

Dynamic Breathing House In UAE (Construction Component Design and Cost benefit Analysis)

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Abstract

The project is to investigate the technical and economic feasibility of introducing the Dynamic Breathing Building (DBB) systems approach in the UAE. It will establish the case for design and construction of a building to demonstrate the benefits of the DBB approach.

In the UAE, air conditioning of buildings consumes approximately 70% of the total electrical energy that is generated each year. This is by far the single largest source of CO₂ emissions contributing to global warming and climate change. Steps to substantially reduce fossil fuel use in the UAE built environment, through the introduction of energy efficiency measures and new technologies, such as Dynamic Breathing Building (DBB) are needed urgently. The objectives of the current project are to design and evaluate the energy-saving performance of a modular dynamic insulation / filtration product, and the Dynamic Breathing Building technology in the UAE.

The idea of the project is to design the construction components to fit the new dynamic insulation inside the envelope and the connectivity to the HVAC system. By utilizing the dynamic insulation technology in the building design, some on-costs to normal practices will be accrued. This will include costs as a result of construction and HVAC connectivity modifications. Against these added costs, a considerable savings in other components and building energy cost is expected due to the reduction of the main central chilling plant ratings resulted from the effect of the dynamic breathing system in reducing the overall chilling load.

The measurable outcomes and performance criteria of this project are: energy saving, CO₂ emissions reduction, filtration performance, indoor air quality, and build ability (Municipalities codes in the UAE).

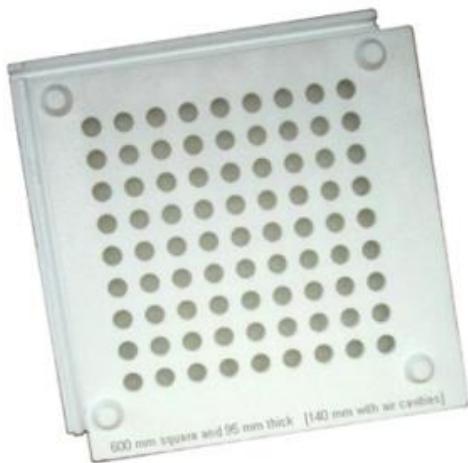


Figure 1: Energyflo cell.



Figure 2: 3D model of the dynamic breathing house.