



Building facade optimization based on hidden water of materials

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Abstract:

Due to the reduction of energy reserves in the world, optimization in the construction industry is more important than ever. One of the effective examples in energy saving is paying attention to sustainable building materials. In this regard, energy and hidden water of building materials can play an important role in energy efficiency. There are several priorities in the selection of materials by architects and experts, but unfortunately, the attitude towards materials in terms of stability and optimality, especially energy and hidden water is not a priority. In this regard, due to the significant amount of hidden water in the materials, in the production process and also at the time of use, research is necessary. From this point of view, the purpose of the research is to formulate criteria and methods for using construction materials with less hidden water in the building, including optional and mandatory criteria. In order to achieve the amount of hidden water of each building material, first the researches were analyzed, then some materials were analyzed in the field and interviews with experts and specialists of manufacturing companies, and finally the classification of common and new materials in terms of hidden water. Presented as a matrix. This analysis shows that refractory bricks and traditional bricks as well as GRC concrete with an average of 1.7 liters per kilogram have the least hidden water in the production process and steel products with an average of 70 liters per kilogram have the most hidden water. Finally, in this study, solutions to reduce water consumption in the construction industry were proposed.

Keywords:

Hidden water, hidden energy, optimality, sustainable materials, building facade