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Biomimicry of Honeycomb Panels

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Abstract

Nature is so wonderful and always manages to surprise us in some way or another. For this reason, I want to highlight how humanity has been able to benefit from nature. Through this project, we will talk about how honeycombs and their particular structure have allowed us to create many things efficiently. Likewise, there are many work areas that use this type of form. Later, we will mention more details and how we come to the conclusion that the hexagonal shape is super effective.

Introduction

In the beginning, nature was a large part of the Planet. Little by little it was created and formed, likewise, it was evolving and adapting little by little to the environment where it lived. The most curious thing of all is that nature always looks for a simple but effective way to solve problems. This was what attracted the attention of scientists since their goal was to look for things in nature that work perfectly both in nature and in humans. This is how they discovered the structure of honeycomb panels. And as the famous biologist Darwin (1809-1882) said “The exquisite structure of the honeycomb is very suitable for the needs, if a person watches the delicate honeycomb and does not know how to praise it, he must be a fool”.

Metod

When they analyzed the hexagonal structure of honeycombs, they wondered why honeycombs are hexagonal in shape and not some other shape. While investigating, they discovered that if they used a circular or octagonal shape there would be empty spaces which was a waste. They also thought about the triangular and quadrangular shapes but unlike the first two, they realized that the space was reduced. Finally, with the hexagonal shape they realized that this shape was the most efficient. This structure offers more space, has more stability, firmness, and is excellent in saving materials. For this reason, we can see that currently the hexagonal shape is used in many areas such as; architecture, automobiles, aviation, industrial machinery, among others.

Results

In what we found in our research, the Honeycomb panel are a sturdy and a lightweight material used for a lot structures. They are mainly used for flat or curved panels depending on how the panels are used and the high specific strength needed for the panels. These honeycombs panels are made from different materials, these include porcelain, stone, Nomex paper, aluminum, Kevlar (infusing para-aramid paper with heat-resistant phenolic resins), thermoplastics and Stainless Steels. With these materials, the primary benefit of these panels is because of their strength. Because these panels are in a hexagonal shape, they easily bond together, and they give mutual support. Because of this, honeycomb panels can withstand high winds and even earthquakes. Since the panels are so lightweight and easy to make them, the process for transporting and installing is much easier because of the shape they have.

Discussion

Honeycomb panels efficient design can help in architecture and in aerospace engineering because of that hexagonal shape and on how sturdy they are in any material you make it out off. They are lightweight and durable which makes it easier to make structures that require a lot of strength and durability to maintain it. With further research people do on these honeycomb panels, this could revolutionize the way we make our structures. Making it safer for everyone since they can withstand earthquakes. They are as well an eco-friendly which makes it better for the structures people can make out of this design.

Conclusion

In conclusion, we can say that these honeycombs panel can change the way of structures, buildings and aeroplanes on how they can be built to make them safer for everyone. The more people know about these, the more we can have more structures like these to help us in this world.

References

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