

NOVEL DESIGN OF SOLAR RECEIVER IN CONCENTRATED SOLAR POWER SYSTEM

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Abstract

Solar Concentrated power systems (CSP) convert the thermal energy from solar radiation to mechanical energy and then to electrical energy, in much the same way as conventional power plants convert the chemical energy in fossil fuels through combustion into thermal energy into electricity. One of the main components of the CSP system is the solar receiver. The present work is focusing on the feasibility of improving CSP plant efficiency through study the influence of the variation in the solar receiver geometry on thermal performance of CSP system manufactured for this purpose. This work was done at Iraqi Summertime weathers. Three geometries considered in the present work, coloring the solar receiver with selective black color, enclose the solar receiver by a glass box and color the glass enclosed by selective black color. Measurements of solar receiver temperature, stored energy and efficiency of the solar receiver with a glass enclosure results show a promising improvement in the CSP system thermal performance when compared with the other geometries.

Keywords : Design prototype, Solar Energy, Concentrated power systems (CSP) and performance.