

A Magnetic Stirrer for Yeast Starters

[By Peter Fitzsimons](#)

What is a Magnetic Stirrer

A magnetic stirrer is a device that lets you stir a solution without having any contact between the stirring motor and the solution. What you do is add a small, sterilised stir bar into the liquid and sit the container on the magnetic stirrer. This is an ideal device for kicking off yeast starters in a short time.

Why use a Magnetic Stirrer

There are many of us that have yeast farms and want to step yeast up quickly from a plate or storage under sterile water, or even from a commercial yeast package.

A magnetic stirrer stimulates the yeast activity and helps you grow the yeast population rapidly. As an example, I stepped up from a partially swollen Wyeast packet to a 2 litre starter where the yeast had fully fermented the starter wort and flocculated in 24 hours.

What you need

You can build a magnetic stirrer very easily as all parts are readily available. You will need a soldering iron to connect a few wires together, but apart from that, the rest of the tools you will have in your shed. Like all projects, this can be done cheaply if you have access to old parts lying about.

An old computer fan is the ideal motor for the stirrer. I paid \$5 for a new one, but you can always get one from an old computer.

The plug pack is one of the most expensive items on the list. There are some phone chargers that are suitable or maybe on that you have that used to run something in the cupboard. Just make sure it is rated between 8 and 12V DC @ 300mA or better. The fans use less than 3 watts of electricity. One of the have seen have draws 120mA and the other around 200mA, so a 300mA plug pack gives us a margin for error.

The parts that I used were

Qty	Part	Source	Approximate cost
1	80mm 12V computer fan	Computer shops, old PC's	\$0 to \$7
1	9 to 12V DC 300ma or better plug pack	Jaycar - MP3006	\$0 to \$18
1	500Ω linear pot	Jaycar	\$1
1	Knob to suit above pot	Jaycar, Dick Smith Electronics	\$1
1	Panel mount socket to suit plug pack	Jaycar, Dick Smith Electronics	\$2
1	Screws to mount aluminium brackets inside case	Hardware store or an old PC	\$1
1	Polycarbonate case 115 x 90 x 55	Jaycar - HB6218	\$17
4	Screws 40mm long to mount the fan	Hardware store	\$2
2	20 x 12 mm angle aluminium approximately 143mm long	Hardware store	\$4
2	50mm magnetic stir bars	Livingstone or other lab suppliers	\$4 each
2	70mm magnetic stir bars	Livingstone or other lab suppliers	\$9 each
2	Bar Magnet - Size: 70 x 12 x 5	Jaycar - TH1874	\$1
4	Rubber feet	Jaycar, Dick Smith Electronics	\$1

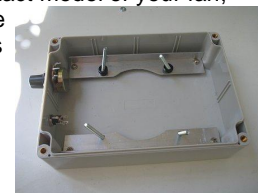
The cost of unit will depend on how well you can source pieces, but I would expect that you can get all pieces (excluding the stir bars) for under \$45

Assembling the stirrer

The following steps outline how to make the stirrer

1. Glue the two magnets together (N to N, S to S). Combining the two gives us a stronger magnet. I used liquid nails to bond them together. Once they are glued, put them to one side and continue with the other steps.
2. Make up two brackets using the angle aluminium to fit inside the case. These will be used to mount the fan. When you drill the holes in the brackets, drill them as close as possible to the angle join in the aluminium as this makes it easier to mount the fan. Screw the brackets into the case (you will need to remove it again, so don't do the screws up too tight).
3. The holes for the potentiometer and socket can be drilled out now. Make sure that you have enough room for the pot to fit inside the case as some models are quite large and the corners of the case intrude inside.
4. Centre the fan in the case and mark holes in the brackets so the fan can be screwed down onto the brackets. Also mark the outline of the where the fan blade travels over the brackets. This piece of metal needs to be removed. Once you have marked the holes and cutout area, remove the fan and the brackets. You can use an angle grinder to carefully remove the unwanted metal from the cutout area.

- Once your brackets are complete, insert the 40mm long fan mounting screws so that the heads are on the underside of the bracket and remount the brackets. Depending on the exact model of your fan, you may need to insert some spacers between the fan and the brackets. The aim is to get the magnets as close as possible to the bottom of the case (this will be the top when in use). The spacers can be additional nuts or pieces of plastic tubing.



- Its now time to mount the magnets on the fan as they should be bonded together by now. Again I used liquid nails to fix the magnet to the fan. The hardest part is getting the magnet in the exact centre of the fan. Put the magnet where you think it is in the centre, then spin it hard and if you can feel any vibration, shift it and try again. If you have any vibration, you will really notice it when you are using the stirrer.



- Once the fan has been mounted, we can now wire the stirrer up. Connect one wire from the fan to the earth (negative) point on the power socket. Connect the positive point on the power socket to the centre point on the pot. The other lead from the fan connects to one of the outer points on the pot. It is hard to tell which one to connect to, but looking at the back of the pot, with all the lugs pointing up, use the one of the right.

- If you have used the case that was listed above, then you will have a length of round plastic. This fits into the slot in the case lid (which will become our base) to make a waterproof seal. It may be longer that what you need and may need to be trimmed. The feet can also be fitted to the lid now as well.



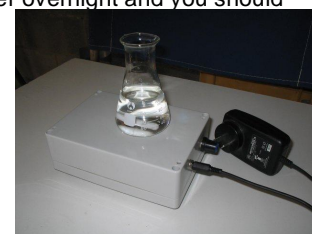
- The case can now be assembled. Once it is assembled, place one of the stir bars on top of the case and it should align itself with the magnet on the fan. Its now time to try it out!

Using the stirrer

Put the stir bar on top of the magnetic stirrer and let it align with the magnet on the fan. Start the stirrer, turn the pot to the fastest setting, then adjust the speed downwards until you reach the required stir rate. Depending on how the pot was wired, this may be fully clockwise or fully anti-clockwise.

When using the stirrer you need flat bottom vessels like Erlenmeyer flasks. In the 100mL flasks, use the 50mm bars and in the 1 or 2 litres ones, use the 70mm bars. You may also find other contains like ice cream topping bottles that have flat bottoms.

I usually pitch the started into 100mL of wort, stir it for 1½ to 2 hours, let it settle for an hour or two, then step the starter up to 2 litres and stir again for 1½ to 2 hours. Leave the starter overnight and you should have an excellent started the next day.



Summary

The magnetic stirrer can be built easily and does make it a lot easier to get yeast starters going. It is not hard to assemble, and if you do need help, you can contact me via [email](#)

Cheers

Peter

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