

**ANALISIS MATEMATIS PENGARUH VARIASI *PAD* DAN LAJU ALIRAN UDARA TERHADAP KONDISI UDARA RUANGAN PADA PROSES *EVAPORATIVE COOLING***

**INTISARI**

**Oleh:**

**IFADA FADLILAH PUTRI**  
**08/269036/TP/09226**

---

*Evaporative cooler* adalah suatu teknologi yang mampu menurunkan suhu dan menaikkan kelembaban ruang. Penelitian ini bertujuan untuk menganalisa pengaruh penggunaan *evaporative cooler* dengan *pad* yang berbahan dasar kawat kassa *stainless steel* terhadap perubahan kondisi udara lingkungan pada ruang tertutup. Penelitian ini menggunakan dua macam perlakuan yakni variasi jumlah lapisan kawat kassa pada *evaporative pad* dan laju aliran udara yang digunakan. Terdapat tiga variasi lapisan *evaporative pad* yaitu *pad* 1 lapis, *pad* 3 lapis dan *pad* 5 lapis serta tiga variasi laju aliran udara yakni 0,230 m<sup>3</sup>/s, 0,325 m<sup>3</sup>/s dan 0,375 m<sup>3</sup>/s. Dari hasil penelitian menunjukkan bahwa nilai konstanta laju penurunan suhu berkisar antara 0,00065 - 0,00236 °C per detik dan nilai konstanta laju kenaikan kelembaban berkisar antara 0,00162 - 0,00260 % per detik. Penelitian ini juga menunjukkan bahwa jumlah lapisan kawat kassa *stainless steel* pada *evaporative pad* berpengaruh nyata terhadap perubahan suhu dan kelembaban udara dalam ruang sedangkan variasi laju aliran udara tidak berpengaruh nyata.

---

Kata kunci: *evaporative cooling*, *evaporative cooler*, *pad*, laju udara

**MATHEMATICAL ANALYSIS OF PAD AND AIR VELOCITY VARIATION TO ROOM ATMOSPHERE ON EVAPORATIVE COOLING PROCESS**

**ABSTRACT**

By:

**IFADA FADLILAH PUTRI**

**08/269036/TP/09226**

---

This research aimed to analyze the influence of evaporative cooler with a pad made of stainless steel wire-netting to the changes of atmosphere condition on a closed chamber. This research used two treatments, namely the number of wire-netting layer on evaporative pad and the rate of the used air-flow. There were three layer variations of evaporative pad, namely 1 layer, 3 layers and 5 layers of pad and three rates of the air flow, that is  $0.230 \text{ m}^3/\text{s}$ ,  $0.325 \text{ m}^3/\text{s}$  and  $0.375 \text{ m}^3/\text{s}$ . The experimental results showed that the constants of the rates of temperature decline were  $0.00065 - 0.00236 \text{ }^\circ\text{C}$  per second and the constants of the rates of humidity increase were  $0.00162 - 0.00260 \%$  per second. This research also exhibited that the number of stainless steel wire-netting layers on evaporative pad significantly influenced the change of temperature and humidity inside the closed room while the rates of air-flow were no significant effect.

---

Key word: evaporative cooling, evaporative cooler, pad, air-flow rate