Cyclone Dust Collector DIY

Okay guys and gals, I have seen folks asking about this over, and over again, and I have seen Phil's answer that includes router table, or band saw and special jigs. I wanted to share with you my approach to the construction of a Thien Cyclone Separator lid. I have learned a LOT in the process of building my first one, and now the second is well under way. I hope this write up helps. I should note that this write up is done with the idea that it will be used for a 4" ducted system. If you are not using 4" adjust your sizes accordingly. Like Phil mentioned, there are no "plans" per se, and my solution may not work for your situation, but this is what I am doing to build my separator / baffles.

First things first, you need to obtain the materials to make your separator. I am using 3/4" MDF for mine since, honestly, it's what I have on hand. If had nothing on hand, I would have gone and grabbed some 3/4" sanded baltic birch, or Poplar plywood. For most builds a quarter sheet is really all you need, some need more than that... So here goes the shopping list.

- 3/4" BB ply, or whatever material you chose. Pine is cheaper, MDF is even cheaper. Take your pick. If you go ply, get sanded, unless you want to sand your arms off.
- 1/4" - 20 threaded rod. This is best purchased in 6' lengths. You will need to CAREFULLY cut this to shorter lengths making certain the threads are undamaged. Be comfortable with a file and possibly a thread chasing die.
- 1/4" - 20 stop nuts A.K.A. Nylon insert nuts, nylock nuts, lock nuts etc... You will need 6 of these.
- 1/4" fender washers. 12 of these
- 1/4" - 20 standard nuts. 12 of these.
- 4" S&D pipe nipple, OR 4" Dust Collection Hose Splice.
- 4" S&D street elbow OR 4" Dust Collection 90 degree elbow.
- Container. Your dust bin as it were. I am getting good results from galvanized steel trash cans.
- Hot melt glue for a glue gun (and the glue gun) or clear silicone adhesive sealant.
- sacrificial strip of lumber, or foam insulation or something to allow bit to cut through and not damage bit or floor. (or benchtop, or sawhorses, or... you get the idea I hope.)
- 4" Dust collection hose, and clamps.

Next, you will need to assemble the tools needed for the project.

- Router. Plunge or fixed base doesn't matter. Plunge is easier to start the cut with, a fixed base is a bit more dangerous to start the circle cut with.
- Straight cutting plunge router bit. I used MLCS item #7751 3/8" dia, 1" cutting length, 1/2" shank plunge cutting straight router bit.
- Rabbeting Router bit. I use MLCS #8366 9 piece rabbeting router bit, 1/2" shank. Set for a 3/8" deep rabbet cut.
- Circle Cutting jig. I use the Craftsman branded version of the Milescraft 1203. If

you don't have a circle cutting jig / edge guide for your router and want to buy this one, I STRONGLY advise you to immediately upon opening the box throw out the all plastic threaded knobs and replace them with 1/4" - 20 star knobs. I got mine from Rockler no problem...

- Jig Saw with GOOD wood cutting blades. I have both a junk old Skil jig saw, and junk Black and Decker blades. They work, but are not ideal.
- A means to sand the INSIDE of a circle. I am using an oscillating spindle sander, you can also use a sanding drum on a drill press to do the same job...
- Work surface and clamps. I use junk sawhorses for mine and don't care if I cut into them.
- Clamps to keep the work piece from moving on the work surface. 2 6 inch bar clamps work fine.
- Hot glue gun if using hot glue.
- Drill and drill bits.
- Measuring and marking tools, specifically.
  - Sewing measuring tape. The flexible fabric kind to measure and mark the outside radius.
  - Straight edge with measuring scale. A carpenter's square SHOULD be enough, but might not be long enough.
  - Pencil.
  - LARGE drawing compass, or at the very least, a string.

Now that you have the stuff, we move on by measuring the top of the container, outside lip to outside lip. I am again assuming a trash can here.... An example.

-Measure the outside lip to outside lip of the container in at least 3 different spots. Add those numbers up, and then divide by the total number of measurements to get your average. So for example your measurements are 19.5", 20", and 20.5" for a total count of 60 divide that by 3 for an average of 20. Now divide that number in half to get your radius (the space between the center point and the outside edge. That equals 10. Now that we have a radius, we know we want to overhang the edge just a hair to keep things from slipping in one way or another. Add 1/4" to that number. Now we have a radius of 10.25" right?

- Measure and mark your sheet material. Say you are using a quarter sheet of MDF. Measure 21" up the long side, and using your square draw a line across, insuring it is square, measure the distances in a couple of locations to insure you have it right. You should have a sort of square, 24" wide x 21" high. Using your square line up the opposing corners of the square and draw a line corner to corner. This gives you the center of the square.
- Drive the center point nail for the circle jig, and using your square, measure 10.25" from the nail, and draw a line.
- Set the router up with the straight bit, and circle jig, Connect the jig to the center point, and adjust so that the INSIDE edge of the cutting carbide is touching the outside edge of the line you just drew. Lock the jig down.
- With the work piece on a sacrificial piece, clamp it down so it won't move. Be careful to keep the clamps out of the path of the router.

- If using a plunge router, set the plunge depth to 1/4", if using a fixed base, set the bit depth to 1/4".
- Make your circle cut plunging or lowering the spinning bit / fixed base as neccesary.
- Repeat the two steps above but adjusting depth for 9/16" depth, and finally 7/8", the final cut WILL protrude through the bottom. This is why we put it on a surface we can cut. This last cut you MAY need to move clamps around to keep the circle piece captive while you complete the cut.
- Remove circle cutting jig, straight bit, and center point pivot hardware.
- Repeat the above process but setting the radius of the circle jig to 9 - 7/8" for the baffle piece.

Now to cut the rabbet.

- Set router up with rabbeting bit, set to make 3/8" rabbet, set bit depth no deeper than 1/2". I personally like doing 3/8" so that the distances are the same.
- Clamp the circle to your work support. You WILL have to stop, restart the cut to move the clamps.
- Make your rabbeting cut. I cannot succesfully do this via plunging, I simply sneak up on the cut and go to full depth riding on the bearing.
- Test fit the lid. It SHOULD be a snug fit, if not, figure out what measurements were off and start over again.

Make the cutout for the baffle.

- Using the sewing measuring tape, measure the outside circumference of the circle, divide by 3, and mark the start and end points on the outside edge of the disk.
- Using your square draw a straight line from the marks you just made to the center point of the disk.
- Measure, and mark 1.25" from the outside edge up on each of the lines you just drew.
- using a compass, or string, pencil, and nail, draw an arc from the center point, around the long way to each of the 1.125" in marks you just made.
- Using your jig saw, and possibly the drill / bits for starter holes, cut out the large radius notch.
- Clean up with a sander if necessary.

Cutting holes in the lid for the plumbing.

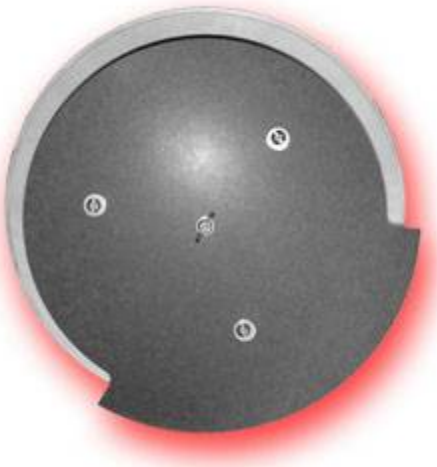
- Center the pipe nipple / hose coupler and use it to draw the outline of the center hole.
- use elbow and line it up to be as close as is comfortable to the edge close to the rabbet.
- Use drill bit and create starter holes.
- Use jig saw and cut out your holes from the lines you just drew being careful to stay inside the lines.
- Using a spindle sander, or similar arrangement, "sneak up" on the fit for the plumbing so that you can just slide the plumbing through.
- Sand the right side of the outlet of the elbow so that you can turn it in as close as possible to the side of the can.
- Line up the baffle with the lid, and insuring that the holes and supports will not

interfere with the plumbing, drill the 3 1/4" holes through both pieces at the same time. (This insures alignment.)

- Insert elbow, align to get as close to the side as possible without touching, and hot glue in place, filling any gap between elbow and its mount hole with hot glue for a complete seal. Insure at least 1-1/2" protrudes for the hose to clamp to.
- Cut threaded rod to 3 7" segments, clean threads on the ends. Install 2 normal nuts on each end, and a washer, allowing enough space to pass through the work pieces. Pass through from the inside, from the outside install washer, and lock nut.
- When all 3 spacer rods are installed, adjust the nutsso that the distance is equal, and the elbow barely touches the baffle.
- On the inside, screw the 2 nuts per side together in a "jam nut" configuration. This keeps it from backing off.
- Insert nipple / hose coupler adjust to where the end is 2" from the baffle.
- Hot glue the nipple / hose coupler in place the same way you did the elbow.
- Connect inlet hose to elbow, clamp in place. If you are using S&D fittings, the fit will be snug, slip the clamp on, then work the hose onto the fitting and clamp it down. You are good to go. Same applies below.
- Connect outlet hose to outlet, clamp in place.
- Test.

http://www.cgallery.com/smf/index.php?topic=137.0

Top of lid showing the two 2.5" dust ports I bought at either Rockler or Woodcraft. The exit port is top dead-center. The input port is positioned so the elbow is approx. .75" from the edge of the can.



The bottom view of the baffle. The baffle is cut such that its large diameter is the same as the inner diameter of the can measured at approx. 3" down from the rim. 120-degrees of the baffle is left at this larger diameter, while 240-degrees of the baffle is reduced in diameter by 2.25" (forming a 1.125" "drop slot."

The guts of the lid. The elbow was slightly modified so it can sit flush to the top of the lid and so it can hug the side of the can a little. Those spacers are made from 1/2" ABS that I cut to length and tapped for a 1/4" machine screw. The output port tube is a PVC coupler. The PVC fittings are simply hot melt glued to the plywood top.

Another view of the guts showing the relationship of the elbow to the baffle's expanded (120-degree) section. Testing indicated that this design minimized turbulence.