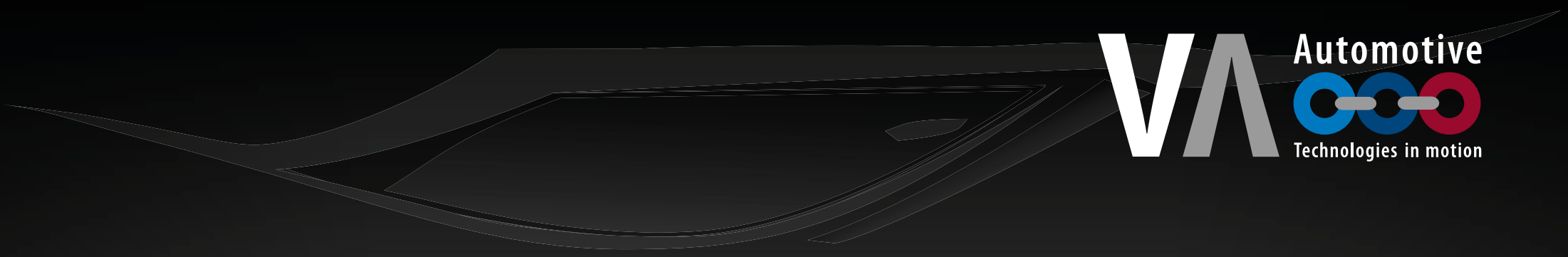
technologies
in motion
#1, 2014

Long-term, innovative, sustainable and profitable business

The future is in the virtual tooling process

Nader Asnafi, Vice President/R&D Manager

How tools are created



VA Automotive
Technologies in motion

A total-solution concept for the vehicle and engineering industries

VA Automotive i Hässleholm AB delivers complete, innovative and cost-effective solutions. We mainly serve the vehicle and engineering industries, providing everything from tooling and production equipment to finished components.

The engineering tradition within the group constitutes an important knowledge base for our operations. Our broad and longstanding experience of safety products guarantees that high demands on safety, functionality and quality are met in everything we do. VA Automotive includes: SwePart Verktyg, Lidhs Verktyg, PR ToolDesign, Ningbo Modern Tools, VA International, Nya IndustriTeknik and Läreda Mekan.

Cost-effective solutions

VA Automotive presents an offering that many of our competitors lack, not least because we are able to take full advantage of the group's collective expertise and resources. That generates significant cost advantages that benefit our customers. The VA Automotive Group mainly serves companies in the vehicle and engineering industries, providing expertise in three strategically important business segments: Tool Engineering, Automation and Component/Systems Solutions. The group's offer covers complete, innovative and cost-effective solutions including everything from tools and production equipment to finished components.

Close customer relations are vital, not least during the product development process. Our ambition is to exceed customers' high expectations. We can only do that by always working to make improvements, through innovation and with a high degree of service. A long-term approach to work and sustainability are cornerstones of our business. Therefore, we prioritize environment and ethics in all of the group's operations.

Investing in the future

VA Automotive operates in three locations in Sweden and two in China. In Hässleholm about one hundred employees work in a 16,000-square-metre facility with products and services that are delivered to customers in Sweden and the rest of Europe, China and South America.

We foresee a future in which VA Automotive is an innovative partner for new and established customers on a broad market throughout the engineering industry. Our strengths are broad expertise, speed and commitment, and our personnel are one of our main competitive advantages. We know that our customers appreciate the fact that they can get a total solution from a single source.

The future is bright for the group and, as new products continue to be developed, we foresee expansion in our business.

It's a matter of always looking ahead and focusing on the international market.

Christer Svensson
CEO, VA Automotive

in motion

www.va-automotive.com

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Our business areas

In each of VA Automotive's three business areas, each company operates either independently or together with the other companies in the respective business area, depending on the customer's needs and preferences. We are also able to deliver a longer chain of expertise to our customers by collaborating across business areas. This results in greater overall efficiency and shorter lead times.

Tool and Die

The business area Tools comprises the companies VA international, Ningbo Modern Tools in China, and SwePart Verktyg, Lidhs Verktyg and PR ToolDesign in Sweden. Tools are designed and made with the aid of a high-tech manufacturing infrastructure. Modern tooling is a process that is integrated into, and often concurrent with, the production development phase.

Automation

Within the business area Automation, via the company IndustriTeknik, various kinds of automation equipment are designed and manufactured. The company also provides industry service in the form of maintenance and refurbishment of production equipment.

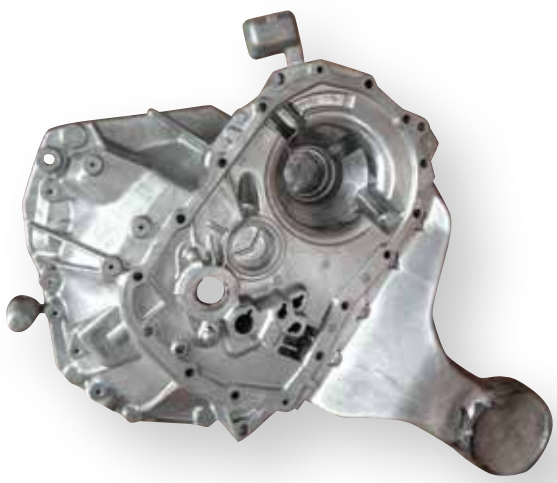
Automotive Components

Läreda Mekan has a longstanding heritage as a manufacturer of vehicle components. The company was established in 1958. With expertise and flexibility, this company produces complex sheetmetal structures. Operations include metalworking, welding, coating and assembly.

The company's biggest-selling product is complete seat frames for the vehicle industry. Läreda Mekan also offers concept and product development services.

Business concept

VA Automotive offers the vehicle and engineering industries complete, innovative and cost-effective solutions that include everything from tools and production equipment to finished components.



Passion for solutions

Thanks to Lidhs Verktyg AB's experience and expertise, customers can always be assured of reliable and economical production with sheet metalworking tools. And, thanks to demanding customers, the company has created an efficient product development process aided by modern, high-tech infrastructure. Most of the customers are based in Sweden and the rest of Europe.

Lidhs Verktyg designs, manufactures and sells sheet metal-working tools for the engineering industry throughout Europe. Using high-tech engineering methods and machinery, the company produces advanced tooling for modern production equipment. By working with virtual quality assurance, optimal solutions for the customer's manufacturing processes are ensured at an early stage.

The company was founded in 1969 by Bertil Lidh. At that time, Lidhs made tools for injection moulding, die casting and sheet metal forming. In 1998 the company decided to focus entirely on tools sheet metal forming. Since 2012, the company has been part of the VA Automotive Group. Lidhs has always seen controlled, stable growth. This has largely been due to the company's ability to analyse the consequences of technological advances and develop manufacturing methods that are well adapted to customers' frequently changing demands.

LIDHS
passion for solutions

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Quality starts with the right tools

SwePart Verktyg i Tyringe AB is one of northern Europe's leading producers in the tool and die engineering segment and, together, Lidhs Verktyg and Swepart Verkstyg are the group's specialists when it comes to press forming tools. The company specializes in the manufacture of medium-sized and large tools and tool equipment for serial production of high-quality metal components in the vehicle industry.

Together, the two companies are northern Europe's leading manufacturer of tools, with more than 100 years of experience in tool and die design and development. Over the years, SwePart has developed, produced and delivered about twenty thousand tools to demanding customers within the vehicle, household appliance and furniture industries worldwide. SwePart has built a good reputation and become a priority supplier to its customers. The company's success is due to its ability to create added value and a commitment to creating unique tooling solutions.

Swepart verktyg

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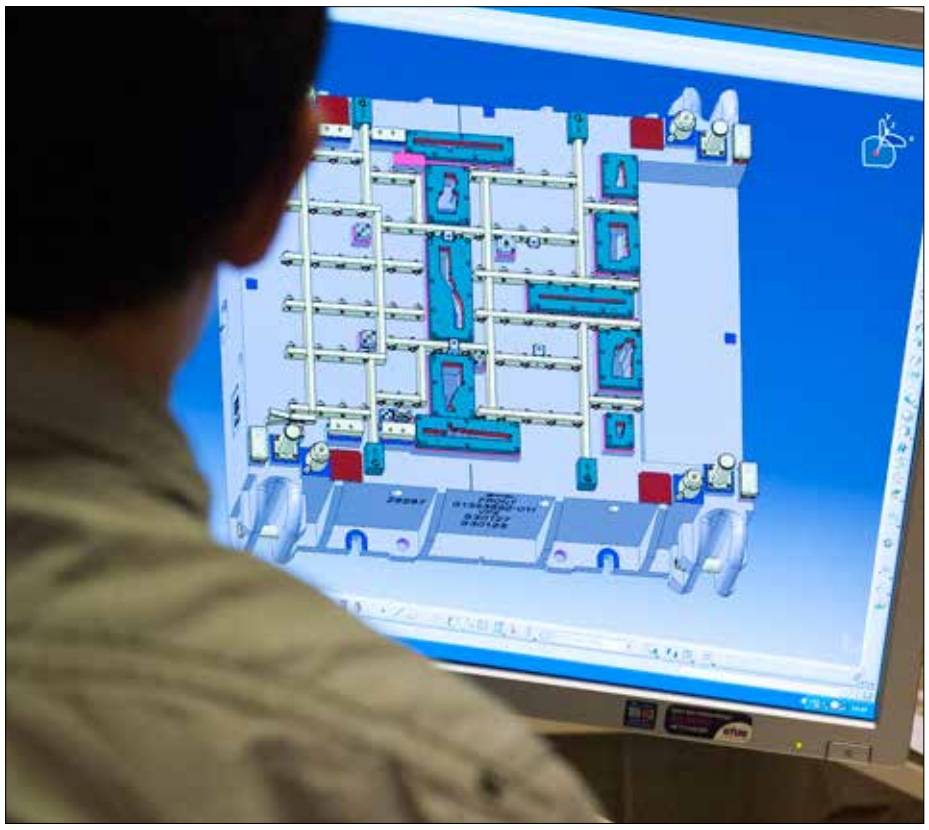
PR ToolDesign
– world-class tool design



PR ToolDesign AB is a team of engineering consultants with offices in Tyringe. The team has many years of experience of tool and die design and can also perform simulation of sheet metal forming in Autoform and CAD process data preparation in Tebis. With the customer's requirements and objectives in focus, PR ToolDesign delivers designs, sheet metal simulations, CAD process data and project management services to industry. The team is backed by solid expertise and experience for project management, design and delivery of total tooling solutions on an international market.

PR ToolDesign produces high-quality designs that are well adapted for fabrication and serial production. The team also has extensive experience of surface modelling in Catia and Tebis. PR ToolDesign's strengths are attentiveness to customers' needs, flexibility and an efficient decision-making process.

The company

The company is based in Tyringe. Currently, seven people are employed in the company, all of whom have worked for one of Scandinavia's largest toolmakers. Together, the team has 40 years of experience in design and CAD preparation. The entire process, from layout work to trial and production-scale pressing, is characterized by a high level of know-how. The team provides solutions and consultancy services in design and fabrication of press tools. From start to finish.

Services

Assignments are carried out both at customers' premises and at the offices in Tyringe. PR ToolDesign also assists customers with project management in their own projects.

- Designs in Catia V5 3D/2D
- CAD data preparation in Tebis
- Sheet metal forming simulation in Autoform
- Process data preparation/layout
- Press/Process simulation
- Model verification
- Project management
- Design reviews
- Tooling engineering consultancy
- Sheet metal forming
- Post-production follow-up
- Inspections

"The ambition is to be at the forefront when it comes to layout work, designs, simulation, project management and consultancy in the tooling world."

PR ToolDesign

PR ToolDesign AB
Box 158, SE-282 23 Tyringe, Sweden
www.prtooldesign.com

The future is in the virtual tooling process

A future challenge in tool manufacture will be to command and retain know-how within the virtual tooling process. SwePart and Lidhs are two solutions-oriented toolmakers that create complex, advanced tools for sheet metal forming. Both are well-versed in the virtual tooling process.

These companies have longstanding experience in the tool engineering industry and both are well established on the Swedish market. An international focus is important and exports account for about 30% of sales, but the ambition is to advance and become even stronger players on the Swedish market. SwePart and Lidhs are both very productive toolmakers that have succeeded in boosting productivity in recent years, which has led to a dramatic increase in capacity. The companies' expertise within the virtual tooling process has been decisive for meeting customer demand for even shorter lead times. This demand will be even more prevalent in the future.

Development of the virtual tool and die process

Companies that have a command of the virtual tooling process are at the cutting edge of toolmaking. By analysing customer requirements and looking at the desired outcome, SwePart and Lidhs have developed a working model that begins with a computer simulation. Following simulation, all necessary modifications are incorporated into the tool design; e.g., compensation is made for factors such as springback, material thinning and material, surplus, etc., prior to a production start-up. This results in significant added value for both SwePart and Lidhs and their customers when it comes to quality, reliability and delivery assurance.

Development of the virtual tool and die process will continue. The vision is to be able to offer northern Europe's most efficient tool design and toolmaking. Here, SwePart and Lidhs are well on their way.

Harriet Lidh
CEO, Lidhs Verktyg AB
and SwePart Verktyg AB

Innovation and flexibility

Läreda Mekan AB is an innovative partner that assumes responsibility for complete product development, from concept to complete design documentation. By entering the development process at the concept stage, the company can produce creative, flexible solutions that meet costs and other requirements. Läreda Mekan never compromises on quality and safety. Together with our in-house partners, we command the full chain of manufacturing equipment, including everything from tools and fixtures to assembly equipment. We have our own prototyping specialists who, together with product developers, are quickly able to produce an initial product version. Most often, we work with concepts consisting largely of sheetmetal components and where the process includes press forming, welding and assembly.

Läreda Mekan is proud of its collaboration with Lund University, Faculty of Engineering, a relationship that ensures continued development and innovativeness within the company.

Mekan
innovative manufacturing partner

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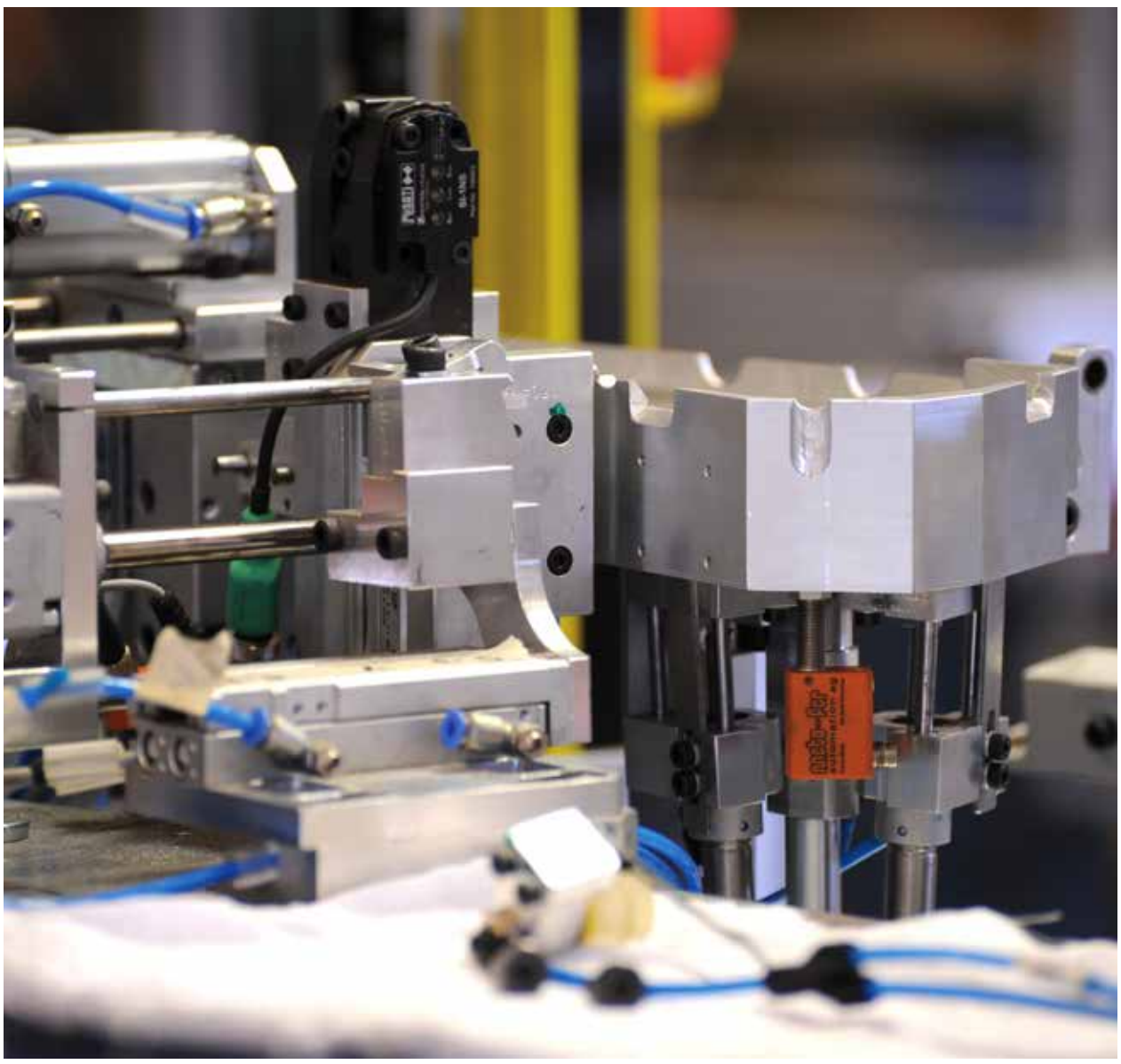
Your partner – from concept to finished product

In close collaboration with our customers, IndustriTeknik develops and manufactures custom machinery, industrial automation systems and production equipment for specific tasks. The company has the engineering know-how to meet customers' needs and requests.

We develop product concepts from start to finish, and we often build "machines that do not exist". Building custom machinery is a complicated process that demands vast knowledge, broad experience, attentiveness and close communication between the company and its customers. The customer knows his own process better than anyone else. This knowledge should be reflected in the product we deliver.

Doing business that benefits both parties should be simple and secure. IndustriTeknik's products must strengthen the customer and give them a better market position. This makes the company more a partner than simply a machine supplier.

IndustriTeknik mainly builds machinery for the vehicle industry, other types of manufacturing, and the electronics and wood industries. The focus on custom equipment is mainly in southern Sweden, but exports account for about 50% of our sales.



IndustriTeknik
Custom-engineered for efficiency

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Nader Asnafi, Vice President/R&D Manager

The vehicle industry will face major challenges in the coming 10 to 20 years

Several political objectives have been set for the coming years. Within the EU, from 2020, the maximum allowable carbon dioxide emission for new vehicles will be 95 grams per kilometre. In addition, the number of traffic fatalities must be halved by 2020, as compared with 2010.

In Sweden, public authorities and companies agree that the transport sector must continue to deliver value to society and industry, but with minimal environmental impact and fewer traffic injuries and fatalities. Swedish companies and authorities have therefore presented joint plans to meet this objective.

In the year to come, the Swedish vehicle industry must also continue to be able to meet increasingly tougher global competition. According to studies by the companies themselves and by independent analysts, this is fully possible, provided that the companies are able to address the following issues:

- The growing number of models and variants, as well as shorter product lifecycles, has a big impact on investment costs and the cost per vehicle produced. New power-train concepts will entail a greater number of components and variants in production.

- To be able to meet future demands from the market, the vehicle industry must be able to produce vehicles with different drive trains and a greater degree of volume flexibility within the same production systems.

- The vehicle manufacturers' suppliers account for 60-75% of the value of each new vehicle. Effective research and development collaboration between vehicle manu-facturers and their suppliers is therefore necessary.

Sustainable manufacturing systems

The vehicle industry will continue to intensify the strong focus on energy-optimized vehicle concepts. The goal is to improve energy efficiency by 20-60% and use of renewable fuels by15-70%, depending on vehicle type, by 2020. Consequently, efforts to reduce vehicle weight will continue. High-strength steels and lightweight materials will be used to an even greater extent in structural components.

This demands sustainable manufacturing systems that produce sustainable and innovative products. These manufacturing systems must be cost-effective, productive, capable (consistent high quality), lead-time efficient, adaptable, flexible, able to accommo-date new process technologies for new materials, and demonstrate good reusability, e.g. in the event of changes in models and/or components. The targets for 2020 are to increase pre-production productivity by 65% and manufacturing productivity by 50% while reducing the environmental impact of manufacturing by 50%.

Nader Asnafi

Head of Research School of Engineering, Jönköping University

Vice President Research & Development, Uddeholms AB

Dean and Chief Research Director School of Engineering, Blekinge Institute of Technology

Senior Manager Research & Advanced Engineering, Volvo Car Corporation

Manager Mechanical Properties, Sapa Technologies

Researcher, Research Group Leader SIMR/KIMAB

Education: Mechanical Engineering, Luleå University of Technology

My vision
– a world-class engineering group

Several years ago I decided to accept the challenge of developing a new industrial group. I soon realized that the Automotive Industry has to some degree lost much of its innovativeness and become eroded. The situation can be summarized thus:
"Next year, volumes will be greater, prices lower and credit terms worse."

This observation nurtured my vision. Here, I can see plenty of opportunities. I want to generate value for my customers and suppliers. I want to help our customers, so that they can command higher prices and boost their sales volumes. It's all about value creation. If my customer is competitive and has successful product development, I have a better chance of developing and building value over time. My ambition for VA Automotive is to build a value chain in which the group's customers gain value by making the most of what companies in our group have to offer. Combinations of tools, products, production solutions and services.
At a very early stage we have identified products and companies which we have chosen to develop. Specialization and continuous product development will make us a world-class engineering group. The way forward is via innovativeness and proprietary products that are patented.

Develop or disappear!

For me, there is no value in manufacturing goods in the BRIC countries and importing them for consumption here in the West. We have to consider long-term sustainability. What is produced in developing countries like India and China should ideally be consumed in those countries.

If VA Automotive is to grow in Europe, we must grow together with larger multinationals whose home markets are in Asia and North America. By transferring technology and product functionality, we create value for different customers in different regions of the world. VA Automotive will follow its customers in different parts of the world and we will collaborate and create alliances.

We are working to support the companies that have allied themselves with us. The international market for automotive products is enormous; that is where our potential lies.

"VA Automotive is not afraid of change. For us, it is the starting point for new business."

Lars Thunberg,
Chairman of the Board, VA Automotive

Several of VA Automotive's companies are involved in Nevs projects

After initial contact with Nevs in March 2013, things moved quickly. The outcome was a project in which several of VA Automotive's companies were involved in the development of new tools, production equipment and manufacturing of components.

The project kicked off in August and, in February 2014, new production equipment came on line at Läreda Mekan. During that period, Lidhs Verktyg was responsible for producing new tools and Nya IndustriTeknik built the production equipment.

The Nevs project was a useful value indicator for VA Automotive. It demonstrated how the group can utilize the full force of its chain of expertise to shorten lead times for a project of this kind. The customer was pleased that, together, we were able to minimize the number of meetings by having all the necessary competences represented at a single project meeting.

This approach meant that project work was effective, efficient and free of red tape. It was a very great pleasure to work together with the talented project managers and engineers from Nevs.

VA Automotive wishes Nevs all success!

Photo: Nevs

Asian innovativeness

Photo: Canstockphoto

With openness for new technology, high-level expertise in product development and design, VA Automotive's Chinese operation creates value for both the customer and for the company itself. The ambition is to always learn more about the customers' products and, in so doing, to be proactive in proposing attractive engineering solutions. This may have to do with reducing the product's weigh while at the same time retaining function and strength, creating unique design solutions or minimizing the product's environmental impact.

Ningbo Modern Tools (NMT), the group's company in China, is located in Ningbo. This area is known as the "Home of Moulds". NMT focuses on design and manufacture of pressure die-casting tools, mainly for customers in the automotive industry, but also in other industries. NMT was established in 2010 and is wholly owned by VA Automotive.

The business model is based on close, long-term relations with customers. The objective is to join a project at the concept stage and work right through to product approval. By taking part in the customer's development work at an early stage, NMT can optimize design, materials and production technology and thereby contribute to a better finished product. An efficient decision-making process, close customer contact and flexible production enable us to rapidly and effectively respond to change.

How a tool is

Engineering

1. Inquiry. Detailed study and process selection. Subsequently, layout of stations in the production process.

2. Computation work. An initial manufacturing calculation is produced. Here, the number of hours for each sub-process is calculated and a tool price emerges.

3. Layout. The next stage is a detailed layout, showing the number of necessary process steps.

4. Simulation. In parallel with layout work, the forming process is simulated, allowing the formability of the component to be determined.

5. Tool design. When Layout and Simulation are approved, the design of the tool and all of its functions can begin. As a basis for the tool and die, castings are used, which are then built up using standard components, tool steel and mould steel, etc.

Production

7. Pre-production preparation. Translation of design data from Catia V5 to Tebis. An itemized list is then produced and cross-checked to ensure that the itemized list corresponds to the design. A material bill for steel and components is then produced.

created – from customer inquiry to finished product

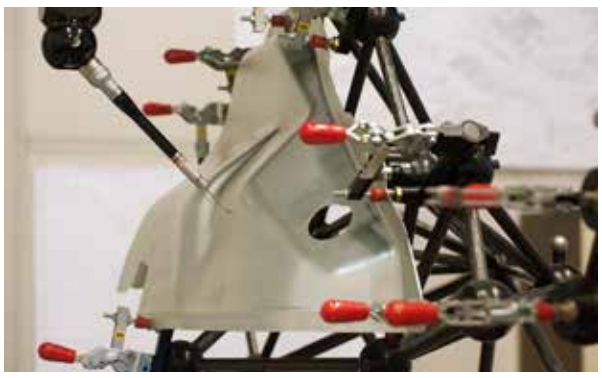
6. NC Preparation. A simulation is performed to determine springback in the work piece, and modelling is done to compensate for the springback. This demands experience in press forming and an analytical ability to interpret data from the simulation program. The compensation model shows how the tool will look when it has left the milling machines.

8. NC programming. The machine operator programs all the basic machining operations. Programming for 3D milling is done by an NC technician, who enters all surface data after simulation results, together with 2D data. The NC technician enters data for the milled slots on 3D surfaces of the tool component.

9. Milling/Wire cutting. All trim steels will be machined after the hardening process, in our HSM machine or wire-cut for highest precision.

10. Assembly. When all the components are ready, we begin the assembly process, which often begins with grinding the cast die and the other milled steels. Depending on which type of tool, drawing-tool, cutting-tool, flange-tool, calibrate-tool or progressive-tool, we perform assembly in different ways. Normally, we mount all the 2D- milled steels on the cast die to rough-mill the 3D surface. The next step is to demount the steels from the cast die and prepare them for the hardening process. When the steels are hardened, we remount them to await the finish milling. After the milling process we check the upper and lower die together with all the included parts, but without gas-springs, to ensure that we have the right cutting and sheet clearance, and to ensure proper function. Then we assembly the gas-springs and deliver the complete tool for try-out.

11. Press forming. The press forming tool will be loaded in our try-out press for control of the complete heights. When the function is ensured, we paint a blanking sheet or a pressed part with our marking colour, and then press the dies together; in that way, a trained eye can verify the spotting of the tool. Now we can start to grind the spots gently until the dies have a uniform surface of colour. This ensures that the upper and lower dies fit well, within a tolerance of +/- 0.01mm.



12. Inspection. When the tool is ready, and the geometry is assured and approved in detail, it is time for tool inspection. This involves reviewing, together with the customer, the requirement specifications for the tool and work piece.

13. Delivery. Now, the product has been approved and is ready for delivery.

Please feel free to contact us!

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in detail...

"The best way to predict the future is to invent it."

Alan Curtis Kay
American computer scientist

Advertisement, supplement for the Municipality of Hässleholm, *Dagens Industri*, April 2014.

New Sales Manager for Business Area Tools

Anders Bengtsson, 57.
Lives in Arkelstorp.
Engineer.

Anders has many years of experience in the tool and die industry in Tyringe, but has also worked for several years at Volvo and Finnveden in Olofström. He has an international focus and vast knowledge of the automotive sector in Europe.

Anders will place great emphasis on relations with Swedish customers, while also assuming successively more responsibility for exports. Germany will be the primary export market, but the UK will also be of great interest in future.

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创新

The Chinese sign for innovation.

Some of our references:

Nevs
BMW
Porsche
Mercedes-Benz
Volvo
Jaguar
Alfa Laval
Landrover
Cadillac
Lear Corporations
Ford
Scania
Mazda
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Suzuki
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