

## DEPARTMENT OF MATERIAL ENGINEERING

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### I. STAFF

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### II. EQUIPMENT

#### II.1 Teaching and Research Laboratories

1. Concrete technology laboratory
2. Lightweight concrete laboratory
3. Ceramics laboratory
4. Binders laboratory
5. Building chemistry laboratory
6. Laboratory for scanning electron microscopy and mercury intrusion porosimetry
7. Laboratory for X-ray diffraction analysis
8. Laboratory for differential thermal analysis

#### II.2 Special Measuring Instruments and Computers

- Derivatograph-C, MOM, Budapest, Hungary
- Derivatograph G 425, MOM Budapest, Hungary
- Diffractometer Mikrometa 2, Chirana, Prague, Czech Republic
- Scanning electron microscope BS-301, Tesla, Brno, Czech Republic
- Spectrophotometer Specol, Carl Zeiss, Jena, Germany

- Equipment for determination of thermal conductivity PMV - 01, Elsys, Prague, Czech Republic
- Apparatus for determination of thermophysical parameters - Isomet, Model 104, Applied Precision, Bratislava, SR
- Schmidt concrete test hammers, Proseq SA, Zürich, Switzerland
- Dyna pull-off tester, Proseq SA, Zürich, Switzerland
- Resonance apparatus RP-5, Mankovický, Bratislava, SR
- Porosimeter, Model 70H, Carlo Erba, Milan, Italy
- Test apparatus for determination of air content B 2020, BC-Export Unlingen, Germany
- Pentium computers
- Testing machines with loads of 200, 400, 1000 and 3000 kN
- Testing device for determination of watertightness of concrete
- Apparatus for measuring length changes

### III. TEACHING

#### III.1 Graduate Study

	Semester	Hours Per Week		Lecturer
		Lectures	Seminars	
Designing Plants for Production of Building Materials	10	0 – 8		L.Marko
Testing	10	2 – 2		V. Priechodský
Lightweight Concrete	10	2 – 3		P.Fajkus
Insulating Materials	10	2 – 2		M. Šveda

#### III.2 Bachelor's Study

	Semester	Hours Per Week		Lecturer
		Lectures	Seminars	
Chemistry for Civil Engineers	1	2 – 2		V. Pavlík
Building Materials	1	2 – 2		M. Šveda
Building Materials	2	2 – 2		I.Rouseková
Building Materials	2	2 – 2		M. Šveda
Building Materials	3	2 – 2		I.Rouseková
Chemistry of Soil, Water, Air and Waste	4	2 – 2		V. Pavlík
Chemistry of Environmental Elements	4	2 – 2		V.Pavlík
Concrete Technology	5	2 – 2		A. Bajza

#### III.3 Master's Study

	Semester	Hours Per Week		Lecturer
		Lectures	Seminars	
Concrete Technology I	1	2 – 2		A. Bajza
Binders II	2	2 – 2		A. Bajza
Technology of Precast Concrete II	2	2 – 2		S.Unčák
Technology of Repair	2	2 – 2		S.Unčák
Plastics	2	2 – 2		I.Rouseková

Concrete Technology II	3	2 – 2	A.Bajza
Technological Project	3	0 – 4	S.Unčik
Microstructure of Building Materials	3	2 – 1	A.Bajza

#### **IV. RESEARCH TARGETS**

Current research in the Department is focused, above all, on the utilisation of industrial waste products in cement composites, the effects of admixtures on concrete properties, and the durability of building materials as well as the modification of properties of brick-shatter using organic substances and lightweight materials made from industrial waste.

#### **V. RESEARCH PROJECTS**

##### **VEGA**

1. Degradation of Alkali-Resistant Fibreglass-Reinforced Cement Composites by Solutions of Ammonium Nitrate (I. Rouseková)
2. Effect of the Pore Structure of Brick Shatter on the Size of a Reduction Core (M. Šveda)

##### **EU PROJECT**

1. 5th Framework Programme on “Competitive and Sustainable Growth“ - ECO - ERVE NETWORK-European Construction in the Service of Society (A. Bajza)

##### **UN DEVELOPMENT PROGRAMME**

1. A laboratory for testing construction materials for Herat University, Afghanistan (A. Bajza, I. Rouseková)

#### **VI. COOPERATION**

##### **VI.1 Cooperation in Slovakia**

1. HYDROSTOP Ltd., Poprad
2. ZIPP Bratislava Ltd., Bratislava
3. HOLCIM BETON Ltd., Bratislava
4. Applied Precision Ltd., Bratislava
5. Sika Slovakia Ltd., Bratislava
6. Slovak Institute of Standardisation, Bratislava
7. Slovak Office of Standards, Metrology and Testing, Bratislava
8. BetonRáCIO, Ltd., Trnava
9. TERRANOVA - INDUSTRIA Ltd., Bratislava
10. HOLCIM, Joint Stock Company, Bratislava
11. Chestreal, Joint Stock Company, Bratislava
12. Premac Ltd., Bratislava
13. SE, Joint Stock Company, Nuclear Power Plant, Jaslovské Bohunice
14. Termstav, Joint Stock Company, Bratislava

15. Civil Engineering Technical and Testing Institute, Bratislava
16. Cooling Towers Ltd., Jaslovské Bohunice
17. Degussa. SKW-MBT Slovakia Ltd., Žilina
18. Porfix, Joint Stock Company, Zemianske Kostofany
19. Xella Pórobetón SK, Ltd., Šaštín-Stráže
20. Calmit, Ltd. Bratislava

## **VI.2 International Cooperation**

1. Klokner Institute, TU Prague, Czech Republic
2. Department of Building Materials, FCE TU Opole, Poland
3. Research Institute of Building Materials, Joint Stock Company, Brno, Czech Republic
4. Brno University of Technology, Brno, Czech Republic
5. Czech Technical University, Prague, Czech Republic
6. VŠB - Technical University of Ostrava, Czech Republic
7. Dansk Beton Teknik A/B, Hellerup, Denmark
8. NNC AB, Solna, Sweden
9. Institute of Fundamental Technological Research – Polish Academy of Sciences, Warsaw, Poland

### **VI.2.1 Visitors to the Department**

- Prof. R. Drochytka, Ph., Faculty of Civil Engineering, Brno University of Technology, Brno, Czech Republic, 5 days
- Prof. RNDr. P. Rovnaníková, PhD., Faculty of Civil Engineering, Brno University of Technology, Brno, Czech Republic, 2 days
- Prof. J. Cigánek, PhD., Faculty of Civil Engineering, Technical University of Ostrava, Czech Republic, 3 days
- Assoc. Prof. T. Klečka, PhD., Klokner Institute, Czech Technical University, Prague, Czech Republic, 2 days
- Aziz Rahman Azimi, MSc., Herat University, Afghanistan, 3 months
- Neman Ghulama Qadera, MSc., Herat University, Afghanistan, 3 months

### **VI.2.2 Visits of Staff Members and Postgraduate Students to Foreign Institutions**

- Assoc. Prof. S. Unčík, PhD., Institute of Fundamental Technological Research – Polish Academy of Sciences, Warsaw, Poland, 3 days
- Prof. A. Bajza, PhD., Institute of Fundamental Technological Research – Polish Academy of Sciences, Warsaw, Poland, 3 days
- Assoc. Prof. I. Rousekova, PhD., Klokner Institute, Czech Technical University, Prague, Czech Republic, 3 days
- Prof. A. Bajza, PhD., Klokner Institute, Czech Technical University, Prague, Czech Republic, 3 days

## VII. THESES

### VII.1 Graduate Theses

No.	Student's Name	Title
1.	Martin Šuster	Cement Composites with an Admixture of Alkali - Resistant Glass Fibres
2.	Marek Magyar	Effect of a Firing Procedure on the Pore Structure of Clay Roofing Tiles

### VII.2 Doctoral Theses

1. STRUHÁROVÁ, A.: Effect of Materials Based on Silicons on Selected Properties of Cellular Concrete. Bratislava: Slovak University of Technology in Bratislava, 2006.
2. LEDEREROVÁ, M.: Optimisation of Recycling Technology of Silicate Concrete Materials. Bratislava: Slovak University of Technology in Bratislava, 2006.

## IX. PUBLICATIONS

### IX.1 Journals

- [1] ŠVEDA, M.: Mathematical Correlations between Properties of Brick/in a Dried State (Part1). Materials Science (Medžiagotyra), 2006, Vol. 12, No. 3, pp. 230-236.
- [2] ŠVEDA, M.: Black Core in Brick Products and Exploitation of the Relationships between Physical Properties in Practice (Part 3). Silika, 2005, Vol.15, Nos. 7-8, pp. 197-202.
- [3] ŠVEDA, M.: The Effect of Black Coring on the Properties of Bricks. Tile and Brick Manual, 2006, pp. 30-36.
- [4] BAJZA, A.: Curing of Concrete. Stavebné materiály, 2006, Vol. 2, No. 4, pp. 44-46.
- [5] ŠVEDA, M.: Bitumen Membranes. Stavebné hmoty, 2006, Vol. 2, No. 4, pp. 6-10.
- [6] UNČÍK, S. – PAVLÍK, V. – DUBÍK, M.: Construction Failure – Efflorescence on Natural Stone Cover Plates. Almanach znalca, 2006, Vol. 4, No. 2, pp18-21.
- [7] ŠVEDA, M.: Development of Waterproofing. Stavebné hmoty, 2006, Vol.2, No.3, pp. 7-9.

### IX.2 Books and Textbooks

- [1] BAJZA, A. – ROUSEKOVÁ, I.: Concrete Technology. Bratislava: JAGA GROUP, Ltd., 2006. 190 pp. ISBN 80-8076-032-2.
- [2] PAVLÍK, V.: Effect of Aggressive Acid Media on Cement- and Lime-Based Building Materials. Bratislava: STU, 2006, No. 27. 236 pp. ISBN 80-227-2262-6.

### IX.3 Conferences

- [1] ROUSEKOVÁ, I. - BAJZA, A.: The Consequences of an Unsuitable Realization of Selected Building Materials. In: 28th Conference. Proceedings of Repair and Reconstruction of Structures 2006. Prague: Czech Construction Society, 2006, pp. 310-312. ISBN 80-02-01866-4.
- [2] HALAŠA, I. – PÚČEK, M. – UNČÍK, S.: Monolithic Crash Barrier. In: Concrete Days 2006. Bratislava, STU, 2006, pp.55-58. ISBN 80-227-2500-5.
- [3] LEDEREROVÁ, M.: Building Waste and Its Recycling. In: Recycling of Materials in Buildings. Košice: Dom techniky, 2006, pp. 33-37. ISBN 80-232-0260-X.
- [4] BAJZA, A. – ROUSEKOVÁ, I.: Permanently Sustainable Development of Aggregate and Concrete Production. In: Proceedings, Concrete Days 2006. Bratislava, STU, 2006, pp.167-172. ISBN 80-227-2500-5.
- [5] ŠVEDA, M.: Exploitation of Mathematical Correlations between Properties of Bricks for Practical Purposes. In: Proceedings of 4th International Scientific Conference on Quality and Reliability in the Building Industry. Košice: SvF TU, 2006, pp.371-374. ISBN 80-8073-594-8.
- [6] PAVLÍK, V.: Effect of Limestone on Hydration of C<sub>3</sub>A in the Presence of CaSO<sub>4</sub>. In: Proceedings of 4th International Scientific Conference – Quality and Reliability in the Building Industry. Košice: CEF TU, 2006, pp. 295-302. ISBN 80-8073-594-8.
- [7] STRUHÁROVÁ, A.: Effect of Hydrophobic Admixture's Efficiency on the Moisture Content of Cellular Concrete Masonry. In: Proceedings of 10th International Conference on Ecology and New Building Materials and Products. Brno: VÚSH, 2006, pp. 182-187. ISBN 80-239-7146-8.
- [8] STRUHÁROVÁ, A. – DUBÍK, M.: Effect of Hydrophobic Admixture on Wet Porous Masonry Materials. In: Proceedings of 12th International Conference on Building Materials. CONSTRUMAT 2006. Nitra: MFSPU, 2006, pp.213-218,ISBN 80-8069-747-7.
- [9] ŠVEDA, M.: Can We Make Pressed or Extruded Clay Roofing Tiles? In: Proceedings of 12th International Conference on Building Materials. CONSTRUMAT 2006. Nitra: MF SPU, 2006, pp.202-205. ISBN 80-8069-747-7.
- [10] ROUSEKOVÁ, I. - BAJZA, A. – DUBÍK, M.: Cement Composites with Admixtures of Alkali-Resistant Glass Fibres. In: Proceedings of the 12th International Conference on Building Materials. CONSTRUMAT 2006. Nitra: MF SPU, 2006, pp.188-194. ISBN 80-8069-747-7.
- [11] UNČÍK, S.: Two-Layer Paving Blocks. In: Proceedings of the 12th International Conference on Building Materials. CONSTRUMAT 2006. Nitra: MF SPU, 2006, pp. 218-223. ISBN 80-8069-747-7.
- [12] BAJZA, A. – ROUSEKOVÁ, I.: Effect of Aggregate and Concrete Production on the Environment. In: Proceedings of the 12th International Conference on Building Materials. CONSTRUMAT 2006. Nitra: MF SPU, 2006, pp.202-205. ISBN 80-8069-747-7.
- [13] LEDEREROVÁ, M. – PROKOPČÁKOVÁ, K.: Building Waste and an Optimal Way to Process It. In: Waste Forum 2006. Milovy, 2006, pp. 3321-3324. ISBN 80-02-01792-7.