
ABSTRACTS

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ECO - FRIENDLY CUSTOMIZED GEOPOLYMER COMPOSITE MATERIALS

(pages 1-4)

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Keywords: composites, geopolymers, waste, sustainable, customization

Abstract: One of the biggest problems facing humanity in recent years is the environmental pollution from industrial and municipal waste. Global efforts are being made to address these problems on a community-wide basis. Tyres are a major problem as the amount of waste increases in proportion to the demand for new cars. It is therefore essential to develop new environmentally and economically sound methods for recycling a waste tyre. From an economic point of view, the use of waste material is irreplaceable. The aim of the present paper is to utilize waste tyre fabrics as a filler which will use as a reinforcement in a geopolymer matrix. The geopolymer Baucis L 160 (cement and activator) and fabrics with a purity of 52% were used for the manufacturing. The advantage of this material is its customized environmental, economic and social benefit for various areas of industries.

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THE POSSIBILITY OF USING PCM SLURRY AS A CIRCULATING MEDIUM IN A HEATING SYSTEM – MODEL TESTS

(pages 5-14)

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Keywords: numerical model, PCM, slurry, CFD

Abstract: The aim of the article is to develop a numerical model in order to compare the classic heating system with a heating system where PCM slurry constitutes the heat-transfer medium. Physical parameters such as PCM slurry specific heat, viscosity and thermal conduction are required in order to generate the numerical model. PCM producers do not possess the required data, so the performance of specialist tests in outside institutions is necessary in order to obtain these values. PCM materials are substances with high heat of fusion values. During fusion or solidification at a specific

temperature, they accumulate or release high amounts of energy. The numerical model consists of two parts that make it possible to compare various heat-transfer media (water and PCM slurry). The model tests encompass the simulation of parameters and their variations for a system utilising water and utilising the PCM slurry at their various concentrations. The tested parameters are variations of slurry temperature at the heat exchanger outlet, depending on the PCM concentration in the slurry. Among the many testing methods, it was decided to analyse the presented solution using the computational fluid dynamics (CFD) method. Analysed test subject numerical solution geometry and discretisation area were discussed, as well as numerical model assumptions and parameter values for the developed PCM slurries.

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INCREASING THE EFFICIENCY LINE OF SURFACE TREATMENT PROCESSES OF THERMO-CHEMICAL REACTIONS BY USING

(pages 15-19)

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Keywords: surface treatment, simulation, flexibility, efficiency

Abstract: The paper is oriented to the field of engineering production. Specifically, it focuses on the field of surface finishing on parts made of different grades of steel. These are surface treatments, using thermo-chemical reactions. In particular, alkaline blackening, or else burning and phosphating of zinc, also called bonderization. The paper deals with increasing efficiency and production possibilities on the line, which provides just these two metal surface treatments. With the help of simulation, a digital model of this line was created, where possible improvements of its production possibilities were tested. The task was to increase the flexibility and elasticity of production and ensure the fulfilment of orders in the greatest possible satisfaction of customers and in the shortest possible time.

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3D SCANNING AS A MODERN TECHNOLOGY FOR CREATING 3D MODELS

(pages 21-24)

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Keywords: 3D scanning, 3D scanner, Leica P30, digitization**Abstract:** This paper is oriented to 3D scanning as one of the most important sectors of digitization of modern digital enterprises to create 3D digital models. The result of this technology are digital models that are characterized by being highly accurate compared to reality. Today, 3D scanner developers are constantly improving the scanning parameters of these scanners and working on optimizations to create scanners that are used not only in engineering or construction, but also in the medical process of creating 3D models of human body parts.

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HOW DIGITISATION IS DISRUPTING AND TRANSFORMING INDUSTRY

(pages 25-30)

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Keywords: disrupting trends, transformation, digitisation, maintenance worker, industrial engineering**Abstract:** The article deals with digitisation and digital technologies, which disrupt today's classical processes in the industry. Behind the scenes of the world's leading industrial and manufacturing factories, a deep digital transformation is underway. This is due to new digital technologies (disrupting technologies), which allow to shorten delivery times, increase resource utilization and maximise product quality. This makes the factory more competitive. Selected digital technologies, to help increase the competitiveness of factories, are described in our article.
