

Narrow band saws

Safe working practices

HSE information sheet

Woodworking Information Sheet No 31 (Revision 1)

Introduction

This information sheet gives practical guidance on safe working practices when using narrow band saws. It is aimed at employers and others who have control of how these machines are used. Machine operators will also find this information of use. A narrow band saw is one where the blades are ≤ 50 mm in width.

Accident history

Most band saw accidents are caused by contact with the moving blade while either cutting material or removing material/off-cuts from the table. Accidents also occur while setting, cleaning, adjusting and maintaining the machine while the blade is still in motion.

Legal requirements

Legal requirements covering the use of these machines are contained in *Safe use of woodworking machinery. Provision and Use of Work Equipment Regulations 1998 as applied to woodworking machinery. Approved Code of Practice and guidance.*¹ This document gives practical advice on the safe use of woodworking machinery and covers the provision of information and training as well as aspects of guarding and maintenance.

When buying a new narrow band saw, it should be supplied with a declaration of conformity and have a CE mark. Designers and manufacturers must conform to the essential safety requirements of the Machinery Directive and associated European Free Trade Association (EFTA) regulations. One way of achieving this is by designing and constructing the machine to meet BS EN 1807-1:2013+A1:2009.²

General safety issues

Risk assessment

Your risk assessment³ should cover all foreseeable uses and operations at the band saw. It should identify the action needed to eliminate or control risks, for example making sure that the correct fences, holders, jigs etc are available and that the operator knows how to use them correctly. As part of the assessment, you should also consider if there is a more suitable machine for the process or operation.

Some machines such as narrow band saws can often be inherently unstable and special steps may need to be taken to ensure that they remain stable during operation, ie fixing the machine to the floor.^{1,2}

Training

It is important that machine operators are trained to carry out the work they are expected to do. No one should be allowed to work at a woodworking machine unless they have demonstrated competence. It is advisable that competent operators are authorised in writing by a responsible person (director, senior manager etc). This will then form part of the training records. Anyone who supervises the use of work equipment should have access to information and where appropriate, written instructions.¹

Training for band saw operators should include:

- principles of machine operation, correct use and adjustment of the tilting table, fence, jigs, holders and templates;
- selection of the correct blade for the operation, the set of the teeth, tensioning and tracking of the blade;
- safe handling of the workpiece when cutting and the position of the hands relative to the blade;
- correct adjustment of the top guide and guard and blade guard below the table.

Guarding the blade

Substantial guards should enclose the pulleys and the blade, except the part that runs downwards between the top pulley and the machine table. These are normally in the form of doors attached to the mainframe of the machine.

On new machines, these guards should be interlocked with the machine drive. If the stopping time of the saw blade exceeds ten seconds⁴ then guard locking is also required.

Any access to the saw blade or other dangerous parts through the dust extraction outlet when the exhaust system is not connected should be prevented by having reach distances that meet the requirements of BS EN ISO 13857:2008.⁵

Between the table and the top pulley enclosure there should be an adjustable guard that fully encloses that section of the blade on all four sides, as shown in the illustrations. This is attached to and moved with the top blade guide. This adjustable guard should be either self-locking or capable of being locked in position. It should also have sufficient adjustment to enable movement down to the table.

The part of the blade between the underside of the table and the lower guide should be guarded at all angles of table tilt.

Safety devices

Guide blocks should be used when hand feeding against a fence. A push stick should be used for feeding timber close to the blade and removing cut pieces from between the saw and fence (see Figure 1).

Braking

An automatic braking device has been a requirement on narrow band saws since 5 December 2005.^{1,4} The braked run-down time should be less than ten seconds, unless this would affect the integrity of the machine, in which case it should be less than 30 seconds.

Wood dust

Narrow band saws should be fitted with effective local exhaust ventilation to control wood dust. To capture the dust effectively collect it where the saw blade enters the casing, and by means of a low-level exhaust connection to the rear of the casing.⁶

Machine setting and maintenance

For a narrow band saw to cut accurately and efficiently it should be set up correctly. This includes making sure that before cutting:

- the blade type and width are suitable for the material being cut and the blade thickness is suitable for the pulley wheel diameter, see 'Tool selection';
- the blade teeth are sharp and properly set;
- the blade is correctly tensioned and tracked.

Tensioning

A saw keeps its condition longer if the tension on the blade is relaxed after use, eg at the end of a working period. Place a notice on the machine to remind operators of this and that the next user has to re-tension the blade before starting the saw.

Tracking

The blade is tracked by tilting the top pulley, which helps the blade run in the correct position on the band-saw pulleys. When tracking, the thrust wheels and guides should be clear of the blade to allow it to move freely. Isolate the machine and then rotate the top pulley by hand and tilt it until the blade runs in the correct position. Reposition the guides and thrust wheel and close the guards then run the machine under power. If the blade does not run correctly when under power, then repeat the manual tracking operation. Once tracking is finished, recheck the blade tension.

Saw blade guides and thrust wheels

The saw blade guides, which can be fixed pads, pegs or rotating rollers, should support the blade behind the gullets. They should not grip the blade but should support it during cutting.

The thrust wheels give support to the blade when cutting. They should be positioned in line and just clear of the back of the blade when the blade is idling after being tensioned and tracked. Lack of clearance will cause grooving of the thrust wheels and lead to blade failure.

Cleaning and maintenance

Never clean the blade or pulley with a hand-held brush or scraper while the blade is in motion. Careful adjustment and regular maintenance of blade and pulley cleaning equipment will ensure resin residues do not build up.

Draw up a routine maintenance schedule that includes:

- the blade condition;
- the pulley and pulley bearing wear;

and the correct operation of:

- guides and thrust wheels;
- blade tensioning device;
- blade and pulley cleaning equipment;
- guards and safety devices.

Tool selection

Select the correct width of saw blade by measuring the smallest radius of any curve to be cut. Choose the widest blade that will cut this curve without bending as excessive blade twisting may cause the blade to break.

Choose a tooth pitch to suit the material thickness, ie the pitch should not exceed the depth of material being cut. The tooth form should also suit the material being sawn, ie standard tooth used for natural timber. If in doubt, follow the manufacturer's recommendations.

Tool handling

You should take care to avoid damaging the saw blade. When not in use, coil narrow band-saw blades into thirds and secure them. They should be stored in a safe dry place and transported in jigs. Check them before use for damaged teeth and cracks.

Machine operation

You should adjust the saw guides and attached adjustable guard as close to the workpiece as possible before you start cutting and they should be kept in this position during cutting.

Cutting with a fence

Always use a fence for straight cutting to prevent the workpiece rocking or sliding (see Figure 1). For shallow work, use a low position fence as this will allow you to adjust the blade guides and guard close to the workpiece. It will also allow the safe removal of off-cuts that are close to the blade by using a push stick.

When hand feeding against a fence, use a wooden guide block to exert an even pressure on the workpiece. You should also use the push stick when feeding close to the blade (see Figure 1).

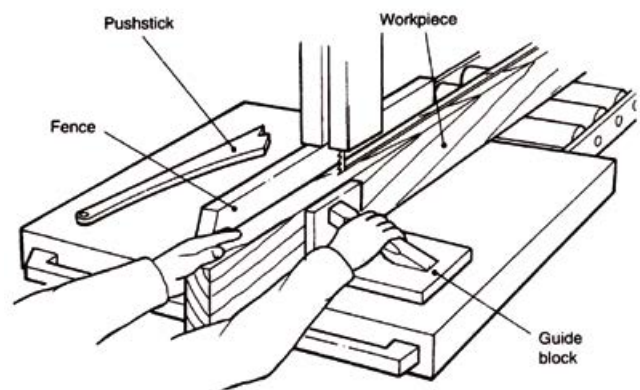


Figure 1 Straight cutting

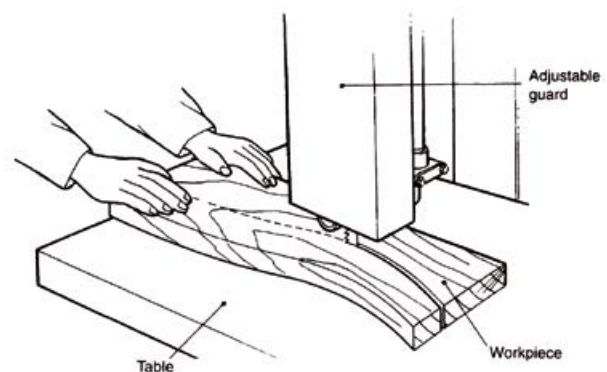


Figure 2 Handling shaped work on a narrow band saw

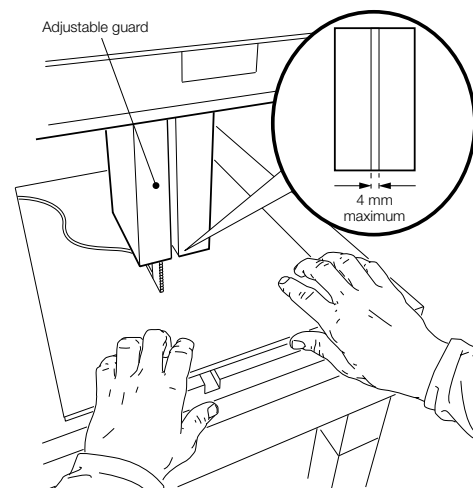


Figure 3 Freehand cutting

Cutting without a fence

Where it is not practicable to use a fence, feed the workpiece forward evenly but without exerting excess pressure. Hold it firmly on the table to make sure that you have effective control during cutting. **Keep your hands in a safe position** (see Figure 2) by keeping them as far away from the blade as possible. If your hands have to go near to the blade place them on either side of it, not in line (see Figure 3).

Curved or irregular work

You can produce a variety of curved or irregular shapes without a template (see Figure 3). However, for repetitive work, a guide pin fixed in front of the blade used with a template improves safety as well as the speed of operation (see Figure 4).

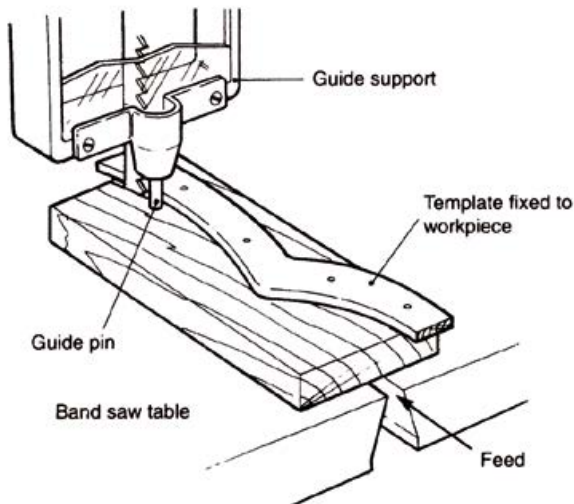


Figure 4 Cutting irregular shapes on a narrow band saw using a template and guide pin

Bevel cutting

Bevel cutting is usually done by tilting the table. This requires additional workpiece support, such as a fence, to prevent the workpiece falling from the table (see Figure 5). On machines with a fixed table or tiltable fence, a jig is necessary to provide support for the workpiece. Use a push stick at the end of the cut.

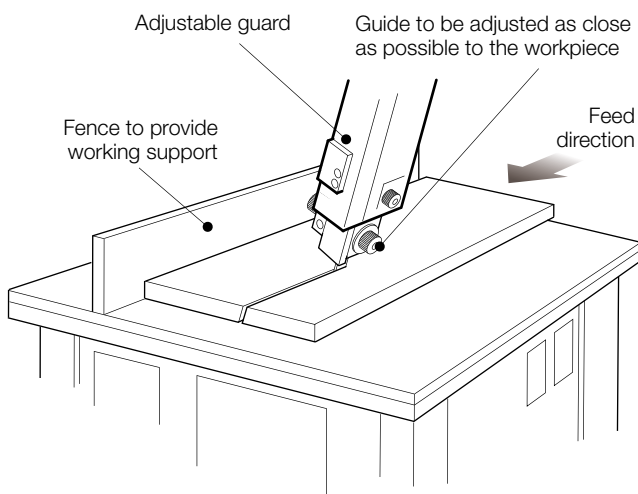


Figure 5 Bevel cutting using a tilting table

For a diagonal cut on square stock, feed the workpiece through a trough type of jig fixed to the table (see Figure 6).

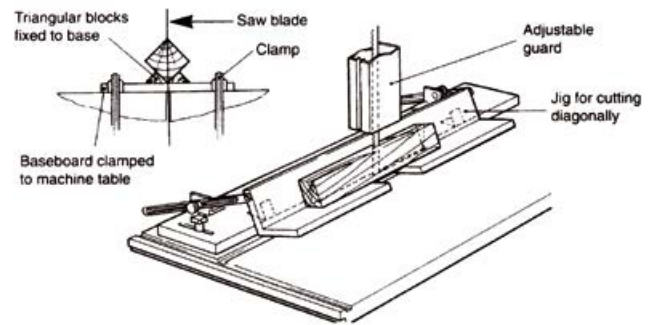


Figure 6 Diagonal cutting

Cutting tenons

You can cut simple tenons using a fence with a stop clamped to the table (see Figure 7). However, for complex tenons or repetitive work using jigs will be safer.

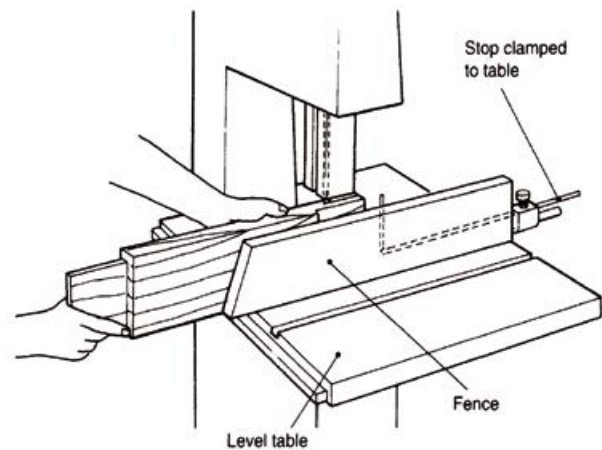


Figure 7 Cutting simple tenons on a narrow band saw using a fence and back stop

Wedge cutting

You can cut small wedges safely using a wedge holder (see Figure 8).

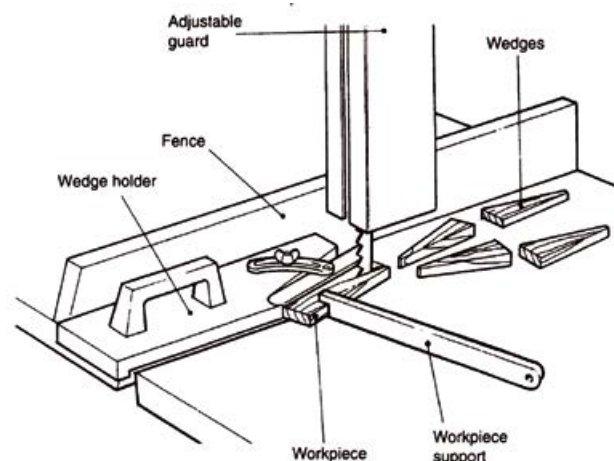


Figure 8 Wedge cutting

Circular work

A jig can also be used for cutting circular discs (see Figure 9). The workpiece is placed centrally on the pivot, with one edge touching the saw blade, and rotated to produce a circular disc. You should start the cut on the end grain and feed the workpiece slowly with even pressure.

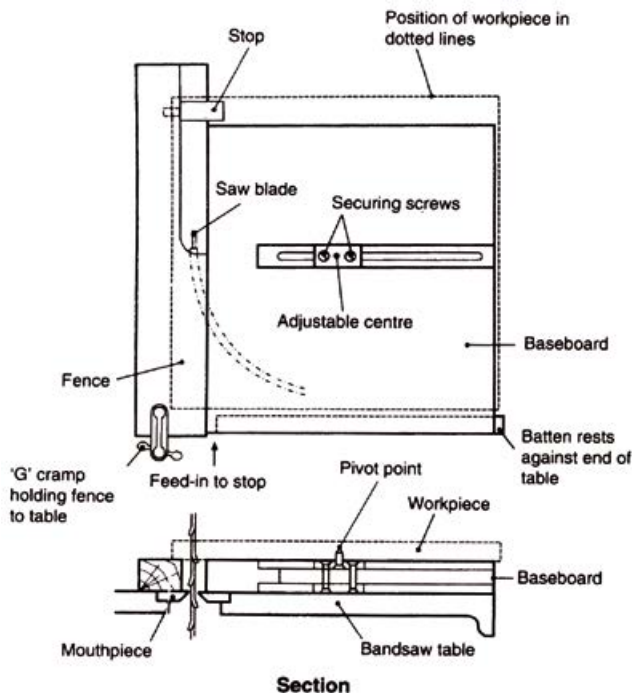


Figure 9 Cutting a circular disc

Crosscutting or ripping round stock

Hold round stock in a suitable jig or holder to prevent rotation caused by the cutting pressure. The blade should also be suitable for cross-cutting.

Workpiece support

The table should support the whole workpiece. Where a large workpiece overhangs the table, use additional support such as extension tables or roller trestles at both the in-feed and out-feed. This is important as large unsupported work pieces tipping are a common cause of accidents.

References

- 1 *Safe use of woodworking machinery. Provision and Use of Work Equipment Regulations 1998 (as applied to woodworking machinery). Approved Code of Practice and guidance L114* HSE 2014 www.hse.gov.uk/pubns/books/l114.htm
- 2 BS EN 1807 2013+A1:2009 *Safety of woodworking machines. Band sawing machines. Table band saws and band re-saws* British Standards Institution
- 3 HSE's risk management website: www.hse.gov.uk/risk
- 4 *Retrofitting braking to woodworking machines* Woodworking Information Sheet WIS38(rev1) HSE 2014 www.hse.gov.uk/pubns/wis38.htm
- 5 BS EN ISO 13857:2008 *Safety of machinery. Safety distances to prevent hazard zones being reached by upper and lower limbs* British Standards Institution
- 6 *Wood dust: Controlling the risks* Woodworking Information Sheet WIS23(rev1) HSE 2012 www.hse.gov.uk/pubns/wis23.htm

Further reading

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Fourth edition) HSE 2014 www.hse.gov.uk/pubns/books/l22.htm

More information on narrow bandsaws, including videos illustrating correct working practices, can be found on HSE's woodworking website: www.hse.gov.uk/woodworking/bandsaw.htm

Further information for suppliers, installers and users of new and second-hand machinery can be found on HSE's Work equipment and machinery webpages: www.hse.gov.uk/work-equipment-machinery/index.htm.

Further information

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