

Liquid Desiccant Cascaded System for Indoor Air Conditioning

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Abstract:

Displacement ventilation combined with liquid desiccant membrane chilled ceiling is an efficient HVAC system. However, it has limited performance in office spaces located in hot and humid climates and characterized by high internal loads due to the lack of ability to control the humidity. This study proposes a cascaded liquid desiccant system to control the conditions of the internal space at minimum energy cost. To this intent, a predictive integrated model for different components will be developed to predict the comfort level and the air quality inside the room as well as the energy consumption of the system. In order to verify the effectiveness of the system, the integrated model will be applied to a case study that takes into consideration the hot and humid climate of Beirut. Energy consumptions predicted with this system will be compared to those of other alternatives and configurations following the same control strategy and under the same comfort conditions.