# Thermophysical Property Measurements on a Cold-Pressed and Sintered Copper-Tin Alloy

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Ever-increasing demands are being placed on materials used in high-tech applications. These materials are expensive and are being pushed to their design limits. This has placed additional pressure on scientists and engineers to improve product quality while simultaneously reducing development time and production costs. These demands have led to the use of computer simulation models to better understand and control production processes. Of course, for these models to be effectively utilized, an accurate and comprehensive thermophysical properties database is required for the materials of interest.

In particular, computer models are increasingly being employed to simulate the sintered metal production processes. Unfortunately, there is a dearth of accurate thermophysical property data for the materials of interest. This is because the use of computer models in this area is relatively new and the task is, in fact, quite difficult. The purpose of this work was to measure the thermophysical properties of a 90% copper-10% tin alloy which is widely used in bearing applications. The measurements were carried out on sintered samples and, during sintering, on cold-pressed alloyed and component powder mixtures. Both the sintering temperatures and times were varied in order to establish the effect of the sintering cycle on the final thermodynamic and transport properties. Thermophysical properties such as thermal diffusivity, specific heat and bulk density will be presented. In addition, the possibility of using transport and thermodynamic property data measured during sintering to characterize the various sintering mechanisms will be discussed.