



# Mechanical Properties of Sustainable Concrete by using RHA and Hydrated Lime

Doddipati Srinath<sup>1</sup> | Gomasa Ramesh<sup>2</sup> | Dr. Syed Viqar Malik<sup>3</sup>

<sup>1,2</sup>PG Scholar, Structural Engineering, Vaagdevi College of Engineering, Warangal, 506005.

<sup>3</sup>Assistant Professor, Civil Engineering, Vaagdevi College of Engineering, Warangal, 506005.

## To Cite this Article

Doddipati Srinath, Gomasa Ramesh and Dr. Syed Viqar Malik, "Mechanical Properties of Sustainable Concrete by using RHA and Hydrated Lime", *International Journal for Modern Trends in Science and Technology*, Vol. 07, Issue 02, February 2021, pp.-83-86.

## Article Info

Received on 16-January-2021, Revised on 31-January-2021, Accepted on 10-February-2021, Published on 18-February-2021.

## ABSTRACT

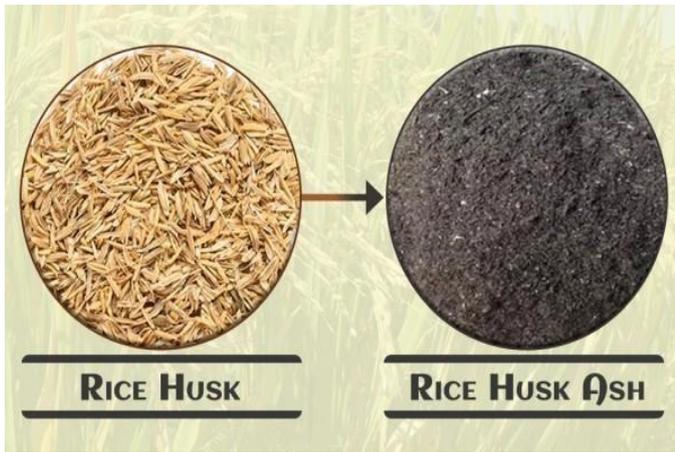
Concrete is globally used material for construction of any type structures. Sustainable construction is very important in now a day. By using proper materials, we can achieve sustainable construction. In this we have used rise husk ash and hydrated lime for construction of structures. Rise husk ash is basically an agricultural waste and which is obtain from rice mills etc. without wasting of these, we can utilize for sustainable construction. RH contains around seventy percentage of organic fickle matter and around thirty percentage is subjected to ash during incineration or firing. The most used and acceptable temperature is around six hundred degrees Celsius. RHA is ecofriendly material and it is used to improve the various strengths of concrete structures and as well as improve properties of the concrete structures. RHA is generally used as replacement of cementitious product and in that place, we can use RHA and hydrated lime. Lot of researches is going on RHA and which are gives a good result compared to other conventional concrete. In this paper mainly explains on importance of using rise husk ash in construction and itsuses.

**KEYWORDS:** Rise husk, Conventional Concrete, Lime, Agricultural wastes, water absorption, strength of concrete.

## I. INTRODUCTION

Concrete is a very good construction material for any construction of reinforced concrete structures. In this sustainable concrete is very important. This can be achieved by using adding some special materials to the concrete during construction of concrete structures. So, the structure can be used as sustainable by using sustainable concrete during construction of structures. Now a days most of structures are used this widely. Now a days the use of rise husk ash is increased, Because of local availability of materials with in the less Cost and good economic conditions for construction of structures. By using rice husk ash and hydrated lime we can slightly increase the

durability and performance of the RC structures. In this one of important thing is we can replace cement with rise husk ash and hydrated lime. By using of these we can get a good result. The main aim of the use of rise husk ash and lime is to reduce the wastages in agricultural point of view and as well as industrial point of view. Without proper use of These results in damages in environmental conditions.



## II. LITERATURE SURVEY

### OBJECTIVES

- Economical
- Sustainable Constructions
- Sustainable Materials
- Cheap incost
- Early Strength
- Good performance
- Better Durability
- Properties of concrete are improved
- Control pollution
- Use of wastes
- Recycling wastes

### ADVANTAGES

- Less costly and lesseconomical
- Easily available
- Easy toutilize
- Good strength
- No pollution

### DIS ADVANTAGES

- More use leads to concrete unworkable
- Workability problems
- Admixtures needed
- Proper compaction required
- Proper curing required

## III. MATERIALS

- rise husk ash
- Silica
- Lime
- fly ash
- Cementitious materials
- Other materials



Fig. Rice husk & Rice husk ash



Fig. Incineration or Heating RH

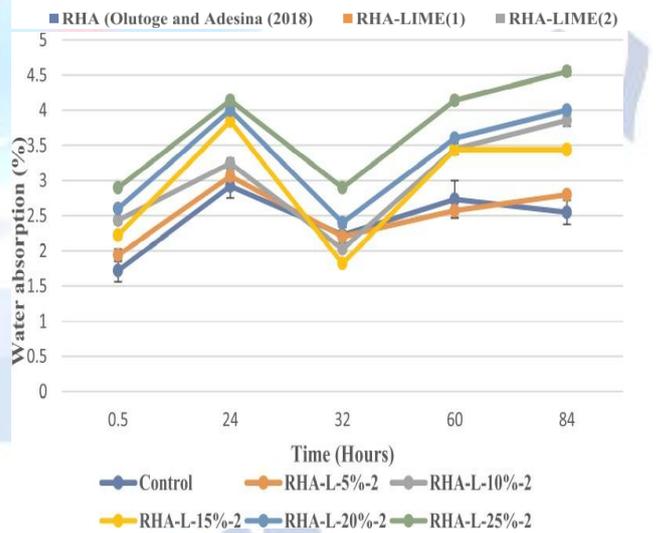
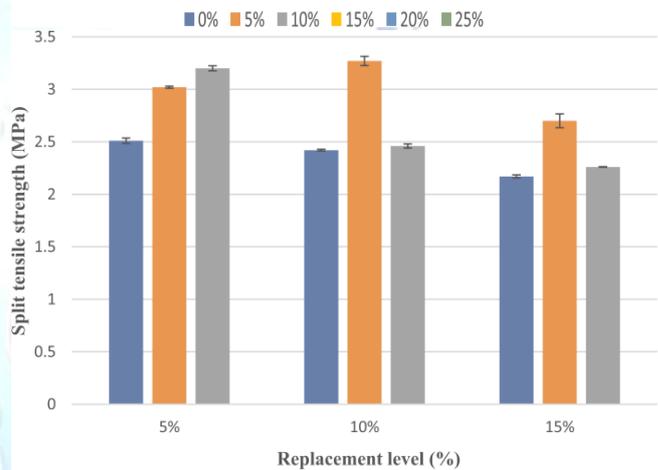
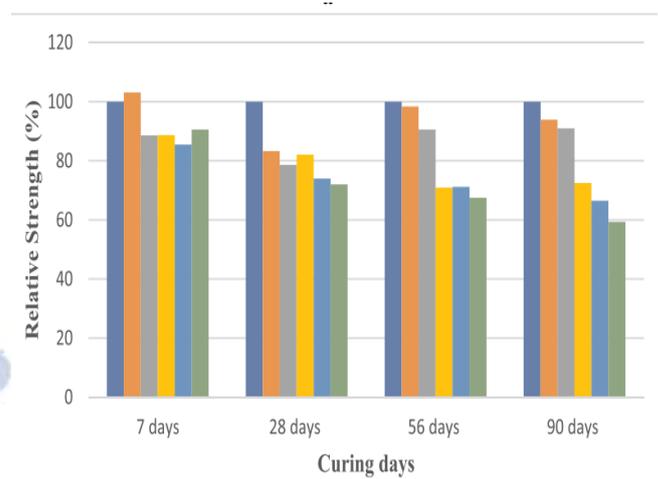
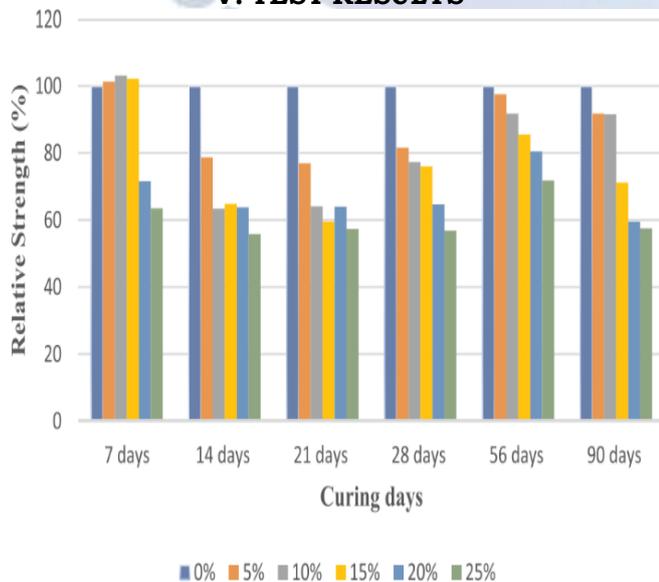
#### IV. METHODOLOGY

In generally concrete is strong in tension zone of compression and it is weak zone of tension. By using of rise husk ash and hydrated lime we increase the both Strength and workability of the concrete structures. By using of these we can get quick reaction and responses and results. The size of rise husk ash is also placed an important role in achieving good Strength and Durability to the concrete structures. In this finer rise husk ash are better than coarse particles. We can identify the variation of results by using coarse and fine rise husk ash

#### RESPONSIBLE FACTORS

- Size
- Shape
- Heating
- Grinding
- Duration
- Voids
- Density
- Porosity
- Carbon content
- Mixing

#### V. TEST RESULTS



#### VI. CONCLUSION

The main conclusion of using RSH and hydrated lime is;

- To get good compressive Strength
- Reduce wastages
- Reuse materials and resources effectively
- To increase the tensile Strength
- To know the strength properties of materials
- To know the behavior of material
- To improve Shear Strength

## REFERENCES

- [1] M. Ahmed, A. Anwar, and S. A. Ahmad, "a Literature Review on Study of Concrete Strength Using Partial Replacement of Cement with Rice Husk Ash and Fine Aggregate with Ceramic Powder," *Int. J. Recent Sci. Res.*,2018.
- [2] D. G. Nair, K. S. Jagadish, and A. Fraaij, "Reactive pozzolanas from rice husk ash: An alternative to cement for rural housing," *Cem. Concr. Res.*,2006.
- [3] P. Gursel, H. Maryman, and C. Ostertag, "A life- cycle approach to environmental, mechanical, and durability properties of 'green' concrete mixes with rice husk ash," *J. Clean. Prod.*,2016.
- [4] M. M. Hossain, M. R. Karim, M. Hasan, M. K. Hossain, and M. F. M. Zain, "Durability of mortar and concrete made up of pozzolans as a partial replacement of cement: A review," *Construction and Building Materials*.2016.
- [5] R. M. Ferraro and A. Nanni, "Effect of off-white rice husk ash on strength, porosity, conductivity and corrosion resistance of white concrete," *Constr. Build. Mater.*, 2012.
- [6] C. Fapohunda, B. Akinbile, and A. Shittu, "Structure and properties of mortar and concrete with rice husk ash as partial replacement of ordinary Portland cement
- [7] A review," *International Journal of Sustainable Built Environment*.2017.
- [8] B. S. Thomas, "Green concrete partially comprised of rice husk ash as a supplementary cementitious material
- [9] A comprehensive review," *Renewable and Sustainable Energy Reviews*.2018.
- [10] J. S. Damtoft, J. Lukasik, D. Herfort, D. Sorrentino, and E. M. Gartner, "Sustainable development and climate change initiatives," *Cem. Concr. Res.*,2008.
- [11] The Concrete Centre, "Specifying Sustainable Concrete," *Concr. Q.*,2014.
- [12] M. Schneider, M. Romer, M. Tschudin, and H. Bolio, "Sustainable cement production-present and future," *Cement and Concrete Research*.2011.
- [13] P. K. Mehta, "Greening of the Concrete Industry for Sustainable Development," *Concr. Int.*,2002.
- [14] J. K. Prusty, S. K. Patro, and S. S. Basarkar, "Concrete using agro-waste as fine aggregate for sustainable built environment - A review," *International Journal of Sustainable Built Environment*.2016.
- [15] A. Ramezani pour, M. Mahdikhani, and G. Ahmadibeni, "The effect of rice husk ash on mechanical properties and durability of sustainable concretes," *Int. J. Civ. Eng.*,2009.
- [16] T. R. Naik and G. Moriconi, "Environmental-friendly durable concrete made with recycled materials for sustainable concrete construction," *CANMET/ACI Int. Symp. Sustain. Dev. Cem. Concr.*,2005