عنوان مقاله:

Indoor temperature and energy optimization using Energyplus and Taguchi method : A case study

محل انتشار:

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خلاصه مقاله:

Cooling system is in charge of a high percent of total energy consumption in buildings. Different cooling systems and devices have different effects on the cooling load and energy consumption. The main objective of this paper is to study the effects of floor and ceiling temperature in comparison with other parameters including location of air diffusers and application of insulation and sealant. On the other hand, hospitals are huge buildings with high energy requirements and systems compared to other buildings such as universities, schools and offices. In this paper the impacts of these different cooling parameters on the temperature and cooling load in a room of a hospital are studied using Design of Experiments (DOE) and the Taguchi method. The experiments are simulated in Energy Plus to achieve the comfort temperature in one hospital's room in Iran during six months of spring and summer. Using different cooling systems such as chilled floor (during night to decrease the peak load during day) and ceiling in combination with air handling unit can provide people satisfaction while optimizing energy consumption. The results show that the location of inlet and outlet diffusers has the most effect while the chilled floor (when the other systems are off) has the less impact on reaching comfort temperature. The ranking of parameters and their interactions has .been discussed through the paper

کلمات کلیدی:

Taguchi method, cooling load, Air Diffusers, Insulation, Sealant