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GUIDING PRINCIPLES OF MATERIALS SELECTION FOR PRODUCT DESIGNERS

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ABSTRACT

This work intends to analyze the importance of the materials selection process for the development of a new product.

The aspects that influence the selection of materials in the Design process are due to the fact that these collaborate in the materialization of a project, stimulating a better interaction in the utilization of the products and consequently in the improvement of the people's quality of life.

The strategic use of a material is one the most influential means designers have to communicate and create emotional connections with its users; however, the materials classification in simple and definitive categories is complex, due to the diversity of options available in the market. This study can provide a significant contribution to the field of the product Design. As such, the general objectives of this work are to identify, analyze and understand the importance of the selection of materials in the development of a new product

Keywords: Materials selection; Material properties databases; Product design

INTRODUCTION

It is extremely important to provide the necessary information so that the designer can make decisions in the selection of materials in the initial phases of a product's development. By using woods, metals, plastics, or ceramics, (Lefteri, 2007) the designer will have a variety of books and technical manuals available applied to several environments and usage conditions. However, as it can be seen in the study of the selection of materials in Design, there are gaps in the selection methods as well as in the way these are available.

Facing an empirical, subjective and quantitative review of the materials selection area in Product Design, it is urgent, to create a library equipped with methods and instruments that allows to follow the development of product design projects, prioritizing a usage reflection and the proposals for the utilization of the best materials and sustainable (Ljungberg, 2007) transformation processes.

Mostly, the supports that the designers have upon this theme are developed by engineering experts, in which the used technical language isn't well interpreted by the designer language. It has come the time to break this current paradigm that exists by the universities as well as by the companies. The Designer should indeed, comprehend and understand the concepts related to the materials being applied to the products, but they don't need to enunciate physical properties, analyze and interpret graphical data, as for example, it is presented to us through the program

CES (M F Ashby & Cebon, 2007), selection of materials, developed by the professor Mike Ashby (Michael F. Ashby & Johnson, 2014) and the respective cooperators of the Cambridge University. Despite the program validating positive results, it adds more value to the engineering area than to the product Design.

The research focuses on an exploratory and quantitative research, which consists of reformulating events, comparing ideas and reflecting on some later studies to the proposed theme building new hypotheses.

After a literature review on the subject, interviews are scheduled to be conducted with alumni of product design and designers (van Kesteren, 2008) who are in the market, with the objective of making a survey of the difficulties in the selection of the materials and the way they have overcome them in their work. A critical analysis of the existing educational materials and a proposal to update them will then be performed.

RESULTS AND CONCLUSIONS

The chances are temporary, considering that we are still in the initial phase of the study, but facts and theories are being analyzed, making the problem less complex. We intend to demonstrate that the methods and instruments of the materials selection aren't easily available and that there are gaps in the way these are used by the product designer. The selection tools aren't intuitive to the Designer and he finds difficulties in the data interpretation, thus the existing tools use a specific language the Designer isn't used to, being necessary to clarify the language, turning to simple and explanatory concepts, with few physical properties.

It is necessary for the Designer to understand the importance of the materials selection for the development of a product, in a way to validate his choices.

It is essential to understand beyond the material inner characteristics, the subjective characteristics, putting himself in the place of the possible user. And, finally, understand as well that the selection of materials is part of the creative process, being adopted as well as a methodology to be used in a specific phase of the project, or in the proposal progression, in cycles.

This study intends to propose supporting guidelines to the product designer, in the selection of materials, taking into consideration aspects as seen in the study, selection of materials in Design. It will be taken into consideration the contribution for the development of useful objects; for the increase of the product lifespan; the product's cycle of life; the culture valorization, materials that can be recycled; the substitution of raw materials, which are harmful for human health and the environment and the use of materials that come from natural resources.

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