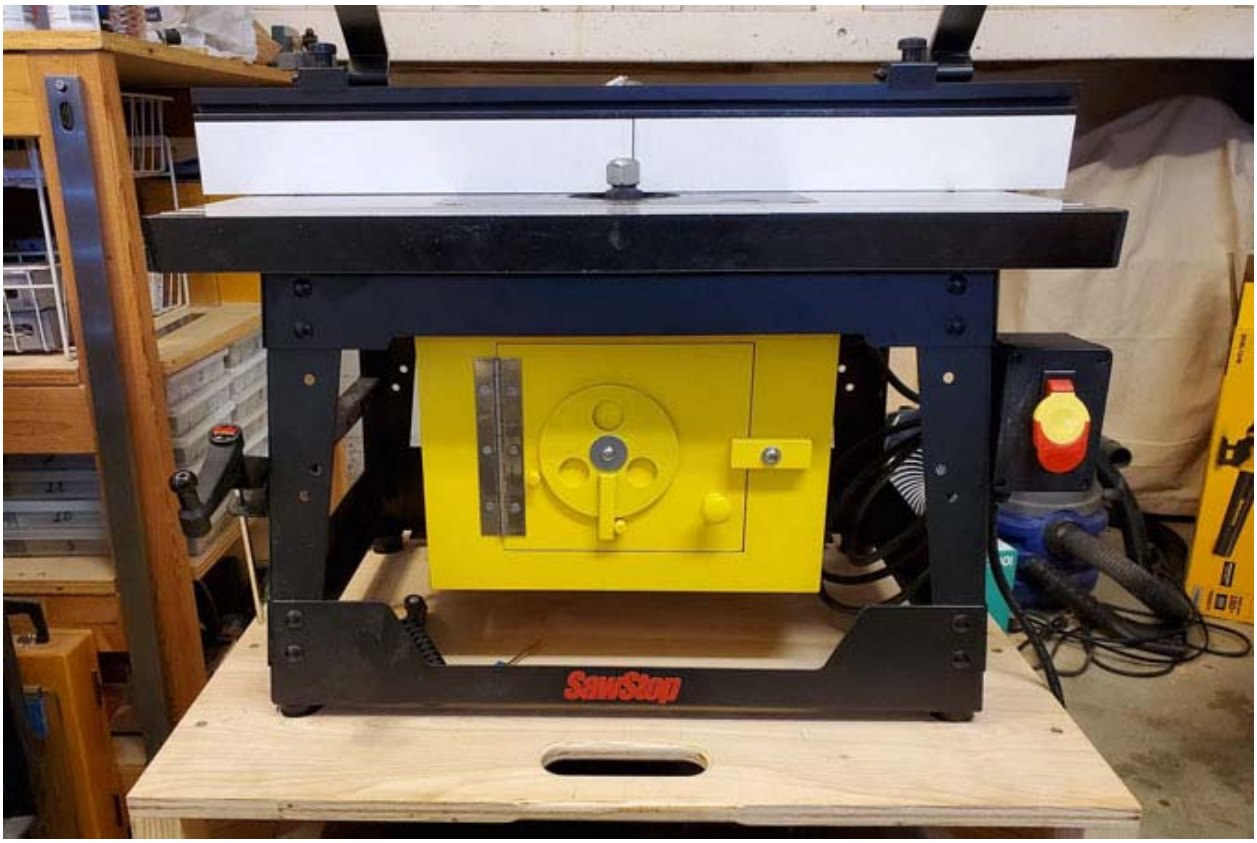
# INSTRUCTIONS

for Building

# A Dust Collection Box for the Sawstop Cast Iron Router Table

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# A Few Remarks About Making the Dust Collection Box

**Robert Penoyer**

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## A WARNING – PLEASE READ

Woodworking can be dangerous! It's up to you to determine if you can safely use the tools and perform the tasks needed to complete this and any other woodworking project. If you are unsure, STOP! Get advice from someone knowledgeable or do some careful studying on your own. Be safe!

Always wear at least an appropriate N95 dust mask or respirator when sanding or spraying paint. For advice about dust masks and respirators, visit this link:
https://woodworkingtoolkit.com/best-dust-masks-respirators/

**READ, UNDERSTAND, AND FOLLOW ALL OF THE INSTRUCTIONS AND WARNINGS THAT CAME WITH YOUR TOOLS. BE CAREFUL!**



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# Why Build This Project?

This Dust Collection Box project was designed and built to use a standard Shop-Vac® style shop vacuum—what most woodworkers rely on. SawStop's own RT-DCB dust collection box is made for a larger, 4" dust collection system.

*So if you use a Shop-Vac® style shop vacuum then this dust collection system is exactly what you need to keep all of that router table debris off of your shop floor.* Even my little 5-gallon shop vacuum works great with this project.

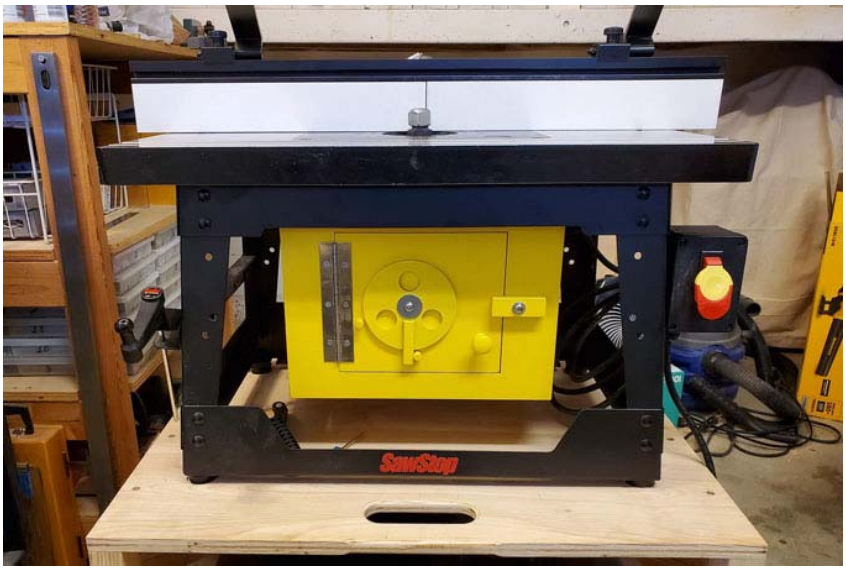


**Figure 1. Front View of the Dust Collection Box**

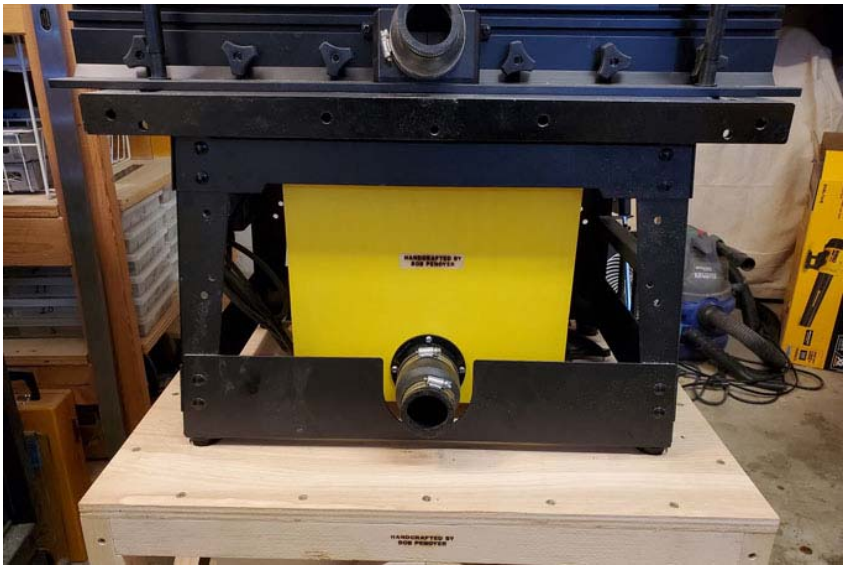

**Figure 2. Rear View of the Dust Collection Box**



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# Important Design Features of the Dust Collection Box

This Dust Collection Box is a great substitute for the SawStop® RT-DCB dust collection box because *it works well with smaller shop vacuums*.

**Mounting on a SawStop router table**

The box mounts beneath the top of SawStop's cast iron router table by using the threaded mounting holes built into the table. The mounting holes along the top edges of the box are designed for that table.

**Mounting on ANOTHER manufactor's router table**

The box can be adapted for use with many other manufacturers' router tables—or your homemade router table—simply by drilling the necessary holes into the table.

**Dust collection is optimized**

- *The Bottom is sloped toward the dust port!* The Front of the box is 2 1/8" shorter than the Back, so the Bottom slopes toward the Back and the dust port.
- *Baffles prevent dust from being trapped in the rear corners of the box.* A Baffle on each side of the box slopes steeply toward the dust port, causing the dust to fall where you want it to go.
- *A standard 2 1/2" dust port is used on the Back of the box.* This means standard shop vacuums can connect with it. I used a rubber pipe coupling (see Figure 2) to adapt the 2 1/2" port to the smaller hose of my 5-gallon vacuum.



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Figure 3 shows a side view of the unfinished box and its sloping Bottom.

**Figure 3. Unfinished Box Showing Its Sloping Bottom**

Figure 4 and Figure 5 show the Baffles sloping toward the dust port hole.

**Figure 4. View into the Unfinished Box Showing the Baffles Sloping Toward the Dust Port Hole**



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**Figure 5. Another View of the Baffles and Dust Port Hole Looking Through the Door**

## The Door of the box features an Air Gate

There is sometimes a need to relieve the force of the vacuum as shown in the following video link. This link is cued to the point of interest:

https://youtu.be/aAVewir54aw?t=43

The rotating Air Gate is shown in the open position in Figure 6.

**Figure 6. The Rotating Air Gate is Open**



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## Baffles surround the power cord

The port for the router's power cord uses two small Cord Baffles to close the 1 1/2" diameter hole in the Right Side of the box so that it closes around the power cord. These Cord Baffles are seen in Figure 7.

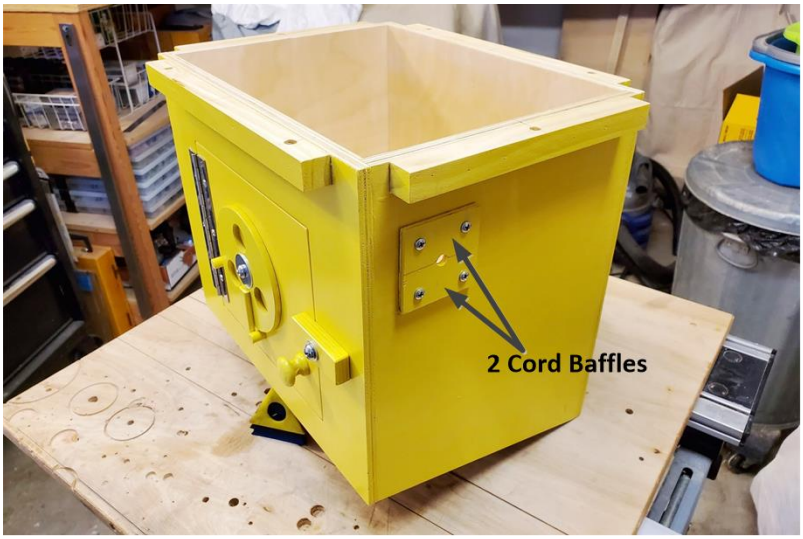


**Figure 7. Small Baffles on the Right Side Close the Large Opening around the Power Cord**

## The box is designed to be sturdy

*Forces caused when the vacuum is operating make the box want to collapse.* In fact, the force on each Side can be as much as 40 pounds inward. So the box was designed to be sturdy:

- The box's structure comprises 1/2" plywood
- Door Stop Rails and Stiles support the Door, so it will withstand the forces pulling it inward. These Rails and Styles can be seen Figure 5 and Figure 8.
- Rabbets cut into the Front, Back, and Sides provide strong joinery
- The Bottom is supported by rabbets at the bottom of each Side



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**Figure 8. The Door Stop Rails and Stiles are Seen Here**

There are no rabbets along the bottom edges of the Front and Back to support the Bottom. Instead, the Door Stop Rail Bottom presses against the Bottom at the Front as shown in Figure 8. A wood screw holding the bottom of the dust port at the Back passes through the Back into the Bottom, thus supporting the Bottom there.

One Stile in Figure 8 has a relief cut to provide room for the screw, washer, and locknut that secure the Latch to the Front.



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## Details of the SketchUp File and Equivalent PDF File

File *Dust_Collection_Box_15.skp* is the SketchUp design for the Dust Collection Box. This file is useful since all of the dimensions and other necessary details are incorporated here. But if you should find a dimension or other detail missing, it can be determined by examining this file. And, you can orbit and move the model around for a better look at everything.

File *Dust_Collection_Box_15.pdf* contains all of the images and dimensions from the SketchUp file. Use this if you're not familiar with, or don't use, SketchUp.

*The information that follows will help to make clear the details of some of the components and construction so that possible misunderstandings might be avoided.*

## Use the Included SketchUp or PDF File to Follow Along With These Descriptions

The heading of each section below corresponds to the name of a particular SketchUp/PDF page. Each unique part is given a unique color for easy identification.

<u>Perspective</u>

Look at the Perspective page to see the view of the outside and some of the inside of the Dust Collection Box. The Cleats along the top edge contain 5/16" holes positioned to agree with the holes on the bottom of the SawStop cast iron router table.

*The Cleats and holes can be adapted easily if you want to use the box on other manufacturers' router tables.*

The hole for the dust port can be seen in the Back near the Bottom. The hole for the router motor's power cord can be seen in the Right Side near the Front.

You can also see the Door, the rotating Air Gate with Air Gate Handle, two Stop Pegs that limit the handle's travel, and a small commercially purchased knob.

Finally, the simply rotating Latch is seen holding the Door closed.

The Door's hinge and other metal hardware are not shown in the design drawings.



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Exploded

This view shows ALL of the wood components of the Dust Collection Box. Each component is identified.

Baffle Placement

This partially open view of the box highlights the Baffles along the edges joining the Sides and the Bottom. Use the 8 1/2" dimensions shown in this view to place the Baffles correctly into the box during glue-up.

Baffle

There two Baffles. They are not symmetrical but are mirror images of one another; the Right is different from the Left. Each Baffle is fashioned from 1/8" plywood. (You can use thicker plywood but you will have to do a lot more sanding.)

To layout the Baffles, lay a sheet of 1/8" plywood on your work surface. Use a compass to strike arcs with the dimensions shown in the drawing. Join the intersections of the arcs with straight lines. Be careful about drawing the arcs and lines or the Baffles won't fit properly.

Cut along each line. *Leave the lines!* Then sand to the lines. A stationary belt sander is best for this since it has a straight, flat surface to press the Baffle against. Carefully sand by hand if you don't have access to such a belt sander.

Sand the inside edge of each Baffle to a sharp bevel as shown in Figure 9. *Remember that the Baffles are not symmetrical but are mirror images of each other. Be sure to sand on the correct side of each one.* The bevels should be sanded sharply enough so that the outer edges of the Baffles—no other part of them—will contact each Side, the Back, and the Bottom; the bevels should be sanded sharper if the outer edges aren't touching these surfaces directly

You'll want to sand to a sharp edge so the dust won't collect along the edges.



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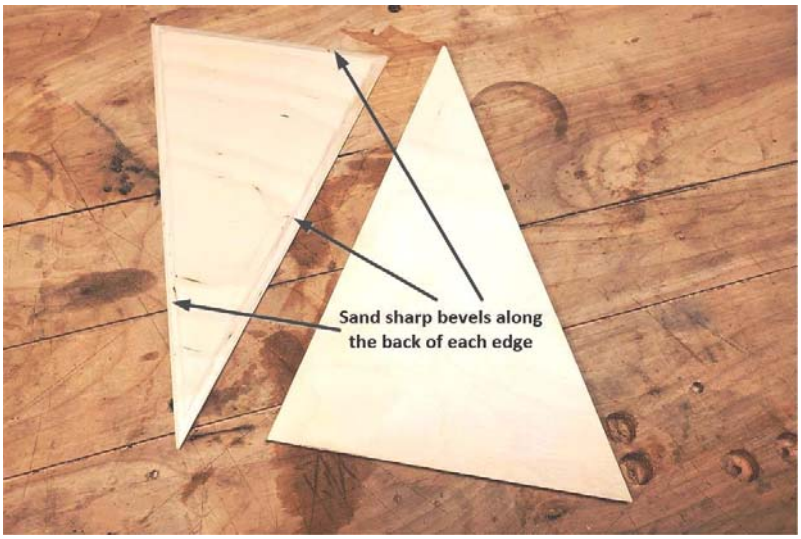


**Figure 9. The Back of Each Edge Must Be Sanded to a Sharp Bevel**

Front Assembly

Both sides of the Front are shown in this view. Notice that rabbets are cut on only two edges.

Read the section titled "Cutting the Door Opening in the Front" on Page 16 for a simple process for cutting an accurate door opening with straight, square edges.

***DO NOT*** *assemble the Door Stop Rails and Stiles until the Front, Back, Sides, and Bottom have been assembled.* It's necessary to wait until then because the Door Stop Rail Bottom must press against the Bottom for strength. This process will be described later on Page 19.

Door Assembly

The Door assembly is shown with the Air Gate turned to the open position. The Air Gate Handle can be rotated anywhere between the Stop Pegs.

There is a note indicating where the hinge is attached. I used a piece of piano hinge but you might want to use a couple of standard hinges.

The knob is purchased. I used a small wooden knob from Rockler. Its scan code is shown in Figure 10.



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**Figure 10. Scan Code for Knob Used on the Door—Sold by Rockler**

Of course, any small knob will do.

Door

The details of the Door are shown in this view. When a material thickness is given as 15/32″ as in this image, it refers to so-called 1/2″ plywood. The true dimension is closer to 15/32″ than to 1/2″, and the true thickness was taken into account in the design.

The centers of the 1″ holes are arranged along a circle with a radius of 1 1/4″ and spaced 120° apart from one another. Their positions are identical to the 1″ holes in the Air Gate.

*You might want to drill all of the holes in the Air Gate first, and then secure the Air Gate to the Door with a 1/4″ machine screw, and use it as a guide for drilling the 1″ holes in the Door. This will ensure exact alignments of all the 1″ holes.*

Air Gate

As with the Door, the centers of the 1″ holes are arranged along a circle with a radius of 1 1/4″ and spaced 120° apart from one another.



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The Air Gate material is called out as 1/4" plywood, but I used 1/4" MDF (Medium Density Fiberboard) instead because I didn't think my 1/4" plywood was flat enough. *You'll want to have a good seal between the Air Gate and the Door to block off air leakage when the Air Gate is in the closed position.*

It's important that the width of the Air Gate Handle is 1/2", as shown, because its width affects the alignment of the holes in the Air Gate with the holes in the Door when it's moved against the Stop Pegs.

*The edges of the Air Gate Handle should be softened by sanding to give it a comfortable feel.*

Latch

Details of the simple Latch are seen in this view.

Cleats

The Cleats are shown here in a top view. The spacings of the holes are dictated by the spacings of the threaded mounting holes in the bottom of the SawStop cast iron router table.

*You might want to modify the hole size and spacing if you intend to use the box on a different manufacturer's router table.*

Carefully cut each Cleat to the correct 3/4" x 3/4" cross section. Finally, mark and drill the 5/16" holes.

***DO NOT** attach the Cleats to the box until that process is described later on Page 23.*

Back

Details of the Back are shown in this view.

Note that the dust port hole has a 2 1/2" diameter but the recommended 2 1/2" dust port has a slightly larger diameter where it attaches to the Back. The dust port is shown in Figure 11.



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**Figure 11. 2 1/2" Dust Port with Scan Code—Sold by Rockler**

*It's important that the screws mounting the dust port to the Back are oriented as shown in Figure 12.* That is, one machine screw is at the top. Two more machine screws are on either side. Finally, *the bottom screw must be a wood screw that passes through the Back and into the Bottom.* This approach gives strength to the Bottom. This process is described later on Page 24.

**Figure 12. Orientation of the Dust Port Screws on the Back**



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## Sides

The two Sides are mirror images of one another with the exception of the 1 1/2" hole in the Right Side.

## Cord Baffle

There are two Cord Baffles as shown in the image. Wood screws are used to secure them to the outside of the Right Side.

I created the Cord Baffles by cutting a single piece of 1/4" thick plywood to the overall dimensions of both Cord Baffles. A 3/8" hole is drilled into the center. (Your router motor's power cord might have a different diameter.)

You should ideally use a thin Japanese razor saw to split the result into two pieces so the saw won't remove too much material and the hole is minimally affected.

## Bottom

The Bottom is a simple piece with two edges beveled to an angle of 77.4°. The bevels make a good fit against the Front and the Back.

## Stop Pegs

Two Stop Pegs are used as stops or limiters for the travel of the Air Gate Handle.

## SawStop Router Table Bottom Pattern

This is the hole pattern on the bottom of the SawStop cast iron table. All of the dimensions were obtained by measurement, not from a primary source such as a SawStop drawing. Nevertheless, these dimension worked quite well as the holes in the Cleats on the box fit very nicely against the bottom of the table.

The rectangle in the image shows the outside dimension of the boss[1] on the bottom of the table casting. The "tabs" extending from the rectangle in the image are part of the boss. No inside dimension is shown here. The width of the boss along the rectangle is about 1/4".

[1] Per Wikipedia (https://en.wikipedia.org/wiki/Boss_(engineering)): "In engineering, a boss is a protruding feature on a work piece."



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The outside edges of the box do not match exactly the outside edges of the boss on the table. This is because the box was designed so that all of the Cleats would be 3/4" wide and all of the holes in the Cleats would be along their centerlines, i.e., 3/8" from each edge. The very small differences with the rectangle's dimensions still permit a good, vacuum-holding fit between the box and the table.

HINT: It would be helpful to very carefully create a full-size pattern of the image showing the centers of the holes. You can then use it to verify the hole placements on the Cleats and box before attempting to mount the box to the table.

## Cutting the Door Opening in the Front

Make a Template

Here's a handy trick to achieving a clean opening for the Door in the Front. This trick applies to any rectangular openings that you might want to cut on other projects.

The door opening in the Front is 8 1/16" wide by 7 1/16" high. So cut up some wide hardboard or MDF strips, being sure that one of the strips is exactly 7 1/16" wide. Make a perpendicular cut across the 7 1/16" strip to give you two strips of exactly the same width.

Now glue the strips' edges together as shown in Figure 13, spacing the 7 1/16" pieces 8 1/16" apart. You've now formed a perfectly dimensioned rectangular opening with straight edges. This is ideal for flush cutting on a router table.

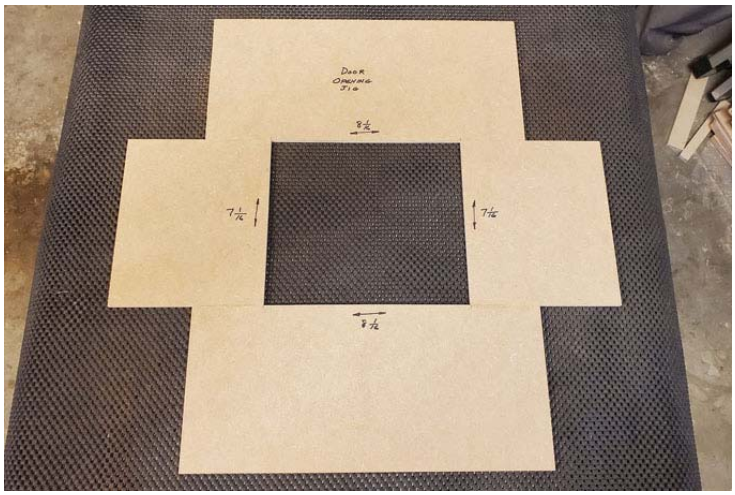


**Figure 13. Door Opening Jig**



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**Use the Template**

Use a pencil to carefully mark the door opening for the Front. Drill a hole inside each corner big enough to accept the blade of your jig saw, but stay away from the lines. Use the jig saw to cut from hole to hole along each line, staying about 1/8" inside the lines.

Now, using several small pieces of double-sided tape, secure the jig to the Front. Carefully align the inside edges of the jig with the lines that you drew on the Front and firmly press the jig against the Front. You're ready to flush cut the opening on the router table.

For stability, the inside edges of the opening in the Front should be cut with the larger jig resting on the table and the smaller Front on top of the jig.

Install a straight-cutting pattern bit into the collet of the router. The bit's bearing should be set to a height such that it will ride securely against the edges of the jig while the cutting edges of the bit are aligned to cut the entire thickness of the Front.

With everything set correctly, start the router, place the openings of the jig and Front over the bit, and flush cut the Front. *Be sure to use the proper safety equipment. Run the workpiece in the correct direction against the bit and trim the edges.*

The round router bit will leave rounded corners. Use a flush-cutting Japanese razor saw against each edge of the opening to square up the corners.

## Assembling the Dust Collection Box

You can obviously assemble the project as you like, but the following descriptions offer what I believe to be the best method.

**Sanding**

Sand all sides of the components with at least 120-grit paper before assembly.



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## Assemble the Back and Both Sides

Have two right-angle assembly squares ready. (A good choice is the Rockler Clamp-It® Assembly Square: https://www.rockler.com/clamp-it-assembly-square.) Have clamps ready.

- Lay the Back on a flat work surface with the rabbets facing upward
- Apply glue to the back edge of the Left Side and the left rabbet in the Back
- Place the Left Side firmly into the Left Side rabbet
- Clamp an assembly square to the flat work surface and the Left Side to ensure that the Back and Left Side are held at right angles to one another
- *BE SURE that the top edges of the two pieces are exactly flush*
- Apply glue to the back edge of the Right Side and the right rabbet in the Back
- Place the Right Side firmly into the Right Side rabbet
- Clamp an assembly square to the flat surface and the Right Side to ensure that the Back and Right Side are held at right angles to one another
- *BE SURE that the top edges of the two pieces are exactly flush*

DO NOT glue the Front into the Left Side or Right Side at this time.

Wait about an hour for the glue to cure before proceeding with the next steps.

## Assemble the Front to the Back and Sides

After waiting an hour for the previous assembly to cure, apply glue to the rabbets of the Front and to the front edges of the Left Side and Right Side. Insert the front edges of the Left Side and Right Side firmly into the rabbets in the Front *being absolutely certain that the top of the Front and the tops of the Sides are exactly flush*.

Wait at least an hour for the glue to cure.

## Assemble the Bottom into the Structure

Perform a dry fit of the Bottom into the bottom of the assembly, being sure that the angles of the bevels are parallel to the Back and Front.



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Is the Bottom a good fit? If it's too tight, sand or trim it as needed to improve the fit. If it's too loose, you should consider cutting a new Bottom or adding some filler to the gaps. The box should be a nominally airtight assembly, so be ready to fix any gaps.

Have some clamps ready.

- Remove the Bottom
- Apply glue to the rabbets in the two Sides
- Apply glue to all of the edges on the Bottom
- Firmly insert the Bottom into its location being certain that it's firmly seated into the rabbets
- Apply clamps as needed to ensure a snug fit between the Bottom, Back, Front, and both Sides

Let the glue cure for at least an hour. Then use wood filler to fill any gaps.

**Glue the Door Stop Rails and Stiles to the Inside of the Front**

Refer to the Front Assembly design image and its description on Page 11.

You might want to have a pin nailer available to help minimize the clamping needed in the following steps.

*Begin with the Door Stop Rail Bottom*. Use a pencil to draw lines *across* it so that a line is spaced 3/4" from each end. The lines will be 8 1/16" apart (the width of the door opening) if you cut the Rail to the specified length of 9 9/16".

Apply glue to the inside of the Front and the Door Stop Rail Bottom on the side with the pencil lines. Place the Rail firmly against the inside of the Front and press its bottom edge against the Bottom while the pencil lines are either both visible inside the door opening or just out of sight on both sides. Clamp it in place. Use a pin nailer here if you have one.

*Next, go to both Door Stop Stiles (the vertical pieces.)* Use a pencil to mark a line along each Stile 1/4" from one edge. For the Stile with the relief cut, draw the line along the edge that is opposite the cut.



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Begin the glue-up on the Stile with the relief cut. Apply glue to the inside of the Front and to the side of the Stile that has the pencil line. Place the Stile firmly against the inside of the Front at the right side of the door opening (the side near the 1/4" hole.) Be sure that 1/4" of the Stile can be seen in the opening and the pencil line is just visible all along the edge. *Ideally, the outside edge of the Stile should be aligned with the end of the Door Stop Rail Bottom.* Clamp the Stile in place. Use a pin nailer if possible.

Perform a similar glue-up and alignment on the left side with the other Stile.

Finally, attach the Door Stop Rail Top. Apply glue to the inside of the Front and one side of the Rail. Press the Rail firmly against the inside of the Front so that it rests on top of the two Stiles and its ends are aligned with the outside edges of the Stiles. Use a pin nailer if possible.

Be sure to carefully remove any glue squeeze-out along the inside of the door opening. *The Door might have trouble closing if you don't remove all of it.*

Also remove any glue in the relief cut of the Door Stop Stile Right. *You don't want hardened glue to interfere with the hardware that will be installed later.*

## Glue the Air Gate Handle

Refer to the Air Gate design image and its description on Page 12. The Handle must be aligned along a radius on the Air Gate spaced 60° from the adjacent 1" holes with the inside end of the Handle spaced 3/4" from the center of the Air Gate.

Glue the Handle to the Air Gate. Put the assembly aside.

## Assemble the Door

Sand the edges of the Stop pegs to soften their appearance and feel. Glue the Stop Pegs into the holes in the Door. Use a wood screw to attach the wood knob.

Prepare a piano hinge or hinges of your choice. Carefully center the Door in the Front while the box lies on its Back. Lay the hinge(s) flat on the Door and Front so that the knuckle(s) are centered along the seam between the Door and the Front. Use a pencil to mark all of the hole locations.



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Drill pilot holes for the hinge screws. I used #6 x 1/2" screws in the Door and #6 x 3/4" screws in the Front. Once the pilot holes are drilled, temporarily install the hinge(s). Hold the box in a vertical position and verify that the Door opens and closes smoothly. Do some trimming or sanding until it does.

Remove the screws and hinge(s) and put the Door aside.

**Preparing to Gluing the Baffles**

Refer to the Baffle Placement design page of the SketchUp or PDF drawing and the description on Page 10.

The assembly of the Baffles into the carcass can be tricky. The Baffles aren't symmetrical, they're mirror images, and they're not interchangeable. So be careful as you proceed.

*First, use a pencil to mark a reference point 8 1/2" down the inside of the Back, next to each Side. This will help to determine the correct placement of each Baffle.*

- You must do a dry fit first so you can rehearse the procedure that you will use to glue each Baffle into place
- Select one of the Baffles and test its fit in the box. Observe the pencil mark that you just made. Try to place one corner of the Baffle at or near that mark and try to place the point of the Baffle at or near where the Bottom, Side, and Front meet. Make sure the bevels that you sanded into it are against the Back, Side, and Front. If the fit is nice, you have placed the right Baffle in the right place.
- If the Baffle didn't fit, try the other Baffle in the same location. If that Baffle fits, you now have the right Baffle in the right location. Now try the other Baffle at the other location.
- If neither Baffle fits, you should take a second look at each one and make sure it was cut to the correct dimensions and the correct edges have been sanded, and sanded sufficiently
- You're ready to glue the Baffles into their corresponding places once you've made sure that you have a good fit



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## Holding the Baffle in Place as the Glue Cures

It will be a challenge to hold each Baffle in place as the glue cures.

My approach is shown in Figure 14. I added A LOT of glue (to help fill any gaps) to the beveled surfaces of the Baffle. I put the Baffle in the correct location. Then I tilted the box up by placing a painter's point (or painter's pyramid) under one Side.

**Figure 14. Tilt the Box and Add a Clamp and Some Weights to Hold the Baffle**

A clamp through the dust port hole, pressing against the Baffle, secures one corner of the Baffle. Weight supplied by two hammers press the Baffle into place along the rest of its length. A close-up of the clamp and hammers is seen in Figure 15.

*Watch for glue collecting in the corners. Wipe away any glue squeeze-out.*



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**Figure 15. Close-up of Weights and a Clamp Holding the Baffle While the Glue Cures**

## Gluing the Cleats

*The accurate assembly of the Cleats onto the carcass of the box is the most important process of the entire assembly. The holes in the Cleats must accurately agree with the threaded holes in the router table.*

*In addition to accurately locating the holes of the Cleats, their top edges must be absolutely flush with the top edges of the carcass in order to prevent unnecessary air leaks.*

Add some pencil marks as references:

- Add a pencil line across the top of the Left Cleat and Right Cleat aligned exactly at the center of the single hole
- Add a pencil line across the top of the Back Cleat and the Front Cleat centered exactly between the centers of the two holes
- Add pencil lines across the tops of the Front, Back, and both Sides located exactly at the center of each

Prepare at least two clamps and glue. A pin nailer is useful here to minimize the usage of clamps.



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Apply glue to one side of one of the cleats. Apply glue to the area of a side of the box where the cleat will be attached. Carefully align the pencil marks on the Cleat and the side, and then clamp the cleat into place. Be sure the top edges of the Cleat and side are absolutely flush and the pencil marks are aligned exactly. Be sure, also, that the glue is not causing a gap between the two pieces. If you have a pin nailer, insert 4 or 5 pins into the Cleat and side.

Repeat the process for the other Cleats.

**Pilot Holes for Mounting the Cord Baffles**

Be sure you've drilled clearance holes in the Cord Baffles for the screws to be used to secure it to the Right Side. Refer to the Cord Baffle design page of the SketchUp or PDF file for hole locations if needed.

Hold the two Cord Baffles together against the outside of the Right Side being certain that the center hole that they form is centered exactly in the 1 1/2" hole. Mark the mounting hole locations on the Side. Drill pilot holes at the locations marked.

**Attaching the Dust Port**

The screw holes in the dust port must be oriented as shown in Figure 12 and described in the paragraph above it.

Place the dust port against the Back with the screw holes oriented correctly. *Be sure the bottom edge of the inside of the dust port is flush with the bottom of the 2 1/2" hole in the Back.* Mark the holes.

Drill clearance holes for #10 machine screws in the top hole and the two side holes. Drill a pilot hole in the bottom hole such that it passes through the Back and into the Bottom. *You might want to angle it up a little bit to help prevent it from blowing out of the sloped Bottom.*

Use a #10x1" machine screw in the top hole and the two side holes. Add flat washers inside the box followed by nylon locknuts.

Use a #10x 1" wood screw in the bottom hole.



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# Applying the Finish

Your choice of finish—or no finish—is up to you but I will describe what I did. I was very pleased with the results that were achieved.

## Disassemble Everything First

Begin by disassembling all items held together with screws.

## Make the Inside Smooth

It was important to me to apply a finish on the inside of the box that would be smooth. I thought that a smooth, slippery surface would help the dust to fall/slide toward the dust port hole. I chose clear shellac.

## Make the Box Noticeable

I decided to use paint on the outside of the box because I wanted the box to stand out from the black router table stand. I chose glossy yellow paint.

## Precautions: No Finish on Some Surfaces

Two painted surfaces that contact each other tend to stick together. The Latch and the Air Gate both rotate against another surface. Do not apply a finish to the surfaces of those two items that will touch the Door or the Front.

Also: Do not apply a finish to the unseen surfaces of the Cord Baffle.

## Sanding Sealer Makes the Surfaces Smoother

I began by applying a single coat of the sanding sealer in Figure 16 on all surfaces of the box except the items cited in *Precautions: No Finish on Some Surfaces*, above. I sanded all of the surfaces lightly with 400-grit sandpaper after the sealer had cured.



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**Figure 16. Sanding Sealer**

It's not common practice to use sanding sealer under paint, but a test on a piece of scrap plywood showed that the top coats were smoother and more uniform when using the sealer.

## Apply Shellac to the Inside

I chose to put a clear shellac finish on the inside of the box. Two coats of clear Zinsser spray shellac (Figure 17) were used, sanding lightly with 400-grit sandpaper after the first coat cured.



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**Figure 17. Zinsser Clear Spray Shellac**

The shellac was also applied to the top edges of the box that will contact the router table.

The result was a nice, smooth, nominally slippery surface for the dust to fall against.

## Apply Paint to the Outside

Two coats of Krylon, All-In-One (paint plus primer,) Gloss Sunbeam yellow paint were applied to all outside surfaces. These included all surfaces of the Door and the paintable surfaces of the Latch, Air Gate, and Cord Baffles. (See *Precautions: No Finish on Some Surfaces* on Page 25 to avoid applying paint to surfaces that should not be painted.) I lightly sanded with 400-grit paper after the first coat cured.



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**Figure 18. Yellow Paint**

**<u>Let the Finishes Cure/Harden</u>**

The finishes should cure so they're not tacky to the touch. You can promote and speed the curing process by apply heat. Don't burn the surfaces of the box or its parts. <u>Don't cause a fire!</u> <u>Don't use a torch!</u>

I used a heat gun, the sort used by painters, to heat up all of the finished items until I was satisfied with the hardness of the finish. The results were smooth, hard surfaces, slippery on the inside and attractive on the outside

## Final Assembly After the Finish Has Been Applied and Cured

**<u>Door</u>**

Use a 1/4-20 x 1 1/2" screw to attach the Air Gate to the Door.

- Put a 1 1/4" fender washer under the head of the screw
- Insert the screw into the Air Gate and then into the Door. Be sure the Air Gate Handle is located between the two Stop Pegs.
- Add a 1 1/4" fender washer behind the Door



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- Screw on a 1/4-20 nylon lock washer
- Carefully Adjust the tightness of the screw and nut. The Air Gate should be held firmly against the door but not too tightly. You want the Air Gate to be able to rotate but not so freely that it might move while the router motor is running.

**Front**

Lay the box on its back on a work surface. Lay the Door into the door opening. Attach the hinge to the Door using #6x1/2" wood screws. Attached the hinge to the Front using #6x1" wood screws.

Tip the box into a vertical position and make sure that the door opens and closes freely with limited or no rubbing.

**Latch**

Use a 1/4-20 x 1 1/2" screw to attach the Latch to the Front.

- Put a standard flat washer under the head of the screw
- Insert the screw into the Latch and then into the Front
- Add a standard flat washer behind the Front
- Screw on a 1/4-20 nylon lock washer
- Carefully Adjust the tightness of the screw and nut. The Latch should be held firmly against the door but not too tightly. You want the Latch to be able to rotate but not so freely that it might move while the router motor is running.

**Dust Port**

*Use #10 hardware to mount the dust port over the hole in the Back.*

- Put a 1" machine screw through a hole in the dust port
- Put the screw through the top clearance hole
- Add a standard flat washer on the inside of the box
- Screw on a nylon lock washer, but do not tighten the nut completely

Repeat the above procedure for the screw holes at the right and left sides of the dust port. Then screw a 1" wood screw through the bottom screw hole of the dust port and into the Back and Bottom.



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Snug up each screw in turn, and then tighten each screw fully.

## Cord Baffles

The Cord Baffles are added after the box is mounted to the router table. This procedure is discussed later on Page 32.

## Rubber Pipe Coupling (Optional)

The hose of my little 5-gallon Shop-Vac vacuum is too small for the 2 1/2" dust port, so I used a rubber pipe coupling as an adaptor. If your vacuum's hose is not compatible with the 2 1/2" dust port, you should do something similar.

The pipe coupling I used is shown in Figure 19. (Ignore the dimensions on the label. I don't know what those represent since I'm not a plumber, but this coupling fits nicely onto the 2 1/2" dust port.) The PlumQwik coupling, part number P1056-215, was purchased at Lowe's.

**Figure 19. Pipe Coupling Used to Adapt the 2 1/2" Dust Port to a Smaller Vacuum Hose**

Loosen the large clamp and force the coupling over the dust port. Then tighten the clamp.

The small clamp will be discussed later on Page 32.



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# Mount the Box to the Router Table

## Mounting the Box

The box is now ready to be attached to the router table. *The process described below is for use on the SawStop benchtop router table. Your method of attachment may differ.*

- Remove the router lift from the table
- Turn the table upside down
- Place the newly completed box through the router table stand and rest it on the boss of the tabletop. (You might have to maneuver the box very carefully to get it inside the router table stand if you attached the pipe coupling in the previous section. If it simply won't fit, remove the coupling and reattach it once the box is screwed into place.)
- Use six metric M6-1.00x25 screws with flat washers under the screw heads to mount the box to the table. I did not use lock washers here, but if you choose to, place a split lock washer between the flat washer and the head of each screw. (If the holes in the Cleats do not line up closely enough to thread the screws into place, you might want to remove the box and widen any misaligned holes using a rat tail file.)

## Installing the Lift and Router Motor

With the box attached, turn the table upright and open the Door. Carefully lower the router lift and router into the table while feeding the power cord out through the Front. Seat and adjust the router lift as needed.

## Dressing the Power Cord

Adjust the router lift to its lowest setting.

Now carefully dress the power cord back in through the Front and through the hole in the Right Side.

My router table uses a JessEm 02120 Mast-R-Lift II with the motor from a Milwaukee 5625 router. Figure 20 shows the power cord dressed with the router lift adjusted to its lowest point.



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**Figure 20. Power Cord Dressed with Router at Lowest Position**

## Attach the Cord Baffles

Be certain that the power cord has enough slack inside the box as shown in Figure 20. Then place the top Cord Baffle on the box and secure it in place with two wood screws.

Now place the bottom Cord Baffle on the box and press it tightly against the cord and top Cord Baffle with the cord passing through the hole in the two Cord Baffles. Secure the Cord Baffle into place with two wood screws.

## Adjust the Small Clamp on the Pipe Coupling

Now is the time to adjust the small clamp on the pipe coupling if you installed one, as I did.

Place the end of the vacuum hose into the pipe coupling. Tighten the clamp enough to provide a nominally air-tight fit and prevent the hose from coming out on its own. Adjust the clamp so that the end of the vacuum hose fits snuggly but loose enough that you can remove the hose and reinsert it without making any more adjustments to the clamp.



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## You are Now Ready to Try Your New Dust Collection Box

Of course, most router tables have a dust port behind the split fence. Select a sample workpiece and router bit that will require recovery of dust by the new box, not the port on the fence. Prepare to cut a dado or groove, for example.

Select a table insert with enough space between the bit and the insert so that the vacuum can easily pull the dust through that space and into the box.

Close the Door on the box and close the Air Gate. Insert a bit into your router, and adjust the router's height. Attach the vacuum hose, turn on the vacuum, and give the new box a try!

## My Results for Comparison

To test the box, I used a 3/4" diameter straight-cutting bit to cut two grooves 1/2" deep into a piece of 2x3 that was 26" long. (This was done in two steps: cutting 1/4" deep and then 1/2" deep.) This is equivalent to turning almost 20 cubic inches of wood into sawdust:

$$3/4'' \times 1/2'' \times 26'' \times 2 = 19.5 \text{ cu. in.}$$

The relative volume of wood converted to sawdust is very roughly 1:2 (wood:sawdust) per
http://www.woodweb.com/knowledge_base/How_Much_Sawdust_Will_I_Make.html
and
https://www.srs.fs.usda.gov/pubs/ja/1968/ja_1968_thompson_001.pdf

So the volume of the sawdust created in my test might have been 40 cubic inches. Picture a square box measuring about 3.4 inches on each edge that's full of sawdust.

Figure 21 shows the dust remaining in the box after the test run. Not much! I can't explain why there was dust on the right side but not on the left side.



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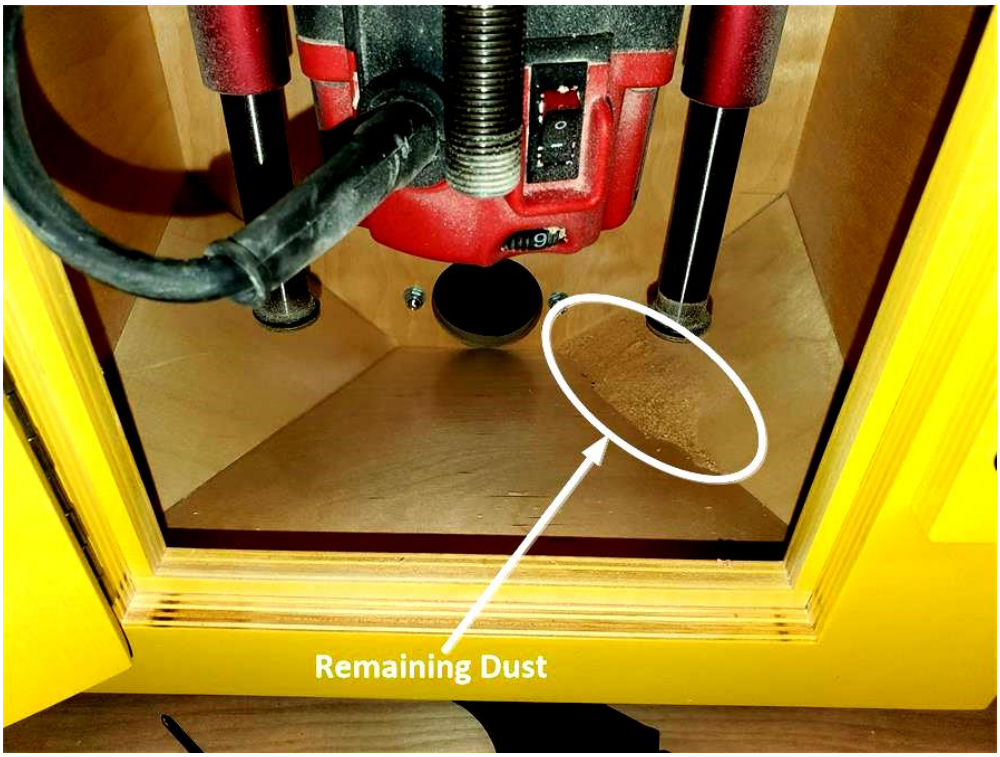


**Figure 21. Dust Remaining in the Box After the Test Run**

The test piece is shown in Figure 22. I used a 1 1/4" table insert around the bit to give some space to pull the sawdust into the box. The remaining dust that didn't go into the Dust Collection Box is shown in Figure 23.



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**Figure 22. The Test Piece After Cutting Two 1/2" Deep x 3/4" Wide Grooves**

**Figure 23. The Sawdust that Didn't Get into the Box**



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