Arctic Silver®
Instructions for Céramique

How to apply Céramique
Intel or AMD Large or Small Exposed Single Core CPU

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1) Initial Precautions

- Don't put it in your mouth.
- Don't give it to children or leave it where children can get a hold of it.
- Keep it away from pets.

2) Technical Precautions

- Never turn on a computer without a heatsink properly mounted on the CPU and thermal interface material between the CPU core and the heatsink. A modern high-performance CPU can be permanently damaged in less than 10 seconds without proper cooling.
- Céramique has no adhesive qualities and is considered grease. It will never dry or set and cannot be used to glue a heatsink to a CPU core.
  To permanently glue a heatsink to a CPU core that does not have any other attachment method, please use Arctic Silver Adhesive or Arctic Alumina Adhesive.

3) Break-In Period

Due to the unique shapes and sizes of the particles in Céramique, it will take a minimum of 25 hours and several thermal cycles to achieve maximum particle-to-particle thermal conduction and for the heatsink to CPU interface to reach maximum conductivity. (This period will be longer in a system without a fan on the heatsink.) On systems measuring actual internal core temperatures via the CPU's internal diode, the measured temperature will often drop slightly over this "break-in" period. This break-in will occur during the normal use of the computer as long as the computer is turned off from time to time and the interface is allowed to cool to room temperature. Once the break-in is complete, the computer can be left on if desired.

4) Application Instructions

Heatsink Preparation

If your heatsink has a thermal 'pad' mounted on it, this pad must be removed before using Céramique. After the pad is removed ONLY Céramique will be between the CPU core and the heatsink.

Thermal pads are made with paraffin wax that melts once it gets hot. When it melts, it fills in the microscopic valleys in the heatsink with wax. To minimize permanent contamination of the heatsink mounting surface with wax, the thermal pad should be removed before it is used and melted. Never use heat

or hot water to remove the pad, as heat will melt the wax into the heatsink. Take care not to scratch the surface of the heatsink when removing the pad, a plastic tool is recommended in the removal of thermal pads or other interface material. You can then optimally remove the remnants of the wax or other thermal interface material by using ArctiClean 1 and 2. You can adequately clean the remnants with a xylene based cleaner, (Goof Off and some carburetor cleaners) or high-purity isopropyl alcohol. If you use Goof off or xylene based cleaners always follow up with a cleaning of high-purity isopropyl alcohol afterwards.

NEVER use any oil or petroleum based cleaners (WD-40, citrus oil based cleaners and many automotive degreasers) on the base of a heatsink. The oil, which is engineered to not evaporate, will fill in the microscopic valleys in the metal and significantly reduce the effectiveness of any subsequently applied thermal compound.

Tinting Heatsink with Céramique:

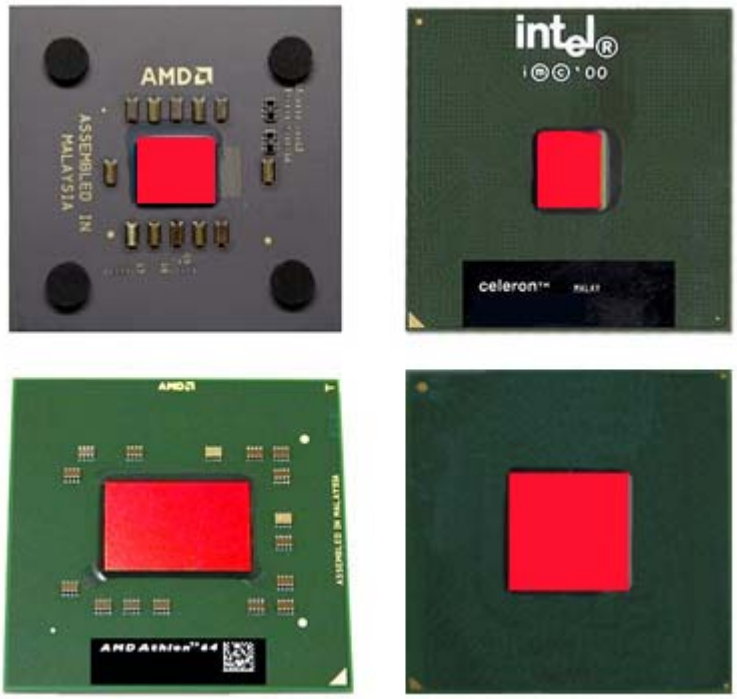
Determine what area on the base of the heatsink will contact the CPU core once the heatsink is mounted. Squeeze enough Céramique onto the center of this area to create a small mound.

Put a finger into a plastic bag and thoroughly rub the compound into the base of the heatsink using both clockwise and counter-clockwise circular motion. This will ensure optimum filling of the microscopic valleys in the metal where the CPU core will contact the heatsink. DO NOT use your bare finger to apply or smooth the compound (skin cells, and oils again)

Re-clean the heatsink surface with a LINT FREE cloth a coffee filter will work. Do not use any solvent or fluid. You may notice that the base of the heatsink is slightly discolored even after the entire compound would seem to have been removed. The discoloring you see is Céramique inside the microscopic valleys of the heatsink.

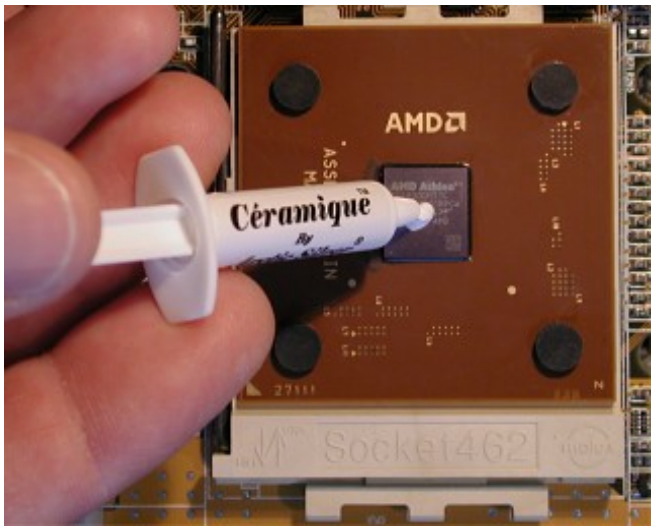
CPU Preparation:

As you may know the core is the raised rectangle in the center of the CPU and is highlighted in red in the photos below of AMD and Intel CPU's.



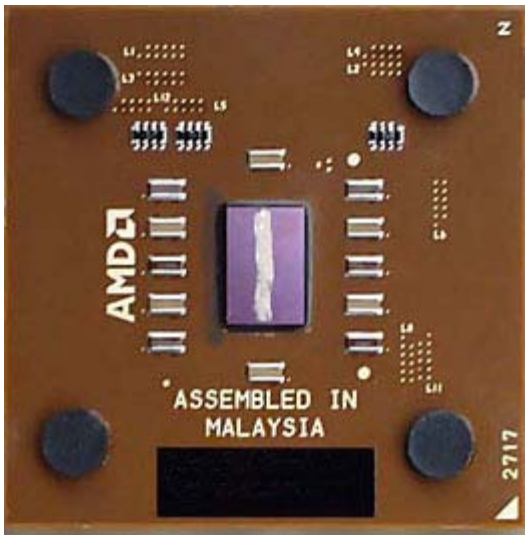
New CPU core surfaces generally don't have thermal interface material applied to them from the factory, so cleaning the surface is not required but is recommended. For optimum performance of Céramique clean the CPU cores surface first with ArctiClean steps 1 and 2 or adequately by using a low residual solvent (high-purity isopropyl alcohol) and a LINT FREE cloth (a lens cleaning cloth or a coffee filter.) If another thermal compound was previously applied to the CPU core you MUST clean the cores surface first. To clean it optimally use ArctiClean steps 1 and 2 or adequately by using a low residual solvent (high-purity isopropyl alcohol) and a LINT FREE cloth (a lens cleaning cloth or a coffee filter.) Important: Keep the surfaces free of foreign materials and do NOT touch the surfaces, a hair, piece of lint, and even dead skin cells can significantly affect the thermal interfaces performance. In addition, oils from your fingers can adversely affect the performance by preventing the micronized silver fill from directly contacting the metal surfaces. (Fingerprints can be as thick as 0.005")

Applying Céramique:



Carefully apply Céramique directly to the core of the CPU. Only apply Céramique to the top of the actual CPU core and nothing else. As you can see in the photo to the right there is a small raised, blue-gray rectangle in the middle of the Athlon processor, this is considered the mating surface of the CPU core, and Intel cores will look similar. Understand that we are just looking to put Céramique on top of the EXSPOSED core of the CPU regardless of brand or type. The same holds true for large single exposed CPU cores such as Athlon 64 or Pentium 4.

Only a very small amount of Céramique is needed for both the small or large exposed single core CPU's. The amount of thermal compound needed for a small exposed core CPU would be equivalent to the size of an uncooked short-grain of white rice or ½ a BB. For large exposed single core CPU's the amount of thermal compound needed would be equivalent to about 1-1/2 the size of an uncooked short-grain of white rice or ¾ of a BB.



Finishing the application:

RECHECK to make sure no foreign contaminants are present on either the bottom of the heatsink or the top of the CPU core. Mount the heatsink on the CPU in the proper orientation per the heatsinks instructions. Verify that the pressure point on the clip is directly above the CPU core. Once the heatsink is properly mounted and the attachment clips are secure, grasp the heatsink and very gently wiggle it slightly clockwise and counterclockwise one time each. (Just one or two degrees or so.) Leave the heatsink parallel with the CPU and the edge of the motherboard. Happy cooling.

5) Storage of Céramique

To keep Céramique fresh for future applications, always replace the cap on the syringe after each use. The syringe should be stored tip down so that any separation between the particles and suspension fluid will be at the back end of the syringe. Like any mix of particles that are many times heavier than the suspension fluid, there will be some separation in the compound over time when stored in the original syringe. Because all thermal compounds eventually experience some separation in storage, storing in a cool place like a refrigerator will also lessen the separation over time. However, this does not affect the performance of the un-separated or remixed compound.

6) Removal from Hardware

Arctic Silver thermal compound can easily be removed from hardware using the proper cleaners and tools: For general clean up, a cloth or paper towel will work well. Intricate cleaning can be accomplished with Q-tip swabs. An old toothbrush can often get the compound out of crevices that other tools cannot reach.

CPU Core: For optimum cleaning use ArctiClean 1 and 2. For adequate cleaning use high-purity isopropyl alcohol or acetone and a bit of careful rubbing. Do not use nail polish remover as it contains fragrance oils and other contaminants. (If you use acetone, do a final cleaning with high-purity isopropyl alcohol.)

Heatsink: For optimum cleaning use ArctiClean 1 and 2. For adequate cleaning use a xylene based cleaner, (Goof Off and some carburetor cleaners) or high-purity isopropyl alcohol. If you use Goof off or xylene based cleaners always follow up with a cleaning of high-purity isopropyl alcohol afterwards.

CPU Ceramic: Use any of the following cleaners: ArctiClean 1 and 2. Any dish detergent. (Dawn, Lux, Palmolive, Etc.) Do not use soap for an automatic dishwasher to clean a CPU. WD-40, citrus based cleaners. Xylene based products. (Goof Off, some carburetor cleaners and many brake cleaners.) Mineral spirits. (Be careful to keep the mineral spirits away from

the core.) Once the majority of the compound has been removed from the ceramic, small patches remaining on the ceramic can be 'erased' with a soft eraser.

If you use any of the suggested products besides ArctiClean 1 and 2 to remove Céramique thermal compound from the CPU ceramic or heatsink base, always do a final cleaning with isopropyl alcohol to remove any residue from the cleaner.

7) Removal from Self

Wash your hands with any dish detergent (Dawn, Lux, Palmolive, Etc.) rather than hand soap. (Do not use soap for an automatic dishwasher.)