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Instructor _____

Course ID. _____

The RSH Certificate in Health & Safety Course

This manual is for use on Marlin's Certificate in Health and Safety course. This course is approved by and follows the syllabus of the Royal Society of Health.

The course will take place over 7-8 contact hours, excluding coffee breaks and lunch. You will already have been issued with a timetable.

Competency Based Training

This course is competency based which means that it has a number of defined aims and outcomes that you will be assessed upon throughout the course to ensure that you are happy with one skill before moving onto the next. This will be done informally while you are working in your groups, and you will not be asked to demonstrate in front of the whole class.

Each lesson has questions at the end of the section to ensure that you have learnt and understood the required knowledge. You may be asked to hand your answers to the instructor for him/her to mark, but this is not a test and he/she will help you to understand any questions that you may have missed.

As well as the ongoing assessment, there is also an end of course assessment and formal exam which is sent to the Royal Society of Health. This will consist of a short theory exam (multiple-choice) and a hazard spotting exercise. There will be nothing new in these exams, so there is nothing to worry about.

Complaints

In the unlikely event that you have any complaint about any aspect of the course, premises or teaching then please make them to your instructor in the first instance. If he/she does not deal with the complaint to your satisfaction then you should write to 'Customer Services' at Marlin. Please quote the date of your course, the location, instructor and exact details of your complaint. Marlin will respond in writing within 14 days of receipt of any written complaint.

Disclaimer

Marlin assumes no liability for the contents of this publication, in whole or in part, nor for interpretations or concepts proposed by the authors. The objective of this book is to provide basic information to cover the syllabus of the Royal Society of Health's Certificate in Health and Safety. If you are making decisions on areas of Health and Safety it is strongly advised that you consult the relevant 'Guidance on the Regulations' published by the HSE.

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What is Health & Safety?

Health

The World Health Organisation define health as:-

"A state of complete physical, mental and social well being. Not merely the absence of infirmity or disease."

The Oxford English Dictionary defines health as:-

"The state of well being in body or mind."

Safety

The Oxford English Dictionary defines safety as being:-

"The condition of being safe; freedom from danger or risks."

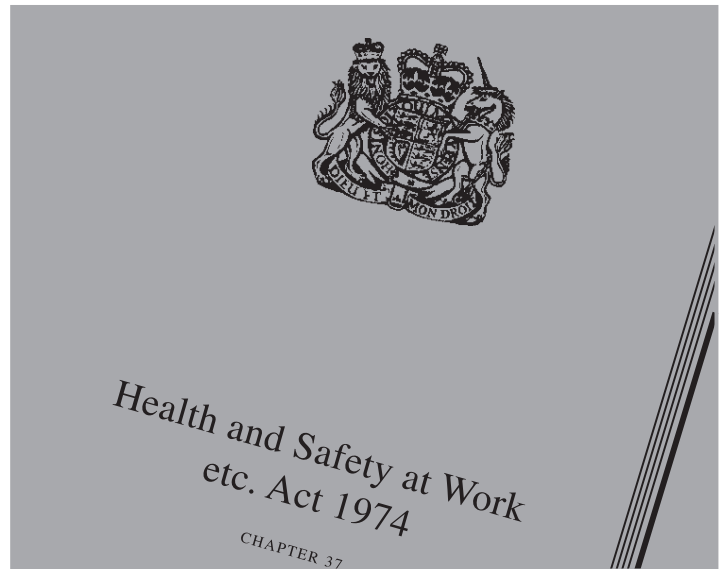
Research has shown that accidents and ill health cost the British economy between £6-12 billion a year, which is between £200-400 per person in employment. Experts have also calculated that if we take into account the social and personal cost of accidents at work, this cost would rise to £10-16 billion a year, which is equivalent to between 2% to 3% of the gross domestic product of the UK!

For a small or medium sized business the result of a single Health and Safety incident could be closure and/or bankruptcy. On a more personal basis the result of a serious accident at work could be either your own serious injury or death!

In 1974 the Health & Safety at Work etc. Act came into force. It replaced several earlier Acts of Parliament including the Factories Act 1961 and the Offices, Shops and Railway Premises Act 1963. This Act and subsequent associated regulations made it a legal requirement for employers to train employees in Health and Safety so as to reduce the likelihood of accidents in the workplace. These newer regulations are less prescriptive (you must do this!) than earlier laws. They are also applicable to all current workplaces and can be easily applied to any new working environments.

"In 1997 a company was fined £16,000 for simply changing a lightbulb!"

The Health and Safety Executive (HSE) is the government body in the UK that has been given the job of regulating Health and Safety. It produces a wide variety of leaflets and publications, many of which are free, to assist businesses in meeting their Health and Safety obligations. The Health and Safety Executive along with local Environmental Health Officers, also have the job of enforcing the law. It is strongly recommended that you develop a good relationship with your local Environmental Health Officer since they will be able to advise you. They also have wide ranging powers and in the case of serious breaches of Health and Safety can close down businesses until the case is taken to court. The fines for breaches of the regulations can be up to £20,000 per breach!



In one recent case a company used staff provided by an employment agency to clean and repair its light fittings. When they could not reach some of the bulbs, and a scaffold tower was not available, the workers improvised and climbed on a crate which was balanced on a fork lift truck! The crate slipped, narrowly missing the truck driver. The electrician fell 20 feet to the floor breaking both his arms. As a result the company and the employment agency were fined a total £16,506 for breaching Management of Health and Safety at Work Regulations.

Besides avoiding such fines, working safely as individuals protects both ourselves and our colleagues from sickness or injury and allows us to work in a more pleasant environment.

Many companies consider Health and Safety to be a hindrance to profit, however it can clearly be seen that on a commercial basis, good Health and Safety practice can in fact be extremely profitable.

The Pro's and Cons of Good & Bad H&S

	Poor H&S	Good H&S
accidents, injuries, deaths	increased	decreased
liability of being sued	high	low
public image	poor	good
efficiency	low	high
likelihood of prosecution	high	low
staff morale	poor	good
staff turnover	high	low

Accidents at Work

Accidents are the result of unsafe activities or items in the workplace. If we consider a simple fall from a ladder this might be dismissed as 'simple carelessness', however this statement may hide other significant factors such as a lack of training, maintenance, adequate job planning and a general lack of instruction or safe systems of work.

If we consider the factors that may lead to accidents these fall into three categories:-

Environmental factors

eg. tripping, slipping, cuts, burns.

Human factors

eg. carelessness, drugs at work, pub at lunchtime,

Occupational factors

These depend on the type of job, eg. firemen - burns, chefs - cuts. It is possible to get national figures for these.

It is simple to remember these factors since the first letters are the same as **E**nvironmental **H**ealth **O**fficer, the person responsible for enforcing the law should an accident occur.

Occupational Health

Since Greek and Roman times scholars have been aware of the risks involved with work activities. One of the first jobs to be looked at was mine work and as early as 1526 measures such as mine ventilation and face veils to protect workers from the dust were introduced.

Occupational Health is therefore concerned with disease or illness brought about by one's work. Whilst some health hazards are immediately obvious, many are not and only reveal their effects on the body after a period of time. Because of this it can be difficult to persuade people that the risk exists and that there is a need for caution. How many times have you seen workers hunched over their computers or workers drilling or cutting without ear protection. Both are inflicting serious damage to their health that will only become apparent in the future!

Health Hazards

Health hazards can be split into four main categories:-

Physical

eg. Pressure, noise, heat or electricity.

Chemical

eg. Exposure to toxic gases, dust or fumes.

Biological

eg. Infection by legionnaire's disease, hepatitis, AIDS or tetanus.

Ergonomic

eg. Working conditions, stress or interactions with machinery such as production lines or VDUs.



"And my father always said pirating was a safe job!"

The most common occupational illnesses suffered are:

1. back injuries,
2. stress,
3. loss of hearing, &
4. repetitive strain injury.

Good occupational health is therefore concerned with preventing these problems occurring in the first place. It does so by using the following procedures:-

Recognition of the hazards

Assessment of the extent and risk that the hazard presents under its conditions of use.

Control of the hazards

Through design, engineering, working systems or using personal protective equipment such as gloves, masks or protective clothing.

Monitoring change

Using audits and re-evaluation of the working conditions to monitor changes in the hazards.

Risk Assessment

In 1974 the Health & Safety at Work etc. Act came into force. It replaced several earlier Acts of Parliament including the Factories Act 1961 and the Offices, Shops and Railway Premises Act 1963. The earlier regulations were very prescriptive, however this act introduced the idea of risk assessment. This process was subsequently clarified and extended in 1992 by the Management of Health and Safety at Work Regulations. Therefore risk assessments have been required and carried out since 1974.

In 1994 the HSE produced a leaflet called "Five Steps to Risk Assessment" (see pages 8 & 9). This sets out the basic steps to conducting your own risk assessments. It states:-

"An assessment of risk is nothing more than a careful examination of what, in your work, could cause harm to people so that you can weigh up whether you have taken enough precautions or should do more. Don't be over complicated"

Risk assessment is therefore nothing more than undertaking a careful examination of all aspects of your work to see what can cause harm to either yourself or others. If there are any potential problems then you need to weigh up the risks and decide whether you have already taken enough precautions, or whether you should do more to prevent any harm.

What is a Hazard?

A hazard is anything that can cause harm, eg. chemicals, electricity, working from ladders etc.

What is Risk?

Risk is the chance, big or small, of harm being done. As an example, think about a can of solvent on a shelf. There is a hazard if the solvent is toxic or flammable, but very little risk. The risk increases when it is taken down and poured into a bucket. Harmful vapour is given off and there is a danger of spillage. If it were then used to clean the floor, the chance of harm, ie. the risk, is high.

The Process of Risk Assessment

1. Identify hazards

Things that have the potential to cause harm.

2. Risk assessment

The likelihood of causing harm.

3. The likelihood of it occurring

The seriousness of potential injury. The number of people likely to be involved.

4. Reduce the risk

As defined in the HSE's "Five Steps to Risk Assessment", your risk assessment must take into account: likelihood; extent of injury and number of people affected.

Recording Risk Assessments

If your company has more than 5 staff you must write down your risk assessments and review them whenever change

occurs.

Your records should include:-

- ◆ date of assessment,
- ◆ hazards identified,
- ◆ the risks of these hazards - who to, how risky?
- ◆ control measures already in place - are they sufficient?
- ◆ any further action necessary to control the risk.

The HSE are not looking for perfect assessments. What is required is that they are 'suitable and sufficient'. The major points are that the precautions taken are reasonable and that something has been written down to show that a proper check has been made.

Ranking hazards by risk

The HSE's "Five Steps to Risk Assessment" leaflet is suitable for most working environments and provides a good starting point. However where the risks are changing frequently a more sophisticated approach is necessary. (eg. the construction industry). This includes the use of generic checklists or even computer programs. The first stage of these approaches is the idea of ranking your hazards by risk. Quite simply this means how dangerous is each of the hazards found.

There are many methods of ranking by risk, however a simple method is presented in the following table:-

Risk assessment ratings

	Probability	Severity
1	Extremely Remote <i>Unlikely to occur</i>	Negligible <i>minor first aid</i>
2	Remote <i>May occur in time</i>	Marginal <i>non-serious illness or injury</i>
3	Reasonably probable <i>Probably will occur</i>	Critical <i>Serious illness or injury</i>
4	Probable <i>Likely to occur soon</i>	Catastrophic <i>wide scale death or illness</i>

To determine the risk simply multiply the probability by the severity:-

Risk = Probability x Severity

By allocating a numerical value to each hazard in this way, you can rank your hazards, with the most serious having the highest number.

This method therefore enables you to deal with the most serious hazards first, eg. some companies will attend to risks rated ten or more within 24 hours.

It really does not matter what system you choose as long as it is effective and everyone in the company uses the same system.

Progressive Risk Reduction

When discovering risks, eg. bleach used by cleaners, some companies would simply tell them to use gloves. However, this is actually the last step in risk reduction.

In order to reduce the risks that your assessments have identified, you should follow a series of corrective and preventative measures as follows:-

Hazard elimination

eg. use of alternatives, equipment design improvements, change in process etc.

Substitution

eg. replacement of one chemical with another less risky one.

Use of barriers

eg. isolation (remove hazard from worker), segregation (put worker in a box) etc.

Use of procedures

eg. limit exposure time, dilute exposure, safe systems of work, etc.

Use of warning systems

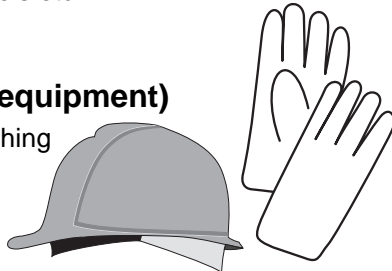
eg. signs, instructions, labels etc.

Use of PPE (personal protective equipment)

eg. gloves, helmets, breathing equipment etc.

Progressive risk reduction simply means trying each of these procedures in turn, remembering that hazard elimination is always the first choice and the use of personal protective equipment is always the last.

The regulations require that PPE should only be used as a last resort. The disadvantages of PPE include an inability to perform the task effectively or alternatively the PPE may fail and expose the worker to the full effect of the hazard.



“Remember the use of gloves and other personal protective equipment is the last choice, not the first when reducing risks!”

The Management of Health and Safety at Work Regulations, 1992 also encourage companies to set improving objectives of risk reduction each year. This can be achieved by using methods of risk reduction that are higher up the list each year.

The Regulations

For most companies, with typical average risks the following are the main regulations that require you to undertake risk assessments:-

Management of Health and Safety at Work Regulations, 1999 (Management Regulations)

Manual Handling Operations Regulations, 1992 (Manual Handling Regulations)

Personal Protective Equipment at Work Regs., 1992 (PPE)

Health and Safety (DSE) Regulations, 1992 (Display Screen Equipment Regulations)

Noise at Work Regulations, 1989 (Noise Regulations)

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

Control of Asbestos at Work Regulations, 1987 (Asbestos Regulations)

Control of Lead at Work Regulations, 1987 (Lead Regulations)

Useful Publications

Each of the regulations also has an appropriate guidance book. These are available from the HSE or any good bookshop. If you need to assess the risk in one of these areas it is strongly recommended that you buy the appropriate guidance notes and become familiar with them.

One of the most useful leaflets the HSE produce is the “*Five Steps to Risk Assessment*”. This is reproduced on the following two pages.

Other useful publications include:-

Five Steps to Successful Health and Safety Management IND(G)132L ISBN 07176 0425 X

Successful Health and Safety Management HS(G)65

Essentials of Health and Safety at Work ISBN 0 7176 0716 X

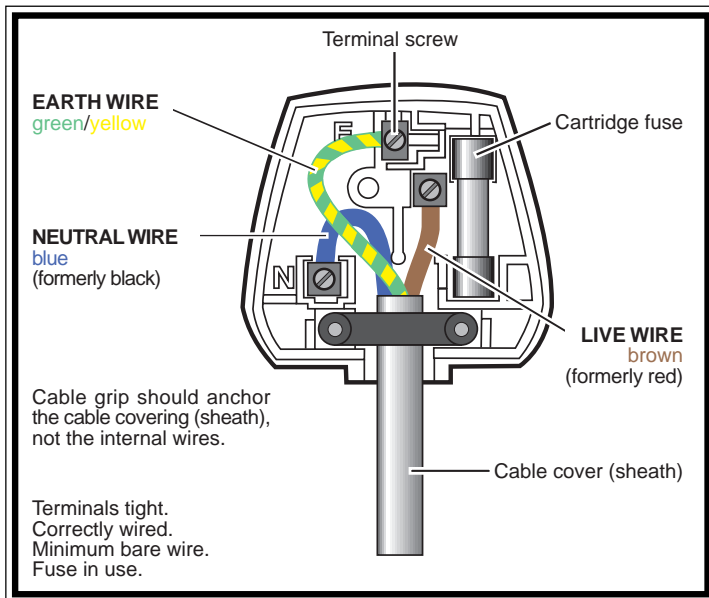
The cost of accidents at work HS(G)96 ISBN 0 7176 0439 X

These are all available from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 6FS. Tel: 01787-881165.

Wiring of a Plug

The correct wiring of a plug is a useful skill to have. It does not need to be undertaken by an electrician, just any competent person.

1. Cut the outer sheath carefully using an appropriate tool.
2. Cut back the sheaths of the individual wires.
3. Wire the plug as follows:-
 Blue (bottom left) - Neutral
 Brown (bottom right) - Live
 Green/yellow (top) - Earth
3. Check that no copper wire is showing on either side of the terminals.
4. Tighten the cord grip.
5. Check that the fuse is the correct size for the appliance - consult the manufacturer's instructions.
 Lights, clocks and electronics - usually 3A
 Heating and mechanical systems - usually 13A



Portable Appliance Testing



It can be seen from the table on page 30 that in addition to visual testing many items need a formal inspection. For items such as kettles this can be every six months. Until recently this meant calling in outside contractors at a considerable cost. However it is now possible to undertake this testing yourself using commercially available meters.

For information on the PAC Tester shown contact Parker Bell Instruments on 01392-364933.

Safety Signs

A safety sign gives a Health & Safety message by means of a combination of colour, shape, symbol and/or text. Since 1996 these have been standard throughout Europe.

The Law

The Health and Safety (Safety Signs and Signals) Regulations 1996 require employers to provide specific safety signs whenever there is a risk that has not been controlled by other means. They apply to all places of work and activities where people are employed, but not transport of dangerous goods which are covered by separate regulations.



The previous Safety Sign Regulations (1980) set the style of safety signs. There are four types of safety sign, each of which is easily distinguished by its colour and shape:-

Safe condition

This gives information about safe conditions such as first aid kits, fire exits and escape routes. The sign always has a green background with a white symbol and is oblong in shape.



Warning

This type of sign warns of danger or a hazard. It consists of a yellow background with a black border and is triangular in shape.



Prohibition

These signs prohibit certain types of behaviour, eg. smoking. They have a white background with a red border and crossbar and are circular in shape.



Mandatory

These signs indicate that a specific course of action is to be taken, eg. wear ear protection. They have a blue background, a white symbol and are circular in shape.



One change from the previous regulations is that fire signs must now have a 'running man' symbol and not be text alone. Employers have until the 24 December 1998 to update these signs.



Introduction

During the period 1991-'92 the average insurance claim for fire damage for British industries averaged £20 million per week. 1 in 4 non-domestic fires are due to electrical problems and over 2,500 people are killed as a result of electrical fires each year.

Preventing and controlling fire is therefore an extremely important feature in the prevention of accidents.

The Law

Fire Safety Legislation

The Fire Precautions Act 1971 is the main piece of legislation covering workplace fire safety (although other legislation such as the Health & Safety at Work etc. Act 1974 also has implications).



Premises with more than 20 employees are covered by this legislation, and require a fire certificate. However those with less employees were not covered by the Fire Precautions Act 1971 and fell into a loophole in the law. This was plugged last year by the Fire Precautions (Workplace) Regulations 1997 which apply to all premises.

Fire Certificates

Every workplace where 20 or more people work at any one time (or where 10 or more people work elsewhere than on the ground floor) must be covered by a fire certificate. (Even if your workplace does not require a fire certificate or is exempt for some reason, there should still be escape routes and fire fighting equipment appropriate to your circumstances.)

Fire certificates must identify:-

- ◆ fire escape routes (preferably with a map or photo),
- ◆ which doors are fire exits,
- ◆ how fire escape routes and exits can be used safely and effectively at all relevant times,
- ◆ the type, number and location of fire alarms, and
- ◆ any highly flammable materials which may be stored or used in the premises.

However the Fire Precautions (Workplace) Regulations 1997 also require all companies to:-

- ◆ have a written procedure in place for fires,
- ◆ risk assess the likelihood of a fire starting,
- ◆ list fire precautions,
- ◆ state how staff will get out,
- ◆ state where they will assemble,
- ◆ assess what fire fighting system is needed based on a risk assessment,
- ◆ assess what fire detection system is needed based on a risk assessment, and
- ◆ detail emergency exit routes and maintenance.

Penalties for failing to comply

If employers do not comply with the Act, the enforcing authority can issue them with an improvement notice, which details improvements, alterations or other measures necessary to remedy the breach. The employer must normally carry out this work within 21 days.

If the enforcing authority believes there is a serious risk to employees and visitors from fire on the premises, they can serve a prohibition notice. This can either demand immediate remedial work or even close the premises down. Employers can also be fined or imprisoned for breaches of the Act.

Other fire safety legislation

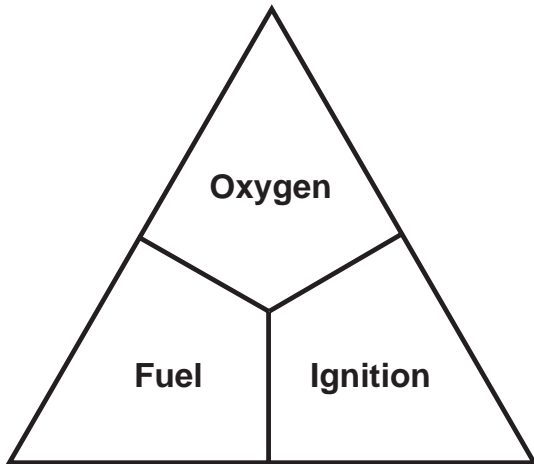
Holding a fire certificate is not the end of an employers' legal duties. They also have responsibilities under the following legislation:-

- ◆ Health and Safety at Work Act etc. 1974,
- ◆ Electricity at Work Regulations,
- ◆ COSHH Regulations,
- ◆ Management of Health & Safety at Work Regulations,
- ◆ Provision and Use of Work Equipment Regulations,
- ◆ Workplace (Health, Safety and Welfare) Regulations,
- ◆ Construction, Design and Management Regulations.

Fire Elements

Fire needs fuel, oxygen and a source of energy to start. These are known as fire elements. Example of these might be wood as the fuel, air and heat. However these must be present in the correct proportions for fire to occur. If one element is missing this will prevent a fire starting or stop it progressing.

The Fire Triangle



We can put a fire out simply by removing one of the elements of the fire triangle.

Smother fire - removes oxygen, eg. fire blanket or foam.

Starve fire - removes fuel, eg. turn off gas supply.

Cool fire - remove ignition, eg. use water.

The Effects of Fire

There are several hazards produced by fire. These are : flames/heat, smoke, depletion of oxygen, gaseous combustion products (fumes) and the structural failure of buildings. Let us look at the effects the most important of these:-

- ◆ **Heat** - leads to burns. Deep burns may result in internal damage. Major burns leave scars. Burns to the airway passages can result in respiratory arrest and death.
- ◆ **Smoke** - Irritates eyes and throat. Leads to panic.
- ◆ **Fumes/smoke** - Inhalation leads to poisoning unconsciousness and death.
- ◆ **Lack of oxygen** - leads to unconsciousness and death.

Fire Prevention

Identification of sources of fire

The major sources of fire in the workplace are:-

- ◆ faulty electrical equipment,
- ◆ deep fat friers,
- ◆ cigarettes,
- ◆ open flames (stoves),
- ◆ gas explosions, and
- ◆ flammable materials.

Fire Protection

There are three methods used to protect against and to deal with fire.



These are:-

- ◆ **Structural precautions.** Careful design of a building will include protection for the occupants against fire. This will include insulation, fire doors and smoke control all of which give people time to escape.
- ◆ **Fire alarms.** These can be activated by sensing heat, smoke or gasses. There will also be some form of manual activation such as 'break the glass' in case a fire is seen before it is sensed by the alarm system.
- ◆ **Fire fighting.** This may be undertaken with fixed hoses, fire extinguishers or automatic sprinkler systems.

When raising the alarm it is strongly recommended that all of the following systems are used:-

- ◆ audible,
- ◆ verbal, and
- ◆ visual (for hard of hearing).

Fire Escapes

The purpose of fire escapes is to allow people a safe exit from a building in the opposite direction to that of any fire. Employers must also provide

- ◆ safe and effective means of escape,
- ◆ fire detection and warning systems, and
- ◆ sufficient number of fire fighting appliances.

The number and types of fire escapes depend on several factors including:-

- ◆ nature of usage of the building,
- ◆ no. of people in building and their physical capabilities,
- ◆ nature of construction of the building, and
- ◆ time needed to evacuate building.

Fire escapes must be:-

- ◆ well signposted,
- ◆ have adequate emergency lighting,
- ◆ not have fire doors wedged open,
- ◆ there must be no locked doors,
- ◆ there should be no risk of overcrowding or bottlenecks
- ◆ escape route should not be blocked by boxes, filling cabinets, etc. Fire escapes are not storage areas!
- ◆ No combustible materials should be used or stored on escape routes.

Final exit doors must:-

- ◆ open in the direction of escape,
- ◆ preferably not open onto steps,
- ◆ not involve revolving doors, and
- ◆ may be opened at all times without keys.

Training and Instruction

Employees must receive training on fire prevention and procedures including their full participation in a fire drill once a year. Managers should keep a suitable record of this training. The requirement for training has been strengthened under the new 1997 Fire Regulations. Employers now have to:-

- ◆ provide induction fire safety training for new recruits,
- ◆ provide refresher training for existing employees,
- ◆ conduct fire drills at regular intervals (at least once a year for five or more employees),
- ◆ assess the effectiveness of fire drills, and
- ◆ keep records of drills and training.

As employees you need to be aware of:-

- ◆ the fire risks associated with your work,
- ◆ the location of your fire alarm call points,
- ◆ the action to take if a fire is discovered or the alarm sounds, and
- ◆ the nearest means of escape.

On Discovering an Outbreak of Fire

Notices stating what actions should be taken in a fire should be displayed in all workplaces and premises where people can be at risk from a fire. The information should be similar to the following:-

1. Raise the alarm by breaking the glass of the nearest alarm point.
2. Call the fire brigade.
3. If possible and without risk, tackle the fire using the appropriate extinguisher.
4. Leave the building via the nearest available route. Do not run, Do not use lifts.
5. Assemble in the designated area.

Fire Risk Assessment

Under the new Fire Precautions (Workplace) Regulations 1997, organisations now have to carry out a fire risk assessment and review this regularly.

If five or more people use the workplace, the risk assessment must be in writing and must identify the employees who are at risk.

The results of any fire risk assessment may have an impact on other fire prevention measures, for example, organisations may need to review their equipment.

Emergency Plans

Companies are required to prepare and keep-up-to-date an Emergency Plan for their workplace. This should include:-

- ◆ what action staff should take if fire breaks out in their workplace,
- ◆ detailed evacuation procedures,
- ◆ arrangements for calling the Fire Brigade and informing them of any special risks, and

- ◆ the names of an adequate number of people who will be responsible for supervising the plan, putting it into effect and supervising fire drills.

Gas

Each year we see news reports of students and other who die from carbon monoxide poisoning because their boiler or water heater had not been serviced.

All gas appliances, such as boilers must be serviced at least yearly, as required by Gas Safety Installation and Use Regulations, 1994. In addition directors, or maintenance supervisor must keep records of maintenance with details of date, defects and remedial action taken as required by the regulations.

If you do discover a gas leak you should take the following action:-

1. Turn off gas supply at meter.
2. Open doors and windows.
3. Call emergency services.
4. Do not turn any electrical switches on/off.
Do not smoke.
Do not use naked flames.

Categories of Fire

There are four main categories of fire which are defined by the fuel and the method used to put the fire out:-

Class A. Fires involving organic solid materials such as wood, coal or paper. The extinguishing method is cooling using water

Class B. Fires involving liquids or liquefiable solids. This is subdivided to:-

- B1. This is for liquids soluble in water, eg. methanol. The method use to put out fires is carbon dioxide, dry powder, light water, water spray and vaporising liquids.
- B2. These are liquids insoluble in water such as petrol and oils. Fires are extinguished using foam carbon dioxide, dry powder, light water, and vaporising liquids.

Class C. These are fires involving gases or liquefied gases, eg. butane or methane. Fires are extinguished using foam or dry powder with water to cool any leaking containers such as gas cylinders.

Class D. Fires involving metal such as aluminium or magnesium. These are extinguished using special dry powder extinguishers. No other extinguishers can be used.

Fire Fighting

If you are confronted with a fire:-

Remember: ⊕STOP ⊕LOOK ⊕LISTEN ⊕THINK ⊕ACT

Do not try to be the hero and remember:-

1. Do not try to tackle a fire unless it is safe to do so!
2. Always use the correct fire extinguisher

The following table shows the types of fire extinguishers and the fires on which they can be safely used.

Type of Extinguisher	Colour <small>(all fire extinguishers are red with a coloured band around the top)</small>	Type of Fire			
		Solid <small>(paper, cloth, wood)</small>	Liquid	Gas	Electrical
Water	Red body / Red band	✓			
Foam	Red body / Cream band	✓	✓		
Carbon Dioxide	Red body / Black band		✓	✓	✓
Dry Powder	Red body / Blue band	✓	✓	✓	✓
Vapourising Liquids	Red body / Green band	✓	✓	✓	✓
Fire Blanket		✓	✓		



Revision Questions

In order to assist you with passing the RSH examination we have prepared the following revision questions. Please take a few minutes to complete them before moving onto the next section of the course.

Q1. What would you do if you found a fire?

.....

.....

.....

Q2. Where is the nearest fire alarm to your work place?

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.....

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Q3. Where is the nearest fire exit to your work station?

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Q4. What must you not use when there is a fire?

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Q5. Where is your assembly point?

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Q6. When can you fight a fire?

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Q7. Where is your nearest fire extinguisher?

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Q8. What can the fire extinguisher be used on?

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Q9. What can a fire blanket be used on?

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Introduction

Work equipment causes 5% of all injuries sustained at work in this country. However although this is a relatively low percentage, the injuries sustained from work equipment are far more serious than those from other causes eg. trips.

Work equipment includes any machinery appliance apparatus or tool and any assembly of components which in order to achieve a common end are arranged so that they function as a whole. The definition of work equipment is extremely wide and includes all of the following items:-

- ◆ check out machine
- ◆ car wash machine
- ◆ air compressor
- ◆ lawn mower
- ◆ computer
- ◆ crane
- ◆ power press
- ◆ road tanker
- ◆ tractor
- ◆ vehicle hoist
- ◆ overhead projector
- ◆ ladder
- ◆ laboratory apparatus
- ◆ potato grading line
- ◆ fire engine turntable
- ◆ resuscitator
- ◆ lifting sling
- ◆ portable drill
- ◆ scalpel
- ◆ soldering iron
- ◆ hammer
- ◆ meat cleaver
- ◆ socket set
- ◆ hand saw
- ◆ drill bit.

The Law

The Provision and Use of Work Equipment Regulations cover minimum Health and Safety requirements for work equipment.



For each piece of equipment a record form, which identifies the major hazards and precautions which are needed should be completed. The methods by which risks can be reduced should be identified and implemented. These records should be maintained and recorded in a work equipment logbook.

In addition employers must ensure that:-

- ◆ work equipment is suitable for the purpose,
- ◆ is used only by trained operators,
- ◆ conforms to CE marks,
- ◆ dangerous parts are guarded,
- ◆ PPE should be provided if necessary,
- ◆ risks are assessed and reduced wherever possible,
- ◆ lighting is suitable,
- ◆ controls is adequate, and
- ◆ equipment is marked with safety warnings.

All new equipment should meet any EC directives, eg. CE marking as should any second hand equipment purchased.

Dangers and Guarding

To be able to identify the hazards associated with work equipment an understanding must be gained as to what the dangerous parts are and which guards should be used.

Dangerous parts

The dangers of work equipment include:-

1. Trapping - eg. a hand is trapped between rollers.
2. Ejection - eg. a piece of metal is thrown out of a lathe.
3. Contact - eg. contact is made with a hotplate in a kitchen on an abrasive cutting wheel.
4. Entanglement - eg. hair caught in an abseiling device or clothing caught in the rotating parts of a machine.
5. Impact - eg. being struck by a fork lift truck or the moving parts of a machine.
6. Electrical - eg. electric shock from a faulty drill.

When assessing items of work equipment it is important to identify the hazardous parts for that equipment.

Guarding

Having identified the dangerous parts of work equipment that equipment should then be checked to ensure that it is adequately guarded. There are 4 main types of guard:-

1. Fixed
2. Interlock
3. Trip
4. Automatic

Guards must be:-

- ◆ suitable for the purpose,
- ◆ of good construction, sound material and adequate strength,
- ◆ not the source of additional risk to health and safety,
- ◆ adequately maintained, in good repair and efficient working order,
- ◆ not easily bypassed or disabled,

- ◆ situated at sufficient distance from the danger zone,
- ◆ not unduly restrictive of any necessary view of the machine, and
- ◆ constructed or adapted to allow maintenance or part replacement without removing them.

In selecting preventive measures, the Regulations sets out a hierarchy of them on four levels. These are:-

- ◆ fixed, enclosing guards to the extent practicable, but where not
- ◆ other guards or protection devices to the extent practicable, but where not
- ◆ protection appliances (jigs, push-sticks etc.) to the extent practicable, but where not
- ◆ provision of information, instruction, training and supervision.

Work Equipment

Areas around work equipment should be clean, tidy, spacious and distraction free and controls must be accessible, easily identifiable and protected. In particular:-

1. Floor

This should be non slippery; free from obstacles and have no trailing wires.

2. Space

Sufficient room. Person operating machine should be away from through traffic and not distracted.

3. Lighting

Should be suitable and sufficient - at least 500-700 lumens.

4. Correct Height

Machine should be sited at the correct height for safe operation.

Dangerous Machines

Extra care needs to be taken in relation to prescribed 'dangerous machines'. These include:-

- ◆ slicers,
- ◆ mixers,
- ◆ robot-coupees,
- ◆ mincers, and
- ◆ bakery rollers.

Dangerous machines must be:-

- ◆ identified with a notice, and
- ◆ only used by trained staff over 18 years old.

Use Of Work Equipment

Certain precautions should be taken when using work equipment. Care should be taken with dress:-

- ◆ no loose clothing,
- ◆ hair tied back, and
- ◆ no loose jewellery.

You should not use work equipment if it is:-

- ◆ defective or broken,
- ◆ you have had no training in its use.

Turn the equipment off:-

- ◆ when not in use,
- ◆ whilst cleaning, and
- ◆ if there is a fault.

Display Screen Equipment

Most people would assume that a display screen refers to computers. However display screens also include TV monitors and monitors connected to equipment such as computer controlled lathes.



Over the years there has been considerable concern expressed about the effect that display screens may have on health. Do you remember the news stories publicising the possible damage to unborn babies by their pregnant mothers using computer terminals? In fact this has been shown to be untrue. The main risks are ergonomic, being hunched over a monitor on too low a desk for example.

The Law

The regulations covering the usage of display screens are covered by the Health and Safety (Display Screen Equipment) Regulations 1992. These lay down detailed requirements for people using display screens in their work. These are mostly ergonomic requirements to ensure that users health is not damaged by working long hours at their computer.



Possible Health Problems from Display Screen Equipment

Repetitive strain injury (RSI)

RSI is the main concern regarding display screen equipment. Repetitive strain is normally found in the wrists and also in the neck areas. RSI is a form of ligament damage. It is a serious debilitating injury that can prevent suffers even holding a cup of tea. Whilst a broken wrist can be fully healed after a few weeks in plaster damaged ligaments can be a problem for life. RSI of the wrist can be caused by using a keyboard without a wrist rest, poor typing technique or over use of the mouse (graphic designers). RSI in the neck is generally caused by poor workstation design with incorrect desk or screen height and/or a poorly designed chair. By taking the time to ensure the correct layout of your work station and taking appropriate breaks you can do a lot to prevent repetitive strain injury.

Effects on eyes and eyesight

Research has shown that working at display screen equipment does not bring about deterioration in eyesight, or make existing eye conditions worse. However display screen use can cause temporary fatigue and make eyes feel tired.

Fatigue and stress

The display screen equipment in itself will not bring on fatigue and stress. It is more likely that the work being performed on the display screen will bring about stress and fatigue, including lack of control, poor job design and a requirement for working at high speed.

Epilepsy

Display screen equipment has not been known to induce epileptic seizures even for photosensitive epileptics.

Facial dermatitis

This is an extremely rare condition. It is believe that the equipment itself does not bring on conditions of the skin but it is possible that environmental conditions, such as low relative humidity could be responsible.

Electromagnetic radiation

There is substantial evidence that original concerns about electromagnetic radiation are not appropriate. Any emissions which do occur are well below those which cause any risk to humans.

Pregnant women

All research shows there is no link between miscarriages or birth defects for those working with display screen equipment. However, to avoid stress and anxiety when employees are pregnant, or planning children, they should be given the opportunity to discuss their concerns.

Work Stations

The regulations lay down specific requirements for the layout of workstations. (See figure on page 46) They require the following-

Display screen

The image must be stable, the screen adjustable and not subject to reflection.

Keyboard

There must be sufficient space for the keyboard and it must be separate from the display screen so it can be adjusted to suit the user.

Work desk

There should be sufficient space on the work desk and a document holder should be provided where information is taken from text and entered.

Work chair

The work chair must be stable, adjustable in height and give back support. A foot rest must to be provided for those whose feet do not touch the floor.

The Environment

The regulations also lay down specific requirements for the environment in which the workstation is situated (see figure on page47):-

Space

Sufficient space must be provided around the work station to allow free movement of the person and equipment.

Lighting

The lighting should be suitable for the task. At times extreme lighting conditions may be appropriate eg. traffic control. On occasions task lights should be provided where detailed information is being extracted from documentation.

Reflections on glass

Display screen users should not be subjected to reflections on their screens. This could be due to bright lights or windows. In addition, they should not be subjected to bright illuminations which cause glare at their periphery vision.

Noise

People working on display screen equipment should not be subjected to high levels of noise. This can traditionally be associated with a dot matrix printer or could be due to other environmental conditions.

Heat

The equipment can be a source of dry heat and ventilation and humidity should be maintained at levels which prevent discomfort and problems for people.

Radiation

As already stated the amount of radiation given off is extremely low. Many people assume that you must have anti-radiation (sometimes combined as anti-glare) screens, however it is not a requirement for these to be provided.

Software

The regulations also lay down requirements for the software used on computers. Software should:-

- ◆ be easy to use,
- ◆ not measure performance without the users' knowledge,
- ◆ should give feedback if designed to monitor the users' performance.

Display Screen User or Operator

It is important to identify those people who are display screen users as they are entitled to free eye sight tests and corrective eye wear. There are no hard and fast rules when deciding who are users, but the following are criteria on which this decision might be based:-

Dependency

Could the person work if the computer were taken away?

Discretion

Can the person decide when they are going to use the computer throughout the day?

Training

Has the person received any training regarding the use of the display screen equipment?

Prolonged work skills

Is complicated work carried out for long periods of time?

Daily use

Is the display screen equipment used on a daily basis?

Fast information transfer

When a person has to work quickly on the keyboard they are more likely to be display screen users.

Criticality of errors

The greater the importance of the information entered the more likely it is they are display screen users.

Are you a display screen user?

Definite display screen users include:-

Word processor operators, typists, secretaries, data input clerks, journalists, telesales and customer complaints staff, air traffic controllers, graphic designers and librarians.

All cannot do their jobs without using display screens and probably use them for more than 4 hours a day.

Possible display screen users include:-

Scientists, building society customer support officers and receptionists.

All use computers but the time spent on the computer may be just a small percentage of their daily work.

Those who are not display screen users include:-

Senior manager who may only use a computer occasionally and a receptionist who only use the display screen on a limited basis, eg. to look up the occasional phone number or address.

Arrangements for Display Screen Users

If you use your computer for more than 4 hours a day you are entitled to:-

- ◆ a free eye sight test, and
- ◆ where necessary, provision of corrective eye wear if required for working on display screen equipment.

In addition display screen users should:

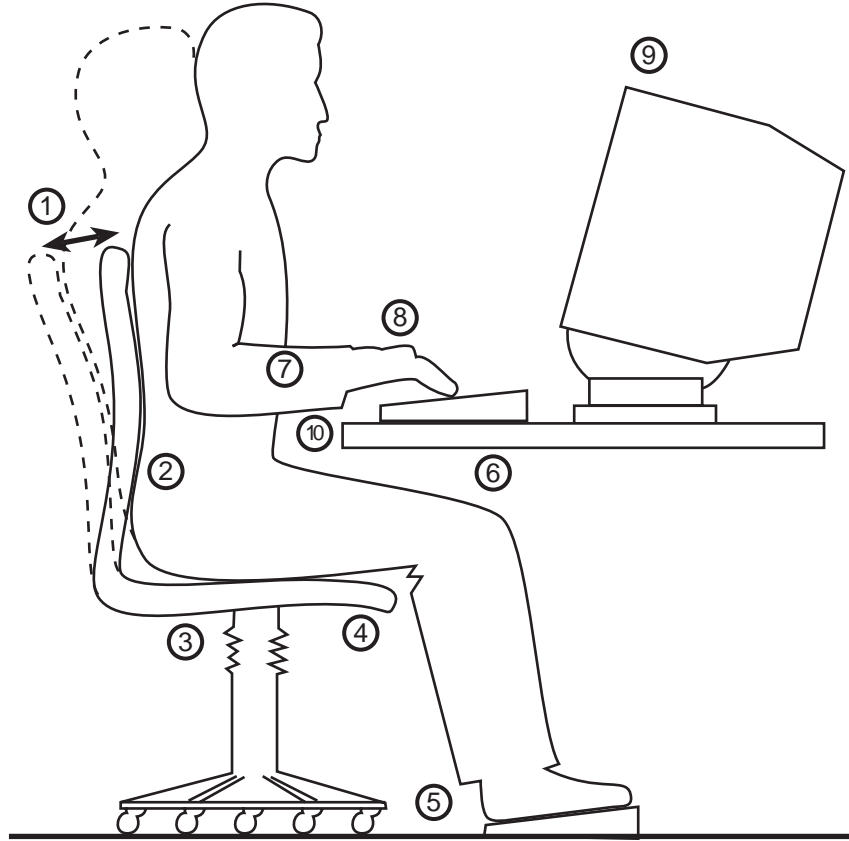
- ◆ plan their daily work routine to avoid long periods at the keyboard whenever possible,
- ◆ receive training and information regarding display screen equipment,
- ◆ change activity once an hour for 5 minutes,
- ◆ ensure your work station is correctly laid out with the right facilities, and
- ◆ inform your employer of any problems.

Display Screen Equipment

Seating and Posture for Display Screen Equipment Workstation

Group Exercise

What do the numbers in the picture refer to?



Fill in the spaces for each number below:-

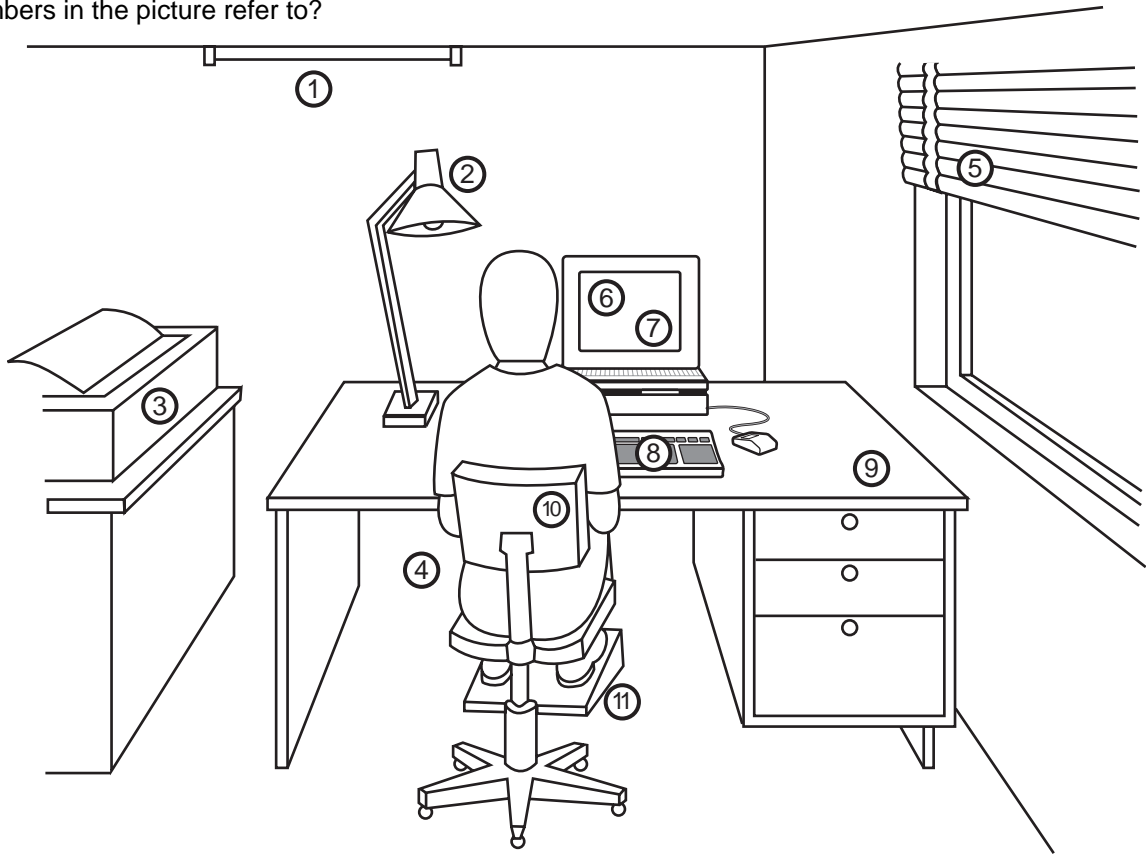
- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Display Screen Equipment

Work Environment for Display Screen Equipment

Group Exercise

What do the numbers in the picture refer to?



Fill in the spaces for each number below:-

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

Revision Questions

In order to assist you with passing the RSH examination we have prepared the following revision questions. Please take a few minutes to complete them before moving onto the next section of the course.

Q1. What are the main hazards associated with work equipment?

.....

.....

.....

Q2. What are the main types of guards?

.....

.....

.....

Q3. Where should work equipment be sited?

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.....

.....

Q4. What additional requirements are there for dangerous machines?

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.....

.....

Q5. How can you avoid repetitive strain injury?

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.....

.....

Q6. State three things you should do with respect to health and safety as a display screen user?

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.....

.....

Q7. Name five important features you would expect to see in a workstation set up for a display screen user?

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.....

Introduction

The most common injury from manual handling is back pain. Over 70% of us, by the time we retire will have or have had a back injury. 45% of all handling injuries are to the back (see graph). The result of these injuries is that 115 million working days are lost each year due to back pain. The annual cost to society in terms of lost output and medical treatment has been estimated at between £110-£130m.

The Law

The Manual Handling Operations Regulations 1992 contain guidance for employers on lifting and moving loads by hand. The regulations place significant obligations on employers to safeguard those at work when undertaking lifting or moving. The regulations also stress a risk assessment approach where the first step is to eliminate lifting tasks completely and if this is not possible to reduce the risk.

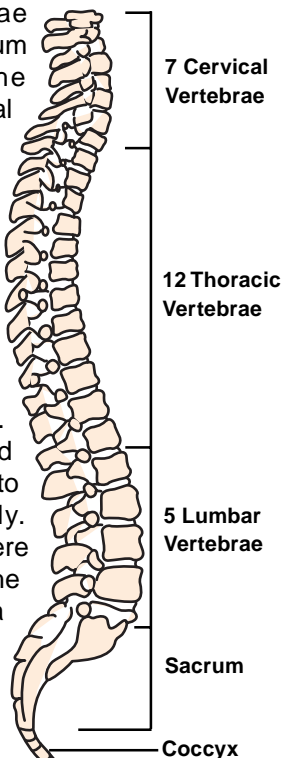


The Back and Spine

Anatomy and Physiology

The human spine is a flexible column of 24 vertebrae plus a larger wedge shaped bone at the base called the sacrum. The upper part of the vertebrae supports the head and the sacrum articulates with the hip at the sacroiliac joints. There are 7 cervical vertebrae in the neck. The ribs are attached in pairs to the thoracic vertebrae. There are 5 lumbar vertebrae in the small of the back.

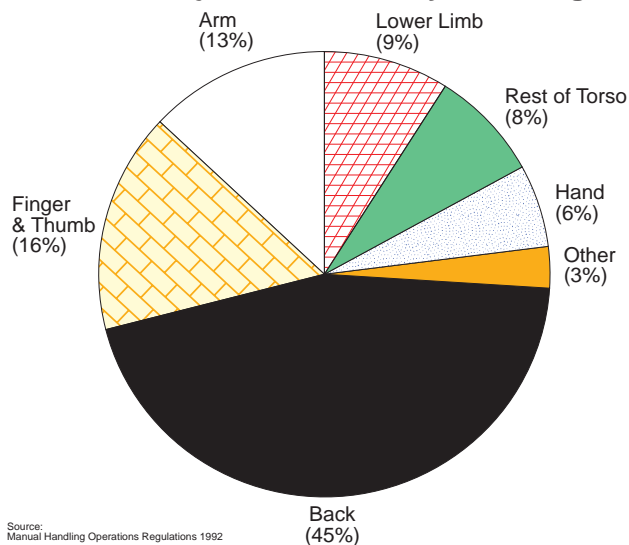
With regard to the anatomy, the lumbar region is the most important area, although any part of the spine may be damaged by manual handling activities. However it is the lumbar region and its adjacent structures which tend to be damaged more frequently. Between each pair of vertebrae there is a tough pad of tissue called the intervertebral disc, which acts as a shock absorber. These discs have a fibrous outer layer and a fluid filled centre and are compressed during certain postures, eg. standing, stooping, sitting or lying. The fibres of the outer layer are arranged something like the cords of a cross-ply tyre.



The Function of the Spine:-

- ◆ transmits load,
- ◆ absorbs shock,
- ◆ allows a certain amount of flexibility, and
- ◆ contributes to the length of the back.

Sites of Injuries Caused by Handling



Muscles

- ◆ Stabilise trunk and move spine
- ◆ Back muscles - Erector spinae muscles run in three columns at the back of and along each side of the spinous processes
- ◆ Abdominal Muscles - help support vertebral column

When the spine is fully bent, much of the load is taken through the ligaments, and the erector spinae stop working.

Mechanics of the Spine

The spine depends on the muscles to control movement and also prevent damage occurring. Without the muscles gravity and the rotational forces would cause the ligaments to rupture when the trunk was bent or twisted. The normal spine if undamaged can withstand considerable loads but if the spine is overloaded damage will occur. The spine is strongest when loaded directly from above and weakest when rotated.

Posture

When standing upright the load on the spine is mainly that of gravity which is transmitted down the vertebral column. Little muscle activity is required to maintain this posture

If the trunk is bent forward the force of gravity acting upon it the weight of the upper body will cause a great increase in muscular activity in the back and hip. This muscle tension will be restricted by the vertebral column and the pelvis causing an equal and opposite compression force to be applied to the discs increasing the intradiscal pressure.

Common Causes of Back Injuries

90% of back problems are caused by lesions to the discs. You do not suffer a slipped disc since the discs are firmly attached to the spine above and below. However during normal bending, twisting and lifting the discs may be pinched. This pinching results in lesions or scars on the disc and wear on its outer surface. Eventually under pressure the disc ruptures and the jelly inside is pushed out. The contents of the disc are irritating to the surrounding tissues and cause an inflammatory response. Further, the crushed disc no longer supports the vertebrae above and below causing pain. Hence the term 'crushed disc' might be more appropriate than 'slipped disc'.

Damage can also be caused to the following structures:-

- ◆ bones (breaks)
- ◆ ligaments (sprains)
- ◆ muscles (strains and hernias)
- ◆ other tissues (cuts/bruises)

Aging also results in disc degeneration. As we get older our disc cores dry out, and because they then contain less water they become more brittle. They act as a less efficient shock absorber are more easily damaged and result in narrower disc space (this is why we all get shorter as we get older!).

Back Pain

Back pain is an extremely common condition. Between two thirds and three quarters of adults will suffer from one or more episodes of back pain during the course of their working lives. At any point in time, about one person in seven will be suffering from back pain. Back pain can be:-

- ◆ IMMEDIATE. The result of trauma or poor technique
- ◆ CUMULATIVE. From repeated minor strains. This often clears up within a few weeks but can accelerate the aging process.

Back pain is equally common in men and women, at all ages, but is more common in people whose job involves certain risk factors. These include:-

- ◆ heavy work,
- ◆ handling and lifting,
- ◆ bending,
- ◆ twisting,
- ◆ combination of above three factors,
- ◆ heavy loads,
- ◆ sudden jerky movements,
- ◆ prolonged poor posture,
- ◆ vibration, and
- ◆ psychological stress.

The stronger and fitter you are, means you are less likely to injure your back doing heavy work.

It has been found that smokers are also more susceptible to back trouble than non smokers, although we do not really know why. Statistically speaking, your chances of having serious back problems increase by about 20% for every 10 cigarettes per day that you smoke.

Primary Back Pain

May arise in -

- ◆ skin,
- ◆ muscle,
- ◆ ligaments, and
- ◆ joint capsules.

All these tissues are supplied by sensory nerves. The pain is often widespread and difficult to localise.

The causes of primary back pain are:-

- ◆ fatigue,
- ◆ unaccustomed work,
- ◆ poor posture,
- ◆ trauma, and
- ◆ local pathological change, eg. rheumatism & arthritis.

Note: The discs have no nerve supply, so can be damaged without pain. The pain is often delayed for 24 hours or more, when other associated structures are injured.

Secondary Back Pain

Occurs when the spinal nerves are irritated, stretched or compressed. This nerve damage is the result of extra bony growth from the vertebra or disc encroachment.

Referred Back Pain

The back pain arises from another structure within the body. For example: a kidney infection. All referred back pain must be eliminated when investigating the causes of a back injury.

The most common areas that back pain occurs in are the cervical (neck) and lumbar (lower back) regions of the spine since these are the areas that allow the greatest movement and are hence the most susceptible to damage.

Reducing the Risk from Manual Handling

The manual handling regulations establish a clear hierarchy of measure to reduce manual handling risks

1. By removing the need for manual handling altogether, either by eliminating the necessity for moving the load or by using mechanical lifting techniques.
2. If this can not be done then a 'suitable and sufficient assessment should be made of the manual handling operation.
3. The introduction of a less hazardous method to move the load. This might be by reducing the weight of the load carried or using assistance to help lift the load.
4. Use of correct lifting techniques.

Lifting and Handling

In the past you may have been advised to keep your back straight and bend your legs when lifting objects. This is basically good advice. Before we examine good lifting techniques let us look at the problem of poor technique.

Poor Lifting Technique

The figure below shows a worker lifting a weight in the stooped position, with his trunk more or less horizontal. Simple mechanical calculations, based upon the principles of levers, show that he is undertaking a serious risk by his actions. Because of the distance the load must be counterbalanced by force exerted by the use of the back muscles. In practice this means lifting loads with the back in this position can cause a force of as much as ten times the weight of the load in the back. Any tension in the muscles which run down the back causes an equal and opposite compression on the spine itself which can result in damage.

When lifting heavy objects it is instinctive to hold your breath and tense the abdominal muscles. Although this is a natural protective mechanism and helps relieve the loading on the spine, it puts pressure on the abdominal area. However, there is a risk that certain regions of the muscle within the abdominal cavity can fail due to the pressure created. This why some manual handlers suffer from hernias due to lifting heavy weights.

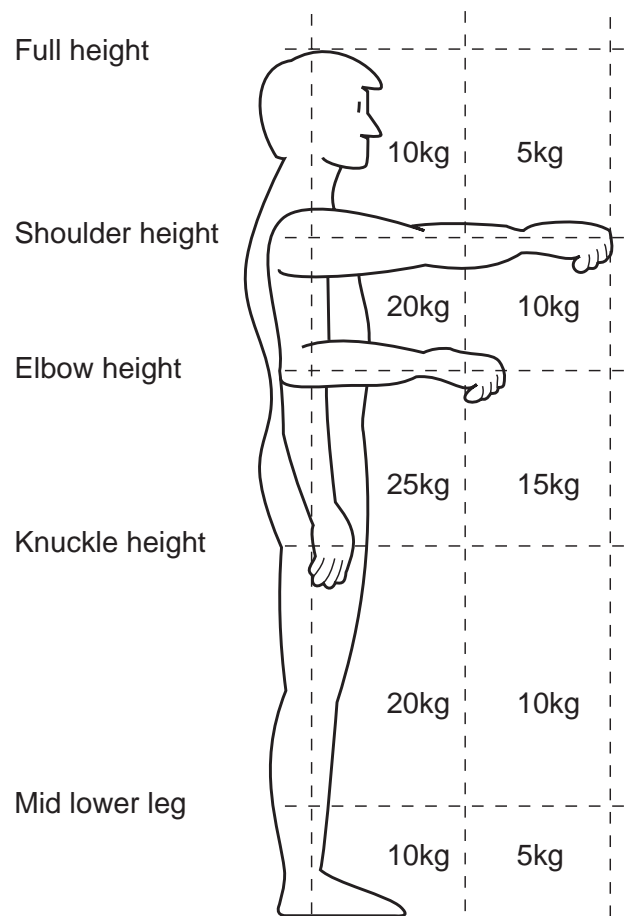


Static Loading

Static holding actions and stooped postures, are more fatiguing than dynamic muscle activity of a similar intensity and may result in a very much greater risk on the heart.

Amounts to be Lifted Safely

The amounts that can be lifted safely are set out in the diagram below. It is important to understand that these are guideline figures not limits. This assumes that the load is easily grasped with both hands in reasonable conditions.



The diagram demonstrates that if we lift loads from the floor, at arms length or above shoulder height we must significantly reduce the amounts we can lift.

There are other situations that also significantly reduce the amounts we can lift safely:-

Twisting

For a 45° twist in the body reduce the load by 10%.

For a 90° twist in the body reduce the load by 20%.

Distance

If you carry loads more than 10m reduce the loads.

Individual capability

If you are small you should reduce the load. If you are a woman you should reduce the loads by 33%.

Frequency of lifting

If you lift loads repetitively you should reduce the loads by these amounts:-

- ◆ Once or twice a minute reduce load by 30%.
- ◆ Five to eight time a minute reduce load by 50%.
- ◆ Twenty times a minute reduce load by 80%.

Safe Lifting

1. Check the Weight

Before you undertake a lift check the weight of the load. Push it or give it a kick to estimate its weight.

2. Stop and Think



Is it safe to lift this weight?

Can you avoid carrying it?

Can you use a trolley?

Think about where you are carrying it to: are there any doors that need opening or obstacles in the way?

5. The lift



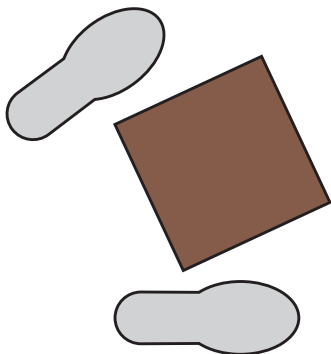
The lift should be smooth and without jerks and at a constant pace. Keep your head up and come up slowly. The load should be kept as close to the body as possible. If necessary the load should be put down on a table (or equivalent) and the load readjusted so that you can keep a firm hold on the package.

6. Lowering

This should be the same as the lifting procedure but in reverse. Care should be taken not to trap your fingers.

3. Feet Positioning

Your feet should be placed close to the obstacle but wide enough apart to ensure that your heels do not come off the ground. One foot should be placed slightly around the container pointing in the direction of travel.



4. Adopt a Good Posture



Get down to the level of the load by bending at the knees and hips.

Get a good firm grip on the package. As much of the hand as possible needs to be used rather than finger or pinch grips to reduce the forces being exerted.

Your back should be kept in an upright position which can be achieved by keeping the chin into the neck, looking straight ahead and tilting the hips forward.

Other considerations include:-

- ◆ is the working area free from obstruction?
- ◆ can the load/handles be modified?
- ◆ is there an off centre of gravity that should be kept close to the body?
- ◆ can the lift be completed without interruption?
- ◆ is a rest stop needed during the carry?
- ◆ are there slopes/stairs to consider?

Manual Handling of Loads - Assessment Checklist

<p>SUMMARY OF ASSESSMENT</p> <p>Operations covered by this assessment: _____ _____ _____</p> <p>Locations: _____</p> <p>Personnel involved: _____</p> <p>Date of assessment: _____</p>	<p>Overall priority for remedial action: Nil/Low/Med/ High*</p> <p>Remedial action to be taken: _____ _____ _____</p> <p>Date by which action is to be taken: _____</p> <p>Date for reassessment: _____</p> <p>Name: _____ Signed: _____</p>
---	--

* circle as appropriate

Section A - Preliminary:

- Q1 Do the operations involve a significant risk of injury? Yes / No***
 If 'yes' go to Q2. If 'no' the assessment need go no further.
 If in doubt answer 'yes'. You may find the guidelines in Appendix 1 helpful.
- Q2 Can the operations be avoided / mechanised / automated at reasonable cost? Yes/ No***
 If 'no' go to Q3. If 'yes' proceed and then check that the result is satisfactory.
- Q3 Are the operations clearly within the guidelines in Appendix A? Yes/ No***
 If 'no' go to Section B. If 'yes' you may go straight to Section C if you wish.

Section C - Overall assessment of risk:

- Q What is your overall assessment of risk of injury? Insignificant / Low / Med / High***
 If not 'insignificant' go to Section D. If 'insignificant' the assessment need go no further.

Section D - Remedial action:

- Q What remedial steps should be taken, in order of priority?**
- i
 - ii
 - iii
 - iv
 - v
 - vi
 - vii
 - viii.....
 - ix
 - x

And Finally

- complete the summary above
- compare it with your other manual handling assessments
- decide your priorities for action
- **TAKE ACTION AND CHECK THAT IT HAS THE DESIRED EFFECT**

Section B - More detailed assessment, where necessary:

Questions to consider: (If the answer to a question is yes place a tick against it and then consider level of risk)	Level of Risk: (Tick as appropriate)			Possible remedial action:
Yes	Low	Med	High	
The tasks - do they involve				
<ul style="list-style-type: none"> ◆ holding loads away from the trunk? ◆ twisting? ◆ stooping? ◆ reaching upwards? ◆ large vertical movement? ◆ long carrying distances? ◆ strenuous pushing or pulling ◆ unpredictable movement of loads? ◆ repetitive handling? ◆ insufficient rest or recovery? ◆ a work rate imposed by a process? 				
The loads - are they:				
<ul style="list-style-type: none"> ◆ heavy? ◆ bulky/unwieldy? ◆ difficult to grasp? ◆ unstable/unpredictable? ◆ intrinsically harmful (eg sharp/hot)? 				
The working environment - are there:				
<ul style="list-style-type: none"> ◆ constraints on posture? ◆ poor floors? ◆ variations in levels ◆ hot/humid/cold conditions ◆ strong air movements? ◆ poor lighting conditions? 				
Individual capability - does the job:				
<ul style="list-style-type: none"> ◆ require unusual capability? ◆ hazard those with a health problem? ◆ hazard those who are pregnant? ◆ call for special information/training? 				
Other factors -				
Is movement or posture hindered by clothing or personal protective equipment?				

Deciding the level of risk will inevitable call for judgement. the guidelines in Appendix 1 may provide a useful yardstick.

When you have completed Section B go to Section C.

Revision Questions

In order to assist you with passing the RSH examination we have prepared the following revision questions. Please take a few minutes to complete them before moving onto the next section of the course.

Q1. What is the back made up from?

.....
.....
.....

Q2. What is in between each vertebrae?

.....
.....
.....

Q3. How are the vertebrae held together?

.....
.....
.....

Q4. What are the common causes of back injuries?

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.....
.....

Q5. What are the common injuries suffered?

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.....
.....

Q6. How can the risks of manual handling be reduced?

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.....
.....

Q7. What are the key steps in lifting?

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.....
.....

Q8. What weight can you lift from the floor safely?

.....
.....
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Introduction

In 1996 there was an accident at Draycote water Sailing Club. Whilst turning a powerboat in a tight circle the console became detached and both occupants of the boat were thrown into the water. The propeller of the still moving boat then cut the passenger's leg quite badly. The HSE prosecuted the club which was fined £12,000 for lack of duty of care.

In another recent incident a company was fined £100,000 plus costs after pleading guilty to failing to ensure the Health, Safety and Welfare of its employees.

In this section we will look at the Control of Substances Hazardous to Health (COSHH), Personal Protective Equipment (PPE) and take an overview of the law, particularly the Health and Safety at Work etc. Act, 1974.

Control of Substances Hazardous to Health (COSHH)

Staff in the workplace may be exposed to substances that may harm their health. These may include chemicals used in their work or produced during a manufacturing process. COSHH also covers naturally occurring hazardous agents such as the Leptospirosis bacterium, the cause of Weil's disease. The purpose of the COSHH Regulations is to reduce the risk of ill health from hazardous substances

A substance hazardous to health is any material, mixture or substance used at work or arising from work activities that may be harmful to a worker's health. It applies to substances that have been classified as very toxic, toxic, harmful, corrosive or irritant under the Chemicals (Hazard Information and Packaging) Regulations 1993 and to any substances that have maximum exposure limits (MEL's). COSHH also covers substances that have delayed effects such as carcinogens, mutagens or teratogens and biological agents. This means that all hazardous agents are required by law to have warning labels on them.

Classifications of hazardous substances

Toxic

Toxins are chemicals that affect the body in various ways. They may damage the function of organs such as the kidneys or liver. Some toxins are lethal and result in death. Examples include methylated spirits, methanol, car spray paint etc.



Highly flammable

These substances ignite and burn easily releasing heat when in the presence of a flame. Extremely flammable substances require just a spark, even below 0°C. Examples include petrol, turps, paint solvents, defroster, adhesives and glues.



Explosive

An explosion is caused by an extremely rapid combustion. These substances can explode with catastrophic consequences. Examples include all aerosols when stored above 50°C.



Oxidising

These substances give rise to a reaction producing heat when in contact with other substances. They require a combustible material, oxygen and a source of ignition and combustion is greatly accelerated in the presence of these chemicals. The most oxidising substance is gaseous or liquid oxygen.



Corrosive

These chemicals rapidly attack materials or people. Hydrofluoric acid, for example, is so corrosive that it will eat through glass bottles, lab benches, people, the floor. Other examples include caustic soda, oven and toilet cleaners and dishwasher products.



Irritants

These substances affect the skin or respiratory system. Examples include bleach, turpentine oil, ammonia and polyester mastics



Harmful

These are substances that if taken into the body present a limited risk to health



Carcinogens, teratogens and mutagens

Exposure to carcinogens may result in cancers. Teratogens cause abnormal development in the embryo and should therefore not be used by pregnant women. Mutagens alter DNA structure and may affect the development of future generations.

Routes of entry into the body

Harmful substances can enter the body by three routes:-

Absorption

This may be through the skin (eg. chemicals), through cuts and abrasions (eg. HIV & Hepatitis B viruses) or through mucus membranes such as the eye (eg. chemicals or common cold/HIV/ Hepatitis B virus).

An example of an occupational disease caused by absorption of chemicals is scrotal cancer caused by absorption of oil in garage mechanics.

Ingestion

This involves eating a substance and is a rare way of contracting problems with substances in the workplace, although common with young children at home.

Inhalation

Breathing in substances is the most common way of taking industrial poisons into the body (90% by this route). It can result in direct damage to the lung tissue. Well known examples are coal dust resulting in emphysema in miners and asbestosis from breathing in particles of asbestos.

The Law

The Control of Substances Hazardous to Health Regulations 1994 (COSHH) require employers to protect the health of employees and other persons who may be exposed to hazardous substances at work. An employer must not carry out any work which is liable to expose any employees to hazardous substances unless these substances have been risk assessed for the purpose for which they are going to be used. The employer must also review these assessments systematically, at least every five years.

Employers must also ensure that exposure to hazardous substances is prevented, or where this is not reasonably practicable, adequately controlled. It should be noted that personal protective equipment is the last resort and other methods should be used first such as substitution with a less hazardous substance, enclosing the process, using extractor fans etc.

Undertaking a COSHH Assessment

The aim of a COSHH assessment is not carry out a complex analysis of risk but to make decisions about risks and what needs to be done about them on the basis of informed judgement. You should base you conclusions and assessments on what really happens and not what should happen, which can be very different.

1. Identify hazardous substances

2. Obtain safety data sheet from manufacturer

3. Assess the level of risk

If the substance is a hazard to health decide what you need to do in terms of:-

- ◆ preventing/controlling exposure,
- ◆ using control measures,
- ◆ maintaining control measures,
- ◆ monitoring exposure,
- ◆ health surveillance, and
- ◆ information, instruction and training.

4. Record the assessment

5. Review the assessment

Page 60 shows a sample COSHH assessment sheet.

Page 61 shows a sample safety data sheet for photocopier toner which is a low risk substance.

Using low risk substances

If you assess the risk from the substance as being low you may continue to use it, although you should do everything possible to reduce any risks.

Using medium risk hazardous substances

If a substance is medium risk and there is nothing safer:-

- ◆ follow manufacturers' guidance,
- ◆ store substances correctly,
- ◆ do not leave in unmarked containers,
- ◆ Keep flammable substances in a fireproof container,
- ◆ only allow trained staff to use it,
- ◆ personal protective equipment must be worn, and
- ◆ replace PPE when worn or damaged.

Using high risk substances

Do not use them!

Hierarchy of risk control

If you use a hazardous substance you should control your risks using the COSHH hierarchy of risk control. Try to do step one, if you cannot then move onto step 2 etc.

1. Eliminate the risk, do not expose staff to harmful substance at all.
2. Substitute the substance for one less hazardous, or a less hazardous form.
3. Control risks at source.
4. Protect all workers.
5. Protect individuals eg. by use of PPE as a last resort.

It is essential that the actions specified are put into practice. COSHH assessments are a waste of time if they just get filed away and nothing is done as a result.

COSHH Assessment Sheet



Company:

Address:

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Product:

Job task:

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Application:

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Equipment:

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Safety Data Sheet attached:

Yes

No

Risk Identification:

Hazardous components:

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Hazardous nature of components:

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Persons affected:

Duration of exposure:

Level of exposure:

Risk Category

low

medium

high

Control Measures:

For users:

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For others in location:

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Training requirements:

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Health surveillance:

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Reassessment due (whenever change in circumstances or at least every 5 years):

Date of assessment:

Completed by:

Signed:

Sample Safety Data Sheet

Photocopier Toner Refill - Low Risk Substance

SAFETY DATA SHEET

PRODUCT CODE Various	DATE March 1992
PRODUCT NAME Powder toner / Developer	DESCRIPTION Powder

MAJOR INGREDIENTS

THE FOLLOWING ARE PRESENT:

Two component toner: Synthetic resin compounded with pigment.
 Mono component toner: Synthetic resin, wax & iron oxide.
 Developer: Two component toner mixed with ferrite powder.

HANDLING PRECAUTIONS

GLOVES Yes	EYE PROTECTION No
PROTECTIVE CLOTHING No	OTHER PRECAUTIONS None

TOXICOLOGICAL DATA / EXPOSURE LIMITS

An LD₅₀ of >5,000mg/Kg. RAT is typical for materials of this type.
 Not mutagenic in Ames test. HSE EH44 guidance note recommends dust levels not to exceed 5mg/m³ for long term exposure to nuisance dusts.

EMERGENCY AND FIRST AID

INHALATION Unlikely. Remove from exposure to fresh air. Keep at rest.	INGESTION Substantially nontoxic, but if swallowed, consult a Doctor..
SKIN CONTACT Wash thoroughly with soap and fresh water.	EYE CONTACT Flush eye with large amounts of clean water. If irritation persists, seek medical attention.

FIRE HAZARDS

FLASH POINT N/A	EXPLOSIVE LIMITS N/A
AUTO IGNITION TEMPERATURE N/D	FLAMMABILITY CLASSIFICATION

EXTINGUISHING MEDIA
 WATER SPRAY - Yes FOAM - Yes CO₂ - Yes DRY CHEMICAL - Yes OTHER -

PHYSICAL DATA

CHARACTERISTIC ODOUR N/A	BOILING RANGE N/A	MELTING POINT N/D
SPECIFIC GRAVITY N/A	SOLUBILITY Insoluble in water	OTHER INFORMATION None

STORAGE

PROTECT FROM FROST No	PROTECT FROM DIRECT SUNLIGHT No	FLAMEPROOF AREA No
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MATERIALS/CONDITIONS TO AVOID:

Material can form explosive mixtures when suspended in air. All ignition sources should be avoided.

SPILLAGE AND DISPOSAL

Spillage should be swept up with a broom or vacuum cleaner. Small amounts may be disposed of with household garbage. For large amounts, consult with local authority.

CUSTOMER'S SIGNATURE:	DATE:
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