

TRNSYS simulation of desiccant powered evaporative cooling systems in hot and humid climate

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Abstract - The Simulations of evaporative cooling powered by desiccant dehumidification systems in hot and humid climate was carried out by using TRNSYS. The moisture level of process air was substantially controlled by the use of the rotary solid desiccant dehumidifier to provide thermal comfort to the indoor space. The simulation results mainly give the output parameters or the system performance varying over a selected cooling during cooling season from March to October. One needs to fix up the time for getting the output or performance at that instant during the selected cooling period. Design engineers can exploit the use of TRNSYS by considering the extreme range of parameters in their designs to know further applicability of the hybrid cooling system for different climatic conditions. Also, the overall system performance can be predicted for variable climatic conditions for different cities in India. Solid desiccant powered evaporative cooling systems are found reliable in performance, environment-friendly and capable of improving indoor air quality using diversified renewable or waste energy resources. Because of high accuracy and short computing time, this methodology can be useful to simulate the performance of desiccant-assisted HVAC systems at different operating conditions in different climatic zones