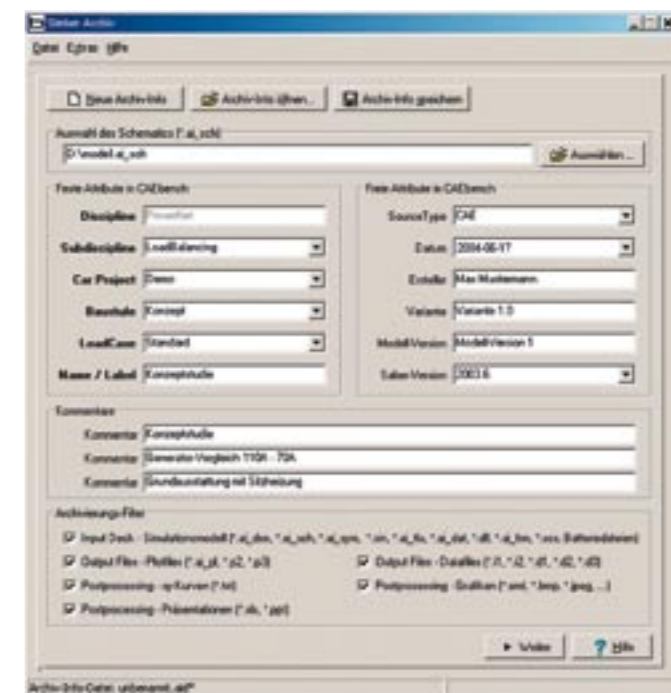
For this reason, the SimBer Archiv tool has been developed. It has the following functions:

- Compiling the meta-information needed for archiving such as the simulation name, the creator, date, version, model information, folder and the Saber version used. This allows the simulation to be easily identified in MSC.VirtualInsight at a later date.
- Identifying all the files needed for archiving. These include the simulation model (input deck), plot files (output files), evaluations and presentations (post-processing).
- Automated archiving in the data management system.

SimBer Archiv uses an intelligent search algorithm to identify all the files needed for archiving as well as their location in the local file system. This allows a usable simulation model (input deck) to be generated. After the search algorithm has been run, all the files needed for archiving in MSC.VirtualInsight are available. The search algorithm ignores any temporary files created by Saber during the simulation.

Now the files can be archived in MSC.VirtualInsight. SimBer Archiv automatically generates an XML-based archiving script containing all the information needed for the archiving process, which is a single button solution. The input deck files and the XML script are automatically zipped and copied to a file server using FTP. Once the files have been uploaded, an automatic process unpacks the zipped archive folder, and creates any additional import files required and then imports the files into MSC.VirtualInsight. Finally, any files on the file server which are no longer needed are automatically deleted.

The use of MSC.VirtualInsight and the SimBer Archiv tool has allowed an integrated process with software support to be set up which efficiently archives simulation models, data and results. The data management system is responsible for managing this data in a data warehouse and for making the appropriate information available to a variety of different user groups with different interests, regardless of their location. ■



The first stage of the archiving process in SimBer Archiv: compiling the archive information.

## Seating Training

Effectively Conveying  
Seating Design Expertise



### Bertrandt offers newcomers training on all aspects of vehicle seating

Bertrandt has developed a training course on the subject of vehicle seats for newcomers to the field. Around 20 engineers and managers from manufacturing and systems supply companies attended the information event at the Bertrandt Ingolstadt site in mid-May 2004. As a result of their positive feedback, the first training courses were held.

#### ► Wide-ranging programme

In the course of the week-long event, participants are given a comprehensive overview of the issues involved in vehicle seating design. Alongside discussions of topics such as ergonomics, orthopaedics, legislation and design, a number of practical exercises are set up. "Analysing, disassembling and reassembling a seat give the participants a chance to gain some practical experience," explained Dirk Zimmer, manager of the seats and interiors department at the Cologne site, who was responsible for the idea.

As a result of the popularity of the event, Bertrandt is already planning a further training session. If you are interested in attending, please contact Christoph Beckers, Phone: +49 221/7022-319, e-mail: christoph.beckers@de.bertrandt.com.



## Supplier Trade Fair

International Supplier Trade Fair (IZB) in Wolfsburg, October 2004

Aussteller bei:



### Bertrandt exhibited at the largest supplier trade fair in Europe

Bertrandt took part in the international supplier trade fair in Wolfsburg for the third time. This year, the IZB had more than 450 exhibitors and the exhibition area doubled in size. It took place from 27<sup>th</sup> to 29<sup>th</sup> October 2004 on the Allerparkgelände in Wolfsburg, which provided sufficient space for the huge influx of trade visitors and exhibitors.

#### ► Bertrandt represented on two stands

On its main stand, Bertrandt presented the Ergoseat and the electronics counter. As a partner of the VW Group, Bertrandt was also represented at the VW Point, where the theme was "The Fascination of Electronics". VW offered selected suppliers the opportunity to present their latest products and developments. Bertrandt's development in the field of electronics found widespread approval amongst VW's experts. It was located next to the display Golf and consisted of the "Steering Column Switch Module Project" results, on the theme of "Digital Requirement Specifications". ■

# 1974

From the extended workbench through to complex projects in value added networks

#### ► Company creation

Harry Bertrandt founded the company in 1974 in the town Möglingen in Germany's Swabian region. His customer base consisted of mechanical engineering companies during the first years. He started to offer a range of services, including tool design, to local vehicle manufacturers at the end of the seventies. Now the company has around 3000 employees working for customers in the international automotive and aviation industries.

#### ► Process chain

Between 1989 and 1995 the company added new business areas to its range of services, including rapid prototyping, testing and vehicle bodywork. Now Bertrandt can offer its customers the full vehicle development process chain, together with other development-related services, and also provides small-scale production services in coordination with partner firms.

#### ► Innovation

In 1999 Bertrandt presented a self-developed and self-built prototype at the International Motor Show in Frankfurt. Now the company demonstrates its innovative abilities by developing components and modules for the growth areas of the automotive industry, such as safety and electrics/electronics.

#### ► The future

The company will continue to develop by extending its customer base and selectively making additions to its range of services. In the long-term, Bertrandt would like to be regarded as one of the leading development partners in Europe, as a result of its work in value added networks.



## 30 Years Bertrandt

# 2004

#### ► Close to its customers

In the course of its ongoing expansion process, Bertrandt is focusing on a decentralised structure that allows close contact with customers. During the 1980s the company opened its first new sites in Germany, followed in 1989 by the French subsidiary. Now Bertrandt AG has 19 sites throughout Europe and a subsidiary in the USA.

#### ► The power of capital

In accordance with German succession regulations, Dietmar Bichler and Heinz Kenkmann took over the responsibility for Harry Bertrandt's shares in 1993. Three years later, the company was launched on the stock exchange. Now Bertrandt has market capital of around 130 million euros and is listed on the Prime Standard of the Deutsche Börse (German Stock Exchange). Dietmar Bichler is chairman of the board and Heinz Kenkmann is a member of the supervisory board.

#### ► Network

The number of interfaces in complex development projects is increasing just as fast as the complexity of the projects themselves. In order to improve communications and create more close-knit teams, Bertrandt set up the Bertrandt Engineering Network in 2003. Now Bertrandt is able to make the specialist knowledge from across all its various sites available for each customers' processes.



## University marketing



## Sponsoring the engineers of tomorrow

### Bertrandt provides support for Formula Student teams from the Hamburg College of Higher Education and Brunel University

Students from Brunel University received the Sir Henry Royce Memorial Foundation Award for the best quality engineered car. The Hamburg College of Higher Education, which was taking part in the competition for the first time, was placed in the middle of the field.

#### ► International teams in the Formula Student project

The moment of truth came during the four days from 8<sup>th</sup> to 11<sup>th</sup> July at Bruntingthorpe Proving Grounds, eight miles south of the city of Leicester in England. A total of 67 university teams from all over the world took part in this year's

competition. For the students, this event is the highlight of their year, a chance for them to exchange ideas about the design and development of racing cars at an international level. There are a total of seven Formula Student teams in Germany alone (Aachen University, Braunschweig Technical University, Hamburg College of Higher Education, Munich Technical University, Stralsund College of Higher Education, Wolfsburg College of Higher Education and Bayreuth University), five of which took part in the competition.

#### ► Ureol models for the Hamburg College of Higher Education

As main sponsor of the HAWKS racing team at the Hamburg college, Bertrandt AG provided support for the 22 students from the vehicle technology department, who have demonstrated their enthusiasm for motor sports and technology. The sponsorship covered the manufacturing of a three-part partial body shell (nose

cone, underbody and main body shell) which complied with the rules of the competition. The positive moulds were milled in the modelling department of the Bertrandt Technikum Ehningen on the basis of initial CAD data provided by the HAWKS racing team. The design process and the manufacture of the positive moulds took only two months using the latest CAD technology.

#### ► CAD development and simulation for Brunel University

Bertrandt UK, which has been involved in university marketing at Brunel for several years, sponsored the university's racing team. The collaborative work on the students' BR-5 car involved the CAD design of the roll bar and the sump, and creating models of these components. Bertrandt's British subsidiary also designed the surface of the chassis and created a simulation of the effect of different forces on the chassis.

For several years the Hamburg College of Higher Education has been an important part of Bertrandt's university marketing strategy. The development service provider has special links with the college, as demonstrated by the large number of employees and managers at the company who studied vehicle technology in Hamburg. Many of them made contact with Bertrandt in different ways during their time at the college. By sponsoring the Formula Student project, Bertrandt aims to provide active support for the practical development activities of the engineers of tomorrow and to demonstrate to them that the Bertrandt Group, with its 20 subsidiaries worldwide, offers numerous opportunities for newly-qualified engineers in vehicle and aircraft development and related areas.



BR-5 car of Brunel University.

Formula Student is an international design competition in which students plan, draft, design and build a formula racing car for an imaginary market consisting of non-professional racing drivers. The aim is to design a single seater car which complies with the regulations and meets specific design and financial criteria, and also to produce a production plan for the manufacture of 1 000 vehicles per year. The cars are evaluated once a year at the Formula Student Event in England. The work involved in the competition gives students a valuable practical introduction to many different aspects of vehicle development, including design, testing, different technologies, teamwork and budgeting.

For more information on the teams and the event, visit [www.hawksracing.de](http://www.hawksracing.de), [www.brunel.ac.uk/faculty/tis/Racing/home.htm](http://www.brunel.ac.uk/faculty/tis/Racing/home.htm) und [www.imeche.org.uk/formulastudent/](http://www.imeche.org.uk/formulastudent/).

#### ► Successful racing teams from the partner universities

Bertrandt takes a positive view of its commitment to the Formula Student project and is pleased about the students' success. The team from Brunel University has won several prizes in the various categories over the years. In 2003 it received the coveted Honda

Engine Award. This year it came first in the best quality engineered car category. The Hamburg College of Higher Education team finished in the middle of the field overall and is now highly motivated to achieve a higher placing next year. ■

During the tilt table test the vehicle must not roll over at a lateral angle of 60 degrees. No fluids must leak out at 45 degrees.



Ureol models of the HAWKS racing team's car from the Hamburg College of Higher Education.

## Trade Fairs

**High levels of interest and a positive response from customers: Bertrandt presents its range of services at trade fairs**

In recent months, Bertrandt has been represented at a number of trade fairs, where its range of services and the activities of its individual departments were exhibited. In the course of numerous discussions, Bertrandt employees received a positive response from customers.

► **The Automotive Forum in Stuttgart**  
The focus in Stuttgart was on Bertrandt Projektgesellschaft mbH, which is responsible for running large-scale projects within the company by setting up networks of internal expertise.

► **German Association of Engineers (VDI) "Body-in-White/Bodywork" Conference in Hamburg**  
Experts from four Bertrandt sites demonstrated that the Bertrandt Engineering Network puts a major emphasis on designing internal process flows to meet project requirements, in particular in the context of body-in-white development.

► **Safety Expo in Aschaffenburg**  
Bertrandt's stand was surrounded by prospective customers at this first trade fair for vehicle safety. The main emphasis

for Bertrandt was on pedestrian protection, FMVSS 201U, energy management and seat occupation detection systems.

► **German Association of Engineers (VDI) "Seat" Conference in Cologne**

At the invitation of the Cologne branch of the VDI, Bertrandt put the Ergoseat on display for visitors to the conference. This innovative seating concept makes travelling in a car more comfortable and safer by using, amongst other things, a variable and adaptive back rest.

► **Annual "Supplier Innovation" Conference in Ingolstadt**  
At this international industry gathering, Bertrandt demonstrated its skills in the growth area of automotive electrics/electronics by means of its universal hardware and software platform. ■



## Bertrandt in brief

**+++ Investor Relations:**  
Since March 2004 Bertrandt shares have been listed on Gateway-M, the new business segment of the Stuttgart stock exchange, as well as on the Prime Standard of the Deutsche Börse (the German stock exchange). Following an analysts' conference in May, Bertrandt took part in BW-Bank's capital market conference and attended investor meetings in Frankfurt and London. Some analysts are currently recommending buying Bertrandt shares. +++

**+++ Girls' Day:**  
Bertrandt in Wolfsburg provided an insight into the engineering profession

for twenty female visitors at this year's Girls' Day. +++

**+++ Vehicle Electronics Conference:**  
As part of the vehicle electronics conference held by the moderne industrie (mic) press, Bertrandt invited participants to attend lectures and discussions in the Technikum in Ehningen. The participants were pleased to have the opportunity to exchange opinions and ideas with other representatives of the automotive industry. +++

**+++ Students in Ingolstadt:**  
Thirty-five students from the College of Applied Sciences in Hamburg came to

Bertrandt in Ingolstadt in June to find out more about the activities of an engineering service provider. +++

**+++ Football:**  
The customer football tournament staged by the Neckarsulm site was won by the team from Quattro GmbH ahead of two teams from Audi. The internal Bertrandt challenge cup tournament was won for the first time by the "Wadenbeißer" (literally: "stable flies") team from Munich. +++

**+++ Quarterly Report:**  
At the end of the third quarter of the financial year 2003/04 (01.10.03 to

## Corporate calendar

03.11.2004	University contact event: HOKO at Munich College of Higher Education	16.12.2004	Press conference to present company results, Stuttgart
04.11.2004	University contact event: ZWIK 2004, Zwickau	19.01.2005	Analysts conference, Frankfurt am Main
09.-12.11.2004	electronica, Munich	25.-26.01.2005	University contact event: Bonding fair, Braunschweig
10.11.2004	University contact event: Company Day at Bonn Rhein Sieg College of Higher Education	15.02.2005	Report on the first quarter of financial year 2004/05
11.11.2004	Lecture: GPM Specialist Conference, Darmstadt	16.02.2005	Bertrandt AG annual general meeting, Sindelfingen
15.-16.11.2004	University contact event: Bonding Fair in Karlsruhe		
17.-18.11.2004	Lecture: Vision for Plastic Bodywork, Bad Nauheim		
19.11.2004	Recruitment event: German Association of Engineers (VDI) News, Recruitment Day in Ludwigsburg		
22.-24.11.2004	Lecture: MSC.Software 2004, Virtual Product Development Conference, Munich		
23.11.2004	"Engineer your Career" careers day: HTS-Autotechnik Arnheim (Vehicle Technology College)		
24.11.2004	6th Baden-Württemberg Vehicle Suppliers Day, Stuttgart		
29.-30.11.2004	University contact event: Bonding Fair, Aachen		
01.-04.12.2004	Euromold, Frankfurt		
09.12.2004	Investors event, Zurich		

30.09.04) the Bertrandt group's turnover was 166.6 million euros, with an operating profit of 3.8 million euros. +++

**+++ Certification:**  
The entire Bertrandt Group achieved ISO 9001 certification in June. The existing VDA 6.2 certification of the sites in Ehningen and Rüsselsheim was confirmed, along with the ISO/IEC 17025 accreditation of the testing departments in Rüsselsheim, Ingolstadt, Munich und Ehningen. In addition, the Bretzfeld, Ehningen and Cologne sites had their ISO 14001 environmental management system extended. +++

**+++ Project Management Award:**  
With its presentation of a "Derivative Development for a Vehicle Manufacturer" Bertrandt Projektgesellschaft mbH was awarded second place at the German Project Management Awards 2004 on 5th October in Nuremberg. According to the organisers, the award is for professional management used to produce top-class project results. +++

**+++ Shareholding:**  
The German Federal Cartel Office has approved ThyssenKrupp Automotive AG's 25.2 percent shareholding in Bertrandt AG. This move will allow both companies to offer the interna-

tional automotive industry a range of integrated services covering technology, development, processes and production for the bodywork, chassis and powertrain. +++

## Portrait of Gerrit Schmidt



**“The main key to success is understanding people and their motivation.”**

Gerrit has always been fascinated by the task of transforming theoretical facts into practical results and by working on challenging projects. As a student technician in the research department of Berlin University, he was able to make the most of these interests while working on complex projects.

This was followed by his own PhD research project at Chemnitz Technical University. The result of this was an award for his research work from the German Research Association for Power Transmission and from the German Federation of Industrial Cooperative Research Associations “Otto von Guericke” e.V. (AiF) in 1999.

After graduating Gerrit Schmidt began working for Bertrandt at Tappenbeck near Wolfsburg. The question of why he chose Bertrandt is easily answered. “The important thing was to be involved in developing something,” he remembers. “The decision-making processes were fast, the team was very dynamic and I could take on challenging tasks.” His major challenge during this period was probably the development of a modular platform system.

Alongside his extensive scientific and technical knowledge, Gerrit Schmidt is firmly convinced that the key to success lies not only in hard facts and structured working methods, but primarily in under-

standing people and their motivation. He believes that this conviction is reflected in the company culture at Bertrandt.

After almost five years in a VW environment, Gerrit felt that it was time to take on a new challenge that allowed him to combine his technical experience with his gift for managing people from other cultures, not to mention the chance to work in a new linguistic environment. The opportunity came in October last year with the move to the Spanish subsidiary in Esparreguera.

One of the tasks which Gerrit Schmidt regards as being particularly important is to continue the process of integrating the Spanish subsidiary into the Bertrandt network. “It is exciting to overcome reservations on both sides and build up something new,” he says enthusiastically. “We already have positive experiences of working together with colleagues in Wolfsburg and Ingolstadt. This is a good foundation to build on.”

Gerrit Schmidt lives with his wife, his two-year-old daughter and five-year-old son in a suburb of Barcelona. In his spare time he enjoys taking trips out into the area around his new home. One essential item which travelled with the family from Germany was Gerrit’s motorbike, which he will no doubt enjoy riding even more in the Spanish sunshine. ■



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