ACS Automotive Cluster of Slovenia

ACS news 2-3

September 2004

No. 2-3
Volume I

Double issue

ACS Convention

Second Annual ACS Convention – already international

The theme of 'Market and Development Trends in the Automotive and Automotive Supplier Industry' attracted over 120 participants from nine countries

Dušan Bušen, Director of the ACS

Second Annual ACS Convention
Photo: Mitja Sagaj

The Automotive Cluster of Slovenia, GIZ ACS, held its Second Annual Convention on 3 May 2004, this time under the title 'Market and Development Trends in the Automotive and Automotive Supplier Industry". On this occasion it also organised a business conference in the form of one-on-one meetings. Over 120 participants took part in both events, with many coming from abroad. Some participants also came from Russia and Belgium, and even from Mexico.

In the introductory part some well regarded guests lent additional weight to the Convention with their addresses. Janez Sušnik, President of the National Council, emphasised the importance of the automotive and automotive supplier sector as one of the leading industrial and service development sectors of the Slovenian economy. Jožko Čuk, M.Sc. and President of the Chamber of Commerce and Industry of Slovenia, spoke about its share and economic conditions for industrial and economic growth. Mateja Mešl, M.Sc., State Secretary at the Ministry of the Economy, who has contributed significantly the development of clustering in Slovenia, made her last public appearance on behalf of the Ministry with an assessment of growth in the establishment of business-to-business connections. Lars Holmquist, President of the European Association of Automotive Suppliers (CLEPA), welcomed the ACS as a new member and on behalf of the CLEPA wished the event much success.

The programme part of the Convention was opened by Michel Bouton, President of the Management Board of Revoz. In his speech, he presented the company's strategy and demands regarding the supply of parts and services and spoke about (the underdeveloped) supplier activity in Slovenia in the example of investing in the production of a new Renault vehicle.

So far Revoz has identified 40 groups of products they could supply from Slovenia for this production programme, which is to be initiated in 2006 with an annual capacity of more than 200,000 vehicles. They accepted sixty percent of them and rejected thirty percent, whilst they are still to decide on ten percent.

Mr. Bouton expressed the company's willingness to involve the highest level of supply of parts from Slovenia as possible, also emphasising the great demands on suppliers for inclusion in the Renault-Nissan supplier system. At the end of his speech, he criticised the (too)

high prices of some Slovenian suppliers, which also applies to tool manufacturers.

Michel Bouton, President of the Management Board of Revoz
Photo: Mitja Sagaj

The generally known fact that only innovations and cost control can help the European automotive supplier industry maintain its competitiveness in the globalised world was confirmed in the lecture of Philipp Radtke, D.Sc., a partner in the McKinsey & Co office in Munich. As a consultant in the fields of mechanical engineering, car manufacturing and supplier industries, he presented the strategic project HAWK (which he manages) and findings concerning the theme of 'Knowledge-based Changes in the Automotive Supplier Value Chain". Mr. Radtke presented the development of (sub)systems and modules up to 2015 and the course of these innovations, emphasising that the biggest changes and increases in the shares in the cost structure are anticipated for the areas of internal equipment, engines with propulsion and chassis. In his opinion, the use of new knowledge and the new integration of development and production processes will considerably change the research and industrial automotive sphere in the future. He thus spoke to the Convention participants about new areas of innovation and growing needs for new partnerships.

Karsten Huelsemann, Director of Market Research and Planning at Magna Steyr (Graz, Austria) presented the process of changes in supply in the automotive industry through the example of the system of Magna Steyr, a car manufacturer, system supplier and integrator in the automotive industry. The presentation of their strategy and the selection of suppliers was particularly welcome at this point since meetings have been going on for the last couple of months between the experts of Strategic Purchase at Magna Steyr and the member-companies of the ACS, as well as some other companies. Magna Steyr wishes to identify new suppliers besides the existing ones from Slovenia.

Dušan Bušen presented the joint offer for the first incorporation and the opportunities for winning new buyers in new markets as the Director of the ACS. He briefly presented (mostly to participants from abroad) the development and tradition of the Slovenian automotive and automotive supplier industry. Above all, he stressed the priority tasks of the Automotive Cluster of Slovenia in terms of joint promotions for car manufacturers and system suppliers, co-operation with foreign clusters and networks and the promotion of the development of complex new products in smaller groups of companies (virtual companies). He also talked about the anticipated growth of the ACS in the direction of the most innovative cluster as possible and defined the related key conditions and growth objectives.

In the second, technical part of the Convention, some new products and examples of developmental co-operation in complex ACS projects were presented.

Marko Gorjup, M.Sc., Director of TPV-Tadis, described his companies path to a development supplier in the automotive industry. Primož Egart, Director of the Developmental & Technological Sector at Iskra Mehanizmi described developments in the field of mechatronics in his company and the benefits of mechatronic solutions for some possible joint ACS projects. Primož Mihelič, M.Sc., Director of R&D at the Cimos d.d. company presented different aspects of simultaneous development and its experience in this field. Bojan Puklavec, Director of TVM Razvoj, presented the development of a new airport bus while Stojan Markič, Head of Propulsion System Research at Iskra Avtoelektrika, discussed the development of an integrated flywheel generator.

In the afternoon, the Convention was followed by the ACS Business Conference, which was organised in the form of one-on-one meetings between representatives of car manufacturers or system suppliers, automotive component producers, their suppliers and the providers of development, production and other services and machine and tool manufacturers for the automotive industry.

Convention and business conference objectives achieved

The objectives of both the Convention and business conference were achieved. The two were carried out at the international level. Over 120 participants took part in both events. They came from Slovenia, Austria, Germany, Belgium, Spain, Russia, Mexico, Croatia and Serbia and Montenegro. Several participants came from clusters and supplier networks with which the ACS co-operates in Austria and Germany (AC Styria, me2c, AC-TMG, BAIKA) and the Russian Federation (NAPAK association of automotive suppliers).

The Convention presented the joint offer, encouraged a higher level of developmental co-operation and promoted technological investments at home and abroad. The presented themes pointed out trends and new opportunities for automotive suppliers in the automotive and automotive supplier industry in Europe and across the world. Good practices for the innovation of complex products and advanced technologies in the automotive supplier industry were also exchanged.

During the business conference participants from over 40 companies established new contacts for developmental partnerships and an increased level of co-operation between industrial, R&D and services companies from the sphere of automotive activity from Slovenia and other countries.

Trends and achievements

Excessive costs of development and quality

The German automotive industry records excessive costs relating to the development and quality of cars. The reasons for this lie in shortcomings in process planning and change management. With a more suitable approach this German activity could be 30% more efficient.

These and other findings were revealed in a study carried out by Fraunhofer IAO and Promind. The researchers established that the biggest shortcomings are found in project management and the process implementation of all co-operating partners. With a high share of assemblies and parts that are developed and manufactured by sub-suppliers, the co-operation between car manufacturers and subsuppliers is hindered by substantial inefficiency in project co-ordination.

The development of new solutions is under great time and cost pressure due to the increasing complexity of such solutions. Highly complex products cause additional disturbances and, consequently, also higher costs of quality. Celerant Consulting has established that 80 percent of all car manufacturers do not ensure a sufficient level of quality. In its opinion, this area needs to be reviewed and hides a high cost potential.

Fifteen new ACS members – a total of 50

Reception of new members
Photo: Euroteh magazine

New ACS members:

AREX d.o.o., Šentjernej,
ELVEZ d.o.o.,
GLINEK d.d.,
Goodyear Engineered Products Europe d.o.o., Kranj,
HELIOS TBLUS KOLIČEVO d.o.o.,
ISKRA EMS d.o.o.,
JOHNSON CONTROLS - NTU d.o.o.,
KGL d.o.o.,
Motoman Robotec d.o.o.,
PRESEK d.o.o.,
RIKO d.o.o.,
Smart Com d.o.o.,
TAB d.d.,
TALUM d.d., Kidričevo,
Faculty of Electrical Engineering at the University of Ljubljana

At the beginning of July fifteen new members joined the ACS by signing the Articles of Association. With the expansion of membership of the Automotive Cluster of Slovenia by 14 companies and one faculty the number of ACS members rose to 50. The Automotive Cluster of Slovenia thus brings together 43 companies and 7 R&D organisations, 2 of which are independent institutes and 5 of which are faculties. Initiatives to join the ACS came from both sides.

The new members improve the joint offer of the ACS cluster that the latter promotes mostly abroad for vehicle manufacturers and system suppliers of the automotive industry. At the same time, new members boost the opportunities for co-operation with old members in joint R&D projects for new products and technologies, particularly in the area of developing more complex products with higher added value.

Globalisation is making industry conditions increasingly tough, especially in such a competitive activity as the automotive industry. Today, clustering and network operating represent an instrument without which vehicle manufacturers and system suppliers could not achieve satisfactory results so that the latter mostly support it. Since vehicle manufacturers are increasingly transferring their competencies to system suppliers which are then further transferred to their subsuppliers, the cluster must use the opportunities for synergy effects and an improved joint offer through interactions between its members. The ACS plans the further expansion of membership and, in particular organic and complementary programme growth by module and subsystem. Initiatives (for membership) from those companies that have an important share in development and production in automotive industry programmes, that have obtained quality certificates for the automotive industry field or intend to obtain them shortly and which achieve at least average business results in their subgroup of activities are welcome. The same applies to R&D organisations and technological centres that wish to co-operate in the development of more complex products with higher added value with their knowledge and research services.

Each member has to contribute something to the cluster in order to be rewarded with its benefits in return.

Vehicle safety – a growing market

The safety belt and airbag were milestones in the safety and technical development of cars in the last three decades. Their use has contributed substantially to the big drop in the number of traffic casualties despite the fact that the number of registered motor vehicles has increased sharply in this period.

These two passive safety systems for passenger and pedestrian protection are already part of standard equipment today, but this is still not enough. Active safety systems such as ABS and ESP which carry great developmental potential due to the large opportunities for development are increasingly being used. For this reason, it can be expected that active safety systems will characterise the future of automotive safety even more than the passive safety systems.

According to a research by Mercer Consulting the entire automotive safety market will jump from EUR 48 billion in 2003 to EUR 62 billion in 2010. Sales of brake systems are growing annually on average by 1.4% in Europe and North America, sales of passive components for passenger protection are increasing by 4.3%, whilst active safety systems are recording up to 14% annual growth.

Electronics will continue to increase its share in value in both active and passive safety systems.

We joined the Automotive Cluster of Slovenia because...

What are the expectations of the new ACS members? What (else) do they want and what can they offer to other members of the cluster? Five of them answered the following questions:

- **Why did you decide to join the ACS and why at this exact point in time?**
- **What do you expect from membership in the ACS?**
- **What else would you want besides the existing services of the ACS?**
- **What will your company be able to contribute to the ACS?**

Borut Petrič, Director, ELVEZ d.o.o.:

We decided to become a member of the ACS mostly because of the opportunity to establish links between companies from similar branches, join capacities and specific types of knowledge and the opportunity to make business contacts in the EU and across the world. At the same time, we see great opportunities in the promotion of our company through the ACS at various fairs, conferences and other events which the ACS takes part in as an association.

We see the greatest potential in the establishment of links with bigger companies from the cluster (Cimos etc.) and other companies which are suppliers for big systems in the automotive industry, which we probably would be unable to enter by ourselves.

We signed the statement on joining the ACS in October 2003, but unfortunately the admission procedure lasted until July 2004.

At this point in time, we do not see what more the ACS could offer within the scope of its programme but there are probably still some things that will have to be done in the future by both the ACS and ourselves as members.

Our company can offer the ACS production capacities, specific types of knowledge and experience in the field of cable confection and plastics, we can co-operate in the development of new products and manufacture them.

Prof. Janez Trontelj, D.Sc., Faculty of Electrical Engineering, Ljubljana:

We decided to join the ACS since some of us at the Faculty of Electrical Engineering in

Janez Trontelj, D.Sc.

Ljubljana are certain that it is necessary to integrate the knowledge and disciplines we are nurturing with the economy. These connections are already present but the ACS offers an opportunity to expand our circle in this field further. We decided to join the cluster immediately after we learned about the ACS from our partners.

We expect membership to bring us into contact with the users of our knowledge in a systematic manner, that we will acquaint ourselves with their development plans as well as establish technical and technological co-operation.

We would like to have more presentations of ACS members, but in a way that would be directed towards concrete developmental challenges and co-operation opportunities.

The Faculty of Electrical Engineering can contribute to and co-operate in those activities of the ACS that are directed at development or education.

Peter Metlikovič, D.Sc., Director of Technology, Goodyear EPE for the European Region:

Peter Metlikovič, D.Sc.

Goodyear Engineered Products Europe (EPE) is one of the biggest Slovenian suppliers to the automotive industry. We are interested in establishing connections between Slovenian suppliers since we can operate better this way.

We mostly expect connections at the developmental level in the field of materials, measurement methods, construction and testing, more intensive connections between faculties and industry, development projects that are in the interests of several members and an impact on the education of human resources and the national development policy.

Goodyear EPE offers the opportunity for the inflow of foreign capital and an affirmation of the Slovenian developmental sphere through the channels of a big multinational, which boosts the competitiveness, export and value added of Slovenian industry.

Bojan Železnik, Director of KGL d.o.o.:

We are a smaller company and have been present in the automotive industry market for twenty years.

By obtaining the ISO 9001: 2000, ISO/TS 16949: 2002 and ISO 14001: 1996 certificates we have proven we are capable of operating in automotive industry markets.

We estimate that we need somebody or something that will unite us and take care of the flow of information.

The ACS has proven with its strategy to be trustworthy. We are certain it is very important that smaller companies join the ACS association since these companies are most frequently incapable of maintaining more extensive developmental and sales activities by themselves.

With the activities that we expect from the ACS we will improve and strengthen the association since only in this way can we expect the desired results to be realised.

Maja Pelko, Assistant Director, TOM, d.o.o.:

We are a manufacturer of automotive parts, mostly for the French automotive and Italian motorcycling industries and their subsuppliers.

By joining the ACS we wish to expand existing knowledge and experience in the automotive industry and offer it to the rest of the automotive industry. We believe it is membership in the ACS that will help us achieve this.

We expect membership in the ACS to expand our business operations and win new buyers for the needs of the automotive industry, improve our knowledge in the technological and marketing fields and bring about co-operation with Slovenian manufacturers from the automotive industry. We are interested in the exchange of knowledge and technologies as well as the use of excess capacities, but above all we are counting on the efficient promotion and improved recognisability of our companies in Europe and across the world.We would like to see more co-operation with Slovenian manufacturers of parts, the inclusion of tool manufacturers, establishment of direct contacts with foreign partners etc.

Our company can co-operate in bigger ACS projects, offer its excess capacities, transfer its knowledge and our connections as well as offer a complete range of supplies to our existing buyers.

Events and activities

JAMA-CLEPA 2004: Japanese manufacturers buying more and more European parts

Dušan Bušen

Beginning of the JAMA-CLEPA Business Conference
Photo: Dušan Bušen

In the second half of April, Gothenburg (Sweden) hosted the 7th JAMA-CLEPA conference along with an exhibition, the traditional event of the JAMA association (14 Japanese vehicle manufacturers) and the European Association of Automotive Suppliers (CLEPA).

At this year's expert and business meeting, the ACS and three of its members, ISKRA Mehanizmi, ISKRA Avtoelektrika and CIMOS, presented themselves with a joint stand for the first time. The President of the Purchasing Committee of the JAMA association and the Executive Director of Toyota presented key data on Japanese vehicle manufacturers to participants of the thematic conference (closed type). The production of Japanese vehicles in Europe increased from 0.2 million in 1990 to 1.3 million in 2003. Sales of Japanese vehicles in Europe jumped during this period from 1.49 million to 2.3 million vehicles per year. Purchases of components and materials of European manufacturers by Japanese car manufacturers doubled in the 1995 to 2003 period (from EUR 3.98 billion to EUR 7.93 billion). Japanese vehicle manufacturers also invested considerably during this period, particularly in Eastern Europe.

A senior representative of Japanese vehicle manufacturers expressed their expectations on this occasion. They expect the best products, more favourable prices, more timely supplies, a stronger partnership and better quality communications from European suppliers.

In his central presentation the President of the SKF company told us that they dedicate most developmental activities to the development of drive-by-wire applications, which includes servo wheel, brake system, clutch and shifting parts. In the near future they expect the weight of vehicles to drop, the share of electronics to rise, drive-by-wire systems to be introduced, alternative propulsion methods (hybrid vehicles, fuel cells) and new concepts of transfer etc. In his opinion, the future trend in the supplier industry will be characterised by system integration, constant cost optimisation, global presence and a decrease in the number of suppliers.

This part was followed by a panel discussion on the theme of Operating in Central and Eastern Europe and a discussion in which active participants presented in detail the grounds for moving their production to Eastern Europe.

Several European suppliers were exhibiting at the accompanying exhibition: the Automotive Cluster of Wallonia (Belgium), Automotive Lighting, Bosch, the Chamber of Commerce of Piedmont, Delphi, GKN Driveline, Hella, IBM, Johnson Controls, Konsberg Automotive, Magna, Magneti Marelli, SFK, ThyssenKrupp Automotive, TI Automotive, the Automotive Cluster of Wales, ZF Sachs and others.

The business conference was carried out in two parts. If companies so wished they could have one-on-one meetings with Japanese vehicle manufacturers. The organiser arranged four discussions of 75 minutes for an extra payment. Of Slovenian companies, only the company ISKRA Mehanizmi made use of this option. During these discussions, Japanese businessmen visited the stands and the organiser also provided for the option to bring requested Japanese companies to a stand (a maximum of 5 minutes), which was free of charge. Teroyuki Minoura, President of the Purchasing Committee of the JAMA association stopped by the ACS stand during his brief tour of the exhibition. He was mostly interested in the reasons for establishing the cluster since Japan does not have similar organisations. On this occasion we presented him briefly with the members, purpose and vision of the ACS and handed him the presentation materials of our members.

Many participants in the event, including other exhibitors, visited the ACS stand.

Of the numerous visits to the stand, the following should be mentioned: Magna Steyr Fahrzeugtechnik, the German Association of the Automotive Industry (VDA), Uddeholm Tooling AB, Honda of the UK Manufacturing Ltd., FER Fahrzeugelektrik GmbH, Polynorm N.V, Agoria Automotive – the Belgian Association of Automotive Suppliers, Suzuki Motor Corporation, Hino Motors, Ltd., the Toyota Motor Corporation, the Automotive Cluster of Wallonia, Belgium, ThyssenKrupp Automotive, Kongsberg Automotive AB, GKN Driveline, Piedmont - From Concept to Car, Scandinavian Automotive Suppliers, Automotive Sweden, and the Volvo Car Corporation.

BAIKA 2004 Congress - 1,150 participants from 19 countries

Janko Puklavec

On 7 July 2004 the 6th BAIKA Congress took place in Ingolstadt (Germany). This time it was entitled 'Zulieferer Innovativ 2004' (Innovative Suppliers). It was organised by the company Bayern Innovativ in co-operation with the Association of the Automotive Industry (VDA) company for the promotion of the economy and employment (IFG) in Ingolstadt and supported by the Bavarian State Ministry for the Economy, Infrastructure, Traffic and Technology. The congress welcomed around 1,150 participants from 19 countries and 140 exhibitors, 60% of whom were from Bavaria and 10% from abroad.

BAIKA – Bayerische Innovations- und Kooperationsinnitiative Auto-mobilzulieferindustrie (Bavarian Innovative Initiative and Encouragement for Co-operation of the Automotive Supplier Industry) was founded in 1997. BAIKA has created a network of approximately 1,500 companies and institutes from 32 countries of Europe, North America, Asia and Africa. Its members include 850 companies and institutes from Bavaria.

In the introductory part of the event, Minister Otto Wiesheu, D.Sc., emphasised the importance of intense innovation activity and the strong integration of the economy and science. When he spoke about the permanent innovation process in the automotive industry and the Bavarian policy which creates borderline innovative conditions for growth and progress of the automotive industry, he emphasised: 'We cannot be cheap, but we have to be better and faster.' The first encouraging shifts in sales growth, after a long-lasting recession, include a reflection of the competitiveness and integration of the automotive industry and science. He called on high education schools in particular, for example, to let students solve problems from the industry in their diploma theses and thus prepare themselves for their careers. In this way, professors can familiarise themselves better with the real problems of the industry and adjust the research and study programmes of their high education schools to these needs. The Ministry and the Bavarian Government must use the entire innovation potential for the high competitiveness of the automotive industry. Due to substantial investments in new technology and processes in the automotive supplier industry it will also strive to direct and attract bank capital to these investments.

2004 BAIKA Congress
Photo: BAIKA

Member of the Presidency of Audi AG for Marketing and Sales Ralph Weyler talked about the product and marketing offensive on top, presenting the methods Audi applied for this purpose and those that it will use in the future. He also mentioned that they reached the premium class with specific positioning of the brand and numerous technical innovations (quatro propulsion, aluminium frame, FSI and DSG technologies). In the future, they will also win with their technique and successful promotion of the brand.

Justus m. Layde, President of the Presidency of the company Oechsler AG presented the experience of this company – how it established itself strategically in the automotive market as an automotive supplier. He particularly stressed the necessary mobilisation on core programmes of the company, pointing to the establishment of developmental capacities, employees and networks, globalisation, corporate culture and its efficiency. He assessed the intellectual capital of the company as being most important.

Within the framework of the section Co-operation and Competitiveness, Linda Hasenfratz, President of Linamar Corporation, Ontario, Canada, talked about choosing between a greenfield investment, acquisition or a strategic partnership (as an agreement on sales and marketing or as JV) as a way of achieving rapid growth in sales and production, illustrated by the experience of her company. As a major development supplier and manufacturer of high-quality components, modules and systems for engines, transfer of power and chassis, they tried all three models over a period of several

years and came to the conclusion, on the basis of establishing several connections throughout the world, that they achieved a successful expansion in 75% of cases with acquisitions and somewhat poorer results by establishing joint ventures. With regard to innovation, Gabriele Nientit, Head of Car Distribution and Management of Partnership Networks for the BMW Group, advocates a softer approach and sees partnership networks as the key to innovation. Cristian Kleinhans, a consultant, spoke about new forms of co-operation between car manufacturers and suppliers, who are expected to account for 80% of development and production and to double their turnover by 2015.

On the basis of carrying out an extensive strategic study, he estimated that Europe will play the leading role in the development and production of vehicles in the next decade, up to a 30% share at the world level. During the discussion, one German businessman doubted such growth because, for example, of low investing capabilities in the supplier industry, modest own capital and banks that prefer to invest in more profitable, as a rule non-industrial, activities.

During the following lectures, the themes of co-operation in networks of developmental partners, reduction of development times with less changes and innovation management in virtual developmental processes were dealt with.

Within the section Technics and Emotions new seats, systems for head protection, an integral steering system, light as an element of car design, internal equipment as a simulator of well-being and other themes were discussed.

Under the section Electronics and Intelligence discussions took place about innovative energy management in a vehicle, the management of complex electronics through co-operation between several fields of activity, an integral safety system, 'pre-safe' as the first step towards connecting active and passive safety and other themes from the field of electronics and system integration.

The message of Mr. Matjaž Jevnišek, our Consul General in Munich, who took part in this esteemed economic event for Bavaria and Germany together with eleven consuls and other diplomats, is also important: it is high time Slovenian suppliers participated in the exhibition of innovative achievements which accompanies the congress. He feels certain that the ACS could gather enough attractive novelties of Slovenian suppliers and present them to the qualified automotive public at the 2005 annual congress. **All presentations are available at www.bayern-innovativ.de/zulieferer.**

The ACS to co-operate in establishing the Serbian Auto Cluster

Dušan Bušen

On 15 July 2004 a convention and establishment of the initiative committee of the SAC (Serbian Auto Cluster) were organised at the premises of the company DP Zastava PES, Srdulica in south Serbia.

The Convention comprised the following themes:

- Introduction – Miloš Radojčević, Vice-President of the Chamber of Commerce and Industry of Serbia
- Presentation of ACS and Slovenian experience in clustering in the field of the automotive industry – Dušan Bušen, Director of GIZ ACS
- The situation in the Serbian automotive industry - Milojko Kokić, D.Sc., Assistant General Director of the group Zastava Vozila Kragujevac
- Opportunities for international co-operation – Bane Soldatović, Director of the company Zastava Kamioni Kragujevac
- The current situation in the production of Automotive components – Branislav Popović, M.Sc., Director of the company Zastava PES Surdulica
- The first joint presentation of Serbian suppliers at the fair Z 2004, Leipzig – Dušan Puača, M.Sc., President of the Regional Chamber of Commerce and Industry of Kragujevac
- Opportunities of Serbian suppliers in the market of the Russian Federation – Toma Gvozdenović, GRS Inžinjering

Representatives of the companies AS Chemy, Azma, FV Gradac, Fadip HKC, GRS Inžinjering, FRAD Filteri, Industrija stakla Pančevo, MI Beograd, PES, FVK Termoplastika, Zastava Inpro, Zastava Avtomobili, Zastava Grupa Vozila, Zastava Kamioni and Zastava Livnica Topola took part in the Convention.

Within the framework of the Convention, the initiative committee of the SAC (Serbian Auto Cluster) was established. The cluster is to be established on 5 or 6 October 2004 in Kragujevac, during the automotive component fair AUTOKOMPO 2004.

In compliance with the ACS strategy, which also anticipates integration into international networks of clusters in the potentially important markets of Central and Eastern Europe and its active role in the integration of automotive suppliers into a network, the Director of the ACS participated in both events. In the continuation of his visit to Serbia, he held a meeting with Deputy Minister at the Ministry of International Economic Relations, Ljubiša A. Jovanović. The meeting was initiated on both sides and took place with the help of Bojan Mikac, economic councillor at the Embassy of the RS in Belgrade. Jovanović was particularly interested in the results of the Automotive Cluster of Slovenia. He would like the ACS to offer technical help in establishment of the Serbian Auto Cluster. Mr. Bušen promised him such support, presented the internationalised operations of the ACS and the opportunities for co-operation with Serbian companies and R&D institutions.

Co-operating in establishing the Serbian Auto Cluster

The Deputy Minister stressed the novelties that his Government is preparing in the field of the automotive industry. These concern some benefits for foreign investors, such as the opportunity for free trade with neighbouring countries and the Russian Federation, the lowering of corporate income tax from 14 to 10 percent, an exemption from corporate income tax for a period of 10 years for investments exceeding EUR 10 million or 100 new jobs or a combination of the two and, on the other side, positive changes in the export of automotive parts. These are the abolition of customs duties on new cars if the manufacturer in Serbia purchases components to the same value, the prohibition on importing vehicles with integrated engines EURO2, the restriction on the age of imported cars to 4 years etc. In connection with this, it should be mentioned that Serbia imports around 150,000 vehicles each year.

During discussions, the opportunity for co-operation in joint presentations between companies and with the cluster that is being established was stressed. They expressed a wish for ACS members to present themselves at the 3rd international fair of manufacturers of automotive parts and equipment AUTOKOMPO 2004, Kragujevac (5 to 9 October 2004). The delegation of Serbian companies under the leadership of Deputy Minister Jovanović will visit the ACS, some member-companies and R&D institutions in the period 25 to 27 October 2004.

AUTOMOBIL FORUM GRAZ

(19 to 21 October 2004): expert lectures, exhibition and visits to factories

From 19 to 21 October 2004, the Austrian city of Graz will host the 6th international AUTOMOBIL FORUM GRAZ, an expert meeting of car manufacturers and automotive suppliers. An expert exhibition will also be organised and, on the third day (21 October 2004), visits to the factories Magna Steyr Fahrzeug-Fertigung, test tracks (with test rides) and AVL – Applikationszentrum will also take place.

Invitation

Due to the highly expert themes that will be dealt with and the opportunity to establish new business contacts, we warmly recommend that ACS members participate in the Forum.

Programme – Tuesday and Wednesday, 19 and 20 October 2004 – lectures and discussions about current themes of the automotive and automotive supplier industry:

- Shifting development and production (strategies for full-line suppliers)
- Maintaining a brand (strategic orientations of the Mercedes group of personal vehicles)
- Diversification of models at OEM (hunters or hunted in a niche market)
- Diversification of versions at suppliers (opportunities or a cost-noose)
- Suppliers' scene (manufacturers are increasing pressure on suppliers)
- Development (are suppliers better developers?)
- Purchase (small series over long distances)
- Tomorrow's market (the Asian strategies of German manufacturers)
- Co-operation exchange (new powers of acceding countries)
- Special presentations (several versions: prevention, control, financing etc.).

Participating presenters will include leading managers and experts from the BMW Group, Robert Bosch GmbH, MAGNA Steyr, other car manufacturers, automotive suppliers and expert organisations.

The ACS will have its stand at AUTOMOBIL FORUM GRAZ. (Smaller) exhibition areas at the stand are available to ACS members for the presentation of products or innovation achievements for the automotive industry. In the period of one month after the forum we are planning a meeting with representatives of strategic purchasing at MAGNA Steyr. We will inform our members of this event in due time.

We managed to lower the participation fee for ACS members. An extra payment is necessary for visits to factories (21 October 2004).

We kindly ask you to announce your participation using the requested online registration form (Online Anmeldeformular is available at the abovementioned website under Anmeldung), in which you add the words 'ACS member) (ACS Mitglied).

Please also send a copy of the filled in registration form to GIZ ACS using electronic mail or fax.

Further information on the programme, contents, lectures and organisation, see **www.automobilforum-graz.de**

Further information: GIZ ACS office (Urška Gluhak, Tel: +386 1 236 1753, Fax: +386 1 236 1733, E-mail: urska.gluhak@acs-giz.si

Co-operation between the ACS and the AC BiH

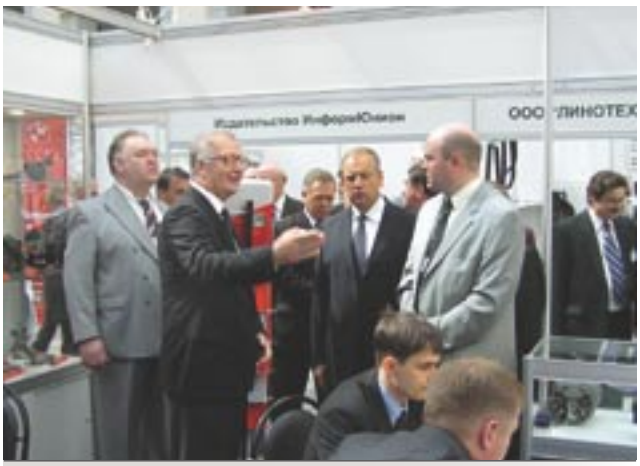
Dušan Bušen

As part of implementing the ACS' strategy regarding expanding the international network of the cluster in Central and Eastern Europe, we hosted a delegation of the Automotive Cluster of Bosnia and Herzegovina on 19 May 2004. The Automotive Cluster of Bosnia and Herzegovina was established in April 2004, while the initiative for its establishment is roughly one year old. The first workshop of the cluster was organised at the beginning of April 2004, where they defined the cluster's activities up until the end of 2004. Twenty-

two companies joined the cluster. The AC BiH signed an agreement on co-operation with the Central European Agency for the Development of Small and Medium-sized Enterprises and is in the process of concluding a similar agreement with the Foreign Trade Chamber of Bosnia and Herzegovina. The AC BiH cluster is very interested in the transfer of the ACS's experience regarding the cluster's operations and contacts between companies. To achieve this objective, we agreed on **a joint workshop and meeting between entrepreneurs, which will be held in Sarajevo on 28 October 2004**. The introductory presentation of the experience and activities of the ACS will be followed by a business meeting between entrepreneurs featuring Slovenian companies and their potential partners from Bosnia and Herzegovina, which will be organised on the basis of submitted profiles of those companies which have expressed an interest. We invite interested companies to apply to attend the meeting (at the office of the ACS cluster).

Participating at the fair AUTOMOTIVE PARTS AND COMPONENTS 2004: entry to a promising market

Dušan Bušen



Visit of Serghej Mitin, D.Sc., at the ACS's stand
Photo by Andraž Potočnik

The Russian Federation is one of the fastest growing markets for automotive industry products. Therefore, the ACS has carried out numerous activities, the most important being the establishment of a joint development centre. The agreement on establishment was confirmed by the supervisory boards and general meetings of both associations and will be signed in November 2004. The centre has already begun to operate and the first concrete inquiries will be received by ACS members shortly.

The joint participation of ACS members at the 2nd specialised fair Automotive Parts and Components 2004 (Avtokomponente 2004), held in Moscow between 9 and 11 June 2004 was included in the planned activities and co-operation with the NAPAK association and the Ministry of Industry, Science and Technology of the Russian Federation. Cimos, Iskra Avtoelektrika, Iskra Mehanizmi, Kovinoplastika and the ACS participated in the joint exhibition space.

The introductory speech at the fair was made by Serghej Mitin, D.Sc., Head of the Industry Department at the Ministry of Industry and Energy, a high government official who visited Slovenia in December 2003 on the invitation of the ACS. He was happy to visit our stand, as were many visitors and exhibitors (AvtoVAZ, GAZ, KAMAZ, NAPAK, OAP – Car Producers Associations and many others). Virtually all Russian companies in the area of the automotive industry participated at the fair. Besides Slovenian firms, foreign companies mostly included French and Italian companies.

Numerous contacts were made at the fair and they are expected to produce results in the future. A new member of the ACS, HELIOS, has already invited to visit Slovenia an important delegation from RUSAvtobusProm, its business partner.

It should also be noted that the presentation pages of members and the cluster itself were also made available in the Russian language.

Automobil Forum 2004, Stuttgart

Among subjects featured at the annual congress of European vehicle manufacturers and suppliers, such as the globalisation of competition, factories of the future, financing of international operations, increase in buyer-adjusted innovations and market changes, the central focus was given over to discussions on the fast growth markets of China and Eastern Europe. Lecturers giving introductory lectures and people participating in the discussions also spoke of the fast growing of new capacity in the automotive and supplier industries in Eastern Europe, including Slovenia, which requires the extensive transfer of know-how and practice from the West.

Iztok Seljak (Hidria) and Peter Potočnik (TBP)
Photo by Janko Puklavec

Iztok Seljak, Vice-president of the company Hidria in charge of marketing and industrial marketing, representative of one of the larger suppliers from Slovenia to Western Europe, said in his discussion that in his experience Central and Eastern Europe should not merely be viewed as an area with fast growing capacity requiring expert assistance from Western Europe, but should instead be regarded as an area with creative potential and opportunities for the many innovations which are developed there.

POLYCENTRIC TECHNOLOGICAL CENTRE BEING ESTABLISHED

Dušan Bušen

Based on the belief held by members of the ACS, namely that the position of Slovenian suppliers in the automotive industry can only be improved by joint investments and closer co-operation between companies and universities, the ACS initiated the project 'Polycentric Technological Centre as the international innovation system of the Slovenian automotive suppler industry'. With this objective in mind, on 7 July 2004 the Automotive Cluster of Slovenia submitted an application with the above title to an invitation to tender published by the Ministry of the Economy. The aim is to receive funding from the European Regional Development Fund for improving the innovative environment by developing new materials, introducing new technological procedures, developing mechatronics and transferring know-how. The ACS expects the initiated project to produce significant impacts in the innovation area, which is the only guarantee of a continued competitive edge and development in the globalised automotive industry.

Nine companies are included in the consortium, namely AET Tolmin d.o.o., ATOTECH Podnart d.d., CIMOS d.d., EMO Orodjarna d.o.o., ISKRA Avtoelektrika d.d., ISKRA ISD d.d., ISKRA Mehanizmi d.d., LIV Plastika d.o.o. and TPV Tadis d.o.o as well as three research and development institutions: the Faculty of Mechanical Engineering from Ljubljana, the Faculty of Natural Science from Ljubljana and the Faculty of Electrical Engineering and Computer Science from Maribor.

The Polycentric Technological Centre (PTC) is an international innovation system joining and connecting business and academic spheres supported by ministries. Each participant is focused on its specific area while at the same time making a synergetic contribution to the whole. The PTC provides the possibility of taking into account starting points and achieving the set objectives stemming from the project as a whole. Its implementation will enable the quality development of Slovenian automotive companies at the local, regional, national and international levels. The new project includes the polycentric development of research and development activities, which are the basis for joint projects enabling the successful development of the industry in the future, reinforcing its economic strength in Slovenia and raising its competitiveness at the international level. The Polycentric Technological Centre will provide quality care, access and the allocation of key sources of research and development activities in the country.

The Polycentric Technological Centre will be used by existing new, domestic, foreign, small, medium and large companies with high market potential as well as by academics. Through its activities the PTC will significantly assist domestic producers of parts in their efforts to establish themselves as quickly as possible as development and system suppliers for the automotive industry. This will thereby enable them to manufacture products of higher complexity and value added for global vehicle manufacturers (in selected segments).

The Automotive Cluster of Slovenia will play the crucial role of co-ordinator.

Founders:

- AET Tolmin d.o.o. Tolmin
- ATOTECH Podnart d.d. Podnart
- CIMOS d.d. Koper
- EMO Orodjarna d.o.o. Celje
- ISKRA Avtoelektrika d.d. Šempeter
- ISKRA ISD d.d. Kranj
- ISKRA Mehanizmi d.d. Kropa
- LIV Plastika d.o.o. Postojna
- TPV Tadis d.o.o. Novo mesto
- Faculty of Mechanical Engineering, Ljubljana
- Faculty of Natural Science, Ljubljana
- Faculty of Electrical Engineering and Computer Science, Maribor

Main objectives of the PTC up until 2008:

Number of qualified research and development centres:	3
Number of newly created jobs:	295
Number of new innovative materials:	5
Number of new technologies and processes:	5
Number of new high-technology products:	30
Average cutting of costs of qualit	-10%
Joint projects with the academic sphere	40

Trends and achievements

Porsche's "attack" on the Indian market

The German company Porsche AG established its own sales network in India in June 2004. Importers are located in New Delhi and Mumbai and the Indian market will be supplied through the Middle East Regional Bureau in Dubai. The company plans to sell more than 2,000 vehicles in the Middle East, including India, by the end of the financial year (31 July), which means a tripling of annual sales. In these markets Porsche offers the sports models 911 and Boxster, as well as its SUV Cayenne. At the moment the company has the right offer for this important future market notably because of its mid-class level. In addition to Porsche's sales network expansion to India, the company will also launch sales of its cars in Yemen in June.

A NEW CAR TO BE MANUFACTURED AT REVOZ – 500 new jobs in suppliers

Dušan M. Mernik

Signing of the agreement between the Ministry of the Economy and the company Revoz d.d. by the Minister of the Economy Matej Lahovnik, Ph.D., (on the left) and the President of the Management Board of Revoz, Michel Bouton
Photo by Revoz

Basic data on the planned investment:

Production of more than 200,000 vehicles per year starting in 2007, up to 700 new jobs in Revoz, approximately 500 new jobs in direct suppliers, an investment in tangible and intangible assets equalling €395 million, and an investment in education and training totalling €5 million.

The Slovenian automotive industry (production of vehicles and automotive parts) employs approximately 16,500 people and accounts for roughly 15% of Slovenian exports of goods and services.

The company Revoz, the only car producer in Slovenia, has been the country's biggest exporter for a number of years and contributes 0.3% to Slovenian GDP. After the investment in the production of a new car model with the working name X44 is realised, the company will (if the company's value added per employee remains unchanged) contribute 0.5% of GDP. This contribution will increase by roughly one-quarter if the contribution to GDP made by the suppliers of Revoz is taken into account.

On the basis of these and other points, the Government of the RS has supported Renault's decision to produce the new car model at Revoz d.d. Novo mesto. The agreement concluded between the Ministry of the Economy and the company Revoz d.d. was signed by the Minister of the Economy Matej Lahovnik, Ph.D., and the President of the Management Board of Revoz Michel Bouton on 13 July 2004.

There are many reasons for grating state aid for the production of a starting-class car, which will be exclusively produced by Revoz for Western and Central European markets.

Investment in the production of the X44 model will strengthen the position of Revoz within the Renault-Nissan corporation. It will crucially improve the security of existing jobs as the investment in a new car model ensures the preservation of car production in Novo mesto. When production reaches full capacity, 700 new jobs will be created in Revoz and roughly 500 in direct suppliers around Slovenia. The new investment in Revoz will be accompanied by an extensive education and training programme in a total value of €5 million. Slovenian workers will thus get the latest knowledge in the area of engineering and management. In short, the new investment is of great importance to the automotive industry in Slovenia and to the national economy as a whole.

It should also be pointed out that this will be the first time that a new model has been introduced in production in Slovenia and that this car model will be exclusively produced in Novo mesto, which will attract more suppliers in Slovenia and in its neighbourhood. Implementation of this investment will strengthen Slovenia's position as a European producer of cars and automotive parts. In addition to extending the suppliers network in Slovenia, the impact of the investment on the linking of companies and development of clusters should also be taken into account. The project has particular importance for the automotive cluster and transport-logistic cluster, which plans to build a distribution centre in the close vicinity of the new factory. The state aid amounting to 10% of investment costs but not more than €39,863,100 will 'pay off' even if only newly created jobs are taken into account, let alone if we include the preservation of existing jobs and creation of new jobs in suppliers.

From supplier to development supplier

The TPV Group decided five years ago to become a development supplier and achieved its goal in 2004

Marko Gorjup, M.Sc., CEO of TPV-Tadis d.o.o.

Marko Gorjup, M.Sc., CEO of TPV-Tadis d.o.o.
Photo by TPV

Achieving the status of a development supplier is the goal of almost every supplier in the automotive industry. This status provides the company with long-term business prospects and further development. When a company becomes a development supplier, it has a greater possibility of creativity in designing and developing its products. The company can use its ideas to greatly assist the buyer in making even better products.

The road to achieving the status of a development supplier, taking the responsibility for product development, is a long and hard one. However, it is often the only way for the long-term survival of a company in the automotive industry. In case of the TPV Group, the road from supplier to development supplier lasted several years and required many resources and organisational changes.

In 2002, the TPV Group integrated all commercial, development and production activities which were previously poorly co-ordinated. The purpose of establishing a new company – TPV Tadis d.o.o. – was for stronger and more independent operations in the automotive industry market with the highest goal – to become a development supplier. We came to the conclusion that this is the only way to ensure the long-term successful operations of the TPV Group.

We have already proven ourselves as successful developers of technological processes. In recent years we have upgraded this stage as a mature company able to assist its buyers in developing new products. We have also been involved as so-called 'assistants' in the development of new products, thus gathering the required experience on our path of independent development. The confirmation that we have done good work came when Renault chose our company as its development supplier in the area of plywood. That gave us a great opportunity to prove ourselves as a competent independent supplier in the automotive industry.

However, the decision to become an independent development supplier is in itself not enough. In order to bring such decision to life great financial input, good organisation of development work and connections to external development institutions are required. Only through systematic work can one achieve one's goals in the automotive industry.

Winning real development work was undoubtedly a big step forward but it still does not conclude our journey. We must consolidate our position and constantly prove ourselves in this elite group, which will open new horizons for our company in the automotive industry.

Products of the company TPV
Photo by TPV

Programme of the TPV Group:

- Car seats
- Larger metal sets (seat skeletons etc.)
- Mechanism and metal sets
- Plywood
- Pipe products
- Wire products
- Engine washers

Buyers' expectations in the development project:

- Adequate development capacity
- Qualification for CAD design and electronic data exchange
- Efficient communications with the buyer
- Complete project organisation
- Satisfying buyers' objectives (Q-C-D)
- Qualification for work in accordance with the standard required by the customer
- Reactivity, risk management
- Obligatory breakdown of costs
- Transparent information on the status of a product

The path of the TPV Group from supplier to the development supplier in the automotive industry

1990:	TPV becomes a supplier in the automotive industry
1993:	Participation in developing various production processes
1999:	Strategic decision to become a development supplier
2000:	Start of creating own independent development, employment of appropriate staff, purchase of required equipment, organisation of development, including external partners
2001:	Start of the marketing and promotion of independent development
2002:	First successes
2003:	Extended strategic goal – to become a privileged supplier
2004:	TPV becomes a development supplier in the automotive industry

The project of expanding and reconstructing the galvanisation plant at Iskra ISD nears completion

Boris Bremšak, Sales Director, Iskra ISD d.d. Kranj

Galvanisation drums
Photo by Iskra ISD d.d.

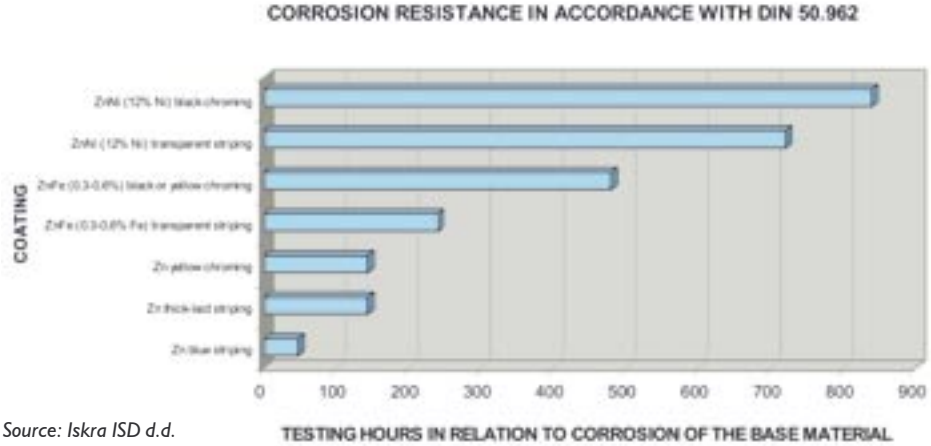
The project of galvanic protection ZnFe, ZnNi was a joint project of ACS members. It was identified on the basis of the needs of Slovenian producers of parts for the automotive industry, which used ZnFe and ZnNi galvanic protection services from companies in Germany and other EU countries. Another reason was the new EU directives which prohibit building in heavy metals such as cadmium, mercury, lead and hexavalent chromium. On these bases a market analysis was made which identified a significant need for such protections and that trends in the automotive industry point to extremely corrosion-resistant protections. These activities were followed by preliminary studies which included an examination of the relevant literature and standards, an analysis of the required galvanisation machinery and equipment, an analysis of the required chemicals, procedures for testing and measuring galvanic deposits… This was followed by the preparing of draft projects and calculations, which formed the basis for approval. The project, including the time schedule and budget, was prepared after the approval was given.

In February 2004, the company ISKRA ISD commenced test production on a galvanisation line using drum technology. We decided to gradually introduce galvanic treatments from alkalic zincing to ZnFe and ZnNi alloys. The first stage of testing zinc coatings with yellow, blue and thick-laid striping has concluded. Next was the stage of testing ZnFe alloys and high-alloyed Zn-Ni coatings. The two-stage electrolytic separation of Zn-Ni coating, which contains 12-15% of nickel, is an extremely technologically demanding process. All parameters prescribing the correct operation of the bath and the process are set very accurately and establish standards for achieving quality, highly corrosion-resistant coating.

The new galvanic line of drums is operated by a processing computer, which means that the computer controls all machinery on the line thereby monitoring, controlling and adjusting the conditions which influence the stability of surface protection procedures. The process computer stores all data on products from the protection type through to the parameters of galvanic processing. Thus, accuracy, stability and foremost the repeatability of processes are achieved. By entering an individual batch through a barcode printed on the work order, we eliminate the possibility of human error and, by a simultaneous reading of the order/batch number, ensure traceability. The computer keeps daily and monthly statistics, while a printout of the quality protocol is available at all times.

One novelty is the drying of wet processed material in special heart-shaped drums. The advantage of the system with oscillating drums in comparison to classic drying in centrifuges lies in greater quality protection as this procedure causes no surface damage to the chromed protective layer.

In addition to classic volumetric, potentiometric and UV and VIS spectrophotometric methods for controlling the chemical parameters of the bath, an 'online' analyser working on the principle of roentgen fluorescence is also used in the new galvanisation line. The analyser is equipped with a flowing measurement cell, through which samples of galvanisation baths are constantly fed. With regard to the measured value, the concentrations of zinc, nickel or iron in the bath are regulated through dosage containers and tubs for melting zinc, thus



Source: Iskra ISD d.d.

providing stability of the bath and keeping the parameters within a very narrow range.

The application of processed material with a protective surface is measured by a roentgen thickness measurement device that is linked to the system for the collection and statistical processing of data. Measurements are performed for all types of protection and the proportion of nickel in the coating is also determined for Zn-Ni alloy. The corrosion resistance of coatings is tested in a salt chamber.

Iskra ISD also has a certified laboratory for longitudinal measurements, which gives the company special prestige and points to the high level of expertise of its control staff.

Particular attention in planning the galvanisation line was given to environmental factors so negative impacts on humans and the environment were reduced. The cascade rinsing system reduces the consumption of water. Recuperation of heat from vacuuming tubs was implemented, frequency regulators for voltage/current are in use in virtually all electromotors. Simultaneously with the setting up of the new line, the wastewater treatment plant was also renewed. In the unpoisoning of Zn-Ni waste water, which contains a highly stable nickel complex, we use a chemical procedure developed by the supplier of chemicals for the new line. The surface protection of zinc and ZnFe zinc alloys with black chroming and ZnNi alloys with black chroming and transparent striping and the additional protection of coatings with organic varnish enable the production of highly quality and extremely corrosion-resistant surface coatings. The requirements of automotive industry standards, prescribing the strictest criteria in the area of anti-corrosion protection, are thus being satisfied through implementation of the new technological procedures.

The European Union Directive prohibits the use of hexavalent chromium in surface protection after 2006. The investment will enable the company to implement the prescribed guidelines and stop using the prohibited heavy metals within the appropriate timeframe.

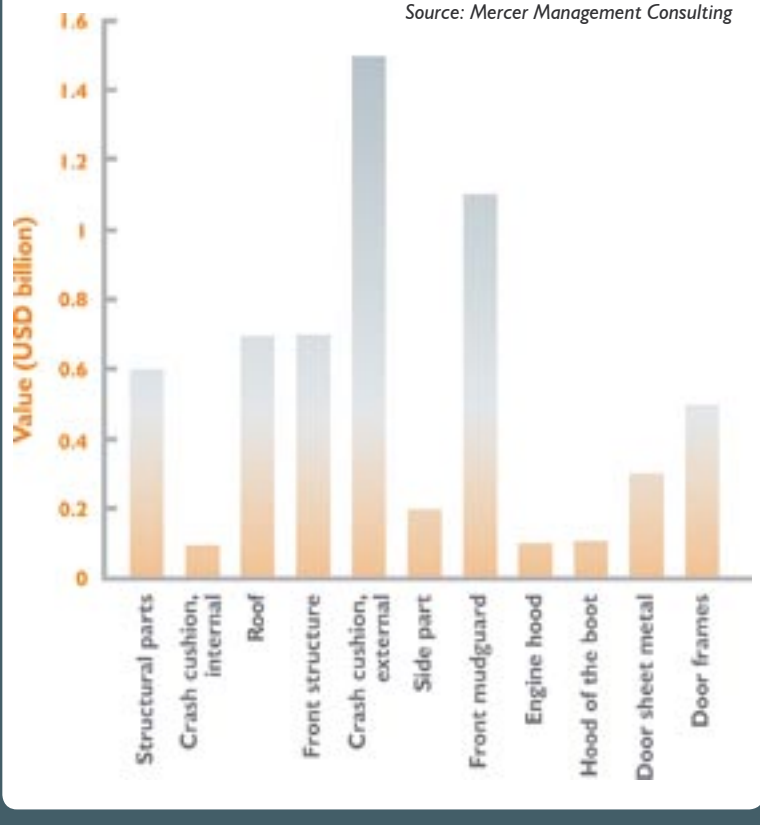
Trends and achievements

Favourable trend for commercial vehicles

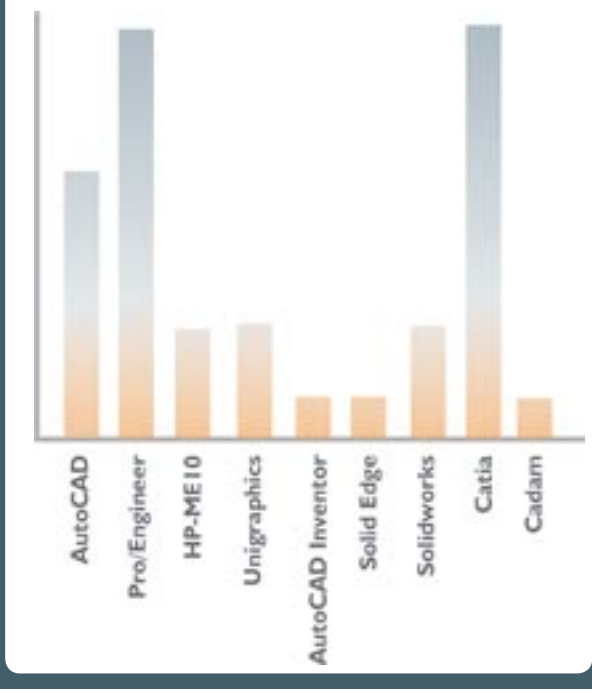
The value of trade in commercial vehicles in Western Europe rose significantly in the first quarter. There was an 8% increase in the sale of tra-nsporters and a 6% increase in the sale of medium and heavy trucks between January and April, compared to the same period of the previous year. By contrast, the sale of buses dropped by 1% compared to the same period of the previous year, according to the German Association of the Automotive Industry (VDA). Demand for lorries was favourable in the last few months, which was particularly due to the general economic upturn and new opportunities in the expanded European Union. New models and engines continue to drive higher demand.

The number of vehicles registered in Germany between January and April increased by 6% compared with the same period in 2003. In April alone, the number of registered commercial vehicles of 6t or more increased by 25%. Good prospects for the US economy have led to significantly increased sales of medium and heavy lorries. The increase in the medium lorry segment was 28% compared to 2003, while the respective rise in sales of heavy lorries was an astounding 50%. Total sales of medium and heavy lorries grew by 37%.

Year 2010: outsourcing in car body parts
Source: Mercer Management Consulting



CAD in the automotive industry
Source: Mercer Roschival & Partner



»1 SERIES« AND CIMOS

Cimos d.d. Koper exclusively supplies pedal structures, auxiliary brakes together with intertwined wire guides and boot door hinges for BMW 1 Series cars. By developing these products, the company has become one of the most important development suppliers of BMW.

A new product of the BMW car company was recently launched globally. It is BMW's smallest car, with which Bavarians aim to prove that even in the Golf's class a top-notch car can be made and successfully marketed at a premium price – enter the BMW 1 Series.

The Koper-based company Cimos has participated from the outset in the development of this car, which in many ways sets new standards in the market and is becoming the new benchmark. We talked to the Director of the Research and Development Department at Cimos, **Primož Mihelič, M.Sc.**, who discussed certain milestones, how they got the deal and how projects for developing parts and components for the BMW 1 Series were conducted.

The new BMW 1 Series
Photo by BMW

What was Cimos' role in this project?

As regards this car, Cimos is one of the most important development suppliers of BMW as it is the exclusive supplier of the pedal structure, auxiliary brake together with intertwined wire guides and boot door hinges. I have to point out that Cimos also developed all the above products to suit BMW's requirements. We have been included in development since the earliest conceptual stage, whereas in the pedal structure Cimos was included already in the stage of preparing the requirements document.

Primož Mihelič, M.Sc., in front of BMW's R&D centre
Photo by Cimos

The Cimos-produced pedal structure and manual brake for the BMW 1 Series
Photo by BMW

How did you manage to get such a deal?

It was hard, I can tell you. It involves a combination of factors and circumstances which must reflect to the greatest possible extent the long-term systematic development of a partnership between the buyer and its supplier. Cimos made its first contacts with the Bavarian company in the 1980s. Initially, it was all about feeling each other out, getting to know one another, checking whether Cimos was appropriate and able to become BMW's supplier. In the first years, Cimos prepared offers that were never put into practice.

The first breakthrough came at the beginning of the 1990s. Cimos got its first orders. They included the production of a bridge and the handle of a motorbike boot and a pedal of the auxiliary brake of the 7 Series. In the mid-1990s, this was followed by a manual brake and parts of the pedal structure of the 5 Series. At that time, we began to co-operate with BMW's R&D on changes to pedal structures. Our construction solutions originated from technology and were also used in manual brakes in the 5 and 3 Series. We started to supply them in the second half of the 1990s. This was followed by work on projects for parts of pedal structures for the Mini, Rolls Royce, the new 7 Series, X5 and X3.

Another breakthrough came at the beginning of this century with the 1 Series project. It was the first project where Cimos attempted to become BMW's development supplier. Activities for winning the deal began very early. Our development engineer co-operated with developers at BMW's R&D centre (FIZ) in preparing the concept and requirements document for the new pedal structure. Such close co-operation of a single supplier with the carmaker in such an early stage of development of a new car, when the supplier has still not been selected, is an exception. We took advantage of this and entered the supplier selection stage with an important edge.

3-D model of the Cimos-produced boot door hinges for the BMW 1 Series
Photo by Cimos

We were at the point of having seen more than a decade of co-operation, a good year of joint work on the project and all the required offers submitted for the project. The meeting at which the decision was made was an interesting one. The Sales Director and I had to fly on short notice to Munich to meet high representatives of the purchasing and R&D departments of BMW. The meeting lasted just ten minutes. They asked us whether we would be able to provide appropriate development support for BMW in this project. We said 'yes' and got the job as a development supplier. That concluded the meeting.

We then also got the job of a development supplier for a manual brake with intertwined wire guides and for boot door hinges for the same car.

Did Cimos manage the project on its own?

We implemented the project in co-operation with our partners. Quite a few of them are

3-D model of the Cimos-produced manual brake for the BMW 1 Series

photo by Cimos

3-D model of the Cimos-produced pedal structure for the BMW 1 Series

3-D model of the Cimos-produced intertwined wire guides for the BMW 1 Series

from Slovenia and are also ACS members: CRV, Liv, TPV, Unior, Kovinoplastika, Ikor, TVP, Sava GTI. These companies will make certain elements of the abovementioned products and also co-operated in their development. Partners in the design and manufacture of tools, machinery and production lines were also included in the project.

What does work on such a project look like?

The work is done in the SET (Simultaneous Engineering Team), which includes representatives of BMW, Cimos and our development partners. For the duration of the project we have formed a so-called extended company.

We simultaneously develop the product, set technological procedures and define tools from the very beginning of the project. Joint SET co-ordination meetings are held every fortnight or more often if necessary. A direct OFTP link enables the secure online exchange of CAD files.

Product development itself starts by defining the requirements document and products concept in the virtual car environment. In this, the earliest stage, our development engineer worked at BMW's R&D centre. The second stage puts emphasis on computer-aided modelling of the product, which is the basis for other development activities. They are carried out simultaneously. We calculated tensions and deformations by using the finite element method, simulated kinematics and checked collisions, simulated casting, defined the tools… The SET also jointly carries out the FMEA analysis of the product and the process. When with regard to the virtual evaluation and FMEA of the product the product complies with the requirements document, prototypes are made. After confirmation of their adequacy with all the planned tests, the product is finally validated and the definition is unchanged for the serial production. Afterwards, only details are changed with regard to actual possibilities in production processes.

The joint R&D team of BMW and Cimos for the area of pedal structures and auxiliary brakes in front of BMW's R&D centre in Munich
Photo by Cimos

The project was thus successfully completed. What are your future plans?

The project is not yet concluded. We will carefully monitor the beginning of its life and optimise both the product and the production process.

We have many new products in the pipeline. These products will be launched in the market in the following months and years, up until 2007. Besides, we have entered a new level of co-operation with our buyers in the last two years, namely we participate in research and development projects aimed at producing new or improved products in the functional areas of a car covered by our company.

Construction evaluation laboratory – LAVEK

LAVEK at the Faculty of Mechanical Engineering in Ljubljana successfully co-operates with domestic companies and in international projects

Dušan M. Mernik

Prof. Dr. Matija Fajdiga, Head of the Laboratory

Jernej Klemenc, D.Sc.

Construction evaluation methods involve a range of experimental methods, 'paper' calculation methods (in decline) and computer simulations, by which it is proven that a construction will withstand the prescribed loads, operate reliably in the planned life cycle with the required maintenance, that the probability of defects is sufficiently low, that it is safe and economical for use… Construction evaluation methods also include proving the so-called maintenanceability of a construction (simplicity of maintenance, ergonomics of its elements etc.).

The objective of a construction evaluation is to prove to the buyer that a construction will meet their desires and requirements.

In tough competition in the global market where supply exceeds demand, a quality product is a prerequisite for a producer's success. A product must satisfy the buyer in all aspects. Tough questions such as: will the construction withstand the prescribed loads? Will it operate reliably in its planned life cycle with the required maintenance? Is the probability of defects low enough? Is the construction solution safe and economical for use… must all be responded to affirmatively by the producer.

For this reason, producers include state-of-the-art construction evaluation methods in the development process: numeric simulations of the behaviour of components, sets and complete solutions in real operating circumstances. These are used by all major car makers and have in recent years also become part of standard development procedures in many first-level suppliers.

The basis for modern evaluation methods was set by Woehler with the dynamic testing of constructions' resilience in the 19th century, Palmgren and Miner with their linear model of growth of wear-and-tear damage (the first half of the 20th century) and Gassner with his testing of constructions for operational strength in the second half of the 20th century. The development of computers brought more advanced mathematical models (finite difference method, finite element method, border element method), which complement and to a limited extent replace (due to relatively lower costs) extensive experimental evaluations of constructions.

Computer simulations for evaluating constructions were not widely used until the 1990s when powerful computers became available at an acceptable price. This was because computer simulations used in the evaluation of constructions require an extremely large amount of processing power.

LAVEK – know-how, experience, state-of-the-art equipment

The construction evaluation laboratory – LAVEK – performs educational and research activities. The educational activities include Mechanical Elements, Dimensioning Methods, Vehicles and Operating Strength, while research activities include basic research, applied research and development in the areas of vehicles, machinery and systems.

The LAVEK laboratory has mastered all of the most recent methods for construction analysis with simulations and/or experiments. Its staff has extensive experience in this area, because the Head of the laboratory, Professor Fajdiga, introduced in his doctorate thesis back in the 1970s as the first in Slovenia to do so what were then the latest methods of construction evaluation for operational strength and also used them in practice (in TAM). The quality of knowledge accumulated in the LAVEK laboratory is also shown by the fact that its researchers have successfully used artificial intelligence methods (neuronic networks, generic algorithm) for improving certain construction evaluation methods. They have already used the artificial intelligence approach several times in industrial projects with Slovenian and foreign partners.

Hardware of the LAVEK laboratory:

- 18 office personal computers and laptops
- MES measurement amplifiers (22 channels) and an HBM digital amplifier (18 channels)
- SCHENK testing device for dynamic strength Software of the LAVEK laboratory for CAE

Software of the LAVEK laboratory for CAE

- CATIA V4 (5 licences) and V5 (18 licences)
- ANSYS 6.1 (8 licences) and LS-DYNA (1 licence)
- FEM-FAT (6 licences)
- ProENGINEER (3 licences)
- LabVIEW 6.0 (2 licences)P

Areas of work of the LAVEK laboratory:

- Simulation of the behaviour of constructions in real operating circumstances
- Proving the resilience of constructions with simulations and experiments
- Establishing the loading conditions of constructions with simulations or experiments
- The most complex statistical analyses of operating and loading conditions etc.

Computer classroom with fifteen graphic workstations

Fifteen employees (Including the head, eleven researchers, three technical assistants and two external assistants) have the hardware and software (and naturally the knowledge) for carrying out numerous tasks: production of prototypes and testing equipment in the workshop, computer-aided modelling and simulations, development of own software, mobile measurements, laboratory measurements and the preparing of expert opinions.

Jernej Klemenc, D.Sc.: 'We want long-term co-operation with industry as much as possible. This was one of the reasons why we became an ACS member. We are convinced that knowledge can be successfully transferred to the industry only through the long-term co-operation of partners from the industry, which extends beyond individual projects.'

LAVEK has the latest versions of professional commercial software packages and additionally develops its own software for construction evaluation. The entire range of structural analyses for construction evaluation can be performed at the LAVEK laboratory, ranging from simple linear simulations and simulations of construction fatigue through to the most complex non-linear simulations such as crash test simulations.

In addition to hardware and software support for performing simulations, LAVEK also has at its disposal state-of-the-art computer-aided experimental equipment for construction evaluations, which enables the simultaneous collection of data from more than 40 sources.

In running projects, LAVEK co-operates with domestic and foreign scientific and research and development institutions. The laboratory co-operates with other laboratories and chairs at the Faculty of Mechanical Engineering in Ljubljana, while its foreign partners are Fraunhofer Institut für Betriebsfestigkeit - LBF, Darmstadt; Škoda Výzkum, Plzen; the Institute of Materials & Machine Mechanics, Bratislava; the Faculties of Electrical Engineering, Mechanical Engineering and Naval Architecture in Zagreb and Split etc.

SCHENK testing device for dynamic strength.
All photos by LAVEK

LAVEK began participating in international European projects in the 1990s: Copernicus, part of the Fourth European Framework Programme, with the aim to determine the dynamic strength of aluminium alloys used for vehicles' felloes and Hipertrack, part of the Fifth European Framework Programme, with the objective to use neuronic networks for evaluating the loading conditions of rails in real operating circumstances.

Growing co-operation with companies

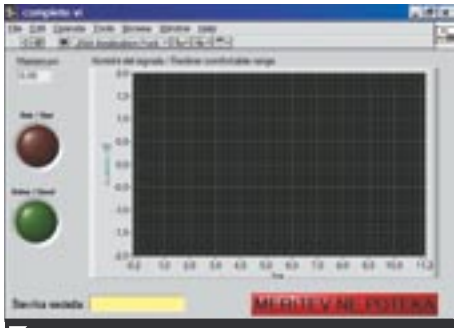
'Producers must prove with prototypes the characteristics of products that are to be used. The problem lies in the very expensive equipment and lack of adequately qualified personnel, which are required for carrying out the complex development procedures. This problem is particularly acute in small companies trying to become development suppliers. Therefore, the activity of our laboratory is interesting for both small and large companies,' says Jernej Klemenc, D.Sc., assistant and senior researcher at the Faculty of Mechanical Engineering in Ljubljana.

Dr. Klemenc is convinced that knowledge can only be successfully transferred to the industry through long-term co-operation with partners from the industry, which extends beyond individual projects. Therefore, the LAVEK laboratory looks forward to any co-operation with partners from the industry and most of all seeks more long-term co-operation. This was one reason LAVEK became an ACS member.

Partners of the LAVEK laboratory have access to state-of-the-art equipment and, even more crucially, to all knowledge accumulated in the laboratory over all of these years. When co-operating with its partners the laboratory tends to be more than a 'provider of a service' but instead provides the partner with a better understanding and the solving of its problems by means of proposed solutions, advice and education. LAVEK has, as part of the Evaluation of Development Centre, established long-term co-operation with a few companies (CIMOS, HELLA LUX Slovenia, TOMOS, TPV) and has also carried out more than 200 smaller and bigger projects. Work is continuously performed on projects for su-

More important recent projects:

- **Measurement of the operating stages of the INDOS forklift (customer INDOS, 1996)**
- **International project COPERNICUS (EU, 1995-1997)**
- **Development of the mechatronic system for weighing communal waste (ATRIK d.o.o., 1998-1999)**
- **International project HIPERTRACK (EU, 2001-2004)**
- **Analysis of a headlight (SATURNUS Avtooprema d.d., 2002)**
- **Determining the operating stages and resilience of an exhaust collector (CIMOS d.d., 2003)**
- **Adjustable pedal structure (CIMOS d.d. in co-operation with ISKRA Mehanizmi d.d., 2003-2004)**
- **Mechantronic system for controlling the quality of electronically adjustable seats (ARSED d.o.o., 2004)**



Display interface of the application for measuring the vibrations of an electrically adjustable seat

ppliers and, at the same time, in other development areas (development of mechatronics systems, introduction of artificial intelligence methods in industrial applications). Recently, companies have been showing increasing interest in the experimental evaluation of constructions in addition to numeric simulations. In the autumn of 2003, in co-operation with the companies Cimos and Iskra Mehanizmi (IM) the laboratory started to develop an adjustable pedal structure for BMW, which is a completely new design (adjustable in depth with regard to different people's heights i.e. the size of their feet). Cimos produced the prototype, IM electromotor and the control device, while LAVEK contributed the 3-D construction and proof of resilience. Teamwork brought success, including several solutions that are currently in the patent procedure.

Since 2004, LAVEK has also been operating in the 'soft' area. It is developing a computer-aided measurement system by which it is trying to establish how much a construction's behaviour in use influences the feeling of the user. The laboratory has designed and produced a measurement system for the automatic determining of vibration levels, which causes an unpleasant feeling in the adjustment of an electrically adjustable car seat.

Trends and achievements

Mechatronics providing for a correct airbag

Bosch recently produced an 'intelligent' seatbelt called iBolt, which enables the more accurate release of an airbag in the event of an accident. The new sensor system takes into account the actual passenger involved by measuring forces on four points of fixing the seatbelt on the car seat and by then using this data to calculate the weight on the seat and its distribution thereby determining the most appropriate method of using the airbag.

Since a large number of passengers, notably in the USA, does not wear seatbelts, the airbag must have a large volume and must open quickly.

The Federal Motor Vehicle Safety Standard 208 requires the release of an airbag in a way which accurately corresponds to weight of a passenger. The new iBolt provides for just that. The system 'knows' how to react with regard to the actual conditions by fully opening the airbag for large or heavy passengers, partly opening the airbag for smaller people and children and by dampening in the case of small children or when no passenger is sitting on the seat.

And how does iBolt work? Four sensors are built into the frame of the seat, changes to the existing construction of the seat or adjustment of the system to different types of car seats are usually unnecessary. According to the manufacturer, the new security system can be built into a vehicle without any problems. The essential improvements of the system involve the 'merger' of classic mechanics and electronics, by using mechatronics. The seatbelt is equipped with sensors on the basis of the Hall effect and determines the weight/forces while the electronic system evaluates (four) readings and recognises the way the passenger is sitting and any changes. The central controlling system of the airbag thus receives several pieces of information (not only the passenger's weight) and can therefore release the airbag

Improved safety with Bosch's "intelligent" seatbelt iBolt
Photo by Bosch

(also) with double or several-stage gas generation adjusted to the actual passenger and their particular way of sitting.

Further improvements in recognising the way passengers are sitting can be expected in the near future. A video-sensor system installed in the passenger cabin will be able to 'see' whether, for example, a passenger not wearing a seatbelt falls under the dashboard and whether the airbag should be released only partially in a crash. Bosch is already developing such a system for serial production.

Bosch 2003: a record number of patent applications

The new Bosch R&D centre in Germany
Photo by Bosch

The Robert Bosch AG Group continues with its innovative orientation. The Group filed 2,748 patent applications in 2003, which is more than ever before. The respective number in 2002 was 2,622 and the Group has been filing more than 2000 applications annually for several years. The emphasis on patents is particularly visible in the automotive industry where Bosch is the leader not only in Germany but also in Europe and the USA.

This all involves the achievement of 'brainwork'. Bosch's Automotive Technique division employed roughly 144,000 people at the beginning of 2004, 16,000 of whom worked in research and development (R&D) – almost 500 more than in the year before. Bosch accordingly increased its R&D budget for the Automotive Technique division by 8% to €2.2 billion. The amount equals more than 9% of sales income, which easily exceeds the normal level of investment in the industry.

The Bosch Group is working all over the world on the development of the motor vehicle of the future. To this end, a new development centre was opened in Germany in May 2004 (near Heilbronn) while the building of a second large technological centre in China has started. Even now, the Automotive Technique division employs roughly 1,800 people in Asia and 1,600 people in America, respectively.

In today's increasingly competitive environment, Bosch has concentrated on innovations which have immediate benefits for drivers or which will provide them in the shortest time possible. Bosch has learned from previous success stories that only innovations understood and appreciated by car drivers become widely used.

Autokomponente Moscow 2004
Photo by Andraž Potočnik

The 2nd ACS Convention: MAGNA Steyr
Photo by Mitja Sagaj

Jama Clepa 2004
Photo by Andraž Potočnik

Jama Clepa 2004
Photo by Andraž Potočnik

Visit by the Oleg Danilov delegation

The ACS business conference
Photo by Euroteh magazine

ACS news
Quarterly Review of the Automotive Cluster of Slovenia

Published by: Economic Association Group ACS, Ljubljana
Dimičeva 9, 1000 Ljubljana
Slovenia
Phone : 01 236 17 35
01 236 17 36
Fax: 01 236 17 33
E-mail: info@acs-giz.si
http://www.acs-giz.si
Editor: Dušan M. Mernik
Graphic design: Miba marketing, d.o.o.
Printed by: Gorenjski tisk-digitalni tisk, Kranj
Print run: 100 Issues

Free of charge