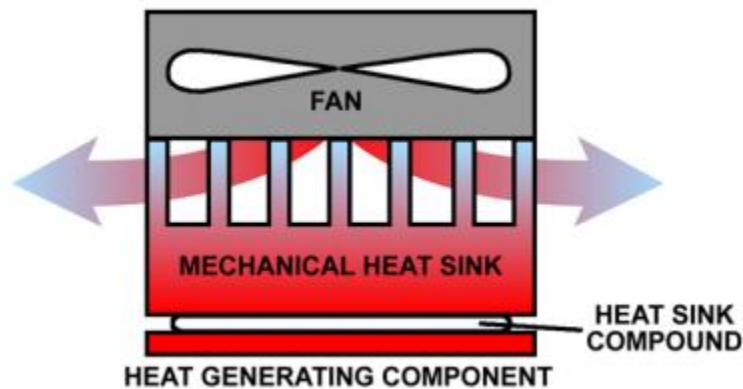


The Facts on Heat Sink Compounds...Keeping Electronics Cool

This article is based on an original publication by Kevin Pawlowski, Sr. Product Manager, Techspray.

Considering the number of transistors in dense, integrated circuits continues to double about every two years as noted by Moore's law, proper thermal management is paramount. Processors are running hotter in smaller devices with more densely populated boards.

Heat sink compound or thermal grease is often used to help keep electronics cool. Once a mechanical heat sink, made of a conductive metal, is placed over the heat generating component such as a central processing unit (CPU), a gap typically forms between them because the two surfaces are not perfectly flat. Heat sink compound fills in the gap to increase thermal efficiency. Heat is drawn into the mechanical heat sink, and the excess heat is dissipated by its fan.



When the gap is not filled properly, the surrounding air can cause a reduction in heat dissipation, leading to device failure. This is because air is a poor thermal conductor. Filling the air gap with the compound improves thermal responsiveness, although heat sink compound does not have the conductivity of metals like copper and silver.

Two types of heat sink compounds are generally used: silicone and silicone-free. For electrical applications, silicone heat sink compounds are preferred. Silicone can cause conformal coating dewetting and solderability issues linked to silicone migration. Silicone-free formulas have similar thermal conductivity yet avoid the issues associated with migration. Depending on your application, either type of product will increase the efficiency of thermal transfer and mitigate the risk of overheating.