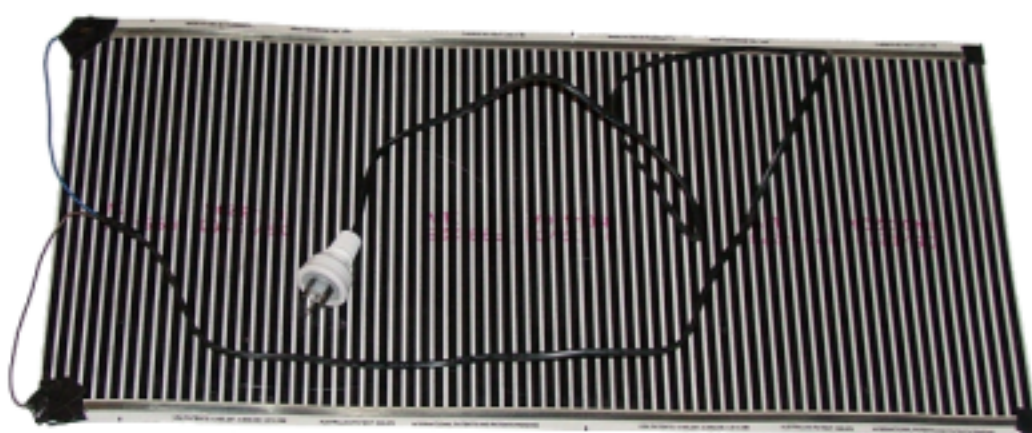


Making Your Own Heat Mats For Reptile Cages Using Flexwatt Heat Tape



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Introduction

These instructions are designed to help you put together a heat mat for a snake or lizard cage that is effective, simple to make and works consistently.

NOTE: These heat mats MUST be used in conjunction with a THERMOSTAT or dimmer switch.

Wiring a Flexwatt mat is quite a straightforward process. There are a number of choices as to how you do this.

This booklet will outline the process and some of your choices.

The heat mats can be inserted directly into the cage under newspaper or substrates, or under the cage.

If the mat is under the cage it will need to be considerably hotter in order to maintain the desired temperatures and you will have to experiment with the thermostat setting to get the desired cage temperatures.

If the mat is inserted directly into the cage you will still have to experiment for a little while to get the correct temperature setting for your reptile.

The mats take a little while to reach the temperatures required and you need to monitor the temperature quite often until you find the desired settings for your reptile.

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Materials

Flexwatt heat matt

This comes in a range of widths that you cut to size. They are 3", 4" and 11".



Roll of Flexwatt



Flexwatt Mat cut to 2'

You need to measure your cage and use about 1/2 to 2/3 the length of the cage of heat mat. The width should also suit the cage size and be about 1/2 to 2/3 the width.

Flexwatt can be bought by the roll, in set sizes or, depending on where you purchase it, by any length you choose. It is generally purchased by the foot.

Extension cord

For wiring to the mat you just need a cheap extension cord of some variety. You could also use old cord from broken tape decks, radios or other appliances, as long as the cord is in good condition.

Below is a commercial product for wiring heat mats. It is slightly more expensive but comes ready to be fitted straight away.



Other Items

- Pliers
- Wire cutters
- Sharp knife or wire strippers
- Electrical tape
- Hammer

To attach using metal connectors

- Metal connectors – these can be purchased from a range of websites. They are easily attached to the Flexwatt mats and do not need any solder.



To attach using solder

- Soldering Iron & Rosin Core Solder

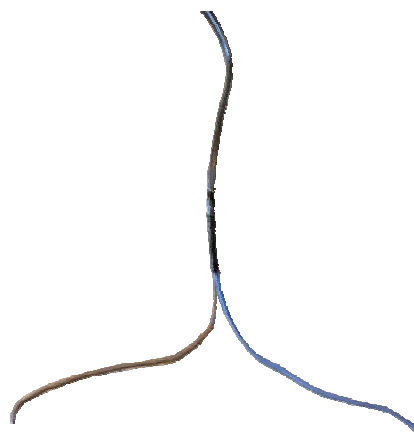
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Step One – preparing the wire

The first thing you need to do is prepare the wire to be connected to the Flexwatt mat.

Cut the female end of the wire off and strip back the outer casing so that the two inner wires are revealed to a length of about 10" - 12" (for 11" Flexwatt) or nearly of the width of the Flexwatt mat.

Now strip about 1" of the wire coating from the end to reveal the bare wires.



These wires should be twisted and then bent over double if you are using metal connectors.

If you are soldering the wire to the mat you should have 1/2"-3/4" stripped for soldering the wire to the heat mat.

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Step Two - Preparing the Flexwatt Heat Mat

As reptile cages require a temperature gradient, you do not need to heat the whole base of the cage. You only need to heat about 1/2 to 2/3 of the cage base, starting from one end. This will give a cooler area within the cage to enable the reptile to regulate its body temperature.

Measure the length and width of your cage. If your cage is about 18" wide you would use 11" Flexwatt Heat Mat. If the cage is 3' then you would need about 2' of 11" heat mat, 4' would be about 2' 6" of 11" heat mat etc.

Cut your Flexwatt mat to size using a sharp knife and a ruler or a pair of scissors.

Try to cut along the clear section of the Flexwatt heat tape.

Now tape both sides of one end of the Flexwatt mat to insulate the exposed metal conducting strips.



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Step Three – Wiring the Flexwatt Heat Mat

There is a range of ways to approach this. The method I favour is to have two small holes in the inside of the cage through which you thread your wire and thermostat probes.

You can wire your heat mat up once the wire is inserted into the cage or you can do it after you have attached the heat mat. If you choose to do it after, cut the male plug from the wire and attach a new male plug that can be rewired and attached and detached as required. That way you can remove the heat mat by removing the male plug and pulling the wire through. Similarly, putting the mat back is a matter of threading the wires through the small hole and re-attaching the male plug.

In this picture you can see the wire is inserted into the cage, ready to be soldered to the heat mat. Another small hole will be drilled next to this hole to allow the heat probe to be placed in the cage.



At the other end of this wire is a detachable male plug that can be removed if it is necessary to take the heat mat from the cage in the future.

Metal Connectors

The metal connectors have holes punched through them. The serrated part of the connector has points that puncture the Flexwatt tape. The connectors are simply folded over the top of the metal strip. These are closed tightly with either pliers or a light tap with a hammer.

This will allow the sharp pieces to contact the metal strips of the tape and conduct electricity.

These should be attached at either side of one end of the Flexwatt tape so that both metal strips have a connector attached at one end and some tape covering the other end.

Finally, cover both the connectors with some electrical tape to insulate them. ([See diagram](#))

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Soldering the wire to the Heat Mat

Helpful Soldering Tips:

Soldering irons corrode and oxidise over time so they need to be filed from time to time to dress and re-tin the end.

1. **File the cold tip to the desired shape.**
2. **Clean the area with fine sandpaper.**
3. **Heat the tip to enable the rosin core solder to be coated over the surface of the tip. It is important that the solder is applied as soon as the tip reaches temperature. If the tip is allowed to sit heated for too long before the solder is applied, the surface will become oxidised and require cleaning again.**
4. **Wipe excess solder from the tip with a damp cloth before using the iron.**
5. **For extended life, leave accumulated solder on the tip between soldering operations. This coating protects the surface from oxides.**
6. **Always wipe the tip surface clean of excess or old solder before making the next join. A sponge or cotton damp cloth is best for this.**

This is my preferred method as the clips are difficult to obtain locally and I also believe the solder gives a better connection that will continue to conduct and not move and lose connection and hence power to the mat, over time.

You will need to remove the plastic coating on the heat mat over the top of the metal strips. This is easily done with a razor blade or just melt the plastic away carefully with a soldering iron, being careful not to get the strip too hot or will melt all of the plastic and come away from the mat completely.

To make a better surface for the solder to adhere to, lightly sand the metal surface.

Now place the wire on the strip.

It is useful to use something to hold it in place like a hammer.



Now put the soldering iron on the wire while touching the solder to the wire.

This should melt the solder onto the wire and the mat.

Most solders come with a rosin core. This enables the solder to adhere to the surfaces better.

Try to avoid holding the soldering iron on the strip too long as it can damage the Flexwatt tape.



Another method to try, if this is unsuccessful, is to put some solder onto the strip and put the wire into the hot solder before it has set. Then re-apply another layer of solder over the top.

If you are having trouble with the soldering, read the **Soldering Tips** at the start of this section. You may need to clean your soldering iron.

Finish the heat mat using some insulation or electrical tape to cover the solder and the wires.

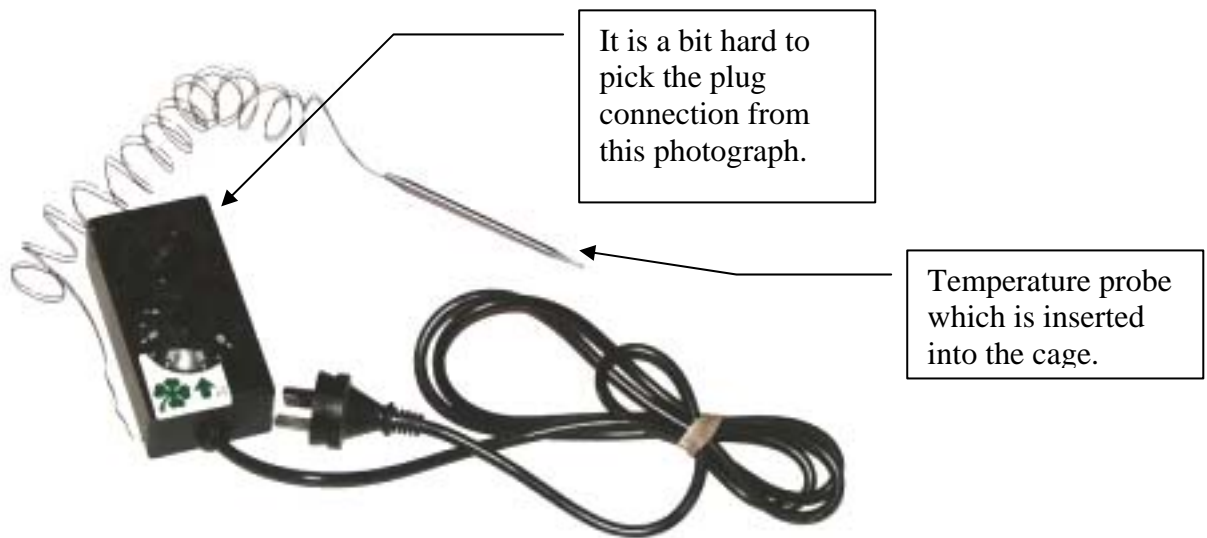
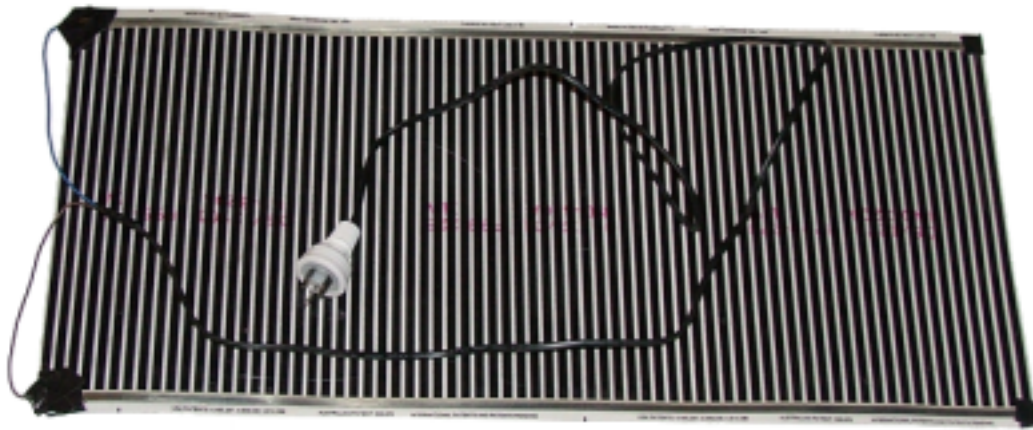
Not the best job, but functional. As long as no liquid can get into the connections they should be very functional.

If you have a concern about water in the base of your cage or a very humid environment you can insulate the connections using a waterproof coating of some sort, such as Silicone.



TIP: A good way of smoothing silicone is to use an ice-cube. The silicone will not stick to it and you can smooth it to how you want it to appear.

Below is a picture of the completed mat, ready to be plugged in to a thermostat.



It is a bit hard to pick the plug connection from this photograph.

Temperature probe which is inserted into the cage.

Another thermostat type pictured below. These are placed on the back walls of cages. As with all of these devices, another thermometer is always useful to measure the temperature in various places around the cage to ensure that your reptile is comfortable.



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Step Four – Setting Up

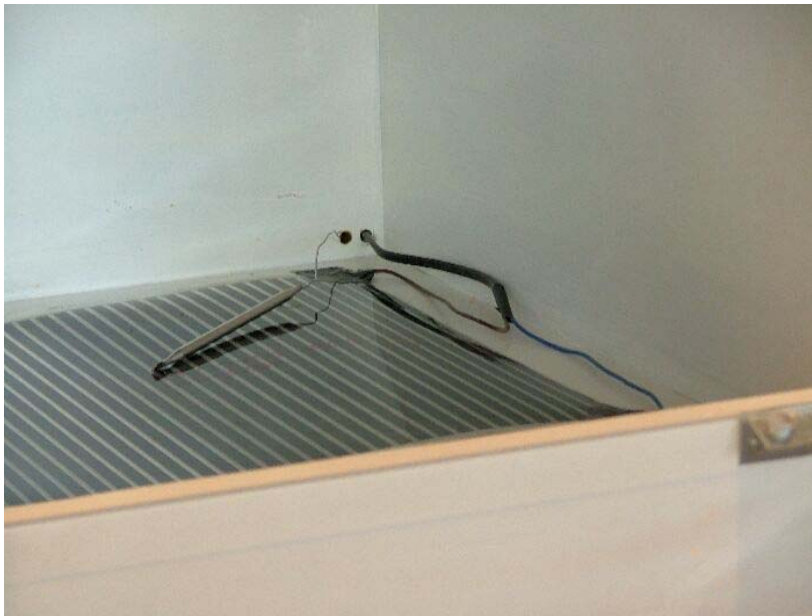
The final step is connecting your heat mat to the thermostat or dimmer switch.

If you have a Thermostat you will need to insert the temperature probe into the cage or next to the heat mat.

It is a good idea to stick the heat mat to the floor of the cage, along with the temperature probe to ensure they do not move and you are getting incorrect temperature readings.

You can use any sort of tape for this purpose. Double sided tape is good for taping the heat mat to the floor of the cage. The probe should be placed on top of or underneath the heat mat as you want to regulate the temperature of the cage by measuring the heat output or temperature of the heat mat.

The mat and probe are ready to be taped or secured to the floor of the cage. Newspaper, substrates or a combination of these are then placed over the top.



Let the mat heat up for a while and use a thermometer to measure the temperature of the cage. You can also use heat lamps at the same time to give your reptiles a very warm basking area. Some reptiles will also require a UV lamp for their health. You need to find out exactly what the requirements are for your reptile.

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Substrates

You can use a range of substrates from newspapers to wood shavings (not cedar or pine due to possible health side effects from the aromatic compounds they contain) to commercially purchased products. All of these have their benefits and short comings.

A good substrate that I have found useful is newspaper covered with recycled paper cat litter. I have found this to be very absorbent and reduces odours considerably.

The other benefit is that when cleaning you simply collect the litter in the newspaper and wrap it up. It is very easy to vacuum the remaining pieces from the cage before wiping it with a mild disinfectant and replacing the whole lot.

As the litter is very absorbent it also reduces water damage that can ruin a cage over time. Make sure the Flexwatt mat will not sit in water as water will conduct electricity.

Conclusion

This book was prepared using available information at the time of publication. If there are any mistakes or omissions the author can be contacted via support@reptile-cage-plans.com

Any suggestions for future publications are also welcomed and can be emailed to the above address.

Happy Reptile Keeping.

Mark Chapple