

## DESIGN OF DISPOSABLE TABLEWARE MADE OF WHEAT BRAN

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**Year:** 2021/2022

**Abstract:** The aim of the project was to produce moulded tableware from mixture of water and bran by using a specific pressure and temperature regime to activate gluing components inside the bran. Wheat-bran based disposable products provide an environment-friendly alternative to the commonly used polystyrene plates as they are fully compostable within just 30 days. The experiments proved the possibility of producing tableware from wheat bran. Differences between strength, water absorption and density were observed. Water absorption was influenced by the pressing time and the moisture content of the bran. The samples of bran prepared in this project were compared with polystyrene plates. A comparison of the properties showed that bran-based plates are not strong enough to replace polystyrene ones, but they are more environment-friendly. Economical evaluation was performed to set the product's price for a given market. An estimation of the production cost comprised of the consumed energy consumed and the ingredients used within the process. The cost of the production of one plate was calculated to be 0.2€. Based upon the results from the experiments, a higher pressure and more pressing stages are needed to obtain the optimum product.

**Key words:** wheat bran, disposable tableware, pressure, environment

## Application of doRest information system

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**Rok vypracovania:** 2021/2022

**Abstrakt:** Aim of the project was to define and prepare software product which includes three basic modules. Ingredients, recipes, and daily menus. For each module is ready analytical documentation which consist of use case diagrams user requirements. There is a multiuser access with different user roles.

*Module of ingredients* include option of creating ingredient, editing, and deleting of the ingredient.

*Module of recipes* consist of creating recipes with ingredients weight of each ingredient. Possibility of calculating price of the meal with margin. Also recalculate the amount of ingredients.

*Module of daily menus* comprise of creating daily menus using recipes module. There is also opportunity for calculating how many ingredients should warehouse man buy.

Results of the project are prepared user interface, with defined user requirements.

**Kľúčové slová:** information system, API, doRest, restaurant,

## COMPARISON OF TECHNOLOGY OF 5-AXIS MILLING AND TECHNOLOGY OF 3D PRINTING

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**Year of elaboration:** 2021/2022

**Abstract:** The main objective of this thesis is comparison of milling technology and technology of 3D printing. The aim of the research was production of a shaped plastic part using both of these technologies.

In the process we focused on technology of milling, on principles of milling, on types of milling, on tools used in milling, on the application of the technology and on progressive methods of milling. After that, the technology of 3D printing was described, different methods of 3D printing, materials used for 3D printing and the application of the technology.

The shaped part, which was selected is called Impeller and a material, from which will this part be made was chosen polyamide (PA6). Production of this shaped part by 5-axis milling was described using software SolidCAM alongside with description of the production by 3D printing using software Slicer.

Our finding shows that production of shaped plastic part by 5-axis milling would last probably the same as production by 3D printing but key aspect is how much money would it cost to manufacture plastic part using these two technologies. The attained results show that production by 5-axis milling would be much more expensive than production by 3D printing.

To conclude, one of the biggest benefits using technology of 3D printing would be money savings. On the other hand, it is limited by amount of materials which could be used by using this method.

**Key words:** Milling technology, 5-axis milling, Technology of 3D printing, Shaped plastic part, Impeller, SolidCAM, Slicer

## COMPANY CULTURE AND ITS IMPACT ON WORKING ENVIRONMENT IS

### SCHINDLER DUNAJSKÁ STREDA, A.S.

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**Academic year:** 2021/2022

**Abstract:** Company culture refers to the attitudes and behaviors of a company and its employees, it represents the personality of a company. It can be divided to nine elements, but I focus mainly on the working environment. The working environment consists of all the elements that can affect your day-to-day productivity, like the physical environment, terms of employment, work-life balance, recognitions and rewards or internal communication. In my project I worked with company Schindler Dunajská Streda a.s. I got my questionnaire to 50 people but answered only 24 of them. In my questionnaire were questions about age and gender of the respondents, in-house events and team-buildings, workplace atmosphere, whether employees feel comfortable at the company, respect each other or just recommend the company to others based on their feelings. From the answers we could see that employees feel moderately satisfied with their workplace and its company culture. I think it's the aftermath of the epidemic situation what caused them to not feel completely well at work and with their co-workers, but I believe, that it will change in next months.

**Keywords:** corporate culture, work environment, working atmosphere

## SOLDERING AS A SUITABLE METHOD OF JOINING COMPOSITE MATERIALS

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**Year of elaboration:** 2021/2022

**Abstract:** The aim of the research was to design a suitable solution of soldering composite materials. The aim of the research was to find a suitable soldering method for soldering composite materials in a combination of ceramic plus metal. In my research, I focused on specific methods used in soldering of composite materials.

In order to propose a theoretical solution, I had to read and understand some researches related to the issue. The older soldering methods tend to fail when we solder composite materials, therefore we had to use progressive methods such as ultrasonic soldering and vacuum soldering. The attained results show that the ultrasonic vibrations may improve the wettability of ceramics and also, vibrations can disrupt the oxidation layer and thus ensure the formation of a solder joint without deformation. The other attained results show that the vacuum soldering may also improve the wettability of ceramics and joint strength of soldered composites using the clean soldering environment in vacuum furnace.

**Key words:** soldering, composite materials, solder alloy, soldering parameters

## ADJUSTING TIME OF PLASTIC INJECTION PROCESS IN AUTOMOTIVE COMPANY

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**Abstract:** The thesis deals with the design and application of modifications to the injection moulding process. The aim of this proposal was to adjust the parameters of the current process on the ENGEL 1150 / 1700W injection moulding machine in order to shorten the dashboard injection cycle and meet the demand owing to increasing volumes from the customer.

We observed the production process of the dashboard on the machine and proposed process improvements that will not affect the final quality of the part and will have no financial impact. We have identified that the individual injection cycle operations run in a sequential cycle. With this finding, we were able to modify the process and ensure its fluidity and increase speed.

The benefits will be a faster injection cycle, saving the cost of producing the required amount of products, guaranteeing the required order to the customer, maintaining the quality of the part. These process modifications can also be applied to other products, but the maximum settings of individual machines can be limiting.

**Key words:** injection moulding process, parameters, injection moulding machine, injection cycle operations