

## **The Efficiency of Using Mineral Insulating Solutions in Buildings in Egypt**

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### **Abstract:**

Energy consumption in buildings is a growing concern worldwide, and Egypt is no exception. With its extreme climatic conditions, including scorching summers and chilly winters, efficient insulation is crucial to reduce energy consumption and enhance indoor comfort. This research paper investigates the potential benefits of using mineral-insulating solutions in buildings in Egypt. This study employs a comprehensive methodology that includes energy simulation to evaluate the performance of mineral-based insulation of Airium in buildings in Egypt. Airium is a mineral-based insulation that is widely used around the world but it has never been applied to buildings in Egypt to determine its efficiency. Results indicate that Airium and mineral insulating solutions exhibit promising thermal performance in the Egyptian context, reducing heat transfer and thus lowering energy consumption for cooling and heating purposes. Furthermore, these materials prove effective in managing moisture, preventing mold growth, and enhancing the durability of building structures. Their fire-resistant properties enhance the safety and sustainability of buildings in this high-temperature climate.

### **Keywords:**

Energy efficiency, Energy Consumption, Insulation, Egypt

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