Development of New Thermal Insulating Materials from Naturally Structured Materials

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Thermal insulation plays a key role in our everyday lives and it is used in a variety of environments ranging from housing to industrial and scientific work. Commonly used thermal insulation materials tend to be hazardous to human health and require protective gear as well as the cost of these materials and their installation is overpriced. To address these problems I have conducted research on the development of new thermal insulation materials based on the use of naturally structured materials and recyclable polymers. Based on the specifics of thermal insulation materials and their properties I developed the methodology on which my research would be based upon. This required me to construct a testing device where the created materials would be tested against the control group (rockwool). Then I started work on prototypes with which I would conduct comparative tests. After the creation of the testing device and thermal insulation materials I refined the categories in which these materials would be graded. Next the testing phase could commence and data analysis and compiling could be performed. Materials with the highest potential to be developed into usable thermal insulation would be promoted to the in depth testing phase which is the next chapter in my research.The data acquired from testing procedures provided results based on which I could examine the performance of each material in the developed grading system. Remarkable results were achieved with a high enough final grade to identify the materials which could be promoted to in depth testing. The use of dissolved plastic polymers (PMMA) for the improvement of developed thermal insulating materials proved to be successful. The (PMMA) coating provided an enhanced adhesion effect to the developed materials.

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