

RIGA TECHNICAL UNIVERSITY
Faculty of Civil Engineering



International Conference

***Innovative Materials, Structures
and Technologies***

Riga, November 8, 2013

**Programme
Book of Abstracts**

Riga, 2013

RIGA TECHNICAL UNIVERSITY
Faculty of Civil Engineering

International Conference

Innovative Materials, Structures and Technologies

Organised by the Faculty of Civil Engineering in the framework of Riga Technical University 54th
International Scientific Conference

Riga, November 8, 2013

Dedicated to the 150th Anniversary of the Faculty of Civil Engineering of Riga Technical University.

Programme
Book of Abstracts

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Dear Participants,

On behalf of Riga Technical University I am pleased to welcome you to International Conference „Innovative Materials, Structures and Technologies” which is dedicated to 150th Anniversary of the Faculty of Civil Engineering. The conference brings together scientists from several disciplines to address challenges of the modern world related to living environment including energy, transport and safety of engineering structures.

Now when Latvia is in process of implementing industrialisation policy, in which technology transfer from science to economy is one of the cornerstones of the development, the interaction between academia and industry is becoming increasingly important. To foster this process further, researchers should be able to work across the disciplines, providing both high quality research and, delivering tangible benefits to society and business. The conference program is offering a wide spectrum of interrelated topics, thus is a demonstration of this endeavour.

Engineering was one of the first faculties when Riga Polytechnic was established 150 years ago. Although the country has come through many economical and political changes, engineering education and science has always been and will remain indispensable. I would like to use opportunity and to congratulate my faculty of Civil Engineering with the anniversary and to wish success in future!!!

I also wish all participants interesting lectures and fruitful discussions.

*RTU Vice Rector of Research
Prof. Dr. sc. ing. Talis Juhna*

In 2013 the Faculty of Civil Engineering can proudly reflect on a hundred and fifty years of its work. In the long period of one and a half century names of the countries and the language of industry standards have changed, but the essence of education has remained the same – to educate and train knowledgeable specialists for the construction industry, who, literally speaking, build Latvia. We can really be proud of our alumni, who have taken part in the implementation of every important construction project in Latvia.

The present poses new challenges – common European research and education area as well as common construction industry market. The Faculty has joined the Association of European Civil Engineering Faculties (AECEF) and European Civil Engineering Education and Training Association (EUCEET). In the last 10 years we have implemented more than 10 EU-funded projects, however, excellence is yet to be reached working together. We can do that. Let us be successful!

*Dean of Faculty of Civil Engineering
Prof., Dr. sc. ing. Juris Smirnovs*

FERROMAGNETIC COMPOSITE SORBENT FOR OIL SPILL COLLECTION, ITS PROPERTIES AND MORPHOLOGY

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Current paper reports on the research conducted at Riga Technical University and Rezekne Higher Education Institution on the development of adsorbent material, which is made of closed hollow microspheres and which possesses ferromagnetic properties, with a large specific surface.

A review and comparison of existing adsorbents for oil product collection are presented. The manufacturing process of the proposed adsorbent is described: including feeding of raw components into reactor – rotating drum, where components are stuck one to other due to adhesive component. The structure and morphology of the obtained composite adsorbent are discussed.

It was found out that the proposed adsorbent allows an efficient and safe way for surface water cleaning contaminated by spilled oil products. In particular, it shows a storing effect on a thin oil film (1-2 mm). Adsorption capacity of motor oil is investigated and compared with other magnetic adsorbents – metal powders.

The newly proposed adsorbent demonstrates a significantly higher adsorption capacity comparing to iron powders. The adsorbent saturated with spilled oil can be evacuated by means of magnetic (or electromagnetic) captures.

Keywords: ferromagnetic sorbent, sorbent, composite sorbent, oil spill collection, iron powder, hollow microspheres.