Repairing a Smoke Unit Core Using Macor®

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Macor®, a product of Corning Glass, is available in many shapes and sizes. For rewinding smoke units, I use a 1/16 inch diameter rod cut to the desired length. This documentation covers the repair of a smoke unit for an S-Helper 2-8-0, http://www.showcaseline.com/Locos/2-8-0/2-8-0.html, which requires a 3/8 inch length of Macor®. In order to produce a clean cut, I secure the rod in a cordless drill. It is also helpful if you secure the drill in a vise. Controlling the drill with my left hand, I rotate the rod at a slow RPM. While the rod is rotating, I hold a fine tooth X-Acto saw against the rod with my right hand to create a score line. See Figure 1.

Figure 1

http://www.corning.com/specialtymaterials/products_capabilites/macor.aspx

When a visible score line has been created, snap the end piece from the main rod. You should have a 3/8 inch piece of Macor®. See Figures 2 and 3.

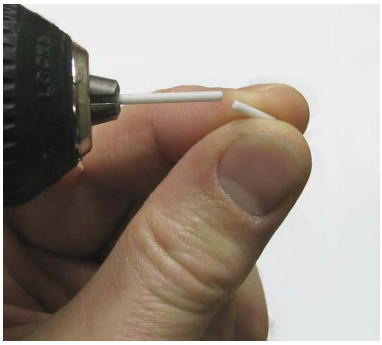

Figure 2

Figure 3

With a pair of forceps or a “normally closed” set of tweezers, secure the small piece of Macor® and drill two small holes on each end with a #76 bit. See Figures 4 and 5.

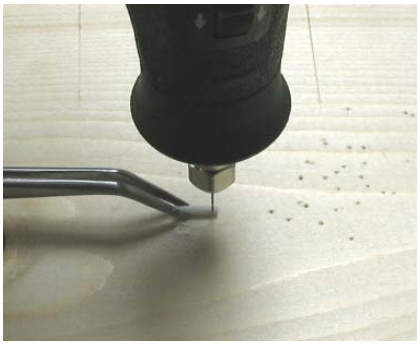

Figure 4

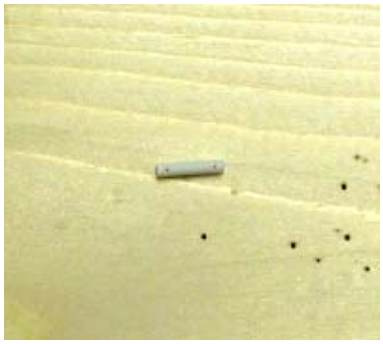

Figure 5

Due to the small size of the Macor®, winding it becomes a matter of personal preference. After threading one hole with #40 Nickel Chromium wire, I hold the Macor® using the thumb and forefinger of my left hand. I then start the winding process with my right hand. After 5 to 6 windings, I slide the wound wire to the left with my right thumb and forefinger and hold it in place with my left thumb and forefinger. For a 5 volt supply which is what you need for S-Helper's 2-8-0, add another 2 to 3 windings for a total of 8 to 9. This should equate to 14 to 15 ohms. For a 12 volt supply continue this process until you have about 30 windings. This equates to approximately 57 to 58 ohms. The Ohm value will need to be adjusted depending on the voltage that you are using to power the smoke unit. Also, if you are using a smoke unit application with DCC, you may need to utilize one or two power resistors to divert unwanted heat away from the decoder. See Figures 6 and 7.

Figure 6

Figure 7

Once the damaged core has been removed, you are ready to install and solder the new one. See Figure 8.

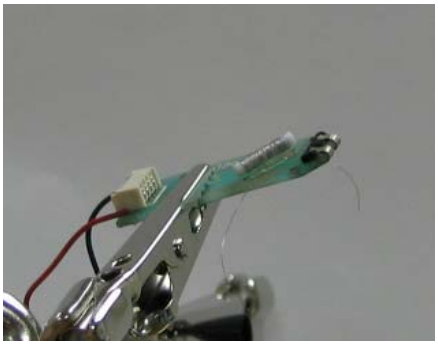

Figure 9

The original core from the S-Helper unit has a wick that is held in place with a brass band. Since the wick material appears to be very durable, I reused the material in the repaired unit. To do this you first need to remove the brass band with a pair of wire snips. See Figure 10.

Figure 10

Cut the wick material into small pieces and place in the smoke unit reservoir. This has to be done in 3 to 4 steps to properly pack the material into place. Install some of the cut material with a pair of tweezers. At first, the material will resist your efforts. I found it helpful to use the tweezers to push the material down in each corner a few times. Then, using a pencil eraser, tamp it down a few times. Repeat the process until you have used all or most of the material. See Figures 11, 12 and 13.

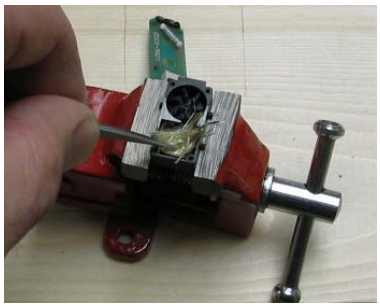
Figure 11

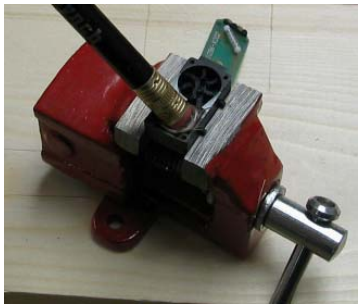
Figure 12

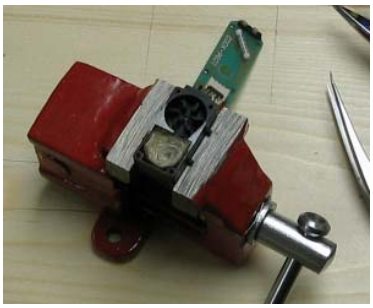
Figure 13

When completed, install the circuit board with the four small screws and you are ready to test. See Figure 14. The unit I repaired is connected to 12 volts DC. As I mentioned earlier, depending on the application and voltage you are using, you will have to vary the windings and possibly add resistors to your installation.


Figure 14