

The Role of Engineering Ethics on Concrete Fire Safety

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As concrete has high specific heat and low thermal conductivity, it has a high capacity to bear high temperatures and fire (Tanyildizi and Coskun 2008). Nevertheless, high temperatures are found to have an impact on its features like surface appearance, elasticity, colour, compressive strength and concrete density. When a new construction material is used, it is important to study and understand all the behavioural aspects of that material because human safety in case of any mishaps such as a fire outbreak is one of the key factors to be considered in the design of buildings.

To create lightweight concrete, oil palm shells (OPS) have been used in lightweight aggregates. Since 1984, many research studies have been carried out to replace conventional crushed granite aggregate with OPS but recently in a study (Jumaat et al. 2015), a concrete's coarse aggregates were totally replaced with OPS aggregates, which was then exposed to 500 °C for 1 h. It was found that its compressive strength plummeted down from 43 to 10 MPa, which is about a 76% reduction. Though the complete substitution of ordinary aggregates with OPS aggregates caused a reduction in density, it may have a remarkable effect on the fire resistance of a concrete and it may even reduce the durability of a building and increase the cost of maintenance (Yahaghi 2017). Therefore research on OPS might be changed if the researchers paid enough attention to the fire weakness of OPS in the first place.

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It is noteworthy that though there have been various research studies to find new materials for improving concrete for a long time, most of them do not focus on the behavioural aspects of this concrete after subjecting it high temperature for an extended time. Hence, it is advised that researchers take into account that engineering ethics are a key point of research and they must set the fire safety test and behavioural features of concrete under high temperatures in their investigations in the first place.

Compliance with Ethical Standards

Conflict of interest None.

References

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