Safety First Practices – Turning

TAW*'s Safety First Practices* is a collection of those practices which the Association believes are generally accepted by reasonable and knowledgeable practitioners of woodworking as contributing to the safety of individuals participating in or observing the practice of the craft. It is not for the Safety Committee to teach wood working but to point out the hazards of associated activities and some possible ways to reduce those risks.

It is inherent in the fluid nature of the Craft of Woodworking, and its ancillary practices and technology, that such a collection of material will always be incomplete and in flux. As such it must be considered a guide to safety and not the last word on the subject. Woodworking and many of its ancillary activities are inherently dangerous and the Association Board of Directors, Officers, Safety Committee, and Members make no warranties or assurances that following these recommendations will eliminate all risk of injury. If you are inexperienced or do not understand a recommendation consult someone experienced in the subject being discussed.

First and foremost to safety is the practice of using good judgement. You are responsible for your own Safety as well as that of those around you.

Please also read Safety First Practices – General.

The Turner

Preparedness

Safe, effective use of a wood lathe requires study and knowledge of procedures for using this tool. Read, thoroughly understand, and follow the label warnings on the lathe and in the owner-operator's manual. Safety guidelines from an experienced instructor, video, or book are good sources of important safety procedures.

An experienced turner is capable of using materials, lathe speeds, techniques, and procedures not recommended for beginning turners. Practice good judgement at all times. If it does not feel right, STOP! Does not look right, STOP! Does not sound right, STOP! Or if it seems too dangerous, STOP! Think it through again. Please work safely.

If too distracted by other matters to focus on your work walk away, both you and your project will benefit from it.

Attire

Wear a full faceshield rated for the type of high impact incidents which can and do occur while turning. This is especially important for out of balance or compromised pieces and bowls, vessels, or any medium to large pieces involving chucks and faceplates. Clean it daily with appropriate materials.

At a minimum, use safety goggles or safety glasses that have side protectors when turning small items. (TAW **requires** the use of a full face shield at all of its sanctioned turning events.)

Wear hearing protection during extended periods of turning. Dust collection, grinding, and power carving create the potential for damage to your hearing.

Wearing gloves is not advised, but if you wear gloves they should be thin and close fitting with open finger tips. Safety gloves that are designed to tear away if they catch on moving materials or machinery are even better.

Avoid wearing loose clothing and jewelry that may get caught in the lathe. If you wear long sleeves they should be close fitting their full length and have secure cuffs.

Footwear should be leather boots capable of protecting your feet from dropped gouges, chucks, and larger pieces of wood.

Environment

Frequently remove shavings from the floor while turning. Green wood shavings are especially slick.

Distractions need to be kept to a minimum. If distracted step back from the lathe and deal with it. Encourage family and visitors to wait for you to acknowledge them before distracting you or doing something that might startle you.

Materials

No matter what type of material you are working, frequently stop the lathe and inspect the blank to determine if defects are being developed or exposed as material is removed. Discard blanks that have significant defects. Adding adhesives to attempt to "fix" defects in the blank is not advised.

Wood

Material integrity should be appropriate to the venue and the skill set of the individual performing the activity. Exercise extra caution when using out of balance or compromised/spalted stock; or stock with cracks, splits, checks, bark pockets, knots, irregular shapes, or protuberances. Beginners should avoid these types of stock until they have greater experience and knowledge of working wood.

When working wood of questionable integrity keep in mind that you have chosen a higher risk project and be especially mindful of safety. If your lathe is fitted with a safety grid use it! Talk with someone experienced in working such materials. There are techniques that will contribute to the success of your project as well as to your safety.

Except when intentionally using bark as a design feature it is safer and easier on your tools to strip the bark before turning.

Be aware of your physical responses to wood species you have not turned before. Sensitivity to some woods varies greatly from person to person. This is especially true of Black Walnut (respiratory toxin), Cedar (skin and respiratory irritant), Persimmon (latex sensitivity and skin irritant), and many exotics. Symptoms may range from minor to severe. Spalted woods may cause allergic reactions because of their fungal content.

For manufactured materials obtain Safety Data Sheets from your supplier or manufacturer – read and heed them!

Stone

Until you are experienced enough to read and sound the stone for defects it is recommended that you use material only from established suppliers of stone for sculpture and turning.

Turning stone – done with scrapers – produces exceptional quantities of very fine dust. Making the use of a Hepa filtered positive pressure air source a must.

As with all sources of dust you should give careful attention to eye protection.

Stone dust also acts as a desiccant and protection of the skin with close fitting long sleeves and a closed neckline is recommended.

Metal

The use of a close fitting cut proof glove on the clamping (usually the left) hand is recommended when spinning metal on a wood lathe. A heavy leather welding glove reduces the hazards of chronic vibration as well as the risk of cuts.

Filing or sanding the edges of the blank to remove burrs and dull the sharp edge is recommended.

If you are using a 3 or 4 jaw chuck to hold the mandrel (aka, the buck) limit the speed to 1000 rpm. Direct attachment of the mandrel to the headstock spindle or with a faceplate is preferred.

If using a faceplate to mount the mandrel, use a minimum of three 3/8"-16 tpi bolts (metal buck) or equivalent metal screws (wood buck).

Lathe

The Lathe should be stable and at an appropriate height for the type of work you do most frequently. This generally places the turning axis within plus or minus three inches of your elbow. Discomfort in you back and/or neck and shoulders when turning may indicate improper lathe height.

Keep the lathe in good repair – follow the manufacture's recommendations,

Check for damaged parts, alignment, binding of moving parts, and other conditions that may affect its operation before each session.

Modern lathes are all fitted with guards over the motor shaft, drive belt and spindle pulleys. These guards should always be in place before using the machinery.

Install a secondary switch that allows you to control the lathe without getting in the line of fire. Ancillary control is especially important when turning off the end or doing outboard turning.

A kill switch does not need to control speed, it only needs to cut the power from a safe position if things start going wrong.

Adjust tool rests so that they are as close as possible to the stock. They should also be set at the appropriate height for the tool and procedure used.

Turn the lathe off when adjusting the tool rest. This is especially important for beginners and when working with irregular or off center materials.

The tool rest is a boundary which your body parts should not cross when the lathe is on – accidents happen at blinding speed and without warning.

Before the lathe is turned on, move all lose items and wrenches aside, ensure that all clamps and fittings are secure, and that the work piece is free to turn.

Always start the lathe slowly – this is especially important at initial startup of a piece and after making adjustments.

Do not leave a running lathe unattended - leave only after the lathe has been turned off and it comes to a complete stop.

Place gouges and accessories so you are not forced or tempted to reach over the lathe to get them.

If you have a large lathe, you will no doubt be involved in lifting large, heavy, pieces of wood. Steel toed boots are advisable. It is also worthwhile familiarizing yourself with safe lifting techniques (sometimes referred to as kinetic lifting) and a lift belt. Employing such techniques will reduce the chance of injury. If the piece of wood you are trying to move is too heavy for one person, either get some help or use lifting equipment.

Sharpening

Keep tools sharp and clean for better and safer performance.

Bench grinders are fitted with guards on the wheels and spark shields. These should always be in place and correctly adjusted.

Keep focused while using the grinder – it is easy to lose control while bringing the tool to the wheel or removing it from the wheel, with disastrous results.

Grinding wheels can – and sometimes do – disintegrate in use. Wear a faceshield when using a grinder.

Fine particles from a grinder are harmful to your respiratory system. Use a dust mask, air filtration helmet, a point of origin dust collection system; or a combination of these to deal with this serious issue.

The area around your bench grinder should be kept clear of shavings and dust to prevent ignition by sparks from sharpening.

Use of adequate lighting while sharpening will improve your sharpening and reduce the risk of injuries.

Gouges

Obtain Safety Data Sheets and/or correct usage information from the supplier and/or manufacture and heed them.

Don't use a tool for a purpose that it was not designed for or intended for. **Do not use a (Spindle) Roughing Gouge for anything other than spindle work.**

Don't force a dull tool – sharpen it.

The further the tool tip extends over the tool rest the greater the danger to the tool, the work in progress, and to you. Make the physics of leverage work for you and your gouges – keep the tool rest close the work at all times.

At all times store gouges such that you are not at risk of landing on the cutting edges if you should stumble or fall.

Mounts

Between Centers

Generally a reference to mounting the turning blank between one of several types of spur drives in the headstock and a live center in the tailstock. Don't over compress the material as it can cause the blank to bend or split. However, the blank must be sufficiently compressed to prevent it from dislodging from the mount. Check the integrity of all types of mounts frequently while turning.

Spur Centers

Drill a shallow hole the same inside diameter or slightly larger as the outside diameter of the drive and set the spur. The depth of the hole should be sufficient to penetrate into sound wood.

Alternately, a flat can be cut down to sound wood and the spur set.

Friction/Compression

References the mounting of a blank between centers in a manner that relies on friction to drive the blank and compressive forces to secure it. A cup with a small point should be used as the live center in the tailstock. Large points or excessive compression may

cause the stock to develop defects. The friction/compression drive must have sufficient surface area to hold the stock in a stable position. Don't over compress the material but the blank must be sufficiently compressed to prevent it from dislodging from the mount.

Scroll Chuck

The standard self-centering chuck used in wood turning. Like all tools it is safe to use only if you take the time to learn to use it properly. Read and heed the manufacturer's instructions and have an experienced turner teach you the nuances of its use. Proper cutting of the tennon or recess is paramount to its safe use.

Wood – especially green wood – shrinks, compresses, and moves under pressure from the jaws, check frequently for a snug fit.

Use bright red or yellow tape or paint around the jaws to remind you to keep your hands and your tools clear of the spinning jaws.

Use spindle-locking screws in the chuck if turning in reverse.

Three Jaw Chuck

Three jaw chucks are generally designed for use with metal lathes and have jaws which move independently, i.e., they are not self-centering scroll chucks. For this reason they are generally not considered to be suitable for turning wood.

Screw Chuck

Properly designed screw chucks have course, deep threads and a flat or slightly dished face. It is critical that the hole for the chuck be the correct diameter. Too small and the wood may split. Too large and it may not hold the blank securely.

Face Plates

Do not use dry wall or deck screws. They are brittle and subject to breaking.

Sheet metal screws (#10 or larger) long enough to penetrate the wood with at least ½"of threads should be used. The larger the turning the longer and the greater the number of screws required.

Use spindle-locking screws in the faceplate if turning in reverse.

Glue Blocks

Glue blocks should be made from sound wood.

Use of a dense hardwood is preferred for larger blocks.

Proper preparation of the glue surfaces is critical to a strong joint.

Obtain Safety Data Sheets and Manufactures usage instructions for correct usage of any adhesives you use.

The glue joint needs to be at least as strong as the wood used for the glue block. Aliphatic wood glues produce the strongest joints.

Glue blocks are not recommended for heavy, out of balance blanks. Go to a face plate.

Vacuum Chuck

It is critical that you monitor the system's performance while using this chucking method. If the vacuum degrades for any reason STOP and correct the problem or switch to a different chucking method.

Mount the Vacuum Gauge where it is easily seen while you turn.

Do NOT take heavy cuts when using a vacuum chuck.

Tailstock

For all types of mounts, even those not requiring it, bring up the tailstock for extra security whenever possible.

Remove the tailstock, or at least remove any sharp live centers, when the tailstock is not in use.

Turning

Be aware of what turners call the “red zone” or “firing zone.” This is the area directly behind and in front of the workpiece, the areas where it is most likely for a piece to travel into if it comes off the lathe. A good safety habit is to step out of this zone when turning on the lathe, keeping your hand on the switch in case you need to turn the machine off. Observers should stay out of this zone.

Many Turners are obsessed with how fast you should turn. In reality the only correct answer is that it depends on your skills and many other factors. Turn the speed up gradually until it starts to vibrate then back the speed off slightly. If you feel comfortable with the speed then proceed. If not – slow it down.

Higher speeds and faster cutting comes with experience.

Sanding/Finishing

Always remove the toolrest before sanding, finishing, or polishing operations. Use appropriate tools to hold the sand paper or emery paper whenever possible. If you must use your hands always hold the paper in a way that will not allow it to entangle around your fingers or the stock.

Do not use cloth to apply finishing or polishing materials if you intend to contact a rotating object on the lathe. Paper towels are more likely to tear instead of pulling your hand into the work. Never wrap polishing materials around fingers or hands.

Use point of origin dust collection and a positive pressure mask in addition to general air filtration. Sanding should be done in reverse when possible so debris and dust is projected away from the turner and towards point of origin dust collection. When a lathe is running in reverse, it is possible for a chuck or faceplate to unscrew if it is not securely tightened or locked on the lathe spindle.

Technique

Invest in yourself, not just tools. Time spent learning from a more experienced Turner can pay significant dividends in skill and safety. Grow skills at a realistic pace – the more you practice the faster you can expect to advance.

Hold turning tools securely on the toolrest, holding the tool in a controlled but comfortable manner. Always contact the toolrest with the tool first before contacting the wood.

If you are going to turn in reverse secure chucks and face plates with set screws. Bring up the tailstock if possible.