



## Bake your graphics card

### Tools used in this guide

- [a working oven](#) (1)
- [baking tray or dish](#) (1)
- [credit card or piece of cardboard to spread paste](#) (1)
- [small screwdriver\(s\)](#) (1)

### Parts relevant to this guide

- [Aluminum Foil](#) (1)
- [Arctic Silver Thermal Paste](#) (1)
- [Tissue Paper](#) (1)
- [Rubbing Alcohol](#) (1) *or even just water*

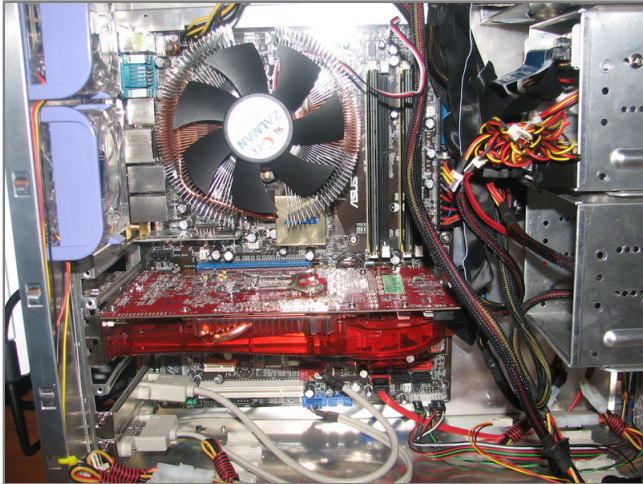
Do you have a dead graphics card?

My friend did, and this is what we did to revive it.

We "re-flowed" the solder on the GPU by baking the video card in the oven for ~10 minutes at ~385F (~195C)

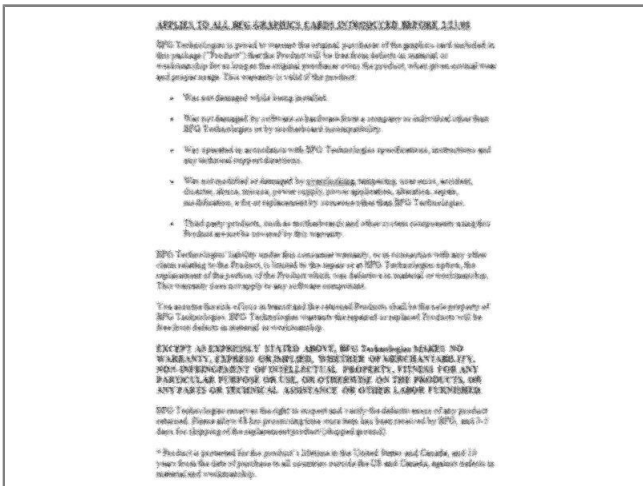
You will need to have some skill with small screwdrivers and a working oven for this procedure

THIS IS FOR CARDS OUT OF WARRANTY ONLY



## Step 1 - Black screen or display corruption

- Remove the video card (if it's installed in the system)



## Step 2

- If the card is still under warranty, get it repaired by the manufacturer. Otherwise, continue with this guide.



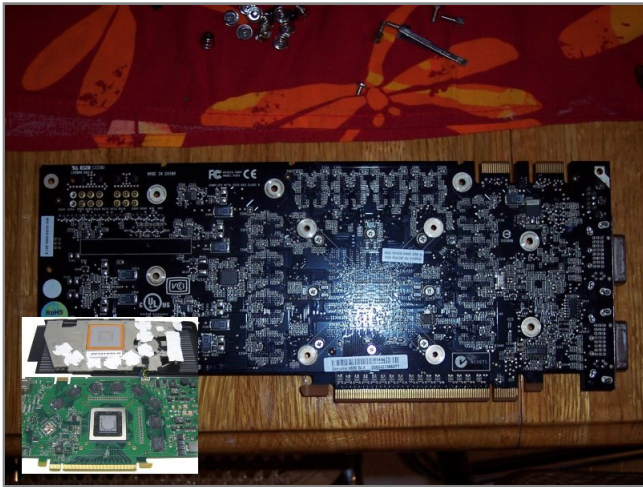
## Step 3

- You will need:
  - Small screwdriver(s) for the fan and other hardware on the video card
  - An oven that works and can achieve accurate temperatures of approximately 385F (195C)
  - A baking sheet or other flat oven-safe object
  - Aluminium foil to prop up the card
  - A dead GPU that is not in warranty
  - Some thermal paste to reassemble the fan/heatsink
  - Some tissue paper to wipe the old paste off the GPU



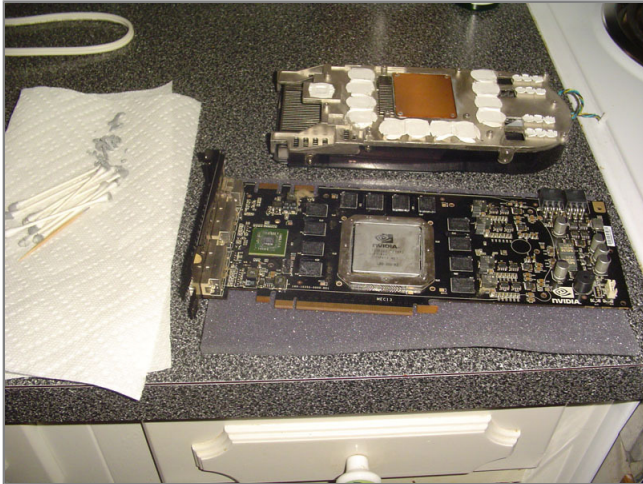
## Step 4

- Preheat the oven to 385F (195C).
- If you've already finished this guide once and are baking again, increase the temperature slightly -- 395F (200C) or 400F (205C).
- Solder melts at different temperatures depending on the type, so if you're squeamish, you might start at 375.



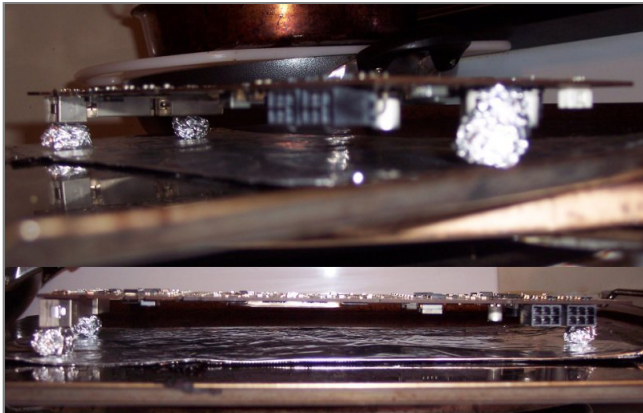
## Step 5

- While the oven is pre-heating:
  - Remove the screws or clips holding your fan and heatsink and any ductwork from the video card.
  - Gently wiggle the fan/heatsink if it does not come straight off.
  - Twisting gently, pull the heatsink off.
  - Some larger cards will have thermal tape or paste/tape on the video RAM chips, save this if you don't have replacement material.
  - Place the screws in a safe place and take a note of which screws go where.



## Step 6

- Clean the GPU chip and main heatsink surface with tissue and alcohol (if available) or a small amount of water.
- Remove any plastic labels from the PCB if you want to keep them; otherwise, they will melt.
- Paper labels will brown slightly, but are more heat resistant.



I actually put the card with GPU chip upwards...  
This photo is copied from a forum... You get the idea...

## Step 7

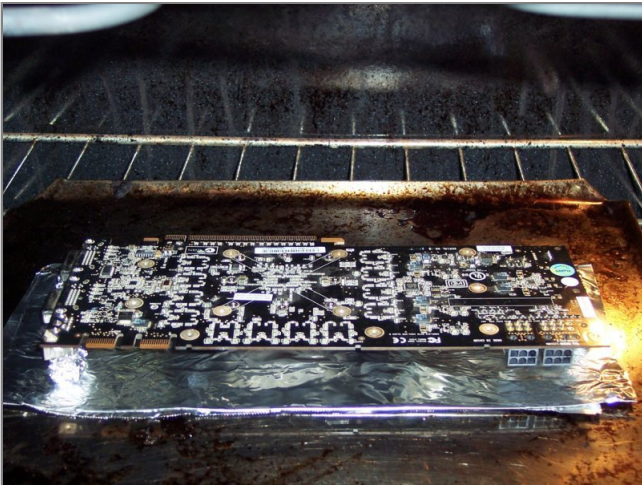
- Make four small (1 inch or smaller) balls of aluminum foil to support the PCB in the oven.
- Line your baking sheet or dish with aluminium foil.
- Place the 4 balls onto the baking sheet/dish
- Place the graphics card onto the balls of foil, suspending the card so that no pressure is applied to any of the PCB components.
- If possible, push the corners of the PCB into the foil balls to keep everything in place.





### Step 8

- Once the oven is preheated sufficiently, set a timer for 8-12 minutes.
- Place the baking sheet or dish in the middle of the oven.
- Place the side of the PCB with the heaviest components (usually the GPU) on top.
- Do not leave the oven unattended for any reason!



### Step 9

- Once the ~10 minutes are up, you may notice a smell from the molten solder/flux.
- Using oven mitts or other protective gear, remove the baking sheet and card from the oven and set them on a heat-safe surface.
- Leave the card to cool for at least 5 minutes; some people allow the card to cool for up to 25 minutes.
- Don't forget to turn off the oven! :)



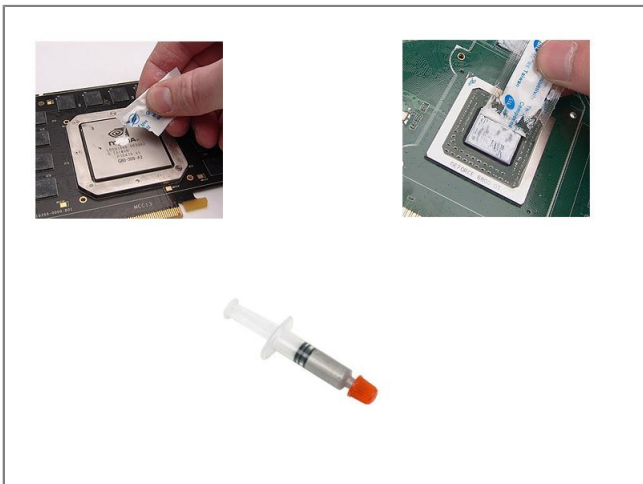


## Step 10

- Make sure the card has cooled enough to touch it before continuing.
- You have 2 options:
  - 1. Test the card quickly without reinstalling the fan/heatsink.
  - 2. Reinstall the fan/heatsink, then test the card.
- Most people will want to test the card to see if it powers on and passes the POST.
- If you are trying it without the heatsink/fan, DO NOT run it for longer than 30 seconds.



- If the card still doesn't work after baking, you may need to increase the oven temperature or the bake time.
- If you were going to throw the card away, you don't have much to lose, so you might as well try a slightly higher temperature or longer time. Do not go much higher than 400F (205C) or longer than 15 minutes.

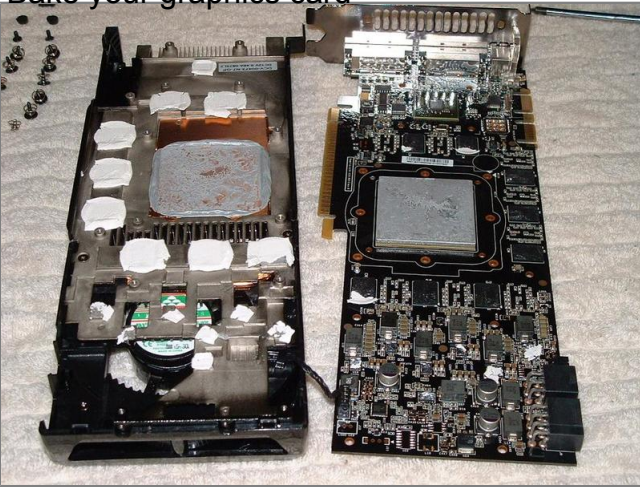


## Step 11

- If you have tested the card and it POSTed ok in the BIOS, or you want to install the heatsink before testing:
  - Apply some thermal grease (thermal compound etc) onto the GPU chip first.
  - Squeeze a **very small** amount onto the chip, roughly the size of a grain of rice, and spread it out with the corner of some cardboard, a credit card, or plastic spoon.
  - Keep spreading it out only using more grease as needed, trying to keep the layer very thin with even coverage.
- Arctic Silver or Arctic Ceramique are popular choices, but any generic Thermal Compound/Grease will work.

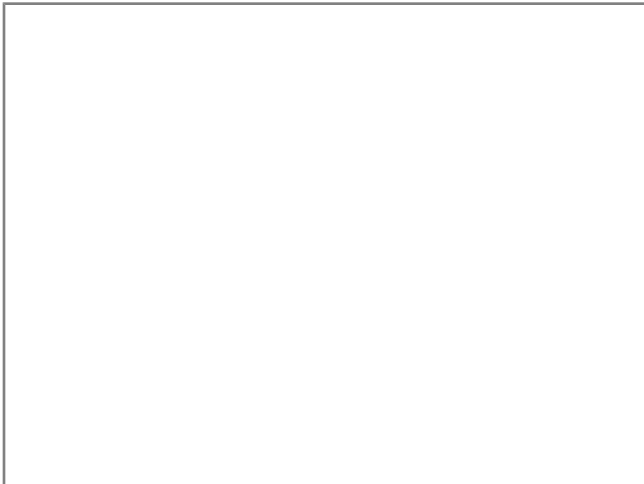


## Bake your graphics card



## Step 12

- Once you've spread a thin and even layer of compound on the GPU, check to see if there was any thermal compound or tape on the RAM chips. If necessary, remove the old material and apply new material, as in the previous step.
- Once you are satisfied with the compound and/or tape, place the heatsink over the GPU carefully, lining up any screws or clips.
- Insert and tighten all the screws carefully! They are usually quite small, and the PCB is brittle and may crack if stressed.
- Tighten the screws in an alternating pattern if they are many surrounding the GPU chip, like you are tightening a wheel on a car.



### **Step 13**

- Verify that the fan was reconnected (if there is one).
- Verify that the fan spins when the PC is powered up.
- Make sure the GPU works when loading up in Windows, etc.
- A good program to get is GPU-Z... it can display the GPU temperature on supported cards.
- Some users have reported that the card worked ok but only for a short time, and more baking was required.
- The success rate for this procedure is unknown. Even assuming only a 30% rate, it's pretty good considering the card is useless otherwise.
- Professionals re-flow electronic PCBs as well using a similar technique, although they use more accurate re-flow ovens.

This document was last generated on Dec 14, 2010.