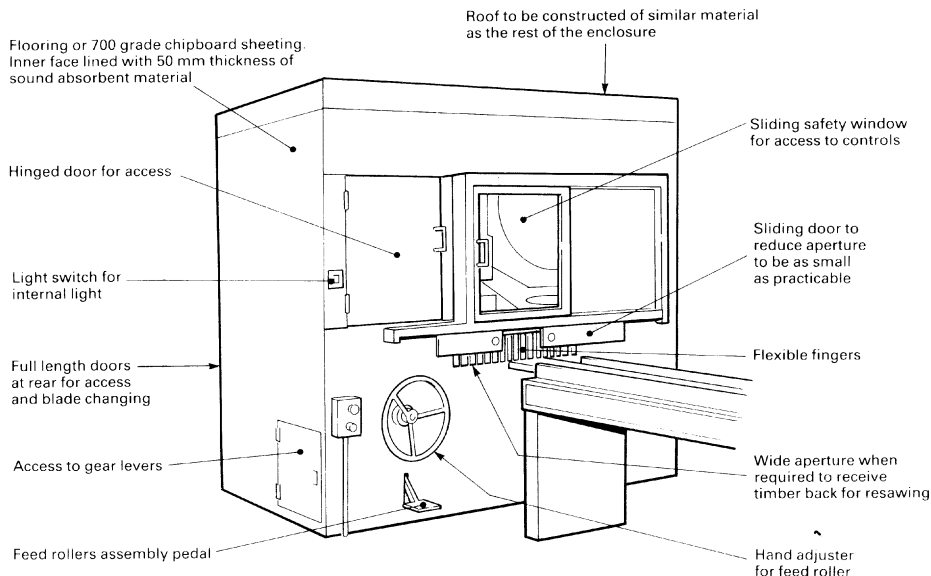


## Noise enclosure at band re-saws

### Woodworking Sheet No 5



**Figure 1** Band re-saw noise enclosure

#### Introduction

This information sheet is one of a series prepared by HSE's Woodworking National Interest Group (NIG). The Noise at Work Regulations 1989<sup>1</sup> require employers to reduce the risk of hearing damage to the lowest level reasonably practicable. Risk of hearing damage exists at a daily personal exposure level of 85 dB(A) ( $L_{Ep,d}$ ) - the first action level of the Regulations.

Control of noise at source by engineering means is the preferred approach. Where employees are exposed to daily personal noise exposures at or above 90 dB(A) (the second action level) employers must reduce exposure as far as reasonably practicable by means other than personal ear protectors.

Designers, manufacturers, importers and suppliers are required under the Health and Safety at Work Act to ensure that noise from machines is reduced so far as is reasonably practicable and, as modified by the Noise at Work Regulations, to provide adequate information concerning the noise likely to be generated.<sup>1</sup>

Band-saw operators are likely to be subjected to noise levels well in excess of 85 dB(A). A noise enclosure for the saw is likely to be necessary to achieve acceptable noise levels. Full enclosure will produce the best results in terms of noise attenuation and is considered reasonably practicable.

Woodworking Sheet No 4 *Noise reduction at band re-saws* describes how engineering controls can substantially reduce band re-saw idling noise and cutting noise. Such measures alone are unlikely to reduce the noise to an acceptable level.

#### Enclosure construction

Effective enclosures may be constructed from a variety of materials. 'Homemade' enclosures can be as efficient as commercially supplied models and may cost much less. A well constructed enclosure is capable of attenuating sound by 10-15 dB(A).

Enclosures should be built on a timber frame (minimum 50 mm x 50 mm studding). The outer skin (cladding) should have good sound attenuating properties. High density 19 mm chipboard or plywood are ideal.

The internal surface of the enclosure should be lined with a sound absorbent material. Mineral wool slabs with a density of 60 kg/m<sup>3</sup> and a thickness of 50 mm are usually adequate. This should be covered with thin polythene sheeting (less than 0.1 mm thick) to keep out dust. The absorbent should be held in place by expanded metal or perforated hardboard with at least 30% open area.

Feed and delivery openings should be as small as possible. Where a wide range of timber sizes are processed the aperture size may need to be adjustable, but in any case restricted such that the maximum cross-section of timber the machine will process is not hindered. Apertures should be fitted with a double row of overlapping rubber or loaded PVC flaps or fingers, each about 18 mm wide. This will allow the workpiece to pass through while creating the minimum possible gap by which noise can leak.

Access doors should accommodate blade changing, machine maintenance and adjustments. Doors should be of double skin 12 mm chipboard or plywood and built on a 25 mm timber framework. They should be well

rebated and be self-closing (eg by the use of rising butt hinges). All gaps around the door should be fitted with soft rubber sealing strips. Robust catches or locks should be fitted to hold the door firmly closed against the sealing strips.

Viewing panels should be acoustically sealed into the structure. Safety glass 6 mm thick is usually adequate, although double glazing is sometimes necessary. Experiment with access and viewing panel positions before completing the enclosure.

Air cooled equipment inside the enclosure should be adequately ventilated. Ventilation openings should be covered by a long dog-legged tunnel (ie containing at least two 90° bends, the ends of which face away from populated areas). It may be necessary to acoustically lag and/or line parts of the ventilation or dust extraction duct work if this is a source of noise transmission.

Some of the machine controls such as the feed roller pedal and control wheel should be extended so that they can be operated from outside the enclosure. The feed stop and start and emergency stop controls should also be located outside the enclosure.

All joints between the enclosure walls, roof, floor, doors, extraction ducts and glazing need to be properly sealed.

In addition to reducing noise, enclosures also offer better control of sawdust. When fitted with lighting they provide more effective illumination of the cutting area and also act as a barrier reducing the risk of operatives inadvertently contacting the saw blade.

### Questions answered

*Is it realistic to think about enclosing machines in 'green' saw mills where irregular logs are fed?*

Where two flat faces have been cut and timber is fed against a fence - this is possible.

*What about frequent changing and adjusting of the saw blade?*

Every enclosure can be designed to have good access doors for this purpose.

*Would an enclosure prevent passing back of timber?*

Some mills have made a passing back tunnel through the enclosure or separated the feed area from the passback area by a partition. Others have increased productivity by off-loading onto a trolley and passing back a batch of timber at a time to be re-sawn.

*Could enclosure of the top pulley prevent checking of blade tracking and lead to accidents?*

Blade tracking can be checked against a mark on the table. Internal lighting and a band tracking window will help. Some machines are supplied with band tracking indicators.

*What about running adjustments - wouldn't these require*

*continual opening of the enclosure?*

Controls can be extended for operation outside the enclosure. The fine fence control can be set electronically.

*What about short length work and angle cutting of firrings; wouldn't the enclosure get in the way?*

These problems can be overcome by careful design:

- 1 by recessing or inclining the windows above the feed and take-off apertures;
- 2 by providing foot recesses to enable the operator to stand close to the enclosure wall; and
- 3 by providing apertures of a suitable size and by using firring jigs.

Alternatively the cutting of short lengths can sometimes be avoided by cross-cutting after resawing rather than before.

*How will the sawyer hear the blade 'clicking' and anticipate serious problems?*

The enclosure will reduce the sound level of the 'clicking' and the noise produced by the rest of the machine by about the same amount. The clicking therefore will still be heard.

### Reading list and references

- 1 *Reducing noise at work: Guidance on the Noise at Work Regulations 1989* L108 HSE Books 1998 ISBN 0 7176 1511 1
- 2 *Sound solutions: Techniques to reduce noise at work* HSG138 HSE Books 1995 ISBN 0 7176 0791 7
- 3 *Noise reduction at band re-saws* WIS4 HSE Books 1998
- 4 *Noise at woodworking machines* WIS13 HSE Books 1997

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