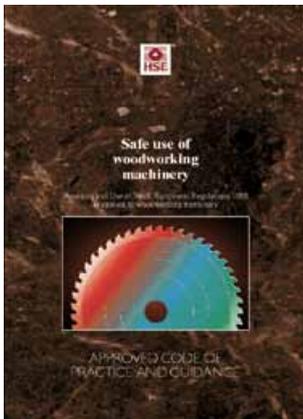


# Safe use of woodworking machinery

Provision and Use of Work Equipment Regulations 1998 as applied to woodworking machinery

Approved Code of Practice and guidance



**This is a free-to-download, web-friendly version of L114, (First edition, published 1998). This version has been adapted for online use from HSE's current printed version.**

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This publication contains the Provision and Use of Work Equipment Regulations 1998 that are relevant to the safe use of woodworking machinery, together with an Approved Code of Practice and supporting guidance. It covers the provision of information and training as well as aspects of guarding.

It is aimed at those who have responsibility and/or control or use of woodworking machinery (either directly or indirectly).

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This Code has been approved by the Health and Safety Executive, with the consent of the Secretary of State. It gives practical advice on how to comply with the law. If you follow the advice you will be doing enough to comply with the law in respect of those specific matters on which the Code gives advice. You may use alternative methods to those set out in the Code in order to comply with the law.

However, the Code has a special legal status. If you are prosecuted for breach of health and safety law, and it is proved that you did not follow the relevant provisions of the Code, you will need to show that you have complied with the law in some other way or a Court will find you at fault.

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# Notice of Approval

By virtue of section 16(1) of the Health and Safety at Work etc Act 1974 (the 1974 Act) and with the consent of the Secretary of State for Environment, Transport and the Regions, pursuant to section 16(2) of the 1974 Act the Health and Safety Commission has on 7 July 1998 approved the Code of Practice entitled *Safe use of woodworking machinery*.

The Code of Practice comes into effect on 5 December 1998.

The Code of Practice gives practical guidance with respect to the Provision and Use of Work Equipment Regulations 1998, and to the extent that they apply to work with woodworking machinery, the Management of Health and Safety at Work Regulations 1992 (as amended by the Management of Health and Safety at Work (Amendment) Regulations 1994 and the Health and Safety (Young Persons) Regulations 1997).

Signed

ROSEMARY BANNER  
*Secretary to the Health and Safety Commission*

5 October 1998

# Preface

This publication contains the Provision and Use of Work Equipment Regulations 1998 that are relevant to the safe use of woodworking machinery, together with an Approved Code of Practice and supporting guidance.

For convenience, the text of the Regulations is set out in italic type, with the ACOP in bold type and the accompanying guidance in normal type. A guide to the requirements of the Management of Health and Safety at Work Regulations 1992, as amended by the Health and Safety (Young Persons) Regulations 1997, is indicated by separate side panels.\*

\* The Management of Health and Safety at Work Regulations 1992 have been replaced by the Management of Health and Safety at Work Regulations 1999.

## Editorial note

Since the *Safe use of woodworking machinery* Approved Code of Practice and Guidance (L114) was published, regulations 10 and 11(2) of the Provision and Use of Work Equipment Regulations 1998 have been amended by the Health and Safety (Miscellaneous Amendments) Regulations 2002.

Regulation 10 now reads:

*(1) Every employer shall ensure that an item of work equipment conforms at all times with any essential requirements, other than requirements which, at the time of its being first supplied or put into service in any place in which these Regulations apply, did not apply to work equipment of its type.*

*(2) In this regulation "essential requirements", in relation to an item of work equipment, means requirements relating to the design and construction of work equipment of its type in any of the instruments listed in Schedule 1 (being instruments which give effect to Community directives concerning the safety of products).*

Regulation 11(2) now reads:

- (a) the provision of fixed guards enclosing every dangerous part or rotating stock-bar where and to the extent that it is practicable to do so, but where or to the extent that it is not, then*
- (b) the provision of other guards or protection devices where or to the extent that it is practicable to do so, but where or to the extent that it is not, then*
- (c) the provision of jigs, holders and push-sticks or similar protection appliances used in conjunction with the machinery where and to the extent that it is practicable to do so,*

*and the provision of such information, instruction, training and supervision as is necessary.*

# Introduction

## What is this guidance for?

1 This booklet, *Safe use of woodworking machinery*, has been prepared by the Health and Safety Executive (HSE) for the Health and Safety Commission (HSC) after consultation with industry. The document sets out the regulations from the Provision and Use of Work Equipment Regulations 1998 (PUWER 98) where specific Approved Code of Practice and guidance material is necessary for woodworking machinery.

## Who needs to read this?

2 You need to read this document if you have responsibility and/or control directly or indirectly for woodworking machinery and its use. Throughout this booklet we have referred to the employer and self-employed people who have responsibility for providing woodworking machinery for use at work, or have control of it, as 'you'. Where the guidance is addressing some other duty holder, for example a hire company, then the text makes it clear at whom the guidance is aimed.

## What is in this document?

3 This document gives advice on some of the precautions to ensure the safe use of woodworking machinery. The advice given in the Approved Code of Practice (ACOP) and guidance reflects the precautions that are widely accepted and used to reduce the risks from woodworking machinery. They mirror some of the requirements previously contained in the Woodworking Machines Regulations 1974, and supplement the advice in *Safe use of work equipment*<sup>1</sup> on the safe use of work equipment in general.

## Other HSC/HSE information

4 Guidance on other hazards encountered in the woodworking industry such as noise, dust, vibration and exposure to substances is not given here, but can be found in other HSE publications. There is a non-exhaustive reference section at the back of this document. Up-to-date information on these publications can be obtained from the HSE Infoline which deals with public telephone requests (0845 345 0055).

## Scope

5 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. It is not an exhaustive guide on the guarding and safe operation of woodworking machinery, but a practical guide as to how the requirements of PUWER 98 should be met. Although the PUWER 98 Regulations apply to all equipment used at work, this woodworking ACOP is narrower in scope. It does not provide a commentary on all of the PUWER 98 requirements. It applies to all sectors and to most woodworking machinery except hand-held tools. It applies to machinery that is used for working on wood, cork, fibreboard and material composed wholly or partly of any of these materials.

## Introduction

### Background

#### ***Accident history***

6 Woodworking machinery presents a significant risk during use. Recent HSE accident statistics show that accidents involving contact with the dangerous parts of machinery or the material being machined accounted for approximately one quarter of all of the fatal injuries recorded in the woodworking industry, and approximately half of all major injury accidents.

7 The risks associated with the use of woodworking machinery are high since they rely on high-speed sharp cutters to do the job and in many cases, these are necessarily exposed to enable the machining process to take place. Additionally, many machines are still hand-fed; woodworking is probably the main industry where the hands of the operator are constantly exposed to danger.

8 There is a high risk of injury at the cutters and also from the ejection of workpieces from the machine, the cutters or parts of them. No two pieces of wood are the same; each piece behaves differently when machined or shaped during the production process. Knots and natural changes in the direction of the grain can give rise to snatching and kickback of the workpiece.

#### ***PUWER 98***

9 The Provision and Use of Work Equipment Regulations 1998 (PUWER 98) implemented aspects of the Amending Directive to the Use of Work Equipment Directive. PUWER 98 replaced the Provision and Use of Work Equipment Regulations 1992 (PUWER 92).

10 The primary objective of PUWER 98 is to ensure that work equipment does not give rise to risks to health and safety, regardless of the work equipment's age, condition or origin. PUWER 98 applies to all workplaces and work situations subject to the Health and Safety at Work etc Act 1974 (HSW Act).

11 PUWER 98 revokes the remaining requirements of the Woodworking Machines Regulations 1974, regulations 13, 20 and 39. These dealt with training of operators and aspects of safe systems of work (the other requirements of the Woodworking Machines Regulations were revoked by PUWER 92). However, because PUWER 98 relates to work equipment in general rather than specifically to woodworking machinery, it was recognised that ACOP and guidance specific to woodworking machinery was needed to enable levels of safety to be maintained.

#### **Risk assessment**

#### ***How risk assessment and the Management Regulations link with PUWER 98***

12 An assessment of the risks associated with the use of each woodworking machine is necessary. Because of the general risk assessment requirements in the Management of Health and Safety at Work Regulations 1992\* (the Management Regulations), there is no specific requirement in PUWER. A risk assessment will help you identify the hazards, evaluate the risks and take the appropriate measures that are needed to eliminate or reduce the risks to an acceptable level. This assessment will help you to choose the correct machine for a particular process or

\* The Management of Health and Safety at Work Regulations 1992 have been replaced by the Management of Health and Safety at Work Regulations 1999.

## Introduction

operation (see regulation 4 of PUWER 98). The main factors that need to be taken into account are the severity of any injury likely to result from any hazard present, the likelihood of that happening and the number of people exposed to it. You can then identify the actions that need to be taken.

13 You may be able to make the risk assessment yourself using expertise within your own organisation to identify the measures which need to be taken. In a few cases, for example where there are complex hazards or equipment, you may need the help of external health and safety advisors, appointed under regulation 6 of the Management Regulations.\* There is further guidance on risk assessment in the ACOP on the Management Regulations<sup>2</sup> which includes advice on the selection of preventive and protective measures. HSE has also produced a guidance booklet called *Five steps to risk assessment - A step by step guide to a safer and healthier workplace*.<sup>3</sup>

### Structure of this document

14 This document is intended to support the regulations in PUWER 98 which are relevant to woodworking machinery. These are:

regulation 1	Citation and commencement
regulation 2	Interpretation
regulation 3	Application
regulation 4	Suitability of work equipment
regulation 5	Maintenance
regulation 7	Specific risks
regulation 8	Information and instructions
regulation 9	Training
regulation 11	Dangerous parts of machinery
regulation 12	Protection against specified hazards
regulation 15	Stop controls
regulation 20	Stability
regulation 23	Markings
regulation 24	Warnings

### Consulting employees and/or safety representatives

15 Proper consultation with those who do the work is crucial in helping to raise awareness of the importance of health and safety. It can make a significant contribution to creating and maintaining a safe and healthy workplace and an effective health and safety system. This can also benefit the business, making it more efficient by reducing the number of accidents and the incidence of work-related ill health.

## Introduction

16 Employers must consult safety representatives appointed by recognised trade unions under the Safety Representatives and Safety Committees Regulations 1977. Employees who are not covered by such representatives must be consulted, either directly, or indirectly through elected representatives of employee safety under the Health and Safety (Consultation with Employees) Regulations 1996. More information on an employer's duties under these Regulations is in the free leaflet *Consulting employees on health and safety: A guide to the law*.<sup>4</sup>

\* Now regulation 7 of the Management of Health and Safety at Work Regulations 1999.

## Young people

17 PUWER 98 does not contain any specific requirements relating to the age of people using woodworking machinery. However there is ACOP and guidance relevant to the provision and use of woodworking machinery under regulation 13D of the Management of Health and Safety at Work Regulations 1992, as amended by the Health and Safety (Young Persons) Regulations 1997, which is set out below.\*

\* Now regulation 19 of the Management of Health and Safety at Work Regulations 1999.

## Management of Health and Safety at Work Regulations 1992 as amended by the Health and Safety (Young Persons) Regulations 1997

### Regulation 13D Protection of young persons

(1) *Every employer shall ensure that young persons employed by him are protected at work from any risks to their health or safety which are a consequence of their lack of experience, or absence of awareness of existing or potential risks or the fact that young persons have not yet fully matured.*

(2) *Subject to paragraph (3), no employer shall employ a young person for work -*

- (a) *which is beyond his physical or psychological capacity;*
- (b) *involving harmful exposure to agents which are toxic or carcinogenic, cause heritable genetic damage or harm to the unborn child or which in any other way chronically affect human health;*
- (c) *involving harmful exposure to radiation;*
- (d) *involving the risk of accidents which it may reasonably be assumed cannot be recognised or avoided by young persons owing to their insufficient attention to safety or lack of experience or training; or*
- (e) *in which there is a risk to health from -*
  - (i) *extreme cold or heat;*
  - (ii) *noise; or*
  - (iii) *vibration,*

*and in determining whether work will involve harm or risk for the purpose of this paragraph, regard shall be had to the results of the assessment.*

(3) *Nothing in paragraph (2) shall prevent the employment of a young person who is no longer a child for work -*

- (a) *where it is necessary for his training;*
- (b) *where the young person will be supervised by a competent person; and*
- (c) *where any risk will be reduced to the lowest level that is reasonably practicable.*

## Regulation 13D

Management of  
Health and Safety  
at Work Regulations  
1992 as amended  
by the Health and  
Safety (Young  
Persons)  
Regulations 1997  
ACOP 13D

18 **Young people are often exposed to risks to their health and safety when using work equipment as a consequence of their immaturity, lack of experience or awareness of existing or potential risks. Therefore, you should not allow such people to use high-risk woodworking machinery unless they have the necessary maturity and competence which includes having completed appropriate training. However, during the training they may operate high-risk woodworking machinery providing they are adequately supervised. Adequate supervision should also be provided after training if a young person is not sufficiently mature.**

Management  
of Health and  
Safety at Work  
Regulations 1992  
as amended by the  
Health and Safety  
(Young Persons)  
Regulations 1997

19 'Young person' means any person who has not yet reached the age of 18.

20 In this context, high-risk woodworking machinery is considered to include any woodworking machine which is hand-fed as well as the following machines, however fed: any sawing machine fitted with a circular blade or saw band; a planing machine when used for surfacing; and a vertical spindle moulding machine. (The term 'hand-fed' is defined in BS EN 847-1: 1997<sup>5</sup> clause 3.26. It includes not only manual holding and/or guiding of the workpiece or of a machine element incorporating a tool, but also the use of a hand-operated carriage on which the workpiece is placed manually or clamped and the use of a demountable power feed unit.)

21 Competence and maturity are not simply a matter of the age of the worker. Training in itself will not ensure competence but it is part of what is required. The level of supervision needed will depend on how mature the workers are and whether they can work safely without putting themselves or others at risk. Even when they have been trained, young people tend to need more supervision to make sure that they do not act irresponsibly or take short cuts which put themselves and others at risk.

Guidance 13D

## Provision and Use of Work Equipment Regulations 1998 - Regulations relevant to the ACOP *Safe use of woodworking machinery*

### Regulation

13

## Regulation 1 Citation and commencement

*These Regulations may be cited as the Provision and Use of Work Equipment Regulations 1998 and shall come into force on 5th December 1998.*

### PUWER 98 Guidance 1

#### When does PUWER 98 come into force?

22 PUWER 98 comes into force on 5 December 1998.

### PUWER 98

## Regulation 2 Interpretation

*(1) In these Regulations, unless the context otherwise requires -*

*“the 1974 Act” means the Health and Safety at Work etc. Act 1974;*

*“employer” except in regulation 3(2) and (3) includes a person to whom the requirements imposed by these Regulations apply by virtue of regulation 3(3)(a) and (b);*

*“essential requirements” means requirements described in regulation 10(1);*

*“the Executive” means the Health and Safety Executive;*

*“inspection” in relation to an inspection under paragraph (1) or (2) of regulation 6 -*

*(a) means such visual or more rigorous inspection by a competent person as is appropriate for the purpose described in the paragraph;*

*(b) where it is appropriate to carry out testing for the purpose, includes testing the nature and extent of which are appropriate for the purpose;*

*“power press” means a press or press brake for the working of metal by means of tools, or for die proving, which is power driven and which embodies a flywheel and clutch;*

*“thorough examination” in relation to a thorough examination under paragraph (1), (2), (3) or (4) of regulation 32 -*

*(a) means a thorough examination by a competent person;*

*(b) includes testing the nature and extent of which are appropriate for the purpose described in the paragraph;*

*“use” in relation to work equipment means any activity involving work equipment and includes starting, stopping, programming, setting, transporting, repairing, modifying, maintaining, servicing and cleaning;*

*“work equipment” means any machinery, appliance, apparatus, tool or installation for use at work (whether exclusively or not);*

*and related expressions shall be construed accordingly.*

### Regulation 2

*(2) Any reference in regulations 32 to 34 or Schedule 3 to a guard or*

**PUWER 98**

*protection device is a reference to a guard or protection device provided for the tools of a power press.*

*(3) Any reference in regulation 32 or 33 to a guard or protection device being on a power press shall, in the case of a guard or protection device designed to operate while adjacent to a power press, be construed as a reference to its being adjacent to it.*

*(4) Any reference in these Regulations to -*

*(a) a numbered regulation or Schedule is a reference to the regulation or Schedule in these Regulations so numbered; and*

*(b) a numbered paragraph is a reference to the paragraph so numbered in the regulation in which the reference appears.*

**Regulation 2**

**PUWER 98**

**Use**

23 The definition of 'use' is wide and covers more than just the machining operation. It includes the activities of starting, stopping, programming (for example of a CNC machine), setting, the selection of guards and protection devices and their installation prior to use, transporting, repairing, modifying, maintaining, servicing and cleaning.

**Work equipment**

24 PUWER 98 applies to all work equipment, but the scope of this document is narrower. It only covers woodworking machinery, although this term should be interpreted to include machinery that is used for working on wood, cork, fibreboard and material composed wholly or partly of any of these materials.

**Guidance 2**

**PUWER 98**

**Regulation 3 Application**

*(1) These Regulations shall apply -*

*(a) in Great Britain; and*

*(b) outside Great Britain as sections 1 to 59 and 80 to 82 of the 1974 Act apply by virtue of the Health and Safety at Work etc. Act 1974 (Application outside Great Britain) Order 1995 <sup>(a)</sup> ("the 1995 Order").*

*(2) The requirements imposed by these Regulations on an employer in respect of work equipment shall apply to such equipment provided for use or used by an employee of his at work.*

*(3) The requirements imposed by these Regulations on an employer shall also apply -*

*(a) to a self-employed person, in respect of work equipment he uses at work;*

*(b) subject to paragraph (5), to a person who has control to any extent of -  
(i) work equipment;*

**Regulation 3**

*(a) SI 1995/263.*

**PUWER 98**

- (ii) a person at work who uses or supervises or manages the use of work equipment; or
- (iii) the way in which work equipment is used at work,

and to the extent of his control.

(4) Any reference in paragraph (3)(b) to a person having control is a reference to a person having control in connection with the carrying on by him of a trade, business or other undertaking (whether for profit or not).

(5) The requirements imposed by these Regulations shall not apply to a person in respect of work equipment supplied by him by way of sale, agreement for sale or hire-purchase agreement.

(6) Subject to paragraphs (7) to (10), these Regulations shall not impose any obligation in relation to a ship's work equipment (whether that equipment is used on or off the ship).

(7) Where merchant shipping requirements are applicable to a ship's work equipment, paragraph (6) shall relieve the shore employer of his obligations under these Regulations in respect of that equipment only where he has taken all reasonable steps to satisfy himself that the merchant shipping requirements are being complied with in respect of that equipment.

(8) In a case where the merchant shipping requirements are not applicable to the ship's work equipment by reason only that for the time being there is no master, crew or watchman on the ship, those requirements shall nevertheless be treated for the purpose of paragraph (7) as if they were applicable.

(9) Where the ship's work equipment is used in a specified operation paragraph (6) shall not apply to regulations 7 to 9, 11 to 13, 20 to 22 and 30 (each as applied by regulation 3).

(10) Paragraph (6) does not apply to a ship's work equipment provided for use or used in an activity (whether carried on in or outside Great Britain) specified in the 1995 Order save that it does apply to -

- (a) the loading, unloading, fuelling or provisioning of the ship; or
- (b) the construction, reconstruction, finishing, refitting, repair, maintenance, cleaning or breaking up of the ship.

(11) In this regulation -

"master" has the meaning assigned to it by section 313(1) of the Merchant Shipping Act 1995;<sup>(a)</sup>

"merchant shipping requirements" means the requirements of regulations 3 and 4 of the Merchant Shipping (Guarding of Machinery and Safety of Electrical Equipment) Regulations 1988<sup>(b)</sup> and regulations 5 to 10 of the Merchant Shipping (Hatches and Lifting Plant) Regulations 1988;<sup>(c)</sup>

(a) 1995 c.21.

(b) SI 1988/1636, amended by SI 1988/2274.

(c) SI 1988/1639, amended by SI 1988/2274.

**Regulation 3**

**PUWER 98**

*“ship” has the meaning assigned to it by section 313(1) of the Merchant Shipping Act 1995 save that it does not include an offshore installation;*

*“shore employer” means an employer of persons (other than the master and crew of any ship) who are engaged in a specified operation;*

*“specified operation” means an operation in which the ship’s work equipment is used -*

- (a) by persons other than the master and crew; or*
- (b) where persons other than the master and crew are liable to be exposed to a risk to their health or safety from its use.*

**Regulation 3**

**PUWER 98**

**Where PUWER 98 applies**

25 PUWER 98 applies to all premises where the HSW Act applies, ie to all ‘at work’ situations. PUWER 98 therefore applies at all workplaces where woodworking machinery and equipment is used, including places such as educational and research establishments, hospitals, and places of entertainment.

**Who has duties under PUWER 98?**

26 PUWER 98 places duties on employers, the self-employed and people who have control of work equipment. The duty on people who have control of work equipment reflects the way that work equipment is used in industry where there may not necessarily be a direct ‘employment’ relationship between the user and the person who controls the work equipment, for example when it is hired. If you have duties under PUWER 98 you need to ensure that the woodworking machinery you provide for use at work complies with the Regulations.

27 Although only the Courts can give an authoritative interpretation of the law, in considering the application of these Regulations and guidance to people working under your direction, you should consider the information in paragraph 28.

28 If you have people working under your control and direction who are self-employed for tax and/or National Insurance purposes, they are likely to be treated as your employees for health and safety purposes. You may therefore need to take appropriate action to protect them. If you are in any doubt who is responsible for the health and safety of a person working for you this could be clarified and included in the terms of the contract. However, remember, you cannot pass on a legal duty that falls to you under the HSW Act by means of a contract and you will still have duties towards others under section 3 of the HSW Act. If you intend to employ such workers on the basis that you are not responsible for their health and safety, you should seek legal advice before doing so.

**Employees**

29 If you are an employee you do not have any specific duties under PUWER 98. Your duties are covered in other legislation, in particular section 7 of the HSW Act and regulation 12 of the Management of Health and Safety at Work Regulations 1992.\*

\* Now regulation 14 of the Management of Health and Safety at Work Regulations 1999.

**Guidance 3**

**PUWER 98**

**Trainees**

30 If employees are being trained outside their normal workplace (for example at a college) the duty holder will be the person who has control of the undertaking where they are being trained while the employee is at that undertaking.

**What you need to do if you have duties under PUWER 98**

31 If you have duties under PUWER 98 you need to ensure that the woodworking machinery you provide for use at work complies with PUWER 98.

**Guidance 3**

**PUWER 98**

**Regulation 4 Suitability of work equipment**

*(1) Every employer shall ensure that work equipment is so constructed or adapted as to be suitable for the purpose for which it is used or provided.*

*(2) In selecting work equipment, every employer shall have regard to the working conditions and to the risks to the health and safety of persons which exist in the premises or undertaking in which that work equipment is to be used and any additional risk posed by the use of that work equipment.*

*(3) Every employer shall ensure that work equipment is used only for operations for which, and under conditions for which, it is suitable.*

*(4) In this regulation "suitable" means suitable in any respect which it is reasonably foreseeable will affect the health or safety of any person.*

**Regulation 4**

**PUWER 98**

**How regulation 4 deals with safety**

32 This regulation deals with the safety of work equipment, including woodworking machinery. It deals with:

- (a) its initial integrity;
- (b) the place where it will be used;
- (c) the purpose for which it will be used.

33 The selection of suitable woodworking machinery for particular tasks and processes makes it possible to reduce or eliminate many risks to the health and safety of people at the workplace. This applies both to the normal use of the equipment as well as to other operations such as maintenance.

**Regulation 4(1)**

34 Woodworking machinery must be suitable, by design, construction or adaptation, for the work it is provided to do. This means in practice that when you provide woodworking machinery you should ensure that it is suitable for the work to be undertaken and that it is used in accordance with the manufacturer's specifications and instructions. If woodworking machinery is adapted it must still be suitable for its intended purpose.

**Regulation 4(2)**

35 This requires you to assess the location in which the woodworking machinery is to be used and to take account of any risks that may arise from the particular circumstances.

**Guidance 4**

PUWER 98

**Regulation 4(3)**

36 This requirement concerns each particular process for which the woodworking machinery is to be used and the conditions under which it will be used. You must ensure that the machinery is suitable for the process and conditions of use.

Guidance 4

PUWER 98

**Suitability of woodworking machinery**

37 **Some operations can be safely carried out on more than one machine. You should ensure that the most suitable machine which is available is selected for the task. For example, for grooving, a properly guarded vertical spindle moulding machine or routing machine are most suitable. If a circular saw is used for grooving, special guards should be provided to prevent access to that part of the saw blade above the table.**

ACOP 4

PUWER 98

38 Some operations are higher risk when carried out on one type of machine rather than another. For example, cutting a rebate on a properly guarded spindle moulding machine is lower risk than using the cutter block of a surface planing machine. Similarly, cutting very thin slivers of wood using a circular saw is higher risk than removing the same material by means of a surface planing machine. In some cases it is possible to carry out the work safely provided more stringent safeguards than normal are taken, for example, rebating on a surface planing machine can be carried out provided the workpiece is properly supported and a tunnel guard projecting beyond the cutter block is formed, with the table gap guarded on both sides of the fence.

Guidance 4

PUWER 98

39 **Where ripping operations are carried out, a circular saw or radial arm saw should not be used unless the saw blade, at all times, projects through the upper surface of the material being cut.**

40 **A radial arm cross-cut saw should only be used for ripping operations if the machine has been designed or adapted especially for that purpose. In such cases it is essential that appropriate, additional safeguards, ie at least a riving knife,\* are used.**

**Limited cutter projection tooling**

41 **You should ensure that suitable tools are selected. The tools selected should be within the range specified by the machine manufacturer. Where possible, limited cutter projection tooling or other devices which achieve the same effect should be fitted to hand-fed machines. Where you already have such tooling or its equivalent you should ensure that it alone is used with effect from the date PUWER 98 comes into force (5 December 1998). Otherwise, the changeover to limited cutter projection tooling or its equivalent should be made when replacement tooling is obtained, or by 5 December 2003, whichever is the sooner.**

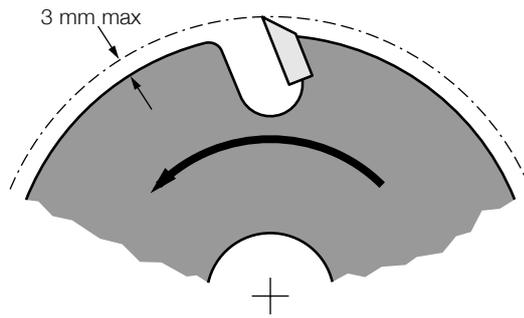
ACOP 4

\* An anti-kickback device will also be required.

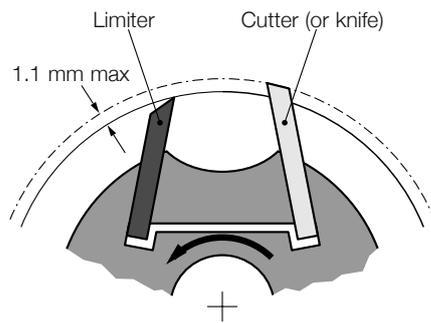
PUWER 98

42 Limited cutter projection tooling, also known as 'chip thickness limitation tooling', is specifically designed and constructed to reduce the risk of injury. There is evidence to show that the use of these tools considerably reduces the severity of the injury if a machine operator's fingers come into contact with the rotating tool.

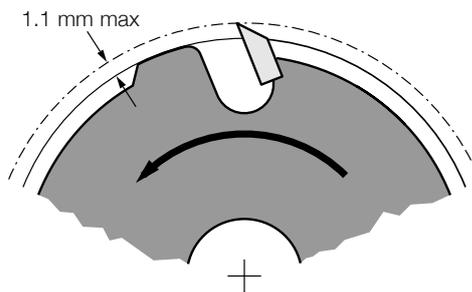
Guidance 4



Round form tool with limited  
cutter projection

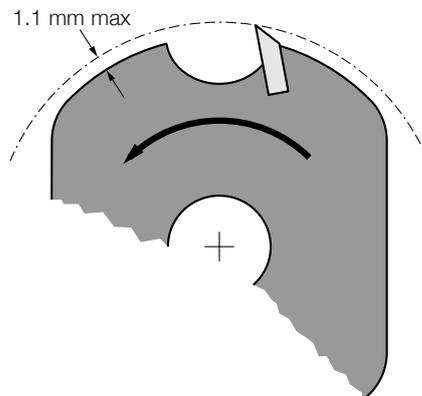


Use of a 'limiter' to achieve  
limited cutter projection



Tool body designed to  
permanently incorporate a  
'limiter'

**Figure 1** Examples of round form tooling with limited cutter projection



**Figure 2** An example of a non-round form tool with limited cutter projection

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43 The European (CEN) Standard BS EN 847-1 *Tools for woodworking - Safety requirements Part 1 Milling tools and circular saw blades*<sup>5</sup> gives guidance on safety standards for tools on new machines.

**Guidance 4**

44 It is possible to fit limited cutter projection tooling to vertical spindle moulding machines, single-end tenoning machines and some rotary knife and copying lathes.

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**Tool speeds**

45 **No tool should be run at speeds greater than the safe working speed marked on the tool or specified in the information supplied by the manufacturers or suppliers of the tool.**

**Cylindrical cutter blocks**

46 **Only cylindrical cutter blocks should be used on hand-fed planing machines. To prevent the cutters from becoming accidentally detached from the block, the manufacturer's recommendations for balancing and mounting should be followed.**

**ACOP 4**

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47 The shape of cutters on some machines will affect the operator's safety. The cutters mounted on spindle moulding machines are invariably detachable from the cutter block or tool body and it is important that the cutter is the correct thickness for the cutter block or spindle upon which it is to be mounted.

**Choosing tools**

48 This regulation also applies to the correct choice of tool for the work and to the need for the cutter to be kept in good condition. Cutters should be kept sharp. If they are cracked or otherwise damaged in such a way as to increase the risk of break-up, they should not be used and should be thrown away.

**Guidance 4**

**PUWER 98**

**Regulation 5 Maintenance**

*(1) Every employer shall ensure that work equipment is maintained in an efficient state, in efficient working order and in good repair.*

*(2) Every employer shall ensure that where any machinery has a maintenance log, the log is kept up to date.*

**Regulation 5**

**PUWER 98**

**Application of regulation 5**

49 This regulation builds on the general duty in the HSW Act which requires work equipment to be maintained so that it is safe. It does not cover the maintenance process (that is covered by the general duties of the HSW Act) or the construction of work equipment so that maintenance can be carried out without risk to health or safety.

50 It is important that all parts of the woodworking machinery are maintained so that its performance does not deteriorate to the extent that it puts people at risk. In regulation 5, 'efficient' relates to how the condition of the woodworking machinery might affect health and safety. It is not concerned with productivity.

**Guidance 5**

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### Frequency of maintenance

51 Woodworking machinery may need to be checked frequently to ensure that safety related features are functioning correctly. The frequency of such checks will vary and depends on the machinery itself and the risks involved. It should also take into account the intensity of use, the operating environment and the variety of operations. The manufacturer's instructions should also help you determine the items that require maintenance, as well as the type of maintenance they need, for example proper lubrication, replacement and adjustment of parts and frequency of the maintenance work.

### Maintenance management

52 The extent and complexity of maintenance can vary substantially from simple checks on basic woodworking machinery to integrated programmes for complex machinery. In all circumstances, for maintenance to be effective, it needs to be targeted at the parts of work equipment where failure or deterioration could lead to increased risks to health and safety. To achieve this a number of maintenance management techniques could be used:

- (a) planned preventive;
- (b) condition-based;
- (c) breakdown.

53 You should select appropriate techniques using risk assessment and apply them independently or in combination to address the risks involved.

54 Different techniques for the management of maintenance have different benefits:

- (a) planned preventive maintenance involves replacing parts or making necessary adjustments at preset intervals so that hazards do not occur as a result of the deterioration or failure of the equipment;
- (b) condition-based maintenance involves monitoring the condition of safety critical parts and carrying out maintenance whenever necessary for the same purposes. When safety critical parts could fail and cause the equipment, guards or other protection devices to fail in a dangerous way, a formal system of planned preventive or condition-based maintenance is necessary;
- (c) breakdown maintenance, however, only needs to be carried out after failure has occurred. This is appropriate only if the failure does not present an immediate risk and can be corrected before risk occurs, for example, through effective fault reporting and maintenance schemes.

55 You may need to review and revise maintenance management measures in certain circumstances, for example if the woodworking machinery is subjected to particularly heavy use.

### Maintenance log

56 There is no requirement for you to keep a maintenance log, although where there is a maintenance log you should keep it up to date. However, it is recommended that you do keep a record of maintenance for high-risk woodworking machinery. A detailed maintenance log can provide information for future planning of maintenance activities and inform maintenance personnel and others of previous action taken.

Guidance 5

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**Training for maintenance workers**

57 Maintenance work should only be done by those who are competent to do the work.

**Hired work equipment**

58 Some equipment may not be owned by the user. Many items of plant and equipment are hired and this could apply to woodworking machinery. It is important for both the hire company and the person responsible for hiring equipment to establish which party will carry out safety related maintenance. This is particularly important for equipment on long-term hire and the terms of the agreement should be set out/recorded in writing.

59 In many cases, safety related maintenance work is not carried out by the duty holder with ultimate responsibility for the work equipment in the mistaken belief that the other party will do it. If the hire company is some distance from the user site, it would be uneconomical for their staff to carry out simple checks and make minor adjustments, so the user may agree to carry them out. Both parties should agree exactly what they are responsible for.

**Guidance 5**

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**Maintaining woodworking machinery**

60 **You should ensure that the maintenance of woodworking machinery includes at least:**

- (a) **worktables (upon which a workpiece rests or over which it passes). These should be smooth and free of any obstruction or damage that is likely to interrupt the continuous feeding of any workpiece to the tool;**
- (b) **mechanical feed systems (where used). These should track and run smoothly;**
- (c) **guards (particularly adjustable, interlocked or automatic guards). These should be freely adjustable over the full range of work for which they are designed, and continue to fulfil their safety function;**
- (d) **protection devices including two-handed controls and photo-electric devices (where provided). These should be in effective working order;**
- (e) **tools. These should be sufficiently sharp and not damaged in such a way to increase the likely risk of disintegration/break-up;**
- (f) **toolholders and workpiece clamping systems (where fitted). These should move freely and continue to function safely;**
- (g) **protection appliances (such as jigs, holders, push-sticks etc). These should be stored in a safe place to minimise the risk of damage and be checked to ensure that they are fit for safe use.**

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**Regulation 7 Specific risks**

(1) *Where the use of work equipment is likely to involve a specific risk to health or safety, every employer shall ensure that -*

- (a) *the use of that work equipment is restricted to those persons given the task of using it; and*
- (b) *repairs, modifications, maintenance or servicing of that work equipment is restricted to those persons who have been specifically designated to perform operations of that description (whether or not also authorised to perform other operations).*

**Regulation 7**

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**Regulation 7**

*(2) The employer shall ensure that the persons designated for the purposes of sub-paragraph (b) of paragraph (1) have received adequate training related to any operations in respect of which they have been so designated.*

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**61 You should ensure that wherever possible, risks are always controlled by (in the order given):**

**(a) eliminating the risks;**

**or if that is not possible:**

**(b) taking 'hardware' (physical) measures to control the risks such as the provision of guards;**

**but if the risks cannot be adequately controlled:**

**(c) also taking appropriate 'software' measures to deal with the residual (remaining) risk, such as following safe systems of work and the provision of information, instruction and training.**

**Normal operation**

**62 You should ensure that where the risks from the use of work equipment cannot be adequately controlled by hardware measures, such as guards or protection devices, during its normal operation, it is particularly important that only the people whose task it is should be allowed to use such equipment. They should have received sufficient information, instruction and training to enable them to carry out the work safely.**

**Repairs, modifications etc**

**63 You should ensure that where the risks from the use of work equipment cannot be adequately controlled by hardware measures such as guards or protection devices during repair, maintenance, or other similar work, only people who have received sufficient information, instruction and training to enable them to carry out the work safely should do the work. They shall be the designated person for the purpose of this regulation.**

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**64 The use of woodworking machines should be restricted to people who are properly trained and have enough information and instruction, particularly where the machine is hand-fed. Much of the cutting tool needs to be exposed to allow the machining of the workpiece. The effort of moving the material through the machine is always towards the fast moving cutter(s) which in many cases cannot be fully enclosed. Safety therefore relies on a combination of the use of guards, protection devices and protection appliances, selecting competent people to use the equipment and following safe working practices and systems of work.**

**65 On machines with an integrated feed mechanism, there is less risk of contact with the tool and ejection of the workpiece, however, there are still inherent dangers during normal operation and similar precautions are necessary.**

**66 For both integrated and hand-fed machines, there are high residual risks while setting, adjusting, removing off-cuts and cleaning of the tools and machines, so appropriate precautions are necessary.**

**Guidance 7**

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## Regulation 8 Information and instructions

(1) Every employer shall ensure that all persons who use work equipment have available to them adequate health and safety information and, where appropriate, written instructions pertaining to the use of the work equipment.

(2) Every employer shall ensure that any of his employees who supervises or manages the use of work equipment has available to him adequate health and safety information and, where appropriate, written instructions pertaining to the use of the work equipment.

(3) Without prejudice to the generality of paragraphs (1) or (2), the information and instructions required by either of those paragraphs shall include information and, where appropriate, written instructions on -

- (a) the conditions in which and the methods by which the work equipment may be used;
- (b) foreseeable abnormal situations and the action to be taken if such a situation were to occur; and
- (c) any conclusions to be drawn from experience in using the work equipment.

(4) Information and instructions required by this regulation shall be readily comprehensible to those concerned.

### Regulation 8

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### How regulation 8 links with other health and safety law

68 This regulation builds on the general duty in the HSW Act to provide employees with the information and instructions that are necessary to ensure, so far as is reasonably practicable, their health and safety. It also links with the general requirement in the Management Regulations to provide information to employees relating to their health and safety. The Health and Safety (Consultation with Employees) Regulations 1996 require employers to consult their employees on the information required under other regulations, including PUWER 98, about risks to their health and safety and preventative measures in place.

### What does regulation 8 require?

69 Regulation 8 places a duty on employers to make available all relevant health and safety information and, where appropriate, written instructions on the use of woodworking machinery to their workforce. Workers should have easy access to such information and instructions and be able to understand them.

### What should be made available?

70 Regulations 8(1) and 8(2) refer to written instructions. This can include the information provided by manufacturers or suppliers of woodworking machinery, for example instruction sheets or manuals, instruction placards, warning labels and training manuals. It can also include in-house instructions and instructions from training courses. There are duties on manufacturers and suppliers to provide sufficient information, including drawings, to enable the correct installation, safe operation and maintenance of woodworking machinery. You should ask or check that they are provided.

### Guidance 8

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**Who needs to know?**

71 You should ensure that any written instructions are available to the people who use woodworking machinery. You should also ensure that instructions are made available to other appropriate people, for example, maintenance instructions need to be made available or passed to the people involved in maintaining your woodworking machinery.

**Keep supervisors and managers informed**

72 Supervisors and managers also need access to the information and written instructions. The amount of detailed health and safety information they will need to have immediately available for day-to-day running of production lines will vary but it is important that they know what information is available and where it can be found.

**How should the information and instructions be made available?**

73 Information can be made available in writing, or given verbally where it is considered sufficient. It is your responsibility to decide what is appropriate, taking into consideration the individual circumstances. Where there are complicated or unusual circumstances the information should be in writing. Other factors need to be taken into consideration such as the degree of skill of the workers involved, their experience and training, the degree of supervision and the complexity and length of the particular job.

74 The information and written instructions should be easy to understand. They should be in clear English and/or other languages if appropriate for the people using them. They should be set out in a logical order with illustrations where appropriate. Standard symbols should be used.

75 You should give special consideration to any employees with language difficulties or with disabilities which could make it difficult for them to receive or understand the information or instructions. You may need to make special arrangements in these cases.

**What should the information and instructions cover?**

76 Any information and written instructions you provide should cover:

- (a) all health and safety issues relating to the use of the woodworking machinery;
- (b) any limitations on these uses;
- (c) any foreseeable difficulties that could arise;
- (d) the methods to deal with them;
- (e) any practical tips gained from experience of using the woodworking machinery.

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**Information and instructions for woodworking machinery**

77 **You should ensure that information and instructions provided on the use of woodworking machinery includes, where relevant:**

- (a) the speed, range, type and dimensions of tools suitable for the machine;**
- (b) any limitation on the cutting speeds of the machine, particular operations or size and material of any workpiece;**
- (c) procedures relating to the repair or replacement of any guard or protection device;**

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- (d) the availability, suitability and use of any additional protection device or protection appliance;
- (e) the correct procedures to be followed for setting and adjusting operations;
- (f) safe methods of handling tools;
- (g) correct procedures for start-up and shutdown, isolation and how to discharge any residual energy;
- (h) procedures for cleaning saw blades by hand (which should be carried out with the machine isolated and with the blade stopped);
- (i) procedures for adjusting any guard, tool, clamp or other part of a machine (which should not be carried out while any part of the machine is in motion, unless they can be done safely).

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78 Information and instruction is needed on the safe mounting of tools and cutters.

79 For most tools, methods for safe handling will be straightforward, but certain high-risk operations will require special information and instruction, for example, how to handle the band blade of a band re-saw to the 'saw doctor's' shop, and the handling of veneer guillotine blades when they are removed for sharpening.

80 When operating a hand-fed circular saw, a push-stick should always be used when making any cut less than 300 mm in length or when feeding the last 300 mm of a longer cut. The operator's leading hand should never be closer than is necessary to the front of the saw and hands should never be in line with the saw blade. When a push-stick is used, the left hand should be moved to a position along the plate of the saw, so that in the event of an unexpected movement of the workpiece, the fingers will not be thrown against the teeth. A push-stick should always be used to remove the cut piece from between the saw and the fence, unless the width of the cut piece exceeds 150 mm.

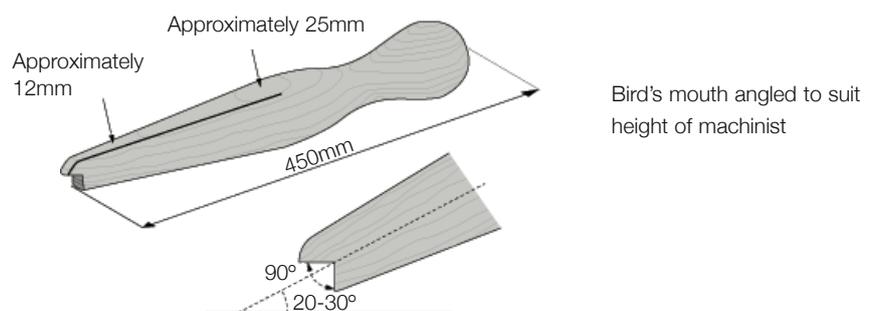


Figure 3 A suitable design for a push-stick

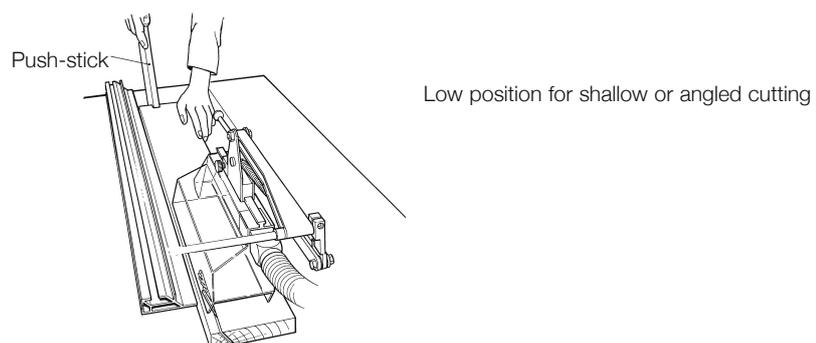
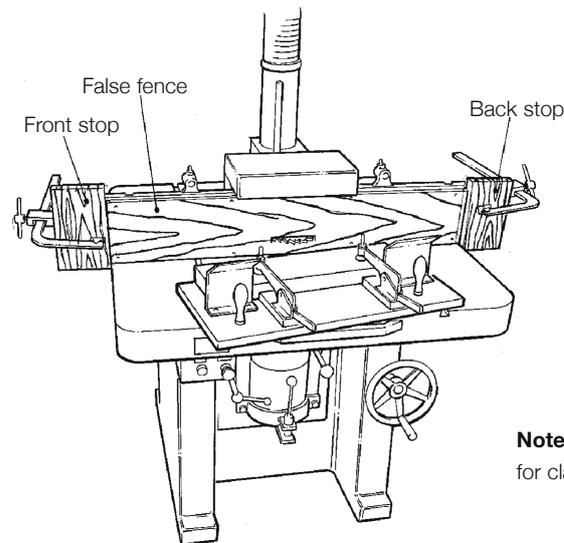


Figure 4 Use of a push-stick

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81 When operating a vertical spindle moulding machine, it may be necessary for the cutters to have to break into the solid face of the workpiece rather than starting the cut at the beginning and/or to have to break out before the end. This type of work requires a jig and control of the workpiece is greatly improved if this is used in conjunction with stops. Stops also allow greater stability of the workpiece and prevent kickback when 'dropping on'. Typically, the jig containing the workpiece is placed against a back stop, fed slowly onto the cutters to break in, then fed forward past the cutters against the false fence to the front stop and the jig taken off. A typical arrangement is shown in Figure 5.



**Note:** Top Shaw guard omitted for clarity

**Figure 5** Jig and back and front stops for stopped work

82 Where the motor driving a vertical spindle moulding machine is capable of operating at two working speeds, arrangements should be made to ensure that the machine cannot run at the higher speed without first being run at the lower speed. This will minimise the risk of cutters flying out from the machine.

83 Two categories of information and instruction are relevant. Both have an important role for safety:

- (a) verbal communication; and
- (b) recorded information, for example keeping records of the significant findings of assessments, and manufacturers' and suppliers' information.

84 It is important that you make available any recorded information and instruction that is necessary for safety to managers, supervisors and machine operators, as appropriate.

85 The role of the manager and supervisor will be important where 'foreseeable abnormal situations' are likely to occur and where there are 'any conclusions to be drawn from experience'. A good example of this is the action to be taken in the event of a malfunction of a guard or a machine control. Further guidance is available in the HSE leaflet *Supervising for safety in woodworking*.<sup>6</sup>

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## Regulation 9 Training

*(1) Every employer shall ensure that all persons who use work equipment have received adequate training for purposes of health and safety, including training in the methods which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken.*

*(2) Every employer shall ensure that any of his employees who supervises or manages the use of work equipment has received adequate training for purposes of health and safety, including training in the methods which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken.*

Regulation 9

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### Who should be trained?

**86 You should ensure that training is provided for machine operators and those who assist in the machining process, for example in taking off, feeding and/or loading workpieces etc. It should also be provided for those who set, clean, or maintain woodworking machinery.**

### Training schemes for woodworking

**87 All training schemes should include the following elements:**

- (a) General. Instruction in the safety skills and knowledge common to woodworking processes. This should include aspects of good housekeeping and awareness of the dangers such as ‘taking off’, ‘dropping on’ and ‘kickback’.**
- (b) Machine specific. Practical instruction in the safe operation of the machine, including in particular:**
  - (i) the dangers arising from the machine and any limitations as to its use;**
  - (ii) the main causes of accidents and relevant safe working practices including the correct use of guards, protection devices, appliances and the use of the manual brake where fitted.**
- (c) Familiarisation. On-the-job training under close supervision.**

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### Training content and its effectiveness

88 Training may take a number of forms: in-house, external or a combination of both. In all cases care should be taken to ensure that the class of the machine involved and the type of work which the operator is expected to carry out has been adequately covered. It is essential to ensure that machine-specific training is given. If training schemes do not include this they will not fully meet all the necessary training requirements. Also, where modular training is carried out, it is essential to ensure that the modules cover training on all of the machines that the trainee will be expected to work on and the types of work to be done.

### Supervisors and managers

89 Where training is carried out by a supervisor or manager, they should be competent in the safe operation of the class and type of machine, the type of work or operation on which the training is to be given and the risks and control measures to be adopted in each particular case. The correct selection of supervisors and managers who undertake training is central to any successful training scheme.

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90 Guidance on a suggested content for training courses is given in Appendix 1. Examples of training records are given in Appendix 2.

**Machine operators**

91 The training and supervision needs of each individual operator will vary. It is essential that an assessment is made of those needs by a person who is competent to make such an assessment.

**Demonstrating competence**

92 Employers need to satisfy themselves that workers are adequately trained and demonstrate competence in the work that they are expected to do.

93 Part of assessing competence means measuring the success of the training that has been given. The person carrying out the assessment should be familiar not only with the machining process but also with the risks and the safe working practices that are used.

94 Competence is demonstrated by the trainee when the requisite knowledge and safe working practices are used consistently when working at the machine.

95 A competent worker will be able to demonstrate:

- (a) selection of the correct machine and tooling for the job, ie have the ability to say 'This is the wrong machine for the job, it can be done more safely on...';
- (b) the purpose and adjustment of guards, protection devices and appliances;
- (c) a knowledge of safe methods of working including appropriate selection of jigs, holders, push-sticks and similar protection appliances;
- (d) a practical understanding of legal requirements, for example the need to provide and use guards, as well as their correct adjustment and positioning etc;
- (e) a knowledge of the nature of wood and the hazards which this produces including kickback, snatching and ejection.

**Refresher training**

96 Training needs are likely to be greatest on recruitment, however, you need to consider the need for refresher training for trained and experienced operators of woodworking machines. Skills decline if they are not used regularly. You should also pay particular attention to people who occasionally deputise for others - they may need more frequent refresher training than those who do the work regularly. This is also particularly relevant if:

- (a) a worker has not operated a particular class of machine for some time;
- (b) the method of control of the machine has changed;
- (c) new equipment or technology is introduced; or
- (d) the system of work changes.

**When should training take place?**

97 The Management Regulations specify that health and safety training should take place within working hours.

98 Guidance on a suggested content for training courses is given in Appendix 1. Examples of training records are given in Appendix 2.

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## Regulation 11 Dangerous parts of machinery

(1) Every employer shall ensure that measures are taken in accordance with paragraph (2) which are effective -

- (a) to prevent access to any dangerous part of machinery or to any rotating stock-bar; or
- (b) to stop the movement of any dangerous part of machinery or rotating stock-bar before any part of a person enters a danger zone.

(2) The measures required by paragraph (1) shall consist of -

- (a) the provision of fixed guards enclosing every dangerous part or rotating stock-bar where and to the extent that it is practicable to do so, but where or to the extent that it is not, then
- (b) the provision of other guards or protection devices where and to the extent that it is practicable to do so, but where or to the extent that it is not, then
- (c) the provision of jigs, holders, push-sticks or similar protection appliances used in conjunction with the machinery where and to the extent that it is practicable to do so, but where or to the extent that it is not, then
- (d) the provision of information, instruction, training and supervision.

(3) All guards and protection devices provided under sub-paragraphs (a) or (b) of paragraph (2) shall -

- (a) be suitable for the purpose for which they are provided;
- (b) be of good construction, sound material and adequate strength;
- (c) be maintained in an efficient state, in efficient working order and in good repair;
- (d) not give rise to any increased risk to health or safety;
- (e) not be easily bypassed or disabled;
- (f) be situated at sufficient distance from the danger zone;
- (g) not unduly restrict the view of the operating cycle of the machinery, where such a view is necessary;
- (h) be so constructed or adapted that they allow operations necessary to fit or replace parts and for maintenance work, restricting access so that it is allowed only to the area where the work is to be carried out and, if possible, without having to dismantle the guard or protection device.

(4) All protection appliances provided under sub-paragraph (c) of paragraph (2) shall comply with sub-paragraphs (a) to (d) and (g) of paragraph (3).

(5) In this regulation -

“danger zone” means any zone in or around machinery in which a person is exposed to a risk to health or safety from contact with a dangerous part of machinery or a rotating stock-bar;

“stock-bar” means any part of a stock-bar which projects beyond the head-stock of a lathe.

### Regulation 11

#### What regulation 11(1) requires

99 Regulation 11(1) requires employers to take effective measures to prevent access to dangerous parts of machinery or stop their movement before any part of a person enters a danger zone.

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100 The term 'dangerous part' has been established in health and safety law through judicial decisions. In practice this means that if a piece of work equipment could cause injury if it is being used in a foreseeable way it can be considered a dangerous part.

**Risk assessment**

101 A risk assessment carried out under regulation 3 of the Management Regulations should identify hazards presented by machinery. If the hazard could present a reasonably foreseeable risk to a person, the part of the machinery generating that risk is a 'dangerous part'. The hazard generally results in a risk when the part of the machinery is in motion. The risk assessment should evaluate the nature of the injury, its severity and likelihood of occurrence. The risk to be overcome is contact of part of the body or clothing with the dangerous part of the machinery. The hazards from woodworking machinery will be identified as part of the risk assessment. The purpose of the risk assessment is to identify measures that can be taken to overcome the risks that the hazards present.

**What regulation 11(2) requires**

102 Regulation 11(2) specifies the measures which should be taken to prevent access to the dangerous parts of the woodworking machinery, ranked in the order they should be implemented. It may be necessary to select a combination of measures (see paragraph 107 for an example of this). The levels of protection are:

- (a) fixed enclosing guards;
- (b) other guards or protection devices such as interlocked guards and pressure mats;
- (c) protection appliances such as jigs, holders and push-sticks etc;
- (d) the provision of information, instruction, training and supervision.

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**Preventing access to dangerous parts of woodworking machinery**

103 **You should ensure that where practicable, access to the tools, cutters or other dangerous parts of a woodworking machine is prevented by fixed guards or distance barriers until they are safely at rest.**

104 **Where it is not possible to prevent access to the dangerous parts by fixed guards alone, a combination of fixed guards, adjustable guards and, if necessary, protection devices should be provided.**

105 **Where guarding is achieved by means of an outer fence of the perimeter type, any hinged, sliding or moveable guards forming a part of that fence or enclosure (such as a door or panel) should be interlocked so that the machine will not run unless they are effectively closed.**

106 **Adjustable guards should be kept as close to the workpiece as possible while the machine is operating. Adjustments to guards should not be carried out while the cutter(s) is in motion unless this can be done safely.**

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107 The guarding arrangements for a circular saw bench provide a good illustration of how this hierarchy of safeguards is applied in practice, since they combine nearly all elements of the regulation. Fixed guards form a partial enclosure for some of the dangerous parts (ie those below the bench); adjustable guards enclose the top part of the saw blade which is not used for cutting the workpiece; an extension table is needed as a protection device if a second person works at the rear of the blade taking-off cut material; and a push-stick is a protection

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appliance that keeps the operator's hands away from the blade as the wood is pushed towards it.

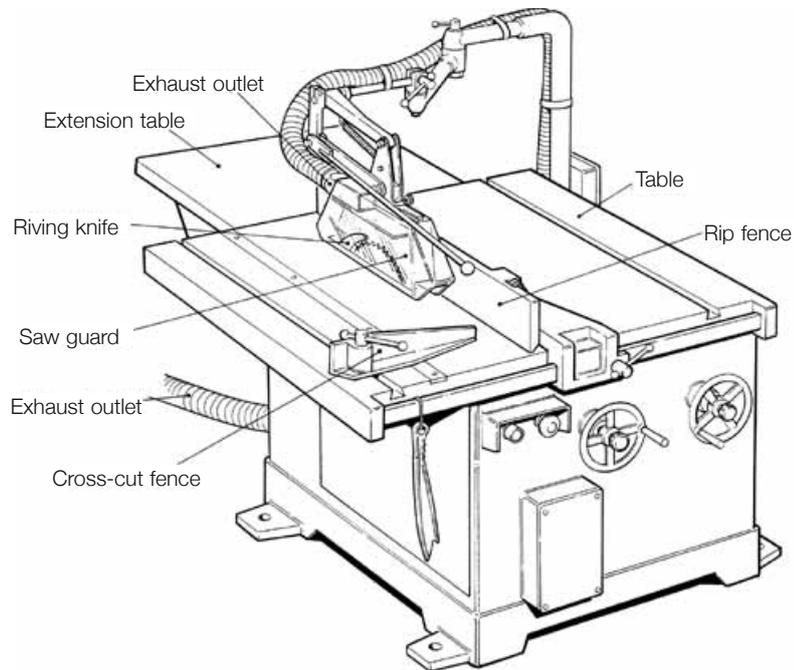


Figure 6 Fixed guard

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108 **An adjustable guard should be:**

- (a) capable of adjustment over the full range of the size and position of the tool and the workpiece;
- (b) of sufficient size and shape so as to enclose as much of the tool as is practicable during the cutting operation;
- (c) sufficiently strong and rigid so as to withstand normal usage and to contain small pieces of the tools and workpiece that may be thrown off. Guards manufactured from wood are unlikely to be suitable in view of the likelihood of them being easily cut should they come into contact with the tool (the exception is the bridge guard for a surface planing machine). Most guards should therefore be made of metal or hard plastic. Where it is necessary for the operator to see the cutting edge, a sighting slot or a transparent panel in the guard should be provided;
- (d) capable of being adjusted without risk to the operator. Workpiece guiding fences should be capable of accepting additional wooden false fences.

109 **A protection appliance should be:**

- (a) made of strong and rigid material that will not damage the tool should it come into contact with it. In most cases therefore, such appliances should be made of wood or a similar material;
- (b) designed so that when properly used, it controls the movement of the workpieces;
- (c) capable of being held firmly. Handholds should be incorporated if the shape of the appliance does not in itself provide adequate means of being gripped securely;
- (d) equipped, where necessary, with means of clamping and/or holding the workpiece;

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- (e) readily available for use at the machine or machines for which it is intended to be used.

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**Routine checks**

110 All guards, particularly adjustable or automatic guards, need to be kept in good working condition and regularly checked to ensure that they move freely, are free from any defect and are capable of being adjusted over the full range of work for which they were designed.

111 Protection devices and guards with interlocking devices need to be checked regularly to ensure that they continue to operate correctly. It is recommended that they are checked at least once a working shift. Protection devices should, when actuated, stop the machine and/or prevent start-up. Guards should, when closed, prevent access to hazardous motion and when opened, actuate the interlocking device to stop the machine and/or prevent start-up.

112 If tool holders and workpiece clamping systems are fitted they need to be checked for correct adjustment, free movement and for the absence of damage.

113 Protection appliances such as jigs, workpiece holders, push-sticks etc should be stored in a safe place to minimise the risk of damage and should be regularly checked to ensure that they are fit for safe use.

Guidance 11

PUWER 98

**Regulation 12 Protection against specified hazards**

(1) *Every employer shall take measures to ensure that the exposure of a person using work equipment to any risk to his health or safety from any hazard specified in paragraph (3) is either prevented, or, where that is not reasonably practicable, adequately controlled.*

(2) *The measures required by paragraph (1) shall -*

- (a) *be measures other than the provision of personal protective equipment or of information, instruction, training and supervision, so far as is reasonably practicable; and*
- (b) *include, where appropriate, measures to minimise the effects of the hazard as well as to reduce the likelihood of the hazard occurring.*

(3) *The hazards referred to in paragraph (1) are -*

- (a) *any article or substance falling or being ejected from work equipment;*
- (b) *rupture or disintegration of parts of work equipment;*

**(Note:** (c) to (e) of regulation 12(3) are not covered by this ACOP and have not been listed here.)

(4) *For the purposes of this regulation “adequately” means adequately having regard only to the nature of the hazard and the nature and degree of exposure to the risk.*

**(Note:** regulation 12(5) is not included here as it is not specifically relevant to this ACOP.)

Regulation 12

**PUWER 98**

**Ejected material/disintegration**

114 **You should take adequate measures to control the risks from 'kickback'.**

115 **Where a demountable power feed device or machine integrated power feed is used, the size and rating of the power feed should be sufficient to overcome the forces of kickback.**

116 **The guarding at the machine should provide a sufficient degree of protection in the event of the cutter or tool disintegrating or the cutter being ejected.**

**ACOP 12**

117 **Risk of break-up should be minimised by the use of proprietary tools which should be maintained in good and sound condition.**

**PUWER 98**

118 Although many of the hazards set out in regulation 12(3) are relevant to woodworking, the only two which fall within the scope of this ACOP are:

- (a) material being ejected; and
- (b) disintegration.

119 Kickback is common and is dangerous on hand-fed machines, especially circular saws, vertical spindle moulding machines and planing machines. Selection of the appropriate measure(s) to either prevent or control the risk depends on the machine and the process being carried out. For the common machines these are set out in paragraphs 120-122.

120 Ejection, which can result from 'kickback', occurs when the tool bites into the wood. This causes the wood to be forcibly thrown out of the machine - often in the direction of the operator.

121 Protection devices, such as clamps that are used to control the effects of kickback, can be manual or power-operated and can take a number of forms. Power-operated clamps normally use hydraulic or pneumatic cylinders with suitable attachments.

**Guidance 12**

122 Protection appliances include feed rollers, belts, spring-loaded pressure pads, drive wheels, jigs, holders etc. They may be used individually or in combination.

**PUWER 98**

123 **At circular saw benches, the risk of kickback of the workpiece should be reduced by the provision and use of a properly designed and well-adjusted riving knife.**

124 **The riving knife should:**

- (a) **be securely fixed below the machine table;**
- (b) **be positioned directly behind and in line with the saw blade;**
- (c) **be shaped so that the inner edge of the riving knife follows as closely as practicable the contours of the largest saw blade that is designed to be used on the machine;**
- (d) **be strong and rigid;**
- (e) **have sides with smooth flat surfaces;**
- (f) **be kept adjusted so that it is as close as practicable to the saw blade and in particular is within 8 mm from the blade at table level;**
- (g) **be kept adjusted so the vertical distance between the top of the riving knife and the top of the blade is no more than 25 mm (except for saw blades that are more than 600 mm in diameter in which case the**

**ACOP 12**

**PUWER 98**

- extension should be to a height of at least 225 mm above the machine table);
- (h) in the case of a parallel plate saw, be thicker than the plate of the saw blade.

125 For vertical spindle moulding machines, when carrying out straight work, a demountable power feed device should be used wherever and whenever possible. When the use of such a device is not possible, for example, when carrying out stopped work or curved work, a properly designed and well-made workpiece holder or jig should be used which will enable the operator to hold or control the workpiece firmly at a safe distance from the tool.

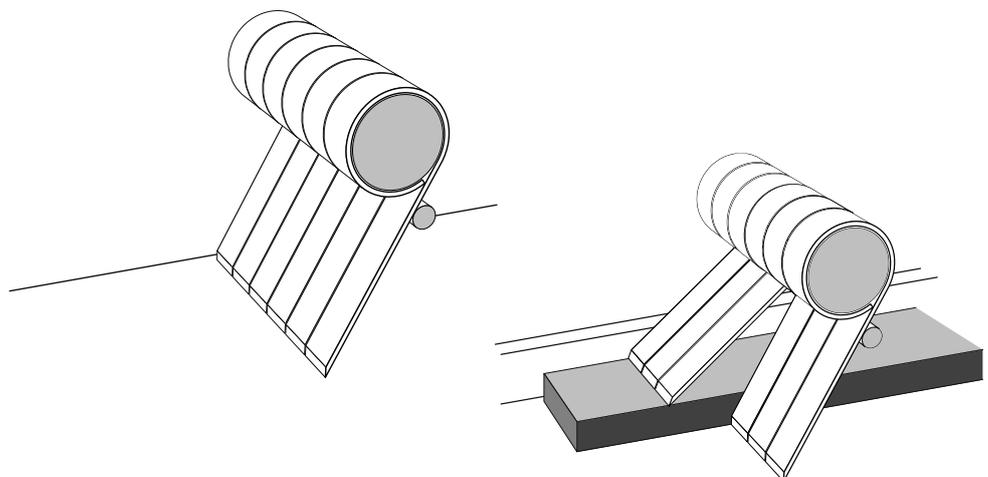
126 When carrying out 'stopped' work (which involves the workpiece being 'dropped on' to the tool, part way along its length), 'stops' should be fitted at each end of the cutting run and the workpiece held in a holder or jig described in paragraph 122.\* Particular attention should be paid where the workpiece is fed in the same direction as the rotating tool.

\* Also see Figure 5.

127 Additional protection devices such as spring-loaded guards, known as 'Shaw Guards' should be used in conjunction with a power feed where this will provide an enhanced level of safety.

128 Sectional feed rollers, designed and constructed so as to restrain any workpiece ejected towards the infeed end of the machine, should be used for planing machines used for thickening. They should also be used for thickening machines when processing more than one piece at a time.

129 When multi-rip sawing machines and straight-line edging machines process more than one workpiece at a time, then anti-kickback fingers should be used to restrain any workpiece which is ejected towards the in-feed end of the machine.



**Figure 7** Anti-kickback fingers

**ACOP 12**

PUWER 98

## Regulation 15 Stop controls

(1) Every employer shall ensure that, where appropriate, work equipment is provided with one or more readily accessible controls the operation of which will bring the work equipment to a safe condition in a safe manner.

(2) Any control required by paragraph (1) shall bring the work equipment to a complete stop where necessary for reasons of health and safety.

(3) Any control required by paragraph (1) shall, if necessary for reasons of health and safety, switch off all sources of energy after stopping the functioning of the work equipment.

(4) Any control required by paragraph (1) shall operate in priority to any control which starts or changes the operating conditions of the work equipment.

Regulation 15

PUWER 98

### Braking devices

130 Woodworking tools run at very high speeds. Sometimes workers approach the tools forgetting that they are running down. Sometimes, because of the stroboscopic effect of the tools, workers believe that they have come to rest when they have not. Operators can also switch off the power to the tools and leave the machine to run down unattended. All of these possibilities put workers at risk.

Guidance 15

PUWER 98

131 **You should fit braking devices to reduce the rundown time of cutting tools on woodworking machinery where the risk assessment shows that this is necessary. They are considered necessary for the following machines: circular saw benches; dimension saws; powered and hand-fed cross-cut saws (unless there is no risk of contact with the blade during rundown); single-end and double-end tenoning machines; combined machines incorporating a circular saw and/or tenoning attachment; narrow band saws; re-saws; vertical spindle moulding machines (unless fitted with a manual or foot-operated brake); hand-fed routing machines; thicknessing machines; planing/thicknessing machines; surface planing machines.**

132 **Where they have been identified as necessary, braking devices should be fitted as soon as possible. In the case of circular saw benches, dimension saws, powered and hand-fed cross-cut saws (unless there is no risk of contact with the blade during rundown), single-end and double-end tenoning machines and combined machines incorporating a circular saw and/or tenoning attachment this work should be completed no later than 5 December 2003. For narrow band saws, re-saws, vertical spindle moulding machines (unless fitted with a manual or foot-operated brake), hand-fed routing machines, thicknessing machines, planing/thicknessing machines and surface planing machines the work should be completed no later than 5 December 2005. For all other machines the work should be completed no later than 5 December 2008.**

133 **Braking devices are not considered necessary when:**

- (a) machines have a rundown time of 10 seconds or less;
- (b) the effect of braking could be detrimental to the integrity of the machinery;
- (c) machines have been built in conformity with a harmonised European standard (and a reference to the standard has been published in the Official Journal of the European Communities), where the standard does not require braking devices.

ACOP 15

**PUWER 98**

134 New CEN Standards will mean that most types of new woodworking machines will be equipped with an automatic brake for the tool spindle or spindles. This will reduce rundown times on most machines to less than 10 seconds (although the Standards also allow stopping time of up to 35 seconds for some larger machines).

135 Further guidance will also be provided in *PUWER 98: Retrofitting of braking to woodworking machines*<sup>7</sup> where braking devices are not considered necessary for large machines with integrated feed. This applies particularly to those with large spindles/large diameter tools or pulleys/wheels, which are not designed to withstand the forces caused by such a braking device.

**Guidance 15**

**PUWER 98**

**Regulation 20 Stability**

**Regulation 20**

*Every employer shall ensure that work equipment or any part of work equipment is stabilised by clamping or otherwise where necessary for purposes of health or safety.*

**PUWER 98**

136 Because of the way most woodworking machines work, there is a risk of the machine moving unintentionally along the floor (or bench). For this reason and to minimise the risk from noise and vibration, all machines, other than portable machines, should be secured in place. This is most effectively done by fastening to the floor, bench or similar fixture.

137 Some machines, eg vertical panel saws, single-sided track-fed tenoning machines and narrow band saws can often be inherently unstable. Special steps need to be taken to ensure stability during operation.

**Guidance 20**

**PUWER 98**

**Regulation 23 Markings**

**Regulation 23**

*Every employer shall ensure that work equipment is marked in a clearly visible manner with any marking appropriate for reasons of health and safety.*

**PUWER 98**

**Tools for use at woodworking machines**

138 **The safe working speed should, where possible, be displayed or marked on the machine.**

139 **The safe working speed should, where possible, be displayed or marked on the tool. Where this is not possible, a table should be available to those who select and/or use the tools showing the speed range of the tools.**

**Circular sawing machines**

140 **The diameter of the smallest saw blade that should be used should be marked on every circular sawing machine.**

**ACOP 23**

**PUWER 98  
Guidance 23**

141 These markings are necessary to ensure that the risks that might arise from too low a peripheral blade speed are controlled.

PUWER 98

## Regulation 24 Warnings

(1) Every employer shall ensure that work equipment incorporates any warnings or warning devices which are appropriate for reasons of health and safety.

(2) Without prejudice to the generality of paragraph (1), warnings given by warning devices on work equipment shall not be appropriate unless they are unambiguous, easily perceived and easily understood.

Regulation 24

PUWER 98

## Planing machines

142 **If a combined surface planing and thicknessing machine is used for thicknessing and the machine does not have sectional feed rollers or another device to prevent kickback/ejection then a notice should be displayed, stating that only one workpiece at a time shall be fed into the machine. Similar precautions should be adopted if a surface planing machine fitted with a demountable thicknessing device is used for thicknessing and the machine does not have sectional feed rollers etc.**

ACOP 24

PUWER 98

## Regulation 38 Repeal of enactment

Section 19 of the Offices, Shops and Railway Premises Act 1963<sup>(a)</sup> is repealed.

Regulation 38

(a) 1963 c.41.

PUWER 98

## Regulation 39 Revocation of instruments

The instruments specified in column 1 of Schedule 4 are revoked to the extent specified in column 3 of that Schedule.

Regulation 39

PUWER 98

## Schedule 4 Revocation of instruments

### Regulation 39

(1) <i>Title</i>	(2) <i>Reference</i>	(3) <i>Extent of revocation</i>
The Operations at Unfenced Machinery (Amended Schedule) Regulations 1946	SR & O 1946/156	The whole Regulations
The Agriculture (Circular Saws) Regulations 1959	SI 1959/427	The whole Regulations
The Prescribed Dangerous Machines Order 1964	SI 1964/971	The whole order
The Power Presses Regulations 1965	SI 1965/1441	The whole Regulations
The Abrasive Wheels Regulations 1970	SI 1970/535	The whole Regulations
The Power Presses (Amendment) Regulations 1972	SI 1972/1512	The whole Regulations
The Woodworking Machines Regulations 1974	SI 1974/903	The whole Regulations
The Operations at Unfenced Machinery (Amendment) Regulations 1976	SI 1976/955	The whole Regulations
The Factories (Standards of Lighting) (Revocation) Regulations 1978	SI 1978/1126	The whole Regulations
The Offshore Installations (Application of Statutory Instruments) Regulations 1984	SI 1984/419	The whole Regulations
The Offshore Installations (Operational Safety, Health and Welfare and Life-Saving Appliances) (Revocations) Regulations 1989	SI 1989/1672	The whole Regulations
The Provision and Use of Work Equipment Regulations 1992	SI 1992/2932	The whole Regulations
The Construction (Health, Safety and Welfare) Regulations 1996	SI 1996/1592	Regulation 27

Schedule 4

## Appendix 1 Training woodworking machinists

1 Without thorough and systematic training in safe working practices, both for those who work at woodworking machines and those who have the responsibility to supervise them, serious accidents will happen.

2 This appendix gives advice to employers and other interested people on how the legal requirements for training contained in the Provision and Use of Work Equipment Regulations 1998 (PUWER 98) can be fulfilled.

3 The advice applies to beginners, improvers and experienced woodworkers and can be used when taking on new staff and for assessing the training needs of existing employees/workers. Where there are special needs, for example in sheltered workshops for the mentally or physically handicapped, an assessment of the particular circumstances should be carried out.

4 People may work at a woodworking machine as part of their training, but they should be under the close supervision of someone who has a thorough knowledge and experience of safe working practices and safe operation of the machine (the supervisor must be thoroughly familiar with the points in paragraph 12 of this appendix). Passing on bad habits and short cuts to trainees creates the potential for yet more accidents.

### Young people

5 Young people are in a special position and warrant special consideration (see paragraphs 17 to 21 of the main text). Induction training is of particular importance for young people because of their relative immaturity and unfamiliarity with the working environment. They are often unwilling to ask questions, fearing to expose their own inexperience.

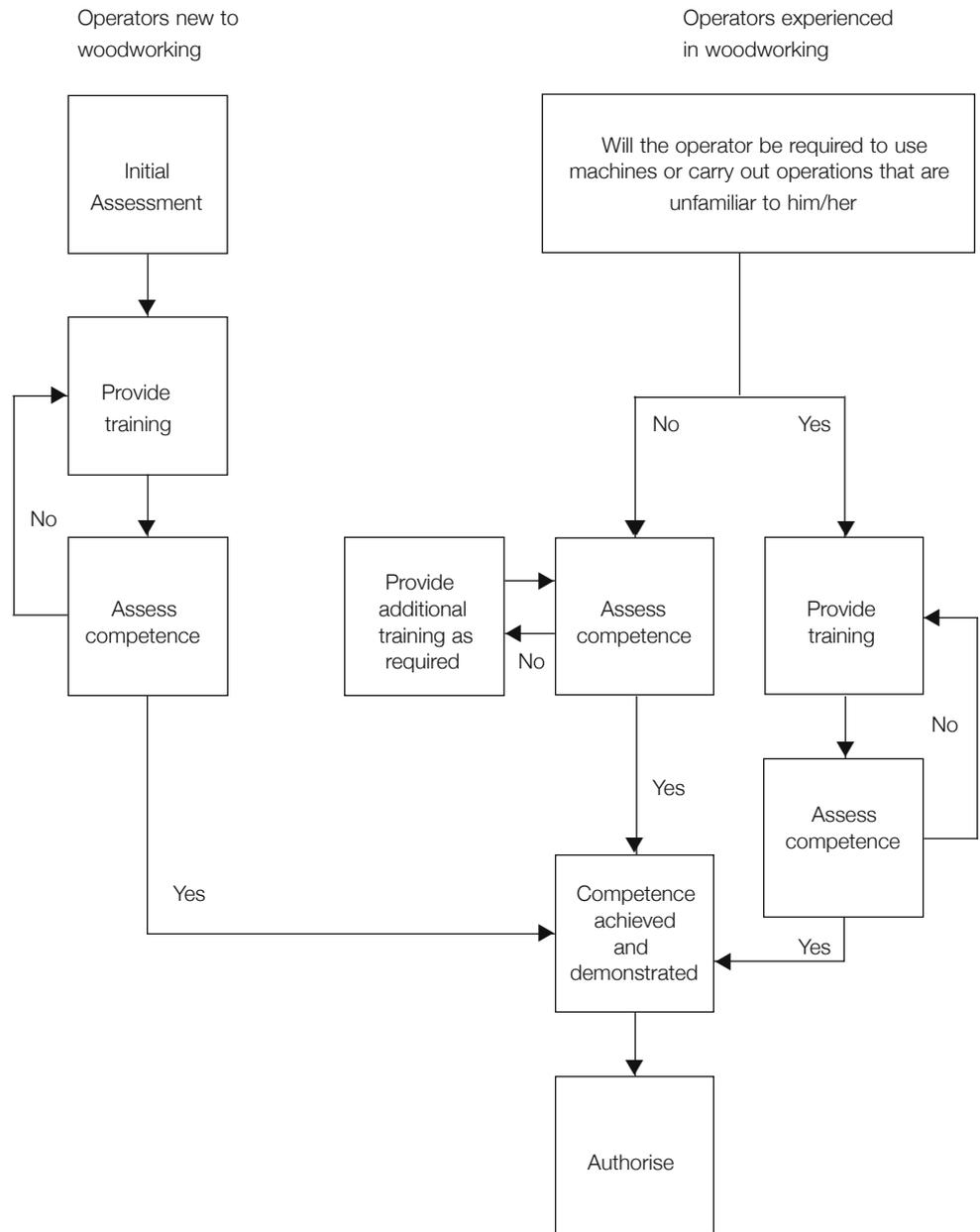
### Authorisation to operate woodworking machines

6 No one should be allowed to work at a woodworking machine unless they have demonstrated competence. This will often be based on an assessment carried out by a supervisor or trainer but it is advisable that competent operators are authorised in writing by a responsible person such as a partner, director or member of senior management.

7 Authorisation should not be given unless the responsible person is satisfied that the operator is sufficiently trained and has demonstrated competence, including the adoption of safe working practices (see Figure 8). The authorisation should list those machines and operations for which authorisation is given and it should be made clear to the operator that other machines should not be used until authorisation is given. A copy of the authorisation should be given to the operator for their personal record.

### Selection

8 The selection of supervisors and trainers is central to any successful training scheme. They must be competent in the operation of the machines on which training is to be given and they must be able to communicate easily and have the necessary technical understanding and knowledge of the legal requirements.



**Figure 8** Assessment and authorisation of machine operators

9 Potential machine operators should be selected with care. Those selected for training should be reliable and have the ability to do the job in a responsible manner. People with handicaps and disabilities may well be able to work safely at woodworking machines but in such cases medical advice should be obtained. This is available from the Employment Medical Advisory Service of the Health and Safety Executive, who can give guidelines on individual cases. The address of the local Employment Medical Adviser can be found in the telephone directory.

### **Assessment**

10 Assessment is carried out in two stages, firstly to identify the training needs of the individual and secondly to measure the success of the training that has been given.

11 An initial assessment should be carried out for all:

- (a) people changing jobs within the company; and
- (b) new employees or those new to wood machining.

12 Existing staff who use woodworking machines should not be overlooked although identifying the training needs of experienced employees can pose particular problems. Assessment should test competence in the following areas, all of which are essential to safe working:

- (a) machine selection: the ability to say 'this is the wrong machine for this operation. It could be done more safely on . . .';
- (b) purpose and adjustment of guards and safeguards;
- (c) knowledge of those operations prohibited on that machine without additional safeguards;
- (d) selection and use of safety devices such as push-sticks, jigs, holders etc;
- (e) practical understanding of the legal requirements. For example the function and setting of the riving knife on a circular bench saw, the adjustment of the top guard on a circular saw or the bridge guard on a surface planing machine. The appropriate use of guards, stops and jigs on a spindle moulder;
- (f) safe working practices including feeding, setting, cleaning, taking off and proper work support;
- (g) the nature of wood and the hazards this produces, including kickback, snatching and hazard to health from wood dust.

13 It is advisable to make and keep a written record of all assessments. The person carrying out the assessment should be familiar not only with the machining processes but also with the relevant legal requirements and safe working practices.

### **Supervision**

14 It is difficult to define precisely what represents an adequate level of supervision as it will vary throughout the training process. Initially, supervision should be continuous and on a one-to-one basis, with gradual relaxation as the trainee becomes more competent. As each new operation or training element is introduced, the level of supervision will need to rise again, reducing gradually to a more general level only when the trainee has demonstrated competence by consistent adoption of safe working practices.

## **Training**

15 Training may take a number of forms: external, in-house or a combination of both. In all cases an achievement record should be maintained and periodically reviewed for each operator. An example of a suitable format for a training record is given in Appendix 2.

### **External courses**

16 Care should be taken to ensure that the class of machine and type of work which the operator is expected to do has been covered by the course. It is very important to establish that training has been received over the full range of work to be carried out. For example some training modules on the vertical spindle moulding machine include only straight work; stopped work and curved work require additional skills and further training will be needed.

### **In-house training**

17 This should consist of three elements:

- (a) General. The basic skills and knowledge common to all woodworking machines. This will include aspects of 'good housekeeping' and awareness of danger appropriate to someone 'taking-off', plus a knowledge of the relevant legislation.
- (b) Machine specific. The basic skill in the operation of the machine, including the position and function of emergency stops; basic safety rules related to the operation of a machine or class of machines; the use and adjustment of guards and safety devices.
- (c) Familiarisation. On-the-job operation under close supervision.

18 Guidance on the establishment of an in-house training scheme is given in Appendix 3. Its purpose is to lay down guidelines for development of training schemes and to aid assessment on whether the legal requirements have been met (see Figure 10 in Appendix 3).

19 The various stages of training may be combined or integrated. Where the general and machine-specific training is given externally at a college or training centre, it is important that familiarisation is carried out in the workplace under close supervision.

20 If in-house training is carried out in conjunction with an external course, then the standard of supervision should be the same as for familiarisation training.

21 Many training providers accredited by training bodies such as the City and Guilds Institute and the Construction Industry Training Board are able to design and deliver training programmes tailored to the needs of a particular company. Training can take place at a college of further education or within the workshop environment. In the latter case, there is the advantage that the training can be related to the machine models and individual processes in use within the organisation. However, production needs must never be allowed to prejudice the quality of the training given or the level of supervision provided.

### **Refresher training**

22 Refresher training is appropriate for trained and experienced operators of woodworking machines and is particularly important if they have not operated a particular class of machine for some time or if the method of control or operation of the machine have been significantly changed, for example NC and CNC machines.

## Appendix 2 Examples of training records

### Example of employer's record: Sheet 1 - List of authorised machine operators

The authorised trainer of \_\_\_\_\_ is \_\_\_\_\_  
(the company) (name of trainer)

Date \_\_\_\_\_

I certify that:

- (a) I have carried out training, as indicated on the machines listed.
- (b) I am satisfied that the people named below have demonstrated competence in the operation of the machines listed and have met all the training objectives for those machines, including:
  - (i) correct selection of machine for type of work to be done;
  - (ii) purpose and adjustment of guards and safeguards;
  - (iii) correct selection and use of safety devices - push-sticks, push spike, jigs and work-holders;
  - (iv) practical understanding and application of legal requirements;
  - (v) safe working practices to include feeding, setting, cleaning and taking off.

Signed \_\_\_\_\_ (Trainer)

Operator's name	Machine											
	Circular saw	Cross-cut saw	Dimension saw	Surface planing machine	Thickness planing machine	Single-ended tenoner	Spindle moulder	High-speed tenoner	Four-sided planer/moulder	Narrow band saw	Band re-saw	etc
J Brown	✓	✓	✓	✓	✓	✓						
D Smith	✓	✓	✓	✓	✓					✓		
C White	✓	✓										

**Example of employer's record: Sheet 2 - List of authorised operators for a specific machine**

**Machine/Class of machine**

List of people authorised to use \_\_\_\_\_ machine

Name	Date of birth	Assessment of competence by:		Range of work authorised	Training course(s) or module(s) completed: title and date	Any special conditions of use	Authorised Director/ Senior manager
		Supervisor's name	Date				

**Example of employer's record: Sheet 3 - Individual machine operator's record of training and authorisation**

**Record of training and authorisation**

Name \_\_\_\_\_ Date of birth \_\_\_\_\_ Address \_\_\_\_\_

Machinist's signature \_\_\_\_\_ Date \_\_\_\_\_

Machine or machine class	Assessment of competence by:		Range of work authorised	Training courses or modules completed: title and date	Any special conditions of use	Authorised by Director/ Senior manager
	Authorised trainer and organisation	Date				

## Appendix 3 Suggested in-house training specification

1 The purpose of this guidance is to enable employers to set up their own in-house training scheme and to satisfy themselves and others that their legal duties have been met.

2 The scheme need not necessarily be complex or sophisticated, but must always contain the following essential elements:

- (a) who the programme is designed for;
- (b) what tasks they should be able to perform safely on completion of the programme, eg:
  - (i) taking off from an 'x' machine;
  - (ii) operation of the 'y' machine (including specific listed operations);
  - (iii) setting of the 'z' machine;
- (c) who is responsible for carrying out the training (and also for the overall supervision if more than one trainer is involved);
- (d) the means by which the training will be given and how it is to be verified (method of assessment); and
- (e) details of the procedure to be adopted if the assessment shows that the trainee has not achieved a satisfactory level of competence, eg specify further training, different training, review of trainee's suitability.

3 Devising training material is a time-consuming and specialised job. Most employers will start by reviewing the material available, which can be used with or without amendments. For many traditional woodworking machines, the employer's task will be to select a suitable training package, amend or extend it as required, appoint someone to carry out training and assessment and arrange for record keeping.

4 Some questions will always need to be answered at the planning stage eg:

(a) Classes of machine to be covered

---

(b) Level of work: taking off

---

operating

---

setting

---

(c) People involved: Trainees *age*

---

*previous experience*

---

Trainers *should have craft experience*

---

*should be trained as trainers*

---

*should be thoroughly familiar with the matters specified in regulation 9*

---

5 The decision will have to be made whether to bring in an experienced trainer from outside the company, such as a college of further education or a training consultant.

**Figure 9** Examples of essential elements to be included in training specification

EXPLAIN DANGERS	MACHINE	TOOL	contact with tool ejection of tool or part of tool	
		DRIVE	(eg v-belt drive to tool spindles)	
		FEED	(eg trap between feed roller and workpiece)	
		CLAMPING	(eg trap between power clamp and workpiece)	
	WORKPIECE	KICKBACK	leading to - contact with tool - forcible ejection of workpiece	
		INSTABILITY	due to poor stacking, handling, work support	
	HEALTH	WOOD DUST	effect on lungs, nose, skin	
		NOISE	effect on hearing (noise-induced hearing loss)	
	EXPLAIN HOW TO REDUCE OR ELIMINATE DANGER BY:	GUARDS	Selection, fitting and adjustment of guards for all routine jobs. Modifications to standard guarding for non-routine jobs.	
		SAFETY DEVICES	Design and use of push-sticks, push-blocks, jigs/holding devices, false fences/stops. Purpose and adjustment of riving knife on circular saws.	
TOOLING		Use of tooling with limited cutter projection. Use of low noise tooling. Avoiding blunt tools. Securing of loose knives etc to prevent ejection. Danger of over-tightening when mounting cutters.		
WORKPIECE SUPPORT		Use of trestles, roller supports, extension tables. Assistance of second person. Angled cuts: use of canting tables, fences, tools. Use of jig or bed piece secured to table to achieve good work support.		
SAFE SYSTEMS OF WORK		Use of brake to reduce rundown of tool. Use of power feed. Safe method for carrying out trial cuts (ie all safety devices/guards in position). Company's agreed safe methods of work for all routine jobs. Refer to supervisor for non-routine work/fault condition. Importance of good housekeeping.		
GIVE ESSENTIAL BACKGROUND INFORMATION	NOISE	<ul style="list-style-type: none"> <li>- Action levels in Noise at Work Regulations</li> <li>- Symbols used to identify where hearing protection should be worn and duty of employees to wear hearing protection</li> <li>- Type of hearing protection available, selection, fitting and maintenance.</li> </ul>		
	DUST	<ul style="list-style-type: none"> <li>- Control of wood dust by extraction, use of vacuum cleaners, good housekeeping.</li> <li>- Purpose of explosion relief in dust collectors and correct siting of panels (to relieve freely to a safe place).</li> <li>- Situations where respiratory protective equipment (dust masks) is required, eg hand sanding.</li> <li>- Selection and fitting of dust masks to protect against wood dust (must be suitable for toxic dusts, ie to an appropriate BS or EN standard).</li> </ul>		

6 For some machines, little or no published material is available. Possible strategies in this case would be:

- (a) employ a training professional;
- (b) look at the nearest equivalent material and adapt it;
- (c) get help from the machine supplier;
- (d) use an instruction manual and adapt it for training; or
- (e) use published guidelines on writing training packages.

7 Whichever strategy is chosen, always check that you have covered all the essential elements. The trainee must be instructed in:

- (a) dangers arising in connection with that machine;
- (b) precautions to be observed;
- (c) requirements of the law;
- (d) methods of using guards, protection devices and appliances.

8 Assessment should be carried out at each stage. Elements (a) to (d) in paragraph 7 must be tested and retraining carried out as required.

9 Published material can be modified to suit your machines/processes, for example by giving details of:

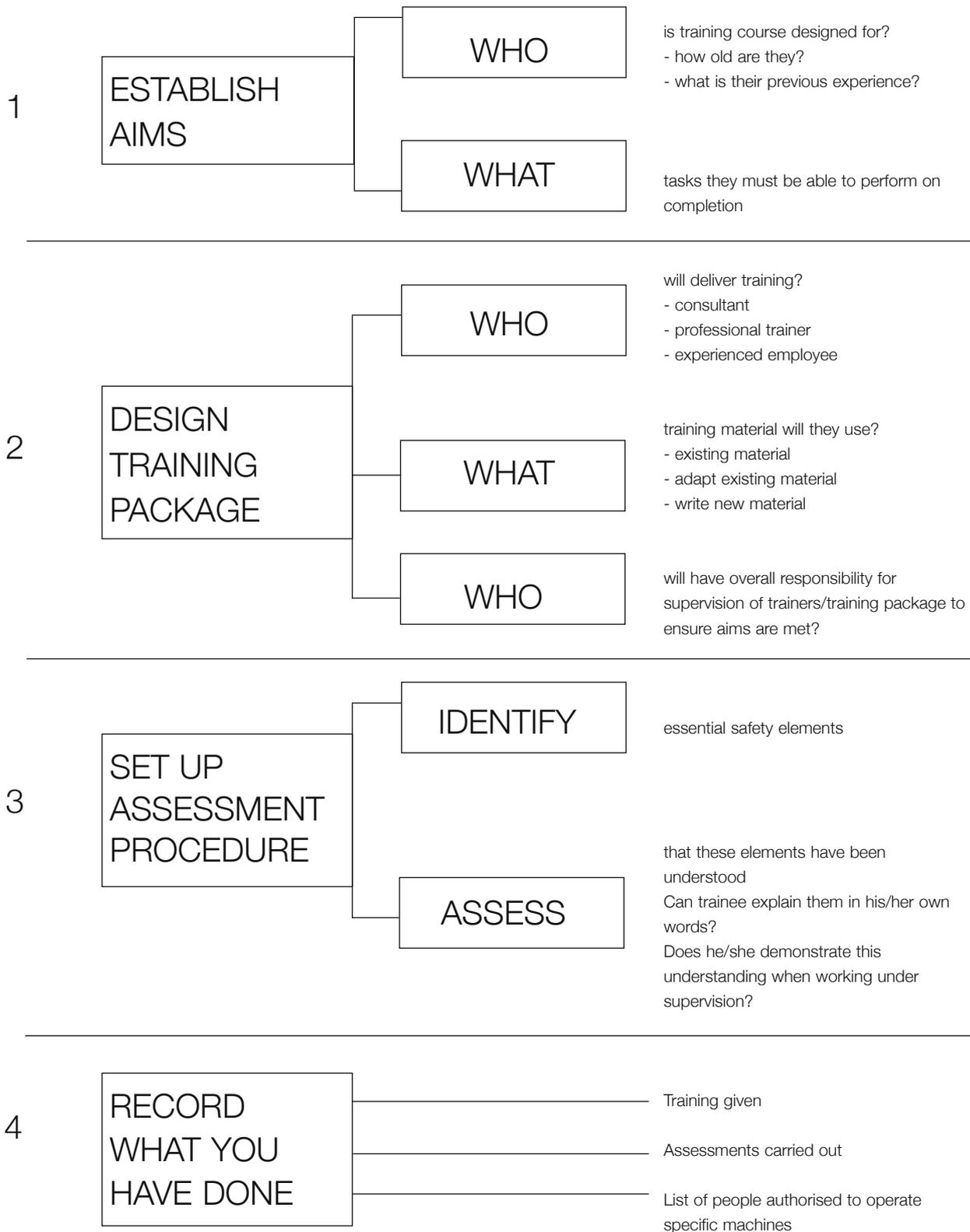
- (a) machine controls;
- (b) extraction equipment;
- (c) jigs for particular jobs (illustrate with photographs as necessary);
- (d) methods of handling/disposal of waste and off-cuts;
- (e) work support devices available;
- (f) tooling. Specify the tooling for the job, including limited cutter projection tooling for hand feeding where this is appropriate;
- (g) a demountable power feed. Show where and how this can be used; and
- (h) additional guards for special jobs. Show where these are stored.

10 All this material could be put together, for example in a loose-leaf binder, to provide a training package for a particular machine and the manual could be readily updated as required.

11 Such a manual is no substitute for training and supervision, but it could act as a useful source of reference to reinforce training received.

12 Finally, ask questions. Does the trainee have all the information necessary to do the job safely?

Figure 10 Developing an in-house training specification



## References

- 1 *Safe use of work equipment. Provision and use of Work Equipment Regulations 1998. Approved Code of Practice and guidance* L22 HSE Books 1998 ISBN 0 7176 1626 6
- 2 *Management of health and safety at work. Management of Health and Safety at Work Regulations 1999. Approved Code of Practice and guidance* (Second edition) L21 HSE Books 2000 ISBN 0 7176 2488 9
- 3 *5 steps to risk assessment: A step by step guide to a safer and healthier workplace* INDG163 (rev1) HSE Books 1998 (Available free for single copies and in priced packs of 10 on ISBN 0 7176 1565 0)
- 4 *Consulting employees on health and safety: A guide to the law* INDG232 HSE Books 1996 (Available free for single copies and in priced packs of 15 on ISBN 0 7176 1615 0)
- 5 *BS EN 847-1 Tools for woodworking - Safety requirements Part 1 Milling tools and circular saw blades*
- 6 *Supervising for safety in woodworking* TOP06 HSE Books 1994
- 7 *PUWER 98: Retrofitting of braking to woodworking machines* WIS 38 HSE Books 1998

## Further reading

*Essentials of health and safety at work* HSE Books 1994 ISBN 0 7176 0716 X

*Workplace health, safety and welfare. Workplace (Health, Safety and Welfare) Regulations 1992. Approved Code of Practice and guidance L24* HSE Books 1992 ISBN 0 7176 0413 6

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- WIS37 *PUWER 98: Selection of tooling for use with hand-fed woodworking machines*
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