

Reducing bandsaw accidents in the food industry



Guidance Note **PM33** Second edition

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.

INTRODUCTION

1 Bandsaws are used in the food industry for portioning meat and other products. They cause a disproportionately high number of accidents compared to most other food processing machines. These accidents frequently result in serious injuries such as deep cuts and amputation of fingers.

2 Almost all accidents at bandsaws result from contact with the exposed moving blade while cutting or removing portions of meat or other foodstuffs from the table, illustrating that although modern bandsaw designs incorporate a number of safety features, they are still potentially dangerous machines. This guidance is intended to help food producers prevent or minimise the risk of injury from bandsaws.

MACHINE SELECTION

3 Work equipment may only be used for those operations for which it is suitable in respect of health and safety. If the operation of cutting meat or other foodstuffs requires close access (less than 50 mm) to an exposed section of blade, there may be other equipment which is more suitable. The risks of any operation should be assessed and the following factors taken into account.

(a) Can other safer types of equipment be used? For high production levels of particular cuts, automatic machines should be the first consideration, for example a chop cutter.

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(b) Can the cutting section of the blade be fully enclosed? Completely enclosed conveyor feed systems incorporating full guarding are available for a number of applications, for example the cutting of cooked chickens or fish fillets. It may be possible to develop others in conjunction with machine manufacturers.

(c) Can a jig be used to avoid close hand approach to the exposed cutting section and offer some protection? Jigs can be used when cutting chicken carcasses in half or cutting fresh or frozen pork loin chops and similar meat products. (See Figures 1 and 2).

4 The risk of injury from some operations at bandsaws with exposed blades may be unacceptably high. The following examples have been held by courts and industrial tribunals to be unacceptable. Many other cutting operations have similar risks which employers need to consider carefully when deciding if a bandsaw is a suitable machine:

(a) trimming butt ends of lamb carcasses (trimming off the thick fatty ends of the breast);

(b) splitting legs or shoulders of lamb to produce the cuts called half leg and half shoulder;

(c) cutting the bone of pork loin after cutting the flesh with a knife, to prepare pork chops; and

(d) cutting cooked chickens in half by hand feeding.

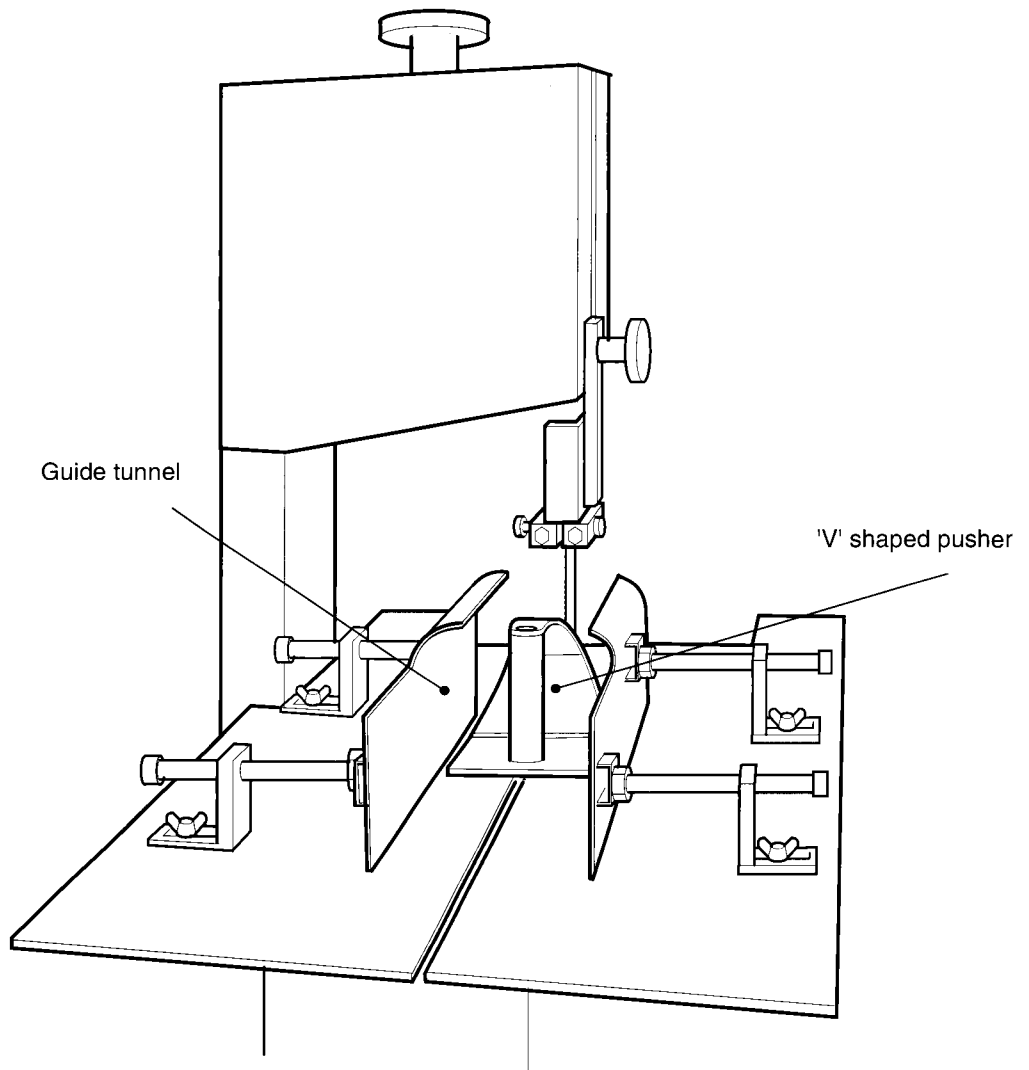


Fig 1 Guide tunnel and pusher for halving chickens

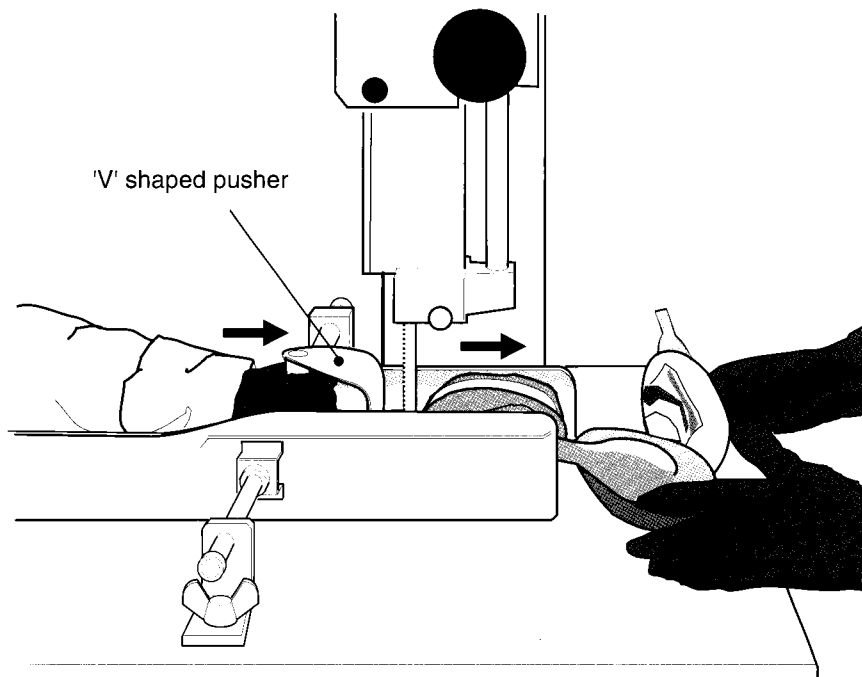


Fig 2 The guide and pusher in operation

5 If it is decided that a bandsaw with an exposed blade is the only practical machine, perhaps because of the variety of jobs performed, or if variation in shape of the product makes use of other machines and jigs impractical, then the risk must be reduced as far as possible. The following sections give guidance.

CHOOSING A BANDSAW

6 It is important to choose the right machine and it is advisable to take account of the following:

- (a) the manufacturer's recommendations;
- (b) the size of the machine and the table - these need to be adequate to support the meat or foodstuff being cut;
- (c) the power of the machine - this should be adequate for the work; and
- (d) the guards and safety devices provided on the machine.

SAFEGUARDING

Guards

7 The pulley/wheel areas and returning part of the blade should be enclosed.

8 An adjustable guard should be provided to cover the part of the blade between the table and the top pulley enclosure. It should be easily adjustable in a vertical direction and should cover the front (toothed) part of the blade and extend back to cover the outer side of the blade. It should be adjusted to expose the minimum amount of the blade necessary for each cut. Alternatively, on small table-top machines, a hinged pusher may be fitted.

9 Doors giving access to pulley/wheel areas should be interlocked with the drive mechanism to ensure that the machine cannot be operated unless the doors are closed and that opening any door cuts off the power. The machine control circuit should be so arranged that the machine can only be started with the start button.

10 Any removable table which gives access to dangerous parts should be interlocked as described in paragraph 9. The drive mechanism should be enclosed by a guard.

Controls

11 The controls, including any brake release mechanism, need to be readily accessible and clearly and permanently identifiable. Using blade guide adjustment and tensioning controls to minimise blade twisting can contribute to safe operation.

12 On new machines the blade should stop as quickly as is reasonably practicable after switching the machine off (or opening an interlocking guard) and no later than 4 seconds. This may not be possible on some older machines, eg those with a cutting width (distance from

blade to inside of main frame mast) of over 500 mm. On these, stopping may take up to 7 seconds. Many older smaller saws do stop in 4 seconds or less.

13 Additional safety devices to be considered include:

- (a) light signals to indicate the status of the 'on/off' controls and power to the machine; and
- (b) sliding tables and pushing plates designed to minimise the risk of a finger touching the blade as the end of the sliding table passes the blade.

Blades

14 Only blades advised by the machine manufacturer and fitted in accordance with the manufacturer's instructions are recommended. It is also recommended that blades which break in service are scrapped.

15 The machine must be electrically isolated before any blade is changed. Blades are extremely sharp so care should be taken in handling them. Protective gloves may be worn to reduce the risk of cuts from the blade. Blades should be stored in a safe and secure place and arrangements should be made for the correct disposal of blades which leave the site.

INSTALLATION

16 The machine should be installed by a competent person. The manufacturer's manual should contain detailed installation and maintenance instructions.

17 The floor should be in good repair and kept dry and free of material which may lead to slips or trips when people are working at the machine. It should be well drained and its surface should be rough enough to minimise the risk of slipping after cleaning.

18 The machine should be level and secure; care is needed to ensure bench-top models do not slide. There should be enough space around the machine to minimise the risk of people bumping into the operator. If there is a risk of passers-by bumping into or distracting the operator, a barrier can be used to separate the work area.

19 Good lighting is essential, which minimises shadows but without glare; to avoid visual fatigue a minimum average illuminance of 500 lux is recommended.

20 Clear notices should be displayed on or next to the machine, for example:

DANGEROUS MACHINE: To be operated by authorised persons only.

WARNING: Do not distract the operator.

21 Good environmental conditions which enable employees to work in reasonable comfort help to minimise fatigue and maintain alertness. Ventilation, temperature and noise levels are all important.

MAINTENANCE

22 Once the machine is brought into use it should be properly maintained. A competent person should carry out planned routine inspection and maintenance of the machine, preferably following the manufacturer's/ supplier's instruction manual. They should report any defects or malfunctions in the machine and the necessary investigations or repairs should be made.

SUPERVISION

23 It is important that people supervising bandsaw operations are familiar with the risks associated with the machine. They should regularly check the equipment and ensure that operators follow recommended practices.

SELECTING AND TRAINING OPERATORS

24 Careful selection of people to operate bandsaws is important. This should take full account of the physical and mental demands of the work, including the need for good eyesight. It should take account of whether the person is right or left handed as the orientation of the machine is important for its safe operation. Special consideration is needed where young people (under 18 years old) are employed. Employers must take into account their inexperience, lack of awareness of risks and immaturity. In general it is recommended that young people do not operate bandsaws with an exposed section of blade. It is important that operators are able to understand the principles underlying the choice of a bandsaw for a cutting operation and are able to recognise when a job should be done on a different machine or using a jig.

25 A competent person should instruct and then assess the trainee, who should work under close supervision until they can demonstrate the required degree of proficiency. It is useful to record dates and details of training provided. Supplementary training may be necessary when introducing different machines or types of cut. The time-table and programme of training will depend on local circumstances and facilities, but is usually in two phases. The following paragraphs give an example of the content of a training programme.

26 During the initial period the instructor demonstrates and explains the machine's operation and dangers. Depending on the extent of the trainee's job, training may include:

- (a) identification, function and proper adjustment of the principal components and guards etc;
- (b) identification and function of the isolator, stop and start buttons;
- (c) blade adjustment, tensioning, guide adjustment and replacement;
- (d) setting of blade/pulley scrapers to remove fat and debris from between the blade and pulleys;
- (e) the assembly, routine checks and adjustment of the machine before starting production;

(f) the sequence of stripping and cleaning the machine; and

(g) all cutting operations to be performed using jigs as appropriate, sliding or roller tables, slice thickness plate and a properly adjusted guard.

27 The trainee should practise the procedures covered by introductory training under careful supervision and instruction. It is recommended that only simple cuts of meat or foodstuffs which are easy to support (stable and not slippery) are practised on initially.

28 The objective is for the trainee to get the feel of the machine and product under load conditions, coupled with the use of the controls.

29 If their progress is satisfactory after a period of supervision, the trainee may be introduced to the cutting of more complex items and then, still under supervision, can progress gradually to normal operating speeds. Only when their performance has been assessed as satisfactory should a trainee be considered to be a bandsaw operator.

RECOMMENDED INSTRUCTIONS TO THE OPERATOR

30 A bandsaw is a potentially dangerous machine and is capable of severing hands or fingers. It must be used correctly to minimise risks. Only a trained operator or a specifically authorised person should operate the controls, except to operate the stop in an emergency.

31 Do not operate the machine without a jig when one should be used, or for operations for which the machine is unsuitable.

32 Keep the guard adjusted to expose the minimum length of blade necessary for each operation.

33 Before leaving the machine or attempting any adjustment, blade replacement or cleaning, check that the blade has stopped and isolate the machine using the isolator.

34 Keep the floor round the machine clean and free of obstructions or slippery deposits.

35 Do not talk while operating the machine. Remain alert and concentrate on the task, watching your hands and the blade, especially when hands are near the blade.

36 Hold the meat/foodstuff or feeding device firmly. Do not use undue pressure to force the product through the blade. Work at a pace that ensures good control, to guard against sudden movement and the meat slipping.

37 Never leave the machine unattended while it is running.

38 Keep the machine table clear and do not use it for anything else except cutting. When removing cut portions from the table take care not to touch the blade. Control the activities of any second person removing cut portions from the bandsaw table.

39 Do not wear loose-fitting cuffs, loose-fitting clothing, watches and pendants etc that could get entangled with the blade. Do not use chain mail type gloves as links may get caught up in the teeth of the blade. Roughened rubber gloves can sometimes be used to improve grip, particularly for frozen meat.

40 Do not use the machine if it is not working properly or if any guards are defective. Report any defects to your supervisor.

41 Do not operate the machine if you feel unwell. Report immediately to your supervisor.

SUMMARY OF LEGAL REQUIREMENTS

42 The following summary outlines the main legal requirements which apply to the use of bandsaws. The list is not exhaustive and does not give a definitive interpretation of the law. You can find full details of the legislation in the further reading section at the end of this guidance note.

43 The Health and Safety at Work etc Act 1974 places a duty on employers, employees and the self employed to ensure, so far as is reasonably practicable, the safety of people involved in work activities, and those who may be affected by work activities.

44 The Management of Health and Safety at Work Regulations 1999 require employers and the self employed to assess risks arising from work activities and to control these risks so that they are reduced to an acceptable level.

45 The Provision and Use of Work Equipment Regulations 1998 (PUWER '98) place a duty on the employer to provide dangerous parts of machinery with guards or protection devices and to maintain and inspect equipment. New equipment taken into use after 1992 has to meet regulations 1-24 and 31-39 of PUWER '98 from 5 December 1998, which can be done by ensuring that the equipment meets the relevant product safety directives. Regulation 11 requires that work equipment is used only for operations and under conditions for which it is suitable. There is also a duty on employers to ensure that those who use work equipment receive adequate information, instruction and training. In relation to bandsaws, these Regulations are essentially the same as the requirements of PUWER '92.

46 The Supply of Machinery (Safety) Regulations 1992 place duties on manufacturers and suppliers of new machinery to ensure that such machinery meets certain essential health and safety (including hygienic design) requirements. The Health and Safety at Work etc Act 1974, section 6, also places duties on suppliers of second-hand machinery, to ensure that such machinery is safe when supplied and without risks to health.

47 Section 2 of the Health and Safety at Work etc Act 1974 places a general duty on employers to provide the necessary information, instruction, training and supervision to ensure the safety of their employees.

FURTHER READING

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998 Approved Code of Practice and Guidance L22 (rev) HSE Books 1998 ISBN 0 7176 1626 6

Supply of Machinery (Safety) Regulations 1992 SI 1992/3073 HMSO 1992

Food processing machinery - safety and hygiene requirements - Basic concepts. Part 1 Safety requirements prEN 1672-1:1997

Food processing machinery - Safety and hygiene requirements - Basic concepts. Part 2: Hygiene requirements BS EN 1672-2:1997

HSE free leaflets

Supplying new machinery: Advice for suppliers of workplace machinery INDG 270 HSE Books 1998 (Also available in priced packs, ISBN 0 7176 1560 X)

Buying new machinery: A short guide to the law and some information on what to do for anyone buying new INDG 271 HSE Books 1998 (Also available in priced packs, ISBN 0 7176 1559 6)

While every effort has been made to ensure the accuracy of the references listed in this publication, their future availability cannot be guaranteed.

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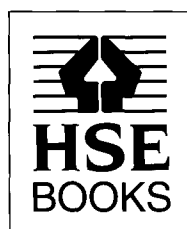
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