Recycling Construction Waste Along With Some Treated Polymer Waste to Produce Water and Heat Insulating Materials Used in Roofs

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This research discusses the development of an effective, economical, and sustainable material using polystyrene waste combined with recycled sand as a water and thermal insulating material for construction purposes, such as lining or ready-made panels for roof insulation. The research emphasizes that using the components of this material, especially polystyrene, will help reduce polystyrene waste, thereby contributing to the preservation of natural resources and preventing environmental pollution, as polystyrene is difficult to dispose of and burning it produces toxic gases that cause significant harm. Additionally, it contributes to environmental sustainability by reusing polystyrene. Our study relied on the experimental method by conducting tests comparing the research material with other construction materials to determine its economic feasibility. Through experiments conducted at Qatar University and discussions with professors there, we reached the following conclusions: Develop a material suitable for construction and waterproof and thermal insulation with very high efficiency, low cost, and lightweight compared to currently used materials. Ensure that the measurements of the new material match those of the materials used in construction. The resulting material should be sustainable and have low economic cost The resulting material should have low economic cost.

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