

7th Annual Congress on

Materials Research and Technology

February 20-21, 2017 Berlin, Germany

Experimental study of the thermal behavior of heated natural composite material

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In the present paper, an experimental investigation was carried out for the thermal behavior of heated natural composite material plates; (polyester resin mixed with seed dates, or egg shells, or and feathers) with different volume fraction (10%, 20% and 30%). Natural composite materials are heated with different heat flux (1078 W/m^2 , 928 W/m^2 , 750 W/m^2 , 608 W/m^2 and 457 W/m^2). Experimental test rig is used to measure the temperature distribution upper surface of composite materials. Also the thermal properties (thermal conductivity, specific heat, and thermal diffusivity) of natural composite materials are studied. The results show that the maximum value of temperature occurs at the mid-point of the all types of natural composite material plate when the volume fraction is equal to 30% and the heat flux equal to 1078 W/m^2 . Results show that the thermal conductivity for seed dates composite material, the specific heat for feathers composite material and the thermal diffusivity for seed dates composite material are higher value when the volume fraction equal to 30%.

Biography

Qasim Saleh Mahdi is a staff member in Mechanical Engineering department at Al-Mustansiriya University in Baghdad. His field of interest is Mechanical Engineering (Thermal Power and Energy). He taught the under-graduate and post-graduate students in the faculty of engineering for more than 30 years. He has many consulting businesses in the field of Air Conditioning and Refrigeration.

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