

The Effect of Copper Material Absorber Pipe Diameter on Parabolic Trough Collector (PTC) Performance

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ABSTRACT

Parabolic Trough Collector uses copper absorber pipe with various diameters (9.5 mm, 12.7 mm and 19.05 mm) with a length of 1 m absorber pipe. The choice of diameter on the absorber pipe is expected to increase the efficiency and maximum temperature produced. This Parabolic Trough Collector has a focal point of 12cm using an aluminium plate reflector with a size of 50 cm x 70 cm with a thickness of 0.3 mm. The test was carried out on the roof of the Engineering Building, Jember State Polytechnic with 3 repetitions. The highest water temperature was found at a diameter of 9.5 mm at 63.2°C at 12.10 WIB while the highest average efficiency value was found at a diameter of 9.5 mm producing 14.28%. This efficiency value is influenced by several factors, including solar irradiation, outlet and inlet temperature differences, and mass flow rate. The highest total average heat transfer rate is at a diameter of 9.5 mm at 42.3 W.

Kata Kunci: *Parabolic Trough Collector, Pipe Absorber, Diameter, Efficiency, Heat transfer*