

Directorate of Education and Leisure Services

**DESIGN & TECHNOLOGY
METAL WORKING**

CODE OF PRACTICE NO 6

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CONTENTS

SECTION	TOPIC	PAGE NO.
1	Introduction	1
2	Risk Assessment	1
3	Class Management	1
4	Hazards and Machinery Defects	4
5	First Aid	4
6	Electric Shock	4
7	Reporting Incidents/Accidents	4
8	Emergency Procedures	4
9	Control of Substances Hazardous to Health	5
10	Provision and Use of Work Equipment Regulations	7
11	Machine Guarding	7
12	Safety Notices	8
13	Personal Protective Equipment	8
14	Purchase of New or Second-hand Equipment	9
15	Modification of Equipment	9
16	Monitoring of Workshop Environment	10
17	Metal Working Machines	10
18	Centre Lathe	12
19	Drilling Machines	12
20	Fly Press	13
21	Grinding – Polishing Machines	13
22	Polishing Machine	14
23	Milling Machine	14
24	Off-hand Grinding Machine and Abrasive Wheels	15
25	Power Hacksaw	16
26	Shaping Machine	16
27	Surface Grinding Machine	17
28	Hand-Operated Bench Shears	17
29	Portable Electric Power Tools	17
30	Hand Tools	18
31	Flammable Liquids	18
32	Safety Signs	18
33	Manual Handling	19
34	Noise	20
35	Distribution of Code of Practice	21
36	Reviewing and Updating the Code	21
Appendix 1	Risk Assessment Form	
Appendix 2	Health Surveillance	
Appendix 3	Examples of Safety Signs	
Appendix 4	Abbreviations and Useful Contacts	
Appendix 5	Definition of Terms Used in this Code	
Appendix 6	Bibliography	

**HEALTH AND SAFETY CODE OF PRACTICE
DESIGN AND TECHNOLOGY
RESISTANT MATERIALS AND MACHINERY - METAL**

1. INTRODUCTION

This Code of Practice is one of a series covering Design and Technology and should be read in conjunction with the School Risk Assessment Manual and the Directorate of Education and Leisure Services' Health and Safety Policy

Heads of LEA establishments, where appropriate through heads of department, teachers, instructors and other ancillary staff, have a responsibility to co-operate with the Council in implementing this Code.

Governing Bodies have a duty to ensure that health and safety policies and directives are observed.

Design and Technology facilities in schools are for educational purposes and should not be used for other activities such as repairs or maintenance of property which would clearly be the responsibility of others.

The head of establishment should ensure that such things as emergency stop buttons and shut down facilities, the control of electrical supplies, the guarding of machinery, dust extraction, storage of highly flammables, etc. are all kept continuously under review.

2. RISK ASSESSMENT

Under the Management of Health and Safety at Work Regulations 1999 it is necessary to carry out a suitable and sufficient risk assessment to identify the measures necessary to comply with appropriate health and safety standards (see also Section 9 for risk assessments required under COSHH.)

This Code of Practice was drawn up on the basis of the main hazards identified in the model risk assessment of the risks in working with metal. It indicates the main hazards and the "protective and preventive" measures necessary. However, the risk assessment must also take account of the local circumstances. It is therefore necessary for the person responsible for the relevant area (e.g. head of design and technology) to consider the work in their department in relation to the model risk assessment and the Code. Where the model risk assessment and the Code totally covers all the work activities and hazards/risks associated with them, and the "protective and preventive" measures are followed and adequately control all the risks, then it is a simple matter of ticking the relevant boxes and signing the model risk assessment. However, there may be hazards not covered by the model risk assessment or different "protective or preventive" methods may be in use. If this is the case it is necessary to indicate the details under the headings 'Hazard' and 'Additional or alternative local measures'.

3. CLASS MANAGEMENT

3.1 Class Size

For safety, the pupil: teacher ratio in a practical class should not normally exceed 20:1. If this is to be exceeded, the head of department should carry out an assessment of the

additional risk. Many factors need to be considered, e.g. size of room, room layout, and work being carried out, the nature and maturity of the class and pupils with special needs. The results of the risk assessment should be reported in writing to the headteacher. There may be some circumstances where an assessment of the risk indicates a ratio of less than 20:1 is necessary (e.g. room size, layout). Again the matter should be raised with the headteacher.

3.2 Supervision

Practical classes should be closely supervised by a qualified specialist teacher or instructor. It is not acceptable for a technician to supervise a practical class on his/her own.

Certain equipment must not be used by pupils (see Sections 17 to 29 for details). Senior pupils may use some equipment (indicated in the relevant equipment section). Senior pupils would normally mean Year 10 and above.

All processes need class or group demonstration prior to starting. Some processes (lathes, jigsaws) should generally be observed under close supervision for the first 5-10 minutes.

3.3 Competence

Teachers, instructors (including teaching assistants) and technicians, employed by the Council for the purpose of providing a design and technology education programme are the only personnel permitted to use materials, machines and equipment provided for that purpose; such teachers and instructors are the only persons who can give pupils permission to use the facilities as part of their design and technology programme. No other persons may use materials, machines or equipment unless under the direct supervision of the relevant specialist design and technology teacher or instructor.

Certificates of Competence

A specialist **teacher or instructor** must have been specifically trained to use the equipment under his/her control.

A new system of accrediting standards for health and safety training in design and technology is being introduced. These standards are compatible with BS 4163 (2000) and have been written in consultation with the National Advisers and Inspectors in Design and Technology (NAAIDT), and other professional groups. These standards will replace the current NAAIDT awards for specific equipment (which will gradually be phased out) and will formally begin for initial teacher training in September 2000.

All teachers of design and technology will need to have the Secondary Core in Design and Technology (SCHS). In addition, for their specialist areas (i.e. resistant materials) they must have at least one of the following:

- Secondary Food Technology (includes Basic Food Hygiene Certificate) (SFHS);
- **Secondary Resistant Materials (includes circular saw and band saw (S1HS) and Centre Lathe for metal cutting (S2HS)) (SMHS);**
- Secondary Systems and Control (SSHS);
- Secondary Textile Technology (STHS).

Teachers without the SCHS and SMHS cannot obtain the specialist modules for resistant materials. S1HS and S2HS are part of SMHS although they are separately registered on the certificate:

- Circular Saw and Band Saw S1HS
- Centre Lathe for metal cutting S2HS
- Casting non-ferrous metals S3HS
- Electric arc welding S4HS
- Oxy-acetylene welding and cutting S5HS
- Milling machines and machining centre S6HS
- Wood turning lathe S7HS
- Planer/thicknesser machine S8HS

For more information on these awards schools should contact The Design and Technology Association (DATA), Tel. 01789 470007.

Authorisation

Machinery and tools may only be used by staff who have been authorised to use it by the head of design and technology and have an appropriate qualification/training.

New employees

New members of staff should hold a recognised certificate (see above) and should be able to demonstrate that they have had sufficient practical experience within the last five years (i.e. practical work was a significant part of their work or training). Where the machines to be used are different to those the employee has used before, the head of department should arrange for familiarisation training to be provided.

The following employees / trainees will require supervision by a member of staff who holds a recognised certificate:

- Those who do not hold a recognised certificate, until completion of a recognised course (within one year).
- Those who hold a certificate but have limited practical experience, until the head of department is satisfied that they have achieved an acceptable level of competence.
- Student teachers.

Refresher Training

Refresher courses should be taken where it is considered that the employees competence may have declined (e.g. if they have not had the opportunity to practice their skills for several years, or following a serious incident). 'Under the new accreditation scheme for design and technology, refresher training will be required every 5 years'.

Training Records

Written training records should be kept so that heads of department can monitor training needs and identify when refresher training is necessary. A record of training given should also be kept on each individual employee's personal file.

4. HAZARDS AND MACHINERY DEFECTS

It is the responsibility of everyone in the workshop to inform the teacher or instructor in-charge of any hazards, e.g. defects to machinery, equipment or protective equipment, so that appropriate action can be taken.

If the teacher or instructor in-charge considers a defect to be a significant threat to health and safety the machine or equipment must be put out of action until the defect has been remedied and/or the head of department agrees it is safe to be used. The machine or equipment should be taken out of use by such methods as isolation of electrical supplies and withdrawal of fuses, and a notice must be hung on the machine and/or electrical isolator indicating that the machine is faulty and must not be operated. The notice should comply with the Health and Safety (Safety Signs and Signals) Regulations 1996 (see Section 28), although in the absence of a suitable notice a hand written one is preferable to none.

5. FIRST AID

Workshops should be provided with a well-stocked first aid kit which is clearly marked with a sign which meets the Health and Safety (Safety Signs and Signals) Regulations (i.e. white cross on a green background).

Soap, water and disposable drying materials should be provided for first aid purposes. Where soap and water are not available, individually wrapped moist cleansing wipes may be used.

Where tap water is not readily available for eye irrigation, sterile water or sterile normal saline in sealed disposable containers must be provided.

6. ELECTRIC SHOCK

All teachers must be aware of the action to be taken in the event of an accident caused by electric shock. Where there is a greater possibility of an electric shock a poster/placard showing steps to be taken in the case of an electric shock should be displayed.

7. REPORTING INCIDENTS/ACCIDENTS

All incidents to both staff and pupils must be reported using the incident/accident report form (INC1). In addition, certain incidents must be reported to the Health and Safety Executive (HSE). Further information can be found at the front of the Council's Incident/Accident Book and in Code of Practice no. 3 "Health and Safety in Secondary Schools".

8. EMERGENCY PROCEDURES

Heads of department are responsible for preparing written emergency procedures for activities where there is a risk of serious and imminent danger to employees and/or pupils (required by the Management of Health and Safety at Work Regulations 1999). The procedures should take into account the need to activate electrical and gas shut-off devices in an emergency and to evacuate to a place of safety. Where employees are allocated specific tasks to perform in an emergency their role should be detailed and they should be suitably trained.

A notice detailing action to be taken in the event of an emergency should be displayed (preferably near the door) in each workshop.

Emergency shut-off devices should be readily accessible at all times and they should be tested monthly. They should be clearly visible and identifiable, or be identified by a safety sign which complies with the Health and Safety (Safety Signs and Signals) Regulations 1996 (see Section 32).

9. CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH

9.1 General

The Control of Substances Hazardous to Health (COSHH) Regulations are concerned with protecting people from hazardous substances. They require employers to carry out a risk assessment, and on the basis of the risk assessment to prevent exposure or, if that is not possible, to control exposure to hazardous substances. The Regulations also require that any control measures are used and maintained, and that monitoring and health surveillance is introduced if necessary.

The risk assessments below are general assessments which have been based on school activities. To ensure they are valid in a particular workshop it is necessary for the person responsible for the area (e.g. head of design and technology) to consider the assessment in relation to the local circumstances. In Appendix 1 there is a form for the head of department to sign and indicate any local variations.

Certain substances have been assigned exposure limits by the Health and Safety Commission (HSC). The limits are based on average exposure over an eight hour day (long term limits) or, in some cases, over 15 minutes (short term limits). There are two types of exposure limit which may be set:

1. Maximum Exposure Limit (MEL): It is an offence to exceed a MEL. In addition exposure to a substance with a MEL must be reduced as far as is reasonably practicable.
2. Occupational Exposure Standard (OES): Where an OES has been prescribed it is acceptable to control exposure to that standard or below.

9.2 Grinding Dust

Risk Assessment: Abrasive materials from wheels and fine particles of ground materials can be irritating to the skin and respiratory system. The OES for dust is $10\text{mg}/\text{m}^3$ (averaged over an 8 hour day). This level will not be exceeded during normal grinding operations. Where a grinding wheel contains abnormally hazardous ingredients it will be marked accordingly. In this case further advice should be sought.

Control Measures: Respiratory irritation due to grinding dust is unlikely, as dust concentration will be low.

Dust on surrounding surfaces created by hand or machine processes should be removed, where possible using a suitable vacuum cleaner.

9.3 Lubricating Oils, Greases

Risk Assessment: Neat oil and grease can cause oil acne (irritation of hair follicles) in some individuals. Unrefined or mildly refined mineral oils are a potential cause of skin cancer.

Control Measures: Unrefined and mildly refined mineral oils should not be used. Suitable alternatives are solvent refined or hydrotreated oils, or water based fluids. Personal hygiene is important in preventing skin disorders. Washing facilities with hot water and a mild cleanser should be available. (Strongly alkaline soaps, solvents and some waterless cleaners can harm the skin). The use of barrier cream is recommended. See also Appendix 2, Health Surveillance.

9.4 Coolants

Risk Assessment: Water based fluids can cause dermatitis.

Control Measures: Washing facilities with hot water and a mild cleanser should be readily available and employees and pupils should be encouraged to wash contaminated areas after each working period. The use of a barrier cream is recommended. See also Appendix 2, Health Surveillance.

Care should be taken when applying coolant with a brush.

Non carcinogenic coolant must be used.

9.5 Polyurethane Paints

Risk Assessment: Polyurethane paint contains white spirit which has an OES of 100 ppm averaged over an 8 hour day. In normal school workshop operations this level will not be reached.

This substance is an irritant and splashes to the eye will cause discomfort and possible damage. Prolonged skin contact may have an effect which can lead to irritation and dermatitis.

Control Measures: Ensure that ventilation is sufficient to control fumes. Where there is a risk of eye contact, eye protection (to EN 166F-3 or BS 2092-C) should be worn. Skin contact should be avoided.

9.6 Cellulose Thinners Based Sealers and Brush Cleaners

Risk Assessment: Contains Toluene. Inhalation of the vapour may cause dizziness, headaches or nausea. The vapour and liquid can irritate the eyes and mucous membranes. Prolonged skin contact may cause dermatitis or absorption through the skin. This substance is also highly flammable. (OES for toluene is 50 ppm (averaged over 8 hours, 150 ppm averaged over 15 minutes).

Control Measures: This substance should be substituted by a safer alternative (e.g. white spirit). Where its use cannot be avoided it should be used in small quantities in a well-ventilated area, away from sources of ignition. Suitable gloves (e.g. Nitrile) and eye protection (to EN 166F-3 or BS 2092 C) must be worn. Section 31 should be consulted regarding the storage of highly flammable substances.

10. PROVISION AND USE OF WORK EQUIPMENT REGULATIONS

The Provision and Use of Work Equipment Regulations 1998 (PUWER'98) lay down health and safety requirements to ensure the safe provision and use of all types of work equipment in all work places. It brings together requirements which previously existed in a variety of legislative forms relating to specific workplaces or pieces of work equipment (e.g. Factories Act, Woodworking Machines Regulations and Abrasive Wheels Regulations).

Broadly the requirements of PUWER'98 can be divided as follows:

1. General duties concerning the selection of suitable equipment, maintenance, information, instruction and training etc. apply to all work equipment.
2. Specific requirements relating to the control of specific hazards such as contact with dangerous parts, risk of fire and explosion etc. These specific standards apply to existing and new work equipment (including second-hand and hired or leased equipment).

The Woodworking Machines Regulations 1974 which were made under the Factories Act have now been completely revoked by PUWER'98. There is now an Approved Code of Practice (made under PUWER'98) Safe Use of Woodworking Machinery which lays down the standards.

In practice compliance with the standards set out in this Code of Practice should ensure that legislative standards are met. Where a work activity falls outside the scope of this Code it may be necessary to seek specialist advice.

11. MACHINE GUARDING

PUWER requires that measures be taken to prevent access to any dangerous parts of machinery (e.g. by the use of guards) or to stop the movement of dangerous parts before any part of a person enters the danger zone. Exposure to any of the following risks must also be prevented or where prevention is not reasonably practicable, adequately controlled:

- (a) Material falling or ejected from work equipment;
- (b) Rupture or disintegration of parts of work equipment;
- (c) Work equipment catching fire or overheating;
- (d) Premature discharge of any article, dust or gas, liquid or vapour;
- (e) Unintended explosions of work equipment or articles or substances associated with it.

In practice, provided the standards set out in this Code of Practice are followed, the above risks will be adequately controlled.

Dangerous parts of machinery including, for example, grinding wheels, circular saws etc., should be guarded to the appropriate standard (see Sections 17-28).

The electrical shut-down facilities local to the machine and for the workshop, e.g. stop button, isolator etc., must be visible, kept clear of obstructions and be in effective operation at all times machines are in use. Isolators must be labelled to identify the machines they serve and machines should be isolated when not in use or being adjusted.

12. SAFETY NOTICES

Safety notices, conforming to the Health and Safety (Safety Signs and Signals) Regulations 1996 (see Section 32) must be posted near to the following design and technology machines and equipment:

DTSN1 Millers, shapers, band saws, large lathes, melt furnaces, mortisers and welding equipment.

DTSN2 Drills, small and medium woodworking and metalworking lathes, polishers, power hacksaws, bench shears, brazing hearths and forges, fly presses.

DTSN3 (Eye protection notice) To be placed above signs DTSN1 and DTSN2 and near any other machinery where there is a risk of eye injury.

DTSN4 High speed and low speed (e.g. sharp edge) grinders, circular saws, surface planers and thicknessers.

These are illustrated in Appendix 3.

13. PERSONAL PROTECTIVE EQUIPMENT

Under the Personal Protective Equipment Regulations 1992 suitable personal protective equipment must be provided for employees and employees have a duty to wear it and report defects. In addition staff have a responsibility to protect the health and safety of pupils by ensuring they wear personal protective equipment where appropriate, and by setting a good example.

All persons involved in workshop activities must ensure that, prior to the activity commencing, loose clothing, ties, long hair etc., liable to become entangled in machines, is adequately secured; aprons, overalls or protective coats and gloves are worn where appropriate and rings, watches and loose jewellery are removed.

Any eye protector bearing the mark BS 2092 or EN 166 S indicates that it is suitable for general purpose use and conforms to British or European Standards.

The following additional markings indicate a higher degree of protection:

<u>EN 166 MARKING</u>	<u>PROTECTION</u>
EN 166 3	Liquids
EN 166 4	Large Dust Particles (>5µm)
EN 166 9	Molten Metals and hot solids
EN 166 349	all of the above categories

The above markings can also incorporate a designatory letter (e.g. EN 166 3-B) to indicate resistance to impacts.

- F Low energy impact
- B Medium energy impact

<u>BS 2092 MARKING</u>	<u>PROTECTION</u>
BS 2092-1	Impact grade 1 (highest impact protection)
BS 2092-2	Impact grade 2

-C	Chemical
-D	Dust
-M	Molten metal
-CDM	Chemical, Dust and Molten Metal

It is recommended that educational establishment workshops have sets of goggles (marked BS 2092-1-CDM or EN 166 349-B)) and some face shields (marked BS 2092-1 or EN 166B).

NB: Under the Personal Protective Equipment at Work Regulations new personal protective equipment is required to comply with European Standards and bear the EN mark. There is, however, no requirement to replace existing equipment if it already meets British Standards.

Dangers to the feet can arise from falling heavy objects, sharp tools and from spillages of hot or damaging liquids etc. Pupils should be encouraged to wear substantial footwear at all times in school workshops. The wearing of open-toed sandals or light shoes e.g. trainers should be discouraged since the wearing of such footwear may cause pupils to be excluded from carrying out specific activities.

Personal protective equipment must be:

- suitable for the intended use
- maintained in good condition
- correctly stored

Defects must be reported and defective equipment repaired or replaced promptly.

14. PURCHASE OF NEW OR SECOND-HAND EQUIPMENT

All new or second-hand equipment must comply with the specific requirements of PUWER (see Section 10 and the sections on individual machines). In addition new machinery must bear a CE mark to show that it conforms to European Safety Standards. Purchasers of new or second-hand machinery must ensure that it is suitable for the task taking into account:

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

Although equipment made for domestic use may bear a CE mark it may not be suitable for use in a school environment. If in doubt about the purchase of a piece of work equipment specialist advice should be sought.

15. MODIFICATION OF EQUIPMENT

Apart from very minor modifications which can be carried out without affecting the integral safety of the machine, modifications should normally be undertaken by a competent organisation or the manufacturer. However, it is recognised that in some circumstances a member of staff may have the required degree of competency. This must be approved by the head of department. The modification and reasons for it should be recorded in Appendix 1.

16. MONITORING OF WORKSHOP ENVIRONMENT

The person responsible for the workshop (e.g. head of design and technology) is responsible for ensuring monitoring systems as laid down in the Directorate of Education and Leisure Services' Health and Safety Policy are implemented in the design and technology area. It is a requirement of the Policy and this Code that the following monitoring procedures are carried out

1. Completion of an Annual Internal Monitoring Checklist for Design and Technology to confirm that management systems are in place and this Code is being followed (to be distributed by the Directorate of Education and Leisure Services during the Autumn term);
2. Completion of the Workshop Machinery Checklist by the head of department or an employee acting on his/her behalf, to confirm that machinery guarding and control mechanisms comply with the Codes of Practice (termly);
3. Termly inspections of the design and technology area by Bexley Council's Safety Monitoring Officer. The results of such inspections should be recorded and appropriate action taken where necessary.
4. Regular inspection, testing and lubrication of machinery and equipment should also be carried out in accordance with manufacturers' instructions. This may be carried out "in house", provided staff have sufficient practical knowledge and experience of the equipment and precautions necessary to control the risks; or establishments may wish to use the services of a specialist organisation for regular maintenance checks, (this is not a substitute for the Workshop Machinery Checklist). Some addresses of specialist organisations who may be able to provide such a service to schools are listed in Appendix 4.
5. Daily visual checks on machinery, equipment (prior to use) and the working environment, which is the responsibility of all staff.

Teachers, instructors and ancillary staff should ensure that the conditions required by the Workshop Machinery Checklist and this Code of Practice are met.

The effect of good housekeeping will be reflected in the achievement of safe working conditions, safe storage, efficient and economical use of resources, and the most favourable circumstances for enabling pupils to achieve their best standards of work.

All scrap and waste materials should be placed in the correct containers provided; the containers should be regularly reviewed and cleared if necessary.

The floor surrounding every machine must be maintained in a good condition, the surface kept free from accumulation of loose material and in a non-slip condition.

Where a coolant system is fitted to a machine care must be taken to ensure that the coolant does not soil the floor thus making the surface slippery. Any spilt oil should be removed immediately.

17. METAL WORKING MACHINES

The dangers associated with metal working machinery and equipment should not be under-estimated and no unauthorised person should be allowed to operate any machine or item of equipment.

Metal working machines must be provided with readily accessible emergency stop controls which are clearly visible and identifiable. Controls should not be placed in a position which would expose operators to risks to their health and safety.

The teacher, instructor or technician must be suitably qualified and should hold a recognised certificate of safety training e.g. NAAIDT.

Before being allowed to operate a machine pupils must be adequately instructed in its use and be conversant with its controls. Such instruction must be regularly reinforced. Pupils must only be allowed to operate a machine whilst under the supervision of a qualified specialist teacher or instructor.

A set of rules detailing matters of safety should be displayed in each workroom and their meaning and purpose explained to pupils.

The machine must be checked by the teacher to ensure that all guards are in position, together with appropriate safety devices and aids, the work is securely held and, where appropriate, the right cutting speed is selected before the pupil is allowed to use the machine. After use the machine's guards should be adjusted to the lowest practicable position, thus encouraging staff or pupils who use the machine next to correctly adjust the guard.

Appropriate clear space should be maintained within work areas and around machines to permit safe movement and retreat from any dangerous situation.

Only one pupil should be allowed to operate a machine at any time. Tools should not be left lying on a machine table; they should be properly and safely stored in a rack or a cupboard conveniently adjacent to the machine. Improvised tools, such as those made from files, must not be used.

Machines should be isolated (and it should be ensured that moving parts are stationary) and portable electrical equipment should be switched off **and unplugged** on each of the following occasions:

- When the machine is not in use, even if it is left unattended for only a few moments.
- Before guards are adjusted or re-adjusted.
- Before measuring or gauging is carried out.
- Before tools are adjusted or changed.
- Before removing chips or shavings.
- Before cleaning the machine.
- Before replacing belts.
- Before changing gear trains.
- Before servicing and maintenance operations.

For maintenance and major operational adjustments, e.g. changing belts, chucks, gears etc., the machine should be completely isolated from the electricity supply.

The power supply to the workshop should be isolated or access to the workshop prevented by locking doors, whenever the room is not occupied/supervised by the qualified teacher, instructor or technician. Following a risk assessment, post-16 students, considered to be responsible, may work in design and technology areas without direct supervision, provided they do not use the machinery. In these circumstances pupils should have access to a member of staff. If it is not possible to isolate the power (e.g. because of the need to use electrical equipment such as computers) there should be appropriate measures to prevent access and use of machinery by non-authorized persons.

All access covers must be secured by a tool operated locking device or other means, complying with BS 5304. A simple push button limit switch is not acceptable.

18. CENTRE LATHE

18.1 Competency

Staff using or supervising use of this machine must hold a NAAIDT certificate M4 or an equivalent qualification. (see Section 3.3).

18.2 Controls

The machine must be provided with a power isolator either on or adjacent to the machine and be controlled by a starter incorporating overload protection and no-volt release.

18.3 Guarding and Use

The pulley drive and gear must be **totally** guarded. A tool operated locking device must be provided to all access covers.

The spindle mandrel should be guarded and the machine should be fitted with a suitable chuck guard. A stock bar projecting beyond the headstock must be completely guarded throughout its length.

A spring-loaded chuck key is preferable. Swarf must not be removed by hand; a long handled swarf remover must be used. Precautions should be taken to prevent long lengths of swarf developing.

If there is a risk of injury to the eyes (e.g. if work protrudes beyond the chuck guard) eye protection conforming to BS 2092-1 must be used. Loose clothing must be secured, long hair tied back and substantial footwear worn to minimise risk of injury if the material or chuck falls.

19. DRILLING MACHINES

19.1 Competency

Staff using or supervising use of this machine must hold an NAAIDT certificate M2 or an equivalent qualification. (See Section 3.3).

19.2 Controls

The machine must be provided with a power isolator either on or adjacent to the machine and be controlled by a starter incorporating overload protection and no-volt release. It must also be fitted with a foot or knee stop switch.

The chuck key, preferably spring loaded, should be removed immediately after use and before starting the machine. A special receptacle should be provided in which to place the chuck key when it is not in use.

19.3 Guarding and Use

The pulley drive and gear must be **totally** guarded. A tool operated locking device must be provided to all access covers.

The drill chuck and spindle must be guarded with an adjustable or telescopic guard. The condition of the guard should be checked regularly to ensure the adjustable mechanism is effective and that acrylic guards are not excessively scratched.

Safety collar stops must be positioned just below the head and table.

The correct cutting speed appropriate to the size of drill bit and type of material must be selected. Drill bits should be well maintained and the condition checked before use. Damaged bits should be disposed of promptly.

The work must be adequately secured to prevent it rotating. A wooden base-board could be made to slot onto the base. Clamps or a fence can then be attached to the base-board.

Precautions should be taken to prevent long lengths of swarf developing, but where these have formed they should not be removed by hand.

Eye protection complying with EN 166 4B or BS 2092-1-D must be worn. Loose clothing must be secured and long hair tied back.

20. FLY PRESS

20.1 Competency

Staff using this machine must be experienced in its safe operation. This machine should not normally be used by pupils. However senior pupils may do so provided they are individually supervised by an experienced teacher or instructor.

20.2 Controls

The fly handle and counter-weights should be removed when the machine is not in use.

20.3 Guarding and Use

The trapping zone between the tool and dies must be effectively guarded. Unless the height of the horizontal position of the fly handle is such that there is no danger of the counter-weights striking the operator, a circular guard should be provided. If there is a danger of an onlooker being struck by the handle at the rear of the press, a protective screen should be provided.

Close supervision of the press should be exercised. All guards must be in position, particularly in the trapping zone, before use. Presses must be securely mounted on the bench so as to resist the twisting effect of the fly handle. Fly handles should be periodically examined for cracks and other defects.

Substantial footwear must be worn and care exercised when lifting the counter-weights into position.

21. GRINDING – POLISHING MACHINES

21.1 Competency

Dual-purpose machines for grinding and polishing are not recommended.

22. POLISHING MACHINE

22.1 Competency

Staff using this machine must be experienced in its safe operation.

22.2 Controls

This machine must be provided with a power isolator either on or adjacent to the machine and controlled by a starter incorporating overload protection and no-volt release. It must also be fitted with a foot or knee stop switch.

22.3 Guarding and Use

The pulley drive and gear must be **totally** guarded. A tool operated locking device must be provided to all access covers. The spindle end and the threaded mandrel must be guarded; in the absence of a fixed sleeve guard provided with the machine a loose sleeve-type guard should be used. The unprotected end of the spindle must also be covered.

Care should be exercised in holding the work and where to apply the work to the wheel. The work should not be held in a cloth or apron and care is needed to ensure that the edge of the work does not catch up in the mop. Normally the wheel should revolve so that the top moves towards the operator and the work applied in the nearer lower quarter of the wheel. The work must not be gripped on the inside but held firmly on the outside.

Full-stitched mops should be used where practicable. Wires, chains and linked pieces must not be polished on a revolving mop. The size of the mop heads used must be within the limits specified by the machine manufacturer.

Eye protection conforming to at least BS EN 166 S or BS 2092 (general purpose) must be used. Loose clothing must be secured; long hair tied back and substantial footwear worn. Consideration should be given to providing local dust collection if the machine is to be used frequently each day.

23. MILLING MACHINE

23.1 Competency

Staff using this machine must hold a NAAIDT certificate M5 or equivalent (see Section 3.3).

No pupils should use these machines unless they have undergone a specific course of instruction and are closely supervised by a qualified specialist teacher or instructor.

23.2 Controls

This machine must be provided with a power isolator either on or adjacent to the machine and controlled by a starter incorporating overload protection and no-volt release. When an automatic power feed to the table is used, the wheel must disengage and not rotate with the feed screw. The control of the coolant pump must be independent of the power control to the cutter.

23.3 Guarding and Use

Horizontal and universal milling machines must have a guard which will enclose the cutter, arbor and table of the milling machine and a means of preventing access to the machine whilst it is moving (i.e. interlock guard).

For vertical milling machines, where the risk of injury is much lower, it is acceptable to have a clear plastic screen. This should totally enclose the cutter.

The pulley drive and gear must be totally guarded. A tool-operated locking device must be provided to all access covers.

The dangers associated with these machines must not be under-estimated. The machine must be checked by the teacher or instructor to ensure that the cutter and work are correctly mounted, the guards are in position and the correct speeds and feeds selected. The work must be securely held on the table by means of a heavily constructed machine vice, angle plates, etc. The work piece must be traversed well clear of the cutter before loading or unloading the machine. Swarf must only be removed using a brush with a straight handle when the machine is electrically isolated.

24. OFF-HAND GRINDING MACHINE AND ABRASIVE WHEELS

24.1 Competency

Staff using or supervising use of this machine must hold a NAAIDT certificate M1 or an equivalent qualification (see Section 3.3).

Bench or pedestal grinding machines must not be used by pupils.

24.2 Controls

This machine must be provided with a power isolator either on or adjacent to the machine and controlled by a starter incorporating overload protection and no-volt release. It must also be fitted with a foot or knee stop switch.

24.3 Guarding and Use

The pulley drive and gear must be **totally** guarded. A tool operated locking device must be provided to all access covers.

The transparent screens should be adjusted correctly and provide good vision. Tool rests must be properly adjusted and secured as close as practicable to the exposed part of the abrasive wheel. Except for the operating section, the rest of the abrasive wheel must be totally enclosed.

The wheel must be checked for cracks and be properly dressed. Grinding on the side of the wheel must always be avoided. The maximum permissible speed must be marked on each abrasive wheel and a notice specifying maximum spindle speed must be fixed to each machine.

Abrasive wheels must only be changed by teachers or technicians who have attended an approved training course on the mounting of abrasive wheels.

Eye protection conforming to at least BS EN 166-B or BS 2092-1 must be used. Loose clothing must be secured and long hair tied back.

25. POWER HACKSAW

25.1 Competency

Staff using this machine must be experienced in its safe operation. Pupils must not use this machine.

25.2 Controls

This machine must be provided with a power isolator either on or adjacent to the machine and controlled by a starter incorporating overload protection and no-volt release. The auto-knock-off switch must be used at all times and regularly checked to ensure that it is in good order. The hydraulic dash pot must be in good working order.

25.3 Guarding and Use

The pulley drive and gear must be totally guarded. A tool operated locking device must be provided to all access covers and guards.

The work must be securely held in the vice and adequately supported on both sides of the cut if necessary. The saw must not be manually assisted to increase the rate of cutting. Care should be taken to ensure the coolant is contained within the machine base and does not spill over on the floor. Substantial footwear must be worn and loose clothing must be secured.

26. SHAPING MACHINE

26.1 Competency

Staff using or supervising the use of this machine must hold NAAIDT certificate M3 or an equivalent qualification (see Section 3.3).

No pupil should use the machine unless they have undergone a specific course of instruction and are supervised by a qualified specialist teacher or instructor.

26.2 Controls

The machine must be provided with a power isolator either on or adjacent to the machine and controlled by a starter incorporating overload protection and no-volt release.

26.3 Guarding and Use

The pulley drive and gear must be **totally** guarded. A tool operated locking device must be provided to all access covers and guards. The ram of the machine must be fully guarded for the full extent of the operating movement.

The work piece must be securely fastened to the table. Where a vice is used there should be sufficient surface of the work piece in contact with the vice and the front part of the vice jaws should be positioned so as to resist the thrust of the tool. Before the machine is started the ram-driving clamp must be securely tightened. The clapper box must move freely. No attempts should be made to make any adjustment whilst the ram is in motion. Pupils should be warned to keep their heads clear of the vice or the work piece whilst the ram is in motion. The machine must be checked by the teacher or instructor to ensure that the tool and work are correctly mounted, the guards in position and the correct stroke and feeds selected.

Eye protection conforming to at least BS EN 166-B or BS 2092-1 must be used. Loose clothing must be secured and long hair tied back.


27. SURFACE GRINDING MACHINE

These machines are not recommended for normal school use.

28. HAND-OPERATED BENCH SHEARS

When not in use these machines must be locked by, for example, a stout pin through the hole in the blades and kept in place by a padlock.

29. PORTABLE ELECTRIC POWER TOOLS

All power tools used for Design and Technology must comply with the Authority's rules on electrical equipment (see appropriate general code). Only Class II double insulated tools (marked ) or earthed Class I insulated tools should be used. Class II double insulated tools are preferred.

Consideration should be given, particularly where portable electric tools are extensively used, to the use of 110V tools operating from an isolating transformer with a centre tapped earth. An alternative is to use a Residual Current Device (RCD), although the former is preferred. In wet or damp conditions it is essential to use 110V tools operating from a transformer with a centre tapped earth. Where pupils are using tools it is strongly recommended that they are rechargeable rather than mains powered to avoid the hazards associated with power leads.

A visual inspection of portable electric power tools should be carried out each time they are used. Particular attention should be paid to the condition of the plug, lead, casing and switches. Faulty or damaged equipment should be taken out of use and marked accordingly until the fault has been rectified. Regular inspection and testing should also be carried out.

Portable electric power tools should be purpose-built; attachments should not be used. They must only be used for their designed purpose.

Certain portable electric power tools can be used by pupils provided they are supervised by a qualified teacher or instructor (see table below for details). The level of supervision is a matter for the teacher and head of department to decide taking into account pupil numbers, ability and maturity. Wherever practicable tools **MUST** be used by de-pressing the trigger and not locked in a running position.

Under no circumstances should a portable power tool be used other than by its designed method. Clamping to a bench or fixing on a vice etc. is a serious misuse and potentially dangerous.

PORTABLE TOOL	USED BY PUPILS	NOTES
Drills	Yes	rechargeable preferable to mains operated
Small portable angle grinders	Yes	Should not be used in close proximity to other pupils. Eye protection should be worn

30. HAND TOOLS

Pupils must be instructed in the safe use of all tools and such instruction must be regularly enforced. It is advisable to list pupils who have been instructed.

Pupils should be properly instructed in carrying and handling of sharp edge tools. Tools should be "checked in" at the end of each session. Loss of tools can lead to dangers outside of the workshop.

All tools must be used in the recommended manner and for their intended purpose.

Tools should not be left lying around; they should be properly and safely stored in a rack or a cupboard. Sharp edge tools should be stored in such a way that the cutting edge cannot be accidentally touched.

Good maintenance of hand tools is essential (see Section 16 – monitoring of workshop environment). All tools must be inspected on a regular basis. Hand files and similar tools must have properly fitted handles which are in good condition. All hammer heads and their fixing to shafts must be regularly inspected for any defects. Turning tools should be maintained sharp and should be of a secure fit in their handles. Improvised tools, such as those made from files, must not be used.

31. FLAMMABLE LIQUIDS

Quantities of flammable and highly flammable liquids should be kept as small as practicable and only sufficient quantities for day to day use should be kept in the workroom.

Quantities of up to 50 litres of highly flammable liquids (flash point less than 32°C) or 250 litres of flammable liquids (flash point 32°C to 55°C) may be kept in any one room in an approved fire resistant bin or cupboard, labelled in accordance with the Safety Signs and Signals Regulations (see Section 32), incorporating a pictogram and text stating "Highly Flammable" or "Flammable" respectively. The floor and shelves of fire resistant cupboards should be lipped to contain leakage (110% volume of largest vessel normally stored in it). Petroleum based products with a flash point below 22°C are subject to the Petroleum (Consolidation) Act 1928 and require a petroleum licence for storage. A total quantity of not more than 15 litres (3 gallons) can, however, be kept without a licence if it is kept in glass, metal or earthenware containers with not more than 570 mls (one pint) in each container. Many adhesives, cellulose solutions and thinners are petroleum based and are within the scope of the Act. All containers of highly flammable liquids and mixtures should be stored away from combustible materials.

Further advice on the registration and storing of petroleum based products can be obtained by contacting the Petroleum Officer at 266B Queens Road, New Cross, SE14 5JN, local contact Mr Howes, Petroleum Officer, Tel: 07879 607894.

32. SAFETY SIGNS

The Health and Safety (Safety Signs and Signals) Regulations 1996 require that appropriate safety signs be provided and maintained where risk assessments made under the Management of Health and Safety At Work Regulations indicate that risks cannot be avoided or adequately controlled in other ways. The Schedules to the Regulations lay down detailed requirements, which include:

- The need to ensure signs incorporate a pictogram, which is simple to understand.

- The need to ensure that signs are positioned appropriately, and maintained and replaced as necessary to ensure their effectiveness

The requirement to ensure the following basic features is complied with.

<u>Safety Colour</u>	<u>Meaning or Purpose</u>	<u>Instructions & Information</u>	<u>Features of Signboards</u>	<u>Examples of use</u>
Red	Prohibition Sign	Dangerous behaviour	Round shape, black pictogram on white background, red edging and diagonal lines.	To prohibit unauthorised use of a machine or use of faulty machine To prohibit smoking near flammable liquids
	Fire Fighting Equipment	Identification and location	Rectangular or square, white pictogram on a red background.	To mark location of extinguishers which can not be clearly seen
Yellow or Amber	Warning Sign	Be careful, take precautions, examine	Triangular, black pictogram on a yellow background with black edging. !accompanied by written information on the danger, to be used where there is not a suitable pictogram,	To warn of presence of flammable substances (e.g. on flammables store)
Blue	Mandatory Sign	Specific behaviour or action, wear personal protective equipment	Round shape, white pictogram on a blue background !accompanied by instructions to be used where there is not a suitable pictogram	To indicate that eye protection must be worn. ! The “exclamation mark” pictogram may accompany safety instructions.
Green	Emergency Escape, Safe Condition	Means of escape, location of facilities	Rectangular or square, white pictogram on a green background.	To mark location of: Fire exits First aid boxes emergency stop buttons.

33. MANUAL HANDLING

The Manual Handling Operations Regulations 1992 require the following three steps:

- avoidance of hazardous manual handling operations where reasonably practicable;
- an assessment of any hazardous operations which cannot be avoided;
- the reduction of risk of injury as far as is reasonably practicable.

Where possible manual handling tasks should be avoided or the risk of handling injury minimised by appropriate task design or the use of handling aids (e.g. trolleys). The layout of storage areas should minimise the need to stretch, reach, bend or twist the body excessively to reach frequently used or heavy items.

Where it is considered a manual handling operation could lead to a significant risk of injury an assessment of the risk should be carried out.

33.1 Carrying out an Assessment

- 1) Identify tasks which are likely to involve a significant risk of injury, and staff or pupils who are likely to be at risk. Examples in metal working areas may be the delivery and storage of materials and moving heavy equipment.
- 2) Assess the risk - using the checklist in Section 3(8) of the Health, Safety and Welfare Manual of Guidance, consider how aspects of the load, task design, and environment may increase risk. Also consider, whether the task requires unusual strength or training, and whether persons required to lift have a health condition which may affect them?

For example materials may be heavy, bulky and difficult to grasp. It may be necessary to transport large objects long distances and negotiate stairs, doors and narrow corridors. The design of the store may require staff to stretch, bend or stoop unnecessarily.

- 3) Reduce the risk. There are a number of ways in which manual handling operations can be avoided or the risk of injury reduced. For example, consider the following:
 - Can handling aids such as trolleys or sack barrows be used?
 - Can ramps be provided?
 - Can distance of travel be reduced (e.g. by asking suppliers to deliver to the workroom or a nearer exit)?
 - Can heavy loads be split into several smaller loads?
 - Ensure certain tasks are only carried out by at least two people.
 - Do certain members of staff require training in safe handling techniques?
- 4) Record the risk assessment on forms RA2 and RA3.
- 5) Review the assessment whenever there is a significant change to the work activity.

34. NOISE

Prolonged exposure to loud noise can cause permanent damage to hearing. The effect is accumulative and irreversible. The Noise at Work Regulations 1989 aims to reduce the risk of hearing damage by setting action levels beyond which certain action must be taken to reduce the exposure of affected employees to noise. Action levels which may be exceeded in a Design and Technology workshop are:

- (i) First Action Level - 85 dB(A) Lep,d
- (ii) Second Action Level - 90 dB(A) Lep,d

(dB = decibels, Lep,d = total exposure to noise "averaged" over an eight hour day taking into account the average noise levels in working areas and the time spent in them).

If people have trouble communicating and have to shout to be heard over a distance of two metres it is likely that the noise exceeds 85 dB(A). However as the exposure also depends on the length of time someone is exposed to the noise it is very unlikely that teachers and pupils will be exposed to noise above the First Action Level. A technician who may spend much of the day preparing wood for practical classes could be exposed to noise greater than the First Action Level. If this is only happening intermittently it will be sufficient to provide the technician with ear defenders (i.e. muffs or plugs) to wear if

he/she wishes. If the technician is exposed to particularly loud noise on a regular basis it will be necessary to carry out a noise assessment.

If Action levels are exceeded the following action would be necessary.

- (i) First Action Level:
 - provide hearing protection for those employees who wish to wear them;
 - inform, instruct and train employees.

- (ii) Second Action Level:
 - reduce noise to the lowest reasonably practicable level;
 - if noise cannot be reduced sufficiently by other means, designate the area an ear protection zone, provide hearing protection to anyone who enters the area and ENSURE it is used.
 - Inform, instruct and train employees.

Information, instruction and training of employees should cover the risks from exposure to excessive noise, why hearing protection is necessary, how to wear it correctly and their duty to wear hearing protection and report defects.

HSE LEAFLETS: "Ear Protection – Employers' duties explained (INDG 298) and "Protect your hearing!" (INDG 299) will provide further information on ear protection". HSE leaflets are available from HSE Books on 01787 881165 (single copy free).

35. DISTRIBUTION OF CODE OF PRACTICE

Heads of Establishments are to be provided with copies of this Code. They are to ensure that a copy is available in every relevant activity area and that all staff are aware of it. A copy is also to be held in the administrative office of each establishment.

36. REVIEWING AND UPDATING THE CODE

This Code, together with other policy documents of the Directorate and the Council, will be regularly reviewed and modified as necessary.

Appendix 1 - LOCAL ARRANGEMENTS

This form should be completed by the head of design and technology.

INITIAL

- 1. All members of the design and technology department have read this Code of Practice.
- 2. The control measures described in this Code of Practice are in place/alternative control measures/variations are outlined on the appropriate Risk Assessment form.
- 3. Allocation of specific responsibilities

TASK	NAME
Completion of Annual Internal Monitoring Checklist	_____
Termly inspections of the work areas.	_____
Regular checks to ensure emergency shut off devices are effective	_____
Regular maintenance checks of machinery and equipment	_____
Maintenance and replacement of personal protective equipment	_____
Arranging the examination and testing by a competent person of:	
• Local Exhaust Ventilation	_____
• Lifting Equipment	_____
• Pressure Vessels	_____
• Power Presses	_____
• Portable Electrical Equipment	_____

- 4. Details of any companies contracted to maintain or examine and test machinery and equipment

EQUIPMENT	NAME	ADDRESS & TELEPHONE NO.

- 5. Emergency Procedures

Potential emergencies have been identified and appropriate procedures adopted.

ADDITIONAL/ALTERNATIVE CONTROL MEASURES

NOTE: Where alternative control measures to those detailed in the Code of Practice are used the person responsible for the work area must satisfy him/herself that standards of health and safety to staff and pupils are not reduced.

SIGNIFICANT HAZARDS/RISKS

ADDITIONAL/ALTERNATIVE CONTROL MEASURES

Location of Sources of Information/Equipment

Item

Location

Design and Technology Codes of Practice

Other Texts

Workshop Machinery Checklist

Routine Maintenance logs.

Records of examination and test of:

- Local Exhaust Ventilation
- Lifting Equipment
- Pressure Vessels
- Power Presses
- Portable Electrical Equipment

First Aid Boxes

Supplies of Personal Protective Equipment (list type and location)

Appendix 2 – Health Surveillance

DESIGN AND TECHNOLOGY RESISTANT MATERIALS AND MACHINERY - METAL

Under COSHH there is a requirement for health surveillance under certain circumstances. The purpose of health surveillance is to protect employees' health by the early detection of adverse effects caused by exposure to hazardous substances.

Health surveillance will be required under the following circumstances:

1) OCCUPATIONAL ASTHMA

Risk: Certain wood dusts and resins or formaldehydes used for chipboards, blockboard, MDF and plywood can give rise to occupational asthma. Respiratory irritants may also provoke attacks in individuals with pre-existing asthma conditions. N.B. As box, mahogany, iroko, rosewood, satinwood, yew and teak are strongly allergenic or poisonous their use should be avoided.

Surveillance required: Employees and pupils should be informed about the risk of respiratory sensitisation and the symptoms to watch for, and advised to report such symptoms to an identified responsible person (e.g. supervisor). The responsible person may wish to make routine enquiries to ascertain whether employees have evidence of respiratory symptoms. A record of such enquiries should be recorded on Form 2.

A record of employees who have existing respiratory conditions should be kept on their personal file for baseline purposes. Pupils who have respiratory conditions should also be identified and it should be ensured personal medication is at hand.

HSE LEAFLET*: Breathe Freely - A Workers Information Card on respiratory sensitisers (IND(G)172L) will provide suitable information for employees. HSE LEAFLET: Understanding health surveillance at work will provide an introduction for employers. The HSE has produced more detailed guidance, Health surveillance at work (HSG61), ISBN 0 7176 1705X.

2) SKIN DISORDERS

Risk: Abrasive materials, coolants (miscible oils), polyurethane paints etc. can cause dermatitis. Lubricating oils and greases can cause oil acne in some individuals.

Surveillance Required: Employees and pupils should be informed about the risk of dermatitis/oil acne and encouraged to report any skin disorder which may be associated with all contact with the above substances to an identified responsible person. Formal records are not required in this instance but the responsible person may wish to use Form 2 to remind themselves to make periodic enquiries of employees.

HSE LEAFLET*: Save your Skin: Occupational Contact Dermatitis MS(B)6 will provide suitable information for employees.

*HSE LEAFLETS are available free of charge from HSE Books (Tel: 01787 881165).

Where employees experience symptoms of ill health which may be related to exposure to a substance in the workplace they should be referred to their Doctor who should be made aware of any substances which may be associated with the condition. Persons responsible for the work area should also satisfy themselves that existing control measures are adequate.



**Red pictogram and text box
White background and text**

**THIS MACHINE MUST NOT BE USED BY JUNIOR PUPILS
AND MAY ONLY BE USED BY SENIOR PUPILS
UNDER THE DIRECT SUPERVISION OF A
QUALIFIED SPECIALIST TEACHER**

EP&O

DTSN 1.

PUPIL SAFETY NOTICE

**White text
Blue background**

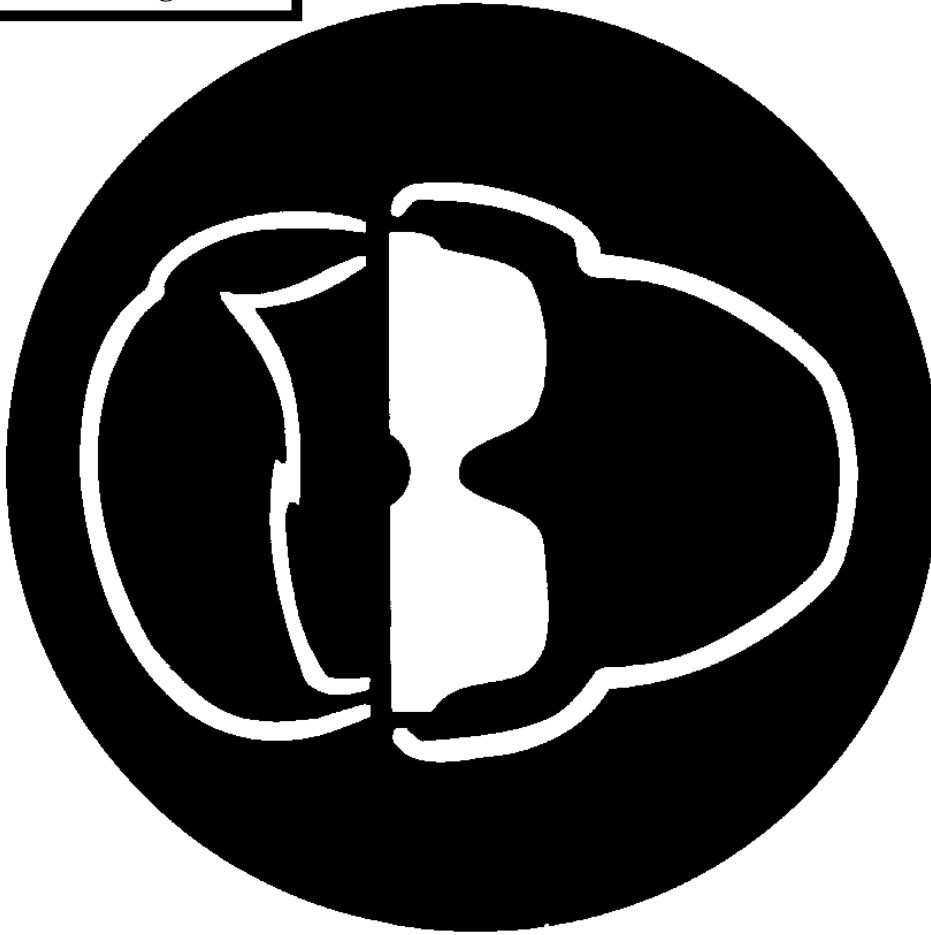
THIS MACHINE CAN ONLY BE USED

- 1. WHEN YOU HAVE BEEN GIVEN PERMISSION**
- 2. WHEN YOU HAVE BEEN SHOWN HOW TO USE IT SAFELY**
- 3. WHEN A SPECIALIST DESIGN AND TECHNOLOGY TEACHER IS PRESENT IN THE ROOM**
- 4. WHEN GUARDS HAVE BEEN PROPERLY POSITIONED AND ADJUSTED AND EYE PROTECTION WORN**
- 5. BY ONE PERSON AT A TIME**
- 6. WHEN LOOSE HAIR AND CLOTHING IS OUT OF REACH OF MOVING PARTS**

EP&G

DTSN 2.

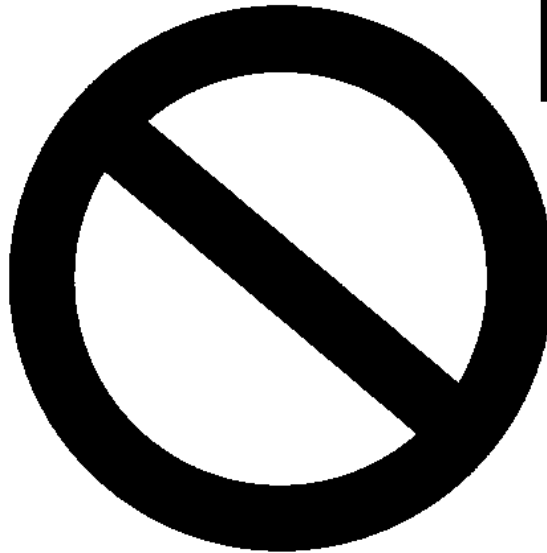
Blue pictogram and text box
White text and background



**Eye protection
must be worn**

DTSN 3.

Red pictogram and text box
White background and text



**THIS MACHINE MUST NOT BE USED
EXCEPT BY QUALIFIED SPECIALIST STAFF**

Appendix 4 - ABBREVIATIONS AND USEFUL CONTACTS

Council Health and Safety Unit:

General advice on health and safety legislation etc.

Contact should be made via the Directorate's Health & Safety Co-ordinator on 020 83037777 ext. 4385.

NAAIDT: National Association of Advisors & Inspectors in Design and Technology
124 Kidmore Road
Caversham
Reading
RG4 7NB Tel: 0118 9470615

For NAAIDT publications contact DATA.

DATA The Design and Technology Association
16 Wellesborne House
Walton Road
Wellesborne
Warwickshire
CV35 9JB Tel: 01789 470007

CLEAPSS The Consortium of Local Authorities for the Provision of Science Services.
Brunel University
Uxbridge
UB8 3PH Tel: 01895 251 496

*Organisations who Provide an Equipment Maintenance and Repair Service

Educational Workshop Services
Mount Pleasant Lane
Hatfield
Herts
AL9 5NR

Tel: 01707 281851

Albion Engineering Services (Anglia) Ltd.
Unit 3 Cherry Gardens
Helions, Bumpstead Road
Haverhill
Suffolk
CB9 7AA

Tel: 01440 707777

*Organisations who Inspect and Test Local Exhaust Ventilation.

Educational Workshop Services
Mount Pleasant Lane
Hatfield
Herts
AL9 5NR
Tel: 01707 281851

P & J Dust Extraction Ltd.
Extraction House
Otterham Quay
Rainham
Kent
ME8 8NA
Tel: 01634 233933
Fax: 01634 234588

Fercell Engineering Ltd.
Unit 60
Swaisland Drive
Crayford Industrial Estate
Crayford
Kent
DA1 4HU
Tel: 01622 791414

Glen Wilson Ltd
177 Sharp Street
Hull
East Yorkshire
HU5 2AE
Tel: 01482 346881

Flamefast (UK) Ltd
Labtec Street
Swinton
Manchester
M27 8SE
Tel: 0161 793 9998
www.flamefast.co.uk
(also inspect and test gas pipework & equipment)

* The inclusion of organisations in these sections does not constitute a recommendation nor does it preclude the use of other organisations who offer similar services.

Appendix 5 - DEFINITION OF TERMS USED IN THIS CODE

Hazard: The potential to cause harm (this can include a substance, machine, method of work etc.).

Risk: The likelihood that harm will occur in the circumstance of use. This would depend on the likelihood of coming into contact with the harmful agent, the number of people likely to be affected and the potential severity if harm occurs.

Risk Assessment: This is the evaluation of risk and consideration of suitable control measures to minimise that risk.

Reasonably Practicable: To carry out a duty 'so far as is reasonably practicable' means that the degree of risk can be balanced against costs in terms of expense, time, trouble and physical difficulty of taking measures to avoid the risk. If the costs are so disproportionate to the risk that it would be unreasonable for the persons concerned to incur them to eliminate the risk, they are not obliged to do so.

Hazardous Substance: The Control of Substances Hazardous to Health (COSHH) Regulations define hazardous substances as:

- those labelled very toxic, toxic, harmful, irritant or corrosive;
- those with a MEL or OES (see below);
- harmful micro-organisms (e.g. legionella, Hepatitis B);
- dusts of any kind in substantial concentrations;
- any other substance creating a comparable hazard.

Maximum Exposure Limit (MEL): This is the maximum concentration of an airborne substance, averaged over a reference period (long term - 8 hours or short term - 15 minutes) to which employees may be exposed by inhalation under any circumstances. A MEL should never be exceeded and COSHH requires the control of substances assigned a MEL to the lowest level reasonably practicable.

Occupational Exposure Standard (OES): This is the concentration of an airborne substance averaged over a reference period (long term - 8 hour, short term - 15 minutes) at which, according to current knowledge, there is no evidence that it is likely to be injurious to employees if they are exposed by inhalation to that concentration day after day. Exposure to a substance assigned an OES should be controlled to below the OES. Where it is exceeded appropriate steps to reduce exposure should be taken as soon, as is reasonably practicable.

Highly Flammable Substance: This is a substance with a flash point of less than 32°C. Containers of such substances must be labelled "highly flammable".

Flammable: This is a substance with a flash point between 32°C and 55°C. Containers of such substances must be labelled "flammable".

Competent: A competent person or organisation should have enough knowledge and training to understand the task they are doing and to avoid danger to themselves and others. In some cases (e.g. use of specialised machinery) it may be necessary to obtain a certificate to demonstrate competence. In other cases (e.g. risk assessment of most general work tasks) common sense and a good knowledge of the task and risks associated with it is all that is necessary.

Manual Handling: The Manual Handling Operations Regulations define manual handling operations as any transporting or supporting of a load (including lifting, putting down, pushing, pulling, carrying or moving) by hand or bodily force.

BIBLIOGRAPHY

Acts

Health and Safety at Work etc. Act 1974 (HASAWA)
Petroleum (Consolidation) Act 1928

Regulations

The Management of Health and Safety at Work Regulations 1999

The Control of Substances Hazardous to Health Regulations 1999 (COSHH)

The Provision and Use of Work Equipment Regulations 1998 (PUWER'98)

The Personal Protective Equipment at Work Regulations 1992 (PPE)

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972

The Manual Handling Operations Regulations 1992

The Noise at Work Regulations 1989

The Health and Safety (Safety Signs and Signals) Regulations 1996

British Standards

BS 4163: 2000 Health and Safety in Workshops of schools and similar establishments.

BS EN 292 Code of Practice for Safety of Machinery

BS EN 166 Specification for Eye-Protectors for Industrial and Non-Industrial Users.

BS EN 149:1992 Filtering Half Masks to Protect Against Particles.