UNIVERSITY OF WEST BOHEMIA

University of West Bohemia

1948 – Founded School of Education
1949 – Founded School of Mechanical and Electrical Engineering
1991 – Founded University of West Bohemia

UWB – 9 Faculties; 2 Institutes
– ≈ 13.000 students
– ≈ 2.000 employees

Located in Pilsen:
- ✓ **Industry driven region**
- ✓ **Long technical tradition**

- ✓ **80 km to the border**
- ✓ **80 km to Prague**

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	No of students
Faculty of Applied Sciences	**1 473**
Faculty of Economics	**1 631**
Faculty of Electrical Engineering	**1 545**
Faculty of Education	**2 229**
Faculty of Law	**1 255**
Faculty of Mechanical Engineering	**1 377**
Faculty of Philosophy and Arts	**2 210**
Faculty of Health Care Studies	**770**
Faulty of Art and Design	**628**

*** New Technologies - Research Centre**

*** Institute of Applied Language Studies**

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RESEARCH CENTRES

NTC - New Technologies Research Centre

NTIS – New Technologies for Information Society

RTI – Regional Technological Institute

RICE – Regional Innovation Centre for Electrical Engineering

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NTC
New Technologies Research Centre

- Materials technologies
- Laser technologies
- Strength analyses
- Convection of heat and heat transfer
- Human body modelling and monitoring
- Human Cognitive Enhancement

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NTIS
New Technologies for Information Society

- Development of cybernetic control systems, identification, intelligent decision-making and communication systems
- Advanced computer and information systems
- Research and modelling of heterogeneous materials and mechanical and biomechanical structures
- Novel nanostructured thin-film materials prepared using plasma processing
- Qualitative and quantitative investigation of mathematical models

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RICE – Regional Innovation Centre for Electrical Engineering

- Intelligent industrial systems
- New traction concepts and advanced technologies for traffic vehicles
- Material research
- Energetics and industrial systems
- Testing and diagnostics

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RTI – Regional Technology Institute

- Research and development of the modern vehical contruction and design icluded traction systems
- R&D of processing machines
- R&D of forming technologies
- R&D of machining technologies

- Traction Vehicles Competence Center
- Machinery Processing Technics Competence Center

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International R&D Co-operation

Agreements

11 countries (24 partner universities)

Extensive experience with research projects:

- Czech Rep: Grant Agency, Ministry of Culture, Ministry of Education, Ministry of Industry and Trade, Ministry of Health Ministry of Foreigh Affairs, Technology Agency …
- 6. FP, 7. FP, COST, ESA, Jean Monet, Czech-Norwegian Research Programme, Visegrad Fund,

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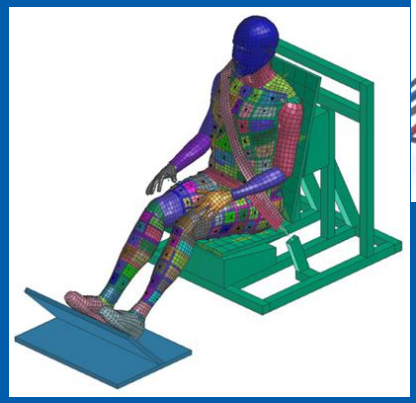
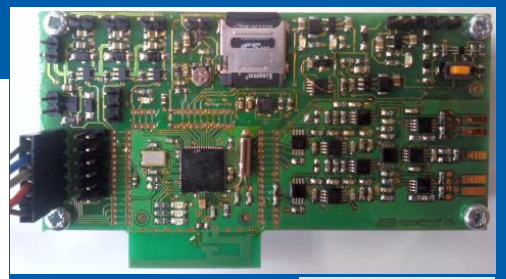
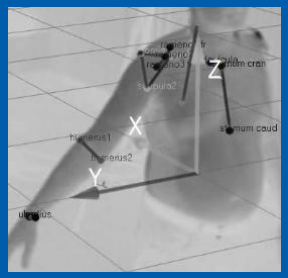
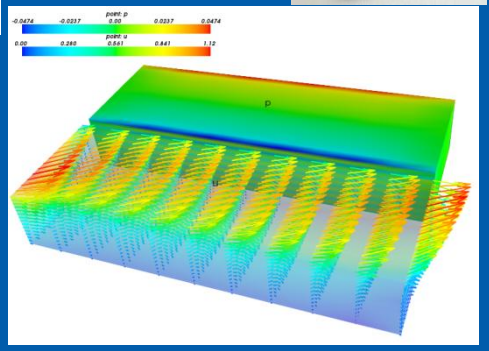
Research projects: Human body modelling and monitoring

- Injury analysis for external impact (traffic accidents)
- Muscle stress/strain analysis
- In-house FE solver http://sfepy.org for modelling strongly heterogeneous materials (BSD license)
- Clinical applications(stress/strain analysis during delivery)
- Electronic systems for biometric data measuring, transfer and analysis









- ***Cooperation: national and foreign universities, university hospitals***
- ***FP6 and FP7 projects, national projects***
- ***References: CEESAR France, ESI Group, TRW Germany***

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Czech leading research center on infrared and laser technologies

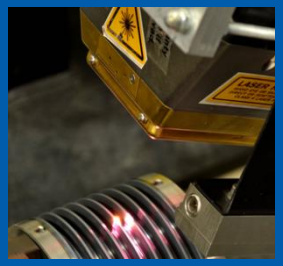
- Industrial laser technologies for materials processing
- Active infrared technologies for process and material analyses
- Measurement of optical properties of materials

Educational Projects cooperation possibilities

Partners: educational institutions, universities, research institutes

Scope of cooperation:

- practical and theoretical presentations preparation on capabilities of infrared and laser technologies, translations into Czech and German language, live demonstrations in application labs for Czech and Bavarian companies or students, workshops in Czech Rep. and Bavaria ...



Research and development projects cooperation

Partners: universities, research institutes, SMEs

Scope of cooperation:

- practical demonstration of laser and infrared technologies, processing of prototypes, material analyses, technical/economical analyses
- definition of tasks, providing test workpieces, analyses of processed parts, competitive technologies for comparison
- Both - joint publications, presentations, workshops, ...

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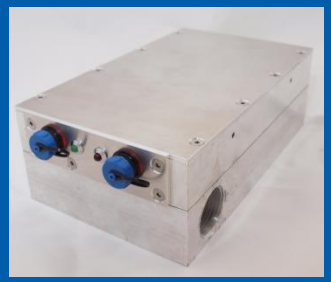
TECHNOLOGICAL SYSTEM FOR PROTECTION OF CUTTING FLUID

Description of technology:

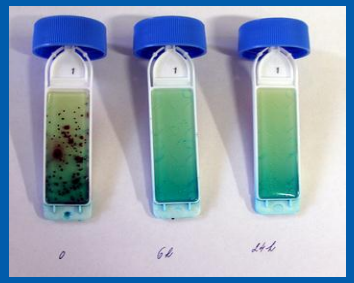
- Our newly-developed technology is based on using photocatalysis to generate a reactive form of oxygen with antimicrobial effects which eliminate undesirable microorganisms.
- We remove the need for cutting fluid additives based on bacterial cultures or bactericides which have undesirable risks and side-effects.

Innovative advantages:

- **Functional** – works over a wide range on all types of bacteria, yeasts and moulds.
- **Economic** – extended operational stability of cutting fluid, material savings.
- **Health** – Operation of machines without biocides. The additive has no undesirable toxic or allergenic effects, minimizes negative health risks to the machine operators.
- **Ecological** – cutting fluid contains no toxic antimicrobial additives meaning no biocides in waste water and soil, and eliminates risks during filtration, cleaning and disposal of cutting fluid.
- **Regulatory Compliance** – elimination of toxicological risks, meets the most stringent safety regulations.



Photoinitiation system



Microbial tests illustrating the efficiency of destruction of microorganisms in cutting fluid. 1. Contaminated cutting fluid; 2. Fluid after 6 hours; 3. Fluid after 24 hours

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INNOVATIVE INTERNAL HIGH PRESSURE FORMING

Description of technology:

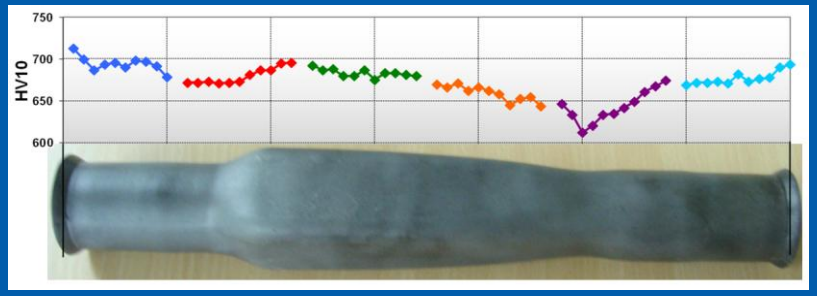
- Our innovation, offering the potential for manufacturing complex-shaped structural parts with enhanced properties, opens new opportunities in the field of processing hollow stock.
- We can deliver excellent ultimate strengths exceeding 2000 MPa at a sufficient elongation level of 10 %. When combined with an unconventional forming method, it allows the production of complex-shaped parts with outstanding mechanical properties.

Innovative advantages:

- Advanced steels achieving strength limit. Reduced cost of heat treatment as the final hardening operation can be omitted.
- Weight reduction (Results in lightweight steel components such as hollow shafts)

Demonstration on automotive shafts:

- Our tests show that hollow shafts with their substantially reduced mass can transmit torques equal to those sustained by solid shafts.



Hardness in the axial direction can be influenced by the wall thickness and the cooling rate.

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THANK YOU

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