

## How To Make And Grind 3/8" Box Scraper/Skew Tool



### **Introduction:**

I learned about this handy tool from Allan Batty during one of his workshops in my studio. It is very useful when turning cylinder style boxes to clean up the inside and finish the flat bottoms on the inside. The tool can be made in right hand and left hand versions to aid in cleaning up the area on either side of the foot on bowls or platters. I have found this tool to be very handy and is a vital tool in my tool kit. The box scrapers that I make have a skew ground on the other end, which comes in real handy for cutting dovetail tenons on blanks that are going to be installed in chucks with dovetail jaws. It too comes in handy when cleaning up the area around the foot in platters and bowls. The end with the skew makes it very easy to under cut the shoulder on tenons to insure a good fit and to improve the ability of a blank to seat itself properly in a chuck. This tool can also be made using 5/16" square stock if one chooses, but by far the 3/8" square tool is the one I use the most. I have found that it takes me about 45 minutes to grind both the box scraper and the skew on the other end of the 8" HSS steel square bar. I currently use a 46 grit Norton 3X aluminum oxide wheel followed by my new CBN 100 grit wheel. In the past I have tried using my belt sanding station with a metal sanding belt to sand the side of the box



scraper at a 5 degree angle, but it seems to have taken a bit longer to grind the side of the box scraper.

### **Materials:**

- Safety Gear such as **Face Shield** should worn or goggles that completely cover your eyes
- 3/8" Square HSS Steel 8" long bar
- Grinder equipped with a course wheel and a finer wheel
- Water container to help keep the tool still cool so that you can hold on to it
- Sand Paper to ease the edges of the bar so that it can slide along the tool rest
- Lemon juice to clean the black off your hands when you are done.



### **Procedure:**

#### **The Box Scraper:**

The first thing I do is grab a scrap piece of wood about 2" square and 2" plus long and cut a notch in it sized to fit the square HSS square bar that I will be grinding. This block is used to



hold the steel against the grinding wheel so that you do not over heat your fingers while holding the steel against the wheel. This comes in especially handy when grinding the side of the steel bar at the required 5 plus or minus degree angle.

Next I set up the flat plate on my grinder so that I can grind the side of the steel bar at roughly a 5 degree angle. I try to set it up as close to the wheel as possible to insure that the steel does not get jammed between the platform and the grinding wheel.



Before beginning to grind the steel dress the wheel to insure that it is flat and that it has fresh cutting surface.

I begin grinding 5 degree angle on the side of the tool by pushing it up against the wheel and sliding it back and forth in order to grind an area about 3" to 4" plus or minus long back from the end of the tool (see photo). I grind the side until it is about an 1/8" or less from the top surface of the tool.

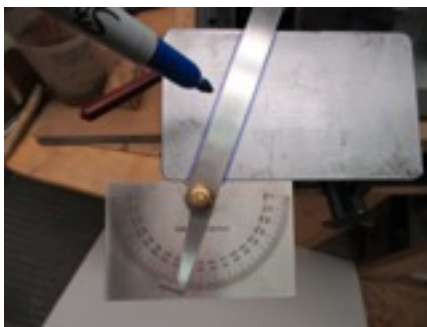
Once I have finished grinding back the side of the box scraper to my satisfaction. I then set the grinder's platform to the same setting I use to grind my other scrapers. Most of my scraper bevels are ground to approximately to 75 or 80 degrees plus or minus. Grind a sweeping arc from the tip to the right side of the front of the tool. This may take a bit of work. Once the arc has been ground, the next step is to grind the front left corner perpendicular to the side for about an 1/8" then it arcs away from the flat area at the tip. Once this is done I flip the tool upside down and grind approximately a 5 degree negative rake on the top of the tool. I grind it down until it meets

where the side was ground back at 5 degrees along the side of the tool. *Check out one of the photos.* Once the top has been ground I like to grind away a bit of the bottom of the tool directly under the front cutting edge to enable the tool to get into a tighter space. *Once again see one of the photos to help guide you and clarify what I am trying to explain.*



### **The Skew:**

Once you have finished grinding the Box Scraper it is time to grind the skew on the other end of the tool. To grind the skew use a protractor to mark two 70 degree lines on the top of the platform one on the right side of the platform and the other on the left side of the platform to help guide you when grinding the skewed angle on the end of the tool steel. *See photo of the platform for clarification.*



I like to use a *Sharpie* to draw parallel lines on the platform at 70 degrees on both sides of the platform with a protractor set to 70 degrees. I use these lines as a guide to keep my steel at the proper angle to grind the skewed edge. I slide the platform away from the grinding wheel in order to clear the wheel when drawing the lines.

Now set the platform up close to the grinding wheel and set the angle to grind the appropriate bevel angle on the end of the tool. A general rule of thumb for the proper bevel angle on the end of the skew states that the length of the bevel should be roughly 1.5 to 2 times the thickness of the tool in this case the tool is 3/8" thick so that would mean that the length of the



bevel should be about 3/4" or a little less depending upon the hardness of the material you intend to turn. *(I learned this little trick from Allan Batty. It may be to your benefit to purchase his book "Woodturners Notes" available from Craft Supplies in Provo Utah)*

After grinding the skew it is now time to hone the edge of the skew to a razor sharp edge. The skew is the only turning tool that I hone on a regular basis.

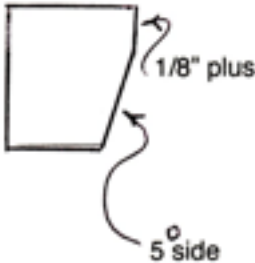
Insert your newly ground tool into a tool handle with a slightly larger than 1/2" collet and test it out. When using the Box Scraper on the inside of a box to clean it out and do the finishing cuts I use only the very corner of the tool and take very light finishing cuts. Once you get to the bottom of the box you can slide the toll across the bottom pass lightly past the center dimple and then slide it back to the side and clean up the bottom the box. This technique is especially handy when the box was hollowed out with a Forstner bit to get rid of the dimple left behind by the bit. I often use the skew end in a scraping position to cut in the dovetail tents for mounting a blank in a chuck. Have fun with the tool and ***Happy Turning!***

***Some other tools that you can make***



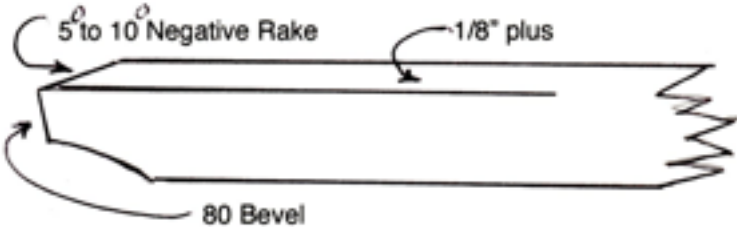
**3/8" Square HSS Bar Stock  
Box Scraper**

**Front View**



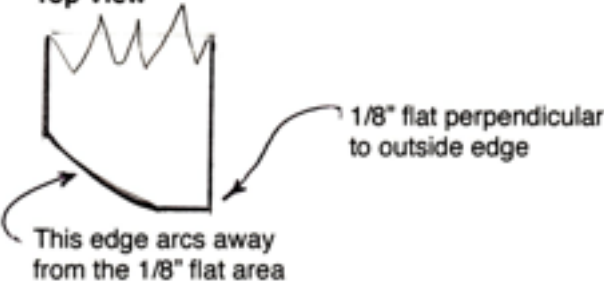
The side edge is ground back approximately 3" to 4"

**Side View**



Bottom edge ground off for extra clearance (angle is not critical) Just need a bit of a relief to aid in getting into tight spaces

**Top View**



*Note: To grind the 5 degree negative rake on the top of the Box Scraper I just turn the tool upside down and rest the top edge on the wheel and guess at the angle and grind it down until it meets the edge where it was ground back to an 1/8"*