Thickness Planer

A Thickness Planer is used in Design and Technology to plane timber to a uniform thickness. Two adjacent surfaces are straightened and squared on a Surface Planer before using the Thickness Planer to bring the timber to size.

Material passes under cylindrical cutter heads with multiple knives. An operator adjusts the depth of cut and then feeds the material into the infeed side of the machine. The surfaced board is retrieved from the outfeed side of the machine.

FELDER 751 THICKNESS PLANER

Acknowledgment: http://www.woodenedge.com/felderd751.htm

WARNING

The main types of injury are cuts or amputations to arms and hands, from contact with the knives.

- **Operators need to be aware of kickbacks and flying wood chips.**

Thickness Planer Guarding

Machinery must have in place guarding which isolates moving parts and the point of operation from direct contact with the operator.

The danger presented by a Thickness Planer is not entirely due to contact with a revolving blade. There is significant danger of timber being violently ejected at high speeds from the machine.

Thickness Planers must be guarded in these ways:

1. The cutter head must be enclosed or otherwise guarded to minimize the chance of contact from the cutter block and cutting knives
    - A dust extraction outlet is often incorporated into this guard
2. Thickness Planers must be power fed.
3. Power feed rollers must be guarded so as to prevent the fingers reaching the nip-point between the rollers and the material being fed.
    - The clearance between the edge of the guard and the material must be as small as practicable.
    - The guards must be effective for all sizes of material.
4. Power feed rollers must be provided with anti-kickback devices placed in front of the feed rollers.
5. Fixed or interlocked guards to prevent bodily contact with moving parts of the power transmission apparatus during maintenance and cleaning procedures.

Thickness Planer Guards should:

- Be strong and rigid
- Be rigid to prevent them touching the revolving blades
- Be robust so those accidental knocks will not displace or bend them.
- Constructed so that it is not easily deflected, which would expose the blade.
- Be designed so that access to moving parts that may still be moving after the power is turned off, is prevented until motion ceases.
- Be difficult to by-pass or disable.
- Cause minimum obstruction to the view of the process.
- Restrict access during normal operation yet allow for servicing, maintenance, installation and repair of moving parts to be undertaken only with the aid of a tool or key.
- Be easy to adjust so that they can be set correctly.
- Be regularly maintained to keep them easy to adjust.
- Not introduce any other risks.
- Cover dangerous moving parts such as motor, belts, gear trains, pulleys and shafts.
- Have provision for connection to an extraction system.

Purchasing a Thickness Planer

General

A Thickness Planer should:

- Meet *DECS Standards for Plant and Equipment: Part A.*
- Have spare parts available through a local distributor.
- Be supplied with detailed instruction/parts manual and all tools required for the operation of the machine.
- Be of robust construction and suitable for continuous use, similar to that found in industry.
- Produce less than 85 dB(A) at the point of operation.
- Meet the provisions of the OHS&W Act and OHS&W Regulations 1995 Part 3.
- Meet the safety requirements of Australian Standard **AS4024.1 – 1995** *Safeguarding of machinery Part 1: General principles.*
- Supplied with a risk assessment.

Parameters

A Thickness Planer should:

- Have a stand sufficiently rigid for the Thickness Planer to be vibration free and stable when used
- Have a dust extraction outlet incorporated into the fixed hood guard
- Have switching controls in an easy to reach location
- Produce less than 85 dB(A) at the operator's ear.

Technical Details

A Thickness Planer should:

- Have guarding to enclose the cutter head to minimize the chance of contact from the cutter block and cutting knives.
- Have a dust extraction outlet incorporated into this guard
- Be power fed.
- Have guarding on the power feed rollers so as to prevent the fingers reaching the nip-point between the rollers and the material being fed.
    - ♦ The clearance between the edge of the guard and the material must be as small as practicable.
- Have effective guarding for all sizes of material.
- Have power feed rollers with anti-kickback devices placed in front of the feed rollers.
- Have fixed or interlocked guards to prevent bodily contact with moving parts of the power transmission apparatus during maintenance and cleaning procedures.
- Have either a 3-phase motor: 415V/3/50, 3.7 kW minimum capacity, or a single-phase motor: 240V/1/50, 3.7 kW minimum capacity.
- Have a circular, 2 or 4 knife balanced cutter block.

Positioning a Thickness Planer

A Thickness Planer depending on the brand and model weighs approximately 500 Kg.

Most workshop floors should be sufficient to carry the weight of a Thickness Planer. The machine may be located on wooden or concrete floors provided they are in sound condition.

- Before moving a Thickness Planer onto a workshop floor, inspect it carefully to determine that it will be sufficient to carry the load of the machine, the device for moving it and its operators.

Ensure a Thickness Planer rests on a suitable foundation.

- On a floor or other support that ensures the plant is stable and secure against movement.
- A Thickness Planer must be securely fixed into position using 'Dynabolts' or similar for concrete floors or coach screws for wooden floors.
- Where a Thickness Planer is fixed to wooden floors, consider either securing the machine on a concrete plinth or fit anti-vibration rubber mounts to the base of the machine.

It is recommended that a Thickness Planer form part of the materials handling infrastructure and, as such, be best positioned in the materials store.

- Extraction plant must be used with a Thickness Planer and this may well affect the options when siting this machine.

The installation, spacing, services and foothold around a Thickness Planer must be such as to ensure:

- Sufficient space for safe access to the machine for supervision, operation, cleaning, maintenance, inspection and emergency evacuation.
- The installation is plumb.
- The plane of operation is not in line with doorways, passageways, entrances or where students regularly work.
- There is adequate space for handling materials and parts to and from the machine and for work in progress.
- All operators are afforded a good view of the point of operation of the equipment.

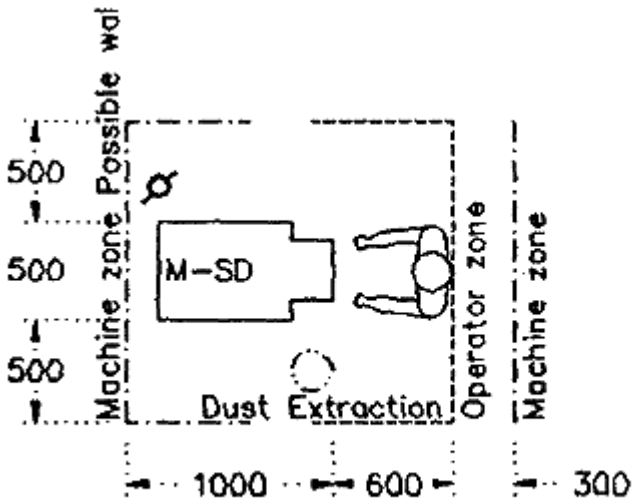
WARNING

A Thickness Planer is a heavy machine.
DO NOT move the machine by yourself.
Assistance and lifting equipment will be required.
Serious personal injury may occur if safe moving methods are not followed.

Spatial allowances for a Thickness Planer

The following graphic indicates the recommended spatial allowances for a Thickness Planer and operator.

- Only a single operator may use a Thickness Planer.
- The measurements displayed are considered minimum requirements.
- Sufficient space should be provided around machines to handle the material with the least possible interference from or to other operators.
- Operator zones must be clearly marked with 50mm. wide yellow or yellow/black line.



THICKNESS PLANER

Commissioning a Thickness Planer

A Thickness Planer must not be used until the following checks have been completed according to the manufacturer's recommendation and necessary adjustments have been made.

1. Ensure the machine is in a clean condition.
   - The unpainted surfaces are coated with a waxy oil to protect them from corrosion during shipment.
   - Remove this protective coating with a solvent cleaner or citrus-based degreaser.
   - To clean thoroughly, some parts may need to be removed.
   - For optimum machine performance, clean all moving parts or sliding contact surfaces that are coated.
   - Avoid chlorine-based solvents as they may damage painted surfaces should they come in contact.
2. A Thickness Planer must be securely fixed to the floor.
   - Under no circumstances must a machine be left to stand unsecured.
3. All nuts, bolts and grub screws must be in place and tight.
4. Belt drives must be checked for pulley alignment, serviceability and correct tensioning.
   - Ensure the belt profiles match the pulley type.
5. The mains cable and plug (if any) should be visually checked for flaws and then electrically tested.
6. A licensed electrician must install hard-wired equipment.
7. When electrical connection has been made, an authorised person must confirm the direction of cutter block rotation.
   - Select neutral position for feed selector lever.
   - Switch on and at the same time switch off to view direction.
   - The cutter block must run in an **anti-clockwise** direction when viewed from the left side of the machine.
   - If required an electrician must make any alterations to correct the direction of rotation.
   - Failure to carry out a cutter block direction test may result in serious operator injury and damage to the machine.
8. Lubrication points should be serviced and all moving parts should move freely.
9. Attach Thickness Planer Safety Operating Procedures.
10. Erect a sign indicating the minimum sizes for material that may be planed.
11. Mark in Machine and Operator zone.
12. Appropriate Personal Protective Equipment must be sited in close proximity to the machine.
13. Housekeeping equipment should be installed in a suitable nearby location.
14. File machine documentation supplied from manufacturer/ supplier to ensure ready availability.
15. Warranties must be processed and forwarded to the appropriate parties.
16. The details of the machine must be entered in the school's record and in the Thickness Planer Maintenance Schedule.
17. Conduct a risk assessment using the *Risk Assessment Process* *Part A* and *Part B* proformas to ensure that there is no likely health and safety risk to personnel.

WARNING

A Thickness Planer is a heavy machine.
DO NOT move the machine by yourself.
Assistance and lifting equipment will be required.
Serious personal injury may occur if safe moving methods are not followed.

WARNING

Use care when disposing of cleaning cloth/rag to be sure they do not create fire or environmental hazards.

WARNING

Guards must be in place and function correctly.

WARNING

The Thickness Planer should run smoothly, with little or no vibration or rubbing noises. Strange or unnatural noises should be investigated and corrected before operating machine further.

Thickness Planer safe work practices

Complementary equipment and the application of appropriate work procedures and practices are fundamental to the safe operation of the Thickness Planer.

- Operators must be **properly instructed** in the **safe operation** and the characteristics of the machine and materials involved.
  - The **safe handling** of the workpiece when thicknessing and the **position of the hands** relative to the work piece.
  - This machine has the capacity to throw workpiece back toward the operator.
- Ensure the cutting knives meet with and are operated according to the manufacturer's recommendation.
- Knives must be kept sharp.
  - Blunt knives require more feeding pressure, which may increase the potential for kickback and increases noise levels.
- The take-off table must be maintained at the same height as the infeed table.
- Approved hearing protection must be worn.
  - The machine is capable of producing noise levels in excess of 100dB(A). This can rapidly cause hearing loss if the ears are unprotected.
- Gloves must not be worn whilst operating this machine.
- Do not feed more than two pieces of material at one time through a machine fitted with one section feed rolls.
- Avoid looking through the machine while the material is being passed through.
- Do not stand in line and behind of material that is being fed through the machine in case of kickback.
- Do not feed material equal to or shorter than the distance between the centres of the feed roller.
- The machine must not be used to thickness branches or second hand timber
- Do not feed boards of different thicknesses.
  - Thinner boards will be kicked back.
- The removal of shavings must only occur when the machine is in a safe rest position and the cutter block has stopped rotating.
  - It is good practice to use a stick rather than hands to remove shavings.
- Ensure that any body parts do not get near the cutting block and knives when loading, moving or unloading timber.
- Beware of the cutting knives, which can cause cuts or amputations.
- Do not use hands or compressed air to remove to dust or off cuts from the machine.

Thickness Planer safe operation

1. Only **operators** who have been authorized as properly **trained** and **competent** are **allowed** to **operate** machines.
2. Adequate **instruction** and **supervision** are **essential**.
3. A Thickness Planer **must not** be used to perform tasks **beyond** its **design specification.**
4. Ensure **workspace** is **clear** before operating machine.
   - Foreign materials may cause **poor footing**.
5. Operators must wear the appropriate **Personal Protective Equipment**.
   - **Eye protection** is mandatory.
   - Operators must wear **close fitting protective clothing**.
   - **Dust mask** must be worn in an extremely contaminated or dusty environment.
   - **Hearing protection** is required.
   - **Sturdy Footwear** to be worn at all times in work areas.
6. **Long** and **loose hair** must be **contained.**
7. **Rings**, **watches**, **jewellery must not** be worn. Medic alert identity (if worn) must be taped.
8. **Waste extraction** must be used for this machine.
9. Check **condition** of the **blade.**
10. Ensure all **locks** are **securely tightened** before operating.
11. Allow the machine to **develop full speed** before thicknessing.
12. **Feed** only **one piece** of material through at a time.
13. **Do not stand behind material** as it is being passed through the machine.
14. Avoid the **accumulation** of **sawdust**, **waste** or **stock** on the **machine table** or on the floor.
15. Ensure that **long** and **heavy** pieces of timber are **properly supported.**
16. **Do not leave machine running unattended**.
   - Turn off the power and make sure the machine has stopped completely before leaving the area.
17. Bring the machine to a **complete standstill** and **Isolate** the machine from power **before cleaning** or **making adjustments.**

Safety Hazards of a Thickness Planer

Safety hazards can cause immediate injury.

Point of operation

- Contact with the knives may occur.
  - ♦ Lacerations or amputations from rotating knives.

Kickbacks.

- Operators must be aware of the potential of being hit by pieces of the machine or workpiece being flung off.
  - ♦ A workpiece can be ejected from the machine after being caught by the knives.

In-running nip points.

- Clothing, hair or hands may be caught by and pulled into the automatic feed mechanism.
  - ♦ Under no circumstances should an operator bend down near this machine whilst it is operating.
  - ♦ The operator must be aware of the position of their hands and fingers in relation to the feed rolls and cutters at all times.

Flying debris and dust

- Wood shavings, splinters and dust, can be thrown up into the operator's face by the action of the blade.
- Certain timber may cause an allergic reaction in people especially when exposed to fine dust.
  - ♦ Certain types of wood dust may cause allergic reactions.
  - ♦ Saw dust has been determined to be a group A carcinogen by the International Agency for Research on Cancer (IARC).
  - ♦ Hardwoods in general such as beech, oak and mahogany and native hardwoods (eucalypts) generate fine particles of dust and this has a prime link with nasal cancers. Softwood timbers from coniferous trees such as pines are less of a risk.
  - ♦ Workers exposed to wood dusts have experienced a variety of adverse health effects such as eye and skin irritation, allergy, and reduced lung function, asthma and nasal cancer.
  - ♦ Dust extraction must operate efficiently.

Thickness Planer maintenance

A documented Thickness Planer Maintenance Schedule must be developed and time should be allocated specifically for maintenance purposes.

The procedure outlined in the maintenance schedule is indicative and may require changes to meet the needs of the school and manufacturer's recommendations for the specific machine.

- The only criteria being that regular maintenance requirements are identified, actioned and documented along with any repair work undertaken.
- Refer to information supplied with the machine for specific maintenance requirements for this machine.
- Manufacturers and suppliers must supply adequate information for the correct maintenance of the machine including tool changing, adjustment, cleaning and lubrication instructions.

A Thicknesser Planer is a reasonably high maintenance machine in that the blades require constant attention.

- Using sharp knives contributes significantly to the safe operation of a Thickness Planer.
  - ♦ A good maintenance procedure is to hone the knives to keep them in top condition.so that they will cut freely without having to force the work piece against the blade.
  - ♦ A knife hone will polish and finely sharpen knives quickly and easily without removing them.
  - ♦ For damaged or extra dull knives, have them re-sharpened by a professional grinder.
  - ♦ To avoid downtime from re-sharpening, it is recommended having an extra set of knives on hand.
  - ♦ It is essential to keep the knives in sets with each knife having equal mass so that the cutter head is balanced.
  - ♦ Never install or adjust the blades so that they protrude more than 3mm beyond the cylindrical cutter head.
- Feeding of timber is difficult if the infeed roll is clogged or the table are gummed or the anti-friction rolls are set too low.
  - ♦ Clean with non-caustic oven cleaner.
- If a ridge is left across the planed surface of the material, the pressure bars require adjusting or the anti-friction rolls are set too high.
- Routine maintenance, cleaning and lubrication is required to ensure the Thickness planer and its safeguards operate properly.
  - ♦ The slides and runways often become dusty, which impedes free running.

WARNING

Isolation procedures must be implemented when cleaning and when maintenance tasks are carried out on machinery.

WARNING

Take care to avoid lacerations when carrying and installing Thickness Planer knives.

WARNING

Keep knives clean, sharp and properly set so that they cut freely without undue force.

Decommissioning a Thickness Planer

A risk assessment using the *Risk Assessment Process* Part A and Part B proformas must be undertaken before decommissioning to ensure that there is no likely health and safety risk to personnel carrying out the decommissioning of the machine.

- Retain risk assessment as a record.

Where plant is to be dismantled and/or stored as part of decommissioning:

- Ensure relevant health and safety information supplied by the designer or manufacturer is provided to the person who dismantles or stores the machine.
- A competent person must carry out dismantling.
- Ensure steps are in place to minimize the potential for injury due to corrosion, machinery fatigue or hazardous substances.

Prior to the removal or relocation of a Thickness Planer the following processes must be completed:

1. The machine must be tagged barring use.
2. A licensed electrician must disconnect hard-wired equipment.
3. Tape the mains cable/plug to the machine.
4. The machine should be in a clean condition.
5. Secure any ancillary equipment such as spanners, etc. to the machine.
6. Any fixings securing the equipment to its bed should be removed.
7. Disconnect the machine from dust collection unit and seal dust collection point.
8. Any belt drives should be freed from tension.
9. Protect any machined surface with a suitable corrosive preventative.
10. Carefully move the Thickness Planer so that the machine does not create a hazard.
    - Observe manual handling procedures when moving the machine.
11. All original documentation should be placed in a plastic bag, which is then securely taped to the unit.
12. School records and electrical testing databases must be amended.

Thickness Planer glossary

Anti-friction rolls	Mounted in the table to reduce friction between the table and the timber.
Anti-kickback device	In the case of a Thicknesser Planer consist of a screen of fingers or stepped pawls to reduce the risk of timber being ejected.
Belt Profile	The shape of the cross-section of a power transmission belt. Common examples are' v ', multi-' v ', flat and round belts. The belt profile must suit the pulley type.
Chip Breaker	spring-loaded device mounted between the infeed roll and cutter block that holds the timber firmly against the table thus prevents timber splintering.
Cutter Block	a solid cylindrical steel bar with machined slots to accommodate the knives.
Danger zone	Any zone within or around machinery in which any person is subject to a risk to health or safety.
Defect	A flaw in timber such as a knot, split; etc that can seriously weaken the timber.
Guard	A physical barrier that prevents or reduces access to a danger point or area.
Hazard	A situation at the workplace capable of potential harm.
Infeed roll	Located in front of the cutter block and is grooved to provide traction on the timber.
Kickback	Unexpected movement of the work piece opposite to the direction of feed.
Knot	A disturbance or inclusion in the grain of the wood, caused by the growth of a branch.
Lux	A unit of measurement relating to light
Lock	A **keyed padlock**, which will secure a control device in the "off" position and prevent it from being reactivated. Combination locks or locks using magnetic keys or bars are not acceptable.
Pressure Bar	Similar to a chip breaker but is fixed behind the cutter block to hold the timber against the table as it passes from the cutter block.
Risk	The probability that the potential harm may become a reality.
Three Phase Power	A system of electrical generation and distribution which enables significant economies in industrial applications. Most commonly used in heavy-duty machinery