

# Transparent Concrete: A Review

Gomasa Ramesh

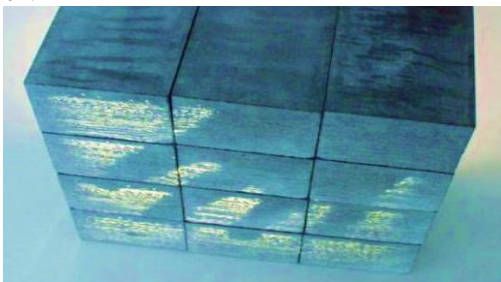


**Abstract:** Transparent Concrete is a new type of Concrete used widely in the construction industry. It has good properties, and it gives a good appearance and architectural design. In this one of the more critical properties is light transmission. So, by using this application, Concrete is very famous. There are many advantages to using LTC, and compared to regular conventional Concrete, it has some special properties. The special property of lightning occurs due to the presence of optical fibers. This paper author mainly explains the importance and uses, and advantages of Transparent Concrete and explained the Materials used for LTC. This paper may help understand Transparent Concrete for everyone easily. It gives a quick review of the Transparent Concrete.

**Keywords:** Transparent concrete, light-transmitting, optical fiber, binding material, Concrete, Transparent, LTC, Applications.

## I. INTRODUCTION

Transparent Concrete is a new technology used in the construction industry. Concrete is a strong material that day-by-day research is increasing in this topic. It is a good and important binding material for constructing any reinforced cement concrete structures. So, everyone is important to know the importance of Concrete. Nowadays, we have available different types of Concrete in the market, and also day by day, researchers are done on this topic by research scholars. Transparent Concrete is also called light-transmitting Concrete. It has a good property, i.e., light-transmitting property. In this, we can see one part of the material to another part of the material. It is one of the different techniques, and it is also different from normal conventional Concrete. It is also known as LiTraCon. Transparent Concrete is originally found in the year 2001.



## II. LITERATURE REVIEW

**Bhavin 2013 et al.**

In this Research Paper author is explained on importance of transparent Concrete in the construction sector. This author is more described on properties and Materials of LTC and explained the important LTC applications.

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**Monika 2017 et al.**

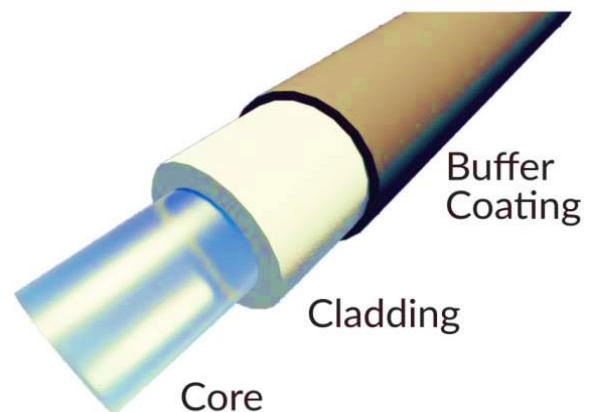
This Research Paper Author has explained the history of the Concrete used in structures and the advantages of using LTC and illustrated its disadvantages. The author is also explained on optical fibers and good application examples.

**Edris 2021 et al.**

This Research Paper author is more explained on optical fibers used in LTC, and the author explained mechanical properties and specifications of LTC. The author also explained about compressive and flexure and also bond strength tests of LTC.

## III. METHODOLOGY

There are three main important parts: core and second one is cladding, and the other is buffer coating. We can understand easily by following figure [2].



### OBJECTIVE USES

- Used in Prefabricated Structures
- Ceilings
- Pavements
- Floors
- Used in Prefabricated Panels
- Load-bearing walls
- Partition Walls
- UV resistance is more
- Good aesthetic appearance
- Architectural Property is good

### DIS ADVANTAGES

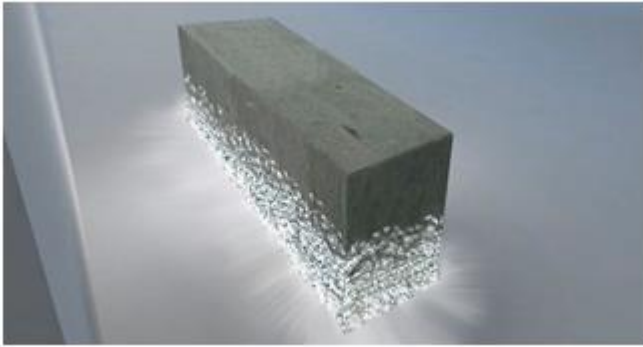
- Costly
- Skilled labor required

### MATERIALS USED

In this Concrete there are two important materials are used, they are as follows.

The first one is fine Concrete, and the second one is optical fibers and cement and water, etc.

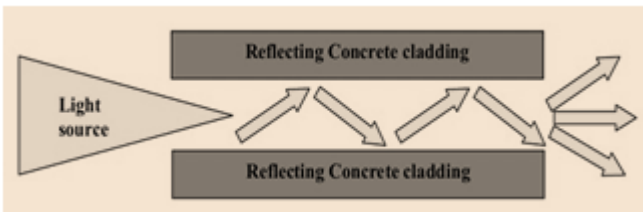




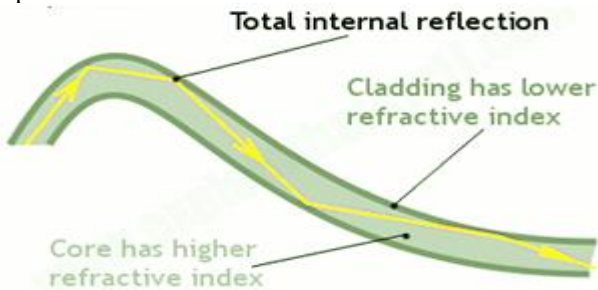
We understand that Concrete is having very fine sand particles other than coarse aggregate or coarse particles in this first one. So, the size of Concrete is very less, and it is subjected to very thin. Two factors are responsible they are one is size and the other one is shape. These are one of the important factors of transparent Concrete. In this second one, fibers are used especially optical fibers are used in place of coarse aggregates or coarse particles. The size of these fibers is very thin, and hairline and it also have glass property. In these also different types of optical fibers are available in the market.



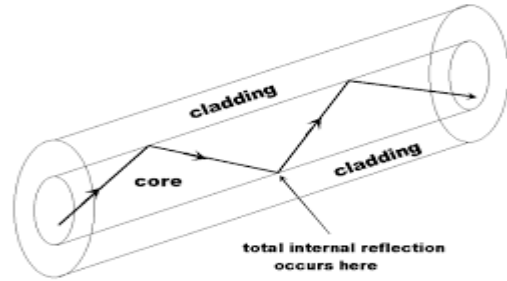
**IV. WORKING PRINCIPLE**



The main important working principle of this Concrete is internal reflection. In the above figure, the light is reflecting from one point to another point. So, the Concrete is transparent.



In the above figure, we can understand that the angle at the incident point is greater than the critical point. So, the total internal reflection takes place from one point to another point. In this, we understand the refractive index for cladding and also core. So, the refractive index is more in the core compared to the cladding.



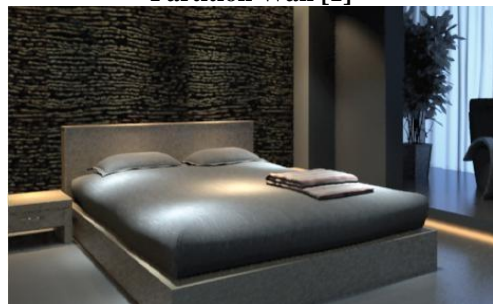
**V. APPLICATIONS**



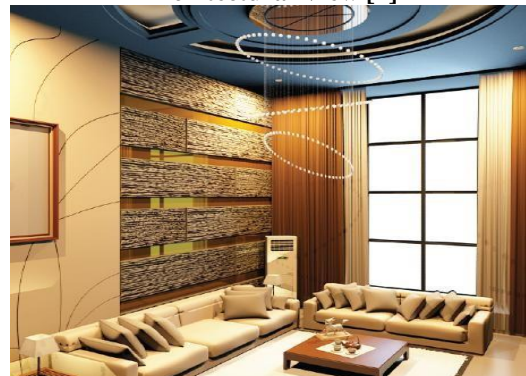
**Panels [1]**



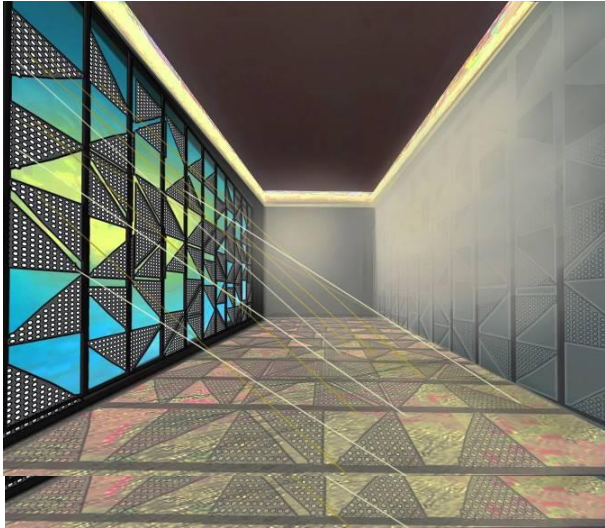
**Partition Wall [1]**



**Architectural View [2]**



**Walls [1] Transparent of Light [3]**



Walls [1]Transparent of Light [4]

## VI. CONCLUSION

Transparent Concrete is one of the excellent techniques, and it is used worldwide. The main importance of LTC is to improve the architectural view and also improves the appearance of the structure. It gives better visibility, and it consists good strength as conventional Concrete. So, the strength difference between LTC and Conventional Concrete is also the same. It is also used to transparent light from one side to the other side.

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