عنوان مقاله:

Sustainable development via energy recovery inside the building using a membrane humidifier with porous channel: Numerical modeling

محل انتشار:

اولین کنفرانس سالانه بین المللی عمران، معماری و شهرسازی (سال: 1394)

تعداد صفحات اصل مقاله: 8

نویسندگان:

Mahdi Shaali - *School of Construction Engineering and Management, College of Engineering, Azad University of Olom Va Tahghighat, Tehran*

Ebrahim Afshari - *Department of Mechanical Engineering, Faculty of Engineering, University of Isfahan, Isfahan*

Mojtaba Baharlou Houreh - *Department of Civil Engineering, Technical University of Mohajer, Isfahan*

Nasser Baharlou Houreh - *School of Mechanical Engineering, College of Engineering, University of Tehran, Tehran*

خلاصه مقاله:

The Membrane humidification is a simple method with the least energy consumption in buildings air conditioning (HVAC) system. It can help Sustainable development by energy recovery. In this study a threedimensional numerical model is developed to investigate the membrane humidifier performance with porous channel. Using porous metal foam in humidifier channels has some unprecedented characteristics including more area efficiency to water transfer, lower manufacturing complexity and lower cost compared to the conventional flow channel. The results indicate that using porous channel leads to an increase in water concentration and temperature at the dry side outlet, indicating better humidifier performance. In a membrane humidifier with the equal mass flow rates at the dry side and wet side channels, an increase in the flow rate leads to a decrease in dew point at dry side outlet exhibiting a decline in the humidifier performance. A thinner membrane leads to a higher dew point at dry side outlet; consequently, humidifier .better performance

کلمات کلیدی:

HVAC, Membrane humidifier, Porous metal foam, Energy recovery