

A b s t r a c t

SOLAR THERMAL COLLECTORS IN POLYMERIC MATERIALS: A NOVEL APPROACH TOWARDS HIGHER OPERATING TEMPERATURES

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The increasing demand for low temperature solar thermal collectors, especially for hot water production purposes in dwellings, swimming pools, hotels or industry, has lead to the possibility of high scale production, with leading manufacturers presenting yearly productions of hundreds of thousands of square meters. In such conditions, the use of polymeric materials in the manufacturing of solar collectors acquires particular interest, opening a full scope of opportunities for lower production costs, by means of cheaper materials or simpler manufacturing operations. Yet, the use of low cost materials limits the maximum operating temperatures estimated for the collectors (stagnation) to values around 120 °C, easily attainable by any simple glazed solar collector. Higher performances, leading to higher stagnation temperatures as those observed for regular metal-based solar thermal collectors, would require high temperature polymers, at a much higher cost. The present paper addresses the manufacturing of a high performance solar thermal collector based in polymeric materials and includes a base thermal study, highlighting the different possibilities to be followed in the production of a polymeric collector, as well as a description of different temperature control strategies.

For the full text contact the author(s) or the publisher:

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