

BOOK REVIEWS

LOW POROSITY BUILDING CERAMICS PRODUCED FROM LOCAL TECHNOGENIC RAW MATERIALS

(R. Mačiulaitis, R. Žurauskienė. Mažo poringumo statybinė keramika iš vietinių ir technogeninių žaliavų. Vilnius: Technika, 2007. 220 p. ISBN 978-9955-28-203-7)



This publication deals with the problems associated with low-porosity building ceramics manufacture.

This book presents information on the use of local resources, selection of additives and production of building ceramics. Full attention is paid to technogenic raw materials.

The monograph consists of four main chapters. However, all these chapters investigate one issue of prime importance for the ceramic industry of Lithuania – production of low-porosity ceramic products.

The first chapter includes a review of building ceramics in Lithuania and properties of building ceramics products. The monograph emphasizes that, with the exception of a few experiments in the Tauragė, Palėmonas and Daugėliai factories, it has never been attempted to manufacture the low porosity ceramic products. Also, in this chapter the influence of additives are analyzed in detail. Non-plasticizing, fluxating, or partly burned out additives can be used in the production of low-porosity ceramics. One of the main technological parameters is a properly selected burning regime. The duration of product exposition to the highest burning temperature has a strong impact on the quality of manufactured ceramic products, especially on the ceramic body, which is produced from hydroglimmere and carbonate low-melting clays.

The second chapter describes the main raw materials and methods used for research. It states that Ukmergė clay is suitable for manufacturing low porosity ceramics. This clay can be mixed with a fatter clay using a larger clay fraction. The composition of samples made from Ukmergė and Rokai clay pits correspond to low porosity in the ceramic body. Water saturation in such ceramic bodies is much lower than 5 %, and the compressive strength is about 27 MPa.

This chapter also deals with the planning method of extreme experiments, in which an optimal manufacturing composition of the formation mass can be achieved that is suitable for producing a low-porosity ceramic body.

The third chapter describes technogenic raw materials that can be used for producing a low-porosity ceramics. This chapter also discusses different waste groups used for producing building ceramics. The topical task of waste utilization is used to create manufacturing processes without waste. This chapter also emphasizes the fact that the moulding mass should contain an admix catalyst which must be thermally stabilized at high temperatures.

The fourth chapter discusses the low porosity of building ceramics from local raw material and technogenic materials.

Technogenic wastes are used as additives in the Ukmergė and Rokai clay moulding mass. The paper evaluates a 20 % catalyst influence on properties of ceramic bodies. These technogenic raw materials can be used for production of frost-resistant ceramic products. Besides, these products should be burned at a higher temperature than the products made of low-melting clays.

This monograph offers a new approach to the possibilities of the low -porosity ceramics production. The results of a new advanced research on low-porosity ceramics have been provided. These products can be used in aggressive environments, which are frequently polluted by exhaust gas or can contain an increased amounts of salt.

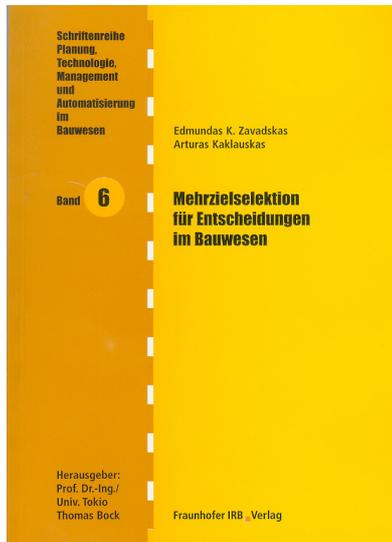
This monograph accents that it is possible to produce the low-porosity building ceramics in Lithuania by the use of local raw material with some additives.

This monograph is important not only from a theoretical, but also from a practical aspect. It provides an advanced and new approach to opportunities in production of building ceramics.

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Mehrzielselektion für Entscheidungen im Bauwesen

(E. K. Zavadskas, A. Kaklauskas. Multiple objective selection for decisions in civil engineering)



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The industrialisation of the building and construction industry as well as the increase of the production volume thereby has led to an increase in the complexity of investment planning. Decisions cannot be made intuitively, they require analytical and model based evaluations. The higher complexity of the overall system structure requires new strategies for a successful work.

The authors have made efforts to collect a valuable assortment of methods for civil engineering processes from various established methods. They discuss appropriate methods and show examples for applications in the building and construction industry. Therefore, this book represents an applicable overview in this field. Positively noticed, extensive mathematical knowledge is not implicitly required.

At the beginning the reader becomes familiarised with general problems of decision analysis. Hereby, it becomes evident that for the assessment of employing real index numbers, the usage of different dimensions is necessary. For evaluating the effectiveness of different index numbers, they are transferred to a non-dimensional interval.

Besides the introduction of methods for transformation and normalisation, disadvantages are discussed so that the reader can obtain the ability to make objective decisions. Notably, the consideration on the maximisation as well as the minimisation for combined solutions is presented.

The remarks on special criteria systems for civil engineering constitute a particular focus. They represent mapping projects in a mathematical syntax. Hereby, it is anticipated to define a criteria system that attains the highest accuracy for the analysed projects. The scope of the objective is defined by the characteristics that are included in the decision making (e.g. aesthetic, spatial, functional, constructive, physical, chemical).

For solving the problem the engineering process is divided into four phases: formulation of objectives, project planning, realisation and utilisation of the project. The assessment of the effectiveness during the different phases can be analysed on the basis of different criteria systems. For simplification of the analysis and for an improvement of clearness, the process is reduced to seven fundamental criteria: price, construction time, technical parameters, location, aesthetics, requirements of utilisation, environmental protection, health and safety issues.

The spectrum of solution methods is diversified. Formal criteria of the game theory is included as well as the application of the utility function and complex assessment methods. The selection of suitable methods is determined by the available level of the initial information. Thus the authors distinguish between methods without additional information on the importance of the effectiveness of index numbers, methods including information on the importance of the effectiveness index numbers and methods including information for comparing variants.

A particularly interesting chapter is about considerations of multiple objective selection and reliability. The introduction of the time-cycle dependent probability as a multiplier for the utility function, should demonstrate the insufficient reliability of multi-dimensional index numbers for effectiveness regarding the multiple-criteria selection. For the undisturbed state of singleness the probability represents the limiting condition.

In the chapter of new methods for multiple criteria analysis the authors present personal research results. Hereby, a special focus is drawn to the complex method for evaluating of the importance of criteria regarding quantitative and qualitative characteristics. The method structured in seven stages includes also the financing concept. Another application is represented by the methods for multiple criteria analysis of effectiveness and market value of real estate property. Hereby, the authors attempt to react to the complexity of decision analysis by introducing new approaches.

Today, projects in civil engineering cannot be seen as a simply defined one-dimensional process. Investments in civil engineering projects contain fundamental decisions. They last over a long period of time, cause tremendous costs, have influences on other economical branches and have a considerable impact on social affairs and macro-economics. The solution of such problems requires new concepts and a renunciation of traditional ways of thinking.

The book is seen as a contribution to the resolution of complex problems in engineering practice. The authors have many years of experience in this field, and they succeeded to present a comprehensible overview with this book. Minor literal errors do not alleviate general conclusions.

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