

THERMAL INSULATION AND MECHANICAL PROPERTIES OF GLAS BUBBLE INVOLVEMENT IN FLY ASH GEOPOLYMER PASTE

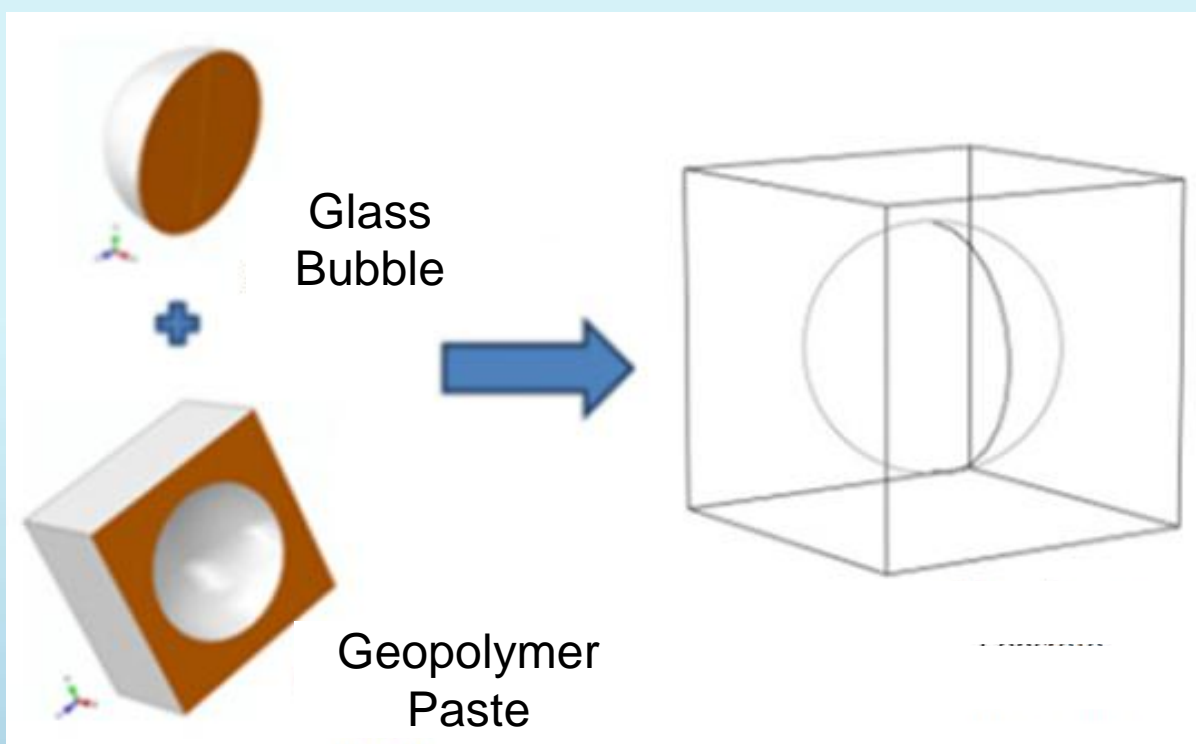


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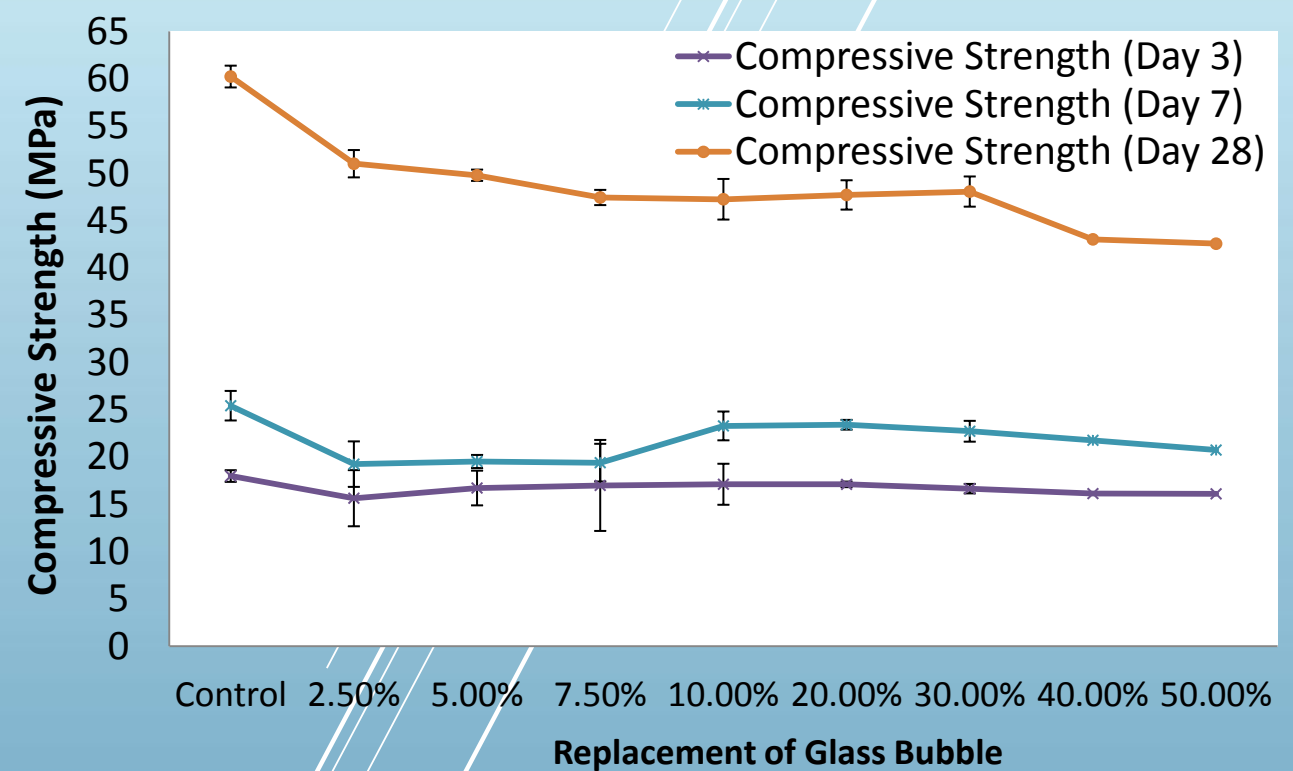
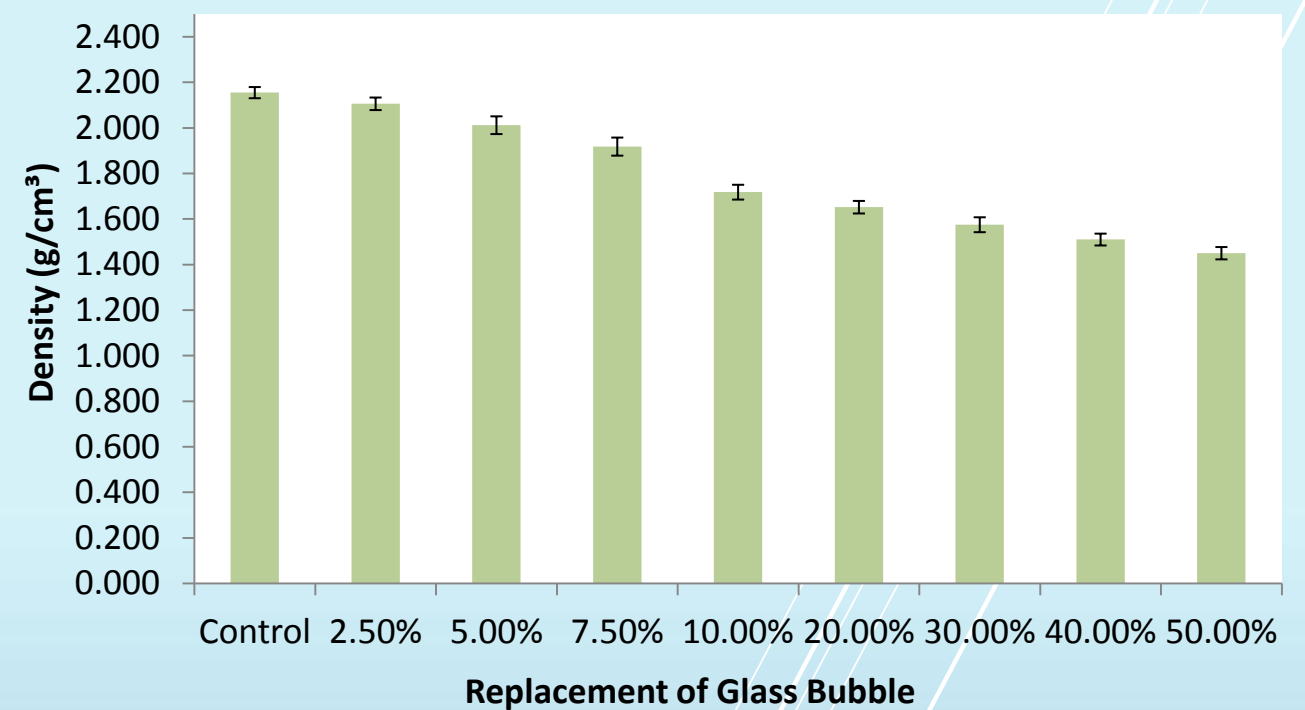
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INTRODUCTION

Novel insulation material of glass bubble was used as a replacement of fly ash binder to significantly enhance the mechanical and thermal properties

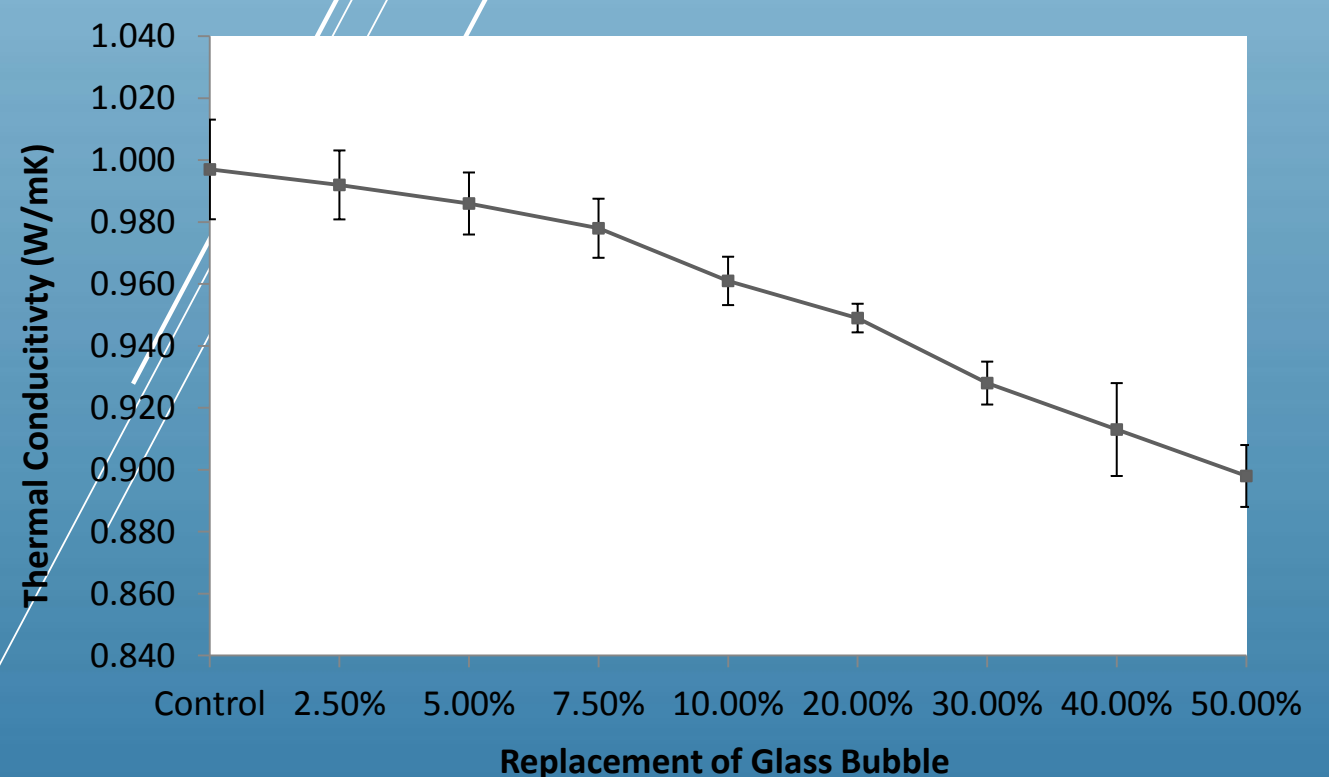


FINDINGS



METHODOLOGY

Curing Temperature	Fly Ash/Alkaline Activator Ratio	Na ₂ SiO ₃ /NaOH Ratio	Percentage of Glass Bubble (%)
Room Temperature	2.0	2.5	0 (Control)
	2.0	2.5	2.5
	2.0	2.5	5.0
	2.0	2.5	7.5
	2.0	2.5	10.0
	2.0	2.5	20.0
	2.0	2.5	30.0
	2.0	2.5	40.0
	2.0	2.5	50.0



ADVANTAGES

- ✓ Promising HIGH thermal properties (insulation)
 - ✓ LOW density concrete
- ✓ Extremely LOW cost raw materials
 - ✓ EASY processing step
- ✓ ENDLESS supply of raw materials
 - ✓ ENERGY saving concrete

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CONCLUSION

The results indicated that the density and compressive strength of 50 % glass bubble involvement was 1.45 g/cm³ and 42.5MPa, respectively, meeting the requirement for structural concrete. Additionally, the compatibility of 50% glass bubbles obtained the thermal conductivity (0.898 W/mK), specific heat (2.141 MJ/m³K), and thermal diffusivity (0.572 mm²/s). The improvement of thermal insulation properties revealed the capability of a glass bubble as an insulation material in construction material.