Plastics and Rubber Industry – an Important Element of the Czech Economy

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The economic results of the manufacture of rubber and plastic products (NACE 25) have been above the average of the manufacturing sectors for many years, and 2006 was no exception, as revenues from the sale of its products and services were preliminarily estimated at almost 21% higher in constant prices than in the previous year. The dynamic growth of the sector, which is supported by investment incentives that go primarily to the plastics industry, is closely linked with developments in other manufacturing sectors, especially the automobile industry, manufacture of electrical machinery and equipment, the building industry, engineering and the food industry, i.e. sectors which are using increasing amounts of rubber and plastic products.

Trade and Investment Remain High
This sector also has good results in foreign trade. In 2006, it accounted for 4.7% of total Czech exports and 5.2% of total imports. The permanently largest trading partner of the Czech Republic in the rubber and plastic products is the European Union. In the Czech manufacturing industry, NACE 25 ranks among the investing sectors. It is noteworthy that the number of enterprises specialising in the manufacture of plastic components for the automobile industry is on a constant rise in the Czech Republic. This is evident from the database of Czech suppliers, which is available, free of charge, in three language versions on the CzechInvest website: http://suppliers.czechinvest.org/. Their number can be expected to continue rising in view of the anticipated development of the sector. The state has been supporting the development of NACE 25 in recent years with numerous investment incentives. By the end of 2006, the Ministry of Industry and Trade had issued more than twenty decisions promising investment incentives in this sector, and other applications are in the pipeline.

Nearest Prospects of the Sector
The rubber and plastics industry in the Czech Republic has a number of favourable prerequisites for its development. It has a solid crude material base, and is...
Plastics and Rubber Industry Ranks among Most Dynamic Sectors

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The manufacture of rubber and plastic products (NACE 25) has been one of the most dynamically developing sectors of the manufacturing industry in the Czech Republic in the last five or six years. The sector includes two large branches, each with revenues ranging around several billion EUR. The main products in NACE 25.1 – manufacture of rubber products – are tyres and tubes, and the range of products in NACE 25.2 – manufacture of plastic products – is diversified and includes a broad range of semi-finished and final plastic products (various parts and components, plates, tubes, hoses, foils, and packaging materials) for the automobile industry, electrical engineering, the building industry, containers and packaging materials for the food industry and other sectors.

According to preliminary results, the sector accounted for 7.1% in constant prices of the total revenues of the Czech manufacturing industry in 2006 (for 6.9% in 2005). The share of the mentioned branches in revenues has been more or less the same for several years, and the ratio of the NACE 25.1/NACE 25.2 share was 42:58 in 2006. Noteworthy is comparison with the chemical and pharmaceutical industry (NACE 24) – the revenues of the rubber and plastics industry were higher for the first time in 2003, and are now exceeding NACE 24 revenues by approximately EUR 1 billion a year.

Present Position of the Sector

In contrast to the related chemical and pharmaceutical industry, small and medium-sized enterprises with up to 249 employees are dominant in the plastics and rubber sector. These two groups account for 46-48% of the revenues, approximately 48% of the added book value, and more than 60% of the number of employees. The main companies in the NACE 25.1 branch include Barum Continental, s.r.o. (www.barum.cz), which is the largest car tyre factory in Europe, and Česká gumárenská společnost, a.s. (CGS) (www.cgs.cz), which manufactures mainly tyres for trucks, tractors and off-road vehicles, and other rubber products. The number of NACE 25.2 entities is much higher, but the revenues of the most important of them are below the revenues of the two above mentioned companies. The main ones include Cadence Innovation k.s. (www.cadenceinnovation.com), Gumotex, a.s. (www.gumotex.cz), and Borges CS, s.r.o. In terms of revenues, the TOP 100 in 2006 included Barum, CGS, and Cadence Innovation.

Foreign Trade

NACE 25 has an important position in the foreign trade of the Czech Republic. According to preliminary results, its 2006 exports amounted to almost EUR 3.7 billion and increased by 16% against the previous year; imports increased by 14% and exceeded EUR 3.9 billion. Since exports were increasing at a higher rate than imports,

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<th>Main indicators in 2002–2006</th>
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<td>Revenues for sale (constant prices)</td>
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<td>Book value added (constant prices)</td>
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<td>Number of employees</td>
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<td>Exports (current prices, CPA)</td>
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<td>Imports (current prices, CPA)</td>
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CPA – Classification of Products by Activity

Source: Czech Statistical Office, Panorama, calculation and estimate of the Ministry of Industry and Trade
the deficit of the sector was reduced by EUR 27 million to EUR 258 million. In 2006, the EU-25 accounted for more than 88% of imports to the Czech Republic, and received 83% of Czech exports. The main trading partner is Germany (share of 45.3% in Czech imports and 35.1% in Czech exports), followed at a distance in 2006 by Slovakia (share of 5.4% in imports and 8.1% in exports), Poland (share of 5.7% in imports and 7% in exports), and France (share of 5.7% in imports and 5.3% in exports).

Economic Development of the Sector in 2006
Preliminary economic results (see the Table) indicate that 2006 was a good year, as dynamic growth continued in all industrial and financial indicators and markedly exceeded the rate of growth in the Czech manufacturing industry as a whole.

Revenues from the sale of products and services in constant prices showed a year-on-year increase of almost 21% as compared with 14.3% in the manufacturing industry. Noticeable is the two-third increase in the productivity of labour from value added (in constant prices) over the period from 2002 to 2006. A specific feature of the NACE 25 sector is the permanent increase in the number of employees – by almost 21 000 since 2002. This confirms that the sector helps to reduce unemployment to a significant extent, especially in regions with a less developed economy. A total of 613 enterprises with 20 and more employees were operating in the sector at the end of 2006, and the number of their employees has been rising by several dozen annually in the last few years. The sector is represented (in terms of revenues) mainly in the Zlín Region, in which Barum Continental, s.r.o., Fatra, a branch of ALIACHEM a.s., and other companies are based, followed by the Central Bohemia and Plzeň Regions. The dynamic development in recent years has been stimulated by the system of investment incentives which has attracted a number of renowned foreign investors who brought first-rate techniques and technologies to the Czech Republic. Besides increasing employment, this development has been favourably reflected in average wages, which amounted to CZK 18 329 state-wide at the end of 2006, which was 4.7% more than at the end of 2005.

Investment into the Sector
In the last few years, gross investment into the NACE 25 sector has been ranging between EUR 330 and 370 million a year. It went mainly to the modernisation of old and construction of new factories producing car and truck tyres, packaging foils, plastic components and items primarily for the automobile industry and electrical engineering. This trend continues as confirmed by new investment plans announced in recent months (such as expansion of rubber hose manufacture, manufacture of plastic window frames, plastic components for automobile interiors, and the construction of a factory to make hi-tech flexible hoses of synthetic rubber).

Position of the Sector in the European Union
The NACE 25 sector has been the leader of the manufacturing industry for many years. According to a study of the "Plastics Europe" association, 1.5 million people are employed in the sector in the European Union alone and thousands of others work in related sectors, and the number is expected to continue rising. In view of the lasting interest of domestic and foreign investors, the sector is fully competitive with the EU countries which have a developed automobile industry and electrical engineering, such as Germany, Italy, and France in terms of both kilogram prices of imports and exports and the standard of manufacturing techniques and technologies. The good position of the Czech Republic is even more striking in comparison with the CEFTA countries which acceded to the EU in May 2004 and January 2007, as the Czech Republic has the highest share in exports to the EU from these countries.

Nearest Prospects of the Sector Are Promising
The prospects of the Czech rubber and plastics industry are very promising at least in the next three to five years. The expected development of the automobile industry and electrical engineering is attracting to this country many new sub-suppliers to new and old factories of these branches. Dynamic development is also probable, as the possibilities of plastics application are far from exhausted. These exist in the automobile industry (plastic connectors, modules replacing expensive cabling in new designs, oil level measuring sensors and hi-tech automobile casings etc.), electrical engineering and electronics (for example, plastic electronic chips made of organic polymers), engineering, the building industry, packaging manufacture (new plastic packaging materials with specific properties), and leisure time products (mainly sports equipment). The sector has a solid crude material base, but the offer does not include, besides natural rubber, special engineering plastics and special additives. Thanks to the massive involvement of foreign capital which has brought to the Czech Republic top-quality technologies and machinery, the sector is fully competitive in international comparison, and impacts on the environment (recycling of plastics, the problem of worn tyres) will be solved in a similar way as in the EU-25. For these reasons, we can assess the prospects of the two branches as favourable and expect the position of the rubber and plastics industry in the Czech manufacturing industry to be ever stronger.
Environmental, Economic, and Legislative Aspects of Plastic Waste

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Every technically advanced country must prevent the adverse consequences of economic development. This also applies to waste management, and in the case of polymers mainly to thermoplastics and rubber. According to processing possibilities, plastic waste can be either upgraded or cleared away.

From an environmental view, the best form of waste management is recycling, i.e. used and discarded products are not included in solid waste but collected, sorted and processed, and the material thus gained is utilised.

The upgrading of plastic waste, mostly mixed, means its transformation into basic materials of the chemical industry or into fuel. The energy upgrading of waste polymers means the use of their energy value by burning (to generate heat or electricity).

Marking of Packaging Plastics
A separate chapter is the marking of plastics especially on packages. This marking is based on the European Commission Directive establishing the identification system for packaging materials. Pursuant to this Directive, the Commission issued a decision which classified the different materials by codes in letters and numbers. Their use is voluntary in general. In the Czech Republic, it became compulsory for plastics, metals, and composites by the stipulated duty to mark consumer packages to inform about their handling when emptied.

Environmental and Economic Aspects
The environmental and economic factors which influence waste management in industrially developed countries, thus also in the Czech Republic, can be divided into three groups, namely limitation of the adverse environmental influences of waste dumps by private ownership of land, which practically excludes the possibility of uncontrolled dumps; high charges for official dumping; and strict rules of the selection of localities for dumps and their operation (and the connected high costs of their founding and running).

Appropriate waste processing (recycling) is in the hands of small enterprises which purchase and process waste. This enables the use of local secondary materials and stimulates the consumption of products made of them in the vicinity of their production. Many of these small enterprises are furnished with old but still functioning machinery written off by large firms.

The Government can support waste processing by allocations from environmental protection funds, credits, and preferential duties on secondary materials.

In specific cases, these factors can determine the manner of waste disposal and especially upgrading, which is economically more effective than extensive and permanent devastation of the environment, and so there is no reason against their application in the Czech Republic.

Prospects
Improvement in waste management in the Czech Republic can be expected in the next decade. At present, almost 60% of waste is dumped, 30% burned and 10% recycled, and at the end of the decade dumping is to be reduced to 20% and burning and recycling are to increase to 40% each.
Cluster Increases Plastics Competitiveness

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A persistent problem of many Czech enterprises consists in their isolation and insufficient communication and co-operation with science-and-research sphere. A possible solution conducive to their development and higher competitiveness is membership in a cluster.

A cluster is a regional co-operating grouping of enterprises of a particular sector and associated institutions and organisations. The participating companies compete with each other, but tackle similar problems. Co-operation in these specific areas allows them to overcome many of their limitations and gain a competitive advantage that is difficult to copy. And so it is a multilateral advantageous partnership of enterprises, universities, and regional institutions that benefits all members in many respects. Through the cluster they can achieve economies of scale and cost savings, diminish the limitations of small enterprises and increase their specialisation, and accelerate the transfer of information and technologies.

Enterprise Mapping Project
Plastikařský klaster z.s.p.o. (Plastics Cluster) was established in the Zlín Region in February 2006. It resulted from an eight-month project of Identification of a Possibility of Plastics Cluster Establishment. The search for suitable enterprises for the Cluster was initiated by Technologické inovační centrum s.r.o. Zlín (Technology Innovation Centre). The Centre co-operated with Mintzberger s.r.o. consultants on a project of mapping companies of the rubber and plastics industry. The project was subsidised from the Operational Programme Industry and Enterprise Clusters. However, the mapping made it evident that in view of the specific differences between the two branches it would be relevant to address only enterprises of the plastics industry. At present, the cluster comprises 19 manufacturing companies, of which almost 75% are small and medium-sized enterprises and 5 large companies. Its partners from the science-and-research sphere are Tomáš Baťa University in Zlín and Technologické inovační centrum s.r.o. Zlín. The Plastics Cluster project was also successful in the second phase, in which its subsidy of approximately EUR 638 000 was approved. (www.ticzlin.cz)

Cluster Activities
The cluster activities are focused on enhancing competitiveness and performance of the sector in the Region, as its vision is becoming the centre of innovative plastics processing in the Czech Republic. The objective is to create a representative forum, establish an efficient network of plastics processors for the use of selected services and products, and ensure a background for the preparation of joint development projects. The Cluster Manager, Mr Toufar, regards the creation of a representative plastics forum, which is designed to assert the interests of the cluster members, as the biggest benefit of the grouping. In general, the cluster activities are divided into four priority areas: cluster presentation and publicity, human resources development, research and development, and joint

List of Members

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<tr>
<th>Name</th>
<th>operates in</th>
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<tr>
<td>AZ Plast s.r.o., Moravský Žižkov</td>
<td>PVC processing, extrusion of profiles for manufacture of plastic fences, gates, and railings</td>
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<tr>
<td>D Plast spol., Zlín</td>
<td>Manufacture of PVC plastisols for rotary casting for technical and food industry applications, manufacture of PVC sheets for roof hydro-insulation</td>
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<tr>
<td>DURAMINE CT s.r.o., Tlumačov</td>
<td>Manufacture of optical cable ducts and piping systems</td>
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<td>Ekotrend Ludky s.r.o., Ludkovic</td>
<td>Waste management – manufacture of rubber and plastic rubble</td>
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<tr>
<td>Form, s.r.o., Horní Lideč</td>
<td>Manufacture of composite and vacuum shaped thermoplastic products, development of new products, manufacture of models, moulds, and prototypes</td>
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<tr>
<td>Frema, s.r.o., Zlín</td>
<td>Manufacture of moulds and simple machines and their components for the plastics, rubber, and footwear industries, plastic products and rubber mixtures</td>
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<td>Greiner packaging Slušovice s.r.o., Slušovice</td>
<td>Manufacture of plastic packages and plastic technical components</td>
</tr>
<tr>
<td>HANHARTPLAST, s.r.o., Chropyně</td>
<td>Manufacture of precise plastic mouldings including large standard injection-moulded ones</td>
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<tr>
<td>INVOS, spol. s.r.o., Březolupy</td>
<td>Manufacture of membranes for food industry and medicine, foils for automated packaging machines, foils for agriculture and building industry, etc.</td>
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<tr>
<td>IRISA, výrobní družstvo, Vsetín</td>
<td>Manufacture of thermoplastics injection and vacuum moulds, cutting and bending tools</td>
</tr>
<tr>
<td>Kasko spol. s.r.o., Horní Němčí</td>
<td>Development and injection moulding of plastic pieces, designing and manufacture of moulds and tools</td>
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<tr>
<td>MEGAT – výroba z plastů Zlín spol. s.r.o., Zlín</td>
<td>Plastics processing by extrusion</td>
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<tr>
<td>PLASTIKA a.s., Kroměříž</td>
<td>Manufacture and assembly of plastics based on injection moulding, hot shaping, extrusion, and welding</td>
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<td>Poma, a.s., Hodonín</td>
<td>Manufacture of large-sized wooden materials and plastic boards and foils</td>
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<td>Retrim CZ a.s., Zlín</td>
<td>Manufacture of glass safety PVB foils by recycling laminated glass trimmings</td>
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<td>SPUR, a.s., Zlín</td>
<td>Manufacture of HDPE cable ducts for telecommunications, PE – TUBE expanded insulating materials and colour concentrates for plastics and research, development, and testing of rubber and plastics technology</td>
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<tr>
<td>VETA ZL, s.r.o., Zlín</td>
<td>Manufacture of adhesive bands and adhesive materials</td>
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<tr>
<td>ZALESI ZL a.s., Luhačovice</td>
<td>Manufacture of plastic components, technical mouldings, tube and bottle caps, injection moulds, and laminated tubes</td>
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<tr>
<td>Zlín Precision, s.r.o., Zlín</td>
<td>Manufacture of technical precision parts by injection moulding of plastics with surface treatment</td>
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purchase of products and services. Effort is exerted to increase the number of members and expand co-operation with other Czech and foreign clusters.

**Plastics Technical Facility**
The chief joint project of the cluster is building of a Plastics Technical Facility as a combination of a development and training centre. Besides professional education and training of personnel, it would deal with partial and complete material, technological, economic, and designing requirements of members in the form of projects. It will test raw materials, technologies and work procedures, solve innovation tasks, monitor development and topical as well as long-term request, etc. The expected results of the project are an increased innovation potential of members and improved qualification of employees of plastics companies.

**Realised Project**
The Plastics Cluster has already realised one of its partial projects: joint purchase of electricity. The members jointly purchased electricity at a lower price than each company would pay separately. This was very good use of the potential of the cluster as a form of co-operation. Then there was co-operation with the University in a benchmarking analysis of the economic performance of the cluster when it came into operation. This will be periodically updated to allow continuous assessment of the effectiveness and performance of the whole cluster. Talks are underway on the purchase of machines for research and development, and a tender for the executive project is in process. In the networking area, the basic principles have been set for co-operation with partner clusters abroad. Worth mentioning is the fact that the quality of the Plastics Cluster has been acknowledged by the nomination for Enterprise Project of the Year 2006 in the Cluster of the Year category.

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**Tradition of Research, Development, and Education in Plastics and Elastomers Technology**

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The research and development of the synthesis, processing, and application of polymers are traditional in the Czech Republic. Its examples include the polyamide 6 (Silon), the development of which began in the Bata Research Institute in Zlín in the 1940s, and silicon rubber manufacture, developed in the Department of Rubber and Plastics Technology of the Institute of Chemical Technology Prague in the 1960s, which ranked the then Czechoslovakia among its few producers worldwide. Another example is the soft contact lenses which made the Institute of Macromolecular Chemistry of the then Czechoslovak Academy of Sciences famous at about the same time. Research establishments are co-operating with industrial enterprises and other institutions which are many and their list would take too much space. They include Kaučuk, a.s., Kralupy nad Vltavou, Mitas, a.s. Praha, Tanex, a.s. Jaroměř, Fatra, a.s. Napajedla, Moravské chemické závody, a.s. Ostrava, Paramo, a.s. Pardubice, and Synpo, a.s. Pardubice, and foreign enterprises, such as DuPont of the USA and DSM Research of the Netherlands.

**Institute of Chemical Technology Prague, Faculty of Chemical Technology**
Research in the Department of Polymers focuses on the study of polymerising mechanisms, syntheses of macromolecular substances and their physical and chemical characteristics, including polymers for medical application and biologically decomposable polymers, such as those which can be composted. It also specialises in relations between the processing, structure, and properties of polymers with focus on targeted modification of polymer properties by crosslinking, additives, formulation of polymer blends and composites, including their application in human medicine, and the development of new types of additives allowing appropriate evaluation of polymer waste. Students who work regularly in laboratories of the Department of Polymers in the capacity of “student scientists” receive monthly financial contribution from the “Plastics and Rubber” Endowment Fund.

The Department of Solid Material Engineering studies biomaterials for tissue engineering, materials for electronics and optoelectronics, and looks into laser chemistry and technology, and environmental pollution detectors.

**Tomáš Bata University in Zlín, Faculty of Technology**
The Polymer Centre studies chemical reactions and physical processes which make it possible to set selected properties of polymer systems during preparation and processing. The knowledge is used in applied and basic research. The results are applied mainly in the rubber and plastics industry, the building industry, medicine, the
automobile industry, agriculture, and the footwear and textile industries.

The Department of Polymer Engineering studies the properties of nanocomposite systems of the polymer/clay type, the correlation of the technological conditions of processing with the structure and properties of polymer systems and their application. Emphasis is also placed on unconventional methods of polymer processing, the role of fillers in polymer systems, the unstable flow of polymers, thermomechanical analysis of polymer systems, structure and properties of liquid crystals, and smart polymeric materials.

Scientific research activities of the Department of Production Engineering cover a large area connected with teaching: the design and measurement of polymer products and composites with polymer matrices, modelling of the mechanical behaviour of polymer products and composites with polymer matrices, instruments for polymer processing including analyses of the flow of polymers, working on polymers and composites with polymer matrices, the surface treatment of moulds, and other tools for polymer processing.

Pardubice University, Faculty of Chemical Technology
The Department of Polymeric Materials deals with the preparation and use of alkyd and epoxy resins, non-saturated polyesters, acrylic emulsions of copolymers and other polymers as matrices for composites and binders for paints, research of paints and organic coatings, study of polymer kinetics in homogenous environment and heterogeneous systems, crosslinking and properties of polyurethanes, polyester and epoxy resins, phase changes in polymers, synthesis, application and assessment of new textile dyes and pigments and means of sequestration for preparatory treatment, dyeing and washing of textiles.

Czech Technical University in Prague, Faculty of Mechanical Engineering
In its research and development of new materials and their application, the Department of Materials Engineering strives for their optimum use in technical practice. As regards polymers, research is focused on the microstructure and breakage behaviour of polymers and composites with polymer matrices, assessment of the orientation, length distribution of fibres and slip resistance on the fibre-matrix dividing line, influence of the processing and running conditions and the modification of fibres and matrices on the mechanical properties and assessment of corrosion and degrading processes, and non-homogenity.
Institute of Macromolecular Chemistry of the Academy of Sciences of the CR

The task of the institute is basic, oriented, and applied research in the physical chemistry of polymers. This research includes three main areas: biomacromolecular systems, the dynamics and self-organisation of molecular and supermolecular polymer formations, and the preparation, specification, and use of new polymer systems with controlled structure and properties. The latter includes polymerisation processes, polymer networks, optoelectronic phenomena and material research concerning the control and modification of the structure of polymer blends in the course of their preparation, processing, and recycling, the dispersion of nanoparticles in the polymer matrix and control of mechanical and processing properties of nanocomposites, control of crystallisation and crosslinking of semicrystalline polymers and their blends, and possibilities of influencing changes in the structure of polymers by the external environment and stabilisation.

The consumption of polymers and consequently their production are increasing much more rapidly than in the case of other materials. This is why the demand for specialists in the branch with a university background is rising very quickly and exceeding the offer of the relevant universities.

Institute of Chemical Technology Prague, Faculty of Chemical Technology

The principal establishment which provides education in the production and processing of polymers is the Department of Polymers. It offers education focused on "Polymeric Materials" within the BA branch "Chemistry and Technology of Materials" in the "Applied Chemistry and Materials" programme, "Polymeric Materials" within the MA programme "Chemistry of Materials and Materials Engineering", "Macromolecular Chemistry" within the MA programme "Inorganic, Organic, and Macromolecular Chemistry" and "Macromolecular Chemistry", and "Technology of Macromolecular Substances" within the doctoral programmes "Chemistry" and "Chemistry and Technology of Materials".

The Department of Solid State Engineering provides education in "Chemistry and Technology of Materials" within the BA programme "Applied Chemistry and Materials" and the follow-up branch "Materials for Electronics" within the MA programme "Chemistry of Materials and Materials Engineering". The main subjects of the latter include "Structure and Properties of Polymers".

Tomáš Baťa University in Zlín, Faculty of Technology

Education in polymer processing is provided mainly by the Department of Polymer Engineering. Its teaching is oriented on engineering of polymer processing, the basic theory and application of macromolecular chemistry, the rheology of polymers, the properties of polymers, and the testing of polymer materials and products. The Department offers regular and combined studies, particularly within the "Chemistry and Technology of Materials" programme in BA, MA, and doctoral studies. In the "Chemistry of Processing Engineering" it offers the MA branch "Processing Engineering and Management of Polymer Engineering".

The Department of Production Engineering educates specialists in the design and measurement of polymer products, and the design of structures and production of instruments for polymer processing.

Pardubice University, Faculty of Chemical Technology

The Department of Polymeric Materials is the centre of research and teaching of macromolecular chemistry and the technology of macromolecular substances, and the technology of chemical fibres and textile chemistry at the Pardubice University, Faculty of Chemical Technology. It offers MA studies in the "Chemistry and Technical Chemistry" programme for the branches "Technology of Polymer Production and Processing" (block A – Technology of Polymers, block B – Technology of Coating Materials) and "Fibres and Textile Chemistry", and doctoral studies in the "Chemistry and Technology of Materials" programme for the branch "Technology of Macromolecular Substances".

Czech Technical University in Prague, Faculty of Mechanical Engineering

The main branch of the Department of Materials Engineering in MA studies is "Materials Engineering", which includes the subjects "Engineering Application of Materials", "Non-metal Materials", "Composites", and "Corrosion and Corrosion-resistant Materials", in which polymers are playing a significant role. The Department also offers a number of subjects in other MA branches, especially "Engineering Technology", and in BA branches. The main doctoral studies subjects in the "Materials Engineering" programme include "Physics of Non-metal Materials in Solid State", "Mechanics of Materials", "Experimental Methods in the Materials Science" and "Processing of Non-metal Materials and Composites". The offer also includes life-long education courses in "Plastics and Composites in Engineering" and "New Materials and their Application in Engineering".

Doctoral student in the Department of Polymers rheological laboratory
Isolit-Bravo, spol. s r.o., is a Czech company and a recognised supplier to Czech and foreign clients. It has some 550 employees, its annual turnover exceeds EUR 40 million, and more than 70% of products are exported.

The company focuses on complete development of products or sets, design and manufacture of tools and moulds, development of most efficient technologies, product tests and certification, and finally series production and deliveries to ordered destinations. We interviewed Mr Kvido Štěpánek, General Manager of the company, about business in this branch in the Czech Republic.

Can you give a brief history of the company?
The company was established in 1921 to manufacture Bakelit products for households. After World War II, it was integrated into Závody silnoproudé elektrotechniky and manufactured Bakelit mouldings for electrical engineering. It was privatised in 1993 and developed a technology for injection moulding of technical and highly visual plastic parts for automotive industry, the manufacture of injection moulds, and the manufacture of kitchen and household appliances.

How do you see the business prospects in the branch of plastics and rubber in the Czech Republic?
I believe that they are not bad at all in the next few years, mainly due to the involvement of many world producers of automobiles and their Tier 1 suppliers. But they are strongly and one-sidedly dependent on the automotive industry.

Your company received a subsidy for the education of your employees. How did you use the money?
We used it for technical training, primarily in the adjustment and programming of injection moulds and their maintenance. The high standard of our team is our main competitive advantage.

Your success rests on "Total Marketing Support". What does it mean?
We conform to the specific requirements of clients. Our cooperation is flexible. If firm B has a very different idea than firm A about the form and content of co-operation, we can satisfy both.

Can you mention your most important foreign customers?
The most important customers include Philips, Ikea, Volkswagen, Grupo Antolin, Automotive Lighting, ABB, and Škoda-Auto. We supply them with injection moulds, mouldings, subsets, and complete products which we develop for them, and manufacture them in accordance with the philosophy mentioned above.

What innovations have you planned for 2007?
Our main innovations rest in the improvement of our services in two interlinked areas – upgrading of our technological standard by investment into new progressive machinery and equipment, and improvement of the standard of our staff.

Naďa Vávrová

More at www.isolit-bravo.cz
KAUČUK, a.s. is a chemical enterprise with a long tradition. Its construction in Kralupy nad Vltavou was decided in 1954 and the foundations were laid in the same year. The manufacture of synthetic rubber was launched in 1963 and in the following years expanded with polystyrene plastics. A boom in the company came in the mid-1980s, when an oil refinery unit went into operation. In addition to propellant fuels and liquid gases, it manufactured several basic components for the KAUČUK, a.s. production programme. Within the restructuring of the Czech petrochemical industry, the refinery was separated and joined with the newly established Česká Rafinérská, a.s. in 1996. The remaining petrochemical part became member of the UNIPETROL group one year later. The year 1998 was an important milestone in the company’s development – the original styrene production unit was replaced with a new modern one with a larger capacity, and a new block crystal polystyrene unit was opened. At the end of the same year, the last coal-burning boiler was laid off and the energy system was switched to environmentally friendly fuels. In 2003, an ethyl benzene unit was opened in the CHEMOPETROL, a.s. complex in Litvínov. In June 2005, the UNIPETROL group became a part of PKN ORLEN.

**Production Programme**

Styrene-butadiene rubbers are manufactured under the KRALEX trade name. They are mainly used in the rubber and footwear industries, and in the manufacture of small household accessories and sports equipment. The major customers are tyre producers.

**KRASTEN® has many possibilities**

KRASTEN® is a registered trademark for styrene polymers, offering a wide range of products for use as raw materials in various branches. Styrene polymers are used as raw materials primarily in food and beverage packaging, disposable fast food kitchenware, consumer products, and their packaging. They are also found in consumer electronics, electronics and the packaging of audio and video carriers, laboratory equipment and medical devices. Krasten can be used as a basic material in the production of toys and parts of furniture, and in the automobile, electrical engineering, and mechanical engineering industries.

**KOPLEN® for the building industry**

KOPLEN® is a registered trade name for expandable polystyrene (EPS). EPS is a white polymer made of styrene containing different amounts of a hydrocarbon blowing agent according to type. It is mainly used as a material for various EPS products in building and packaging. EPS products have a foam polymer structure of closed cells containing air, which gives them excellent thermal and sound insulation and shock-absorbing properties. The products are self-extinguishing, contain a flame retardant and meet the requirements of flammability, in accordance with DIN 4102 - B1 and EN ISO 11925-2, E. KOPLEN® is distributed in recyclable octagonal wrappings, so-called octabins, of a net weight of 1 100 kg.

**FORSAN mainly for automobiles**

FORSAN is a registered trade name of acrylonitrile-butadiene-styrene polymer (ABS), which is used in the manufacture of automobile interiors and exteriors. FORSAN can also be used in the consumer industry and electrical engineering.

**The Company Has a New Owner**

In January 2007, a contract was signed on the sale of 100% KAUČUK stock to the Polish company Dwory, which became its sole owner after the relevant authorities of the two countries gave their consent. Chemiczne Dwory, S.A. has a similar production programme as Kaučuk.
Leader in Czech Production of Polyethylene Foil Films

Granitol has a more than 110-year history. Its present annual production of 28,000 tonnes makes it the largest manufacturer of polyethylene foils films in the Czech Republic. Approximately one half of the products are exported to more than 30 countries including Austria, Belgium, Bulgaria, Croatia, Denmark, France, Germany, Greece, Hungary, Ireland, Israel, Kazakhstan, Latvia, Lebanon, Lithuania, the Netherlands, Poland, Romania, Russia, Slovakia, Spain, Switzerland, Syria, Tajikistan, the Ukraine, the United Kingdom, and Yemen. Granitol ranks among the most modern enterprises with top-quality production equipment.

Production Programme
The main products are shrinking foil films for group packaging (LDPE). The properties of this product were acknowledged with the national award for Package of the Year 2006. The programme includes shrinking and self-shrinking foils films and bags (LDPE), polypropylene binding bands (PP), perforated foil films for boiling bag manufacture (HDPE), hydro-insulating foil films for the building industry (LDPE), packaging foils with print (6.8 colour flexoprint), special high-tech foil film for the manufacture of hygienic articles, nappies, ladies’ hygiene needs, bags and carrier bags.

Investment into Production Technologies
Granitol development is based on investment into new production technologies. A new production line went into operation at the end of 2006 to manufacture laminated shrinking foil films for group packaging of beverages in PET bottles, tins, chemist’s goods, and other products.

A new type of shrinking foil was developed specially for this line in the Granitol technical development department in co-operation with the supplier of the line and European suppliers of raw materials. Besides excellent optical properties, the new foil film is stronger and can be used in lower weights. In addition to lower transport costs, it reduces the weight of waste and is thus environmentally friendly. The foil film was awarded the title Package of the Year 2006 by the SYBA Association.

Besides the new shrinking foil film, the new line will turn out non-shrinking foil films for the manufacture of special types of polypropylene foil films for high-tech packaging.

Investment into New Logistic Centre
The new logistic centre has technical conditions for modern continuous acceptance and dispatch of goods, their proper storage, and on-line electronic registering. Its progressive technical arrangement was chosen on the basis of analysis of simulation models. It is a combination of stationary and mobile stands with a total storage capacity of 4,500 pallets.

Line of World Standard
Granitol has invested into a new production line with state of the art technical equipment. This means that the line has automated material dosing, automated regulation of the thickness and thickness profile of the manufactured foil, film and diagnosing of possible faults and their remote removal by modem.

The line is equipped with the patented Maximazer system of molten mass cooling. Intensive cooling of the molten mass also has a favourable effect on the optical qualities of the foils film. This is particularly important in the manufacture of packages with defined optical properties.
GUMOTEX Mattresses Go to the USA

Josef Horníček, GUMOTEX, a.s., e-mail: hornicek@gumotex.cz, www.gumotex.cz

GUMOTEX, a.s., is the successor to an enterprise which began manufacturing protective clothing of rubber-coated textile in Břeclav in 1950. It became independent and adopted the name GUMOTEX in 1952. Initially, it manufactured rubber-coated materials and later expanded its production with inflatable beach mats, boats, and kayaks. Its boom came with the introduction of the technology of polyurethane foam manufacture in the 1960s and especially the 1970s, when the company became the largest producer of this type of foam in the Czech Republic and has retained this position to the present day. Its main partners are customers in the furniture and automotive industries.

Products for Furniture and Automotive Accessories

GUMOTEX manufactures polyurethane foam plates, bed mattresses and shaped pieces for furniture producers, and moulded seat cushions, head rests, sun visors and other small interior pieces for the automotive industry. Important products include inflatable bed mattresses, surface finish textiles with special plastomer and elastomer coating, inflatable tents, rescue system elements, and inflatable systems for emergency survival after accidents on water.

Largest Czech Manufacturer of Polyurethane Foams

GUMOTEX is the largest Czech manufacturer and processor of polyurethane foams which it sells under the trademark MOLITAN®. It manufactures products of rebounded polyurethane foam (RE foam), and operates in the rubber and plastics business. The company's annual turnover ranges around EUR 88 million and foreign markets account for almost 60% of revenues. GUMOTEX has been ranked among the largest exporters for a long time. A major trading partner is the USA, where the company exports mainly inflatable bed mattresses. Exports to the USA exceeded EUR 21 million in 2006. Products are also exported to European Union countries such as Germany, Slovakia, the Netherlands, France, and southeast European countries. GUMOTEX commercial activities are supported by trade and distribution centres in the Czech Republic, Slovakia, Hungary, and Poland.

GUMOTEX and Foreign Investors

GUMOTEX was transformed into a joint-stock company in 1991 and privatised by a Czech company. In late 2006, it was taken over by the Genesis Capital, Expandia, and Milestone Partners consortium of financial investors. The new owners intend to ensure the company's further development and expansion to developed foreign markets.
MITAS a.s. – Second in Europe for Agricultural Tyres

MITAS a.s., an established manufacturer of tyres for off-road vehicles, now comprises three factories, in Praha, Zlín, and Otrokovice, the Rubber Technology and Testing Institute (IGTT), and several subsidiaries abroad (CGS TYRES). Its product range consists mainly of tyres for agricultural, multipurpose, and construction machines, and also includes tyres for trucks, high-lift trucks, motorcycles, aircraft, and rubber compounds.

In the last few years, MITAS a.s. has been thoroughly reorganised and modernised, and currently ranks among the top European suppliers.

Past and Present Production
The manufacture of tyres for off-road vehicles in the Czech Republic was launched in the late 1970s by MITAS Praha, which was equipped with Mitsubishi machinery. Since then, the product portfolio has been gradually expanded and now includes a complete range of diagonal EM tyres for large construction machines. All dimensions of these EM tyres are made using a new technology on Marangoni machines, which apply the tread and sidewall in one piece. This new technology has upgraded the quality of EM tyres, and MITAS a.s. now belongs among the best-known manufacturers of tyres for use by the building industry. In 2002, MITAS commenced the manufacture of radial tyres for light construction machines, which it is constantly improving in keeping with developments in the tyre industry and specific demand on individual markets.

Compared with diagonal tyres, the carcass and the breaker of these radial tyres are made of steel cord, making them more resistant to fracture and providing better grip, a longer service life, and a higher degree of driver comfort.

Similar developments in the agricultural tyres range followed World War II, and are also connected with the company’s Prague factory. Manufacturing technology at the plant has been gradually modernised, and the range has been adapted to suit both Czech and foreign markets. Production of radial tyres has also been introduced. MITAS a.s. continually works on the development of its agricultural tyres, especially the large Continental tyres, with the aim of ensuring that Mitas tractor radial tyres and radial float tyres are pioneers in industry-wide developments. As of 2004, agricultural tyres have also been manufactured at the Otrokovice factory, which is now one of the most modern of its kind in the world.

Specialists in Agricultural Tyres
According to available data, MITAS a.s. is the second largest manufacturer of agricultural tyres in Europe (after Michelin) and fourth largest in the world (after Michelin, Goodyear, and Bridgestone). The quality of Mitas agricultural and off-road tyres is evident, as they are supplied for the first outfit to such prominent producers as John Deere, CNH, Claas, Caterpillar, Liebherr, Terex, and JCB. MITAS a.s. products also include motorcycle tyres, at present of the Mitas and Trelleborg brands. The company’s range of motorcycle tyres covers all categories from moped to sport off-road tyres. At present, the main products are off-road enduro trail, enduro FIM, and motocross tyres. Mitas is the world leader in standard and long speedway tyres. The quality of the company’s off-road tyres have been proven by the results of racers who use Mitas tyres and regularly finish in the top places in European and world motorcycle competitions.

Holding Member
MITAS a.s. is a member of the Česká gumárenská společnost, a.s. (CGS) holding, which represents all rubber manufacturing in the Czech Republic that is fully in Czech hands. Besides MITAS a.s., the holding also consists of RUBENA a.s., the largest Czech manufacturer of technical rubber and bicycle tyres, and BUZULUK Komárov, a.s., which produces a broad range of machinery and equipment for the rubber industry and piston rings of all types and sizes. All CGS companies cooperate closely with each other. They also work in conjunction with universities and scientific establishments in research and development. The CGS Graduate Programme has been a successful initiative within the CGS companies for several years. It is designed for university students to facilitate their choice of profession.

Co-operation with the Rubber Technology and Testing Institute
An important part of MITAS a.s. is the Rubber Technology and Testing Institute (IGTT), which is a top-ranking establishment in the world. It conducts all static and dynamic laboratory tests of tyres, rims, tubes, liners, repair kits, and preventive preparations for all on-road and off-road motor and non-motor vehicles, sport planes, and handcarts in accordance with Czech, European and world standards and testing procedures.

MITAS a.s. – Exporter
MITAS a.s. ranks among the leading Czech exporters, as is proven by its several top-place finishes in the national “Exporter of the Year” competition. MITAS a.s. exports to the whole world, mainly to Europe and America. The company has been thoroughly reorganised and modernised to become a leading partner of the agricultural and industrial sectors and to provide its partners with the best technical support and service.

Martin Maňas, MITAS a.s., e-mail: martin.manas@mitas.cgs.cz, www.CGS.eu
Barum Supplies Tyres to Whole Europe

Antonín Vetešník, Barum Continental spol. s r.o., e-mail: info@barum.cz, www.conti-online.cz, www.barum-online.cz

Barum Continental spol. s r.o. is the largest tyre manufacturer in the Czech Republic and since 1999 also in Europe. Its success is due to the use of modern development trends, technologies, and commercial strategies, and to experience gained from the long tradition of tyre production in the Zlín Region. The renowned footwear manufacturer Tomáš Baťa was at the cradle of tyre production in the Zlín area. He laid the foundations of tyre production in 1932 when he made the first car tyre. After World War II, the Baťa joint-stock company was nationalised to become Svit Zlín and the factory continued to manufacture tyres. The Barum trade mark originated in 1946 as the acronym of three companies: Baťa, Rubena Náchod and Mitas. In 1953, the tyre production was separated and the Rudý říjen enterprise was established. Tyres were still manufactured on the Svit premises until the Otrokovice factory was opened in 1970.

Company’s Present
The new history of the company commenced in 1993 with the establishment of Barum Continental spol. s r.o., a joint venture of Continental AG and the then joint-stock company Barum Otrokovice. The joint venture of the Otrokovice tyre factory and the German concern Continental proved to be an absolutely correct decision. Continental, which ranks among the most important enterprises in the branch worldwide, brought the latest technology and machinery, and introduced a new business culture and change in the attitude to work.

Production Programme
The company’s annual production exceeds 20 million tyres, mainly for cars but also for trucks, both road and off-road vehicles, and industrial tyres. The manufacture of car tyres is being constantly developed.

Multibrand Strategy
The company’s “multibrand strategy” range of products suits all clients. The portfolio of trade marks includes Continental, which is the worldwide leader in tyre quality, Uniroyal, Semperit, and Barum. The products of each of them are specific and designed for different clients. Continental uses the latest production technologies and procedures, and places great emphasis on utmost safety. Uniroyal tyres have excellent driving properties especially on wet roads. The Semperit speciality is winter tyres which distinguish themselves by a highly comfortable drive. Barum tyres rank in the economic segment of an advantageous quality/price ratio. It is a domestic trade mark with a very long tradition.

Novelties in Production
Two new products will be placed on the market in 2007: the Barum Bravuris 2 and Continental Vanco 2 tyres. The Bravuris 2 tyre has a new asymmetric pattern which guarantees optimum transmission of the driving and brake forces, and thus also excellent handling. The tread is made of a modern mixture which improves adhesion to wet surfaces and so shortens the braking distance. This tyre is designed for powerful cars and so it is manufactured only in higher inch series and speed indexes. Another innovative product is the Continental Vanco 2 which is designed for delivery vehicles. Its new robust structure and the use of new materials make the tyre more resistant to overloading and increase its mileage by up to 20%. Since the pattern is deeper and made of a new mixture, the tread is very tough. The result is outstanding handling and stability in bends. Safety on a wet surface is ensured by the innovative lamellar system due to which the tyre adheres well to the road.
Excellent Standard of Tomáš Baťa University Polymer Centre

Jan Malý, Tomáš Baťa University in Zlín, e-mail: maly@rektorat.utb.cz, www.utb.cz

The Polymer Centre (CPM) is a research unit attached to the Faculty of Technology of Tomáš Baťa University in Zlín. It was established in 2000 to boost the research potential of the future university. Its main purpose is basic, applied and industrial research in polymer sciences, which have an outstanding standard in Zlín. The results of the research are applied mainly in the rubber, plastics, automobile and textile industries, and in medicine, agriculture, and electrical engineering.

Research Programme
The CPM research programme covers many areas, such as applied rheology, the development of biodegradable materials, the electrical and magnetic characteristics of composites, electrorheology, packaging materials, structural relaxations of polymer materials, optical and electronic properties of polymer systems, and polymers for medicine and the food industry.

The quality of CPM work is evident: besides graduates of the Faculty of Technology of Tomáš Baťa University, its members are scientists from Japan, Russia, Sweden, China, Slovenia, India, and other countries. Moreover, CPM takes care of its aspiring young research students. At present, it is also training two dozen doctoral students from a number of countries including Russia, Colombia, China, and Mongolia.

Research Projects
In 2006, CPM members carried out work on 20 research projects and other grant projects were approved for solution. The interesting ones certainly include those which will be applied in medicine. These are the projects Rheology and the Treatment of Medicinal Polymer Systems accepted by the Grant Agency of the Academy of Sciences of the Czech Republic, and Innovation of Polymer-based Medical Aids accepted by the Ministry of Industry and Trade of the Czech Republic within the Enduring Prosperity Programme. CPM research is also undertaken in production programmes of enterprises. In addition to enterprises throughout the Czech Republic, CPM is co-operating with those in Copenhagen, Denmark, Zwijndrecht and Brussels, Belgium, and Painesville and Oakdale, the USA. International co-operation is also going on in other areas – CPM is in contact with a number of universities and research establishments and institutions in Europe, Asia and America.

Accomplishments and Awards
CPM members have given a good account of their work. In January 2007, Ms Berenika Hausnerová was awarded the L’Oréal Scholarship for Women in Science. The scholarship project is organised by the L’Oréal company in co-operation with the Czech Commission for UNESCO and the Academy of Sciences of the Czech Republic to support the scientific career of women aged up to 35 years. Senior lecturer Berenika Hausnerová gained the award in recognition of her work on the influence of pressure on the rheological behaviour of PIM materials.

The work of Mr Vladimír Sedlařík was recognised with the Siemens Prize for 2007. Siemens awards this prize every year in co-operation with the Industry and University Forum of the CR.
For many years, a division of the Department of Polymers of the Institute of Chemical Technology Prague, Faculty of Chemical Technology has been studying silicon rubber and possibilities of its application. Silicon rubber has a number of exceptional properties which rank it among the group of rubbers for special uses. It has high and low temperature stability (ordinary types of silicon rubber can be used from -60 to 180° C, with a short load up to 300° C), electrical insulation properties, and very good resistance to ultraviolet radiation and ozone ageing. Silicon rubber has a high selective permeability of gases and steams, resistance to mineral oils and many chemicals, repels water, and is chemically inert. Another important property is tolerance to living organisms – biocompatibility which predetermines the application of silicon rubber in medicine.

Application of Silicon Rubber
The Department of Polymers has been dealing with many research tasks concerning the application of silicon rubber in different areas of human activity. An example is the improvement of the water-repellent properties of silicon rubber surface to gain a material serving as base for the settling of micro-organisms. It has been established that the water-repellence of the substrate surface on which micro-organisms (such as yeasts) are settled has a major influence on the effectiveness of these micro-organisms, for example in the removal of toxic substances from waste water. On the contrary, the water-repellence of silicon rubber is undesirable in many applications in human medicine. In order to improve the wettability of the silicon rubber surface by water and similar substances, the Department of Polymers and the Institute of Macromolecular Chemistry of the Academy of Sciences of the Czech Republic jointly prepared polymer blends based on silicon rubber and a substance that is super-absorbent in water – hydrogel. These blends are not only absorbent in water, but also permeable to substances soluble in water, such as medicaments.

Co-operation of Research Institutes
The Department of Polymers co-operated with the Nuclear Research Institute Rež in the application of silicon rubber in the transformation of nuclear waste into a compact, solid form before it is stored in underground deposits. Silicon rubber is easily processed and resistant to radioactive radiation and these properties served the purpose. The use of this method in the storage of medium-active waste from nuclear power plants is being considered.

In another task, the Department of Polymers used scission of the silicon-oxygen bond for chemical regeneration of silicon rubber and this resulted in a blend of mainly cyclic organosilicon compounds. Polymer tests proved that the gained low-molecular blends are a suitable material for the preparation of silicon rubber. This manner of chemical regeneration of silicon rubber has been patented.

Project of the Department of Polymers and Ecosoft s.r.o.
The Department of Polymers, the Institute of Rock Structure and Mechanics of the Academy of Sciences of the Czech Republic, and Ecosoft s.r.o. jointly developed a method and equipment for monitoring the course of silicon resin hardening processes with the use of changes in the electrical properties of resins which occur during this hardening. Among other applications, the method is to be used to define the manner of the preparation of materials on the basis of silicon resins and glass fibres, and possibly corundum fibres. These materials could be used in products resisting temperatures higher than 600° C.

Use of Silicon Rubber in Construction
The development of silicon rubber applications in the building industry has reached the stage of manufacture of elastic strips to serve the sealing of expansion joints in the peripheral panels of prefabricated structures. The façade strips must meet many requirements – prevent water penetration into the peripheral walls of buildings and improve their heat insulation, allow damaged sealing materials to be left in the joints, improve the architectural impression, and be very resistant to the dynamic stress caused by the thermal expansion of the prefabricates. These elastic strips are industrially manufactured by Lučební závody, a.s. Kolín.
Poll of Successful Companies Operating in the Plastics and Rubber Industry

Fatra, a.s.

tř. T. Bati 1541, 763 61 Napajedla, phone: +420 577 501 111, fax.: +420 577 502 555 e-mail: info@fatra.cz, www.fatra.cz

Turnover (2006): CZK 3.1 billion – approx EUR 110 million
Number of employees: 1 400
Contact: Mr Daniel Tamchyna, e-mail: info@fatra.cz
Export: 43 countries worldwide, for example to Germany, Austria, Russia, the Ukraine, Switzerland, and the United Kingdom

Fatra is part of the AGROFERT HOLDING and ranks among main processors of PVC, PE, PP, and PET materials. Fatra traditionally belongs to the plastics industry in the Czech Republic and Central Europe. In 2006, revenues from the sale of its products and services were EUR 110 million and one half of its production went to foreign markets. The basic products are in the PVC and PO group: floorings, insulating foils, technical foils, extruded profiles, PVC conveyor belts, PVC granulate, synthetic rubbers, BO PET – biaxial oriented polyester foils, PPF and L – vapour permeable membranes and laminates, packaging materials, and special products – textured membranes and injected products.

You rank among the largest plastics processors in Central Europe, your turnover is huge and more than one half of your products is exported. What is behind such success?
The essence was Fatra's restructuring, which began in the middle of 2005, focussing on products with a higher value added and divestment of specific commodity manufacture. Fatra also invested into sale teams on both west and east markets. The key role was played by the tradition of our production, innovation, flexibility, and geographic expansion.

Can you mention your present most important deliveries abroad?
Certainly worth mentioning are the special BO PET foils (biaxial oriented polyester foils) and HIF (hydro-insulation foils) exported to eastern markets, and vapour permeable membranes and laminates exported to western markets.

Fortell, s.r.o.

Opletalova 92, 563 01 Lanškroun, phone: +420 465 323 820, fax: +420 465 323 920, e-mail: fortell@fortell.cz, www.fortell.cz

Turnover: CZK 92.56 million – approx EUR 3.31 million
Number of employees: 75
Contact: Mr Filip Ambrož, e-mail: filip.ambroz@fortell.cz
Export: 25.32%, for example to Germany, the Netherlands, Finland, Switzerland, Austria, France, and Hungary

Fortell, s.r.o. provides complete services in the branch of injected thermoplastics. Besides the actual injecting, an advantage is high-quality manufacture of injection moulds in the company's own tool room. This makes it possible to adapt moulds and deliver plastic components on schedule. Fortell products go to the automobile, electrical, consumer goods, and medical equipment industries. The construction of a new factory began in 2007 and is to be completed in 2008. This will increase the capacity, especially of the injection moulding of plastics, and the size of the moulds (investment into new machinery).
You hold several prestigious awards. Which are they?
In 2004, the company was awarded the DHL Export Award for the best Czech exporter in the category of small and medium-sized enterprises in the whole Czech Republic (we had a three-fold year-on-year increase in export, which had a share of 40% in revenues). In 2005, the company’s financial standing received a very good Dun & Bradstreet rating and placed sixth among Czech enterprises. In the same year, Fortell became member of the CzechTrade Export Club under the auspices of the Ministry of Industry and Trade of the Czech Republic.

Can you mention your most important deliveries abroad?
In the last few years, the company manufactured and tested many moulds for large automobile plants. Most of them were moulds for interior parts. Fortell also manufactures and sells some of them. A success was involvement in the medical area, which is very specific and technically complicated.

PLASTIKA, a.s.
Kaplanova 2830, 767 01 Kroměříž, phone: +420 573 511 111, fax: +420 573 331 179, e-mail: plastika@plastika.cz, www.plastika.cz

Number of employees: approx. 400
Contact: Ms Monika Vrzalová, e-mail: vrzalova@plastika.cz
Export: 85%, to Germany, France, the United Kingdom, Switzerland, Slovakia, and Mexico

Plastika, a.s. is an European supplier of complete plastic components with many accompanying services for the automobile, electronic, and PC industry with many accompanying services. Plastika operates on B2B markets exclusively and its customers are prominent multinational corporations.

Can you mention your major foreign customers and the products you supply to them?
Some of our key customers are: Siemens VDO Automotive, which Plastika supplies with dashboard sets for the Opel, Skoda, and Volkswagen cars, fuel system components for Audi and ventilation system components for the Smart. Another important customer is Magna Slovteca, which purchases wing mirror sets mainly for the Ford, Toyota, and Suzuki cars. For the Eissmann Group, Automotive Plastika makes ceiling fittings for Mercedes-Benz and Toyota. Then there is TI Automotive, which buys fuel system components and sets, and Automotive Lighting, which Plastika provides with light systems for the brands BMW, Daimler Chrysler, Mercedes-Benz, and Land-Rover.

Fujitsu Siemens Computers purchases complete keyboards including our logistic services. The most important customer in the electrical industry is Schneider Electric, which Plastika supplies with sets of binding materials.

You introduced new technologies, hot stamping and ultrasonic welding, in 2006. What are the outstanding features of these technologies?
Hot stamping and ultrasonic welding are only two of the innovations with which we expanded our service offers last year. Hot stamping serves for the decorative refinement of plastic products. This technology upgrades the quality and durability of the final products. It is used mainly for the decoration of dashboard apparatus. Ultrasonic welding is a highly efficient technology which allows the connection of several components made of different materials. The company has seven welding machines (Branson, Herrmann), which serve the completion of dashboard apparatus sets.

Other innovations include metal injection moulding, nitrogen injection moulding, mould manufacture in co-operation with a Chinese partner, and preparation of a pure environment for the manufacture of components of clear materials such as PMMA or PC.
Gumárny Zubří, a.s.
Hamerská 9, 756 54, Zubří, phone:+420 571 662 111, fax: 571 658 735, e-mail: marketing@guzu.cz, www.guzu.cz

- Turnover: CZK 7.8 billion – approx EUR 275 million
- Number of employees: 910
- Contact: Mr Jindřich Vaculín, e-mail: Vaculin@guzu.cz
- Export: 55%, for example to Germany, Poland, Russia, the Ukraine, and Croatia

The enterprise was founded in 1935. During its existence, it has gained and retained a firm position on the market. The present products include rubber, plastic, and thermoplastic components for the automobile and building industries, engineering and electrical engineering, and protective masks.

Which of your products are most popular on foreign markets?
Most popular are protective masks and rubber car floor mats. Other components are parts of large systems (such as automobile systems).

What innovations have you prepared for 2007?
Our new products include a protective mask for civilian use and new types of car floor mats.

Bohemia Bartering vytlačování plastů, spol. s r.o.
Na Roudné 21, 301 00 Plzeň, phone: +420 378 011 351, fax: +420 378 011 353, e-mail: bbplasty@bbplasty.cz, www.bbplasty.cz

- Turnover: CZK 45 million – approx EUR 1.6 million
- Number of employees: 40
- Contact: Mr Petr Pospíšil, e-mail: pospisil@bbplasty.cz
- Export: Germany, Austria, Belgium, France, Norway, Slovakia, and Hungary

Bohemia Bartering vytlačování plastů, spol. s r.o. manufactures extruded plastic profiles for the building industry, medicine, interiors, the automobile industry, and other sectors. The company co-operates with the suppliers of basic materials, manufacturing equipment and universities to optimise production.

You are co-operating with suppliers and institutions. How does it work?
We offer solutions. This means that we co-operate in the specification and manufacture of custom-made profiles, i.e. "tailor-made" profiles, and offer plastic profiles for a broad range of branches.

Can you mention your most important customers and supplies?
Our most important customers include companies such as BRAMAC Dachsysteme Int., BORGERS CZ, ISOLA Holding, REHAU, SKANSKA, STOKVIS TAPES, TYCO Health care Int. and YAZAKI.
Exhibitions and Fairs in the Plastics and Rubber Industry in the Czech Republic in 2007 and 2008

PLASTEX 2008

International fair of plastics, rubber, and composites
16–19 May 2008 – Brno – Exhibition Grounds
Veletrhy Brno, a.s., e-mail: plastex@bvv.cz, www.bvv.cz

Official Participation of the Czech Republic in International Fairs and Exhibitions

HANOI – VIIF

International industrial fair
E-mail: vefac@netnam.vn, www.vietnamindustrialfair.com

K 2007

International exhibition of plastics and rubber
24–31 October 2007 Düsseldorf, Germany
E-mail: mhorakova@bvv.cz, www.k-online.de

more at: www.veletrhavystavy.cz

Important Contacts

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<td>Czech Plastics and Rubber Industry Society</td>
<td><a href="http://www.cspg.cz">www.cspg.cz</a></td>
<td><a href="mailto:info@cspg.cz">info@cspg.cz</a></td>
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<td>Pardubice University, Faculty of Chemical Technology</td>
<td><a href="http://www.upce.cz">www.upce.cz</a></td>
<td><a href="mailto:KDCPFCHT@upce.cz">KDCPFCHT@upce.cz</a></td>
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<tr>
<td>Institute of Chemical Technology Prague, Faculty of Chemical Technology</td>
<td><a href="http://www.vscht.cz">www.vscht.cz</a></td>
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<td>Polymer Institute Brno, spol. s r.o.</td>
<td><a href="http://www.polymer.cz">www.polymer.cz</a></td>
<td><a href="mailto:pib@polymer.cz">pib@polymer.cz</a></td>
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<td><a href="mailto:sara@utb.cz">sara@utb.cz</a></td>
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