Guidelines For Thermal Pads

Heatsinks are used as thermal solution to dissipate heat that gathers on chipsets like CPU, Northbridge, Southbridge, audio chip, VGA chip and etc. In order for the heatsink to fulfill its intended purpose (heat dissipation), thermal pad is applied between the heatsink and the chipsets. The purpose of the thermal pad is to effectively conduct heat from the chipset to the heatsink. Should conditions required, there are cases that one heatsink is responsible for the heat dissipation of more than one chipset. And in this case, there would be more than one thermal pad for each heatsink.

The most common types of thermal pad are thermal grease, phase change, and gap filler. Below are the guidelines.

Thermal Grease

Major Ingredient:	• Metal compound and grease.
Characteristics:	• In general, fairly low thermal resistance. • Since it is in grease form, it can be pasted to the areas that require thermal treatment. Grease is subject to evaporation (dry-out) with it ambient high temperature and the passage of time. Its heat conduction characteristics in general would be enhanced when it is dry-out.
Attention:	• When you dissemble the heatsink, the thermal pad may already practically “seal to” the chipset. This can cause much adhesion to the chipset. Thus, this would take some afford to remove the heatsink.
When to replace?	• If using the same heatsink and the same chipset, it can in general be reused for 5 times. That is there is no need to replace it unless the heatsink had been disassembled for more than 5 times. • If with new chipset (that is there is not residual thermal paste from previous installation), you **must** replace the thermal pad.

Phase Change

Major Ingredient:	• Metal compounds and wax.
Characteristics:	• In general, fairly low thermal resistance. • It is in solid state when in room temperature. It would melt into semi-fluid state when its ambient temperature raises (to say 60˚C); and would return its solid state when falling back to room temperature (which is the temperature when you disassemble the system unit).
Attention:	• When you dissemble the heatsink, the thermal pad may already practically “seal to” the chipset. This can cause much adhesion to the chipset. Thus, this would take some afford to remove the heatsink.
When to replace?	• If the chipset or the PWA board that the chipset is mounted on have not been disassembled, there is no need to replace the thermal pad. • If the chipset or the PWA board that the chipset is mounted on have been disassembled and the same chipset or its board is mounted back, there is no need to replace the thermal pad. • If a new chipset or the PWA board that the chipset is mounted on have been changed, you **must** replace the thermal pad.

Gap Filler

Major Ingredient	• Metal compounds, silicon and etc.
Characteristics	• In general, thermal resistance is not as low as the other two.
Attention	• No particular attention is required as adhesion in general is not excessive.
When to replace?	• In general, there is no need to replace unless it has noticeable damage or deformation.