Vacuum Chucks Demo

1 Introduction: What Good Are Vacuum Chucks?

What good are vacuum chucks? Why should I waste my money on a vacuum system?

I think the following quotes provide a good explanation.

⇒ Beaver Pond Studio: "*There are times when you need to re-work a bowl after you thought it was finished. A little touch-up sanding here, a little re-shaping there, fixing a ding somebody put in a piece at an Art Fair. Or, you might just want a way to hold a piece while you turn off the bottom tenon so nobody knows how you had it attached to the lathe. I find a vacuum chuck perfect for these applications.*"

⇒ Packward Woodworks Inc: *"Woodturners are becoming more aware of the advantages of holding the workpiece on the lathe with a vacuum setup. When reverse turning a bowl no marks are left on the workpiece and natural edge bowls can be held easily."*

⇒ Oneway Manufacturing: *"Vacuum chucking is one of those things that has to be seen to be believed. Put your piece on the drum chuck, turn on the vacuum and turn on your lathe. Your piece is held quickly and securely. Work is not marked and can be removed instantly when the vacuum is turned off. With a vacuum set up you will be able to add a professional touch quickly and easily to almost all your work."*

2 Credits & References:

Updated: 12/28/2019

Beware! This is an old handout with some out of date information.

I no longer have access to Framemaker program thus I can not easily update this document and frankly I rather spend my time working on other things.

Thus I am just going to update or remove the really out of date things.

www.stubylatheusa.com is out of business. Thus you can not purchase vacuum pumps from them.

I now recommend checking out the used vacuum pumps at www.frugalvacuumchuck.com

The general information and the vacuum drum chuck info at the end is still relevant. Thus I have decided to leave this document on the web with this warning at the top.

3 About McMaster-Carr Industrial Supply

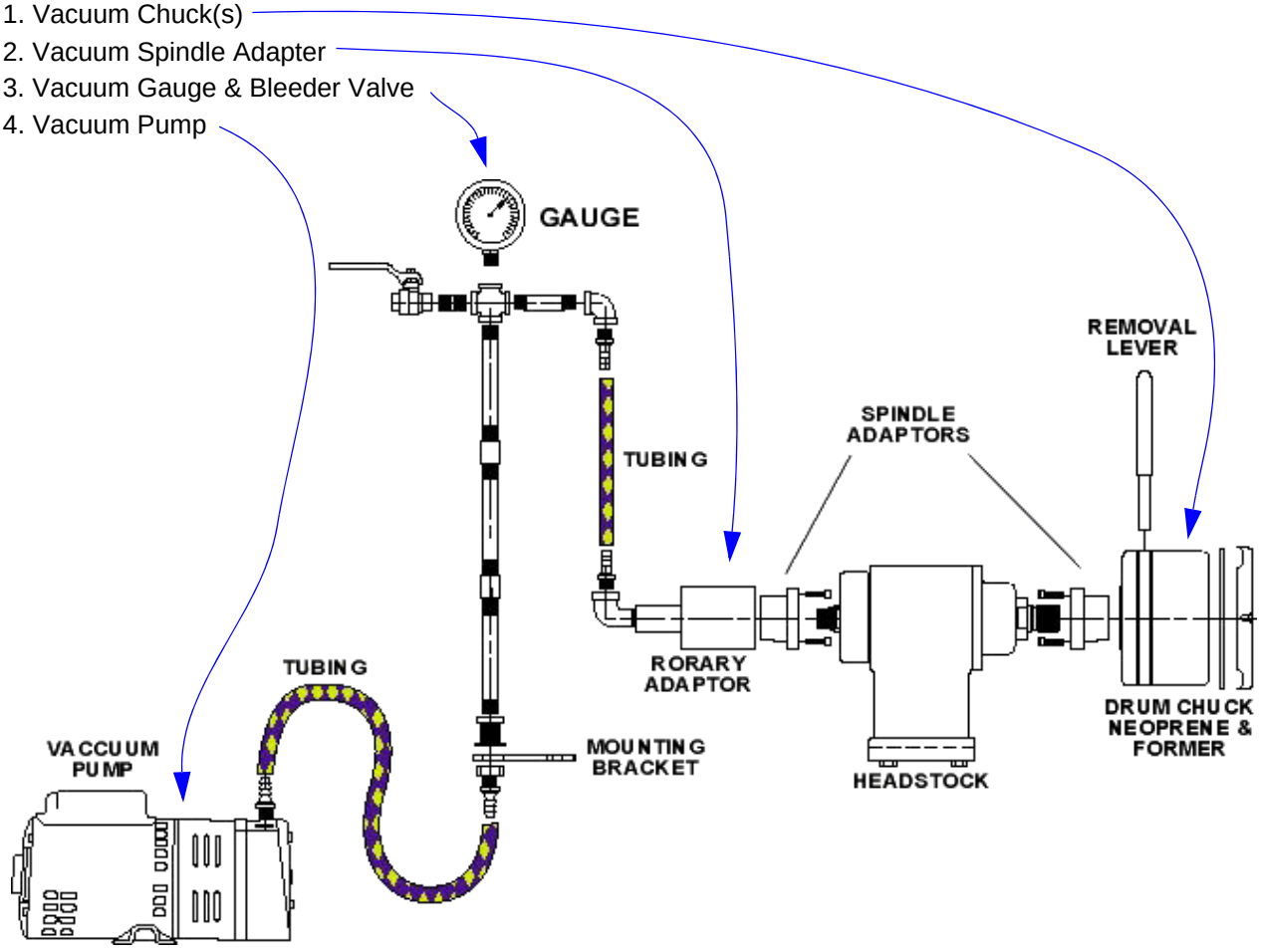
McMaster-Carr (www.mcmaster.com) is an industrial supply company. They are a big old name and used to be wholesale only. They will now sell to anyone if you pay by credit card and order via internet.

I buy everything from McMaster-Car because there prices are very good, **there shipping is cheap and very fast.** They ship actual cost from Dayton NJ. Things almost always come the next day at no extra cost. However, they do things the old fashioned way. They will send you a separate invoice in the US mail latter showing you the shipping charge. It usually is $5-$6 dollars, or less. Really heavy stuff can be a little more.

4 Vacuum Chuck Systems: What Do I Need?

In order to set up a vacuum system on your lathe you need 4 main ingredients:

1. Vacuum Chuck(s)
2. Vacuum Spindle Adapter
3. Vacuum Gauge & Bleeder Valve
4. Vacuum Pump



Vacuum System Diagram (From Oneway, thus it shows Oneway Style Components)

5 Vacuum Pumps & Gauge: What Are My Options?

~~There is a very good used vacuum pump available from the Surplus Center for only $90. This is the way to go!~~ People have tried cobbling together all kinds of things, but for only $90 why not go with a first class system that was designed for the intended purpose?

3/5/2009 Update: It appears that the really good vacuum pumps that use to be available from the Surplus Center are no longer available. **The vacuum pumps the Surplus Center now has for sale appear to be of lower quality. Nosier? More used? But the price is now only $55. The new vacuum pumps are only rated at 20 in Hg max vacuum rather than 26 in Hg max.** However this still appears to be the best way to go.

Another option is to look for a vacuum pump on Ebay. **Beware! Gast makes a lot of different vacuum pumps. They look similar but are vastly different.** You need to look for a **Rotary Vane Pump** that is rated at **26 in Hg** max vacuum! **Look for a picture of label on the pump** and look up the Gast mfg number on Gast Web site. (*http://www.gastmfg.com/productinfo.html*) **DO NOT trust the Ebay write up!**

5-1 Purchase EXPENSIVE New Vacuum Pump and Gauge Kit

I **DO NOT** recommend going this way! I am showing this option for reference.

New Vacuum Pump

Gauge Kit (Gauge, Valve, Cross Fitting, Pipe)

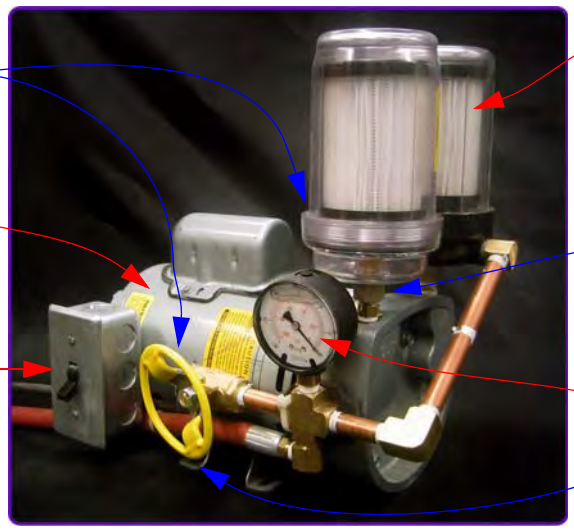
Item Description	Supplier	Item #	Quantity	Price on 3/5/09
Gast Rotary Vane Oilless Vacuum Pump, 4.5 CFM Free Air, 26" Hg Max Vacuum, 10 PSIG, 1/4 hp, **110 VAC**, 4.6 amps Note: **McMaster-Carr shipping is fast and cheap.**	www.mcmaster.com The same pump is sold by Packard Woodworks for $445 and Craft Supplies USA for $400 plus shipping.	9901K64	1	**$365.64** + Cheap Shipping ($14 ???)
Oneway Vacuum Gage Kit Note: This is a very expensive way to go. A better valve and gauge plus pipe fittings will only cost you about $42 from www.mcmaster.com. Purchase items 3 to 6 and 12 to 14 in section 5-2. If you want a hose with quick disconnect fittings also purchase items 7 to 9.	www.woodturnerscatalog.com	327-1600	1	$89.99
Switch for Vacuum Pump Supply your own or purchase items 15 to 19 in section 5-2. Item #15 is two pole switch. You only need a 1 pole switch (www.mcmaster.com #7030K32 rather than 7030K33) Or, plug it into a switched outlet strip.	Local Store	NA	NA	$12.00??

12/28/2019 Update
The Vacuum Pumps from www.frugalvacuumchuck.com is probably adequate and a better deal.

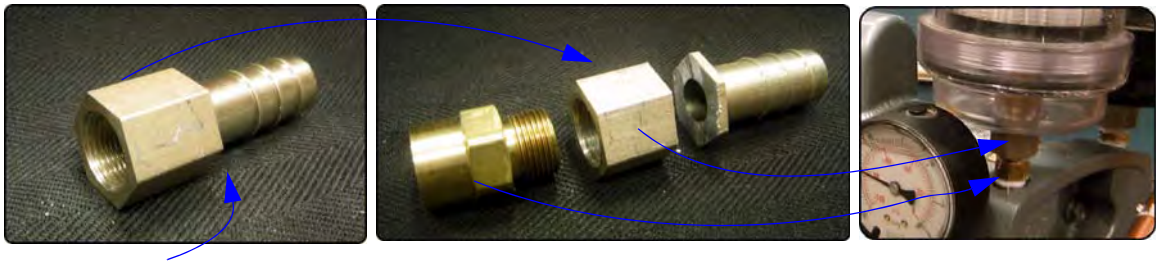
5-2 Purchase Used Vacuum Pump, Supply Your Own Gauge Kit

This is the option I recommend. **The only big downside here is the Vacuum Pump will only work on 220 VAC**. It will not work on 110 VAC. But, it only draws 1.5 amps so you can add it to an existing 220 VAC circuit. (VAC = Volts AC)

Note: If you want to plug the 220 VAC vacuum pump into the same outlet as your lathe you can replace the commonly used 220 VAC **single** female receptacles with a **duplex** one available from www.mcmaster.com. Item # 7120K93 for 15 amp 250VAC plug blade configuration or item # 7120K94 for 20 amp.



This barbed fitting comes with air filter from Surplus Center. Modify it to create coupling nut.



Cut with hacksaw. Sand on belt sander back to start of threads. It will be hard to get started on pipe but not impossible. This is necessary because thread on air filter is non standard 9/16" by 24. Hard to match!

Item Description	Supplier	Item #	Quanity	Price on 3/5/09
1. USED: Gast Rotary Vane Oilless Vacuum Pump, 4 CFM Free Air, 20" Hg Max Vacuum, 10 PSIG, 1/4 hp, **220 VAC**, 1.5 amps Note: This pump is **not as good as** the 26" Hg Max pump sold by McMaster, Packard Woodworkers, etc. This pumps is also **220 VAC** rather than **110VAC** and does not have filters on input/output. **The motor CAN NOT be rewired to run on 110VAC.**	www.surpluscenter.com	4-1669	1	**$54.95** + Shipping **You can buy 6 of these for the price of a new one at $365.00**
2. Air Filter	www.surpluscenter.com	4-1565	2	2 * $5.99
Pipe Hook Up for Vacuum Pump (Hard to find! Get from www.mcmaster.com)				
3. Brass Ball Valve With Oval Handle 1/4" NPT Female	www.mcmaster.com	4901K21	1	$20.65
4. Glycerin-Filled ABS Case Gauge 1% Midscale Accuracy, Bottom Conn, 0 To -30 Hg	www.mcmaster.com	38465K11	1	$20.35
5. Bronze/Steel Exhaust Muffler/Filter 1/4" NPT Male, 1-3/8" Height, 9/16" Diameter	www.mcmaster.com	4450K2	2	2 * $1.97

12/28/2019 Update

It looks like the Surplus Center has sold all of its good used Vaccum Pumps.

The best deal now is probably the Vacuum Pumps from www.frugalvacuumchuck.com

If you go with that vaccum pump you don't need a lot of the stuff listed in this table. See Section 5-1 on page 3

Item Description	Supplier	Item #	Quanity	Price on 3/5/09
6. Brass Pipe, 1/4" NPT, Cross	www.mcmaster.com	50785K233	1	$7.61
Pipe Hook Up for Vacuum Pump (Local Store or www.mcmaster.com)				
7. Air and Water House W/3/8" Brass Male X Male Fitting, 10', 3/8" ID, 200 PSI	www.mcmaster.com	5304K84	1	$17.45
8. Tru-Flate-Shape Hose Coupling Plug, 1/4" NPTF Male, 3/8" Coupling Size	www.mcmaster.com	95815K44	1	$1.48
9. Tru-Flate-Shape Hose Coupling Socket, 3/8" NPTF Male, 3/8" Coupling Size	www.mcmaster.com	95815K64	1	$10.72
10. Brass Pipe, Compression Fitting Male Straight Adapter for 3/8" Tube OD, 1/4" NPTF	www.mcmaster.com	50915K323	2	2 * $1.53
11. Brass Pipe, 1/4" NPT, 90 Deg Elbow	www.mcmaster.com	50785K36	1	$2.76
12. Brass Pipe, 1/4" NPT, Male X Female 90 Deg Elbow	www.mcmaster.com	50785K43	2	2 * $1.57
12a. Brass Pipe, 3/8” x 1/4” NPT, Female x Male Adapter	www.mcmaster.com	50785K28	1	$2.75
13. Brass Pipe, 1/4” NPT, Nipple 2" Length	www.mcmaster.com	4568K133	2	2 * $1.71
14. Brass Pipe, 1/4” NPT, Nipple 6" Length	www.mcmaster.com	4568K142	1	$4.02
Electrical Hook Up for Vacuum Pump (Local Store or www.mcmaster.com)				
15. Light Switch, 15 Amps @ 277 Vac, Dpst-No, (double pole) Note: This is a light switch but it is rated to handle motors at 80% of rating.	www.mcmaster.com	7030K18	1	$13.50
16. 1/2” Conduit Box Adapter, 11/16” Length Note: This will thread into the existing knock out on motor so you can attach steel switch box directly to motor.	www.mcmaster.com	7513K17	1	$0.47
17. Steel Switch (Handy) Box, 2”x4”x1-7/8”	www.mcmaster.com	71695K21	1	$1.82
18. Toggle Switch Cover, 2-1/”x4” for Handy Box	www.mcmaster.com	71695K24	1	$0.69
19. Romex Cable Clamp, for 1/2” knockout	www.mcmaster.com	7798K41	1	$1.03
20. 3 Conductor Power Cord, 220V Plug, 18/3 6’7”	www.mcmaster.com	70355K77	1	$3.16
21. 220 VAC Duplex Female Receptacle. 7120K93 for 15 amp, 7120K94 for 20 amp.	www.mcmaster.com	7120K93	Optional	
			Total	$189.04 + Shipping

5-3 Purchase Hold Fast Vac Generator

The Hold Fast Vac Generator is **not a vacuum pump!** It generates a vacuum from compressed air via a venturi system. **It must be driven by an Air Compressor.** Cost is around $130.

I have never used one of these system however, the following questions come to mind:

Update : 12/28/2019 I really don't like Venturi Systems!

1. Why should I wear out a $500 air compressor when I can purchase the right tool for the job, a vacuum pump? A used pump from Surplus Supply is only $55.
2. Venturi systems are very inefficient. Only 4% efficient. See *http://www.industrial-vacuum.net/glossary1.htm*
3. My air compressor is nosier than my Gast vacuum pump. Way to nosey. I don't want to add the venturi noise on top of this.
4. Turning the bottom of a bowl and sanding it often takes 30 minutes or longer. Do I really want to run my air compressor that much?
5. The Vac Generator only generates 19" Hg of vacuum. Same as used pump from Surplus Supply. Less than 26" Hg vacuum of a new Gast vacuum pump from McMaster Car.
6. When it gets humid in my shop there is a lot of water vapor in the output from my air compressor. How long before this fouls up the Vac Generator? Will it generate less than 19" Hg of vacuum?
7. Why would I want to walk in an easterly direction if I really want to go west? Why not walk west if I want to go west?

   If you want a vacuum then use a vacuum pump, not an air compressor!
8. A real vacuum pump is really the way to go?

6 Vacuum Spindle Adapter: What Are My Options?

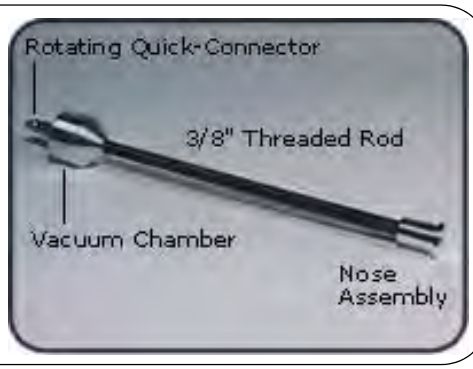
Pick one of the options in this section that suits you. All of the options are for lathes with a spindle thru hole. If your thru hole is air/vacuum tight you can use any of the options shown here.

If your lathe does not have a thru hole (like a Polewood lathe) then your only choice is a "VacuuMaster" chuck. That option is not discussed because it starts at $300.00 and quickly adds up to more. It is covered by *http://www.wonderfulwood.com/vacuumchuck.html*

6-1 Purchase E-Z Vacuum Adapter for #2MT

This option is reasonably priced but you can make your own for less. The **disadvantage** to this system is you end up with the nose assembly at the inboard spindle end of your lathe. This adds length that may interfere with your face plates and/or chucks. The same holds true if you make your own E-Z Vacuum type adapter. A Oneway Style Rotary Style Vacuum Adapter provides a more solid and thus better solution for permanent mounting. See section 6-3 and 6-4.

E-Z Vacuum Adapter



Item Description	Supplier	Item #	Quanity	Price on 3/5/09
E-Z Vacuum Adapter #2MT	www.packwardwoodworks.com	111210	1	$82.95 + Shipping

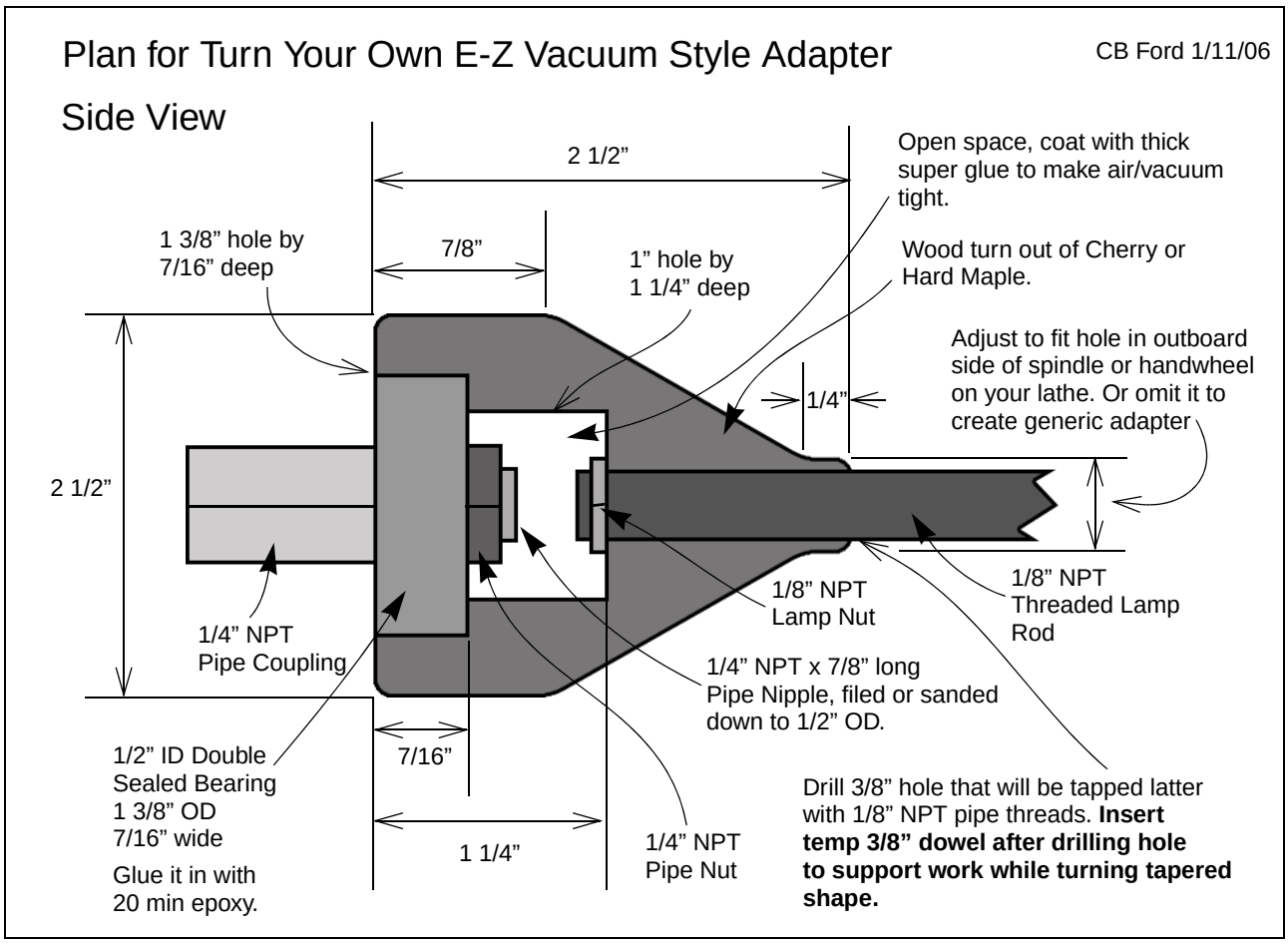
Update : 12/28/2019 I think the "Precision Vacuum Adapters" from jtturningtools.com are a better deal.

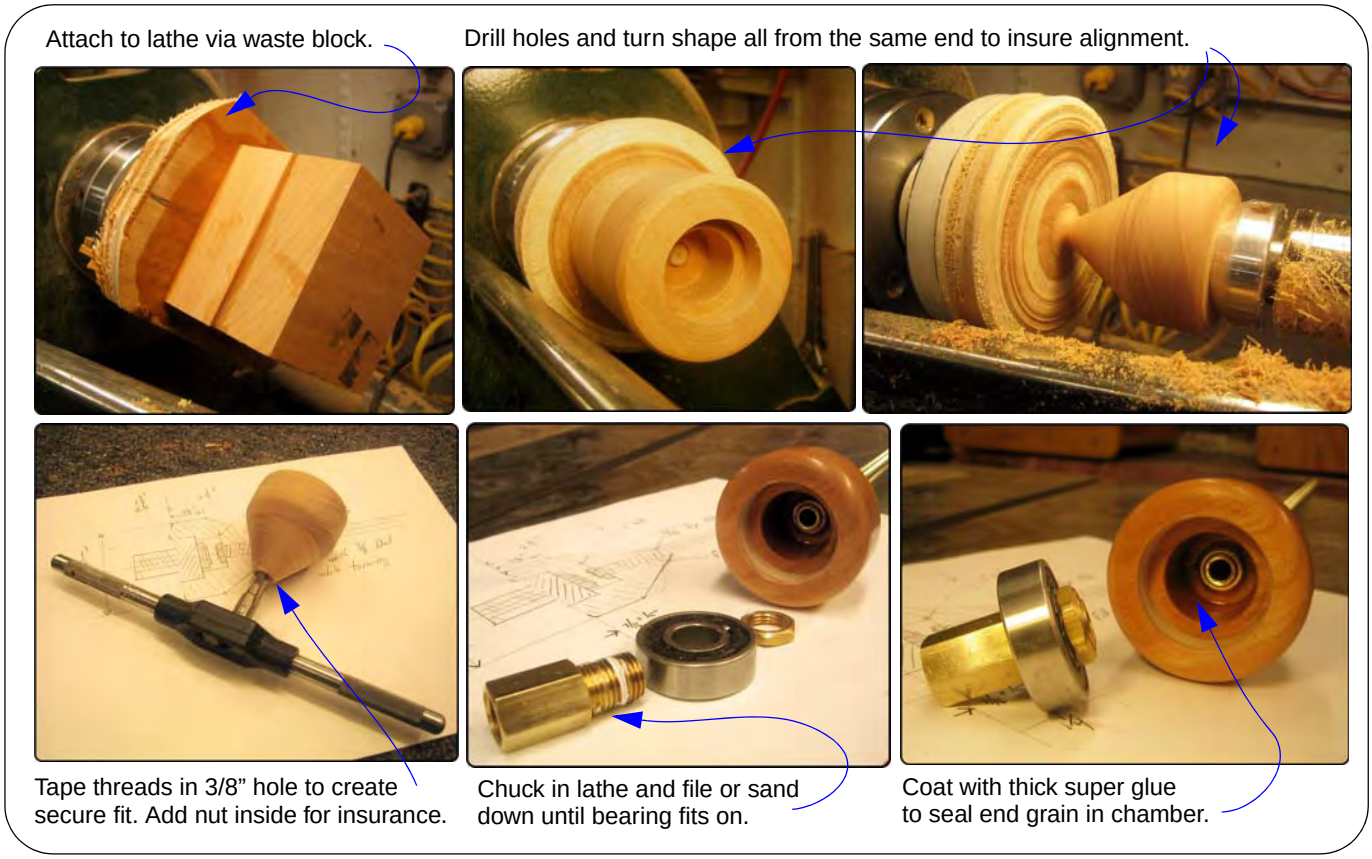
6-2 Make Your Own E-Z Vacuum Style Adapter

Turning your own E-Z Vacuum Adapter out of Cherry or Hard Maple is a simple project. You just need to order a few simple parts. You can easily find all of the parts locally except for the double sealed ball bearing.

Finished E-Z Vacuum Style Adapter in Cherry

Using a rubber plug with a hole drilled in the center rather than a washer is another option.





Item Description	Supplier	Item #	Quantity	Price on 3/5/09
Steel Ball Bearing, Plain Double Sealed For 1/2" Shaft Dia, 1-3/8" Od	www.mcmaster.com	6384K74	1	$9.04
Bronze Thrust Bearing for 1/2" Shaft Diameter, 3/4" OD, 1/16" Thick (For shims, not needed?)	www.mcmaster.com	5906K512	2	2 * $0.97
Brass Pipe, 1/4” NPT, Hex Coupling, 7/8” Length	www.mcmaster.com	50785K92	1	$1.83
Brass Pipe, 1/4" NPT, Nipple, 7/8" Length Note: Thread this pipe into Hex Coupling, and then chuck the coupling up in your lathe and file or sand down this pipe it until 1/2” ID shaft bearing fits on. There will be enough thread left to attach /14” NPT Locknut.	www.mcmaster.com	50785K152	1	$1.11
Brass Pipe, 1/4" NPT, Male X Female 90 Deg Elbow	www.mcmaster.com	50785K43	1	$1.57
Brass Pipe, 1/4" NPT, Locknut *Note: This nut is a little big. A 1/4” Lamp Rod nut from Lowe’s is smaller thus better.*	www.mcmaster.com	50785K142	1	$1.81
Westinghouse Lamp Pipe Kit (1/8” NPT Lamp Pipe & Nuts)	Home Depot Or www.mcmaster.com 14695K11 and 14695K14	?	1 Kit	$6.00
Cherry or Hard Maple Wood, 2 1/2” x 2 1/2” x 2 1/2”	Scrap Bin		Total	$23.30 + Shipping

6-3 Purchase Oneway Vacuum Adapter

This is an expensive option. However you know it will run true.

Update : 12/28/2019 I think the "Precision Vacuum Adapters" from jtturningtools.com are a better deal.

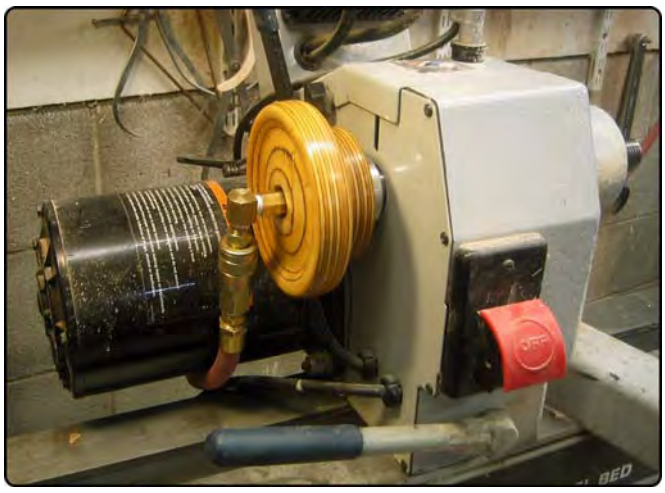
Oneway
Vacuum Adapter
with Threaded Insert

Item Description	Supplier	Item #	Quanity	Price
Oneway Rotary Vacuum Adapter	www.packwardwoodworks.com	111045	1	$85.95
Oneway Spindle Adapter for Rotary Adapter	www.packwardwoodworks.com	Varies	1	$24.95
			Total	$110.90

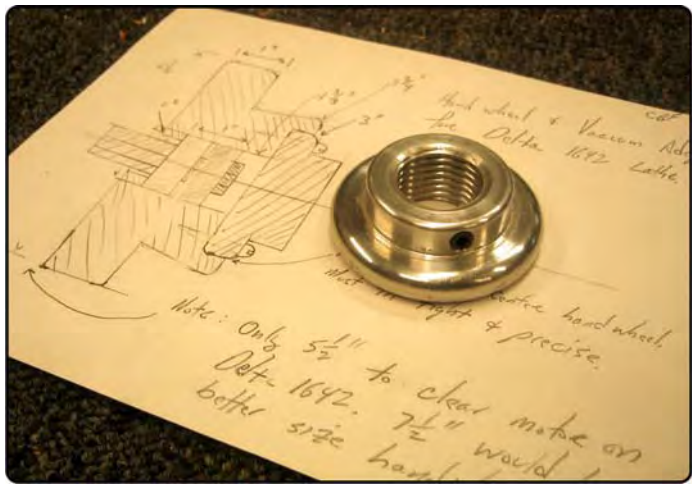
6-4 Make Your Own Oneway Style Custom Vacuum Adapter

You can turn a custom vacuum adapter for your lathe. You can simply attach it to the existing hand wheel on your lathe with screws and a plastic washer and/or plumbers putty to make the attachment air/vacuum tight. Another option is to buy a face plate or the Oneway Thread Adapter that fits the outboard spindle on your lathe.

Finished Custom Vacuum Adapter for
Delta 1642 Lathe



Start by drawing a cross section plan for your lathe.

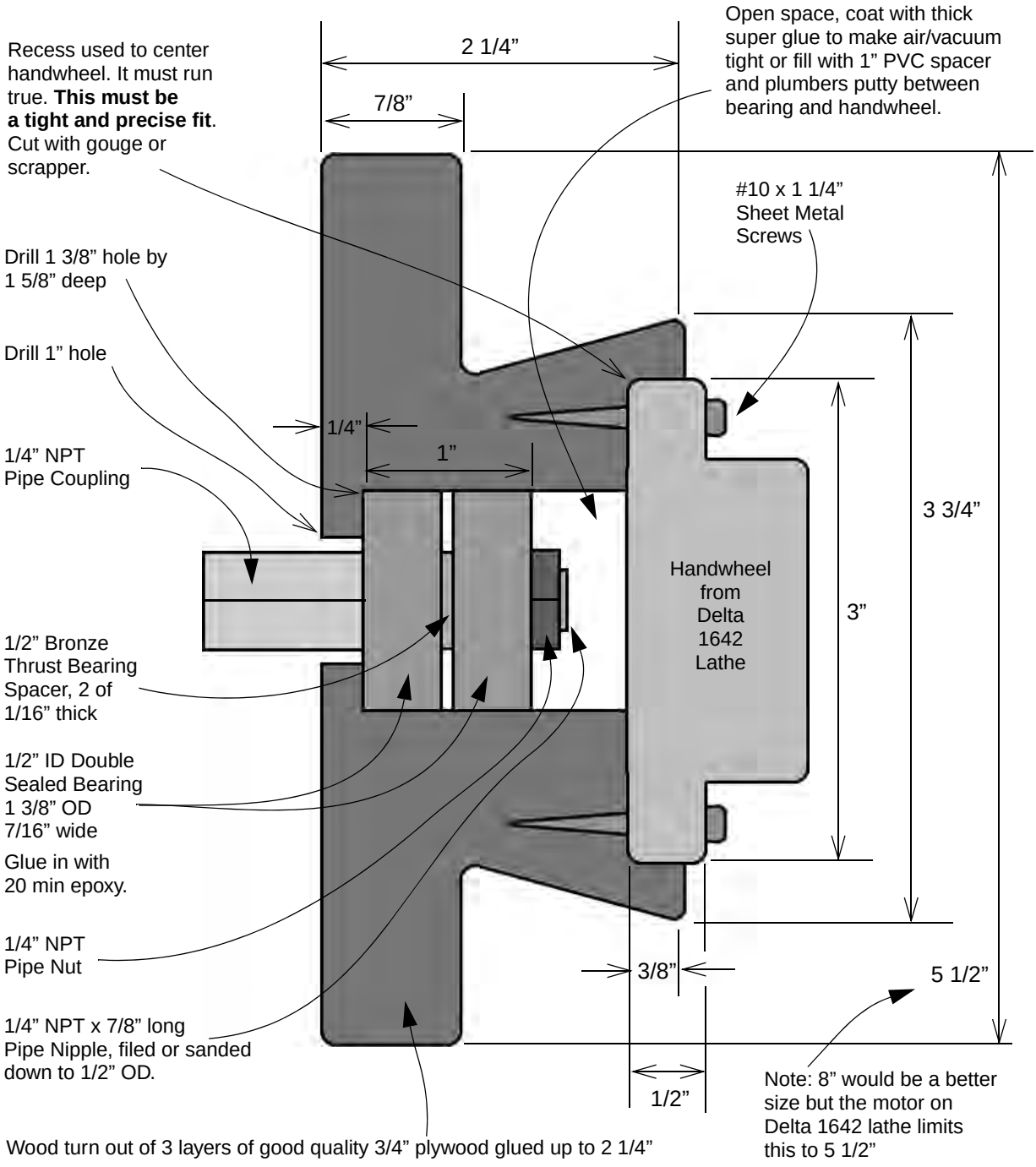


Plan For Custom Handwheel with Vacuum Adapter for Delta 1642 Lathe

CB Ford 1/11/06

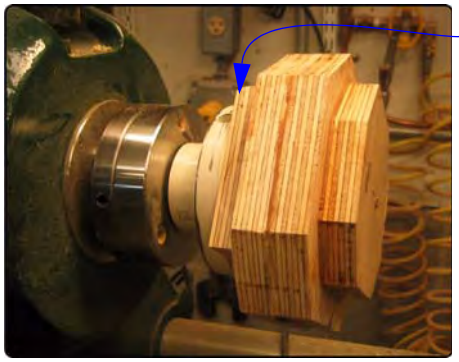
Side View

Adjust sizes to fit your lathe!



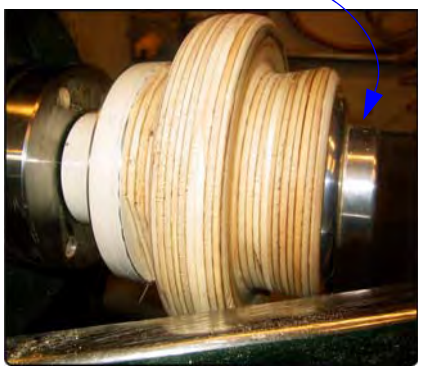
The challenge here is to get everything to run true. We do this by cutting outside shape and drill holes all from the same side with out remounting.

Mount to face plate with a waste block screwed (not glued) in between.

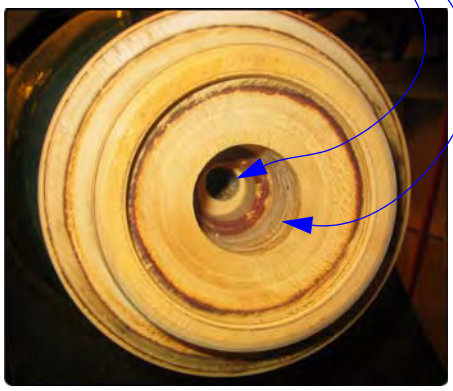


Cut tight pop fitting recess for handwheel with gouge/scrapper.

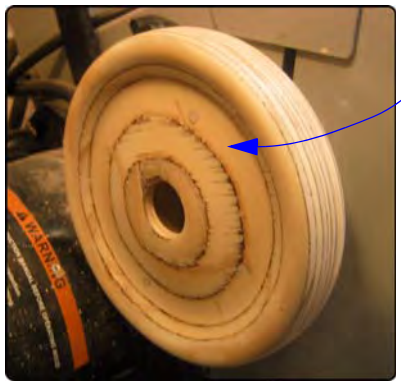
Test fit handwheel.



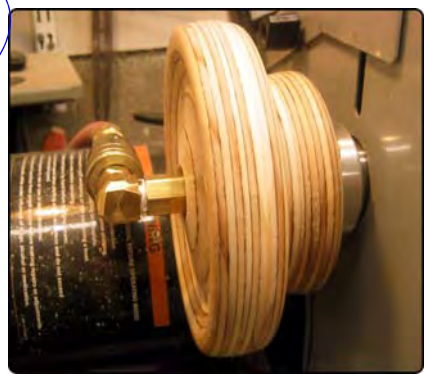
Drill 1 3/8” hole for bearings. Drill 1” hole thru into waste block.



Remove from face plate. Mount on hand-wheel. Outboard turn shape on end.



Assemble and test before finishing.



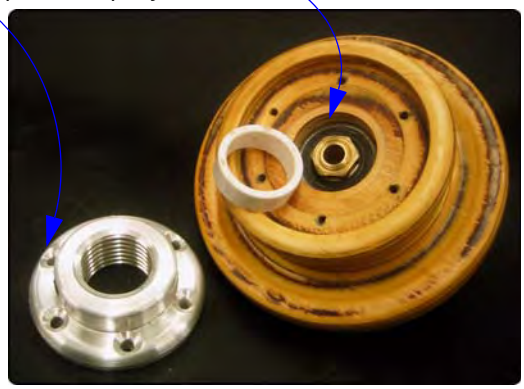
Item Description	Supplier	Item #	Quanity	Price on 3/5/09
Steel Ball Bearing, Plain Double Sealed For 1/2" Shaft Dia, 1-3/8" Od	www.mcmaster.com	6384K74	2	2 * $9.04
Bronze Thrust Bearing for 1/2" Shaft Diameter, 3/4" OD, 1/16" Thick (For shims between Ball Bearings)	www.mcmaster.com	5906K512	2	2 * $0.97
Brass Pipe, 1/4” NPT, Hex Coupling, 7/8” Lenth	www.mcmaster.com	50785K92	1	$1.83
Brass Pipe, 1/4" NPT, Nipple, 1-1/2" Length	www.mcmaster.com	50785K12	1	$1.67
Brass Pipe, 1/4" NPT, Male X Female 90 Deg Elbow	www.mcmaster.com	50785K43	1	$1.57
Brass Pipe, 1/4" NPT, Locknut *Note: This nut is a little big. A 1/4” Lamp Rod nut from Lowe's is smaller thus better.*	www.mcmaster.com	50785K142	1	$1.81
Existing Handwheel or chuck or Oneway Thread Adapter that fits Outboard Spindle on your Lathe.			1	
Good Plywood (7 or 11 layer Fir) or Engineered Beam scrap.			Total	$26.90 + Shipping

Thread pipe into coupling nut. Chuck in lathe and file or sand pipe down to 1/2” OD. Until bearing slips on.

Bearing assembly ready to be tested and 20 min epoxyed in. Note, Bronze bearing used as shim does not interfere with outside of ball bearings.

Parts ready to be assembled. Note, holes drilled and counter sinked in handwheel for #10 x 1 1/4” screws.

This area needs to be sealed with thick super glue to make air/vacuum tight. Or, use 1” PVC ring with plumbers putty.

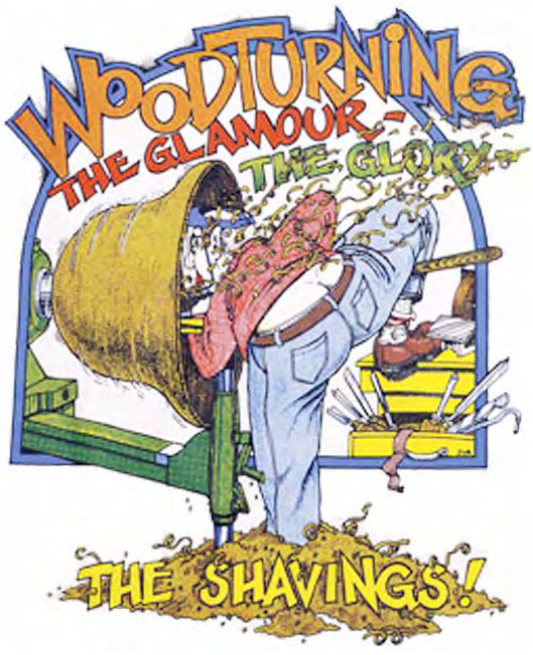


7 Vacuum Drum Chucks: What Are My Options?

The Oneway Aluminum Vacuum Drum Chucks are really nice but expensive.

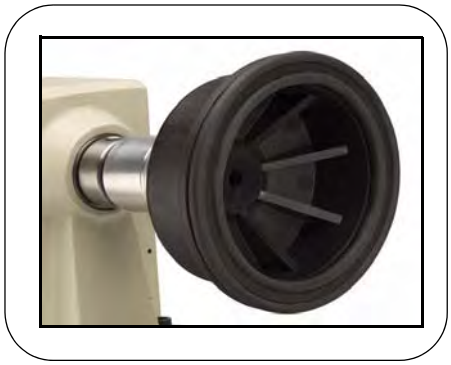
Making your own chucks completely out of plywood requires spending a lot of time gluing up lots of plywood to get 4 1/2” tall, or what ever.

Making your own hybrid chuck out of PVC pipe with a plywood face is a good way to go. Cutting a groove for PVC pipe and expoxying in the PVC requires a little time. But you end up with a nice chuck that you can customize the plywood face to meet your needs.



7-1 Purchase Hold Fast System Chuck(s)

A little less expensive than the Oneway aluminum chucks but they only have 3” and 6” chuck available. I have never seen this system up close and personal. Only in catalogs.



Update : 12/28/2019 These work but I perfer my PVC drum chucks. See section "7-4 Make Your Own Hybrid Drum Chuck (PVC Pipe with Plywood Face)"

Item Description	Supplier	Item #	Quanity	Price on 3/5/09
Holdfast 6” Chuck Head	www.packwardwoodworks.com	varies	1	$68.95
Holdfast 3” Chuck Head	www.packwardwoodworks.com	varies	1	$57.95
1/4” Neoprene Foam Rubber for Jam Chucking warped work/bowls?	See Section 7-5			

7-2 Purchase Oneway Vacuum Drum Chuck(s)

This is a very expensive way to go and you can not customize the shape to meet your needs. However, the chucks run true and are air/vacuum tight. The shape of the face on these chucks works good. The shape is worth copying if you make your own chucks. Making your own hybrid chuck out of PVC pipe with a plywood face is probably a better way to go..

8” wide x 4 1/2” tall, 3/4” thick rim with a 3/8” radius round over.

5 1/2” wide x 3 1/2” tall, 3/4” thick rim with a 3/8” radius round over.

3 1/2” wide x 2 5/8” tall, 1/2” thick rim with a 1/4” round over.

On all 3 drums the side wall is thinner than the rim so there is a recess inside of the chuck.

Item Description	Supplier	Item #	Quanity	Price on 3/5/09
Oneway 8” Drum Chuck & Thread Adapter	www.packwardwoodworks.com	112654	1	$199.95
Oneway 5 1/2” Drum Chuck & Thread Adapter	www.packwardwoodworks.com	112655	1	$94.95
Oneway 3 1/2” Drum Chuck & Thread Adapter	www.packwardwoodworks.com	112653	1	$74.95

7-3 Make Your Own Oneway Style Vacuum Drum Chuck(s)

The shape on the Oneway Vacuum Drum Chucks is good and worth copying. Making a copy of them in plywood works good but requires a lot of glue up. If you can find some Engineered Lumber Beam scraps they generally come in 2 inches thick and save time. Check the dumpsters at local building sites

Update : 12/28/2019 I perfer my PVC drum chucks. See section "7-4"

See section 7-1 for chuck dimensions. The inside of these chucks is taper towards center rather than thin side walls like on the aluminum Oneway Drum Chucks. The shape was customized to fit the work mostly common done by the owner.

The chucks must be sealed with polyurethane to make them air/vacuum tight. Otherwise you will suck air thru the end grain in the plywood. You need less layers of polyurethane if you first seal the chucks with automotive icing (thin auto body filler).

Drill a 5/8” hole in center for vacuum. Sealing the end grain inside the hole is a pain. The simplest method is to glue in a short piece of 1/2” PVC pipe.

Item Description	Supplier	Item #	Quanity	Price on 3/5/09
Aluminum Face Plate(s) Or use a Steel Face Plate, or something you already have. Note: Using a scroll chuck does not work because they are not air/vacuum tight.	www.woodturner-scatalog.com	Varies based on tread size	3	3 *$22.00 Price Var-ies based on thread size
Fir Plywood. Use good 7 layer or more plywood. Or Engineered Lumber Beam scraps.				
Neoprene Foam Rubber for Jam Chucking	See Section 7-5			

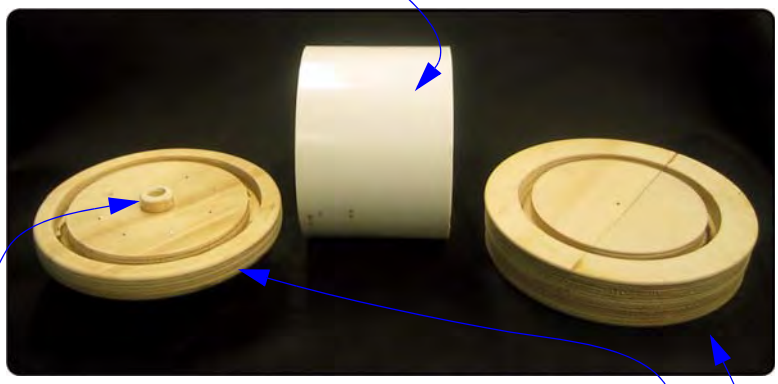
7-4 Make Your Own Hybrid Drum Chuck (PVC Pipe with Plywood Face)

This is a good way to go! You can make the PVC pipe longer to make deeper chucks. You can get smaller PVC pipe sizes from local stores. You can get larger PVC pipe couplings from McMaster-Carr (www.mcmaster.com) or local construction companies. **Purchasing PVC pipe couplings rather than dealing with 10 foot PVC pipe is a good way to go.** The couplings already have nice true ends. PVC pipe comes in two thicknesses. A thin version used for rain gutters & sewer pipe, etc. and a thicker (Schedule 40) version. **The thicker Schedule 40 pipe is the way to go.**

Remember that a 4” PVC coupling is made to fit over PVC pipe with a 4 1/2” outside diameter (OD). So coupling’s inside diameter (ID) is 4 1/2” and the outside diameter (OD) is 5 1/8”. The coupling is roughly 4 3/4” long. The sizes given here are for schedule 40 pipe.

Mount plywood on face plate and turn on lathe.

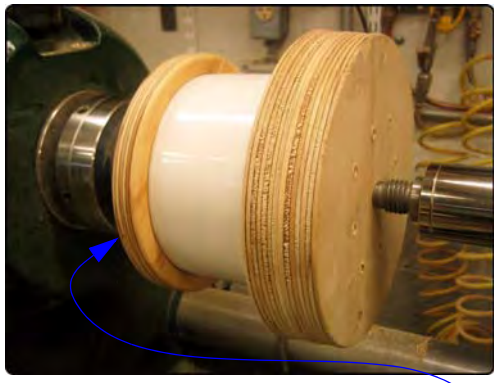
4” PVC Coupling Schedule 40



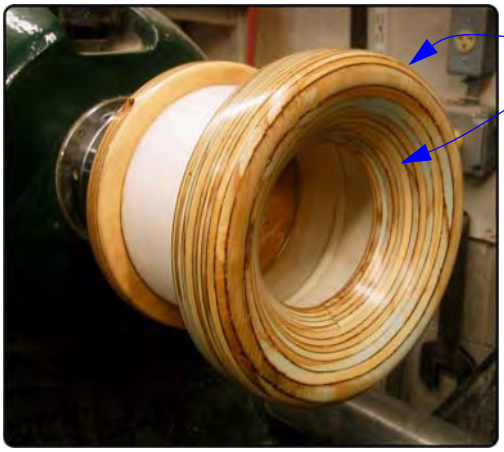
6” diameter x 3/4” plywood disk with 3/8” deep grove.

6 5/8” diameter x 1 1/2” plywood (2 layers of 3/4” glued up) with 3/8” deep grove.

Glue PVC to plywood with 20 min epoxy
Clamp together using lathe. Dry overnight.



Mount bottom plywood on face plate permanently. (Not in view in photo.)



Turn a 3/8” radius cure on outside.

Turn a tapered inside to fit your most common work.

The chucks must be sealed with polyurethane to make them air/vacuum tight. Otherwise you will suck air thru the end grain in the plywood. You need less layers of polyurethane if you first seal the chuck with automotive icing (thin auto body filler).

Drill a 5/8” hole in center for vacuum. Sealing the end grain in the hole is a pain. The simplest method is to glue in a short piece of 1/2” PVC pipe.

With this style of chuck you turn the plywood face. **You never have to turn the PVC pipe which catches easily and thus is nerve racking.**

I recommend using plywood rather than MDF. Because MDF swells when it gets wet. MDF does not mix well with turning green (wet) wood

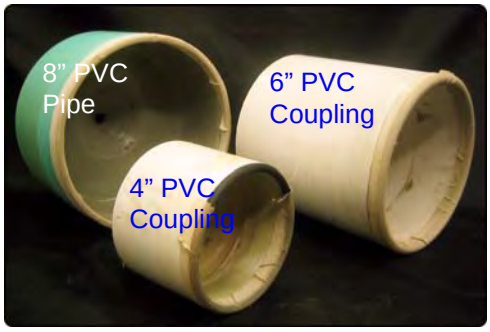
Item Description	Supplier	Item #	Quanity	Price on 3/5/09
Aluminum Face Plate(s)	www.woodturnerscatalog.com	Varies based on tread size	3	3 *$22.00 Price Varies based on thread size
Fir Plywood. Use good 7 layer or more plywood. Or Engineered Lumber Beam scraps.				
4” PVC Coupling	Local Store			
Neoprene Foam Rubber for Jam Chucking	See Section 7-5			

7-5 Make Your Own Vac-Cord Style Drum Chuck

Not recommended! Plywood faced PVC chucks work better. These are relatively easy to make. However the 1/4" diameter rubber cord on the edge is a little narrow. The 3/4" round over on the Oneway Vacuum Drum Chucks works better. **Turning the grove on the end of the PVC pipe to mount the rubber cord is very catchy and thus nerve racking**

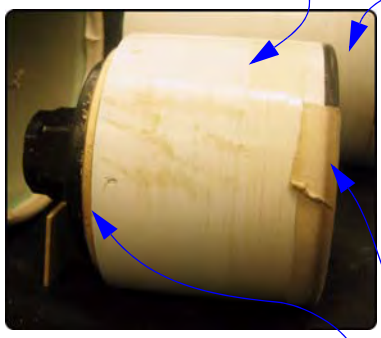
Update : 12/28/2019 These really suck! I perfer my PVC drum chucks. See section "7-4"

Vac-Cord Drum Chucks



PVC Pipe with Vac-Cord Super Glued into grove turned in end of PVC pipe.

4" PVC Coupling Chuck



Bad design! Hard to align PVC pipe. Better design is to cut a grove into plywood that will accept pipe.

Vac-Cord

Vac-Cord covered with old fashion cloth athletic tape to prevent leaving black ring when turning wet wood.

Item Description	Supplier	Item #	Quanity	Price on 3/5/09
Neoprene O-Ring Cord, 1/4" x 5ft	www.mcmaster.com	12975K35	5 ft	$2.20 + Shipping
PVC Coupling or Pipe	Local Store			
Neoprene Foam Rubber for Jam Chucking	See Section 7-5			

7-6 Purchase a Plastic Vacuum Cylinder

This is just a variation on the above methods where you purchase a Plastic Cylinder from Woodturning Supplier rather than using a PVC pipe from local supplier.

Available from Craft Supplies USA (www.woodturnerscatalog.com).

The following questions come to mind:

1. Why should I pay for shipping on a Plastic Cylinder when I can buy PVC pipe or coupling at local supplier?
2. I still have to true up the cylinder. Turning plastic is very catchy and thus nerve racking.
3. MDF like shown in the picture is not a good choice. Because MDF swells when it gets wet. MDF does not mix well with turning green (wet) wood.
4. I still have to supply my own plywood or MDF.
5. I still have to supply my own face plate.

This is not an off the self solution.

7-7 Neoprene Rubber Sheet

Normally when you jam chuck you use some soft open cell foam or carpet underlayment pad between chuck and work/bowl. This helps match up the sizes of things and prevents the bowl from getting scratched up when/if interface between chuck and bowl slips. **You can not use SOFT foam when vacuum** chucking because it passes air, thus the vacuum will not take or hold. The solution is to use some “Neoprene Foam Rubber”. Like they use in wet suits and mouse pads.

You can order the neoprene rubber from McMaster-Car. It comes in 3 feet wide sheets then you order how many feet you want.

Another source is mouse pads **or the funny foam stuff they sell in craft stores**.

Funny foam works good for small things. Less than 6” diameter.

You can use 3M “77” spray adhesive to attach the neoprene to chucks if you want or you can just shove it in there when you jam chuck. 3M “77” is available from office supply stores.

Item Description	Supplier	Item #	Quanity	Price on 3/5/09
Neoprene Rubber Sheet, 1/8” thick, 36” wide, Firmness 4 to 5 1/8” is like what comes on Oneway Vacuum Drum Chucks. Good when work/bowl is perfectly round.	www.mcmaster.com	8570K19	1 ft?	$15.62 per ft
Neoprene Rubber Sheet, 1/4” thick, 36” wide, Firmness 4 to 5 1/4” is good when work/bowl is slightly warped. Use it for jam chucking.	www.mcmaster.com	8570K22	1 ft?	$21.92 per ft

8 E-Z Procedures for Using a Vacuum Drum Chuck

You can mount your work and center it on a Vacuum Drum Chuck the same way you mount it on any Jam Chuck and then turn on the vacuum.

Getting work centered and running true on a jam or vacuum chuck is a lot easier if you have a Oneway Live Center with Thread Adapter. It is almost fool proof and effortless.

The thread adapter allows a chuck or faceplate to be mounted onto the live center in the tailstock. Thus a chuck or faceplate can then be easily centered on the bottom of the workpiece being held on the headstock end of the lathe.

The Oneway center at $110 is not cheap, but it comes with a couple of cones that make it a great all around center. You have to purchase a thread adapter separately.

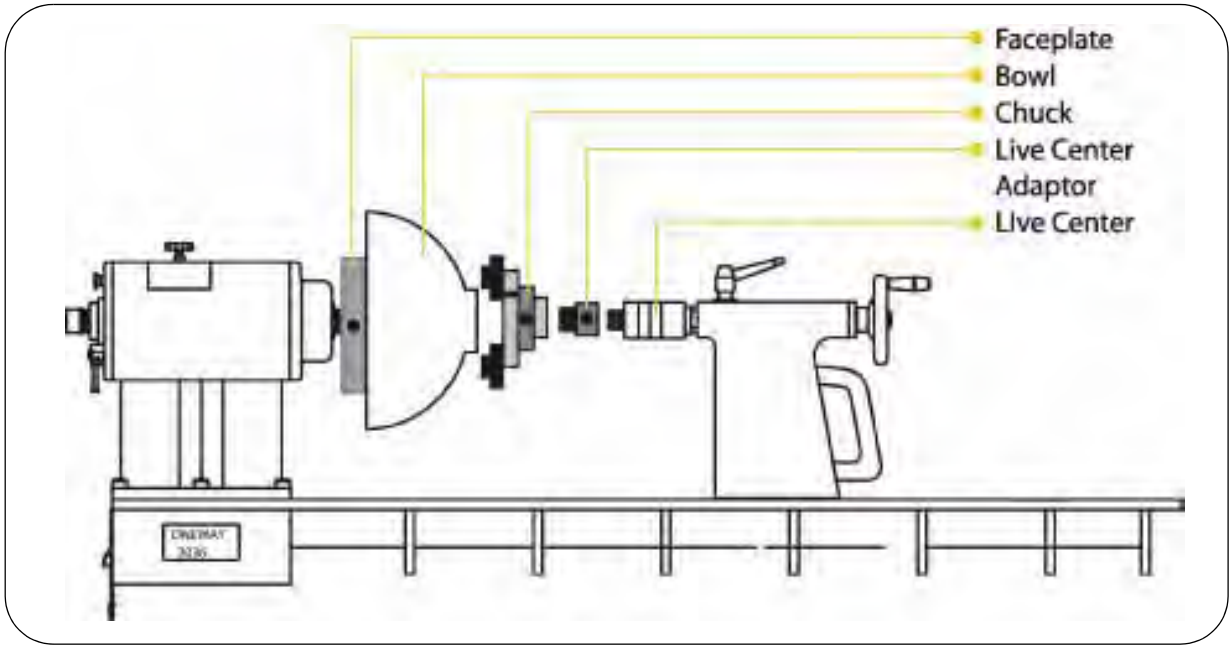
Item Description	Supplier	Item #	Quanity	Price on 3/5/09
Oneway Live Center #2MT	www.packardwoodworks.com	112622	1	$119.95
Oneway Live Center Thread Adapter Pick thread that matches your spindle thread	www.packardwoodworks.com	1126??	1	$42.95
			Total	$161.95 + Shipping

Note: The thread on the Oneway center is 3/4” x 10 TPI. Same as 3/4” nuts you purchase from local hardware store. So you can make your own face plate for the center by welding a 7/8” washer to a 3/4” nut. Then use the face plate to make your own custom cones, etc.

Oneway Live Center (comes with point, 2 cones and knock out bar)

Purchase thread adapter that matches your spindle thread

Reference diagram for E-Z Procedures.



8-1 How To Rough Turn a Bowl and Precisely Center in a Scroll Chuck.

1. Attach a rough blank to faceplate.
2. Attach the faceplate to the headstock of the lathe and turn outside of bowl.
3. Turn a foot or tenon for scroll chuck mounting.
4. Mount Oneway Thread Adaptor on Oneway center in the tailstock.
5. Mount a scroll chuck on the thread adaptor and grab the bowl while it is still attached to the faceplate and lathe.
6. Remove the whole mess **in one piece** from the lathe.
7. Remove the faceplate from bowl.
8. Mount the scroll chuck on the headstock.

8-2 How To Precisely Center a Bowl on a Vacuum Chuck to Finish the Bottom

1. Turn a bowl. **DO NOT** remove it from faceplate or scroll chuck.
2. Remove faceplate or scroll chuck from headstock with the bowl still attached.
3. Mount Vacuum Drum Chuck in the headstock. Attach Vacuum Pump, etc. **DO NOT** turn on vacuum yet!
4. Mount Oneway Thread Adaptor on Oneway center in the tailstock.
5. Reattach faceplate or scroll chuck with bowl to thread adaptor in tailstock. **DO NOT** run it into headstock yet!
6. Turn on the lathe at VERY LOW speed. 20-30 RPM.
7. Slowly run the tailstock into headstock. Snug it up. When the bowl in tailstock starts to turn it will be precisely centered.
8. Open Relief Valve on vacuum system and then turn on Vacuum Pump.
9. Close Relief Valve while watching Vacuum Gage. Adjust to appropriate pressure.

   The appropriate pressure depends on the size of your bowls, the thickness of your bowls, wet or dry wood, the size of the drum chuck, and how aggressively you want to turn. Oneway suggests 20 lbs. However, this may crack thin bowls.
10. Remove the faceplate or scroll chuck from tailstock.
11. Remove thread adaptor from tailstock.
12. For safety, leave the point center in the tailstock and snug it up to bowl. Leave it there as long as possible.

Appendix A Surplus Center: Used Gast Vacuum Pump Information

Here is some information I found on the Gast web site on the used Gast vacuum pump from Surplus Center. It is Gast part # 0523-P335-G509DAX.

1. The Operation and Maintenance manual for the pump in PDF format is available here:

   `http://www.gastmfg.com/pdf/23_oilless_OM.pdf`

2. The following information was found on one of the discussion groups. From http://www.gastmfg.com/discus/messages/23/132.html?TuesdayFebruary1220020512pm

By tech on Tuesday, February 12, 2002 - 05:12 pm:

Hi Matthew,
The model number (0523-P235-G509DAX) that you give is not a good number. It could be a 0523-P335-G509DAX if so then that unit was made special for a OEM called Storage Tech.

This unit is a oilless rotary vane unit used for a pressure application in the Medical Field. The unit was designed to produce 10psi max. pressure and has a open flow of 4.5cf.

The motor is a 1/4hp, 220 volt-+20%, 50-60HZ, 1 Phase.

The unit can be run at its max 10 psi 24-7-365.

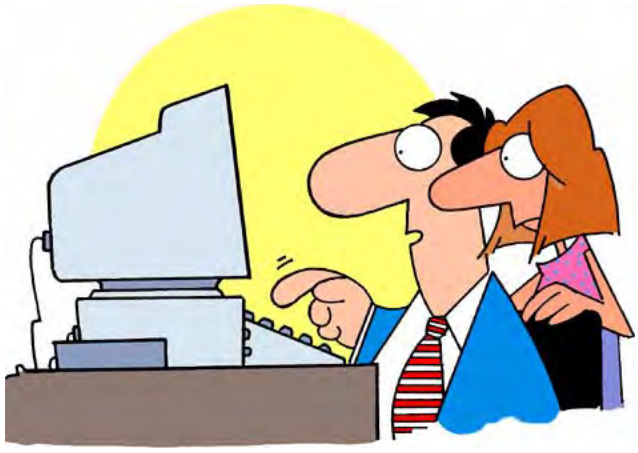
There are still parts made for this unit. **It takes a service kit (Gast part # K478A).**

all of the equipment on the unit was supplied by the OEM not Gast. We made just the pump.

Although the pump was made for pressure it could be used for vacuum. It would get around 26"Hg max. vacuum with a open flow of 4.5cfm. You will need to place a inline filter on the unit to prevent any foreign material from getting into the unit and causing damage to it. I would suggest the (V400G Gast part #) and a muffler (V425K)this will help quiet the unit. The Gast Rep can give you pricing.

A unit like this today would run around $350. to $400. US.

Yes you will damage the motor of this unit if you reduce the voltage to 110V it was designed to run on the 220v 50-60Hz



"And this button gives the computer
a mild electric shock when
I need to punish it"