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SAFETY MANUAL FOR FORESTRY WORK

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INTRODUCTION

This safety manual for forestry workers has been jointly produced by the EFA and GEOPA and sets out the guidelines and best practices which those organisations regard as important for ensuring protection in forestry work and similar activities.

It can be used when planning the purchase of machinery, supplies and materials, in organising work, or if problems arise with machinery or in other aspects of work.

The manual therefore constitutes a valuable tool for employers and safety representatives required to participate in the above-mentioned tasks.

In order to acquire a more detail insight into the rules applicable etc., safety representatives, individual employees and employers must acquaint themselves thoroughly with the content.

It is also necessary for the employer to be familiar with the material for the purposes of promising the required instruction.

At the end of the manual there is a list of directives etc. which provide the background for the content of the individual sections.

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WORK ORGANISATION

The tasks and responsibilities of workers, supervisors and **contractors** should be clearly defined.

Clear instructions should be given to workers and **contractors**, in writing where appropriate, but at least verbally. These should include:

- job specifications;
- location of the work site;
- required tools and machines;
- identified risks and relevant safety rules;
- required personal protective equipment;
- information on rescue procedures in the event of an accident requiring evacuation;
- need for liaison with other workers, including any contractors.

Working methods, tools and equipment should be safe and comply with ergonomic principles.

If alternative working methods are available, the least hazardous in terms of safety and health should be chosen.

To reduce prolonged unfavourable working positions and workloads inherent to certain jobs, workers should be encouraged to practise job rotation among the members of their group. This should be supported by training in different tasks and by organisational measures.

No person should be required to work in a location which is so isolated that emergency assistance cannot be summoned. Forestry workers in isolated situations should be linked to their base or superiors by a reliable means of communication. Regular contact must be made during the workday, including contact at the end of the day. Where scheduled contact is not made, search and rescue operations should be undertaken immediately.

In any operation where felling, debranching and cutting with a chain saw is carried out, there should be a team of at least two workers who should be in visible or audible contact with one another. Exceptions to this requirement may be made for workers provided with a two-way radio or mobile telephone or other effective means of communication. Workers must always carry a mobile phone in their pocket when working alone with a chain saw and not in visible or audible contact with another worker.

Employers should conduct a briefing with workers before the start of work, to inform them of the findings of the workplace assessment and provide guidelines on how to deal with the hazards identified.

Supervision of work in progress should be entrusted to a trained and competent person.

If an operation becomes unsafe because of inclement weather conditions or darkness, it should be discontinued until conditions change to allow a safe resumption.

Where work during darkness is unavoidable, the site should be provided with enough lighting.

Where unexpected hazards are encountered or a task cannot be performed in accordance with safe methods, the work should be stopped and the competent supervisor consulted on how to proceed.

Where several crews, contractors or self-employed persons are working on the same site, arrangements need to be made to ensure coordination and to assign and communicate responsibility for supervision.

In the event of work which poses a threat to the safety of visitors, including the general public, unauthorised entry should be prohibited by signs, such as “danger, tree felling” or “no entry, timber operations”.

MOUNTAIN WORK

With regard to forestry work in the mountains, ensuring safety involves four main types of consideration:

- topographical (steep slopes, heights, nature of the ground),
- geographical (distance from roads and inhabited areas),
- ecological (protection of fauna, flora and tourism interests),
- climatic (snow and rain, which weaken the ground).

Against this background, persons who have to undertake forestry work in the mountains must know and apply all the specific rules needed to protect their own safety and that of others.

These rules cover the following five aspects:

- working methods,
- marking of work sites,
- personal protective equipment,
- tools,
- first aid.

Working methods

The high value of wood (especially construction timber) and the obstacles caused by the terrain mean that forestry workers in the mountains, in order to ensure the safety of themselves and others, must be fully conversant with working methods, protection of the environment and storage of timber. Such know-how which can be acquired only through a combination of training and practical experience.

Trees must be felled by experts who know how to control the fall (chipping, cutting rule) and how to fell trees on slopes.

The processing of felled trees requires a good knowledge of trimming, sawing of knots, log dressing and cropping.

Timber felled in the mountains has to be removed using tractors fitted with one or two winches, owing to the steepness of the slopes and the long distances along forest tracks to the storage area. The tractor must be placed on the track and the logs secured with the greatest possible care, in order to prevent the logs from breaking loose or the tractor from being dragged down the slope, which are the causes of many accidents to forestry workers in the mountains. At the same time it is necessary to protect the trees along the tracks (packing with earth to avoid damage and to keep the logs on the track) and the watercourses passed (building of temporary ditches or bridges to prevent pollution).

Finally, the logs must be laid down in the storage area in stable piles in order to minimise the risk of collapse, and the area must be marked in order to warn any rambblers of the risk in the vicinity of the storage area.

Marking of work sites

In the same way as areas where logs are stored, it is necessary to mark work sites to inform the various users of the woods of areas where hazardous work is carried out.

For this purpose, “work site” notices can be placed at the entrance to working areas and on all access roads. These should be hung on trees, for example, and should contain information on the activities, the company or person responsible, the nature of the work, the exact location, and the risks incurred by any unauthorised persons entering the area.

Personal protective equipment

It is possible to work in the mountains using the normal safety equipment for forestry workers (helmet, ear defenders, eye protectors, safety boots and safety overalls).

However, safety and comfort can be improved by using more suitable equipment.

As the majority of work accidents are caused by slipping, boots are of vital importance.

Safety boots with ankle protection, waterproofing, padding, double lacing (hooks and eyes) and soles which are anti-perforation (steel plate enclosed in rubber) and non-slip

(very thick rubber or with large pimples) improve workers' footholds and walking comfort substantially.

Helmets of the type used by mountaineers give a high level of comfort owing to their lightness, and the chin strap ensures they remain in place. They also allow workers to see better than traditional helmets. However, it is essential to provide additional protection for the ears and face.

Tools

As a result of the terrain and access conditions (steep slopes and long distance between forestry workers' vehicles and the work site), the transport of material to the site is often difficult.

There are various types of backpack for chain saws and small items, which allow workers to keep their hands free.

Some forestry workers also use own sleds consisting of plastic containers with a content of between 50 and 200 l, divided longitudinally into two sections and equipped with a rope attached to the end. These can be used for collecting material and transporting it over most terrains.

First aid and emergency assistance

A first aid kit is an important and compulsory safety item which must always be on the spot, especially in the mountains, where workplaces are geographically isolated and a long way from workers' vehicles.

The kit must contain:

equipment for major emergencies (minimum equipment)

- anti-haemorrhage pad (or compression bandage)
- isothermal survival blanket
- disinfectant (for washing hands)
- disposable gloves
- mouthpiece for mouth-to-mouth resuscitation (to be used by trained persons)

products

- antiseptic solution (colourless)
- eye drops or dacryoserum
- sterile bandages (individually packed)
- elastic bandage
- roll of plaster
- self-adhesive bandages

instruments

- splinter tweezers
- scissors with round ends, sharp-edged
- safety pins

Especially in the mountains, products to combat insect poison and snake-bite serum are recommended.

Equipment must be kept clean, and products with a limited lifetime must be checked regularly and replaced when necessary. Finally, every person working in the forest must attend first-aid training so as to be able, in the event of an accident to:

- avoid a further accident,
- examine the victim (for bleeding, unconsciousness, breathing, blood circulation, etc.),
- send for expert emergency help, or ensure that it is sent for,
- stop major bleeding,
- perform mouth-to-mouth resuscitation if the victim stops breathing,
- perform mouth-to-mouth resuscitation and heart massage if the person stops breathing and the heart stops beating,
- place an unconscious but breathing victim in the lateral safety position,
- know how to deal with a person who has suffered burns, wounds or broken limbs.

If first-aid training has not been provided, every forestry worker must know how to protect an accident victim and how to send for emergency help or ensure that it is sent for.

WORKPLACE ASSESSMENT

Health and safety legislation requires work to be planned, organised and carried out in a fully responsible manner. Part of the basis for this is an assessment of health and safety conditions at the workplace.

A workplace assessment with significant safety and health implications must be in writing.

A workplace assessment is a general assessment of working conditions in the company. It sets out the safety and health problems and explains how they can be solved. Safety and health conditions must be identified and assessed, and a plan of action must be drawn up with a view to solving the problems, together with guidelines for following up the plan of action.

How much has to be written down will depend on the nature and extent of the hazards observed, the size of the company, the type of organisation, etc.

The written workplace assessment must be kept in the company and must be accessible to employees and the labour inspection service. It must be revised when working procedures, processes or methods are changed in a manner likely to have a significant impact on safety and health at work, if an occupational accident occurs in the company, and at the latest every three years.

Smaller companies do not usually have to produce a written workplace assessment if the risks and hazards are minor. Smaller companies, in this context, are those which are not obliged to set up a safety organisation and where cooperation on safety and health takes the form of personal contact between the employer and employees.

It is the employer's responsibility to prepare and update the workplace assessment, but he must also involve the safety organisation or employees in planning, producing and implementing it, and also in following it up.

A workplace assessment can become a useful tool in ensuring health and safety at work, if it is implemented through close cooperation and dialogue between management and workers.

When preparing a workplace assessment it might also be necessary to call in external consultants.

SCAFFOLDING AND MOBILE LIFT DEVICES

Scaffolding and mobile lift devices such as sky lifts with a work platform are designed to lift persons and materials up to the height at which work has to be carried out.

They consist of a work platform or cradle mounted on a mechanically powered lifting device which raises it to the required height and position.

Mobile and stationary lift devices purchased after 1 January 1997 must bear the CE mark.

Only persons over 18 who have been properly trained may operate lift devices.

Assembly, operation and maintenance instructions in the user's language must be supplied with lift devices and kept in the vicinity.

A summary of the most important safety rules contained in the instructions must be clearly displayed on a durable signboard on the work platform.

At the entrance to the work platform there must be a sign indicating the authorised load in kg and the authorised number of persons and other loads.

The work platform must be fitted with a guard rail (1 m high) with hand rails and protective knee and toe boards on all sides, and a non-slip floor surface. It must be possible to close the cradle gate properly. The barrier must prevent tools etc. from falling out. Staggered hand rails may also be required, together with a safety belt or short rope to prevent falls.

Work platforms may not be used in gusty weather or when the wind force exceeds the limit authorised according to the instructions for the specific platform, as there is a risk that it may tip over.

Equipment must stand on a firm and stable surface, with the load-bearing structure upright. The support leg must be used.

Lift devices may not be moved to another location while there is someone in the cradle.

The controls (push buttons or levers) must be designed so that movement stops when the operator lets go (deadman's handle). They must be positioned in such a way that they cannot be activated accidentally. In the event of a breakdown it must be possible to lower the platform from the ground. For this reason there must be at least two people present, one of them on the ground.

It should not be possible to operate the lift device from anywhere but the cradle. In an emergency, however, the cradle may be lowered from the ground. The person in the cradle must wear a safety belt and life line attached to the structure of the lift device.

Lift devices must be inspected and checked before being brought into operation on any occasion/daily and also according to the supplier's instructions. At least one main inspection a year must be carried out by the supplier or another expert.

A logbook must be kept, normally located on the device. It must contain technical documentation on the lift device in question.

WORKING CLOTHES

A distinction is made between ordinary working clothes and those designed to function as personal protective equipment.

Ordinary working clothes must be suitable for work. Boiler suits or overalls which are loose and comfortable are the most suitable.

Working clothes should not be tight or impede movement. It should not matter if they get dirty, and it should be possible to wash them repeatedly and to repair them. They must prevent heat loss when it is cold, they must be rainproof and windproof, and they must allow body heat and humidity to escape. In other words they must minimise temperature changes and draughts.

It is also important for working clothes to cover the lumbar region so that they do not come adrift in the middle when the wearer bends over, thus cooling the muscles and causing a chill.

Underwear must allow good air circulation and absorb body humidity and sweat. It should be tight-fitting. A thermal vest is useful.

Underwear made of artificial fibres is available which does not absorb humidity, but on the other hand is so thin that the body heat forces the humidity and sweat out through the underwear to the outer garments. This keeps the area next to the body warm and dry all the time.

The garments worn over underwear should keep heat in and should be appropriate to the season, e.g. a shirt, pullover and overalls.

Outer garments should provide protection against wind and weather but should not be too heavy or inhibit movement. The material should be smooth, water-repellent and breathable. A boiler suit or overalls with jacket is advisable. Artificial fibres are generally discouraged, as they are often highly inflammable.

Wear a hat and woollen gloves if it is cold. In summer, a hat which provides protection from the sun is advisable in order to avoid the risk of a headache from squinting.

It is recommended that workers have two or more sets of middle and outer garments.

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment is clothing designed to protect workers from one or more of the risks to their safety or health at work. It includes oilskins, rainwear, thermal wear and fireproof clothing.

See also the sections on individual types of personal protective equipment.

PESTICIDES

Pesticides are active agents used to kill or deter pests or control vegetation growth.

Work with pesticides must be planned and organised in such a way that safety and health is ensured. Before spraying begins, the risk level associated with the pesticide must be assessed by checking the label and the supplier's and workplace instructions.

All pesticides must bear a label and directions for use, explaining how and where they can be used. The label and directions for use must be in the user's language. The directions for use on the label should not be confused with the statutory supplier's and workplace instructions.

Pesticides bearing a danger symbol must also be accompanied by supplier's instructions when purchased. If these instructions are missing, they can always be obtained from the supplier.

The supplier's instructions may form part of the label. It is important for all the following points to be covered in detail.

Use of personal protective equipment

Personal protective equipment and special working clothes must be used when mixing and applying chemical pesticides.

It is important to use protective equipment correctly and to ensure that it fits and affords the proper protection. Personal protective equipment is for one particular individual and should not be used by others.

To find out what personal protective equipment to use, read the label and workplace instructions carefully, so as to be clear about the risk class and any risk phrases. When you buy protective equipment, the supplier will be able to tell you what pesticides it protects against.

Workplace instructions must indicate which protective equipment is suitable for the task to be performed.

Personal protective equipment must be cleaned after use in accordance with the supplier's instructions. In the absence of instructions, it should be washed in soapy water and properly dried. It must be cleaned after every use, even if the work is to continue the next day.

You must be absolutely sure that all pesticide residues have been removed from inside boots, clothing and personal protective equipment.

NB: filters cannot be cleaned, but must be replaced in accordance with the supplier's instructions.

When you wear protective clothing, boots and gloves, the skin becomes hot and sweaty and hence softer, making it more prone to absorption. For this reason you must ensure that there are no holes in equipment. It is advisable to wear cotton gloves under protective gloves, as well as a type of underwear which draws off perspiration while you are working.

Respirators must be looked after carefully. The supplier's guidelines must be precisely followed. Respirators are best kept in a dark and airtight place to keep them supple.

The lifetime of filters is increased if they are kept in an airtight place. Work while wearing a respirator must not exceed three hours a day.

So as to avoid contamination with pesticides, personal protective equipment, including clothing, must be kept separate from other working clothes and should not be stored in the same place as pesticides.

It is of course important for personal protective equipment to be in good condition, but it will provide real protection only if combined with a high level of personal hygiene.

Personal hygiene means washing your hands and face and removing working clothes before eating, drinking or smoking, so as to avoid absorbing small quantities of pesticides.

If you get spray on your skin, wash the contaminated area immediately with plenty of soap and water. This is one of the reasons why you should always take along clean water and soap when working in the field.

You should also wash your hands **before** going to the toilet.

The employer is responsible for ensuring that all items of protective equipment, including respirators, are kept in good condition so as to provide the necessary protection.

PRUNING FROM A SKY LIFT

Pruning trees from a sky lift can be dangerous for those working in the sky lift, i.e. the chain saw operator and any assistant.

As a general rule, there should be only one person in the cradle during pruning with a chain saw. However, there may be instances when it is necessary to have two people in the cradle, in which case they must be made aware of the potential danger.

Guidelines for pruning:

- Before starting work with a chain saw, remove all smaller branches with a diameter of up to approx. 10 cm with a hand saw.
- Before starting to use a chain saw, run a lowering rope around the trunk and over a branch or lowering sling and fasten it to the branch to be sawn off using a double bend; then secure it with a lockable snap hook.
- The pieces to be sawn off should not be too heavy for a person to carry.
- The assistant, located at the opposite end of the cradle, should hold on to the free end of the lowering rope.
- Do not lower the branches that have been sawn off until the chain saw has been switched off and put in its holder.
- Start and stop the chain saw outside the cradle.

By following these instructions you will avoid the risk of the chain saw operator being hit by the branches sawn off or the assistant being hit by the chain saw.

When working with a chain saw, the operator and assistant must wear safety helmets, ear defenders, goggles, and trousers and boots with a cut-resistant lining.

See also the section on scaffolding and mobile lift devices.

DISPOSAL OF CHEMICAL RESIDUES AND EMPTY PACKAGING

Agricultural, forestry and gardening companies using pesticides are responsible for the proper disposal of empty packaging and any pesticide residues.

If allowed according to the label, small amounts of empty and thoroughly cleaned packaging can be disposed of through the normal refuse collection. No type of empty packaging may be burnt.

Cleaning packaging:

Before packaging is disposed of, it must be absolutely empty and clean. When preparing spray solutions, the packaging must be rinsed with water three times to get all the contents out and into the spray solution.

The outside and/or inside of highly contaminated packaging must be rinsed in a place where none of the rinsing water can run into sewers, watercourses, lakes, drains, etc.

It is particularly important to ensure that the water does not run into wells.

Storage of empty packaging:

Empty packaging must be stored in the same way as when it is full or partly full.

Chemical waste

If special rules have been issued for the disposal of chemical waste, stipulating for example that it must be delivered to the municipal reception facility, these rules must be complied with.

CE MARK

All general machinery and personal protective equipment purchased after 1 January 1995 must carry the CE mark.

The CE mark is a guarantee that the machine or personal protective equipment fulfils the safety requirements of the current EU legislation.

Furthermore, all newly purchased machinery acquired after 1 January 1995 must also bear the following:

- the name and address of the manufacturer

- Industrial trucks, certain types of civil engineering plant purchased after 1 January 1996 and lift devices for persons must carry the CE mark,
 - series specification or type designation,

- serial number if applicable,
- year of manufacture.

ELECTRIC HAND TOOLS AND ELECTRICITY SUPPLY

When electric hand tools are used outdoors, cables, plugs and sockets must be heavy-duty, hard wearing and resistant to moisture and oil. Plugs and sockets must be of the green/red type or made of neoprene.

Tools with single insulation must be earthed and must be inspected by an expert at least every two months.

Tools with double insulation should not be earthed and must be inspected by an expert at least every six months.

The type plate on the tool will show how it is insulated.

Damaged or defective equipment may not be used, must be taken out of service immediately, and must be repaired before it is used again.

Electric hand tools must be fitted with a contact so that they can operate only when the contact is pressed in (deadman's handle). The contact must be designed in such a way that the operator does not have to keep the hand or finger in a particular fixed position while using the machine over a long period.

Fail-safe devices may not be removed or blocked so that they do not work as intended.

Young persons under 16 may not use grinding, polishing, slicing or similar dangerous machines.

New electric hand tools must carry the CE mark.

SINGLE-AXLE MACHINES

Rotavators, cutters, and other single-axle machines operated by a person who is walking must be fitted with a deadman's handle (grip) so that the machine stops as soon as the grip is released.

Anyone using machines on public or private roads, including forest roads intended for vehicles, must comply with the traffic regulations, e.g. brakes must comply with the law.

The machine must always be inspected before starting, because the driver is responsible under the traffic regulations. Illegal machines may mean fines, imprisonment or loss of driving licence.

Exhaust fumes must be discharged in such a way that they do not disturb the driver, e.g. angled out to the side at high speed.

Machine noise must be suppressed as far as possible. If it is over 85dB, ear defenders must be used.

Where there is a risk of damage to the toes (e.g. when going backwards), safety boots with toe-caps must be worn.

Machines must be set up so that they can be safely operated with a light hold on the handlebars. Vibration must be suppressed, for example by means of rubber suspension and rubber handlebar grips. Machines and tools must be serviced regularly in order to keep vibration as low as possible.

Gloves must always be used when working with vibrating machines.

If a single-axle tractor has a trailer and the driver sits down while driving, he or she must have a driving licence for cars or tractors, except where driving on roads which are clearly closed off (e.g. for road works) or to which there is no public access.

The age limit for operating rotavators, cutters and other single-axle machines is 18.

All new single-axle machines must carry the CE mark.

REPETITIVE WORK

At company level, it is the responsibility of each employer to ensure that consideration is given to the debate on, and survey of, repetitive work.

Companies in which repetitive work is carried out should draw up an action plan containing proposals on what must be done within the company to minimise the amount of repetitive work.

In larger companies it is the safety organisation which must take the initiative. In smaller companies with no safety organisation, the action plan must be drawn up through cooperation between management and labour.

The survey of repetitive work will form a natural part of the workplace assessment. The problems caused by repetitive work in the forestry sector include:

- tennis elbow, tendonitis, back pain and knee problems.

Tennis elbow and tendonitis are caused by very repetitive movements involving the elbow and wrist, e.g. repetitive precision control operations using the hands.

Back pain is caused by heavy lifting, working with a chain saw, and wrenching one's back, for example when operating machinery.

Knee problems are caused by jumping down from machines, working on hard surfaces, etc.

To reduce the amount of repetitive work, and hence to reduce or prevent injuries, it is important during the course of the day to switch between different tasks and postures, e.g. between work carried out while sitting, walking and standing.

Changing between different tasks and postures makes work more varied, thus giving individuals a chance to perform more meaningful work.

CHIPPERS (WOOD HOGS)

Material which has become lodged must not be removed until the machine, i.e. the motive power (e.g. tractor), has come to a complete halt. The feeder must be long enough to make it impossible for an arm or leg to reach the blades or rollers. Gloves must be worn during work.

Chippers designed to be loaded mechanically may not be loaded manually.

Chippers often produce more noise than the permitted 85 dB(A), in which case ear defenders must be used. Noise must be suppressed as far as possible.

Stored chips may harbour fungi and fungal spores which can give rise to allergic infections. Dust masks must therefore be used when handling dusty or mouldy chips.

Dust, fibres, etc. are generated during work with chippers and this can present problems. Tightly fitting dust masks and possibly goggles must therefore be used.

Chippers must bear the CE mark.

FELLING AND LOGGING WORK

During felling and logging it is important to ensure that no one is in the area where the tree is going to fall. This is also important when several people are involved in felling and logging at the same time. Felling on hilly ground must be organised so that there is no risk of the tree rolling or sliding after felling.

An escape route must be established before felling, e.g. sloping away from the direction of fall.

Forestry work involves a significant risk of cuts and scratches, and vaccination against tetanus is therefore recommended. The vaccination lasts for around ten years, after which revaccination is necessary.

The following protective equipment must always be worn when using a chain saw for felling, logging or pruning:

- helmet (type B)
- ear defenders which reduce noise to less than 80 dB(A)
- eye protection
- safety trousers
- safety boots with toe-caps and cut-resistant lining.

Instruction

Workers assigned to felling and logging work must first be given safety training covering safe behaviour, limitations on working alone, removing hang-ups, and contacts with employers and fellow-workers.

Topping

High trimming and topping involving climbing may be carried out only by persons who have taken a course in topping, basic or advanced climbing, or similar. Exceptions to this are high trimming and topping from a work platform.

Technical aids:

An undercut must be made before felling trees more than approx. 12 cm thick at chest height. This, together with sufficient dog boards, will ensure that the tree falls in the right direction.

In windy conditions there is a risk that the wind pressure will prevent the tree from bending in the desired direction (following the undercut). A backcut must always be made when using a chain saw to fell trees more than approx. 25 cm thick at chest height.

Appropriate technical aids (hammers, wedges, gunning stick with peavey) must always be available to make the tree fall in the right direction.

When felling is taking place near houses, roads, electricity lines, etc., a winch must be used with a steel wire rope which is long enough for the operators to be outside the range of the falling tree.

Lodged trees (hang-ups):

The employer must ensure, when hang-ups are being dislodged, that established working instructions are followed and that these clearly describe the procedures to be used and the order in which they are to be carried out.

Examples of aids in order of priority:

1. gunning stick with peavey;
2. peavey or bar with a moment arm of over 2 m.;
3. lever to move the lodged tree backwards;
4. hand winch;
5. if it is not possible to dislodge the tree by one of the above four methods, the falling range must be roped off before the tree is left.
6. tractor-mounted winch.

A hang-up may not be dislodged by cross-cutting or felling the tree in which it is lodged.

No work must be done under a hang-up.

Working alone:

Workers must not work alone while cutting windfalls free, high-trimming or topping standing trees, or dislodging hang-ups.

Hang-ups which are small enough not to be dangerous (which can be dislodged with an ordinary peavey) may, however, be dislodged by a person working alone.

Logging must be organised so that each individual logger has regular contact with another person on occasions evenly distributed over an ordinary working day.

Logging inspection rounds may be replaced by radio or mobile telephone. If radio and mobile telephone contacts are to be used, the base must know where the individual workers

are, and it must be physically possible to provide help if needed. There must also be an arrangement for personal contact in the event of the failure of radio or telephone contacts.

FIRST AID

Since it is common for forestry workers to work in small groups and even alone at separate locations, every worker should be trained in basic first aid. This training should include the treatment of open wounds and resuscitation. In areas where the work involves the risk of intoxication by chemicals or smoke, snake-bites, insect-bites, spider-bites or other specific hazards, first-aid training should be extended accordingly in consultation with an appropriately qualified person or organisation.

First-aid training should be repeated at regular intervals to ensure that knowledge and skills do not become outdated or forgotten.

The provision of first-aid facilities and trained personnel should be prescribed by laws and regulations.

Well-maintained first-aid kits should be readily available at the work site and should be protected against contamination by moisture and debris. They should be clearly marked and contain nothing other than first-aid equipment.

Workers should carry in their pocket a small personal first-aid kit containing the most essential first-aid supplies.

All workers should be informed of the location of the first-aid equipment and the procedure for obtaining stocks.

Rescue

Provision should be made for the quick evacuation of a person in the event of an injury or illness requiring medical assistance.

Transport or a means of communication should be available at the work site to contact the rescue services in case of an emergency. The functioning of the communication line should be checked.

All workers should be informed of the telephone number or radio call sign of the nearest hospital, ambulance station or doctor. Information should also be given on the location of the work site and a meeting point for transportation.

Vehicles for transportation to a point where an ambulance can be met should be always available. If practicable and appropriate, helicopter landing areas should be designated and made known to all personnel present at the work site.

FORK-LIFT TRUCKS AND PALLET FORKS

Fork-lift trucks which have a mechanical load lifting device on one side of an upright post may be driven only by persons over 18 who hold the appropriate certificate.

It is possible to drive a fork-lift truck without a certificate if the lifting height does not exceed 1 m or the truck is guided by rails. The lifting height must be restricted either by a fixed stop or by a built-in key stop.

Agricultural tractors fitted with a fork-lift unit with a lifting device on one side of an upright post may be driven for agricultural purposes without a certificate if the lifting height does not exceed 3.3 m. However, the driver must have a tractor driving licence. There are no exemptions where agricultural tractors with a fork-lift unit are hired out by machinery stations etc.

The driver's cab on a fork-lift truck must be covered to provide protection from falling objects.

A fork-lift truck may occasionally be used as a lift for persons carrying out light work, e.g. changing bulbs or fluorescent tubes, light assembly work, cleaning, painting, etc. The truck must be fitted with an approved cradle. The maximum load for the cradle is two persons. The driver must hold a certificate. There are instructions on steering, lifting height, weight limits, operating, etc.

The truck must have a log book containing all necessary information.

COMMERCIAL FERTILISERS

Ordinary commercial fertilisers are not classified as dangerous substances. As a result, only the normal rules for chemical substances and materials apply.

Persons working with commercial fertilisers should avoid breathing in the dust.

If high dust levels arise during work, respirators should be worn. Skin contact should also be avoided, and gloves must therefore be worn. Eye protection may be necessary.

Wind direction must be taken into account when handling fertilisers.

Safety measures for storage:

Nitrogenous fertilisers - particularly NPK types, in which the three main fertilising substances are nitrogen, phosphorous and chlorides in varying proportions - can, in the event of intense heat, emit a variety of gases (some of which are toxic), such as oxides of nitrogen or chlorine.

The nitrous fumes which may be emitted during burning present an insidious risk, in that a person can breathe in dangerous concentrations without really noticing. The suffocating symptoms do not appear until a few hours later when the lung tissue has been damaged (oedema).

In the event of a fire in a building where NPK fertilisers are stored, the fire service must immediately be informed of the quantity and location. Breathing apparatus is essential. A large quantity of water is the only effective way of dealing with such a fire (foam, carbon dioxide, steam or attempts at smothering with sand or fertiliser will have no effect at all).

Preventive measures:

- fertilisers may not be stored in the vicinity of large quantities of flammable substances;
- fertilisers may not be stored where there is a risk of severe heat (e.g. near a gas-fired grain dryer, electric motors, cables, etc.);

- smoking is strictly prohibited.

Under normal conditions, fertilisers should not present a risk.

GLOVES

There are no rules or type-approvals for the various types of gloves used in agriculture. Nor is there any form of goods declaration for gloves. All gloves must, however, bear the CE mark.

Nevertheless, the following recommendations can be made with regard to different types of work:

- When working with vibrating tools such as vibrators, chain saws, hedge cutters and the like, work gloves with a vibration-absorbing lining are recommended. However, the effectiveness of vibration-absorbing linings in gloves is questionable.
- When working with chemicals it is recommended that work gloves be worn which are suited to the particular task and have been tested with the substances concerned. Only disposable gloves should be worn, and they should be changed once they have become contaminated with pesticides.
- Heavy-duty rubber or plastic gloves are recommended when handling concentrated spray solutions.
- For handling stone, tiles etc., cotton gloves with rubber facing or leather gloves are recommended, as they are the most hard-wearing.
- Fur-lined gloves are recommended in winter, so that the hands and fingers are not unnecessarily exposed to the cold.

Irrespective of the type of rubber or plastic glove used, it is always advisable to wear a cotton glove inside the protective glove so that hands remain dry. Wet or sweaty hands are more likely to absorb substances, increasing the risk of eczema.

Reusable gloves must be rinsed before removal and replaced when contaminated with pesticide.

Gloves with holes or tears must be discarded.

Disposable gloves must be discarded after one use, i.e. the first time they are removed. If they become contaminated with a pesticide during work they must be changed without delay.

It is always good practice to start each day with a clean pair of protective gloves.

HELMETS

The protective helmet is an item of personal protection equipment. It must be adjusted to fit the person wearing it.

Helmets are to be used where there is a risk of being struck by falling objects and when felling, logging or pruning etc. is being carried out using a chain saw.

Employees must be instructed in the use of helmets and warned of the dangers of working without one. Instruction should cover the correct adjustment, maintenance and storage of helmets.

Employees must wear protective helmets when required.

Instructions for the use of a helmet in the user's language must be supplied with the helmet. These instructions must provide information on the protection afforded, and the correct adjustment, use, maintenance and storage of the helmet.

The helmet's type identification is shown inside the helmet.

If a helmet and ear defenders are to be worn together, the helmet must be of an appropriate design.

A cracked helmet or one which has been subjected to a powerful impact or crushing force must be discarded.

Information on a helmet's durability can be obtained from the supplier.

No aspects of a helmet's design must be changed (for example by drilling holes) and helmets must not be painted.

Suppliers may only sell helmets which bear the CE mark.

HEDGE CUTTERS

The level of vibration must be kept as low as possible. Always choose the hedge cutters with the lowest vibration level on the hand grips

The vibration level must be indicated in the instructions for use.

Gloves with a vibration-absorbing lining should be worn.

Safety equipment supplied with a hedge cutter must be fitted and never removed except for repairs to the cutter.

Special rules apply to young people under 18. See the section on "Young people working".

Power hedge cutters

- Power hedge cutters must be designed for two-handed operation.
- Between the front handle on the cutters and the blade there must be a guard which keeps the front hand clear of the blade if it slips and which keeps the clippings away from the hand.
- Hedge cutters must have a sheath or similar protection for safe transport.
- Power hedge cutters must be designed to minimise the risk of the blade injuring the operator if a hand slips from the grip.

It is considered acceptable if the blade's stopping time does not exceed two seconds from the release of a grip and,

- if the power cutters either have a deadman's lever on both grips so that the motor stops or the blade is disengaged even if only one of the grips is released, or
- the power cutters are designed in such a way that the opening between the blades is 8 mm at most.
- Hedge cutters driven by a combustion engine must automatically switch to idling speed and disengage the blades if the throttle is released.

Electrically powered hedge cutters:

- Electrically powered hedge cutters must have motors which are operated using a deadman's lever which automatically reverts to stop if the lever is released.
- Hedge cutters operating on 220 V can be conveniently powered from a mobile generator. This affords greater protection from electric shocks.

For outdoor work the cables, plugs and sockets must be heavy-duty (green/red or made of neoprene), i.e. resistant to moisture and low temperatures. A low-noise generator should be used.

The work must proceed in such a way that the cables are pulled behind the operator.

Hedge cutters should be insulated against moisture to prevent electric shocks.

The level of vibration should be as low as possible. When selecting hedge cutters the model with the lowest level of vibration to the grips should be preferred.

Gloves with vibration-absorbing lining should be worn.

Safety equipment supplied with hedge cutters must be fitted to the cutters and must not be removed other than to repair the machine.

Before repairing the cutters, switch off the power and pull out the plug. If a generator is used, it must be turned off. Electrically operated hedge cutters should not be used in the rain.

All new hedge cutters must bear the CE mark.

HIGH-PRESSURE CLEANERS

When high-pressure cleaners are used, personal protective equipment should be worn, e.g. overalls (or waterproof clothing plus hat), long gloves, non-slip boots, ear defenders and possibly also face protection and a respirator supplying fresh air.

High-pressure cleaners must be fitted with two grips.

The operating grip must be designed in such a way that the water jet automatically shuts off when the trigger is released. Where pressure exceeds 100 bars both grips must be fitted with a trigger incorporating an automatic cut-off function. It is illegal to jam the trigger.

The lance must be fitted with quick-lock couplings so that it is only possible to operate the equipment with fittings designed for it.

The nozzles used should produce small amounts of "large" droplets, which remain suspended in the air for less time.

Owing to their weight and the difficulty of moving them, high-pressure cleaners can cause back or joint injuries. Vibrations in the hose and the equipment itself can also cause white finger. These risks increase in cold and wet conditions.

Cleaners which operate with hot water may not be used indoors or at other poorly ventilated locations due to the combustion gases from the oil burner used for heating.

Before repairing or servicing high-pressure cleaners, the pressure must be released.

The water jet must not come into contact with electrical installations.

High-pressure cleaners may not be used on asbestos roofs.

Special rules apply to young people under 18. See the section on "Young people working".

EAR DEFENDERS

Ear defenders are items of personal protection equipment and must be adjusted to fit the person wearing them.

Ear defenders must be supplied with information on the level of protection and the frequencies protected against. This makes it possible to assess which ear defenders (possibly several types) will provide sufficient protection against noise. Individual users can then choose those which suit them best among those providing sufficient protection.

Ear defenders must be worn throughout the work in order to ensure the expected protection.

There are two types of ear defenders: ear muffs and ear plugs.

Ear plugs are inserted into the auditory canal. They may be of the disposable or reusable types, which can be shaped to fit the aural canal. The most common ear plugs of this type are made from glass wafer or expanded foam.

There are also rigid ear plugs in various sizes which are adapted to various diameters of auditory canal or are individually shaped. The most common ear plugs of this type are made from plastic, rubber or wax. It is important to use the correct size of rigid plug. There may be a difference between the right and the left ear.

Glass wafer or expanded foam plugs must be shaped carefully, and the hands must be clean. Dirt in the auditory canal can cause skin irritation and eczema.

Ear muffs enclose and cover the ear and part of the head. They are held in position by an adjustable band or belt which is adjusted to fit the head. Some ear muffs can be fitted to helmets. The soundproofing cushions should be inspected regularly and immediately replaced if they begin to crack or are damaged.

Ear defenders must be adjusted to fit the person using them. All ear defenders should be accompanied by information on, among other things, their efficiency and which frequencies they protect against.

This shows which ear defenders (possibly a number of different types) offer sufficient protection against noise. Individual users can then choose those which suit them best among those providing sufficient protection.

All new ear defenders must bear the CE mark.

EARTHWORKS

When excavating or carrying out earthworks it is important to remember that slopes are at risk of collapse. Behind what looks like stable earth there may be water veins, water-bearing strata (running ground) or earlier excavations with loose fill. The consistency of the excavated earth is the only thing that is known.

The stability of earth slopes is reduced by:

- heavy rain
- the freeze-thaw effect
- the pressure of water behind frozen surfaces
- vibration from road traffic
- vibration from blasting
- earlier excavations.

Excavations may collapse owing to:

- the existence of buildings
- stockpiled materials
- soil tips
- heavy vehicles which have been parked.

CHEMICAL SUBSTANCES AND MATERIALS

Work involving disinfectants, lubricating oils, petroleum spirit, pesticides etc. (chemical substances and materials) must always be organised and carried out in a proper manner, so as to avoid unnecessary effects.

All chemicals must bear a label in the user's own language, indicating the trade name of the product and including instructions for the correct use of the product.

Hazardous chemical substances and materials must be classified in accordance with EU rules, in other words the packaging must bear a label which indicates, in the user's own language, the:

- trade name
- name(s) of the dangerous substance(s)
- hazard symbol(s)
- risks and safety regulations
- name and address of importer/dealer

In accordance with Directive 91/155/EEC and subsequent amendments, hazardous substances or materials sold must be accompanied by supplier's instructions. These must be easy to understand and contain 16 sections, including information on the health hazards and any personal protective equipment required.

On the basis of the information from the supplier, the employer in conjunction with the safety organisation must draw up workplace instructions tailored to the individual workplace. These must contain information on the same 16 points covered by the supplier's instructions and must be accessible to all employees at the workplace.

The rules governing work with substances and materials also lay down the principle of substitution, in other words before using a chemical substance or product there should be a review of whether it can be replaced by another less hazardous one or by a different working method.

Employers must ensure that the work processes and methods effectively protect employees from avoidable effects of exposure to substances and materials. Employers must provide employees with information and detailed instructions on the use of chemical substances and products. Instructions must be provided on an ongoing basis. Employers must also familiarise employees with the accident and illness risks associated with their jobs.

Employees must follow such instructions.

When working with chemical substances and products, care must be taken to prevent them coming into contact with the skin, respiratory tracts or mucous membranes. If it is not possible to contain them within a closed system or remove them via an effective ventilation system, personal protective equipment must be used.

Hazardous chemical substances and materials must be stored securely. Highly toxic and toxic substances must be stored in a special room or cupboard which is marked and kept locked. This applies to all substances and products marked with a skull on an orange background.

Substances which are hazardous to health, corrosive or can cause local irritations must be stored securely, out of children's reach, and not together with food, medicines, animal feeds etc. They are best kept in a locked cupboard or room, though not together with toxic products.

Hazardous substances and materials must be kept in the original packaging or in another correctly labelled container of a similar type. They must never be stored in bottles etc. where confusion concerning the contents could arise.

Chemical waste must never be poured into drains or mixed indiscriminately in a waste bin. Empty packaging and chemical residues must be kept together with full packaging pending delivery to the municipal reception facility.

POWER TAKE-OFFS

A tractor's PTO shaft must be shielded with a rigid guard, which must be large enough to allow the driveshaft's protective collars to move freely underneath.

The uptake driveline on machinery and vehicles must also be shielded by rigid guards which are large enough to cover the torque clutch, friction clutch and overrunning clutch. The guard should extend at least 20 mm beyond the nearest universal joint.

The driveline must be mounted inside a cylindrical guard comprising two collars which shield the universal joints at either end of the driveline and a cylindrical telescopic guard between the collars. The edges of the collars must reach at least as far as the middle of the

universal joints. They must be secured against rotation, for example by using chains with spring hooks fastened to the rigid guards.

Cylindrical guards, collars and the rigid guards on the tractors and machinery must be designed to ensure an overlapping of at least 20 mm between collars and the edges of the rigid guard, irrespective of the angle which arises during transit.

The friction clutch and the overrunning clutch must always be on the machinery side.

The shafts, pawls and telescopic tube must always be kept clean and well lubricated, as this facilitates assembly. A support to take the weight of the PTO when it is unhitched from the tractor is essential.

New PTOs must bear the CE mark.

SCRUB CUTTERS

Scrub cutters normally produce a level of noise which is significantly above the 85 dB(A) limit. Ear defenders which effectively reduce the noise level must therefore be worn.

Gloves must always be worn when operating scrub cutters.

Carrying straps must be wide and padded. It is recommended that a double shoulder strap and a hip plate be used.

When using scrub cutters as grass trimmers, for example, it is essential to wear protective boots, overtrousers and a face mask as protection against flying stones.

When using round-blade scrub cutters (grubbing saws), for example for thinning out Christmas trees, operators should use the same protection as when operating a chain saw: trousers with cut-resistant lining, safety boots with cut resistant lining and a helmet with visor or safety goggles.

The scrub cutter must always have a fixed guard above, below and behind the lowest part of the blade's arc. When a grubbing blade is used, a special guard must be fitted. Never fit blades which are larger than those approved for the machine.

When clearing vegetation which constitutes a health hazard, e.g. hogweed, bracken or similar plants which can give rise to allergies, the user must be effectively protected against the risk of being splashed or hit by sap or bits of vegetation. In other words the user must wear a face mask, apron etc. and possibly an extra-wide guard on the scrub cutter's shaft.

For reasons of safety the machine should not be operated within 10 m of other persons.

Scrub cutters must bear the CE mark.

Manual and mechanical-manual debranching

Workers should ensure that trees are in a stable position before any debranching commences.

When trees have been felled across a slope, the lower side branches should be removed first to ensure that most of the debranching can be done from the relative safety of the upper side.

Workers should adopt a secure and balanced stance.

When debranching using a chain saw, workers should:

- keep the saw close to the body and support the weight of the saw on the tree or the right thigh;
- not walk when debranching the near side of the stem;
- keep the right foot well away from the chain when debranching the far side of the stem;
- beware of branches and undergrowth under tension and watch out for spring-back;
- not cut branches with the tip of the bar (risk of kick-back);
- not allow the tip of the bar to contact uncut branches, supporting logs, butt ends or other obstacles (risk of kick-back);
- maintain a firm grip on both handles of the saw whenever the chain is moving;
- not reach across the guide bar in order to move a loose branch.

Manual and mechanical-manual crosscutting

Workers should carefully examine a log before crosscutting, to determine which way it will roll, drop or swing when the cut is completed.

Workers should not work on the downhill side of the log being crosscut unless this is unavoidable; in this case the log must be blocked or otherwise secured to prevent rolling.

On sloping ground logs should be completely crosscut. If it becomes dangerous to complete a cut, the log should be marked as a hazard with clear and unmistakable signs.

Whenever it seems likely that the guide bar will become jammed before the cut is complete, the kerf should be kept open by the use of a wedge.

Logs under tension should be crosscut by making the first cut into the compression zone.

Cuts should be made from whichever side of the stem will not spring towards the operator when the log is severed.

MANUAL HANDLING

Manual handling includes lifting, carrying, pushing, pulling etc. In order to minimise manual lifting, technical aids must be used wherever possible, e.g. tractors, log sleds, logging hooks.

Overloading can be prevented by properly planning work processes, arranging working hours, using appropriate technical aids, adopting proper lifting and carrying techniques, and limiting the weight and number of loads when manual handling is unavoidable.

The risk of load-induced injuries can be reduced by adopting correct lifting and carrying techniques:

- Move up close to the load.
- Face the load with legs apart.
- Assess the weight of the load and where the centre of gravity is.
- Get a good grip on the load.
- Bend the knees and hips and keep the back balanced by flexing the back and stomach muscles.
- Lift the load slowly whilst straightening the knee and hips.
- Hold the load close to the body with the elbows slightly bent.
- Lift and carry the load symmetrically, in other words in front of the middle of the body or distributed equally over both hands.
- Avoid twisting with the load or, if unavoidable, do not exceed 45°. Do this by moving your feet.

When setting down the load reverse the sequence of movements.

The risk of injury from lifting a load is greater when there are aggravating factors. The ground in the forest can be uneven and fallen branches, dead leaves, etc. may make it difficult to get a firm footing or to walk. The combination of leaning too far forwards, twisting the back and other aggravating factors entail a particularly high risk. If there is a significant risk of unexpected stress, the load ought not to be too heavy. Repeated lifting is also an aggravating factor.

The health risks involved in performing certain types of lifting operation are greater for people who do not have a young man's strength, e.g. those who are older or not in the best of health. The weight limits are lower for young people aged under 18. Heavy or frequently repeated lifting operations below knee height or over shoulder height should be avoided by placing the objects to be lifted above knee height.

HEAVY LOADS WHICH CANNOT BE HANDLED WITH TECHNICAL MEANS SHOULD BE LIFTED BY SEVERAL PEOPLE TOGETHER. CHAIN SAWS

Chain saws must be type-approved and must either indicate the type-approval number and the level of noise and vibration or carry the CE mark.

Chain saws must be as quiet as possible.

Work with chain saws may not be performed by persons aged under 18. This also applies to young people in agriculture, forestry and horticulture who are members of the employer's family and belong to the household.

The following protective equipment must be used in logging, felling and pruning operations:

- helmet
- ear defenders able to reduce the noise level to less than 85 dB
- eye protection
- safety boots with toe-caps and cut-resistant lining
- safety trousers with permanent cut-resistant lining
- personal first aid kit.

Chain saws may not be used above shoulder height, with the exception of special long-shaft saws.

Chain saws may be used on ladders only if the ladder is fitted with a work platform. Ordinary ladders must never be used. The chain saw must be held in both hands when working.

Special chain saws for tree pruning (with one-hand operation) may be used only for pruning involving climbing and only by persons trained in topping.

Gloves should always be worn to protect against the effects of vibration and low temperatures (to reduce the risk of white finger).

Chain saws must always be well maintained for safety reasons.

Special rules apply to young people under 18. See the section on "Young people working".

Netting machines

Netting machines used for wrapping Christmas trees must comply with the Machinery Directive as regards safety.

The following requirements must be observed:

- the machine must be protected to prevent persons becoming caught by the intake hook, e.g. by means of a shield or stopping device,
- drive chains etc. must be shielded,
- the operating lever must be protected against accidental operation (deadman's handle).

New netting machines must bear the CE mark.

Personal protective equipment

Personal protective equipment means all equipment, including clothing, designed to protect workers against one or several risks to their safety or health while working. It includes working clothes, gloves, helmets, ear defenders, safety boots, eye protection and respirators. See the individual sections.

Personal protective equipment must nowadays be manufactured, tested and marketed in accordance with the common provisions which apply within the EU.

All personal protective equipment must bear the CE mark, and it must be clear which specific hazards it provides protection against, and to which level, how it must be maintained and kept, how long it will last, and when it must be withdrawn from service.

Personal protective equipment exists as follows:

- Equipment protecting against minor risks, e.g. ordinary work gloves, ordinary working clothes, rubber boots and sunglasses.

- Equipment providing protection against special risks, e.g. ear defenders, safety goggles/masks, protective gloves, helmets, and trousers and boots with cut-resistant lining. A lot of the protective equipment used in forestry work belongs to group II.
- Equipment providing protection against serious hazards and manufactured under ongoing controls, e.g. all types of breathing apparatus, equipment protecting against falls, and chemical-proof suits.

Use of personal protective equipment

If work cannot otherwise be planned, organised and carried out with due regard for safety and health, the employer may allow such work to be carried out only if personal protective equipment is used.

- Personal protective equipment must be used as soon as the work starts and throughout its duration.
- Personal protective equipment must conform with the provisions of the Directive, and the supplier is responsible for ensuring that the equipment meets the requirements.
- All personal protective equipment must be supplied with clear instructions for use, and the employer must ensure that it is used in a manner which is consistent with those instructions.
- The employer must cover the cost of purchasing, maintaining and cleaning personal protective equipment, which remains the employer's property.
- Personal protective equipment must be adjusted to suit the user and function.

TREE PLANTERS

Mechanically powered hand-held tree planters can vibrate and produce high noise levels.

If the noise level exceeds than 85 dB(A), workers must use ear defenders.

. The noise and vibration levels must be indicated in the instructions for use.

A tree planter must be fitted with a deadman's handle so that it comes to a stop if the handle is released.

Gloves should be worn when operating machines that vibrate.

Two people are needed to operate large tree planters.

Special rules apply to young people under 18. See the section on "Young people working".

All new tree planters must carry the CE mark.

PLANTING

Handling and planting of chemically treated plants

Where chemicals must be used, the manufacturer's instructions for the safe handling of hazardous chemicals and treated materials must be precisely followed.

Only chemicals which have been approved by the competent authority for the intended purpose should be used.

Treated plants and other contaminated materials should be kept separate from rest and eating areas, stored personal clothing and other personal belongings.

Plants and containers should be clearly labelled with the full name of the chemical and its active ingredient, essential precautions, symptoms of intoxication and measures to be taken should intoxication occur. Workers should be informed about the above, preferably in writing.

For handling and planting trees treated with hazardous chemicals prior to the expiry of toxicity, workers should use personal protective equipment. This should include:

- chemical-resistant boots with non-slip sole
- chemical-resistant gloves.

When plants have to be dipped in pesticides prior to planting, personal protective equipment should consist of:

- a face-shield and suitable respirator which must cover the nose and mouth
- a chemical-resistant one-piece suit (or jacket and trousers) with hood
- elbow-length chemical-resistant gloves
- chemical-resistant boots
- personal first-aid kit

Operation

Arrangements should be made so that personal protective equipment and tools can be washed separately from personal washing.

Treated plants should be handled carefully to minimise personal contamination. They should be packed and transported on the work site in such a way that access to the plants is easy, thus making it possible to avoid handling them more than necessary.

Planting bags or harnesses or other containers for transport of treated plants at the work site should be cleaned by emptying and washing out daily. They should be manufactured using chemical-resistant material or linings.

Any contamination of the skin or protective clothing by a pesticide concentrate must be washed off immediately and thoroughly.

Before eating on the work site, workers must always wash their hands in soap and clean water and use paper towels for drying.

Workers feeling unwell should immediately report the symptoms to the supervisor and seek medical advice as soon as possible, giving details of the work undertaken and the full name of the pesticide used.

At the end of each work period workers should:

- thoroughly clean the outsides of gloves and protective clothing, preferably with running water;
- wash their hands in soap and clean water which has not previously been used to clean contaminated tools and protective equipment.

Clothing or protective equipment which may be contaminated by chemicals hazardous to health should not be allowed to be laundered, cleaned or kept at workers' homes.

Care should be taken to ensure that waste water from washing does not contaminate watercourses.

Mechanical-manual planting by hand-held posthole borer (rock drill)

Correct augers for the type of operation and ground should be selected.

Hand-held power posthole borers should be operated and maintained according to the manufacturer's instructions.

Operators should ensure by frequent inspection that machines are in safe working order.

The auger must remain stationary when the engine is idling.

Machines should be lifted using the leg and arm muscles and keeping the back straight.

The appropriate auger speed and drilling pressure for the conditions encountered should be maintained, and the bit should not be forced.

The engine must be switched off while clearing the auger of any unwanted material.

On sloping ground, operators should adopt a safe, well-balanced stance at the site to be drilled, keeping their feet well clear of moving parts.

Workers should use the following personal protective equipment:

- safety boots or shoes with integrated steel toe-cap and protection at the front vamp and instep
- ear muffs
- gloves
- personal first-aid kit

SAFETY FOOTWEAR

Safety footwear or protective footwear with protective toe-caps must be used when there is a risk of crushing or of foot injury caused by falling objects, for example when heavy and cumbersome objects are being moved or worked on. Objects weighing more than 16-20 kg fall into this category. The more sharp-edged and heavy the object, the greater is the risk of injury; hence the need to keep weight down.

When choosing safety footwear or protective footwear, ensure that it has the protective features needed. Footwear must be suited to individual users and their needs.

Safety footwear with toe-caps and cut-resistant lining must be worn when working with chain saws.

Safety footwear with safety soles is required where there is a risk of treading on pointed or sharp objects which would penetrate an ordinary sole and injure the foot.

Protective footwear with non-slip soles must be worn where there is a risk of slipping. The risk of slipping depends on the nature of the surface and the soles of the footwear worn.

Footwear must bear the CE mark.

SAFETY ORGANISATION

Safety work must be undertaken in every firm, in line with Directive 89/391/EEC.

Where the workforce is only small, this can be done through personal contacts between the employer and employees.

In firms with more employees a safety representative should be elected.

The safety representative must undergo some form of safety training.

The safety representative is elected from among the workforce and, like shop stewards, should be protected from dismissal or any deterioration in his situation.

The employer must ensure that there is enough time for safety work, and must cover any related costs.

All arrangements relating to the company's working environment should be discussed with the safety representative, who must also ensure that working conditions and working arrangements are sound.

WOOD TICKS

The woodland tick transmits a small micro-organism, *Borrelia*, which can cause serious infection in human beings (Borreliosis = Lyme's disease). The infection, which follows a bite from a woodland tick, is estimated to affect several thousand people every year. The tick lives in woodland and scrubland, and forestry workers are especially at risk.

The symptoms of a local infection are a well-defined red patch which appears around the bite after one to two weeks and lasts one to two months. Serious infection is often accompanied by a high temperature and a feeling of being unwell.

Anyone developing such symptoms should urgently seek medical advice and explain that they have been bitten by a tick. A blood sample will indicate whether there are antibodies in the blood. In the early stages, the condition can be treated with antibiotics.

The tick should be removed as soon as it is discovered. This reduces the risk of infection, which is greatest if the tick is left for more than 10-20 hours or if its soft abdomen is squeezed, forcing the bacteria into the victim's body.

The tick is removed with tweezers placed on its mouth area, by applying alcohol, or by twisting it out.

Forestry workers should therefore examine themselves for ticks at the end of every working day, and remove them without delay.

LOGGING MACHINERY

MECHANICAL HARVESTING AND EXTRACTION BY FORWARDER

All equipment used in forestry operations must be CE-approved. The following safety equipment has to be used when working with harvesters and forwarders:

Personal protective equipment

- Ear defenders to be worn at all times when the machine is working, except when the noise inside the cab is less than 85 dB(A).
- Oil-resistant gloves (for handling oils and other materials - e.g. urea).
- Safety shoes (boots if needed) - non-slip sole.
- Non-snag outer clothing.
- Handwashing facilities, waterless skin cleanser (or soap and water) and paper towels.
- Personal first-aid kit
- If the operator has to use a chain saw, he must have following safety equipment
 - Safety helmet with suitable eye protection and ear defenders
 - Safety boots with protective guarding at front vamp and instep - good grip
 - Safety gloves with protective guarding on the back of the left hand
 - Safety trousers with leg protection incorporating clogging material

Machine (harvester)

Any danger zone specified by the manufacturer must be clearly and prominently marked on the machine.

The operator must be adequately protected from physical injury. Cab windows facing the operational zone should be of 12 mm polycarbonate, correctly fitted. Other windows should be of safety glass. Where necessary, suitable metal mesh screens should be provided.

All machine control functions and float positions must be clearly marked in a language understood by the driver.

A notice warning against working in the vicinity of overhead electricity transmission lines must be prominently displayed in the cab, together with the maximum machine height in the recommended travelling (non-operational) position.

An ear protection warning sign must be displayed where the noise level inside the cab exceeds 85 dB(A).

Harvesting machines which apply urea to cut stumps must have urea warning signs affixed to the urea storage tank.

Fire extinguishers (at least two) or a fire extinguisher system must be mounted on the machine and be readily accessible.

Adequate field lighting must be fitted for working in poor light conditions.

Machine (forwarder)

All machine control functions and float positions must be clearly marked in a language understood by the driver.

The safe working load and reach of the crane must be clearly marked on the main boom.

A warning against working in the vicinity of overhead electricity transmission lines must be prominently displayed in the cab, together with the maximum machine height in the recommended travelling (non-operational) position.

An ear protection warning sign must be displayed where the noise level inside the cab exceeds 85 dB(A).

Fire extinguishers must be mounted on the machine and be readily accessible.

Adequate field lighting must be fitted for working in poor light conditions.

OPERATION (HARVESTER)

The machine must not be operated or maintained by people other than those who have been trained by the manufacturer, have received corresponding training or have similar experience.

Identify all work site hazards.

Operate the machine only from a seated position in the operator's seat. Use the seat belt.

In order to minimise musculo-skeletal disorders and mental stress in machine operators, creative work organisation, which may include job rotation and suitable shift schedules, should be encouraged.

Beware of changing weather conditions which may effect the stability of the machine in the course of the day.

Plan the work so that brush and tops from processed trees assist travel over difficult ground.

Tracks or chains should be fitted according to the ground's bearing capacity and condition.

Do not store loose objects in the cab.

Drive the machine within the operational limits specified by the manufacturer in the user's manual.

The operation of harvesters should in general be restricted to slopes not exceeding a gradient of 35%.

Keep windows and doors closed when driving, felling or processing.

Operators should inspect cutting equipment for signs of excessive wear or damage at least once a day and ensure that all parts of the cutting equipment are properly aligned.

Saw chains including depth regulators should be sharpened and maintained according to the manufacturer's recommendations.

The machine should be operated using the techniques and within the limits specified by the manufacturer.

Driving and operating on side slopes should be avoided whenever practicable.

If the machine tips over, hold on to the handles. Do not jump from the cab.

The machine should not be destabilised by overloading.

When manoeuvring the machine, the operator should ensure that the grapple, harvesting and processing units are in the correct working position.

Work should be stopped immediately if a person enters the risk zone specified for the machine or comes closer than two tree lengths plus the length of the boom, whichever is greater (for example tree length x 2=28 m+7 m boom = 35 m).

Always, when approaching a machine, establish telephone contact with the operator. If possible, use a mobile phone or other means of communication to ensure that the operator has noticed the person who is approaching the machine and is going to stop the machine.

Anybody approaching a machine should do so in full view of the operator. Nobody should approach the danger zone before being invited to do so by the operator.

Processed material should be left in a safe and stable position with safe access for extraction machinery.

The machine should be parked on level ground, if possible, with parking brakes or brake locks applied, with the transmission in the park position specified by the manufacturer, and with the wheels chocked if necessary.

When parking the machine the operator should ensure that:

- hydraulic equipment is left in the lowered position;
- hydraulic pressure is de-activated where this is possible;
- saw teeth are in guarded position and blades are closed.
- turn the master disconnection switch off if the machine is to stand still for a prolonged period of time (overnight, for example).

Maintenance and repair

Ensure that the machine is maintained according to the manufacturer's instructions.

Before maintenance or cleaning (e.g. removal of brush or cleaning of photoelectric cells), position all operational parts of the machine so that they are accessible, and switch off the engine.

Wherever possible, ensure that all hydraulic pressure in systems to be serviced or repaired is dumped before work commences. Where it is not possible to dump oil under pressure once the engine is stopped, take great care to ease pressure in a pressurised system by careful slackening of joints.

Do not use your hand to check for hydraulic fuel leaks; use a piece of paper or cardboard. Hydraulic fluid under pressure can penetrate the skin. Seek medical attention immediately.

Remove oil and urea spillages.

OPERATION (FORWARDER)

The machine must not be operated or maintained by persons other than those who have been trained by the manufacturer, have attended corresponding training or have similar experience.

Identify all work site hazards.

Operate the machine only from a seated position in the operator's seat. Use the seat belt.

In order to minimise musculo-skeletal disorders and mental stress in machine operators, creative work organisation, which may include job rotation and suitable shift schedules, should be encouraged.

The operation of forwarders should in general be restricted to slopes not exceeding a gradient of 35%.

Do not store loose objects in the cab.

Keep windows and doors closed when driving.

The grapple should not be operated if any part of the machine comes within 15 m of overhead electric lines suspended from steel towers or 9 m in the case of wooden poles.

Beware of changing weather conditions which may effect the stability of the machine in the course of the day.

Tracks or chains should be fitted according to the ground's bearing capacity and condition.

Grapples should be correctly secured before driving the forwarder.

The stability of the machine should always be maintained by operating only under conditions which are within its technical capacity.

Excessive side slopes should be avoided. Turning uphill on side slopes should be avoided.

If the machine tips over, hold on to the handles. Do not jump from the cab.

The loader or carrier should not be overloaded or loaded above the level of the headboard or stanchions.

When ground conditions are difficult, the load should be reduced accordingly.

When loading and unloading, the parking or loading brake must be applied.

When loading on sloping ground, the machine should be parked straight up or down the slope.

The load should be fully encircled when the jaws are closed.

Before driving down steep slopes, the brakes should be checked, and low gear and differential lock engaged.

When the machine is not operating, the brakes should be applied and all hydraulic equipment should be secured in lowered position.

Stacking

When unloading, stacks of timber should always be made and maintained in a stable condition.

Where additional manual handling will be necessary, the height of stacked timber should not exceed about one metre.

Special care should be taken in areas frequented by the public.

Maintenance and repair

Ensure that the machine is maintained according to the manufacturer's instructions.

Before maintenance or cleaning, position all operational parts of the machine so that they are accessible and switch off the engine.

Wherever possible ensure that all hydraulic pressure in the systems to be serviced or repaired is dumped before work commences. Where it is not possible to dump oil under pressure once the engine is stopped, take great care to ease pressure in a pressurised system by careful slackening of joints.

Do not use your hand to check for hydraulic fuel leaks; use a piece of paper or cardboard. Hydraulic fluid under pressure can penetrate the skin. Seek medical attention immediately.

Remove oil spillages.

EMERGENCY PROCEDURE

Ensure that a responsible person is familiar with the daily work programme and a suitable emergency procedure. Where reasonably practicable use 2-way radio or mobile telephones, and a pre-arranged call-in system.

PARKING THE MACHINE

Always apply the parking brake

For overnight parking, immobilise the machine when public safety is at risk.

Ensure all hydraulic equipment is left in the lowered position.

WINCHES AND CABLES

Before starting work with winches or cables it is extremely important to evaluate the risks and then to carry out the work in a way which minimises those risks.

Where the cable runs over drums or pulleys, the danger is that a person could become entangled in the winch. Appropriate protection must therefore be provided at such places.

The risk when working with cables is that they may snap owing to wear and tear or because the cable is too thin in relation to the object to be moved.

Persons must therefore be protected against being hit by wires by being made to stand to one side of the winch and behind a wire mesh screen or remain seated inside the operator's cab behind a mesh or safety glass screen. It must be possible to operate the winch from such safe working positions.

When operating a remote-controlled winch the operator should move diagonally behind the object in its direction of travel to avoid being exposed to the risk of the cable snapping or, where the land is not flat, of the object rolling back over him.

The cables used in forestry winches should be of the low twisting variety ("dead wire"). The strength of the wire must be suited to the load-bearing capacity of the winch.

To avoid wire burn to the hands, heavy-duty gloves must be worn, and worn cables must be shortened.

Where radio control or another form of remote control is used, the winch must stop automatically when there is no signal. Operation must take place from the operator's cab or a minimum of 5 m to the side of the winch.

The winch must be designed in such a way that the mechanism cannot start unintentionally.

In order to ensure safety, it is necessary to have guidelines on:

- personal protective equipment
- winch assembly and dismantling
- transport, installation and operation
- checks and maintenance
- cooperation.

The following personal protective equipment must be accessible and must be used: helmet, ear defenders, working gloves and safety boots.

During transport, the equipment must be properly secured. When installed, it must be ensured that the winch is properly stabilised and the operator's workplace is safe.

Regarding cooperation, procedures must be agreed and followed, e.g. concerning the use of hand, audible or radio signals.

Maintenance must be carried out when the winch is stationary.

New winches must bear the CE mark.

LADDERS

Work on ladders must be for short periods only. If work alternates between ladders and a fixed surface, work on the ladder may not exceed one-third of the daily working hours for any employee.

Only one person may be on a ladder at any one time. On trestle ladders, however, one person may be on each side.

The tools used must be light, easy to handle and suited to single-handed operation. Only light and easily handled loads may be carried on normal ladders. Metal ladders may not be used in the vicinity of overhead power lines.

Ladders should be leant against walls, placed on a firm surface and the angle should be approximately 70°.

When using ladders over 5 m in length there should be a second person at the bottom of the ladder, unless it is properly secured.

Ladders should be inspected at regular intervals for breaks and wear and tear.

Ladders must bear the CE mark.

STORM DAMAGE

When clearing up storm damage, the working area is divided into a storm damage zone, a processing zone and a transport zone. Working alone is not permitted. If practically possible, machinery such as harvesters, forwarders, skidders etc., should be used.

Storm damage zone

This is where the difficult process of cutting trees takes place. It is especially here that the specific problems of storm damage clearance are concentrated. The tangled trees must be sorted and cleared in the correct order, and cutting must take place in a safe manner so that trees do not split. Machinery should be used to take the load during cutting, e.g. excavators and winches.

It is important not to place time pressure on the workers. This prevents accidents caused by stress or by not having time to think about things.

If winches or chains are used to remove the logs, the clearing workers should be relieved of the job of securing the logs, as this binds them too much to the working rhythm of the machine.

Processing zone

This is where the trees that have been removed are trimmed and shortened. It must be located as close as possible to the storm damage zone, and should move with the processing front. In this way the haulage distance is reduced, together with the amount of ground covered in bark

or damaged by chain saws. The use of excavators and logging machines has nearly got rid of this problem.

In the processing zone, the cut logs are piled up to a comfortable working height.

Transport zone

Excavators and rubber-tyred loaders must be used where a substantial tractive or lifting effort is required.

NOISE

The current noise limit is 85 dB(A), which is the average noise level to which a person may be exposed over an average, eight-hour working day.

Technical or administrative measures must be taken to reduce noise exposure.

Unnecessary noise exposure must be avoided. Noise levels during work should therefore be kept as low as is reasonable, in line with technical developments.

If it is not possible to reduce noise exposure below 85 dB(A), work may not be carried out without ear defenders.

If noise exposure is over 80 dB(A), or is otherwise harmful or a serious nuisance, ear defenders must be provided and used.

The need to wear ear defenders must be indicated by means of signs.

Emissions of dust, gases etc. Machinery must be so designed and constructed, and work must be planned and organised, so that risks due to gases, liquids, dust, vapours and other waste materials which has been produced during the work can be avoided as far as possible, taking into account technical progress and the availability of means of reducing these.

TRACTORS

Tractors and self-propelled machinery with at least two axles and an unladen weight of at least 500 kg must be fitted with crash-proof protection for the driver.

Tractors and self-propelled machinery in excess of 7 tonnes do not need protection for the driver, as the risk of overturning is considered slight.

The driver's cab must bear the CE mark. Tractors with protection for the driver must be fitted with an approval sign and a warning. New self-propelled machinery and tractors must bear the CE mark.

Noise levels in tractors should be kept as low as possible. If the noise level in the tractor exceeds 85 dB(A), the driver must be issued with ear defenders.

The vehicle's controls must be located so that the driver can reach them from his seat. The steering wheel must be adjustable.

The driver's cab should be ventilated.

There should not be more people in a tractor than there are seats.

EXHAUST FUMES

The exhaust fumes of internal combustion engines consist mainly of oxides of nitrogen, carbon dioxide, soot particles and water vapour. Carbon monoxide, sulphur dioxide, lead and various combustion by-products as well as petroleum spirit and others are also present. It is dangerous to inhale exhaust fumes.

To avoid creating hazardous substances, machines must be operated correctly. They must be properly tuned, for example. Preference should be given to machines which eject the exhaust gases away from the operator. The machine should not be left to idle for too long, and excessive throttling or braking should be avoided.

The most environmentally friendly petrol etc. should also be used.

By correctly adjusting machines and using them in the best possible way, it may perhaps be possible to avoid many of the long-term harmful effects.

Machines powered by internal combustion engines can endanger life if used indoors in a closed room.

YOUNG PEOPLE WORKING

There are rules concerning work by children and young people.

Employers are obliged to ensure that young people receive the necessary instruction and that effective supervision is provided by an adult.

The rules specify which equipment young people may operate and which they may not.

Young people aged under 18 may not work with the following equipment or machinery:

Chain saws

Powered hedge cutters

Scrub cutters

Tractors fitted with winches

Tractors fitted with front loaders

Tractors fitted with excavating equipment

Tractors fitted with forklifts

Trench excavators

Forklift trucks

Mowers

Precision cutters

Rotary saws

Snow ploughs

Wood splitters

Chippers

Logging machinery

High-pressure cleaners operating at pressures in excess of 70 bars (7 MPa).

Hand-operated, self-propelled equipment, for example, cultivators.

Percussion drills or vibro-polishers for more than half an hour per working day.

Lubrication, cleaning and maintenance of engines, machines, whenever moving parts can cause injury.

Young people under 18 are not allowed to work with or be exposed to various hazardous substances and materials, e.g. detergents, disinfectants and pesticides.

Substances and materials are regarded as hazardous if they are marked with one of the following symbols:

(Insert the symbols for the following: Tx very toxic, T toxic, C corrosive, E explosive, Xn hazardous to health, Xi irritant, Fx extremely flammable)



Meget giftig



Giftig



Åtsende



Ekspllosiv



Sundheds-
skadelig

Efterfulgt af en eller flere af følgende risikosætninger:

R 45 kan fremkalde kræft

R 39 fare for varig skade på helbred

R 40 mulighed for varig skade på helbred

R 42 kan give allergi ved indånding

R 43 kan give allergi ved kontakt med huden

R 46 kan forårsage arvelige genetiske skader

R 47 kan medfører fosterskader

R 48 alvorlig sundhedsfare ved længere tids påvirkning

R 49 kan fremkalde kræft ved indånding

R 60 kan skade forplantningsevnen

R 61 kan skade barnet under graviditeten

R 64 kan skade børn i ammeperioden



Lokal-
irriterende

Efterfulgt af en eller flere af følgende risikosætninger:

R 42 kan give allergi ved indånding

R 43 kan give allergi ved kontakt med huden

1. Tx, T, Xn, C, E including substances and materials covered by one or more of the following risk phrases:

R 45 may cause cancer

R 39 danger of very serious irreversible effects

R 46 may cause heritable genetic damage

R 49 may cause cancer by inhalation
R 60 may impair fertility
R 61 may cause harm to the unborn child
R 64 may cause harm to breastfed babies.

2. Xn, Xi in combination with:
R 40 possible risks of irreversible effects
R 42 may cause sensitisation by inhalation
R 43 may cause sensitisation by skin contact
R 48 danger of serious damage to health by prolonged exposure
R 62 possible risk of impaired fertility
R 63 possible risk of harm to the unborn child

3. Fx

R 12 extremely flammable

plus substances which are included in the following lists:

List of substances considered to be carcinogenic.

List of organic solvents.

16 and 17-year-olds may operate the following:

Tractors, if a driving licence for tractors is held
Tractor-mounted cultivators if a driving licence for tractors is held

Physical loads:

Young people may not be exposed to physical loads which may harm them. Young people under 18 should not lift loads exceeding 12 kg, but if the work is performed in a way which is ergonomically sound, this limit may be raised to 25 kg.

VIBRATION

All work must be planned and carried out such that there is no exposure to harmful vibration. Machines and tools should, where possible, be so designed and constructed that risks resulting from vibrations produced are reduced to the lowest possible level, taking account of technical progress and the availability of means of reducing vibration, particularly at source.

Hand-arm vibration

Hand-arm vibration occurs during forestry work especially when operating striking, rotating or vibrating hand tools, e.g. chain saws, hedge clippers, scrub clearers and tree planters.

Fitting the tools with suspension, isolating the vibration source from the rest of the machine, maintaining or replacing the rubber suspension, and using vibration-insulating handlebars and gloves can all help limit the effects of vibration.

The vibration level must be indicated in the instructions for using hand-held machines bearing the CE mark.

Whole-body vibration

Whole-body vibration is the effect which a vehicle driver receives via the seat while the vehicle is in motion.

Whole-body vibration can give rise to back problems, especially lumbar pain. Fixed working postures and repeated twisting of the back increase the risk of injury. Bumps and unexpected movements on uneven surfaces increase the risk.

Measures to minimise the risk include:

- Adjusting speed to the surface, and if possible flattening the stretches along which vehicles travel regularly.
- Using a non-vibration seat suited to the vehicle. The seat must have good back support and be easy to adjust to and by the driver. It must have particularly good lumbar support. Another important aspect from the vibration point of view is the possibility of adjusting the seat to suit the driver's weight.
- Ensuring the vehicle's spring suspension, shock absorbers, etc. are properly maintained.

New machines must have low vibration levels and seats which limit vibration to the driver.

ANGLE GRINDERS

Broken grinding wheels on angle grinders can cause serious accidents. There is also the possibility of discomfort due to dust, noise and vibration.

Grinding wheels should be suited to the machine and its rotation speed. They must indicate the maximum permitted peripheral velocity in m/s and also the maximum permitted rotation speed.

Wheels should be clamped using an appropriate shim and clamping flanges, the diameters of which must be at least one third of that of the grinding wheel. There are special flanges for certain types of special wheel.

When changing grinding wheels, switch off the power and pull out the plug.

Angle grinders must be fitted with safety guards which can intercept fragments of the wheel if it breaks. Eye protection must be worn.

Angle grinders must be held so that sparks and dust are directed away from the body.

Eye protection must be provided for workers working with angle grinders.

Dust from angle grinders must be effectively removed by local evacuation or dust collectors. If the dust cannot be effectively removed, breathing protection fitted with an approved dust filter must be worn.

If the angle grinder produces noise exceeding 85 dB(A), ear defenders should be worn.

When working outdoors or in damp rooms, cables, sockets and plugs should be of the heavy-duty type (red/yellow or neoprene), which are resistant to moisture and oil.

Angle grinders produce considerable vibration, which should therefore be reduced, for example by using insulating handles. Gloves can help prevent vibration injuries.

All new angle grinders must bear the CE mark.

EYE PROTECTION

Eye protection is an item of personal protective equipment intended to protect the eyes from mechanical or chemical hazards or radiation (welding flash).

Eye protectors may take the form of goggles which fit tightly to the face, facial screens, eye screens or part of a full mask.

Employers must:

- provide and pay for eye protectors, which remain their property;
- ensure that eye protectors are properly maintained and cleaned.

Employees must:

- obtain eye protectors and use them while working.

They must be instructed in the use of eye protectors and informed of the risks of failing to use them.

Eye protection should always be used when working with chain saws, angle grinders and scrub cutters.

Instructions for use in the user's own language must be supplied when eye protectors are delivered. These instructions must provide information on their protective properties, fitting, use, maintenance and storage.

Eye protection must be chosen which is suited to the nature of the work. Welding goggles must be worn for welding, and a face shield or goggles must be worn when working with chain saws.

Air-tight eye protectors should be of the anti-fog type.

Eye protectors should be adjusted to fit the user.

Eye protection should bear the CE mark.

RESPIRATORY PROTECTION

Respiratory protective equipment is an item of personal protection which protects against the inhalation of contaminated air and/or oxygen deficiency.

Respiratory equipment and filters must bear the CE mark.

The use of respiratory equipment is a solution which is permitted only if work cannot otherwise be planned, organised and carried out properly.

There are two main types of respiratory equipment:

- that which supplies fresh air,
- that which filters the air.

It can take the form of full, half or quarter masks. Respiratory equipment can either filter (clean) the ambient air before it is inhaled or it can supply clean air. If the filtering type of respiratory equipment is fitted with a fan or auxiliary motor, breathing is no more difficult than it would be with a fresh-air type protection system.

When choosing a respiratory protection system, attention should be paid to beards, face shape and to whether any goggles, helmet, ear defenders etc. are worn which might affect the functioning of the respirator.

Consideration should be given to whether a fresh-air type respirator should be used or whether a filter-type is sufficient.

Fresh-air respirators and filter-type respirators with motors may be used all day with breaks, the length of which will be determined by the workload and discomfort.

Filter-type respirators should only be worn for three hours in any one working day. The three hours should not be consecutive. If a mask has to be used for more than three hours per working day, a fresh-air type respirator should be used from the outset.

Dust-filter masks have either a replaceable filter or a disposable filter mask. They are classed as "filter-type respiratory protection".

Dust filters do not protect against gases or vapours.

Certain dust filters protect against aerosols, as shown on the filter label. Dust filters are classified into three groups (P1 - P2 - P3).

P1 filters protect only against coarse dust and cannot therefore be used as protection against fine airborne dust such as mould or quartz dust. They can be used for work in dusts produced by substances and materials for which a limit of 5 mg/m³ or more applies.

P2 filters protect against hazardous and toxic dusts. However, they cannot be used as protection against bacteria or viruses. Where a lower limit than 5 mg/m³ applies, P2 filters should be used as a minimum.

P3 filters protect against noxious and toxic dusts as well as bacteria and viruses. They are normally used in conjunction with a full mask.

Gas filter masks are classified in classes and types. The classes indicate the filter's ability to absorb greater or smaller quantities of gas and vapour, whereas the types indicate which types of gas the filter can protect against.

The class and type must be indicated on filters.

Filters are divided into classes 1, 2 and 3.

- Class 1= low-capacity,
- Class 2 = medium capacity.

- Class 3 = high capacity.

Combined filter types must be used if protection is required against dust and gases. This is the most common type of filter used, e.g. for spraying operations.

Gas filters should be replaced before they begin to leak or the contamination can be smelled.

Some suppliers are able to calculate the probable service life of filters if they are given an indication of the concentration of the contamination and the work load. The filter must be replaced in good time, before it gets to the end of its estimated service life.

Filters normally have a service life of three hours, or less if they have been used for fine-droplet spraying.

Operating instructions in the user's own language must always be supplied with filters and masks. These instructions must provide information on the protection given by the filter, and on how it should be adjusted, used, maintained and stored.

Safety signs must be placed in areas where respiratory protection must be used.

Instruction and training must cover filter replacement, adjustment, maintenance and storage of respirators, as well as how they are removed and put on. Employees must also be warned of the risks of failing to use respiratory protection.

Employees must use respiratory protection where it is required. Such protection must always be used for high-pressure cleaning and demolition work and when handling dusty or mouldy materials.

Where a tractor with an enclosed driver's cab is used for spraying, the cab's air filter cannot be used as respiratory protection. This is because such filters can become saturated with vapour from a pesticide during the morning's spraying operations and release the toxin later in the day when the cab's ventilation system is switched on.

Respirators and filters must carry the CE mark.

RELEVANT EU LEGISLATION

Council Directive 94/33/EEC on the protection of young people at work

Council Directive 92/58/EEC on safety and/or health signs at work

Commission Directives 91/155/EEC and 93/112/EEC; Article 10 of Directive 88/379/EEC

Council Directive 89/654/EEC concerning the minimum safety and health requirements for the workplace

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work; 91/383/EEC; 92/85/EEC - Framework Directive

Council Directive 90/394/EEC on exposure to carcinogens

Council Directive 74/150/EEC on the type-approval of wheeled agricultural or forestry tractors; Council Directive 77/536/EEC on the roll-over protection structures of wheeled agricultural or forestry tractors

Council Directive 86/298/EEC on rear-mounted roll-over protection structures of narrow-track wheeled agricultural and forestry tractors

Machinery: Council Directives 89/392/EEC, 91/368/EEC and 93/68/EEC

Council Directive 84/532/EEC on construction plant and equipment

Council Directives 89/686/EEC, 93/95/EEC, 93/68/EEC and Directive 96/58/EC of the European Parliament and the Council

Council Directive 89/656/EEC on the use by workers of personal protective equipment

Council Directive 89/655/EEC on the use of work equipment

Council Directive 90/269/EEC

Council Directive 92/57/EEC of 24 June 1992 on the implementation of minimum safety and health requirements at temporary or mobile construction sites

Council Directive 74/150/EEC on the type-approval of wheeled agricultural or forestry tractors, and all subsequent amendments

Council Directive 88/379/EEC of 7 June 1988 on the classification, packaging and labelling of dangerous preparations

Council Directive 67/548/EEC on the classification, packaging and labelling of dangerous substances

Council Directive 79/117/EEC

Commission Directive 85/298/EEC

Council Directive 86/214/EEC

Council Directive 86/355/EEC

Council Directive 87/181/EEC

Commission Directive 87/477/EEC

Council Directive 89/365/EEC

Commission Directive 90/335/EEC

Council Directive 90/533/EEC

Commission Directive 91/118/EEC

Council Directive 92/32/EEC

Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market; Directive 78/631.