

What you need to know about buffing

Kurt Hertzog explains everything you need to know about buffing your work

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Many woodturners spend their entire career without ever having buffed one of their turnings. Others wouldn't ever consider showing or selling a piece without having buffed it. In this issue, we'll delve into the topic of buffing from the very practical point of view. We'll cover the mechanics of doing buffing, where to get the needed supplies, what to do and not to do, safety and more. The terms buffing and polishing are often used interchangeably. They really are different both in the mechanics and often the aggressiveness. Buffing is defined as done with the abrasive

loosely applied to the work wheel. The buffing process allows you to select and charge the wheel as desired. While only sometimes done, it allows the user the freedom to charge the same buff with different compounds as needed. Regardless of the technical distinctions, let's focus on buffing because I believe it is far more common to woodturning. We'll focus on the materials that are most commonly used by woodturners, but be aware that this is only the tip of the iceberg. You can open a huge new world of buffing products by visiting an industrial supplier, whether local or via the internet.

Safety

For the most part, buffing is done with a buffing wheel rotating at a reasonably high rotational speed. There are buffing systems that the operator holds and presents the buff to the work. Much like a car buff, that method is usually reserved for very large work. More often, the work itself is presented to the buff while the buff is rotating. As such, not only is there the potential for flying debris but also loss of control of the piece being worked on. Both buffing methods have

the potential of inhaling particles of buffing compounds and other debris. With any rotating machinery, there are the obvious dangers of being pulled into the machinery if long, loose hair or dangling cuffs are caught. When buffing, take all of the precautions you do at the lathe when turning or sanding. Eye protection, dust protection and keeping hair and cuffs short or safely secured are the minimum. Face protection may be needed because of the chance of turnings being caught and thrown.

KEY POINTS ON SAFETY

1. Always wear proper eye, face and dust protection
2. Wear short sleeves or tight cuffs
3. Jewellery to be removed and long hair tied back safely
4. Use caution with work in contact with buff to prevent 'grabbing'
5. Buffed items can get hot. Be careful to keep things cool
6. Always maintain a secure grip on the item being buffed
7. The buffing wheel always runs off the edge of the work, never into the edge

Buffing basics

Buffing, other than the application of wax, is a sanding process. Usually a very fine sanding process but sanding none the less. The buff, usually a multi-layer assembly of soft material, becomes the carrier for the abrasive. You charge the buff with your buffing compound. That compound is really an abrasive turning the buffing wheel into a rotary piece of sandpaper. There are several items that are considered when setting up your buffing system. We'll skip the hand-held buffing systems to focus on



There are interchangeable buff buffing systems available for the single and double end shafted fractional horsepower motors

the more commonly used buff mounted types with work presented set-ups. All of the fundamentals of buffing do apply to the hand-held buffers as well.

You'll first determine whether you will be using a dedicated buffing machine. These are usually floor- or bench-mounted systems with their own motor. The motor can drive a combination of a buffer on one side and some other operation on the other or have both sides of the motor shaft arranged to receive a buffing wheel. These systems often are reserved for those who have the floor space and funds to dedicate to a buffing system.



I favour the version that mounts in my lathe. The adaptor fits into the taper and provides the proper threading to receive the various buffs

The more common system among hobbyists is buffing wheels that use the lathe for their drive system. Depending on their shape, size and purpose, there are several different mounting methods. They rely on their fastening to the headstock for drive and sometimes use the tailstock for containment or shaft support. With either system, the selection of the buffing wheel material and design, buffing compounds to be used, actual rpm/buffing wheel diameter, and presentation gives the user a huge amount of control over the process.

KEY POINTS ON BUFFING SYSTEM BASICS

1. Lathe-mounted systems take no dedicated floor space
2. Buffing, regardless of fineness of compound, is a sanding process
3. Lathe-mounted buffing systems may have access limitations
4. Like sanding, fast buffing isn't necessarily better
5. Too aggressive buffing can cut through a finish

Four control knobs



It is far too easy to run the buff too fast. The buff should still be fluffy and floppy when running at speed. If it narrows in width appreciably, it is too fast



Whether stitched or not, the typical buff is constructed of many thin plies of cloth. There is an assortment of materials available



Buffers are available in different materials, diameters and rigidities. By stitching the buff, the pattern and nearness to edge controls the stiffness

There are four independent control knobs to your buffing. The first and often the most misused is the buff rpm. In reality, it is surface feet per minute of the buff past your work that matters but for now we'll speak to the rpm portion of the equation. For the fixed motor, you'll often be stuck with the motor rpm but do have buff diameter to have some impact. With a lathe-mounted system, you'll have either the fixed pulley speeds or the variable speed controls of the lathe to set rpm. There are two impacts of rpm. The first is the stiffness of the buff. The higher the rpm, the stiffer the buff. How stiff you make the buff

will impact the way it buffs. Faster makes it less deflective and more aggressive from the cutting standpoint. The other impact rpm has is the actual rate at which the buff material is presented. It is all about surface feet per minute. A 200mm buff on a 3,500rpm motor will not only be very stiff but will also present a huge amount of wheel length to the turning per unit time. A 100mm buff on a 1,725rpm motor will provide a far less stiff buff but also much less distance of wheel to the turning per unit time. Often, fixed speed motors will drive a pulley system that alters the rpm to buffs mounted to a separate shaft. You see

where a lathe-mounted buffing system can offer not only space savings but also more speed flexibility. With either system, you have the opportunity to select the diameter of the wheels and by controlling the speed of that wheel, you have a control over the aggressiveness of the buffing process.

Selecting the buffing wheel material and design gives the end user another method of controlling the buffing process. Linen, muslin and cotton wheels are most common in the woodturning retailers. There are many other materials available but these will usually fulfil the woodturner's needs. With the

material chosen for the desired size, the shape and construction of the wheel should be considered. Some are simply a plain buffing wheel of many plies of material. Some are the many plies that have stitching to reduce the 'softness' of the wheel, really meaning it is somewhat stiffer at lower rpm because the stitching for part of the radius of the wheel changes the wheel's performance. The design, along with the amount and placement of the stitching, has a varying effect. There are different shapes available to be able to buff different types and sizes of turnings. Bowl and goblet buffs are the most common deviations from the standard buffing wheel. The bowl and goblet buffs come in different sizes to address variations in the size of these turnings. Remember that the buff diameter and the buff rpm really create buffing effect. In reality, the only thing that really means much is surface feet per minute. Simply the circumference of the buff times the rpm of it. Obviously, changes in diameter will have more than three times the impact of changes in rpm – $\pi \times \text{diameter}$.

Another of the variables that the turner has in their buffing process is the compound used. Many of the popular buffing systems consist of three buffing compounds along with three separate buffs. This allows each buff to be dedicated to its own compound. This is the only good way to buff with multiple compounds. Using the same buff with multiple compounds is a recipe for poor buffing results. The three commonly

provided buffing compounds are called tripoli, white diamond or white rouge and wax. Technically, the wax really isn't a cutting compound but the buff is used to apply the hard wax, often carnauba, to the turning. These are the three provided with the popular Beall Buffing System offered by many retailers. There are other manufacturers offering similar systems. With the two-step buffing and a wax overcoating, most turnings can be brought to a fine 'sanding' with a high gloss provided they were properly prepared before the finish application. In addition to these, many turners buffing plastics skip the wax and continue using various jeweller's rouges to bring up the high gloss. One commonly seen moving finer is a blue rouge. These have very little if any cutting action and act more as a polish.

The last control that the user has to use for buffing is the presentation of the work. This includes both the time spent in any one location as well as the pressure applied. Because the stiffness of the wheel is impacted by the rpm of the wheel, buffing can cause considerable damage to a turning's finish if improperly done. Too much force used in presenting the work to the buff or too high of a buff rpm creating too stiff of a buff will not improve things. To the contrary, you can easily degrade the finish rather than improve it. Technique is something that is learned but the good basics are to use no more than two pounds of force when applying your turning to the wheel. That force is about the amount

of force you would use to easily close a bureau drawer. That presentation of the turning to the wheel with a buff that slightly deflects in use is a good starting point. The key to success is to let the compound do the cutting. Force holds the work against the wheel and the reasonable surface feet per minute of the buffing wheel charged with a small amount of compound will get the work done. The amount of time spent in one area is minimal since continuous movement of the buff over the surface will prevent too much material being removed from any one spot. Since the final result is visual, inspecting the work to be certain that it is uniformly processed will also indicate when your results are pleasing and it is time to stop. That or move to the next finer compound.

KEY POINTS ON CONTROLLING THE PROCESS

1. Surface feet per minute of the buff over the work causes the results
2. Slower is far better than faster. Let the buffing compounds do the work
3. Like sanding, since it is, work through the 'grits'. Let each one work for you
4. Too much of anything, SFPM, applied force, time in place or amount of compound, is detrimental.
5. Charge the wheel with compound lightly and frequently. Too much is far worse than too little



Not only are there buffing wheels but there are also different shapes to accommodate different areas and types of turnings. These are goblet buffs



For most woodturners, the three-buff system with tripoli, white diamond and carnauba wax will take care of nearly all buffing needs



For best results, dedicate a buff to each of the compounds you use. Often you can keep them straight by the colouring but marking them is a wise idea



There is a huge assortment of compounds available from industrial sources. Don't be afraid to experiment with non-traditional items



The key to good buffing is to use a mild pressure and let the compound do the work. When buffing, always keep the work moving to avoid burn through

What and when to buff



Bare wood can be buffed as can plastic. The lower portion of the Blackwood barrel is buffed only, no wax. The difference is apparent



When dealing with plastics, buffing will really make them pop. This Corian – really a filled plastic – with only a quick buffing takes on a great look



For materials such as very hard, dense woods and virtually all plastics, moving to the blue rouge and other jewellery compounds adds value



Even older work can be refreshed with buffing. This segmented bowl made back in 2006 gets a buffing that brings it back to life

Buffing can be done to bare wood. Since it is a cutting process, although very fine, it can help bring a glossy finish to denser woods. You would buff your unfinished wood at the completion of turning and sanding. The buffing is simply an extended sanding routine. You can also buff your plastic turnings to improve on their appearance. Plastics usually don't start with the coarser tripoli and white diamond but will use more of the blue rouges and other jewellery compounds. That really depends on how far you've taken your sanding and MicroMesh routines. If you have applied finish to your turning, you must wait until the finish has cured hard. I mean really hard. You will mess your finish up if you begin buffing it before the finish has cured. You can end up with either a gummy kind of mess or hazing the finish. If you have any doubts as to whether you've waited long enough, wait longer. If you need to hurry because of an impending show or sale, I recommend you

skip the buffing. Buffing too soon will be far worse than not buffing. An example I'll offer is the refinishers I know who finish or refinish pianos. They most often shoot a multi-coat lacquer finish. They won't even consider working on their finish for nearly a month depending on conditions. They know that they will end up with a gummy mess rather than the results they want. While we aren't putting concert grade lacquer finishes on Baby Grand pianos, we can learn from them. Wait until it is hardened and will benefit from buffing. Rushing things doesn't help. Think about the time you'll need to cut back the entire finish and redo it. How long do you wait? I certainly am not suggesting you wait a month. Depending on your finish, ambient conditions, how thick, etc., you may be ready in minutes to days. Know your finish and there is no shame in having practice blocks to learn on or test. The value of your turning and the end customer will dictate not only the level of finish you need but also the

level of finish they will demand. Personally, I don't buff until I have to. I am more than content to take the turning to completion short of buffing and set it aside. When it needs to be taken to a customer ready, then it gets buffed if I plan on that. Until then, I am content to let it sit for days or months.

KEY POINTS ON WHAT AND WHEN TO BUFF

1. Unfinished woods and plastics can be buffed at any time after sufficient sanding
2. Unfinished woods that are hard and fine-grained buff better than others
3. Open grain woods will collect buff fuzz and buffing compound
4. Hard finishes buff far better than softer finishes for buffing
5. Finishes need to be fully cured prior to buffing

Good buffing techniques



Charging and recharging the wheel with buffing compound is a simple task. Done below centre with an easy touch, the wheel is lightly loaded for use



When a buff needs initial preparation or a cleanup of stray strings, the manufacturer recommends 100 grit sandpaper wrapped around a block



Keys to good buffing are: let the compound do the work, always work off the edges and keep the work moving

You've got your buffing system sorted out and have something in need of buffing. How do you go about it for best results? Be certain that you have the correct buff and compound for the first buffing. Most often, the woodturner will be using tripoli. It is the brown compound. The buff should always be rotating towards you. For lathe-mounted units, be certain that you always follow this. Charge the buff with your compound. Done below centre while the buff is running, a light contact of the compound to the buff moving side to side is all that is needed. Remember, less is better than more. You can recharge the wheel with compound as needed. Hold your turning firmly and present a surface away from any edges to the buffing wheel below the centreline of rotation. The work surface should be slightly tipped downwards as it is brought into contact. The amount of force used to present the work is a light amount. It is recommended as the same as closing

an easily closed drawer. I find that at proper buff speed, the force of presentation should be slightly mushroom the face of the buff. Let the compound do the work. Always keep the work in motion as you buff. Pausing in any area may cause burning through of the finish. As you present the work and orient it so you cover all of the areas, use caution so you never present an upper edge to the buff. This raises the likelihood of a catch. To cover these areas, always buff with the wheel coming off the work with any corner coverage being faced downwards as you proceed off that edge. Recharge the buff as needed. When complete with that compound, move to the next buff and its finer compound. With multiple wheels, you simply move to the next wheel. With a single wheel setup, in a lathe for example, change to the next buff with its finer compound and repeat. Once you've progressed through the 'grits' and have arrived at your desired endpoint, the norm is to apply wax. It has its own buff

and is used exactly as you would buffing compound. Charge the wheel, follow good safe buffing practices and apply the wax.

KEY POINTS ON CONTROLLING THE PROCESS

1. The wheel always rotates towards you
2. The work is presented and worked below the centreline tipped away
3. The compound does the work, not the force. Firm yet light force is best
4. If possible, dedicate a buffing wheel to each compound for best results. Mark each clearly
5. Work through the compounds like you do with sanding, coarser to finer
6. The work is always kept in motion to prevent overcutting in any area
7. Not technically cutting, application of wax follows good buffing procedures

Conclusions

If you aren't familiar with buffing, you probably should explore it. It can add that little extra to your turnings that may catch the potential customer's eye. It is a simple process that is relatively low cost with few rules. I find that any of the hard, dense, fine-grained woods will take on a look as if they had a finish applied. The gloss that can be created does set them apart. Every plastic that I have buffed with the appropriate rouge has had a clearly noticeable improvement. The turnings that have a finish applied are also markedly improved in appearance with proper buffing. The time required is minimal for the benefit provided. If you are new to buffing, do take the time to create a few practice pieces with your woods of choice and typical finish rather than learn buffing on one of your masterpieces. The time invested in making them and then buffing them to your satisfaction will certainly be a wise investment. Once you've got a taste of buffing, I'm quite certain you will be buffing most if not all of your work. ●



A walnut (*Juglans regia*) bowl made in 2001, painted bowl made in 2008 and a stick pen made in 2013 all have a fresh and vibrant look after a quick buffing only