

Tiles From Recycled Tyre Rubber: The Future

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Abstract- This research present a case study of producing flexible tiles from rubber crumb obtain from automobile tyre waste using a polyrethene resin asa binder matrix. The process was made in collaboration with a company located in colombia, where the manufacturing of this materials has been optimized. The material is green solution to an increasing worldwide problem, rubbertyres ,mostly put in landfills or burn to extrat their reinforced steel wires instead of properly recycled. Several rubber contents and particle size disrtibution were investigated and tested. Tension, density scanning electron microscopy, and thermo-gravimetric analysis characterization were used to evalute the composites. Result shows that the amount of rubber usedis quite large in comparision with the binder, maximizing the rubber in the formulations, and composites to be used in multiple application. The tensile test showed the composites can work very well for structural application of low solicitations , asuch as well cover soft floors and barriers. The project is sucessful example of a small-medium entreprise company that contributes to the circular economy of these highly pollutant materials.

Keywords- Polyrethene resin, Waste tyres, Economic, Eco-friendly, Smooth surface,

I. INTRODUCTION

The type of economic model and its consequent increase in the demand of new cars has led in an incredible and uncontrollable amount of waste tires everywhere . Over 1.4 million of new tires are generated every year , and there are more than 4 billion tires in landfills worldwide. Besides the multiple solutions, which includes waste to energy ,

asphalt , concretes , and composites , among others, there is a need of more solutions that increase the circulatory of materials and maximize its useful time. In addition, tire waste is not only a common source of mosquitos from stagnant water , which is a source of dangerous diseaFrom a social and environmentally conscious point of view the best way of tire recycling is reusing or manufacturing for the same application. Remanufactured tires deliver similar mileage as comparable new tires, although they are sold with discounts between 30% &50% waste material is

not zero :they are several stages in the retreading process where some material is lost, and tire retreading is not always technically feasible. The strongest limitation in tire reusing and remanufacturing is given by the market. Tire retreading already reached its limits with respect to the fraction of demand willing to buy tires. As a result, remanufacturing cannot be considered as the only solution for spent tires but only a valid alternative

The largest part of spent tires has to be reprocesses ; but also is a common illegal practice, particularly in developing countries, the tire burning for the steel extraction that

produces very hazardous pollution Therefore, the handling of this problem is still far from a total solution, and thus, very diverse and innovative solutions are required.

As we know there has been huge amount of tire solid waste are generated in whole world as well as INDIA there are 77% tire send to landfill from the amount of total waste of tire generated and remaining 11% burned, 5% exported for processing and only 7% percent tire waste recycled from total amount of tire waste generation and solid waste tire is non – degradable material. It causes a serious environmental effect, it is dangerous and unhealthy for environment as well as human or living organisms used with other technical solutions. For this aim, it is necessary to separate and reuse single tire constituents. Grinding is necessary to separate rubber from other materials .

From an exhaustive analysis of the potential applications of the processing of this type of waste, a small company committed to the environment arises focused on the use and transformation of recycled materials “EcoReproducts” has been created as result of this research. The company develops flexible floors from granulated rubber from tires and industrial surpluses.

Designing efficient, innovative and ecological impact solutions for all types of environments: gyms, playgrounds, kindergartens, sports plaques, decorative spaces (indoor and outdoor), stables for horses, livestock, among others. Rubber waste powders were made in combination with polyurethane resin, using a hot-press machine These materials contribute to the reduction of pollution generated by rubber residues, but also create new business opportunities for local people.

1. Aim

Manufacturing of rubber tiles from recycling of tyre.

2. Objective:

- To manufacture economical and eco-friendly rubber Tiles.
- To create impact resistant floor.
- To create fire resistant floor.
- To provide slip-resistant floor.

3. Necessity:

Rubber tiles a flooring type that is quickly gaining popularity in wide ranges of settings. This type of flooring has already been popular in gym, Fieldhouse, and weight rooms, but is used more in homes and commercial buildings. Not only are rubber floors resilient, durable, and easy to maintain, but they are also available in many different colours and designs to fit the décor of any space. Rubber floors have been commonly overlooked because they can be pricey and they have a reputation of being difficult to maintain and while it may cost more than flooring options, its durability makes it a great long term investment.

- 1] Durability and Resiliency
- 2] Low Maintenance
- 3] Good Slip Resistance.
- 4] Good Slip Resistance.

I. METHODOLOGY

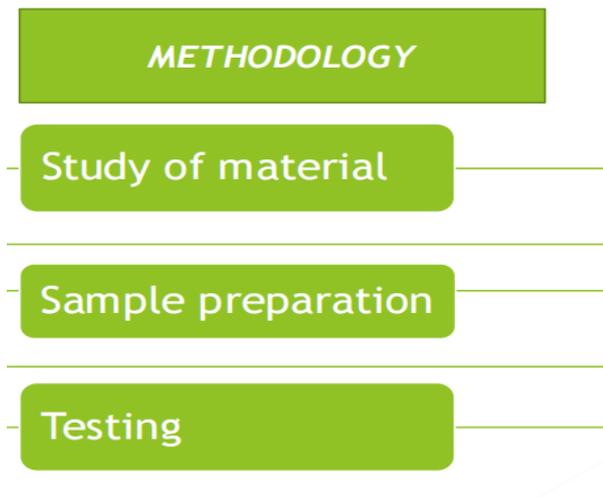


Fig 1.Methodology Flow Chart.

1. Study of Materials:

- Waste OTR Tyre- 30kg
- Polyrethene Resin- 100gram

2 Sample preparation:

2.1 Removing wire from tyre :

Using of radial tyre wire machine we are remove the wires From tyres.

2.2 Grinding of rubber :

Using rubber grinding machine rubber is grind in the crush from, and the size of crumbed rubber is approximately 4mm.

2.3 Specimen Mixing :

Using of mixing mill the specimen like ployrethene resin and crumbed tyre mix properly..

2.4 Apply hydraulic pressure :

The material which form from the mixing mill place these material on mould and kept it on hadraulic rubber press machine, at 150 degree tempterature for 15 to 20 minutes and give normal is 50 tone.

3. Testing:

3.1 Tensile Strength Test.

- Most Common Test on Rubber tiles.
- Carried out on UTM
- Width of tile is 45cm
- Thickness of tile is 0.5cm

3.2 Heat resistant test

3.3 Slip resistant test

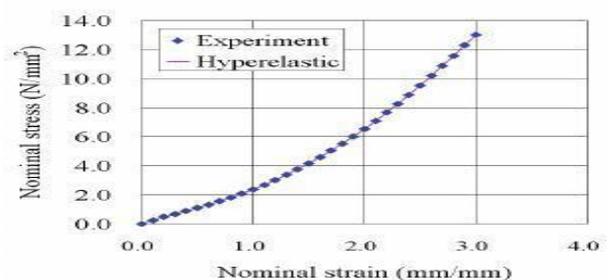
II. COMPOSITION OF SPECIMEN.

SAMPLE BY PARTICAL SIZE	WEIGHT (gm)	WEIGHT (%)
RUBBER CRUMB	900 gram	90%
POLYRETHENE RESIN	100 gram	10%
PARTICAL SIZE OF RUBBER CRUMB	4mm	_____
TOTAL WEIGHT	1kg	_____

Fig 2.Composition of material.

III. RESULT ANAYLSIS

1.Tensile strength test



IV. CONCLUSION

- The cost of rubber tile is less i.e 20 Rs as compare to normal tiles i.e 60 RS.
- The rubber tile content sulphur so it can not catch fire upto 200 degree therefore tile become heat resistant
- Rubber tile having smooth surface as compare to normal tile so, its automatically become a slip resistant floor.
- Rubber tile is making by using the waste tyre which is harmful for environment so its become environment friendly.

V. FUTURE SCOPE

All in all, rubber is a great flooring option, especially if you are dealing with large open spaces or high traffic areas. In the or high traffic areas. In this end its worth the extra upfront cost. Its very durable product that has unique color and design elements, and its made from natural material rubber flooring. For bathrooms is easily the most ideal of bathroom flooring options. Rubber natural qualities promote safety, durability, and ease of maintenance.

- To conduct a detailed literature review .
- To create water and moisture resistance floor To create sound absorb and static resist floor .
- To create sleep resistant floor.
- To create heavy resistant floor.

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