The Four Scraping Techniques Used on a Wood Lathe

History of Negative Rake Scraping Technique
Stuart Batty initially developed his Negative Rake Scraping technique in 1983 to perfect the large 1/8” thick wing surfaces on his natural edge Western Australian Goldfield burl turnings.

***Brown Mallee Burl** (Australian Goldfield Burl)*

***Size:** 22” Long x 10” Wide x 4” Depth*

Turned and shaped using 40/40 & bottom bowl gouge grinds.

The bowl’s large wings were refined & finished down to 1/8” thickness using negative rake scraping.

Sanding started at 180 grit.

Made by Stuart Batty

These burls are highly figured and extremely dense, with the grain running in every direction. Therefore, cutting with any gouge technique across the relatively flat, wide wing surface always results in some fibers being chipped out. With these burls being incredibly dense, the wing surface mainly end grain, and wanting to keep outside edges razor sharp, sanding to remove the imperfections was not an option.

All the attributes of this type of woodturning, such as extremely dense wood, grain direction, thickness, and an intermittent cut, make it impossible to use a conventional scraper; it would simply be far too aggressive and will tear out the wood fibers.

Stuart, therefore, decided to use an old Ivory shaping technique: a skew on its side. However, in the 1980s, every turner honed every tool, from skews to gouges. As a young production turner, Stuart was the first to eliminate honing for all his tools and always worked straight from the bench grinder wheel, which creates a burr on the edge.

Note: Ivory can be shaped with a skew that has had the burr honed off. Ivory has a grain structure of non-hollow layers of collagen and dentine, with twice the density of most woods. However, wood is made up of hollow tubes, and it is these hollow fibers that require the chisel with a secondary bevel to have a burr on the edge to abrade the wood surface. This is what Stuart calls Negative Rake Scraping.

A honed skew/chisel used flat on a tool rest will not interact with the wood surface without reasonable pressure, and this pressure, plus a trailing edge, does not shape the wood without tearing the grain. This is why Stuart’s father and other turners of that time did not use skews for scraping.

The burr that is created on the top bevel edge with a bench or belt grinder (Not a burnisher/ticketer) works as a form of rigid abrasive that does not flex like sandpaper. This enables a negative rake scraper to refine shapes far easier, faster, and significantly more accurately than any form of sanding.

Negative rake scraping can form very fine details and create sharp edges while enabling sanding to start at much higher/finer grits, improving the workpiece and saving time. The secondary top bevel with a burr is what makes this technique neutral, neither pulling the wood in like a conventional scraper nor pushing it away as would a gouge on thin workpieces.

Redwood Hanging Burl: *Acrylic Impregnated*

Size: *14” Tall x 6” Diameter*

Turned and shaped using 40/40 and bottom bowl gouge grinds. Final inside & outside surfaces refined to 1/10” thickness using negative rake scraping. Sanding started at 150 grit for the interior and 180 grit for the exterior.

Made by Stuart Batty

Why Did Every Woodturner before Stuart Batty Hone their Chisels?
Both Stuart’s grandfather and father were apprenticed time-served production spindle turners, and at that time, every turner honed all their blades. The reason was simple: There was only one motorized bench grinder for all the turners in a factory, as electric motors were expensive then. A production turner ground their blades on the grinder at the beginning of the workday, followed up by honing to remove the burr. They would continue to hone throughout the day using a slip stone to keep their tools sharp.

These blades would not work as a negative rake scraper, as a honed edge that removes the burr would make it ineffective for this technique.

It is worth noting that woodturners at the time only used high-carbon tool steel for their blades, which has a much shorter edge life than today's vanadium alloy steels. Therefore, if a skew were used on its side with a burr to scrape, its working life would have been mere seconds and impractical for this technique.

It is also easy to hone the edge of a blade when ground on a bench grinder due to the concave bevel the wheel creates. This makes locating the slip stone much easier than a flat ground bevel for an edge touch-up.

Also, at this time in woodturning, every turner used conventional scrapers with a burr created by using a burnisher (ticketer in the UK) and not a bench grinder. The only option to reduce the aggressive nature of conventional scrapers at that time was to hone off the burr and increase the bevel angle to 70°-80°.

However, when Stuart started his apprenticeship, bench grinders were much less expensive, and he positioned his grinder right beside his lathe. Stuart was also the first in woodturning history to remove the heel of the bevel to aid his gouge cutting on concave shapes. His dad strongly disagreed with this as he always honed his gouges, so removing the heel made it much more difficult to position the slip stone to hone a gouge accurately.

Stuart, at 18, demonstrated at the first-ever British woodturning symposium in 1983 at Craft Supplies Ltd in Buxton, England. This was before “The Association of Woodturners of Great Britain (AWGB),” which was formed in 1987. The other demonstrators were Richard Raffin, Ray Key, and Michael O'Donnell, and they all honed their tools and kept the gouge bevels full length.

Stuart was the only turner there who used two different grinds for his bowl turning: his 40/40 and bottom bowl gouge. This created great notoriety, as Stuart was such a young turner and could turn thinner and faster bowls with no torn grain using two gouges versus one.

This was when Stuart noted that he was the only turner who 100% controlled and pushed his gouges from the handle/rear and never formed any shapes by pulling the gouge from the front. Stuart coined his technique “Push Cut,” a style he developed when working for his father. He also coined the technique used by other turners as “Pull Cut.”

Kingwood & Afzella Burl Boxes

Size: *3” & 4” Diameters*

Shaped using 40/40 bowl gouge grind. Inside and outside surfaces completed using negative rake scraping for unmatched accuracy and exceptional finish.

Made by Stuart Batty

Stuart developed his “Push Cut” style for bowl turning, using his 40/40 grind for large-volume cuts to finish the exposed end grain surfaces. Stuart then developed the bottom bowl gouge to complete the side grain areas of his bowls. Negative rake scraping compliments both these gouges, as this technique removes tool marks and refines the shape without torn grain.

When you watch Stuart turn in any of the videos in our “Free Videos & Articles,” note that his “Push Cut” technique uses leverage, not strength, to create large-volume cuts directly to a sandable surface with no torn grain and little physical effort.

Stuart uses his negative rake scraping technique to refine shapes further, noting that this is the only technique in woodturning that allows a turner to “BACKTRACK” on a thin piece and still be able to work it further. Using a gouge once the wood is too thin creates deflection and excessive tool marks. A conventional scraper would pull the thin wood into its edge, creating a rough surface or even a catch.

Bench Grinder Burr Versus a Burnisher/Ticketer Rolled Edge
Two types of burrs can be formed on the edge of a woodturning blade; however, one is not truly a burr.

Originally, burrs were formed using a burnisher. Today, these are made out of tungsten carbide and are used to roll the edge, so it is not a true burr; it’s a curled edge, the same as a cabinet scraper.

The other option is to form a burr on a grinding wheel or belt grinder. When grinding a bevel on chisels, some of the metal is pushed over the top of the edge, this is what we call a burr, and when used in certain ways, it can be very effective for shaping wood on a lathe.

This second option (Bench/Belt Grinder) forms a burr that is much better suited for negative rake scrapers. Firstly, it is far faster and easier to form the burr on a grinder than with a burnisher. It is, however, very important to set your grinding platform at an angle low enough to form a significant burr at the edge of the blade. Ensure you use a rigid flat platform set at the same angle for each resharpening to form the burr. If you don’t match the same angle each time you refresh the burr, it’s likely you will not form a burr at the edge, and the tool will be ineffective.

Each time you create a new burr, it is worth checking before you walk away from the grinder. You can do this by drawing your finger or nail from the back of the top bevel past the edge; you will note the burr if there is one created. However, do not push your fingers toward the burr edge, as these are very capable of creating a nasty cut on your hand.

Rules to Help with Conventional Scraping
Conventional scrapers are notorious for being aggressive or hard to control and creating torn grain. The following will help you use conventional scraping appropriately, as there are times when this technique has advantages.

First, let's establish what scraping means in the world of woodturning. You can scrape with any woodturning blade, from a gouge to a skew. Scraping means the bottom/lower bevel that forms the edge is not in contact with the rotating wood surface.

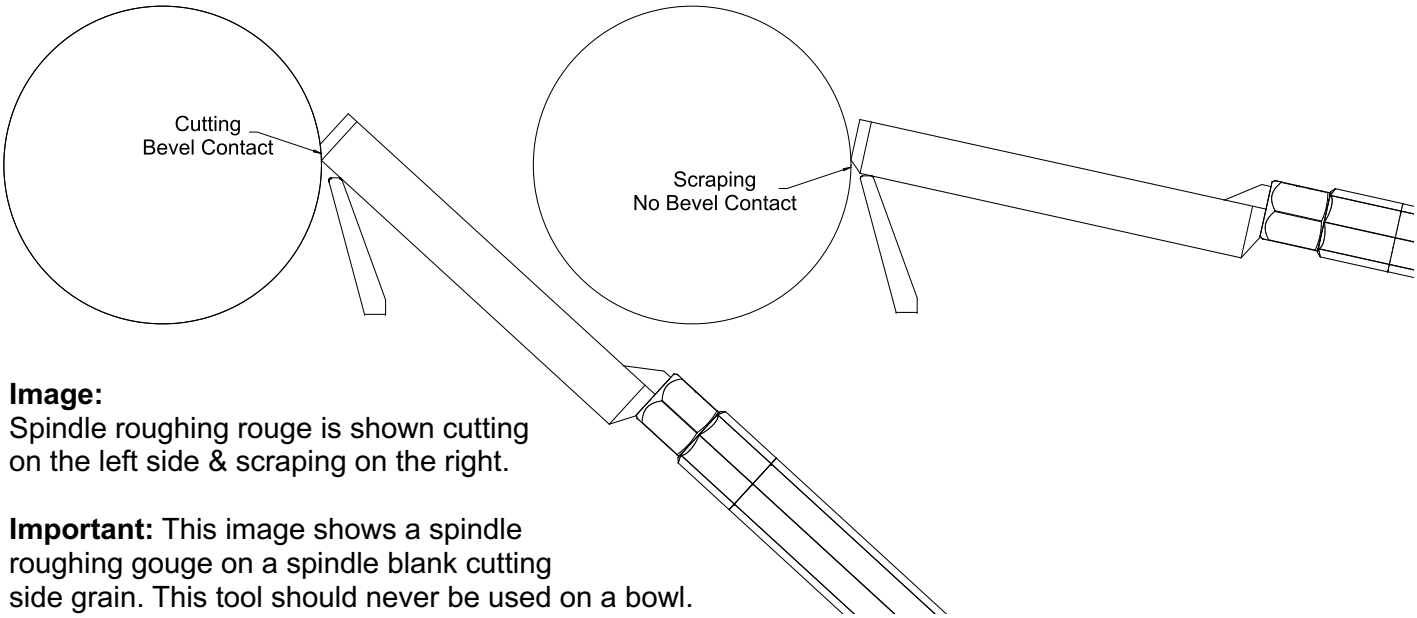


Image:
Spindle roughing rouge is shown cutting on the left side & scraping on the right.

Important: This image shows a spindle roughing gouge on a spindle blank cutting side grain. This tool should never be used on a bowl.

However, the geometry of a gouge, skew, parting tool, and negative rake scraper allows these tools to scrape without always needing to point downhill, especially when cutting side grain. This is not the same for a conventional scraper, which MUST be used with the edge LOWER than the handle (Pointing downhill), or it will immediately catch, especially when working end grain.

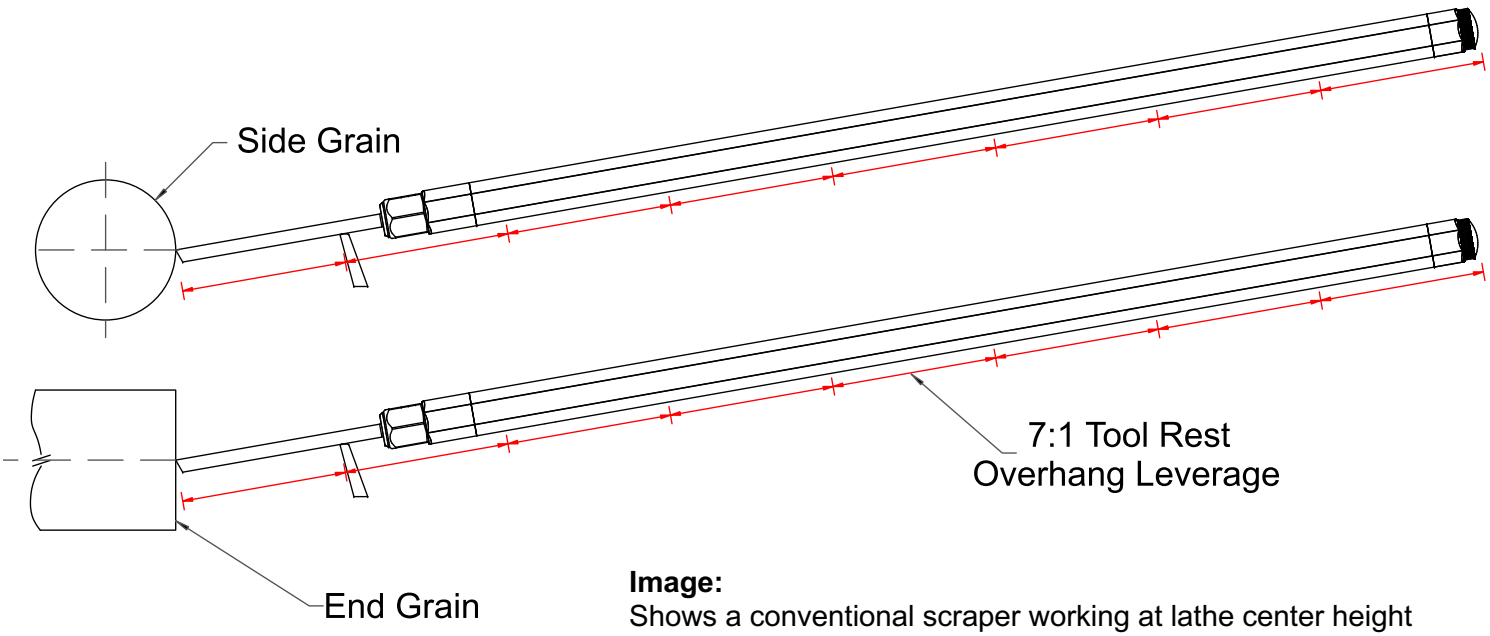


Image:
Shows a conventional scraper working at lathe center height & pointing downhill to prevent it from catching.

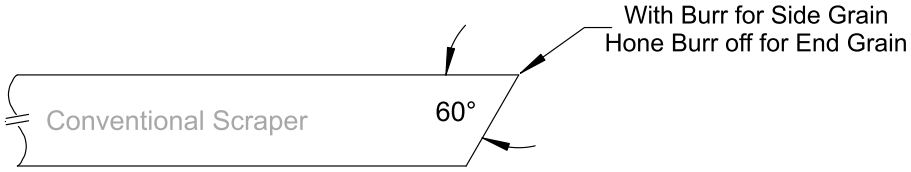
Conventional Scraper Tool Rest Height
For conventional scrapers, the tool rest must be located higher than for cutting tools or NRS so that the scraper edge is at the lathe center height, with the handle slightly higher than the blade.

A long enough handle is also essential to create a minimum 7:1 ratio for conventional scrapers, the highest ratio of all woodturning blades. This means you must have at least seven times the overhang length behind the tool rest to create sufficient leverage to control a conventional scraper. Virtually all manufacturers supply their scrapers with handles that are too short to create this essential ratio. This is why SB Tools offers ten different modular handle lengths to suit any requirement for any woodturning blade, taking less than 10 seconds to change handle length, and no tools are required.

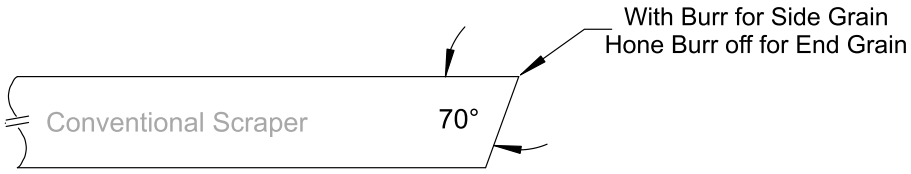
Conventional Scraper Included Bevel Angle
Unlike gouges, chisels, and negative rake scrapers that work all wood types with a 40° included bevel angle, conventional scrapers must have an included bevel angle set to match the wood type.

Adhering to the following angles will make your conventional scraper more efficient and reduce its tendency to self-feed.

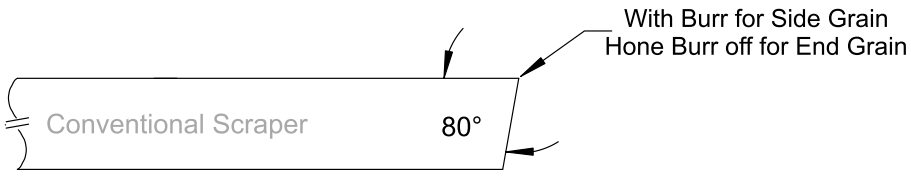
60° for Softwoods
Specific Gravity 0.60 or lower
Pine, Spruce, Cedar, Alder etc.



70° for Medium-Density Woods
Specific Gravity 0.6-0.8
Ash, Oak, Hard Maple, Walnut etc.



80° for Dense Woods
Specific Gravity 0.80 & higher
Ebony, Boxwood, Rosewood etc.



However, one other point that must be considered is whether to work with a burr or to hone it off to leave a sharp edge. The rule for this is simple; if working side grain, use a burr; if working end grain, hone it off.

Conventional Scrapers Edge Life
Conventional scraping or scraping with any tool dulls the edge approximately 30 times faster than an edge with bevel support. This is often overlooked and one of the reasons conventional scrapers tear the wood grain so easily. Therefore, working a conventional scraper for an extended period will dull its edge or wear off its burr and tear the grain. Therefore, it is recommended to resharpen for the final tool pass.

Conventional Scraper Quick Check List:

The following is a simple checklist that can help reduce the self-feeding nature of conventional scrapers, enable better tool control, and reduce or eliminate torn grain when using this technique. The following is for steel scrapers and not carbide insert scrapers.

- Convention Scraper Must Always Point Downhill
    - Set the tool rest so the edge is at center height & with the handle higher than blade
- Tool Rest Overhand Ratio
    - Minimum 7:1
    - Use a long enough handle
- Edge Angle to Suit Wood Type:
    - Softwood (Specific gravity: 0.6 or lower): **60°** Included Angle
    - Medium Density Woods (Specific gravity: Above 0.6 to 0.8): **70°** Included Angle
    - Dense Woods (Specific gravity: Above 0.8): **80°** Included Angle
    - Polymers or polymer-impregnated woods: **80°** Included Angle
- Edge Burr Type:
    - Bench or Belt Grinder formed burr
    - Burnisher formed edge: Rolled/Curled edge, not a true burr
        - Aggressive, especially on dense woods & any form of end grain
- Grain Type:
    - Side grain: Use a burr
    - End & mixed grain: Hone the burr off
    - Burls: Hone the burr off
- Resharpen for final shaping

Sheer Scraping

You have likely heard of or used this technique. It is popular with some woodturners because it is user-friendly but has limits.

For those unfamiliar with this type of scraping, it involves taking a conventional scraper and angling the blade so that the burr/edge contacts the wood surface at a sloped angle. It also requires the conventional scraper blade side corner to sit on the tool rest rather than the base of the blade. The tool is then pulled across or around the wood surface at a chosen slope angle.

Sheer scraping is simply a more complex form of negative rake scraping, which is why it is much less aggressive than conventional scraping. It also allows a turner to use a conventional scraper without modifying it to a negative rake for a more user-friendly experience.

However, sheer scraping has several significant disadvantages compared to negative rake scraping.

Firstly, because the scraper must be pulled to make this technique work, it can never form, create, or work into a corner or tight-angle surfaces. This is because the blade body and handle are always ahead of the burr/edge, preventing the edge from getting into a corner of any kind.

Secondly, because the scraper needs to be held at an angle throughout the shape while also resting on its side corner, this technique is less stable and significantly harder to control than a negative rake scraper.

Thirdly, the amount of burr/edge-to-work surface area is very small, making it much harder to make smooth, controlled movements. This also means that only a small percentage of the burr/edge can be used to shape and so these blades dull quicker than a negative rake scraper.

Here at SB Tools, we don't use sheer scraping, which has too many drawbacks.

Why Negative Rake Scrapers are Non-Aggressive (Neutral Technique)
The following images will help to explain why conventional scraper self-feed and negative rake scrapers are neutral.

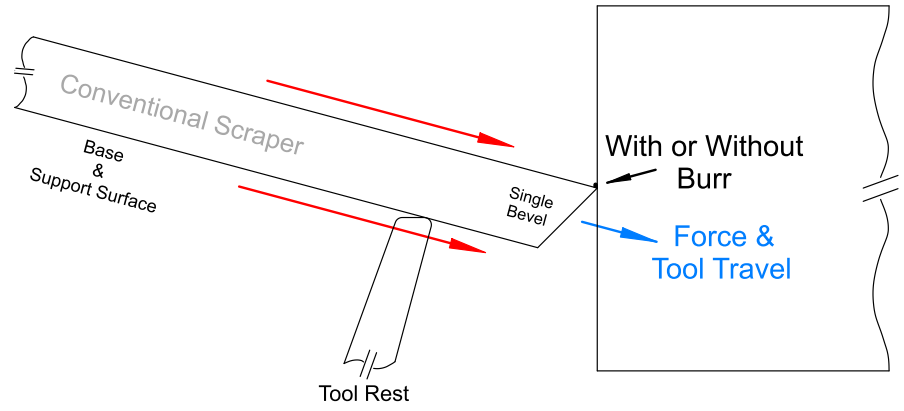
Conventional Scrapers
Note that the burr/edge on conventional scrapers is on the top plane of the blade, which is parallel to its base.

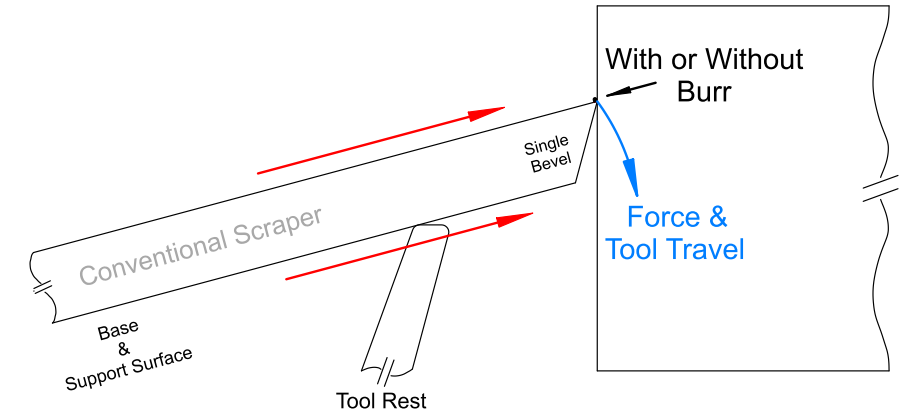
Due to the burr/edge being located parallel to the blade's base, when the tool engages the rotating wood surface, the wood fibers can pull on the burr/edge, sliding the blade forward, creating a self-feeding action. If used on end grain or denser woods, this force is increased, making it harder to control the blade. Holding the blade flat will increase the self-feeding action.

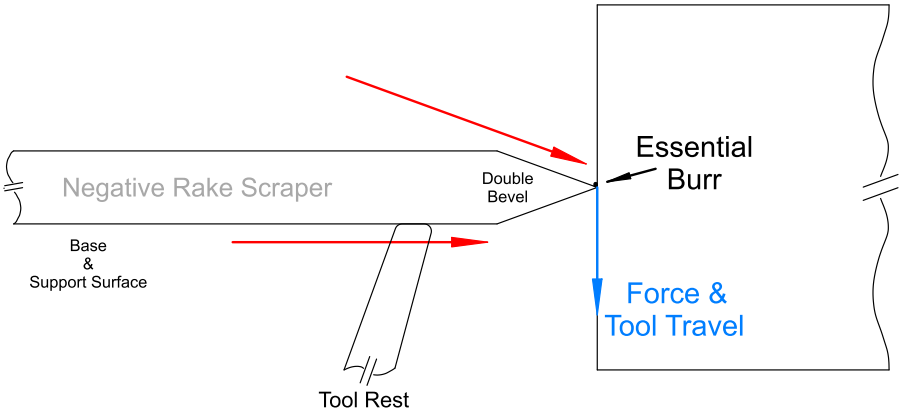
Pointing a conventional scraper uphill induces a very hard catch as the blade will be pulled deeper into the wood fibers before it can be released.

Using our recommended overhang ratios, bevel angles, and to use a burr versus to hone it off, you will be able to use conventional scrapers with much better control.

Negative Rake Scrapers
The burr/edge on a negative rake scraper is formed on a different plane to its base, as shown with the converging red arrows. As the burr/edge engages the rotating wood surface, it creates a downward stabilizing force that neither pulls nor pushes the blade away, the only neutral shaping technique in woodturning. This interaction also requires the lowest tool rest ratio at 3:1, making this technique the easiest for tool control.





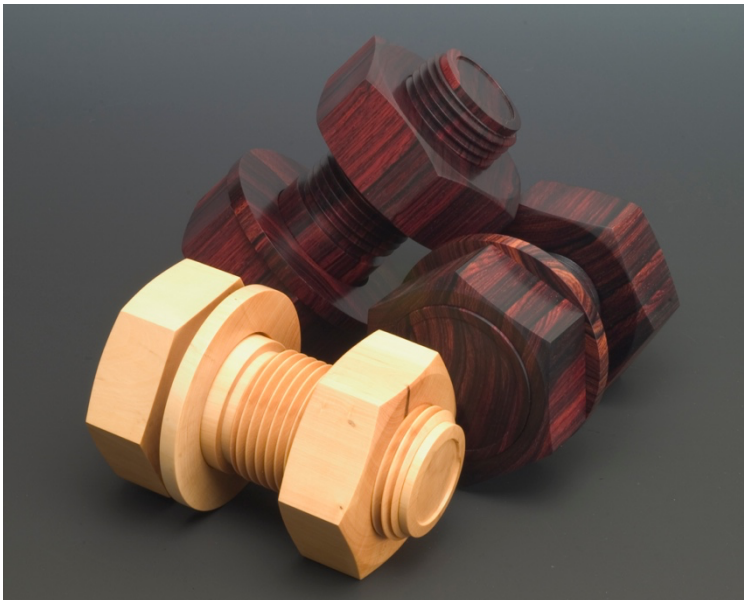


Boxwood & Cocobolo Boxes

Size: 4” Hexagon x 5” long

Negative rake scraping the final surfaces for both exceptional finish and accuracy for threading

Made by Stuart Batty



Controlling a Negative Rake Scraper
When using NRS, allow the burr to do its work by lightly passing the burr edge of the blade across the wood surface. If you need to push the edge of the blade into the wood surface with more than light pressure, this indicates the burr is worn down and it needs a regrind to establish the burr again.

Note that conventional and negative rake scrapers dull the quickest of all woodturning tools. We make our blades from 10V and 15V, the longest edge-holding steels available. We also offer significantly wider replaceable NRS blades than any other manufacturer, as this gives a much longer burr length, increasing a blade’s area and therefore working life.

Unlike conventional or carbide scrapers, that need to be narrow to reduce their aggressive nature. NRS has no limit on the amount of edge/burr contact area, even for our largest blades at over 6” wide; if all the edge is in contact at once, it still won’t self-feed. This would be impossible for a conventional scraper.

Pointing a Conventional Scraper Downhill does not make it a Negative Rake Scraper
Other woodturners say that if you point a conventional scraper downhill, it becomes a Negative Rake Scraper. This is incorrect, as a conventional scraper must always be pointed downhill, or it will always catch.

Negative Rake Scrapers can be used flat, pointing downhill, and even a few degrees pointing uphill. However, if you point uphill more than 10°, you have just turned your NRS into a skew chisel with the potential to catch.

Negative Rake Scrapers require two bevels; the second top bevel creates a negative rake angle. This is a trailing angle that points the burr/edge downhill in the direction the wood is rotating. When an NRS is held flat or even pointing slightly uphill (10° max), the top bevel will still be negative/trailing angle.

No Burr = No Negative Rake Scraping
We cannot over-stress how important having a wheel or belt-formed burr is for this technique. Some turners say that using a burnisher (Called a ticketer in England) to form the burr is best, but that is not true for negative rake scraping. A burnisher (usually made of carbide) does not create a burr; it creates a rolled/curled edge, which cannot abrade the wood surface in the way a wheel or belt-formed burr can.

The advantage of a wheel-formed burr is speed and repeatability. The burr on negative rake scrapers has a much shorter life than a cutting edge. This is why using higher vanadium content steels is very advantageous for this technique, as 10V can hold the burr up to 3 times longer than M42, with 15V lasting up to 5 times longer.

SheOak Off Center Winged Bowl

Size: *12” Long x 6” Width x 5” Depth*

Turned and shaped using 40/40 and bottom bowl gouge grinds.

1/8” thick bowl wings shaped and finished using negative rake scraping.

Made by Stuart Batty

Where Our Negative Rake Scrapers Excel:

- Easiest technique to master
    - Fast and easy resharpening
- Never aggressive on any wood or grain type: side, end, mixed grain or burl
    - Exceptional for polymer-impregnated woods
    - No other technique can finish dense end grain better
- 10V for excellent burr life & 15V for the longest burr life possible
- SB Tools’ large range of shapes & sizes enables smoother finishes than ever before
    - Unlimited edge/burr to surface area contact
- NRS is the only neutral woodturning technique
    - Does not push or pull at the wood, even when the workpiece is thin
- Only turning technique that enables backtracking
    - Rework a surface that is too thin for a gouge or conventional scraper
- Naturally smooths out curved or flat surfaces
    - Our very long & wide blades make this even easier
- Exceptional on broken surfaces
    - Natural edge
    - Winged bowls
    - Off-center work
- Eliminates the need for coarse grit sandpaper
    - Significantly reduces sanding time
    - Start sanding at 150-220 grit
- The lowest tool rest overhang ratio of any woodturning blade 3:1
    - NRS only requires short handles
    - Easy to control technique even with long tool rest overhang

Negative Rake Scrapers with Replaceable Blades
Our new Negative Rake Scrapers are designed for stability. Precision-machined 3/8” thick hardened stainless-steel bodies create the ideal mass for balance and maneuverability, making it easier to refine the shape, remove tool marks, and significantly reduce sanding time.

Supplied in the widest range of shapes and sizes and replaceable 10V & 15V blades, our NRS ensures the longest edge/burr life possible and offers great value.

Our blades are designed only to be sharpened on one side until used up. Our easy-to-swap-out precision-fitted blades ensure the NRS remains at its original shape and length for an unlimited working life.

Negative Rake Scraper Bevel Angles

NRS can be used with a wide variety of bevel angles and burr positions and still be very effective. The following images and rules will ensure you have the best information to maximize the efficiency of negative rake scraping.

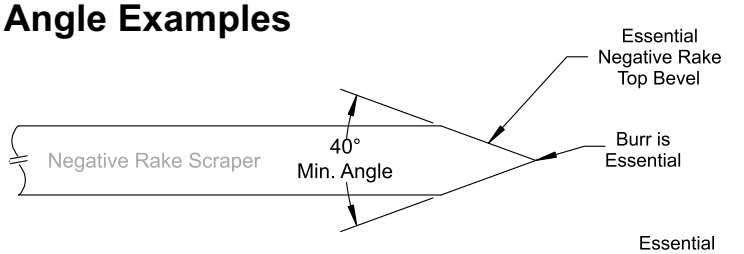
“Essential Negative Rake Top Bevel”

“Negative Rake” refers to the trailing top bevel, which points downwards from the blade’s top surface and towards its base. When grinding the lower bevel, it creates a burr on the top bevel, which is on a different plane from the base of the blade. This is what makes this tool neutral and never aggressive.

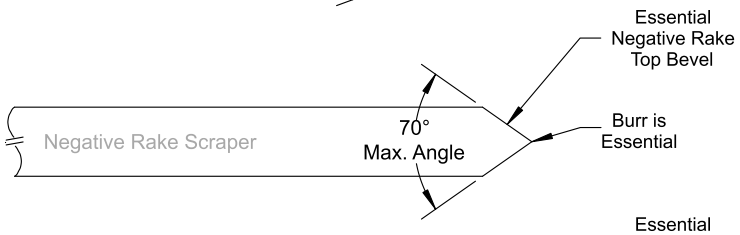
With conventional scrapers, the burr is created on the top surface and is parallel to its base; therefore, to make it trail requires the handle to be higher than the blade, but this alone does not stop it from wanting to self-feed.

NRS Bevel Angle Examples

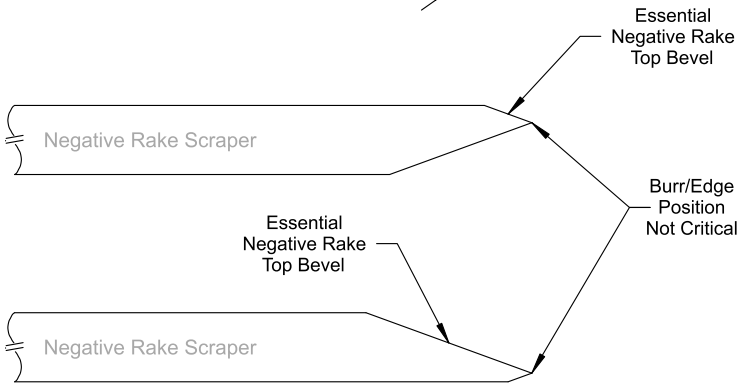
40° is the recommended lowest included angle for an NRS blade, creating a bigger burr with a longer working life than a higher angle. Lower than 40° is impractical to create.



70° is the recommended highest included angle for an NRS blade. However, this angle creates a small burr with a shorter working life than lower angles. Above this angle and the burr is too small to be effective for this technique.

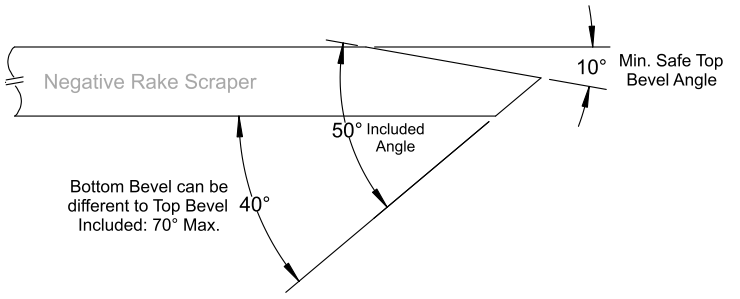


The position of the burr relative to the top or base of the blade does not affect its working life. However, the blade is more stable when the burr/edge is closer to the base of the blade.

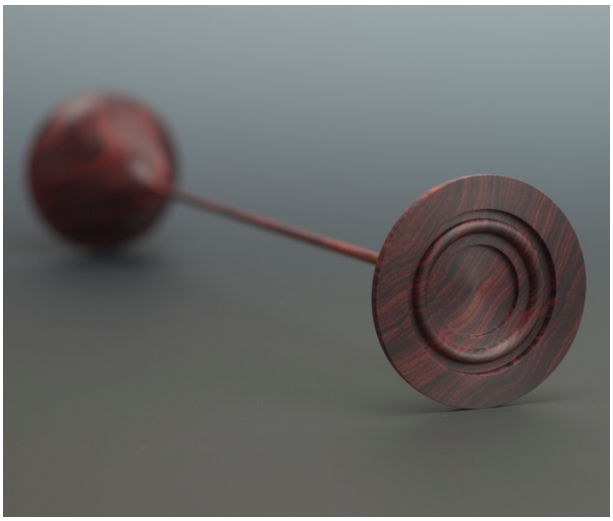


We recommend that an NRS's top bevel be at least 10°. Any lower than this, the NRS will perform like a conventional scraper and become aggressive.

Two different bevel angles can be used to create the included angle for an NRS. Ensure the two combined angles do not exceed 70° included angle.



10° & 30° = 40° Included Angle
20° & 30° = 50° Included Angle
20° & 40° = 60° Included Angle

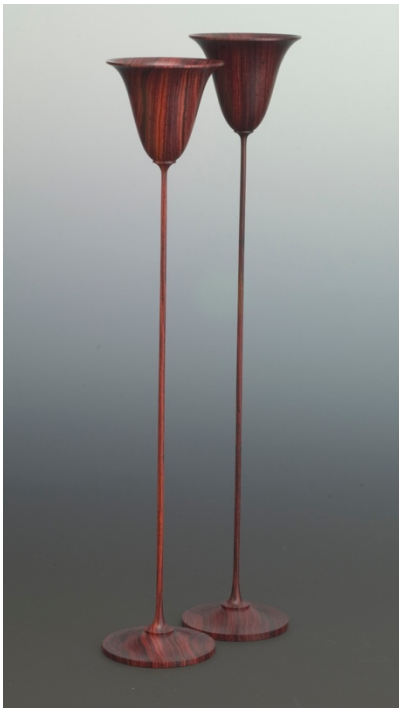


Cocobolo Goblets

Size: 18” Tall x 4” dia.

The base of the goblet completed using negative rake scraping.

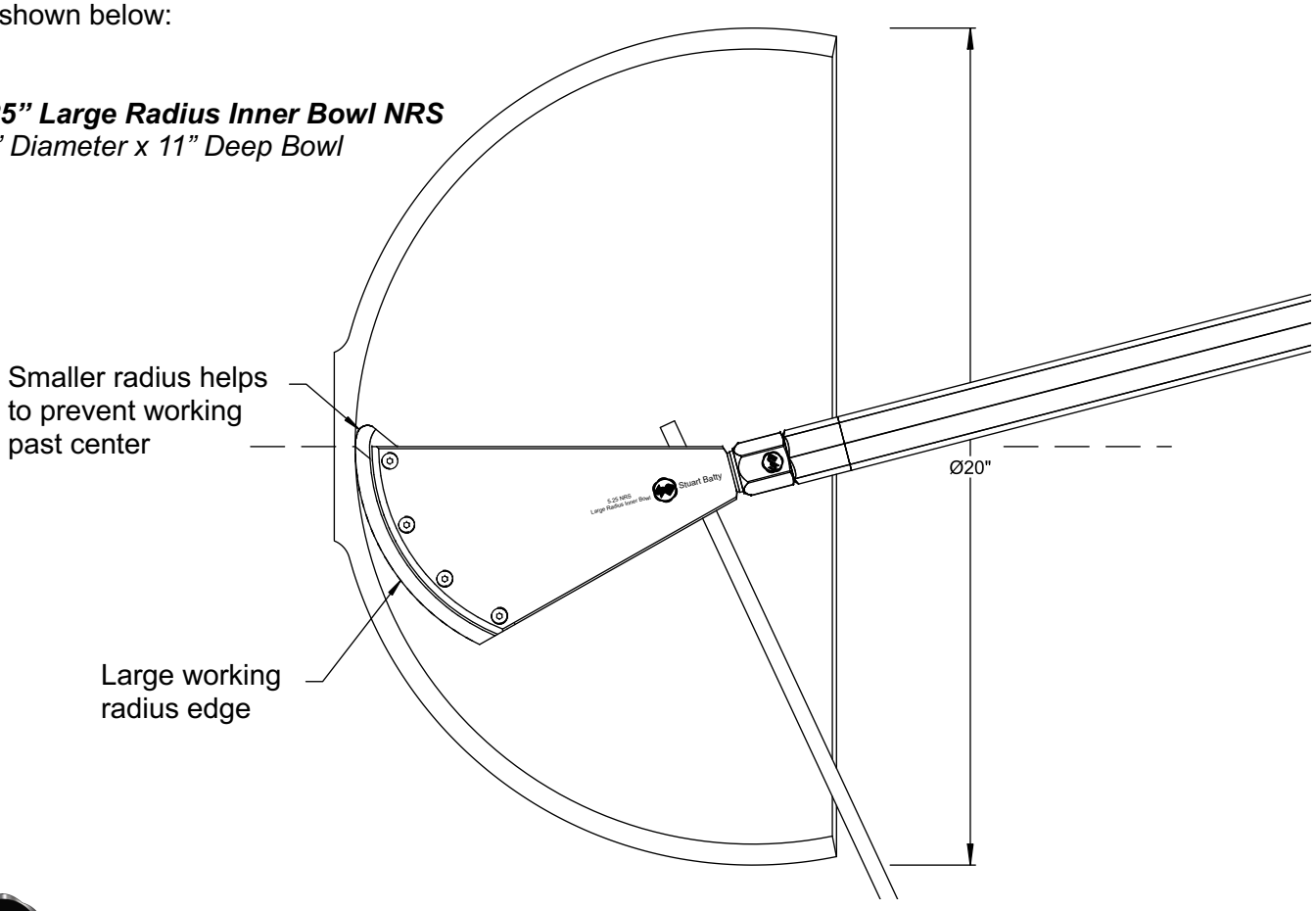
Made by
Stuart Batty



Note: Negative Rake Scraping Limitation
Unlike conventional scrapers that can only cut with the edge facing upwards, NRS blades cut even if the blade is upside down or flipped.

Why does this matter? It’s simple: a conventional scraper at the bottom of a bowl or box stops cutting when its edge goes past the center. An NRS blade, if allowed to go past the center, will continue to cut on the uphill-moving wood. Therefore, it is important to pay attention when working in the very center of bowls or boxes and to prevent working past the center. We designed our new Large Radius Inner Bowl NRS with an additional smaller curve on the right side of the blade that prevents the blade from cutting past the center, as shown below:

5.25” Large Radius Inner Bowl NRS
20” Diameter x 11” Deep Bowl



Figured Maple Platters – Completed Using Negative Rake Scraping

Made by Tom Wiring

Big Leaf Maple: *Acer Macrophyllum*
17" Diameter

Big Leaf Maple: *Acer Macrophyllum*
12" Diameter

Tom Wirsing is a student of Stuart Batty who specializes in making platters from highly figured wood. These two platters are made from the same species of maple but with slightly different grain structures.

Tom's platter's form and finish are among the best in the world, with flawless curves and no visible sanding marks.

Maple is a relatively soft hardwood, and the grain structure in these pieces is created by the wood fibers repeatedly curving along their length. This exposes both the side and end grain, which reflect light differently, making this stunning figure.

Though initially shaped using a combination of 40/40 and bottom bowl grinds, the grain structure makes cutting the large shallow curves challenging without tool marks and undulations.

Whether hand or power sanding, these forms of abrasion are flexible and always take the path of least resistance. Because figured wood is a mixture of both side and end grain, any excessive sanding creates a surface ripple effect, as more side grain will be sanded away than end grain.

Tom completes his platters using negative rake scrapers to perfect the shape and surfaces.

A negative rake scraper with its non-aggressive non-flexible burr edge can glide over all the platter surfaces, removing tool marks and eliminating undulations without tearing the grain. Stuart's negative rake scraping technique has enabled Tom Wirsing to start his sanding sequence at 180 grit, eliminating the coarse grit abrasives that create surface flaws on figured wood surfaces.

At SB Tools, we are developing a series of Tom Wirsing-inspired NRS for platters; details will follow soon.

Advantages of Steel over Carbide for Scrapers

Carbide has up to five times the life of 15V and over thirty times that of M2. At first glance, using a carbide scraper seems the better choice, but once you review the benefits of high vanadium tool steel versus carbide, you can see why we went with 10V and 15V for our conventional and negative rake scrapers.

There are numerous grain types: side grain, end grain, mixed grain (bowl blank), burrs, figured grain, crotch figure, angled grain, knots, etc. However, only side grain should be treated as side grain. All other grain types should be treated as end grain for conventional and carbide scrapers.

When using conventional scrapers, it is important to be able to change the bevel angle to suit the wood density and to be able to have a burr for the side grain. This can easily be done on a bench or belt grinder.

Carbide cutters are diamond-lapped at the factory to obtain a sharp edge and are supplied with a low included bevel angle that suits softer woods. Trying to resharpen or change the bevel angle of a carbide cutter on a bench grinder will only damage its edge, even with CBN. Though CBN can grind carbide, it will not be able to get it back to factory sharp and will significantly reduce the CBN wheel life.

Carbide excels when used for the inside of hollow forms. Its long edge life and small cutter size enable it to work with reasonable control. However, carbide's small cutter size makes smoothing out large surfaces more difficult than wider conventional scrapers. Neither can compare to negative rake scrapers, which can have an unlimited blade width and still be the most user-friendly technique.

Goldfield Burl Winged Bowls
Eucalyptus species
Specific Gravity: >1.0

These Eucalyptus burls were shaped using 40/40 & bottom bowl gouge grinds.

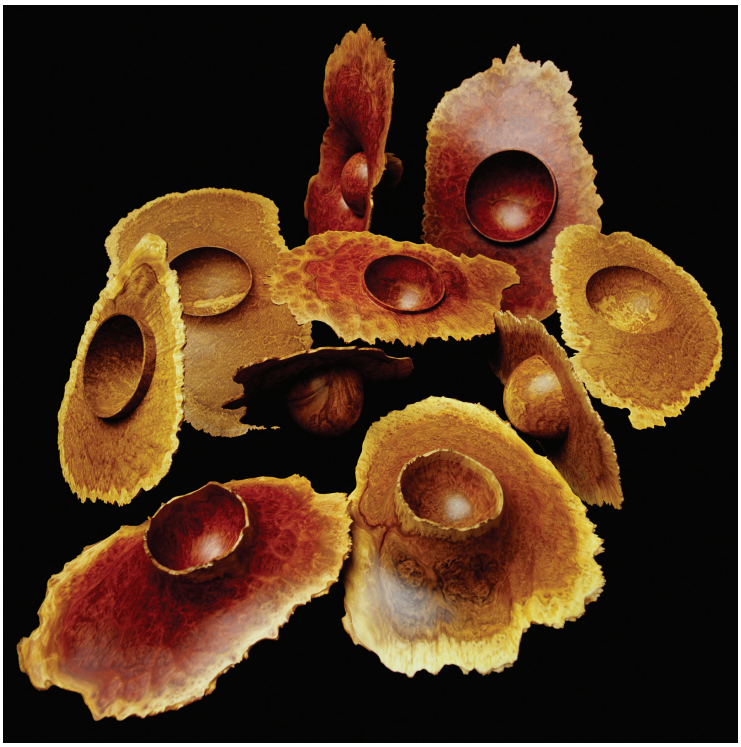
The final surfaces were all finished using negative rake scraping.

Sanding started at 180 grit.

The 1/8" thick wings, wood density, grain formation, and broken surface shaping make conventional or carbide scrapers impossible to use on these winged bowls.

Sheer scarping can't work into the corners and would be extremely hard to control over the large broken surface areas, especially at 1/8" thickness.

Only Negative Rake Scraping can work these winged bowls & types of wood down to 1/8" with ease and safe tool control.



Made by
Stuart Batty

Key Points to Consider when Choosing a Scraper Type:

Carbide Tipped Scrapers

- Carbide holds the longest edge
    - Requires diamond lapping to resharpen correctly
- Carbide cannot create burr
    - Eliminates these as Negative Rake Scrapers
    - Eliminates working side grain efficiently
- Carbide cannot be ground back to factory sharp on a bench grinder
    - Grinding on a CBN wheel will significantly reduce wheel life
    - Changing bevel angle with CBN to suit wood/grain types won't be factory-sharp
    - Supplied bevel angle usually too low for denser woods
- Smallest working surface area of the 3 Scraper Types (Ex. Sheer Scraping)
    - No large or wide carbide available scrapers for woodturning
    - Hard to control for smooth wide surfaces
    - Requires highest overhang ratio 7:1
        - Never supplied with long enough handle

Conventional Steel Scrapers

- Capable of grinding bevel angle to suit wood-type
- Aggressive if used with wrong bevel angle
- Use with a burr for side grain
- Use with burr honed off for end grain
- Requires highest overhang ratio 7:1
    - Rarely supplied with long enough handle

Sheer Scraping

- Makes conventional scrapers less aggressive
- Requires blade to be held at an angle on the tool rest
    - Hard to maintain a constant angle on longer shapes
- Much harder to control than NRS
- Small burr/edge contact area
    - Shorter working life
- Can't work into a corner
- Can't be used for detail or complex shapes
- Requires lowest overhang ratio 3:1

Negative Rake Scrapers

- Easy to resharpen
- Effective on all wood types
- Works any grain direction or type
- User-friendly & never aggressive
- Easiest technique to master
- The widest usable working burr/edge area
    - No limit to edge-to-surface area contact
- Able to create fine detail
- Exceptional surface finish
- Start with finer grit sanding
- Reduces sanding time
- Requires lowest overhang ratio 3:1