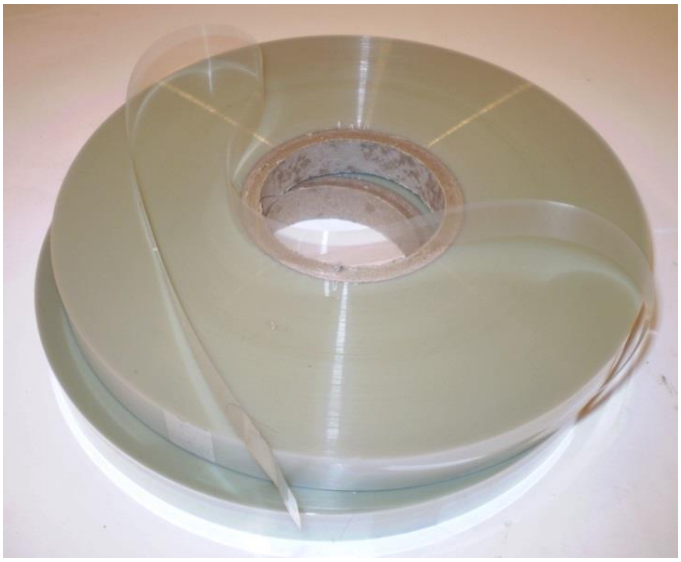
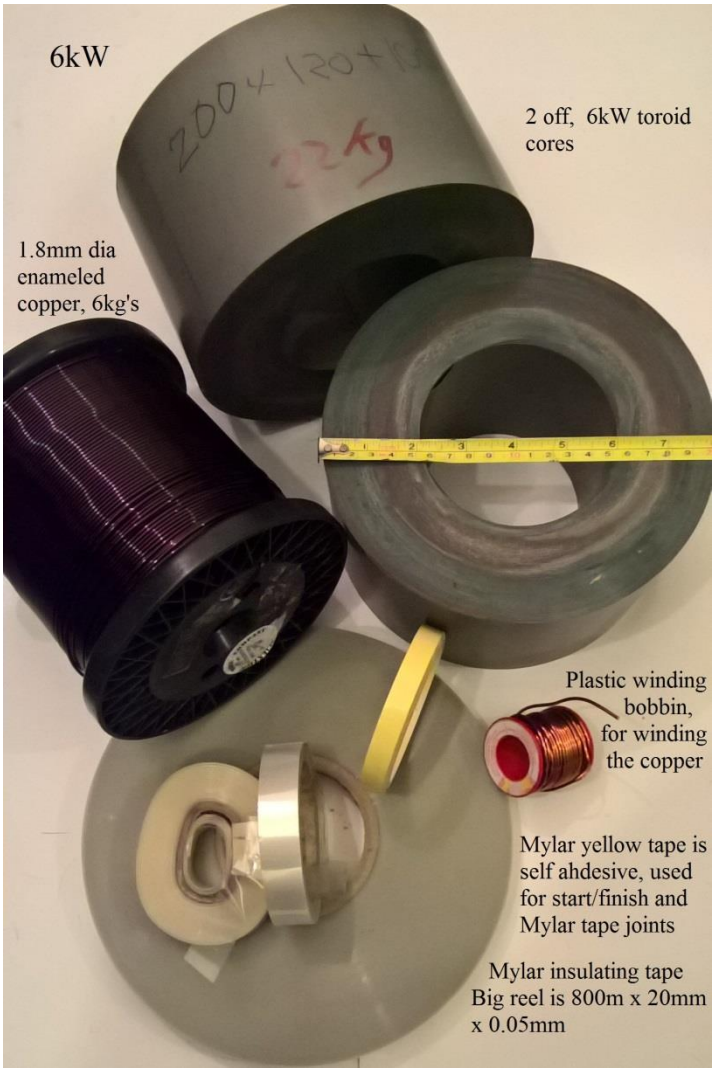


Two rolls, 800m, 20mm wide, 55micron, Mylar non adhesive insulation tape.



Insulation winding tape. Mylar tape, or Molinex, Nomex, Non Adhesive, my observations…….

The trick is keeping it tight, and wrapping it right, let it go or drop the bobbin and a birds nest ensues.....

I obtained 20mm wide and 0.055mm thick, or 55micron, from the supplier of my toroid bare cores, the thickness was exactly correct.

The recycled PowerJack toroid I dismantled had super thin stuff, 0.040mm, that very easily broke, but I did managed to salvage most in small runs, I just used the adhesive backed Mylar tape to do the joins.

The Mylar tape I get from the USA.....
http://www.ebay.co.uk/itm/181696004499?_trksid=p2060353.m1438.l2649&ssPageName=STRK%3AMEBIDX%3AIT
..... is 0.125mm thick, but i found that it is just too thick, Especially when its not flexible enough to allow the next winding of the secondary to fit down in the gap of the previous winding, especially on the internal centre hole windings. But it does come oval shape and goes down a 62mm diameter hole okay without having to unwind. And it is ideal for the last winding before the Primary goes on.

I half lap the Mylar tape on its self on the exterior of the toroid, and I do 2off complete wraps as a minimum, with the super thin breaking stuff I did 3off wraps, Waste not.

Don't forget the epoxy resin on each secondary winding before you cover it with Mylar tape. I like the thin viscosity stuff that I mix and lightly paint on. I have some thin Molinex sheet that I put under the whole toroid to collect any excess resin.

The following evening turn the toroid over, peel off the Molinex sheet, gently remove or roll flat any epoxy protrusions or excess. Then Mylar tape on the hardened, but still soft, epoxy resin coated winding, and then next copper wire winding goes on.

I use a small length of Mylar adhesive tape here its yellow colour, to hold the Mylar wrapping tape in position.
Firstly I wind the mylar tape onto a plastic spool or bobbin, this must fit down the inside hole of the core.

In the left photograph the bare core is now wrapped with 3 layers of the 55micron thick Mylar insulation tape. The cut out area in the bench/ table is handy as you only need to rotate and move the toroid 5 or 6 times.

Winding the secondary.

For my 6kW Oz inverter I used 118 turns of 1.8mm diameter enamelled copper wire, and did a total of four for the secondary. We are winding 4 in parallel, or what is called 4 in hand.

For my BigOzInverter I used 80 turns of 1.8mm diameter enamelled copper wire, and did a total of six for the secondary. That's 6 in parallel, 6 in hand.
Firstly cut a disc of card and equally space out your turns of the secondary.

On this toroid on the first of the secondary windings, I used the adhesive Mylar yellow tape to give me guide positions where the first secondary winding should fit.

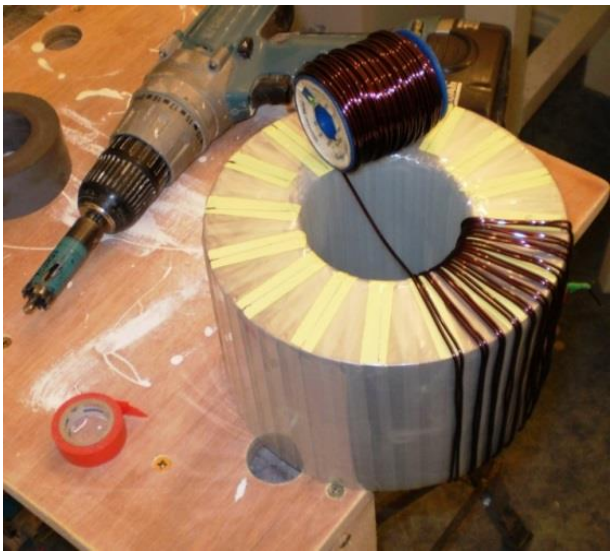
I like 'Oztules' idea of putting 2 turns close to each other as this leaves a gap, and after Mylar winding, for the next secondary to fit into. So recalculating the spacing is made very simple on subsequent secondary windings.

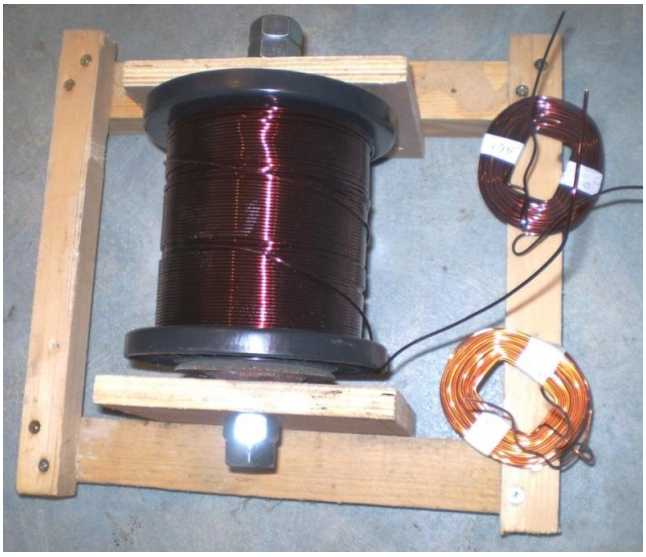
When winding the toroid core. Keep the copper tight and use your finger to make sure it goes around each corner tightish. That's my battery electric screwdriver and arbour in the photograph; it's the right size, that goes in my small copper wire plastic bobbin. The battery powered screwdriver is very controllable for winding from the Big wire drum.

The enamelled or coated copper wire normally comes on a 200mm diameter, approx., plastic drum. A 5kg drum of 1.8mm diameter coated copper wire was plenty for the 6kW OzInverter.

I use the lock nuts to get a little tension on the drum so the copper winds onto the small plastic bobbin reasonably taught. Those other small wound coils in the photograph bottom right, are for my 3.7m diameter 48vdc, Hugh Piggott design Wind Turbines, which also uses 1.8mm diameter coated copper wire.

Remember …. One turn is when the wire passes through the centre hole.
Also remember that centre hole is a reducing diameter so the bobbin might need turning down each time to fit through.





For the 200mm x 100mm x120mm toroid core, now test the first secondary winding 118 turns, and add a temporary Primary winding of 14 turns, with some ordinary 10mm/2 single core flex . ***(See testing procedure further in this chapter).*** This will ensure that the secondary and primary winding number of turns are correct for the toroid care material. Please remember you are looking for a voltage on the primary of between "28v to 30v for our 8010 chip, for a nominal 48v system."

When you are happy with the winding number of turns then remove the temporary primary, and coat each secondary winding with epoxy resin just lightly brushed on. I normally only use about 25ml to 50ml of thinish epoxy lightly painted on each secondary winding. Let it set, then the mylar insulation tape goes on for the next secondary winding, and then repeat with 3 more secondary's repeating the epoxy.

With most resins you can use chalk powder as a thickener, mix it well with the epoxy first before adding the hardener. Try a little test batch with a little epoxy and see how you get on. Chalk also slows down the hardening process. I used about 25 to 50ml of epoxy on each secondary.

Also if you get the small plastic bobbin to unwind as in the photograph you can just roll it around the toroid reasonable easily, but remember to keep the winding taught.

The photograph below ….The second 118 secondary winding going on, between the spacing's of the first 118 turns secondary.

Once you have the second secondary on, then its time to test them so that they are the same, an extra turn or loss of a turn