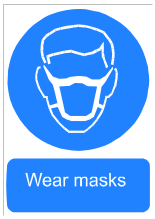
SAFE OPERATING PROCEDURE (SOP) & ACCREDITATION GUIDE	Sanding Machines – Drum, Edge, Bobbin, Disc & Sand-Flee	Accreditation Code	W8

Safety Requirements whilst operating the Sanding Machines.

Compulsory when sanding dusty materials, acrylics or brittle materials



Required when hazardous or significant dust likely

If using the machine for extended periods or if high noise level

Long and loose hair must be contained.

Do not wear gloves

Always use dust extractors to which these machines are attached.

- Knowledge of Key features of the Sanding Machines must be understood and clearly evident during competency assessment. Safe operation of the Sanding Machines must also be demonstrated.
- This document applies to the following Sanding Machines**: Major 26" Dual Drum Sander (Drum Sander), Major 26" Oscillating Belt Edge Sander (Edge Sander), Major Oscillating Vertical Spindle Sander (Bobbin Sander), Woodfast 305mm Disc Sander & SandFlee SF-1800,** and must be read in conjunction with the Manuals and appropriate guides. Recognition of the main parts of the Sanding Machines is necessary in order to understand descriptions below. Reference to diagrams in the Sanding Machines' Manuals and observation of the actual machines may be useful information sources. Web tutorials are also an excellent informer. The Web link http://www.jamarco.com/91b_Technical/sandpaper/Making%20Sense%20of%20Sandpaper%20-%20Page%201%20-%20Fine%20Woodworking.htm provides excellent information on various abrasives including grades, bonds and applications.
- Clear knowledge of our Shed's Safety Induction Package should also be evident and practised by aspiring Sanding Machine operators.
- Persons who are unable to see finer work details should not use the Sanding Machines unless aided by suitable lenses.

Key Features of Sanding Machines

❖ **For all the Sanding Machines:**

- They use abrasive coated paper or cloth as a working medium,
- *The most common abrasive material used is aluminium-oxide. It is most commonly bonded to a cloth backing with two resinous coatings. Aluminium-oxide is graded according to the size of grit and whether open or closed coat. Open coat abrasives are needed for wood whereas closed coatings are used for metals because there is less wood or swarf being removed and metal is harder to sand away.*
- *Common abrasive grades used, from coarse to fine, include 40, 60, 80, 100, 120 and 180. The finer grades are not suitable for heavier machine sanding and tend to clog and wear rapidly. 40 grit is more suited to floor striping. A "P" in front of the grade number indicates a European rather than an American grading. Some abrasives are graded according to the micron size of the grit.*
- The abrasive action is renewed by the breaking away of small chips of abrasive as the work is abraded,
- They require dust extraction,
- All have abrasion injury potential,
- All require eye protection and prevention of dust inhalation,
- When clogged they require cleaning with a cleaning stick (Maintenance Coordinator ONLY to clean Duel Drum Sander),

- Generally they produce smoother results when work is sanded along the grain,
- All potentially clog up with painted or gummy wood which therefore should not be sanded,
- There is a tendency for them to heat the work as well as the abrasive medium due to friction *(Excessive heat generated can cause burning and blackening of the work and also the abrasive bonding adhesive. The effectiveness of the abrasive is reduced by overheating which melts the abrasive bonding material and tends to irretrievably burnish the abrasive surface),*
- They use a table or support surface on which to hold the work.
- None of them should be subjected to excessive pressure when holding the work against the abrasive surface.
- Sanding is usually done after fine-edged cutting-tools have been finished with because abrasive particles embed in the work surface and will blunten sharp tools.

❖ **The Dual Drum Sander features:**

- ***Coordinator Supervision requirement for use.***
- The Sander has two drums, one can be fitted with 80grit paper and the second with 120-grit paper.
- The Key switch must be turned on to start the running of the conveyor belt and rotation of drums.
- Timber to be sanded is fed automatically through the machine on the conveyor belt drive.
- Hands should never be placed closer than 200mm to the conveyor feed table opening to avoid being caught and trapped by the conveyor belt, or between the conveyor belt and the workpiece.
- A crank handle is used to set the sanding thickness to the required height. It should only be turned approximately one eight of a turn between passes of the workpiece under the drums.
- When the height (thickness) is unknown, the work piece can be set on the table, under the sanding drums. NOTE .The machine must be turned "OFF".
- The conveyor table is raised until the sanding drums just make contact with the workpiece without over tightening.
- The work piece is then removed and placed at the centre of the conveyor belt on the in-feed side.
- The unlocked isolating switch and a green "ON" button is pressed to start the Drum Sander.
- The material should never be force-fed.
- When long lengths are sanded, an out-feed table, roller stand or another person is required to 'tail out' as the ends of the material clear the Drum Sander.
- The Drum Sander is capable of detail sanding broad boards up to 26 inches wide.
- The maximum thickness that can be sanded is 300mm (12 inches)
- The minimum length that can be sanded is 150mm (6 inches)
- The minimum thickness that can be sanded is 6mm or (1/4 ")
- <u>The depth of the sanding should not exceed 0.30mm (0.0118")</u>
- There are two dust collection ports and blast gates which should be opened when sanding.
- When sanding matched pieces, sand each one in sequence at the same thickness and finish sanding with all pieces sanded to the same thickness: note the thickness on the height gauge.
- Note: if the sander appears to be operating incorrectly or is making an unusual noise, seek advice from a Shed Coordinator.
- UNDER NO circumstances are users to open the safety cover, change the sanding belts or adjust the conveyor belt and tracking; these tasks must only be undertaken by a Coordinator who has the required level of expertise.

❖ **The Oscillating Edge Sander features:**

- The Edge Sander is a belt sander that is mounted on a fabricated stand. It is suitable for smoothing flat surfaces, sides, edges and chamfers, on the sanding belt which is 150mm wide. A trailing, sweeping action of the work can produce rounded corners with sanding marks following the grain.
- The sanding belt oscillates transversally and moves at a fixed lineal speed of around 900

metres per minute. The belt can be changed from a vertical to a horizontal position and is tensioned between two flat-belt pulleys, one of which can be adjusted for tracking. **If the belt is not tracking centrally, a Coordinator should be sought to make necessary adjustments.**

- Behind the belt, is a highly polished steel surface which can be fitted with a graphite-impregnated material known as a slip cloth. The slip cloth surface is better than plain steel because it reduces heat and friction to a minimum and considerably increases abrasive belt life.
- The belt angle is adjustable to any angle from 45º to 90º with the surface of the worktable.
- The job being sanded is usually held on the table with both hands then slowly placed against the belt and the stop at the same time. The work piece should not be moved sideways whilst sanding, as this tends to move the belt off the pulleys.
- The machine was designed for edges but flat surfaces up to 600mm x 125mm can be sanded.
- The dust extraction system must be used with this machine. Ensure the blast gate is open and then closed after use.

❖ **The Bobbin Sander features:**

- The Spindle Bobbin Sander is a standalone machine on a fabricated stand. It has an attached sanding table which is adjustable from the horizontal to angles that enable sanding chamfers and splays.
- The Sander is equipped with a selection of spindles of various diameters which will suit a variety of shapes. Matching plastic table-inserts are available and should be used to suit the spindle size. This keeps the gap between the spindle and table to a minimum.
- The operational spindle rotates and moves up and down on a vertical axis at the same time. A LEFT-HAND THREAD at the base of the spindle fits a corresponding thread UNDER the work table to allow exchange of spindles. It should only be tightened firmly BY HAND. Ensure correct direction for loosening and tightening spindle is used.
- The sander is suitable for sanding curved surfaces, sides, edges and holes in small timber pieces.
- A LEFT-HAND THREADED NUT on top of the spindle is used to compress the rubber spindle to enable it to firmly grip and release the interior of the tubular abrasive sleeve when it is being renewed.
- The work piece is held in the hands of the operator. While pressing firmly down against the sander table, the operator slowly presses the work piece against the surface of the revolving and bobbing sanding spindle. It is important that the work piece is not allowed to lift up off the table. The work piece can be slowly moved sideways whilst sanding to ensure that the area / edge being sanded is evenly sanded, and this helps to alleviate 'burning' the work piece.
- Use of the mobile dust extractor unit in the corner of the room is required with this machine. Make sure blast gate behind the machine is open also.

❖ **Disc Sander Features:**

- The Disc Sander is a standalone, bench mounted machine with an attached sanding table which can be adjusted down from the horizontal to angles that enable sanding chamfers and splays.
- The sander is suitable for sanding end grain of long lengths of timber and smoothing flat surfaces, sides and edges of small timber pieces. The abrasive pad is attached to a diameter 305mm metal disc by way of contact adhesive or by Velcro sheeting.
- The work piece is held in the hands of the operator. While pressing firmly down against the sander table, the operator slowly presses the work piece against the face of the DOWNWARDS (left-hand) revolving part of the disc. It is important that the work piece does not lift up off the table and hence the UPWARDS MOVING PART OF THE DISC (RIGHT-HAND SIDE) SHOULD NOT BE USED.
- The work piece can be slowly moved sideways (and back) whilst sanding, to ensure that the area / edge being sanded is evenly sanded, and to help alleviate 'burning' the work piece.
- The disc sander has a mitre gauge attachment that can be used as a consistent angular guide on repetitive pieces. It slides in the machined groove of the work table.
- Work can be rotated on the table during sanding to achieve rounded corners.

- Disc Sanders leave characteristic curved sanding marks which should be further removed on quality work.
- On top of the machine, there is a push-down braking mechanism to stop the disc rotating AFTER it has been turned off. When the sanding operation is finished, switch the sander off and use the brake to ensure that the disc is stationary before leaving the work area.
- Use of the mobile dust extractor unit in the corner of the room is required with this machine.

❖ **The Sand-Flee features:**

- The Sand-Flee is a bench mounted machine with a nickel plated work table, measuring 584mm x 540mm, with a slot through which a 50mm diameter x 457mm long sanding drum only just protrudes. The drum is spiral wrapped with a Velcro attached, 75mm wide sanding belt. A 610 mm long extruded aluminium guide fence can be locked to the table at both ends.
- The sanding drum is adjusted so that only the abrasive on the drum is above the table surface so excessive pressure on the work does not achieve any benefit.
- The workpiece is fed from the front of the machine towards and over the drum which rotates towards the work at 1,435 rpm.
- Thin work pieces down to 4 or 5 mm thick can be sanded with the aid of friction pad pushing devices.
- There is no restriction of work height which can be sanded provided it can be adequately supported.
- The machine is suited to fine sanding such as boxes and can use abrasive grades of 220 and 320 grits.
- The drum can be fitted with three different abrasive grades at once for sequential sanding.
- Further details, adjustment and maintenance information can be viewed on the Shed's DVD or on http://www.youtube.com/watch?v=_fMbfLE5ki8

Safety & Procedural Issues

Main risks in using Sanding Machines

1. Serious injury resulting in torn skin, finger-tip flesh removal or finger nail tearing can occur if these machines are used carelessly.
2. Entanglement of clothing and hair can also occur.
3. Grit in eyes can occur if eye protection is not worn or the operator rubs their eyes with dusty hands.
4. Dust can cause breathing problems and can be harmful long term if dangerous dust is inhaled.

Before using a sanding machine

5. ***If in doubt about the operation you are about to do, seek a Coordinator's assistance.***
6. Ensure the dust extraction is turned on and gates on ducting are open.
7. Ensure you are using PPE appropriate to the task. Eye protection is essential.
8. Do not wear loose clothing, especially long sleeves and neck ties.
9. Ensure all adjustments are carried out when the machine is completely isolated electrically.
10. Ensure the grade of the abrasive is appropriate for the work to be carried out.
11. Check condition of the abrasive and any joins in the belts or drum coverings. Also examine the abrasive for nicks or tears in the edges.
12. Ensure any gap between the abrasive surface and the support surfaces such as the table are kept to a minimum but with sufficient clearance to prevent the support surface contacting the abrasive.
13. Ensure all locking devices and screws are tightened.
14. All tools, scrap and other project components must clear of the machine.

15. Only one operator is to use the machine at one time and all other persons should be well clear of the machine.

16. Positioning of the operator must allow clear and quick access to the stop switch.

17. Ensure the workpiece is flat and can be firmly supported on machine tables or conveyor belt. The jointer or a plane may be required to flatten work surfaces prior to sanding.

During Sanding operations

18. Observe the direction of movement of the abrasive in the particular machine being used and take up a braced stance with feet apart to help resist the forces applied to the work due to the moving abrasive.

19. Keep clothing and hair restrained away from the moving abrasive.

20. Allow the machine to reach maximum speed before applying sanding pressure.

21. With the exception of work on the drum sander, ensure the job being sanded is held in both hands, rests flat on the table, then is slowly placed against the abrasive surface and any end stops on the machine.

22. Bring work into contact with the abrasive surface in such a way as to avoid the work catching on a sharp corner or leading edge. Sharp corners can dig into the abrasive surface and rip it. The trailing part of the work should contact the abrasive first.

23. Keep hands and fingers well clear of the abrasive and position them in such a way as to avoid them being pulled onto the abrasive if the work should happen to be grabbed or jam.

24. Be especially careful not to get fingers caught in "pinch points" of the machine where fingers may jam between the abrasive and the support surface of the machine. Pinch points exist between;

i. The support stop and belt of the edge sander

ii. Between the table and downwards rotating disc of the disc sander

iii. Between the drum and the feed-in table's trailing edge of the Sand-Flee

iv. Between the bobbin and support table of the Bobbin sander

25. Observe that excessive dust is not being generated and that the extractor is working properly.

26. Avoid excessive pressure on the work which will cause over-heating, burn the work and irretrievably damage the abrasive surface.

27. Avoid sanding gummy, resinous or painted surfaces. These will clog the abrasive.

28. Use the abrasive cleaner to remove any early signs of clogging.

29. Distribute wear of abrasive by moving the workpiece to an unworn area or adjusting the work table to expose a different section of the abrasive surface.

30. The sanders should never be left unattended with the power turned on.

After machine use

31. On completion of sanding operations, clean the abrasive surface using the cleaning stick in a trailing fashion.

32. When sanding is complete switch off the sander, close the blast gates and switch off the dust collector. DO NOT leave machine running.

33. Return worktable and abrasive to original settings and check vertical alignment to worktable.

34. Clean-up workspace, removing any dust with a hand held vacuum and/or bannister brush.

COORDINATORS' OPTIONAL CHECK LIST AND NOTES *Accreditation Applicant can:*	**INITIAL**	**DATE**
1. Locate and turn on dust extraction units and open blast gates for Drum, Edge, Bobbin, Disc, and SandFlee Sanders.		
2. Check machine abrasive grade and condition, table settings and select and use PPE for sanders.		
3. Adjust Disc, Bobbin and Edge Sander table angles, and Bobbin drum sizes with matching table inserts.		
4. Choose appropriate machine to sand end grain, edge grain, surfaces, chamfers, hollows, and rounded corners.		
5. Demonstrate operations listed in item 4.		
6. Clean abrasive surfaces on various sanding machines except Drum Sander		
7. Turn off sanding machines and shut down extraction units.		
8. Clean up dust from machine and surrounds.		
9.		
10.		

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Please tick ONLY ONE of the boxes:
New Accreditation to be added to records ☐ **Confirmation of existing accreditation** ☐

Accreditation seekers signature: …… **Print Name:** ……	**Date:** ……..	**Accred Code:** **W8**	**1st Assessor's signature:** …… **Print Name:** ……	**2nd Assessor's signature:** …… **Print Name:** ……

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