
ABSTRACTS

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Basic hydrogel polymer materials for 3D printing

(pages 1-11)

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Keywords: hydrogels, polymer, 3D printing, polymerization, gelation.

Abstract: Currently, 3D printing of hydrogel scaffolds, which are used in tissue engineering to come to the fore, is gaining prominence in order to restore the structure and function of soft tissues and organs. For successful printing of soft constructs, the FRESH method using a support bath is used, thanks to which the printed hydrogel is kept in the desired shape during solidification. The aim of the study is to create an overview of hydrogel materials and their properties affecting printing, to summarize previous printing of hydrogel scaffolds. The choice of material, the method of crosslinking for the formation of the hydrogel, is taken into account, while at the same time the non-toxicity and compatibility of the material with the biological environment. Specific emphasis is placed on adapting the technological procedure of the FRESH method, where the chemical composition of the support bath must be in accordance with the crosslinking agent and the rheological properties of the printed hydrogel.

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Mathematical modelling of process planning problem

(pages 13-17)

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Keywords: linear programming, mathematical model, process engineering.

Abstract: This paper discusses a mathematical modelling of process planning problem. As everybody knows, a component has a set of operations derived from its design. Each operation can be performed by a set of machines, which are associated with it. Each such machine has a setup cost and processing cost per unit period. The goal is to choose the machine for each operation in such a way that the total cost, which is the sum of the setup costs and processing costs of the machines associated with the operations of the component, is minimised by taking the desired production volume of

that component per period into account. The topic of processing planning is explored in this study as a linear programming model.

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Thermal sensation models for environmental parameters testing

(pages 19-23)

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Keywords: microclimate, thermal stress, thermal comfort, environment, thermal manikin.

Abstract: Currently, there are various complex models that are used to predict the thermal load, or thermal comfort of the employee with different scales for evaluating the feeling of warmth or of cold, with the help of which it is possible not only to speed up the evaluation of the thermal load but also to make it more precise. With the help of thermal manikins, it is possible to simulate human reactions to heat and humidity conditions. The article deals with the possibilities of using thermal manikins as a useful aid in measuring heat exchange between the environment and the human body, testing thermal stress, etc. These tools will then be available for use by the industry to develop more efficient thermal comfort systems.

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Significance of employee education for the development of the company

(pages 25-29)

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Keywords: employee education, company education, training program, training methods.

Abstract: Education is a process during which new knowledge, skills and attitudes are acquired and developed. The goal of employee education is to ensure qualified, educated and capable workers, necessary to meet the needs of the organization. In order to achieve this goal, employees must be willing to learn and able to take responsibility for their own learning. Education thus becomes a lifelong process. Without the development and training of employees in companies, these companies may lose flexibility, quality and loyalty of employees in the near future, as well as the interest of customers. That is why this article focuses on the importance of education through which business is developed. The following theoretical overview is devoted to the importance of employee education in companies. Significant terms are defined and the meaning of company education for the present and future of the company. The next part is devoted to the system of company education itself, its phases, methods and possible training programs.

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3D printing methods used in engineering

(pages 31-34)

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Keywords: 3D printing, FDM, ColorJetPrinting, DOD-PolyJet, SLS.

Abstract: 3D printing as a functional Rapid Prototyping tool has been used for years, and along with the advancement of engineering technology, 3D printing technology is also developing and improving. This technology has not found representation only in the engineering industry, but across industries such as healthcare, construction, etc. In the end, I also present specific cases of the use of 3D in practice. From the most basic 3D printing with simple technology, several kinds of printing methods have evolved. From the point of view of simplicity for the novice user, the technology is FDM (Fused Deposition Modeling). With this 3D printing technology, the process of applying a thin layer of molten filament to the printing surface is used until a complete model is finally created. FDM is also characterized by the use of a wide range of materials, such as ABS, PLA, HIPS, PET-G but also wood or copper. Other methods I will describe are SLA, SLS, DOD-PolyJet. These are less available for use and acquisition by the average user, but are increasingly sought after, due to the expanded printing options. In the end, there is also an example that we processed for a company in the field of assembly.

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Design of an automated plastic bag packaging machine

(pages 35-38)

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Keywords: plastic bags, prototype, packaging, machine design.

Abstract: Thin plastic bags are common in Vietnam's sweets and food stores. Currently, due to the need to preserve dried goods, the majority of these items will be stored in fully sealed plastic bags. In order to improve package efficiency, design, and eliminate packaging errors, a completely automatic packaging machine is required to assure safety and cleanliness, enhance performance, and enhance the aesthetics of packaging designs. The study provided an approach for designing a prototype of plastic bag product packaging. Use the SolidWorks to design, analyse, and select materials based on machine concept. Then, an electrical and pneumatic system was constructed, followed by the fabrication and testing of a prototype to demonstrate the validity of the model.
