

Papercrete Solar Cooker

I have several satellite TV dishes sitting around, and one day I tried coating one with silver/chrome paint to see if it would make a good reflector. The paint wasn't nearly reflective enough but did make a nice hot spot that encouraged me to continue experimenting.

The next trial was with some aluminum tape that I got at a hardware store. It is used for HVAC ducts, and was only \$1.50 for a roll large enough to cover one dish. This worked much better, and would set wood on fire in about 30 seconds. However, the focus was a spot maybe 6" across, with a really hot spot maybe 3/4" across. Since it burned wood it was making 500 degrees F or better, but only on a small area. Fine for heating a cup of tea, but certainly not for baking bread.

Realizing that I would need an array of dishes focusing on an oven to be practical, and having only a few dishes, I thought of a way to get more dishes.

I mixed up a batch of pc and slapped it on the back of a metal parabolic dish about 2" thick. Then I let it cure/dry for a few days until it separated from the metal.



Papercrete parabolic dish and metal mold

The surface is far from perfect, but it is an accurate parabola. With care while applying the papercrete, the surface defects can be avoided. For the first experiment, this was close enough.

Papercrete is not reflective enough, so I first tried what was left of the silver/chrome paint. In some small areas it did give a nice reflective surface, but mostly it just soaked in and would have needed several coats. Since the results on the metal were not good enough, I quickly abandoned this idea.



Painted Dish

For years now many of the junk food bags are lined with reflective mylar, and even some larger bags like dog food are now made that way. This lining is much more reflective than the paint, and I have used it for various reflectors for several years. It holds up well to the sunlight since it reflects most of the energy, and the price is right.



Reflective food bags

I split a dog food bag open and laid it out flat, placing the pc dish on it, and cut out an area large enough to cover the dish.



*The back of the dish
measuring reflective plastic*

I wasn't too careful since this step isn't critical and it isn't rocket surgery. I just made sure it was large enough to cover without all the extra to get in the way.

Next I cut from the edges of the plastic to near the center, making pie shaped wedges that stopped short of the center.



Cut wedge shapes so the plastic will conform to the shape of the dish.

Again, I didn't waste too much time being accurate, I just eyeballed it. To be more precise you could actually measure for consistent angles. I don't think it is critical.

Then I spread glue on the dish surface, put the reflective plastic in place, and then used the original metal dish to press the plastic into place and shape. I left the metal in place until the glue dried, then trimmed around the edges for a neater appearance.



A few of these focused on the same spot, or on a metal box oven, should concentrate enough energy to cook just about anything.