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AN EXAMINATION OF THE FACTORS DEFINING ENGINEERING TECHNOLOGY IN BIOPLASTICS AS WELL AS THEIR ANTECEDENTS AND DETERMINANTS

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ABSTRACT

There is no doubt that the use of bioplastics in the industry has become more widespread in recent years, but the process of these bioplastics remains one of the biggest challenges that remain to be overcome, despite the fact that the use of these materials is becoming more widespread in industry. For plastic engineers and researchers, this paper provides a basic, practical and valuable understanding of the differences between bioplastics and biodegradable polymers. This paper also contains information on different ways that bioplastics can be processed in various ways, in a methodical manner, as well as different ways in which they can be processed in different ways. The name bioplastic implies that it is a plastic material made from renewable biomass sources such as vegetable oil, fat, corn starch, straw, wood chips, sawdust, and even recycled food waste can be used to produce bioplastics. Some bioplastics can be produced directly through the processing of natural biopolymers such as starch, cellulose, chitosan, and alginate, as well as proteins (such as soy protein, gluten, and gelatin). Several of these compounds are chemically synthesized from sugar derivatives (such as lactic acid) and lipids (oils and fats) derived from plants or animals or are biologically generated by fermentation. Compared to petroleum or natural gas-based plastics (also known as petrochemicals), common plastics are derived from fossil fuels.

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Introduction.

Currently, the majority of bioplastics made today are derived from biomass and are therefore referred to as biobased plastics. As mentioned before, some biodegradable polymers are still obtained from fossil fuels, but they are a minority of the total (mainly PBAT and PCL). An introduction to the field of bioplastics engineering was presented and the technicalities were explained (Ashter, S. A., 2016). The biomass used for the production of biobased polymers is predominantly renewable and can be sourced from various activities such as agriculture or the agro-food industry, depending on the application. Among the first of its kind, the Handbook of Bioplastics and Biocomposites Engineering Applications is a comprehensive guide to the many applications made with bioplastics and biocomposites in the packaging, automotive, biomedical, and construction industries (S Pilla, 2011). Bacterial fermentation of sugars from a variety of sources is the key to the various steps of the process of processing biomass. As a result of these procedures, it is possible to produce the building blocks for green chemistry, which can then be used as monomers for making biobased polymers in order to create green products.

In order to conserve limited natural resources, like fossil fuels, for example, bioplastics made from renewable sources can be naturally recycled by biological processes. As a result, biodegradable products

can either be produced from renewable resources or they may not be. As with conventional plastic bags, biodegradable plastics have the same characteristics as conventional plastic bags - they cannot be disposed of in natural environments, and they are not decomposable if they come into contact with water, but only when they are composted under industrial conditions. As you can see, the main difference between bioplastics and non-biodegradable plastics is the way they decompose. In terms of appearance, there isn't much difference between them, except for the markings on the products.

Bioplastics have a long history in the world of plastics.

Plastics have been around since 1862 when oil-based plastics were invented, but it was not until 1907 when the Bakelite phone was created that the plastics industry really took off, and that became the beginning of the plastics revolution. Plastic was actually the first ever made material, and it was made from cellulose nitrate, which is actually a bioplastic. Cellophane was invented a year later, in 1908, after a year of research and development. This chemical compound was first invented 12 years ago, in 1920, paving the way for its use in the medical field, where it has been widely used for a number of decades during the past century. In the year 1924, Henry Ford was the first to develop bioplastics out of food that would serve as the base for future automobiles that would be built with these materials. During the last few years, Ford has become synonymous with bioplastics since the company has been trying to use bioplastics whenever and wherever possible to make its products.

For more than a century, plastic has been one of the most valuable materials in the world. That is mainly due to the fact that there is a low cost involved. The majority of plastics on the market today are made up of synthetic polymers, which are derived from petroleum and their components. This kind of resource takes millions of years to form and the quantity is limited, as it takes millions of years to form. As well as the question of biodegradability, there is also the issue of the non-biodegradability of plastics, which are made from fossil fuels. As a result of environmental awareness in recent years, bioplastics have thus been developed into a new generation of materials as a result of the development of new technologies. The bioplastics are made using renewable resources and can be recycled after they have been used. Because of their characteristics, they are an excellent alternative to conventional plastics.

21st Century and issues with plastic.

It is extremely difficult to dispose of plastics in an environmentally friendly manner. There is a danger in burning them because they emit toxic chemicals like dioxins, and it is also difficult to collect and recycle them responsibly because there are different types and each of them has to be recycled by a different process. The problem with plastic would not be as bad if we used only very tiny amounts of them, but we use them in staggering amounts. Each year, the British people (one small island in a very big world) use 9 billion disposable plastic bags, making it the most widely used plastic bag in the world.

Conclusions.

As a result, the author believes it is to the benefit of scientists and evangelists to advance the unique characteristics of bioplastics, which can be used by designers and manufacturers to create inspiring products that will empower consumers to make a positive impact on the environment. As part of our daily operations, we are committed to reducing our use of petroleum-based chemicals, maximizing the use of renewable materials, maximizing reclaimed and recycled materials as well as enhancing the performance of biodegradable materials.

The green movement is not devoid of pragmatism, but it does have a place. The use of bioplastics as a single solution will not be able to solve all of the problems associated with waste, overreliance on non-renewable resources, or the use of harmful chemicals in the manufacturing process. The author however believes that, when it comes to bioplastics, a combination of strategies can give product designers and entrepreneurs the flexibility to choose more sustainable materials without sacrificing quality in the process.

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