



An Experimental Investigation on the Use of Lathe Chips (Mild Steel) and Coconut Coir in Fiber Reinforced Concrete

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ABSTRACT

The dissertation is based on the use of the lathe chips and coconut coir in the construction of the fiber reinforced concrete. The employment of these things can improve the strength of the structure and extend its life span when compared to alternative options. The research is about an exploratory examination into the applications of those items in everyday construction activities. The dissertation's complete procedure is dependent on experimental data and discoveries of the research team that are working on this linked fact's investigation. The dissertation's introductory section comprises all of the material necessary to describe the scientific act as a whole.

Keywords: Coconut Coir, Lathe Chips, Fibre reinforced concrete etc.

Introduction

The use of lathe chips and coconut coir in the process of fiber reinforced concrete is continuously increasing. The use of these objects is able to increase the strength of the construction and provide it a longer time compared to the others. The dissertation is about the experimental investigation about the usages of those objects into the regular work of construction. The entire process of the dissertation is based on the experimental data and the findings by the research team who are engaged in the research work of this related fact. The introduction part of the dissertation contains all the information which is important to introduce the act of the entire research.

Background

The research is based on the entire procedure of the research paper is based on the usage of the lathe chips and coconut coir in the work of constructing fiber reinforced concrete. The background part of the dissertation is able to express the importance of the matter and the main reason behind this kind of research. The advantage of the use and its importance also described in this dissertation are very elaborate. The lathe chips belong to the type of mild steel which are very commonly used in the modern days for its strength, flexibility and long lasting character. The use of these objects is able to reduce the cost of contrasting and provide it a longer time compared to the others.



Figure 1: Coconut coir

(Source: indiamart.com)

The background of the research is expressed as the increasing importance of the use of those things for the constructors and the construction related labors. The low costing and long life of those metals are also a reason for increasing the interest in the research on mild steel like the lathe chips and the

object of coconut coir. With all the evidence and logical statements mentioned in the dissertation are enough able to state the facts about the research subject.

Research Rationale

The rationale of research belongs to importance and reasons behind the occurrence of the entire work. This part is able to justify the significance of the research work. The research results may be used to illustrate the necessity and efficacy of using lathe chips and coconut coir. In society, these artifacts are referred to as wastages. By utilizing them in novel ways, the research is possible to reduce the quantity of waste in society. The outcomes of the recent research might also pique people's curiosity in using that additional garbage's in their construction projects. This fact may also boost the work's inventiveness; give it a long life and strength, and lower the total expense of the job. Coconut fiber has a far higher tensile strength than other fibers.



Figure 2: Lathe chips

(Source: dajinprecision.com)

The increasing demands of those objects are one of the major reasons for increasing the interest about these objects to the research team. Conducting this kind of research is also able to provide a method to the human being to reduce the amount of garbage from the environment and utilize them according to the benefit of the human being. As a rationale it is enough for conducting this research work by the research team.

Research Significance

Significance of the research work is huge for the new days. The findings of the research are able to express the importance and effectiveness of the use of the lathe chips and coconut coir. Those objects are referred to as the wastages in society. The research is able to decrease the amount of wastage in society by using them in innovative ways. The findings of the entries research are also able to increase the interest of the people to use that extra garbage in their work of construction. This fact is also able to increase the innovation of the work, provide a long life and strength to the work and also be able to decrease the total costing of the work (Singh *et al.* 2021). The strength of the coconut fiber is many times stronger than the others. So the use of the fiber in the work of construction is able to provide more strength, durability, moisture, flexibility and toughness to the new construction. As a result of the entire research work more people are getting knowledge about those factors and are able to utilize these valuable factors and objects to their work of construction.

Empirical study

According to Ikumapayiet *al.* 2018, the fiber has a better geometric and column friction than the conventional steel reinforced concrete. The use of the coconut coir is able to provide more strength and flexibility to the concrete. Using this type of concrete is responsible to make transforming the entire fiber more strong, tough and flexible. He did his experiment on those facts by a time circle of seven and twenty eight days. The result of the findings was so conclusive and related to the increasing usages of these facts. It is also seen by his study that these types of objects are considered as garbage (ABBA-AJI, 2021). The availability of that garbage is also very high. Using this type of garbage is able to provide a longer life and flexibility to the reinforced concrete. Using the lathe chips is also able to provide more strength and toughness to the construction of this kind of fibers, by which the objects made from these fibers are able to increase the interest of the public about those things. The study also expresses the effectiveness of this kind of hybrid fabrics. The liability of these hybrid fabrics is also very high according to the normal fabrics.

By the study of McGavinet *al.* 2019, it has been seen that Matrix multiplication is a technique for multiplying matrices. Blended Fiber Reinforced Concrete Cantilever Beam Behavior of the rupture modulus Due to the use of crimped fibers, adding fibers to beams increased their flexural behavior. The beam's flexural strength rose by almost twenty two percent. Beams with almost one percent fiber have a moment carrying capacity of almost seven percent, less than one percent has a moment carrying capacity of almost thirteen percent, and more than one percent have a moment carrying capacity of minus seven percent. The moment bearing capacity of the beam is raised by almost twenty two percent by adding only one percent crimped steel

fiber. It was discovered that specimens with a higher percentage of fibers had greater elastic characteristics (Nolan *et al.* 2019). This is considered as the effectiveness of the hybrid fabric than the normal ones into the work of constructing reinforced fabric concrete. By this it is also seen that the use of this kind of hybrid fabrics are able to reduce the cost of the entire projects by applying the most available resources like the lathe chips and the coconut coir in the work of contracting.



Figure 3: Fiber reinforced concrete

(Source: constrofacilitator.com)

According to Ahmed *et al.* 2020, the fibers made with the hybrid of lathe chips and coconut coir are stronger and flexible than the conventional fiber. The acceptability of this kind of fiber to the people is also very high. Using this fiber is able to provide a better life and designs of those objects by the increasing flexibility provided by the lathe chips and coconut coir. The use of these things refers to the recycling of the garbage of the environment. The fact is directly connected with the wellbeing of the environment and the human being as well. The use of the mostly available objects are also responsible to increase the effectiveness and innovation of those hybrid fiber and also able to reduce the hard work and costing of the entire project of constructing the reinforced fiber concrete. According to the study, the usage of fibers in concrete to improve qualities such as tensile and flexural strength has increased significantly (Syed *et al.* 2020). Existing structures can also be retrofitted using fiber concrete. Glass fiber is a relatively new addition to the field of structural concrete, among the many various forms of fibers accessible to the modern world. The hybrid fibers are also able to increase the interest of the common people about these facts.

By the study of Yadav and Singh, 2019, Construction materials will aid in the creation of an environmentally friendly structure. This will aid in the reduction of pollution caused by chemicals, various types of construction materials, and other factors are perhaps the most important components for long-term building. Plastic and some other hazardous elements of the design process can be replaced with sustainable concrete. Various administrative organizations use these strategies to generate a large profit while also reducing pollution in the environment. In this circumstance, competent administration is required to keep track of all building activities. This strategy was employed in business in the past. This procedure will support a variety of environmental preservation strategies by repurposing certain natural products and new supplies in the construction stage. The most prevalent and well-known example of achieving sustainability is green architecture (Bamigboye *et al.* 2020). Water collected for use as domestic wastewater in the residences, and then the whole power source is powered by solar energy. Those are perhaps the most attractive instances and the most needed for good for the next generation to develop sustainable structures. Those facts are considered as the most effective ways and innovation of the entire process of constructing the hybrid fibers for various projects and structures.

Results and findings

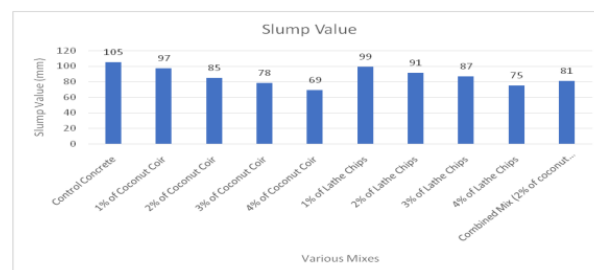


Figure 4: “Slump value of various mixes”

(Source: Provided)

It can be shown in Figure 1 that the droop number of solid drops as the proportion of fibres increases, lowering the concrete's operability. However, there is a modest increase in the blended mix.

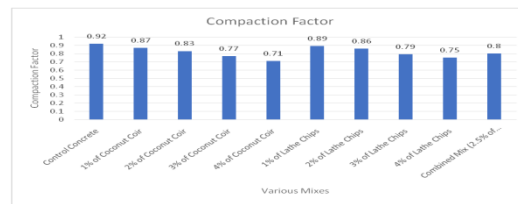


Figure 5: "Compaction factor of various mixes"

(Source: Provided)

As shown in Figure 2, the compressive factor falls as the amount of fibers increases, limiting the concrete's operability.

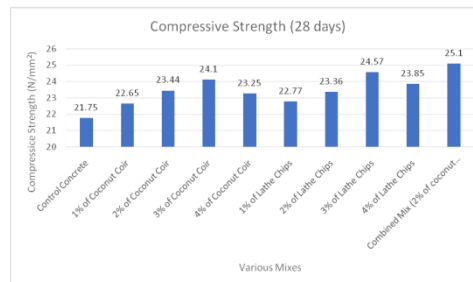


Figure 6: "Compressive strength of various mixes"

(Source: Provided)

As the amount of fiber in concrete grows, the concrete strength improves progressively, but beyond three percent, it begins to decline. The strength of concrete of the Blended Mix (2.5 percent coconut coir, 3 percent Lathe chips) has increased by at least twenty five percent.

Conclusion

The entire dissertation is based on the use of the coconut coir and the lathe chips in the construction of the fiber reinforced concrete. The research objectives and the variable are also directly connected to the findings of the research work. In conclusion it can be said that the entire dissertation is able to express the importance and the effectiveness of the coconut coir and the lathe chips in the construction of the fiber reinforced concrete.

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