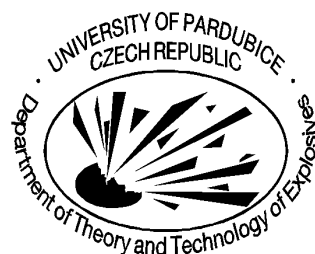


UNIVERSITY OF PARDUBICE
Faculty of Chemical Technology
Department of Theory & Technology of Explosives
CZ-532 10 Pardubice
<http://www.upce.cz/~kttv>



PROGRAMME
of the fifth Seminar

**„NEW TRENDS IN RESEARCH OF ENERGETIC
MATERIALS“**



held at University of Pardubice

Pardubice, the Czech Republic

April 24 - 25, 2002

*intended as a meeting of students, postgraduate students, university teachers and
young research and development workers concerned from the whole world*

Seminar is held under the aegis of his magnificence,

Prof. Miroslav Ludwig, Ph.D.,

rector of the University of Pardubice

and in support of

European Office of Aerospace Research and Development,

Air Force Office of Scientific Research,

United States Air Force Research Laboratory,

and United States Office of Naval Research

Chairman of the Seminar:

Prof. Svatopluk Zeman, D.Sc.

Scientific Committee:

Prof. José Campos (*Univ. of Coimbra, Portugal*)

Dr. Adam S. Cumming (*DSTL, Fort Halstead, Sevenoaks, U. K.*)

Dr. Stanislaw Cudziło (*Military Univ. of Technology, Warsaw, Poland*)

Prof. Li Bing-ren (*Inst. of Chem. Materials, CAEP, Sichuan, China*)

Prof. Boris Lur'e, D.Sc. (*Mendeleev's Univ. of Technology, Moscow*)

Prof. Andrzej Maranda, D.Sc. (*Military Univ. of Technol., Warsaw, Poland*)

Prof. Gurdip Singh (*DDU Gorakhpur Univ., Gorakhpur, India*)

Dr. Muhamed Sućeska (*Brodarski Inst., Zagreb, Croatia*)

Assoc. Prof. Pavel Vávra, Ph.D. (*Univ. Pardubice*)

Assoc. Prof. Boris Vetlický, Ph.D. (*Univ. Pardubice*)

Dr. Fred Volk, (*ICT Pfinztal, Germany*)

Dr. Woodward Waesche (*Office of Naval Res. Int. Field Office, USA*)

Prof. Ou Yuxiang (*Beijing Inst. of Technology, Beijing, China*)

Organizing Committee:

Jiří Vágenknecht, Ph.D. (*Univ. Pardubice*)

Zdeněk Jalový, Ph.D. (*Univ. Pardubice*)

Marcela Jungová, M.Sc. (*Univ. Pardubice*)

Břetislav Janovský, Ph.D. (*Univ. Pardubice*)

Martin Kouba, M.Sc. (*Univ. Pardubice*)

Miloslav Krupka, Ph.D. (*Univ. Pardubice*)

František Masař, M.Sc. (*Univ. Pardubice*)

Robert Matyáš, M.Sc. (*Univ. Pardubice*)

Jiří Pachmáň, M.Sc. (*Univ. Pardubice*)

GENERAL INFORMATION

Seminar Venue:

Seminar will take place at a new University hall (*Aula Magna*), which is a part of University library on Studentská street 519, Pardubice, near the hotel Harmony (*see enclosed map*).

Lunches:

There is a possibility to bespeak lunches in University cafeteria one day before the lunch.

Price of the lunch + drinkables ~100.-CZK

There are also restaurants within the walking distance from meeting hall.

Official Language:

The official working language will be English. Simultaneous interpretation in Czech may be partly ensured.

Registration fees:

No fees will be charged.

Proceedings:

The Proceedings will be provided to the members of scientific committee, delegates of CEPA-14 and main authors free of charge.

Other participants can buy corresponding Proceedings at the beginning of the Seminar.

Price of the Proceedings of 5th seminar will be 420,- CZK (i.e. \$12,-) printed version and 350,- CZK for electronic version (CD). Limited amount of printed version of Proceedings from the 4th seminar is also available for 760,- CZK.

Presentation of papers:

Data, slide and sheet projectors, overhead projector and devices for Power Point presentation. will be available for oral presentation.

Tables (*1980 mm high and 1000 mm wide*) will be available for poster presentation.

Registration of participants:

Registration of participants will take place at the University Hall.

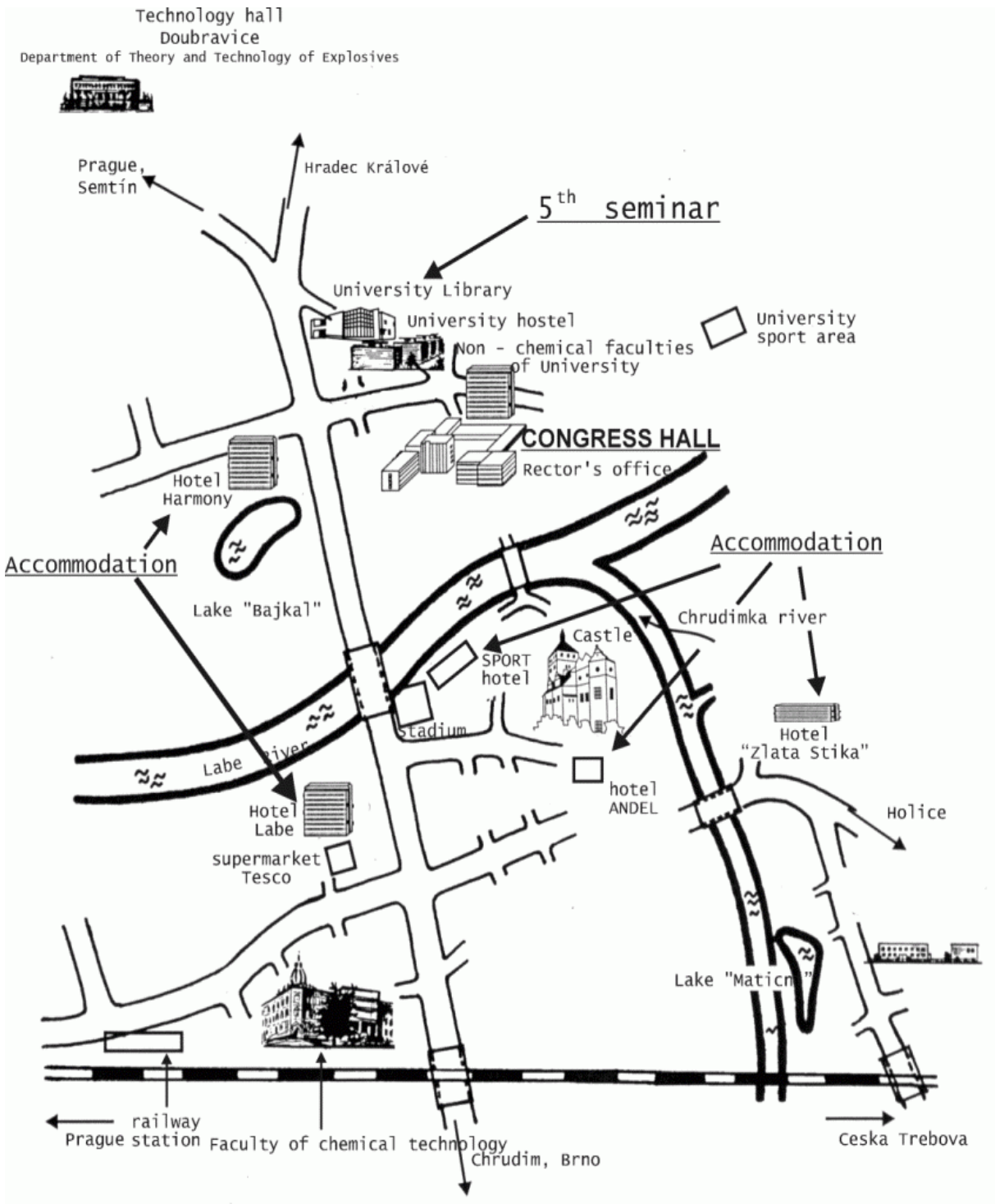
April 23rd 4:00PM - 7:00 PM

April 24th 7:30AM - 10:00 AM

Special Programme:

Social party for foreign participants with dinner will be arranged in hotel **ZLATA STIKA** restaurant on April 24th at 19:00.

In the case of participants interest it is possible to organize a visit of the Department of Theory and Technology of Explosives.



Schematic City Map - Pardubice

Lecture programme – Wednesday April 24th

08:40 **Opening of Seminar** – speech of Prof. Jiří Málek, D.Sc., vice-rector of University

I. Session

Chairman: Dr. Fred Volk
ICT Pfinzthal, Germany

09:00 A S Cumming
Chairman CEPA 14, Defence Sci. & Technology Laboratory (DSTL), Sevenoaks, UK
CEPA 14 – A Mechanism for European Collaboration on Energetic Materials and their Applications

09:20 R. Mendes, J. Campos, I. Plaksin and J. Ribeiro
Lab. of Energetics & Detonics, Mechanical Eng. Dept., Faculty of Sciences & Technology, University of Coimbra, Coimbra, Portugal
Initiation of a PBX Based on RDX by Divergent Detonation Wave.

09:40 Luisa Durães, José Campos and António Portugal
Lab. of Energetics & Detonics, Mechanical Eng. Dept., Faculty of Sciences & Technology, University of Coimbra, Coimbra, Portugal
Iron Oxide/Aluminium Fast Thermite Reaction Driven Propagation.

10:00 Tadeusz J. Rychter and Andrzej Teodorczyk
Warsaw University of Technology, Warsaw, Poland
Engineering Calculation of Gas Explosion Parameters in Closed and Vented Vessels.

10:20-10:50 **Coffee break**

11:10 Andrzej Teodorczyk
Warsaw University of Technology, Warsaw, Poland
An Analysis of Large Scale Ethylene Release and Explosion.

11:30 Waldemar Witkowski*, Radosław Trębiński** and Andrzej Teodorczyk***
and Andrzej Maranda**
)Institute of Industrial Organic Chemistry, Warsaw; **)Military University of Technology, Warsaw; *)Warsaw University of Technology, Warsaw, Poland*
Overpressure Generated by Detonations of Elongated Gas Clouds.

11:50 Stanisław Cudziło and Waldemar A. Trzcziński
Military University of Technology, Warsaw, Poland
Thermochemical Analysis of Combustion Process of Gas Generants Containing Sodium Azide.

12:10-14:00 **Lunch break.**

2. Session

Chairman: Dr. Muhamed Sućeska
Brodarski Institut, Zagreb,

14:00 Fred Volk

Fraunhofer Institut für Chemische Technologie (ICT), Pfinztal, Germany

Performance Parameters of Explosives: Equilibrium and Non-Equilibrium Reactions.

14:20 Zdeněk Jalový and Robert Matyáš

Dept. of Theory & Technology of Explosives, University of Pardubice, Czech Rep.

The Influence of Reaction Conditions on TEX Synthesis.

14:40 Miroslav Pospíšil*, Pavla Čapková*, Pavel Vávra** and Svatopluk Zeman**

**)Dept. of Chemical Physics & Optics, Faculty of Mathematics & Physics, Charles University, Prague; **) Dept. of Theory & Technology of Explosives, University of Pardubice, Pardubice,*

Characterization of Explosive Materials Using Molecular Dynamic Simulation

15:00 Ou Yuxiang, Liu Lihua and Chen Boren Lijin

School of Chemical Engineering & Material Sci., Beijing Inst. of Technology, China

Synthesis and Crystal Structure of Tetraacetyldichloroacetylhexaazaisowurtzitane Trihydrate.

15:00-17:00 **Poster session** (see below)

Lecture programme – Thursday April 25th

3. Session

Chairman: Dr. Adam S. Cumming
DSTL Fort Halstead, U. K.

08:40 Richard Wild

Diehl Munitionssysteme Werk, Maasberg, Germany

Energetic Materials for Insensitive Munitions.

09:00 Luka Čačić*, Zvonimir Ester** and M. Dobrilović**

**)Ministry of Interior, Zagreb; **)Faculty of Mining, Geology & Petroleum, University of Zagreb, Rep. of Croatia*

Determination of the Detonation Velocity of Emulsion Explosives in the Different Thermal Conditions.

09:20 Marcel Hanus

Military Institute for Weapon and Ammunition Technology, Slavičín, Czech Rep.

New Methodologies for Military Explosive Materials Testing in the Czech Army

09:40 Shu Yuanjie, Dong Haishan, Liu Shijun, Liu Yonggang, Song Huajie, Hao Ying, Zhan Chunhong and Chen Jie
Inst. of Chemical Materials CAEP, Mianyang, Sichuan, China
Effect of Molding Powder Production, Charge Pressing and Aging on Particle Size of Explosives

10:00-10:30 **Coffee break**

10:30 Muhamed Sućeska
Brodarski Institut - Marine Research & Special Technologies, Zagreb, Rep. of Croatia
Influence of Thermal Decomposition Kinetic Model on Result of Propellants Self-Ignition Numerical Modelling.

10:50 Gurdip Singh and Prem Felix S.
Dept. of Chemistry, DDU Gorakhpur University, Gorakhpur, India
Thermolysis of a Plastic Bonded Explosive.

11:10 Stephan Wilker, Uldis Ticmanis and Gabriele Pantel
WIWEB, Swisttal, Germany
Heat Conductivity Measurements of Explosives.

11:30 Maša Rajić and Muhamed Sućeska
Brodarski Institut - Marine Research & Special Technologies, Zagreb, Rep. of Croatia
Thermal Stability of Propellants under Accelerated Ageing.

11:50-13:50 **Lunch break**

4. Session

Chairman: Prof. Svatopluk Zeman
University of Pardubice

13:50 Jiří Pachmáň*, Marcel Hanus** and Jakub Šelešovský*
**)Dept. of Theory & Technology of Explosives, University of Pardubice;*
***)Military Institute for Weapon and Ammunition Technology, Slavičín, Czech Rep*
Some Aspects of Stability Evaluation of Composite Propellants.

14:10 V. A. Malchevski, N. A. Zarytovskaya and T. A. Mikhailikova
Mendeleev Russian Chemical Technological University, Moscow, Russian Federation
Mechanical Destruction of Energetic Polymeric Composites (EPC)

14:30 Jacek Borkowski, Maciej Miszczak and Jan Szymanowski,
Military Institute of Armament Technology, Zielonka, Poland
Thermal Stability and Compatibility Research of Mortar Augmenting Propelling Charges.

14:50 **Closing remarks**

Poster programme

Posters should be hanged out in Wednesday, *April 24th*, before 10:20 h. A special poster session will take place on Wednesday (*April 24th*) from 15:00 up to 17:00 h. During this time authors should be present for discussion at the posters.

- P 01** Alevtina S. Medvedeva, Lyubov' P. Safronova, Maria M. Demina, Vladimir V. Novokshonov, Andrei V. Afonin and Galina I. Sarapulova
A. E. Favorski Irkutsk Institute of Chemistry, Siberian Branch of the RAS, Irkutsk, Russian Federation
Synthesis of New Heterocyclic Azidonitramines.
- P 02** Camilla Sandberg*, Nikolaj Latypov*, Patrick Goede*, Rolf Tryman* and Anthony J. Bellamy**
*)*FOI, Swedish Defence Res. Agency, Dept. of Energetic Materials, Tumba, Sweden;*
**) *Dept. of Environ. & Ordnance Systems, Cranfield University, Royal Military College of Science, Shrivenham, Swindon, U. K.*
Acid-Base Characteristics of FOX-7 and its Monohydrazo Analogue.
- P 03** Miroslava Trchová*, Irina Sapurina** and Jaroslav Stejskal***
*)*Faculty of Mathematics & Physics, Charles University, Prague;* **) *Inst. of Macromol. Compounds, Russian Acad. Sci., St. Peterburg, Russian Federation;*
***) *Inst. of Macromolecular Chemistry, Czech Acad. Sci., Prague*
FTIR Spectroscopic Study of the Protonation of Conducting Polymer with Energetic Compound
- P 04** Aleš Eisner, Karel Ventura and Robert Varga
Dept. of Analytical Chemistry, University of Pardubice, Pardubice
Determination of additives from explosive materials with GC/MS (EI,NCI)
- P 05** Sergey Smirnov and Boris Lur'e
Mendeleev Russian University of Chemical Technology, Moscow, Russian Federation.
Kinetics and Mechanism of Triaminoguanidine Nitrate Thermal Decomposition.
- P 06** Alexander M. Astachov*, Alexander D. Vasiliev**, Maxim S. Molokeev**, Ludmila A. Kruglyakova* and Rudolf S. Stepanov*
*)*Siberian State Technological University, Krasnoyarsk;* **) *Institute of Physics, Siberian Branch of the RAS, Krasnoyarsk, Russian Federation*
1,2-Dinitroguanidines: Structure-Property Relationships.
- P 07** Miloslav Krupka and Svatopluk Zeman
Dept. of Theory & Technology of Explosives, University of Pardubice
Study of Thermal Stability and Compatibility of 2,3-Dimethyl-2,3-dinitrobutane. (DMDNB).
- P 08** Aleš Nepovím*, Radka Podlipná*, Hartmuth Thomas**, Andre Gerth**, Zdeněk Jalový***, Svatopluk Zeman*** and Tomáš Vaněk*
*)*Dept. of Plant Tissue Cultures, Inst. of Organic Chem. & Biochem., AS CR, Praha 6, Czech Rep.,* **) *Bioplanta GmbH, Delitzsch, Germany,* ***) *Dept. of Theory & Technol. of Explosives, University of Pardubice,*
Study of Biodegradation of Selected Explosives by Plants - Alternative Way of Soil and Water Decontamination
- P 09** Pavel Mareček and Kamil Dudek
AliaChem, a.s., Res. Institute of Industrial Chemistry, Pardubice, Czech Rep.
Cast TNAZ Mixtures.

- P 10** Svatopluk Zeman*, Miloslav Krupka*, Zdeněk Friedl** and Radim Huczala*
^{*)}*Dept. of Theory & Technology of Explosives, University of Pardubice;*
^{**)}*Chemical Faculty of the Brno University of Technology, Brno, Czech Rep.*
Study of the Impact Reactivity of Polynitro Compounds.
- P 11** Pavel Vávra*, Miroslav Pospíšil** and Jarmila Repáková**
^{*)}*Dept. of Theory & Technology of Explosives, University of Pardubice;*
^{**)}*Dept. of Chemical Physics & Optics, Faculty of Mathematics & Physics, Charles University, Prague;*
Effect of Intermolecular Forces on some Properties of Explosives.
- P 12** Jiří Kočí, Svatopluk Zeman, Jiří Majzlík and Jiří Strnad
Dept. of Theory & Technology of Explosives, University of Pardubice
Notices to Determination of the Electric Spark Sensitivity of Energetic Materials.
- P 13** Peter Očko, Martina Chovancová, Luboš Čavojský and Jozef Lopúch
Military Technical & Testing Inst. Záhorie, Slovak Republic
Stability Investigation of Plastic Explosives During their Ageing Process.
- P 14** Andrzej Orzechowski*, Witold Pagowski* and Andrzej Maranda**
^{*)}*Institute of Industrial Organic Chemistry, Warsaw;*
^{**)}*Military University of Technology, Warsaw, Poland*
Research of Physicochemical Properties of Plastic Explosive.
- P 15** Li Bing-ren and Li Xianming
Inst. of Chemical Materials, China Acad. of Engineering Physics, Mianyang, Sichuan, China
Study on the Desensitization of Plastic Bonded bis(β,β,β -trinitroethyl-N-nitro)-ethylenediamine.
- P 16** Andrzej Książczak* and Tomasz Wolszakiewicz**
^{*)}*Dept. of Chemistry, Warsaw University of Technology, Warsaw;* ^{**)}*Institute of Industrial Organic Chemistry, Warsaw, Poland*
Thermodynamic Properties of Binary System Nitrocellulose + 2,4,6-Trinitro-toluene.
- P 17** Maciej Miszczak, Jan Szymanowski, Jacek Borkowski, Andrzej Marczuk and Beata Smigielska
Military Institute of Armament Technology, Zielonka, Poland
Investigations on Contact Compatibility between Smokeless Powders and Epoxide Paint Measured by Thermal Analysis Techniques and by UN Test Method at 75 °C.
- P 18** Sanja Matečić Mušanić, Muhamed Sućeska and Bakija Sanko
Brodarski Institut - Marine Research & Special Technologies, Zagreb, Rep. of Croatia
Influence of Testing Conditions on Dynamic Mechanical Characteristics of Double Base Propellants.
- P 19** Andrzej Maranda*, Katarzyna Lipińska** and Marek Lipiński**
^{*)}*Military University of Technology, Warsaw;* ^{**)}*Institute of Industrial Organic Chemistry, Warsaw, Poland*
Analysis of Possibility of Waste Energetic Material Application in Mining Blasting Agent.
- P 20** Andrzej Maranda*, Barbara Gołabek** and Johann Kasperski**
^{*)}*Military University of Technology, Warsaw;* ^{**)}*BLASTEXPLO, Duninów, Poland*
Detonation and Application Characteristics of the Latest Generation of Emulsion Explosives.

- P 21** Milka Matejic Grguric
Technicki opitni centar, Belgrade, Serbia, Yugoslavia
Effect of Discontinuous Phase of Emulsion on the Stability of Emulsion Slurry Explosives.
- P 22** Waldemad A. Trzciński, Radoslaw Trębiński and Stanisław Cudziło
Military University of Technology, Warsaw, Poland
Analysis of the Motion of Metal Plates in Model Reactive Armour.
- P 23** František Masař, Pavel Vávra and Jiří Vágenknecht
Dept. of Theory & Technology of Explosives, University of Pardubice
Determination of Physical Characteristics of Detonation Products
- P 24** Jiří Vágenknecht, Zbyněk Akštein and Pavel Vávra
Dept. of Theory & Technology of Explosives, University of Pardubice
Measuring of Detonation Velocities of Formed Linear Charges
- P 25** Marcela Jungová and Jiří Strnad
Dept. of Theory & Technology of Explosives, University of Pardubice
Initiation Strength of Detonators – Measurement of Air Gap Test Method.

Product Education Session

Jiří Chládek
Jiří Chládek AALL, Sulova 1247, CZ-156 00 Prague
Explosive and Metal Detectors

J. Zeman and J. Chládek
ZEMAN Co., Otrokovice, Czech Rep.
AM - Blast Protective Boots

Instruments demonstration

Instruments will be demonstrated on Wednesday and Thursday (April 24th and 25th) from 08:00 up to 17:00 in room No. A8. Demonstrations will include instruments developed in Dept. of Theory & Technology of Explosives and with its cooperation with firms OZM Res. and RMI.

- I 1** Jiří Majzlík and Jiří Strnad
Dept. of Theory & Technology of Explosives, University of Pardubice
Electric Spark Sensitivity Tester
- I 2** Miloslav Krupka
Dept. of Theory & Technology of Explosives, University of Pardubice
Vacuum Thermal Stability Tester „STABIL 16Ex - MVST apparatus“
- I 3** Radim Švejka
R.M.I. Pardubice
Ballistic Analyzer