

Bottle Stoppers

By Dan Douthart



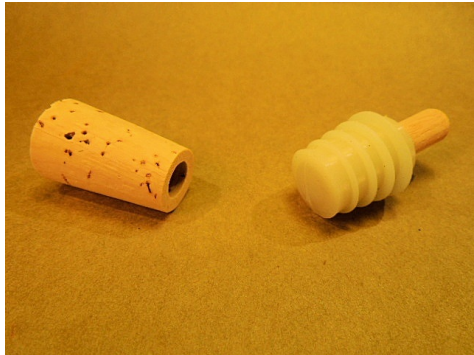
<http://www.gwinnettwoodworkers.com/>

<http://www.youtube.com/user/gwinnettwoodworkers/videos>

Bottle Stoppers

These bottle stoppers are commonly thought of as wine bottle stoppers, but they can also be used for many other kinds of bottles. I have heard that the Baptists use them on olive oil bottles. There are many styles of bottle stoppers ranging from a simple cork to machined stainless steel with silicone "O" rings.

Cork and Silicone Stoppers



These are by far the cheapest option.

Corks with a 3/8" hole are sold in packages of 10 with a price per cork in the 43 to 55 cent range. If cost is a concern then you could probably buy solid corks and drill them yourself.

The silicone stoppers with maple dowels are sold in packages of 5 or 10 with a unit price of \$.90 to \$1.10.

Metal Stoppers with Silicone Rings



Here are is a sample of the available metal stopper designs.

Numbered 1-5 from left to right, stoppers 1,2 & 4 are available in either plated steel or stainless steel. Stoppers 3 & 5 are only available in stainless steel.

The plated steel unit prices range from \$3.45 - \$6.99. The stainless steel unit prices range from \$5.55 - \$14.29. There is typically a price break for quantities of 10 or more.

Considerations for the Bottle Stopper selection and Stopper Knob Design

A bottle that needs to be chilled after opening also needs special attention when selecting a bottle stopper. Some stoppers seal tight enough that the bottle can be laid down, but for most stoppers the bottle will need to stand upright. My refrigerator has a narrow shelf designed to handle tall items, but even with this shelf at its lowest point there is only 2" of clearance over a standard 750ml wine bottle. Most of the finished stopper knobs that I see will sit too tall in the bottle to permit a wine sized bottle to stand upright in a refrigerator.

The stainless steel stoppers will not rust, chip or corrode like the plated steel stoppers when left in a bottle of wine for an extended time. On the other hand, if you do not let an open wine bottle linger and you wash and dry the stopper after use, a plated stopper will give good service.

Bottle Stoppers



I prefer a stopper knob that has a nice feel in the hand. I do not go for ones that have small sharp details. This is the knob style that I have been using. The lower element is tapered to continue the conical shape of the stopper. The side is a smooth ogee curve up to the slightly domed top. The upper corner is then cut off to create a smooth taper and take away from the door knob appearance.

The domed top provides for texturing or an inserted detail.

Completed Bottle Stopper Examples



This is a cork stopper.

It is the cheapest solution, but not one of my favorites.

The cork does not seat firmly enough that I would trust it on a bottle laying down in the refrigerator and with this knob, it is too tall to stand up in the refrigerator.

I also do not particularly care for the visibility of the cork between the bottle and the knob.

The corks with a 3/8" hole and 3/8" dowels are available in packages of 10 at:

	corks	dowels
Craft Supplies USA	\$4.35	\$0.70
Woodcraft	\$4.50	
Packard Woodworks.	\$5.50	\$0.60

These prices are for the premium Flor corks. Craft Supplies USA also has a lower quality cork, which has more and larger pits, at a lower cost.

Bottle Stoppers



This is a silicone stopper.

At around a dollar this is an inexpensive solution and my favorite stopper.

I like the way it allows the stopper knob to sit in contact with the bottle.

It seals tight enough to lay a bottle down in the refrigerator and with the knob sitting directly on the bottle, I have 2" to play with in designing the knob, allowing the bottle to stand upright if desired.

These silicone stoppers with maple dowels are available in packages of 5 or 10 at:

Packard Woodworks 10 for \$8.95

Peachtree Woodworking Supply 10 for \$8.99

Rockler 10 for \$10.99

These silicone stoppers sleeves and dowels are available separately at:

Craft Supplies USA 5 for \$3.25 Silicone Sleeves

5 for \$1.50 Maple Dowels

Woodcraft 10 for \$8.99 Silicone Sleeves



This is stopper #1 with my primary knob style.

I do like that way this stopper looks with the style of my knob. I do not like the way so much of the shiny metal is showing. To be happy with this stopper I would need to come up with a different knob style that would blend in with the stopper shape.

On the positive side, with the top silicone ring seated in the bottle, the seal is very tight and probably the best of the lot.

The silicone rings are easily removed for cleaning and replacements are available if needed.

These stoppers are available at:

	Stainless	Plated
Rockler		\$3.49
Berea Hardwoods	\$9.00	
Woodcraft	\$14.29	\$6.89

Bottle Stoppers



This is stopper #2 with a knob designed for this specific stopper.

The idea for this knob came from a picture in the Craft Supplies USA catalog.

This stopper is known as the “Classic Bottle Stopper”.

The seal is not tight enough to lay a bottle down and with all of that stuff showing above the bottle, the stopper knob cannot be over an inch tall to permit standing the bottle up in the refrigerator.

This stopper is available just about everywhere:

	Stainless	Plated
Penn State Industries		\$3.45
Packard Woodworks		\$3.85
Peachtree Woodworking Supply		\$3.99
Craft Supplies USA		\$4.25
Rockler		\$6.99
Berea Hardwoods	\$9.00	
Woodcraft	\$14.29	



This is stopper #3 with my primary knob style.

This stopper is known as either a Mini Droplet or a Mini Teardrop.

The seal is good, but I don’t believe that I would trust it with a bottle laying down.

The small amount above the top of the bottle provides for more flexibility with the stopper knob design.

This stopper is available from several sources:

	Stainless	Plated
Packard Woodworks	\$5.55	
Craft Supplies USA	\$5.75	
Penn State Industries	\$5.95	
Peachtree Woodworking Supply	\$5.99	

Bottle Stoppers



This is stopper #4 with my primary knob style.

This stopper is known as either a Droplet or Teardrop.

Like the mini, the seal is good, but I don't believe that I would trust it with a bottle laying down. There is a bit more of the stopper showing above the bottle and larger in diameter than on the mini. This limits the height of the knob and requires a thicker knob neck to fit the stopper.

The longer tail on this stopper adds more weight lower on the assemble, which provides for a different balance and feel.

This stopper is available from several sources:

	Stainless	Plated
Packard Woodworks	\$5.55	
Craft Supplies USA	\$5.95	\$3.95
Berea Hardwoods		\$4.99
Woodcraft		\$5.29



This is stopper #5 with my primary knob style.

This stopper is known as the "SS Niles Stopper"

Even though this stopper has three "O" rings, I have never found a bottle that fits the smallest or the largest "O" ring. Maybe one of those rings will fit an olive oil bottle.

The quality of this stopper is very good with a machined body and cut threads. The only draw back that I see is that it only seals on the middle "O" ring about 1/8" in from the top of the bottle. I would not even consider using it on a bottle that is laying down.

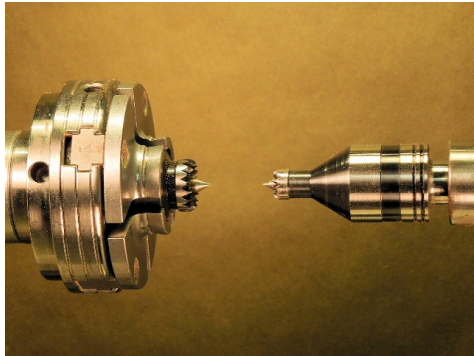
The small amount above the top of the bottle provides for more flexibility with the stopper knob design.

This stopper is available from several sources:

	Stainless
SS Niles Bottle Stoppers	\$6.45
Packard Woodworks	\$6.50
Peachtree Woodworking Supply	\$6.99
Rockler	\$8.49

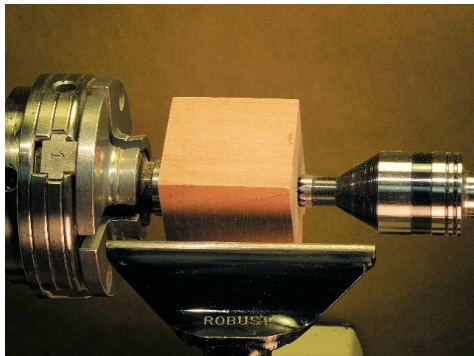
Bottle Stoppers

Preparing the Stopper Knob Blank

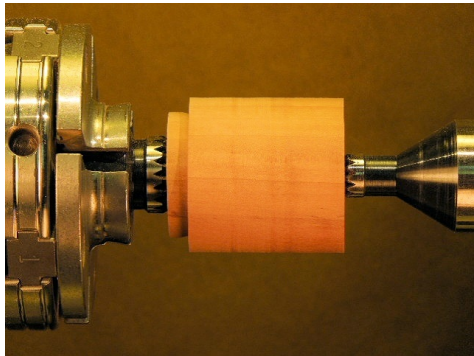


I start the blank preparation between centers.

I prefer a Sorby Steb drive mounted in the chuck, which makes it easy to judge the correct size tenon for mounting in the chuck and quicker than swapping between a morse taper drive and the chuck.

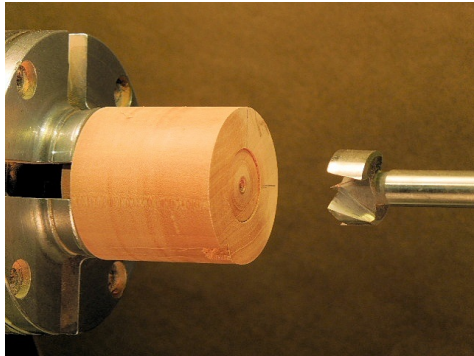


I start with a blank about 1.75" square by 2" long mounted between centers. Decide which end of the blank would be best for the top of the knob and mount the blank with that end facing the chuck



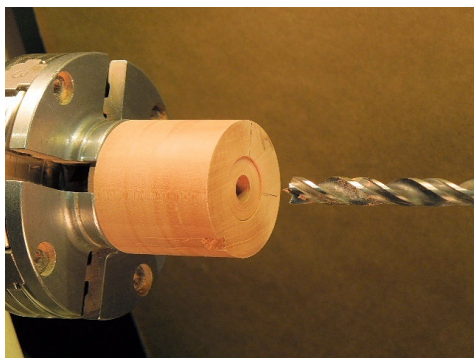
Turn the blank round and cut a tenon on the chuck end.

Bottle Stoppers



Remove the round blank and the drive center. Mount the blank in the chuck, using the tail stock live center to assist with proper alignment.

Replace the live center with a chuck mounted Forsner bit. Use a Forsner bit that is a bit larger than the diameter of the stopper. Bore a hole in the blank that is just deep enough to provide a perfectly flat mating surface for the stopper to seat against.



Replace the Forsner bit with a brad point drill bit sized for the stopper.

3/8" for the cork stopper dowel

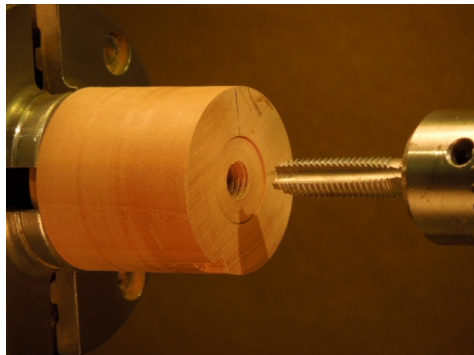
23/64" for the silicone stoppers from Peachtree

6mm for the 1/4"-20tpi thread on stopper #1

11/32" for the 3/8"-16tpi thread on the others

Bore a hole deep enough so that the tap will give full size threads for the length of the stopper shaft.

For the cork or silicone stoppers, glue the dowel in this hole using a water proof glue. Proceed to mounting the stopper knob blank for turning.



Unplug the lathe or if the motor drag does not permit free movement of the spindle, remove the drive belt. Swap the drill bit with the correct sized tap. Back off the quill until the drill chuck morse tape is not bound in the quill.

Advance the tail stock until the tip of the tap is close to the hole in the blank. The tail stock will keep the tap properly aligned while you hold the drill chuck and turn the lathe spindle by hand, threading the tap into the blank's hole. If the stock is soft, I coat the walls of the hole with thin CA before taping. I always coat the threads with thin CA after

taping the hole. After the CA has cured, run the tap through again to clean up the excess CA.

Bottle Stoppers

Mount the Stopper Knob Blank For Turning



I use a collet to hold the dowel on the a cork or silicone stoppers. The cork stopper uses a 3/8" collet. The silicone stoppers from Peachtree uses a 1/2" collet.

The threaded mandrels for the other stoppers can have a morse taper to fit the spindle taper, threaded to fit the spindle or have a straight shaft to fit a collet.

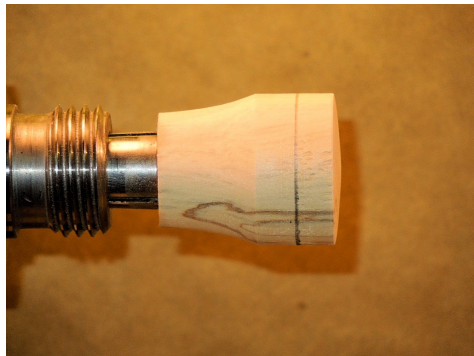
Turning the knob for a Silicone Stopper



I used medium CA to glue the dowel into the block and sealed the Forsner cut surface with thin CA.

For this style of stopper, the Forsner cut surface is large enough to cover the top of the bottle.

The dowel is inserted into the collet and then tightened into the spindle with a draw bar.



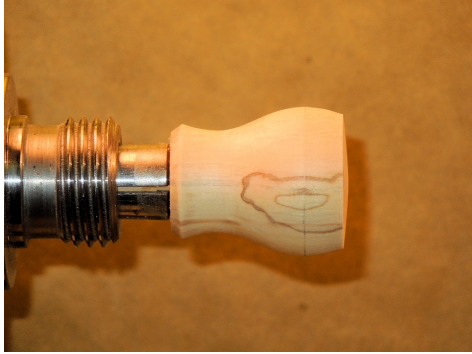
I turned the knob block to 1 3/8" in diameter to match the fattest area of the knob.

The top end of the block is slightly domed at about 1 3/4".

Taper the spindle end down to just over 1" to match the diameter of the bottle neck.

The pencil mark locates the fattest part of the knob.

Bottle Stoppers

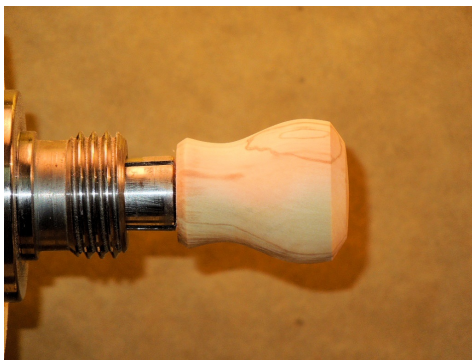


Cut a small taper on the base edge of the block.

Cut from this new edge down to the narrowest point.

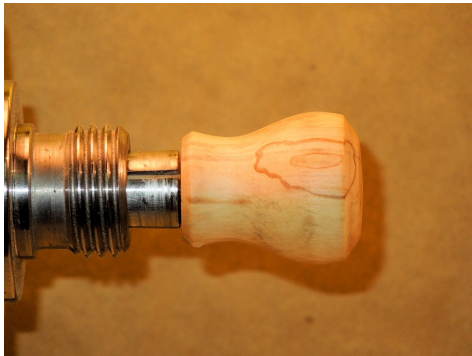
Cut from the fattest point down to the narrowest point forming a smooth ogee curve.

Continue the ogee curve around to the edge of the top.



Cut a bevel across the top edge.

Sand through the grits to 400.



Apply a coat of Mylands Cellulose Sanding Sealer.

In this photo, after the sanding sealer, I finished with gray (600) and white (800) non-woven abrasive pads.

Bottle Stoppers

Turning the knob for a threaded metallic stopper

I have never liked the way part of a metallic stopper shows between the bottle and the knob. I believe that shiny bits of the bottle stopper showing, detracts from the stopper knob. After all the stopper knob is what I want to show off. Ron gave me the idea of imbedding the top of the stopper into the body of the stopper knob. The knob style shown previously does not allow for that, so I had been trying to come up with a knob style that would allow imbedding the top of the stopper.

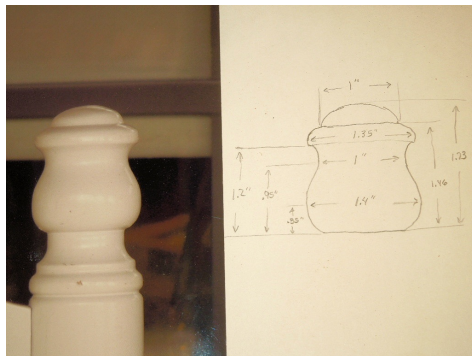


When my wife and I are traveling, we always try to find a Cracker Barrel restaurant for lunch or diner. After eating, the wife must check out the gift shop, while I occupy a rocker out front and check out the sites.

The sites were slow one day and I happened to notice the finials on the rocker's back.

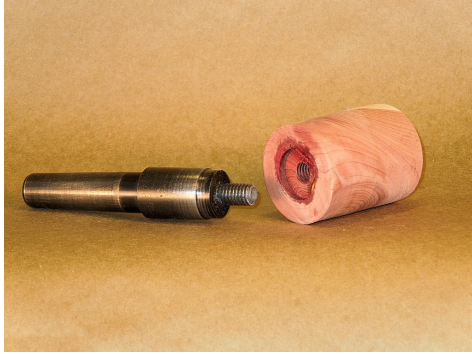
Then it struck me, that is exactly what I have been looking.

You just never know where you might find a inspiration for a design.



I scaled it down to my desired dimensions.

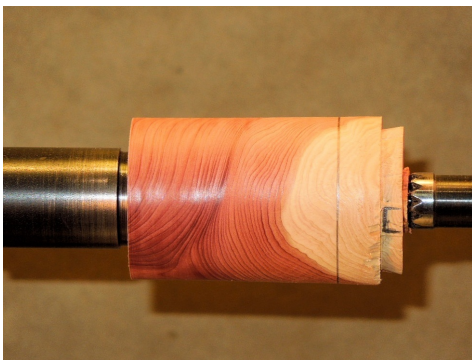
Bottle Stoppers



With the bottle stopper inserted fully into a bottle, I measured the length of the stopper above the bottle. I subtracted 1/16" from this number and bored the Forsner hole to that depth. The bottom of the Forsner hole is a finished surface so I sealed it with thin CA.

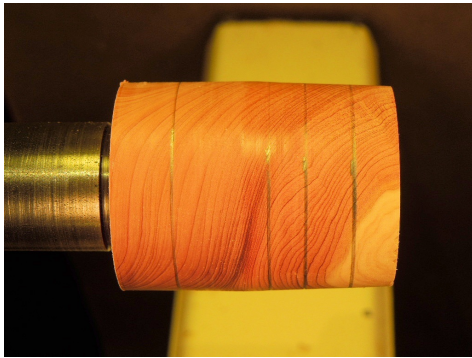
A threaded mandrel holds the knob blank for turning.

A draw bar holds the mandrel in the lathe spindle

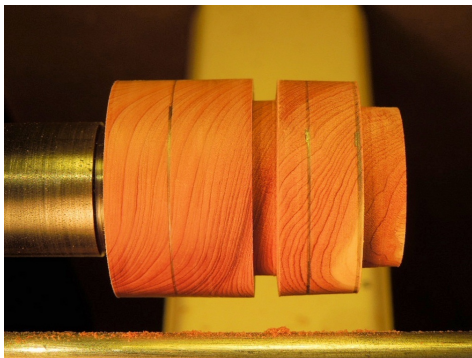


The stopper block has been turned down to 1 3/8" to match the largest diameter of the finished knob.

I have marked the blank 1 3/4" from the base to show the finished knob height.



I trimmed the length of the blank down to the desired stopper knob height and marked significant locations. The lines from left to right are: the lower widest point, narrowest point, the upper widest point and the base of the top button.



Using a parting tool I cut into the narrowest point a bit short of the final depth and removed waste material around the top button.

Bottle Stoppers



Round the base from the lower widest point down to the edge of the Forsner hole.

Working down hill from both sides of the narrowest point, create a smooth ogee curve between the lower widest point and slightly below the upper widest point.

From the upper widest point, cut a smooth curve up to the base of the top button and a slight curve down to form an edge with the ogee curve. Round over the top button.



Sand through the grits to 400.

Apply a coat of Mylands Cellulose Sanding Sealer.

In this photo, after the sanding sealer, I finished with gray (600) and white (800) non-woven abrasive pads.

Bottle Stoppers

Finishing the Stopper Knob

I am currently using Liberon Finishing Oil on my bottle stoppers. The instructions on the can says that the oil will dry in 5 hours, but I typically let it dry over night. I usually apply 4 or 5 coats of oil to build the desired sheen. After the final coat of oil has dried over night, I use gray (600) and white (800) non-woven abrasive pads and Liberon 0000 steel wool to remove any dust nibs and then use the Beall buffing system to bring out the shine.



I use a hand piece to hold the stopper knob during the finishing process. The one on the left has a 1/2" hole to hold the dowel. The one on the right has a 3/8-16 bolt to hold the threaded knob.

These knobs have received 5 coats of oil and have been buffed by hand with the non-woven pads and steel wool. They are ready for buffing on the Beall system.



The knobs have been buffed and are ready for use.

The stopper is out of sight.

