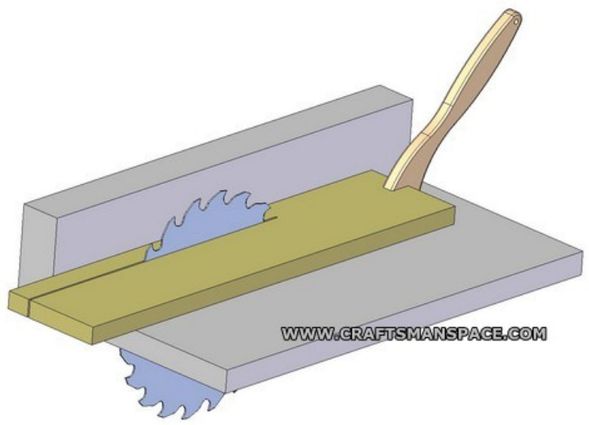
Wood-1 Widget: TABLE SAW PUSH STICK/BLOCK

For this proficiency demonstration, you will craft a “shoe” style push block. Push blocks are used on a table saw or jointer to push material through the danger zone while keeping the operator’s hand clear of the blade. There is no “perfect” size nor shape for a push block, as can be seen in the variety of examples below.



Wood-1 Widget: Required/Recommended Reading

It is assumed that you already have some wood shop experience-- the exercise is designed to demonstrate basic proficiency, not teach it. If you are unfamiliar with the tools that will be used in this exercise, or if you are not fully confident in your woodworking skills with these power tools, please see John Sullivan before going further!

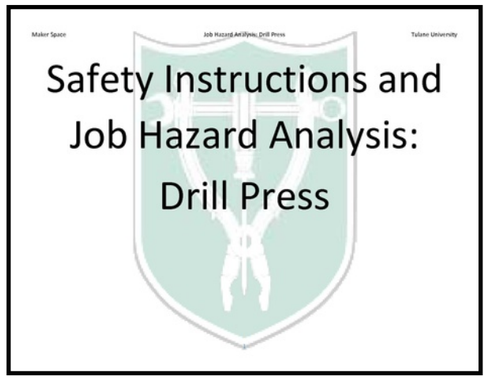
Woodworking Power Tools used: *Users who never used similar power tools in a shop environment, or are unfamiliar/inexperienced with these power tools, MUST review manuals for each tool as described below.*

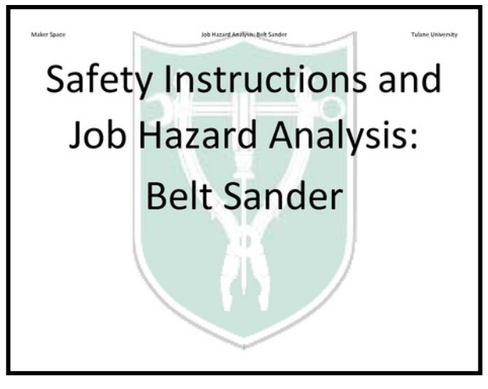
Wilton Drill Press (#3 on the Wiki Drill Press page… the manual is for a comparable but not identical drill. See pp 5-11)
Bandsaw (you may use either or both for this project – see bandsaws #3 and #4 on MS wiki… manual pp 2-10 for the small Craftsman; pp 4-5 and 9-19 for the Jet)
Powermatic Belt/Disc Sander (manual pp 15-18)
Bladerunner Table-mounted Jigsaw (manual pp 3-15)
Dust collection tools (you may simply discuss MakerSpace dust collection tools & procedures with a Ninja)
WEN Oscillating Spindle Sander (manual pp 5-13)

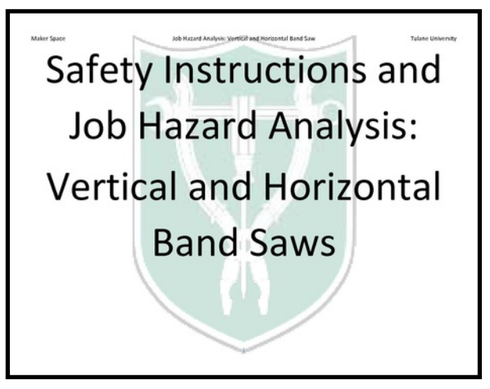

WEN
Oscillating Spindle Sander
Model: 6510
IMPORTANT:
Need help? Contact us!
techsupport@wenproducts.com
WENPRODUCTS.COM

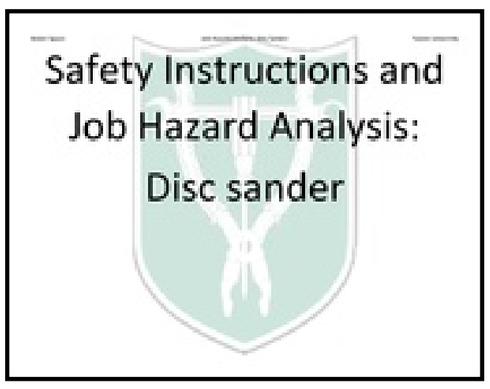

JET
Operating Instructions and Parts Manual
AFS-1000B Air Filtration System

Manuals and Hazard Analysis documents are posted on the Tulane MakerSpace Wiki.


Safety Instructions and Job Hazard Analysis: Drill Press


Safety Instructions and Job Hazard Analysis: Belt Sander


Safety Instructions and Job Hazard Analysis: Vertical and Horizontal Band Saws

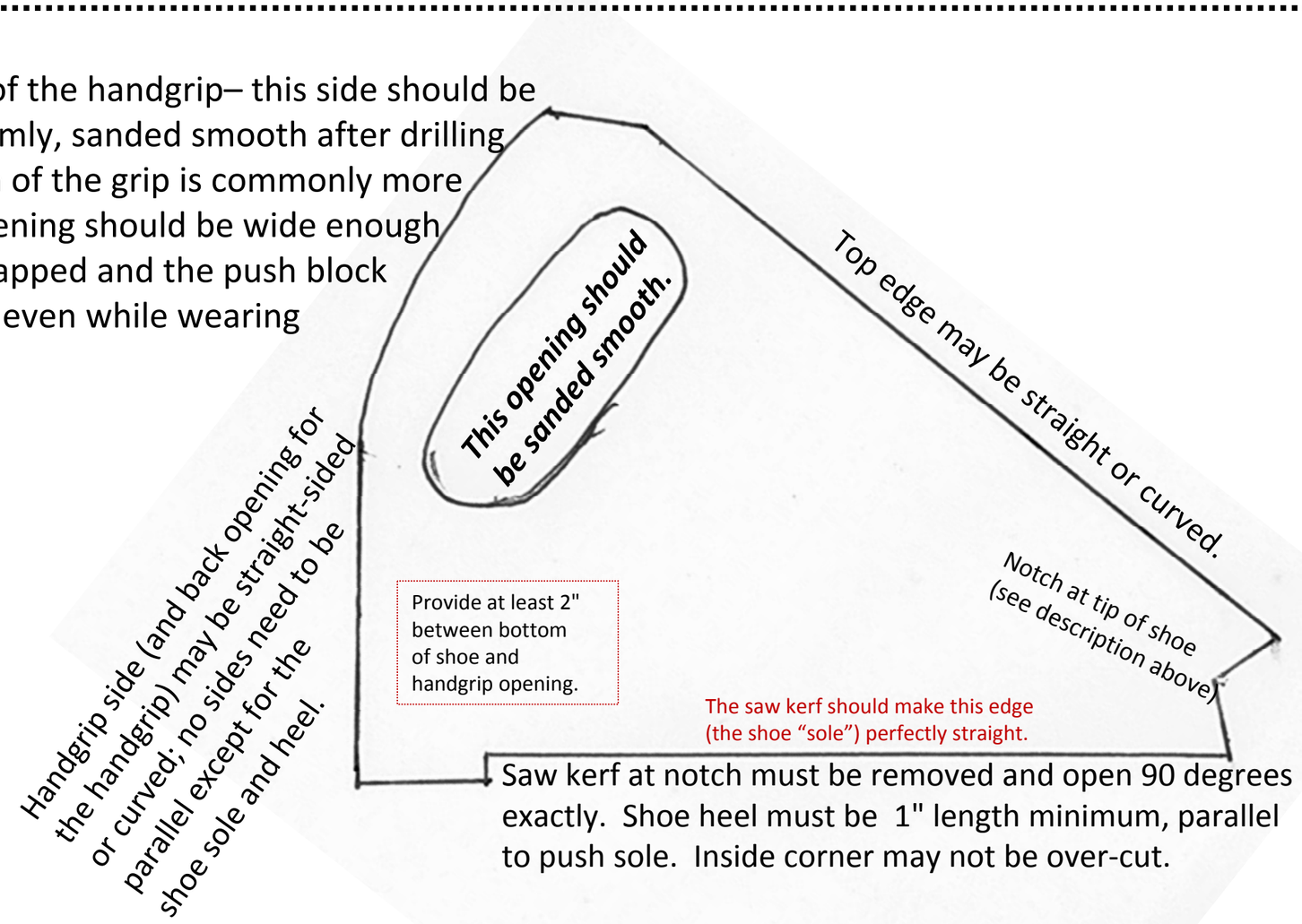

Safety Instructions and Job Hazard Analysis: Disc sander

Wood-1 Widget: YOUR PUSH STICK/BLOCK

You will be provided with a plywood scrap board with a single saw kerf (blade-width cut), and these instructions. Review tool manuals as needed and lay out all your cutting lines before coming into the wood shop. There is no "perfect" size nor shape for a push block.
Do not worry about making an exact copy of the shape below. The hand grip cutout should be comfortable for you to grasp in your dominant hand, so finished sizes will vary.

Visualize this push block as having the parts of a shoe, where the workpiece is pushed forward by the heel, and the sole applies downward pressure to keep the workpiece on the table. The notch at the tip allows the operator to push/manipulate the wood in a different way, keeping hands even farther from the blade (although this gives less control over the workpiece) and should open to an angle of 90 degrees or more.

This back edge is part of the handgrip– this side should be comfortable to hold firmly, sanded smooth after drilling and cutting. The width of the grip is commonly more than one inch. The opening should be wide enough that fingers can't be trapped and the push block can be dropped easily, even while wearing heavy work gloves.



It is assumed that you either have some wood shop experience, and/or have already read the basic instructions for all tools that you will use on this project– the exercise is designed to demonstrate basic proficiency, not teach it. We don't actually care if you finish the push block; we just need to see that you are capable of working with this set of stationary woodworking power tools safely and effectively.

Wood-1 Widget: Ninja Guidance

This is a guide for Ninjas who mentor MakerSpace users to earn the Wood-1 badge. It's meant to be a reminder of topics that must be addressed. Feel free to keep it with you, and check off the completed items, as you walk through the training.

Preparation
Trainees should be provided with a paper copy of the drawing and a pre-kerfed scrap of ½" plywood. They should already have read the operator's manual (Wiki pointers are on page one of these instructions) and have a basic familiarity with each tool; this exercise is to demonstrate proficiency, not teach it.

Safety first
These are Yellow zone tools so appropriate Personal Protective Equipment is required
- Hair tied back
- No loose jewelry
- Closed toe shoes
- Safety glasses
- Optional: Leather or Latex Gloves for users with skin sensitivity issues (please have a conversation about pull-in risks associated with gloves)
- Recommended: Ear plugs or muffs for noisy tools, Respiratory Protection

Plan the project
Discuss the order of operations, and what tools will be used. Steps described are not necessarily sequential. Walk through the tools for orientation and location, functions of knobs, safety features, risks/hazards associated with each tool. Check workpiece for stray metal that could damage tools/blades, etc

Discuss the basics
Even though the push block won't be used until Wood-2, discuss the functions of the shoe/heel configuration on the push block to affirm that the trainee understands its purpose. Do the same for the concave notch at the point. Verify that the layout lines will result in a comfortable/practical push block for that user. Confirm that the trainee has thought about which dimensions/angles/functional parts of the push block require precision and which parts don't. Why are some parts more critical than others, and demonstrate/discuss a saw operation where the push block may not be helpful.

Drill 2 or more holes for the handgrip (drill press operations)
Drilling out in succession to clear wood is often called "hogging out" and is acceptable, but will make finishing the handgrip opening more difficult.
Which size and type of drill bit; where are drill bits kept?
Forstner, Spade, or Hole Saw? Twist bits would make a poor choice for this application.
Large holes highlight the importance of clamping a workpiece after aligning the center of the bit.
Discuss the need for a backer board to protect table and bit, and how to prevent splintering on the back side of the workpiece. If holes overlap, how does this impact the choice of drill bit?
Introduce drill press: remind that some operations/bits/workpiece materials will work better at different speeds.
How to properly chuck the bit and verify that it's straight. Remove chuck key immediately!
Clamp workpiece for safety. How to target center of hole. Appropriate downward speed/force to apply when drilling. Use vacuum to clean up drill press area when done, put the drill bit(s) away

Complete roughing out the handgrip on Bladerunner (table-mounted Jigsaw)
Discuss correct jigsaw blade for material and shape of cut
Importance of keeping workpiece flat to table
Remove extraneous material
Use dust collection while tool is running or clean up after?

Long, relatively straight cuts or more precise inside corners (either band saw)
Adjust guide post to correct height
Location of power switch, dust collection options
Check table/blade angles, check trunnion
Hold workpiece so blade is not near fingers
Ensure that cut can be completed (upright won't block workpiece)

Smooth outside edges – belt/disc sander
Check table angles
Importance of dust collection: demonstrate central (CNC) dust collection AND Jet mobile dust collector
Torque kick, don't cut until fully up to speed
Slightly advanced: how to round edges over freehand/unsupported

Smooth inside edges – oscillating spindle sander
Choose appropriately sized spindle
Importance of ongoing dust collection, using portable or shop vac systems
How to change spindles
Hold workpiece securely during startup with no contact to spindle
Advanced: how to round over edges without full table support