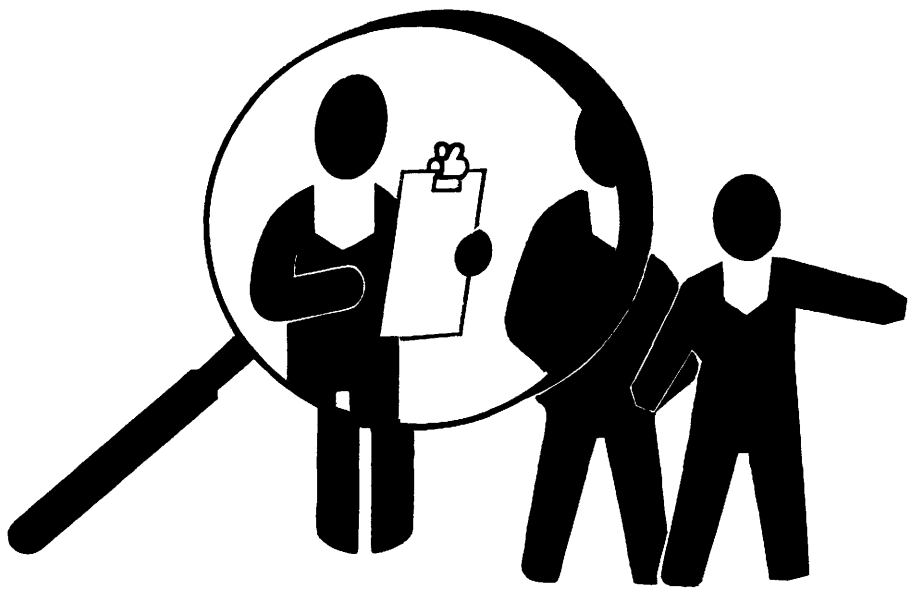
Europe
for safety
and health at work



Health and safety protection at work: a guide for small and medium-sized enterprises

COMMISSION OF
THE EUROPEAN COMMUNITIES

Publications in the series *Europe for safety and health at work:*

Working with dangerous products

Training in safety and health at work

Health and safety training in the fishing industry

General practitioners and occupational diseases

Safety and health in the construction sector. 'Training: temporary or mobile construction sites'

Cataloguing data can be found at the end of this publication.

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Preface

January 1993 saw the removal of the Community's internal borders and the introduction of the free movement of persons, goods and services.

The Commission has endeavoured to provide the Member States with the legal instruments necessary for the improvement of working conditions, and the Member States, for their part, have endeavoured to transpose these legal instruments into their national legislations.

However, no amount of laws, regulations or penalties will be effective unless people can be convinced of the need to change their behaviour, to become more **safety-minded** and to follow the safety rules **in order to avoid risks** and hazards at the workplace.

This can only be achieved through information and training.

The Commission has always been convinced that information has a vital role to play alongside legislative action in the development of safety and health protection at work, particularly in small and medium-sized enterprises (SMEs).

This document is designed to give readers a better understanding of the Community's health and safety directives and should serve as a teaching aid for employers and for trainers in professional organizations and teaching establishments.

It ties in with the Commission's recently adopted policy of transparency and accessibility,[1] and the information it contains is intended to help enterprises be aware of, and comply with, their new obligations.

This document is in no way designed to be used as a substitute for the official Community texts published in the *Official Journal of the European Communities.*

1 SEC(92) 2272 and 2274 final.

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Introduction

The improvement of occupational safety, health and hygiene is a main concern of the Community. But actually implementing the improvements on the ground concerns us all.

Thirteen million small and medium-sized enterprises, employing more than half of the Community labour force

Small and medium-sized enterprises (SMEs) employ more than half of the Community labour force.

These 13 million SMEs form the backbone of Community employment, accounting for more than 50% of investments and 60% of gross domestic product within the Community.

SME owners must cope with the fundamental changes that are occurring today **by identifying and then dealing with** all the risks which may affect the work carried out within their company.

Any enterprise is a combination of **technical, commercial, financial and human resources,** all of which play a part in **production costs.**

The management of **human resources** is one of the ingredients in the effective management of resources and the success of an SME.

What are the main accident risks mentioned in SMEs?[1]

Cuts: 44%
Handling operations: 35%
Falls: 33%
Crushing: 28%
Traffic accidents: 24%
Burns: 24%
Falling objects: 23%
Electrocution: 17%
Poisoning: 16%
Explosions: 11%
Other: 11%

Who are the main victims of accidents?

Certain categories of workers are more at risk of accidents than others:

- foreign employees,
- young persons and new recruits,
- workers aged over 45 years,
- temporary workers.

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1 'Europeans and health and safety at work', 1991 *Eurobarometer* survey for DG V/E/5, Commission of the European Communities.

Protecting employees from accidents makes firms more competitive

The cost of occupational accidents

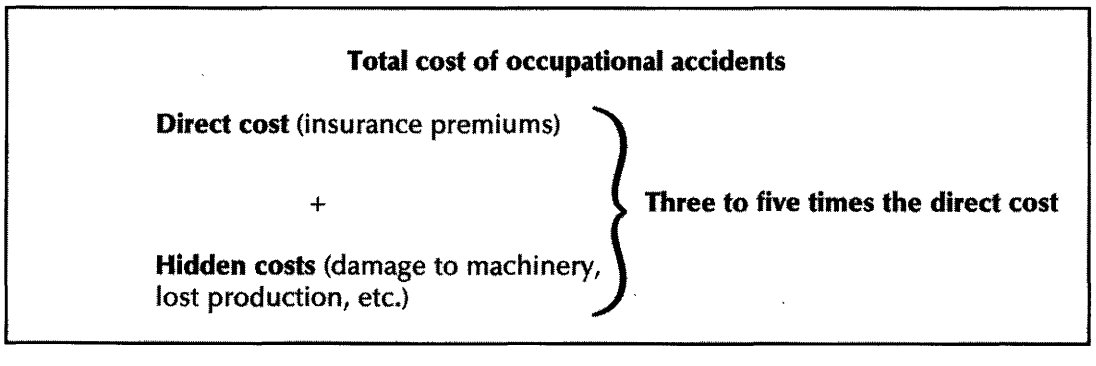
The real cost of occupational accidents is far higher than the visible costs such as insurance premiums and the basic wages and medical costs reimbursed by the insurer.

The hidden costs of occupational accidents

To the visible costs must be added the indirect (or hidden) costs. It is impossible to list them all, but they include:

- **Wage costs:** The costs for time lost by the victim, by colleagues whose work is disrupted, by medical staff, by technical staff involved in repairing damaged equipment, etc.
- **Extra personnel administration costs:** These include the costs of employing a temporary or permanent replacement, the salary paid to the victim over and above the insurance benefits, overtime payments to the victim's colleagues for work to make up time lost, and the training of replacements.
- **Material costs:** Repair or replacement of damaged equipment, increase in damage insurance premiums, etc.
- **Other costs:** Loss adjusters, lawyers, fines, etc.

These indirect costs are estimated to run at two to four times the amount of the visible costs.



Occupational accidents

are not only
costly in human terms
and in insurance premiums,

but are also
a sign of poor resource management
and of serious disruptions in the production process!

Productivity, quality and safety at work

The workplace is the point where numerous dysfunctions created 'upstream' converge. **Occupational accidents,** or the risk of accidents, are often **indicators of dysfunctions** reflecting weak points in the management and general organization of the company.

Specialists in safety management are all agreed: 'Safety and health improvements in a firm will normally result in better working conditions, better quality of performance and thus greater **customer satisfaction**.'

'A risk which is not detected in good time ends up costing more than the cost of its prevention.'

European legislation in the field of safety and health

The Single European Act

The Single European Act of 1987 considerably strengthened the European Community's capacity to implement a strategy for the protection of workers' health and safety.

The Community policy aims to establish a solid foundation of **minimum requirements** necessary for protecting the health and safety of workers, through the adoption of **directives** applicable to a maximum number of workers exposed to risks.

These directives place the accent on **promoting the protection of safey and health at work** in the context of specific activities or specific particularly high risks.

The framework Directive

The framework Directive 89/391/EEC of 12 June 1989 sets out the basic principles to be complied with in order to cover the main aspects of safety and health at work.

General principles set out in the framework Directive

1. **Avoid** risks.
2. **Evaluate** the risks which cannot be avoided.
3. Once evaluated, **combat** these risks **at source**.
4. Adapt the work to the individual **(ergonomics)** especially as regards the design of workplaces and the organization of working and production methods.
5. In implementing these objectives, **keep abreast of technical progress**.
6. In general, **replace the dangerous** by the non-dangerous or the less dangerous.
7. Develop a **coherent overall prevention policy** which covers **production, organization of work, working conditions and dialogue between management and workers**.
8. Give priority to **collective protective measures,** and only resort to **individual protective measures** if the situation renders any other choice impossible.

The individual directives

Pursuant to this framework Directive, seven individual directives have been adopted by the Council, laying down minimum safety and health requirements for:

workplaces;

the use of work equipment;

the use of personal protective equipment;

the handling of loads;

visual display units (VDUs);

temporary or mobile construction sites;[1]

safety and/or health signs at work.

Mention should also be made of:

- the Commission recommendation of 22 May 1990 on the adoption of a **European schedule of occupational diseases**;
- the Council Directive of 28 June 1990 on the protection of workers from the risks related to **exposure to carcinogens** at work.

The Advisory Committee

The Advisory Committee on Safety, Hygiene and Health Protection at Work was set up by a Council Decision of 24 June 1974. Its task is to assist the Commission in matters of safety and health at work.

Composed of government, workers' and employers' representatives, the Committee's role is to facilitate cooperation between the national administrations and the organizations representing workers and employers.

All proposals submitted by the Commission to the Council are presented to the Advisory Committee, which has gradually come to play an active part in the preparation of texts, both on a scientific and technical, and political, level.

The Committee has become an important forum for the Community social dialogue and has participated actively in defining the Community texts presented in this publication.

Impact statements from Directorate-General XXIII

In order to ensure that the Community's legislative proposals do not impose excessive or unjustified burdens on SMEs, the main proposals must be accompanied by an 'impact statement'. This identifies the main economic sectors and regions concerned by the legislation and the size of the undertakings covered; it describes the new burdens and obligations which the legislation will impose on undertakings, and the special measures proposed for SMEs; and it describes the consultations which have taken place with the sectors concerned.

This procedure ensures that more heed is taken of companies' interests throughout the decision-making process prior to the adoption of Community directives.

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[1] A publication devoted specifically to the 'construction sites' Directive has been issued in the series *Europe for safety and health at work.*

The general organization of safety and health in enterprises

The framework Directive [1]

Europe is opening up its frontiers, and the process of harmonizing social policy has begun.

'The single market could provide new opportunities for my business. I have heard that there is a lot at stake for SMEs and that the Council of Ministers of the European Communities has produced a number of directives setting out the minimum requirements which must be complied with in order to provide safety and health protection at work.'

What's new in all this for me as owner of a company or boss of an SME?

The general principles applicable to safety and health at work have been gathered together in a framework Directive, which came into force on 1 January 1993.[1]

General principles

The employer is responsible for the safety and health of the workers within his company.

NB: Nothing absolves the employer from this responsibility: neither the unwillingness of employees to fulfil their obligations nor the enlistment of outside agencies to deal with health and safety questions.

Yes, but what's new in practice? As the boss of an SME, what will I have to do?

The framework Directive stipulates that the employer must take the practical measures necessary for the safety and health protection of workers, based on the following rules:

1. **Avoid** risks.
2. **Evaluate** the risks which cannot be avoided.
3. **Combat the risks at source:** in other words, if a machine is making too much noise treat the machine itself before soundproofing the room in which it is housed.
4. **Adapt to technical progress:** take account of progress and modern production methods.

[1] Framework Directive 89/391/EEC of 12 June 1989.

5. In general, therefore, **replace the dangerous by the non-dangerous or the less dangerous.**

   Examples:

   - modern circular saws are better guarded than older models;
   - certain products are less hazardous to health than others while being just as effective.

6. **Introduce risk prevention into the organization of work and working conditions** ('prevention is better than cure').

   For example, foremen should:

   - integrate risk prevention into their activities;
   - give collective protective measures priority over individual protective measures (e.g. provide an effective guard-rail rather than an anti-fall harness);
   - ensure hand and airway protection by choosing safe products in the first place rather than by ordering men to wear gloves or masks.

7. **Adapt the work to the individual.**

   For example:

   - choose equipment whose safety contributes actively to productivity;
   - set workbenches, typing tables, etc. at the right height for individual workers (neither too high nor too low).

   Equipment selection and workplace design are therefore important elements in safety and health protection.

   Monotonous work is also a risk factor, and one which employers should endeavour to alleviate through workplace design, work organization and through the choice of equipment, products and working procedures.

8. **Give collective protective measures priority** over individual protective measures. This means that **all** workers must be protected, for example, from noise, noxious dusts or dangerous gases, before individuals are issued with, and ordered to wear, such items as earmuffs, masks or respirators.

9. **Give appropriate instructions** to workers to ensure that they have adequate information for the protection of their safety and health; only workers who have received adequate instructions may have access to areas where there are serious and specific dangers.

10. **Check,** or have a third party check, that these measures are actually implemented.

I will bear the following factors in mind:

(a) When issuing work instructions I will not forget those concerning safety.

(b) Prevention measures need to be set up in my firm. Of course everything depends on the men and women I employ; but one of them can be designated to be responsible for occupational safety and health questions in order to advise me and give me effective support — after all, I can't do everything on my own!

If that is not possible, there are competent external services which can be enlisted.

(c) Competent external services or persons. These are occupational medical services, inspection bodies, etc. I know them and know that I can count on them to implement appropriate measures for the protection of my workers.

But all this has to be paid for!

You have to choose: it is better to pay for effective prevention than to pay for work disruption caused by accidents (accidents also have to be paid for, but you do not get a detailed bill).

Fair enough, but prevention — I assume that means fire prevention services, first-aid services, assistance in the event of serious and imminent danger?

That's right!

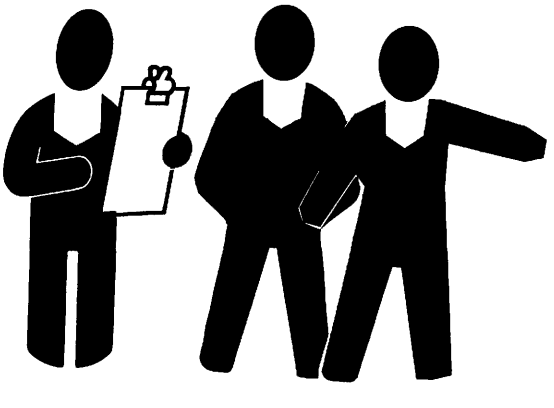
You must (and it is in your interests to):

1. **evaluate,** or get someone else to evaluate, the safety and health risks which exist in your firm;

2. **keep a list** of all occupational accidents which result in any of your workers being unfit for work (you have to avoid more lost time and recurrence of risks).

To sum up, as the boss of an SME I have to:

- **inform** my workers[1] of the risks involved and the measures taken or to be taken;
- **consult** my workers on prevention and involve them in setting up preventive measures;
- **train** the workers concerned[2] and provide fresh training whenever there is a recruitment or change of job.



1 And their representatives, if there are any.
2 During working time.

And what about the workers?[1] What do they have to do?

They must follow my instructions in accordance with the training given and take care of their own safety and health as well as that of their workmates.

What does that imply?

Workers must:

(a) **make correct use of** machinery, apparatus, tools, substances and equipment supplied to them;

(b) make correct use of **personal protective equipment supplied to them,** which they must return to its proper place after use;

(c) **leave in place safety devices** fitted to plant and machinery, and use such safety devices correctly;

(d) **immediately inform** the employer or the persons responsible **of any work situation presenting a serious and imminent danger** to safety and health, and of any shortcomings in the protection arrangements;

(e) **cooperate in all tasks** imposed by the safety regulations and cooperate with the employer to ensure that the working environment and working conditions are safe and pose no risk to safety and health.

In other words, your employees must cooperate actively in your preventive and protective measures.

For that, however, you must take the initiative in drawing up and putting into practice the necessary preventive measures!

Conclusions

That, in essence, is the framework Directive. The basic principles have since been fleshed out in other directives.

The important thing for you to be aware of is that **you are responsible for safety and health protection** in your firm. You are alone, but you can (in some cases you will need to) enlist specialist help.

For their part, workers and their representatives are **obliged to cooperate with you,** but if they are to do so you must of course keep them informed of your intentions, ask their opinions and train them so that they are able to carry out your instructions as efficiently as possible.

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1 And their representatives, if there are any.

Worker information, consultation, participation and training in the fields of safety and health

Workers are, justifiably, concerned to be better informed about their work.

The European Community shares this concern, as reflected in the Recitals preceding the framework Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work, in which it is stated that 'information, dialogue and balanced participation on safety and health at work must be developed between employers and workers and/or their representatives by means of appropriate procedures and instruments, in accordance with national laws and/or practices'.

How does the framework Directive 89/391/EEC provide for such consultation, participation and training?

The Directive provides that the employer shall:

1. **inform** workers and/or their representatives;
2. **consult** workers and/or their representatives to ensure their participation;
3. **train** workers in safety and health.

What must workers be informed about?

About the safety and health risks, but also about all measures taken within the enterprise to overcome such risks in respect of each type of workstation and/or job.

About the measures taken and persons designated:

- for first aid;
- for fire-fighting and the evacuation of workers.

About the serious and imminent dangers to which certain workers may be exposed, and the protective measures organized in this context. The employer must give each worker concerned instructions enabling him or her to stop work and proceed to a place of safety when threatened by serious and imminent danger (workers in this situation who leave their workstations must not be placed at any disadvantage because of their action and must be protected against any harmful and unjustified consequences). The employer must also provide any worker put in this situation with information enabling him or her to take the appropriate steps.

NB: The employer must give workers' representatives and workers with safety responsibilities access to all the information necessary for a proper evaluation of the risks within the enterprise and to the accident reports drawn up for submission to the competent authorities.

How should the consultation and participation of workers be organized?

For all questions relating to safety and health at work the employer must:

- consult the workers and/or their representatives,
- respect their right to make proposals,
- organize their balanced participation in deciding on the measures to be taken.

In particular, he must consult the workers and workers' representatives with specific responsibility for safety and health within the firm.

The issues on which consultation must take place are:

(a) any measure which may substantially affect safety and health;

(b) the designation of workers responsible for protection and the prevention of occupational risks, and the activities involved in this work;

(c) the designation of workers responsible for:

- protection and prevention activities,
- first aid,
- fire-fighting and the evacuation of workers;

(d) the nature and use of information relating to the assessment of safety and health risks and to groups of workers exposed to particular risks.

In this context, workers must be consulted on:

- the protective measures to be taken (and the protective equipment to be used),
- the list of occupational accidents resulting in more than three days' incapacity for work,
- the accident reports for submission to the competent authorities;

(e) the enlistment of competent outside services (where there is a lack of competent personnel in the enterprise;

(f) the planning and organization of worker training (see 'Safety training of workers' below) in safety and health.

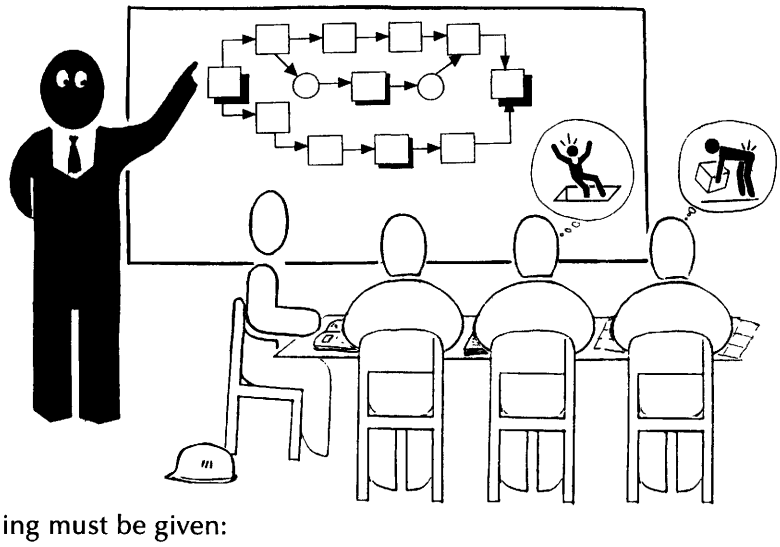
NB: 1. Workers and/or their representatives have the **right to ask** the employer to take appropriate measures and to submit proposals to him to that end.

2. The employer must allow workers and workers' representatives with specific responsibility for safety and health **adequate time off work,** without loss of pay, and provide them with the necessary means to perform their functions.

3. Workers and/or their representatives **are entitled to appeal to the competent authority** if they consider that the measures taken and the means employed by the employer are inadequate for the purposes of ensuring safety and health at work.

Safety training of workers

Each worker must receive adequate safety and health training specific to his workstation or job.



Such training must be given:

- on recruitment,
- in the event of a transfer or change of job,
- in the event of a change in work equipment,
- in the event of the introduction of new technology.

The training must be **adapted** to take account of new or changed risks and must be **repeated** periodically if necessary.

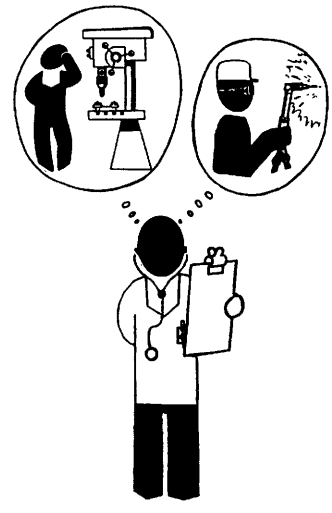
Conditions applying to safety training:

- it must be provided free of charge to workers and their representatives;
- it must take place during working hours, either within or outside the enterprise (in accordance with national practice).

NB: The employer must take the appropriate measures to ensure that, in this same place of work, the 'outside' employer receives appropriate information so that his employees can be instructed about the risks in the enterprise and the preventive measures relating to each workstation or job.

Surveillance of workers' health

Workers must receive health surveillance appropriate to the health and safety risks they incur at work. The type of surveillance must be in accordance with national law and/or practices. Each worker may, if he so wishes, receive, at regular intervals, health surveillance appropriate to the health and safety risks he incurs at work.



Conclusions

The framework Directive of 12 June 1989 gives a new dimension to the establishment of active prevention by employers and workers to combat occupational accidents and occupational diseases. All sides involved have certain obligations and certain rights.

Safety and health at work

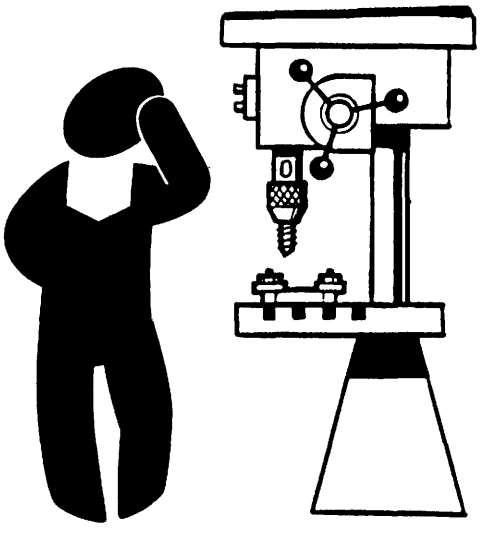
Ensuring the free movement of workers is important, of course, but ensuring their safety and health is equally important: the framework Directive 89/391 EEC of 12 June 1989 sets out the basic principles in this regard.

But the basic principles are only the first step. The next requirement is for rules imposing the implementation of these basic principles in all Member States, and above all at all places of work; in other words, for minimum requirements designed to benefit each individual at his/her place of work. This is the object of Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace.

Why minimum requirements for workplaces?

Because in order to provide an adequate level of safety for all workers in the 12 Member States account must necessarily be taken of existing safety levels in the Member States, and a new level must be established which is not an average of these existing levels but a minimum level to be applied throughout the Community, having regard to Member States' economies and the state of advancement of their safety and health legislation.

This is what Directive 89/654/EEC does with regard to workplaces.



What is a workplace?

A workplace is defined in the Directive as being the place intended to house workstations on the premises of the enterprise and/or establishment and any other place within the area of the enterprise and/or establishment to which the worker has access in the course of his employment.

Thus, the following are also considered to be workplaces: loading ramps, storage areas, rest rooms, changing rooms.

And in all these workplaces, **minimum safety and health requirements must be applied.** This is only fair, since workers should be entitled to enjoy the same occupational safety and health conditions throughout the Community.

Who has to arrange workplaces to match these minimum requirements?

The employer is responsible for doing so, and in the process he must inform and consult the responsible workers, as provided for in the aforementioned framework Directive.

What must the employer do?

1. See to the arrangement of **traffic routes** to exits and emergency exits, making sure they are kept clear at all times.

2. See to the **technical maintenance** of workplaces, equipment and devices, by rectifying any faults found which are liable to jeopardize the safety or health of workers. (In particular, he must see to ventilation, temperature, room lighting, stability of floors, walls and ceilings, maintenance of doors and gates, windows, escalators and travelators, sanitary equipment, etc.)

3. See to the **regular cleaning** of workplaces, equipment and devices in order to ensure an adequate level of hygiene.

4. See to the **regular maintenance and checking** of safety equipment and devices intended to prevent or eliminate hazards.

In order to apply these measures (described in detail below) and principles, the employer must:

- **inform workers** and their representatives of all safety and health measures taken or to be taken;

- **consult workers and their representatives and allow them to participate,** encouraging them to cooperate in the introduction of such measures.

Member States may[1] *apply* ***more stringent national measures*** *to workplaces if they feel that these are necessary in order to afford workers greater protection.*

Also, it goes without saying that if the employer and the workers together agree to more stringent preventive measures for the enterprise, these can be applied at the workplaces.

In more detail, what must the employer do?

The Directive on workplaces was due to be brought into force by 31 December 1992 at the latest and distinguishes between:

- workplaces used for the first time **after** 31 December 1992;

- workplaces already in use **before** that date.

So as not to make matters too complicated, however, this distinction will be ignored in the following examination of the main aspects of safety at the workplace. Normally, the same rules will apply to both new and existing workplaces. Where there are differences, these will be pointed out at the end of each subsection.

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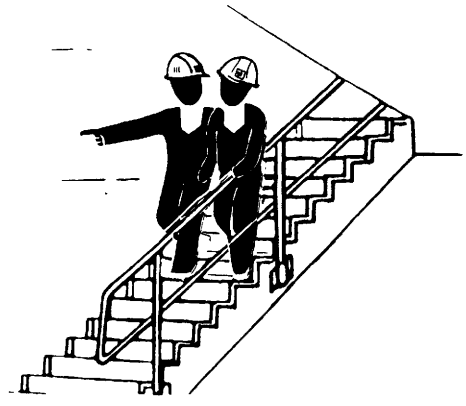
1 And must, in certain situations (see Article 118A(3)).

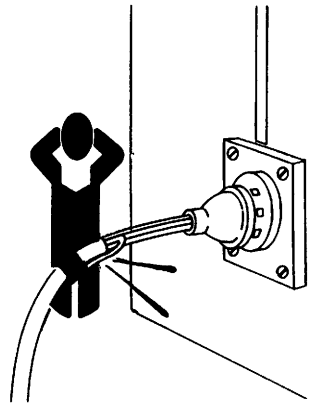
1. Stability and solidity of buildings

Buildings which house workplaces must have well-designed structures and have solid foundations and frames. Their design must be appropriate to the nature of their use, i.e. industrial or commercial.



2. Electrical installations

These must be reliable and be designed and constructed in such a way as not to present a fire or explosion hazard to workers or the public. Electrical hazards are insidious. Equipment and protective devices must be designed, constructed and chosen with care. Account must also be taken of external conditions (e.g. protection of outdoor installations from rain), voltage used, and the competence of persons with access to parts of the installation.



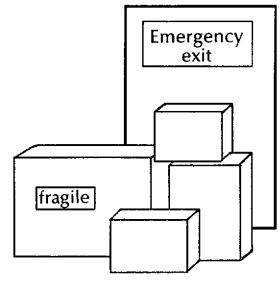
Voltage (low or high) in line with efficiency requirements; suitable earthing; no easy access to live parts; electricity rooms, cabinets, etc., where dangers exist, to be kept locked, with access restricted to authorized persons; warning signs to be affixed where dangers exist, with access prohibited where necessary.

Example: all wiring up must be neat and correct for maximum safety.

3. Emergency routes and exits

The number, distribution and dimensions of emergency routes and exits depend on the use, equipment and dimensions of the workplaces and the maximum number of workers (and of members of the public in enterprises which are open to the public). Routes will lead to the open air or to a safe area.

Emergency doors and exits must not be locked and must open outwards easily. They must be easily openable by any person needing to use them in an emergency.



Not like this!

Emergency routes and exits must not be obstructed by cardboard boxes, waste, chairs, trolleys, etc.

In the event of danger, **each worker must be able to leave his workplace** as quickly and safely as possible, by following appropriately-placed direction signs towards these exits. Emergency routes and exits must be provided with emergency lighting in case the normal electricity circuit fails. Routes and exits must be free from obstruction (no blocked staircases, corridors sufficiently wide for the number of employees, etc.), and sliding or revolving doors are not permitted.

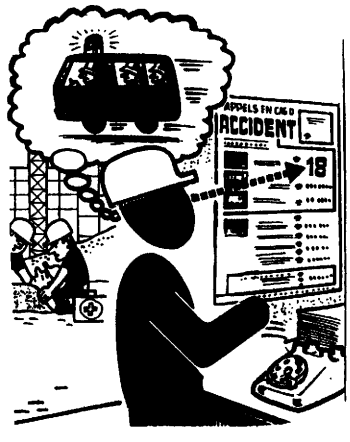
4. Fire detection and fire-fighting

The key word in this context is prevention: firms must be **properly prepared** to deal with fires before one actually occurs.

Instructions must be posted up: these must be **simple instructions which all workers can easily understand.**

They must include the following information:

- fire-service phone number;
- how to set off the alarm;
- how to alert the in-house or external emergency services (telephone, siren, etc.).



All workplaces must be equipped with appropriate fire-fighting equipment (for example extinguishers), which employees must know how to use (there is no time to start reading the instructions once a real fire has started). This equipment must be **clearly signposted,** easily accessible and simple to use.

Evacuation must be prepared for and practised by organizing **frequent fire drills**, so that each worker is familiar with the escape route he must use. Routes must be well signposted.

Depending on the applicable national legislation, enterprises will be equipped with **automatic** fire-detection and extinguisher installations (sprinklers).

NB: Enterprises which manufacture or store flammable materials must adopt appropriate preventive measures (no smoking, no naked flames, no sparks, etc.).

5. Ventilation of enclosed workplaces

In enclosed workplaces it is necessary to provide **sufficient fresh air**, having regard to the working methods and the physical demands which these make on the workers.

If a forced ventilation system is used it must be maintained in working order by means of regular checks designed to reveal malfunctions and prevent breakdowns.

For new workplaces (i.e. those used for the first time after 31 December 1992), the Directive stipulates that air-conditioning or mechanical ventilation installations must not expose workers to drafts which cause discomfort. Any deposit or dirt likely to cause risks to health must be removed without delay and there must be:

- monitoring of air velocity,
- cleanness of pipes,
- regular air renewal.

Also remember that specific measures need to be taken for the ventilation of enclosed workplaces occupied simultaneously by personnel and dangerous products or substances (laboratories, rooms for filling sacks, cans, drums, etc.).

6. Temperature in rooms containing workplaces

The temperature must be adequate for human beings.

Buildings and rooms must be heated during the cold season, with due precautions taken to avoid any dangerous emanations.

The temperature in other rooms must be appropriate to the particular purpose of the room (e.g. rest rooms, canteens, rooms for duty staff, first-aid rooms, shower rooms, bathrooms).

In addition, in new premises, used for the first time after 31 December 1992, steps must be taken to ensure that workplaces are not exposed to direct and excessive sunlight via windows, skylights and glass partitions, having regard to the nature of the work and the workplace.

NB: Member States may apply their own regulations governing excessive sunlight in existing workplaces.

7. Natural and artificial lighting of rooms

Priority should be given to **natural lighting** (this is preferable to any other form), which should be supplemented by artificial lighting adequate for the protection of workers' safety and health.

Example: the national regulations specify the number of lux required for certain types of precision work such as technical drawing, watchmaking, etc.

Emergency lighting is essential in places where power failures are liable to occur. Emergency lighting must be effective and independent of the normal electrical circuits in the establishment.

The type of lighting provided in rooms containing workplaces and in passageways must be such that there is no risk of accident to workers (e.g. falls on staircases), nor must it be damaging to eyesight (in particular, it must not cause glare or visual fatigue). Excessive differences in levels of illumination between adjacent rooms must also be avoided.

8. Floors, walls, ceilings and roofs of rooms

Floors

(a) These must be stable, fixed, non-slippery, with no dangerous bumps, holes or slopes.

(b) The surfaces of floors, walls and ceilings must be easy and safe to clean, and if necessary be refurbished to an appropriate standard of hygiene.

Walls

Transparent or translucent walls, in particular all-glass partitions and walls in the vicinity of workplaces and traffic routes, must be:

(a) clearly indicated,

(b) made of safety material or be shielded from workplaces to prevent workers from coming into contact with them, and be arranged so as to avoid injuring anyone should they shatter.

Roofs

Access should be prohibited. Where access is permitted, equipment must be provided to ensure that the work can be carried out in safety. This applies principally to roofs made of materials of insufficient strength.

The Directive also stipulates that workplaces must have adequate thermal insulation, having regard to the physical activity of the workers.

9. Windows and skylights of rooms containing workplaces

(a) Workers must be able to open, close, adjust or secure windows and skylights: these must therefore be **easily accessible** and safe to manipulate.

(b) When open, they must **not constitute a hazard** to workers.

(c) Their design must be such that they can be **cleaned without risk** to the workers carrying out this work or to other workers present in and around the building.

Special apparatus can be provided for window cleaning, for example telescopic-arm or cable-hauled cradles on external facades.

NB: Under the terms of the Directive this applies only to new workplaces, but good preventive practice quite obviously requires that these principles be applied everywhere.

10. Doors and gates

For all workplaces: Transparent doors must be appropriately marked at a conspicuous level, and swing doors and gates must be entirely or partially surfaced with see-through panels.

For new workplaces: The position, number and dimensions of doors and gates, and the materials used in their construction, are determined by the nature and use of the rooms or areas.

It must be possible to **open** them when the workplaces are occupied.

It must be possible to open them from the inside **without special assistance**.

All transparent or translucent parts must be made of safety material or must be **protected** against breakage in order to avoid injuries to workers.

Sliding doors must be fitted with a safety system to prevent them from being derailed and falling over.

Doors and gates opening upwards must be fitted with a mechanism to **secure them against falling back**. Automatic gates must be fitted with an emergency closure system.

Mechanical or automatic doors and gates must be checked regularly to avoid accidents. They must be openable manually and be provided with emergency closure devices.

Gates for vehicle traffic must be supplemented by doors for pedestrians unless it is safe for pedestrians to pass through; such doors for pedestrians must be clearly marked and left permanently unobstructed.

11. Traffic routes and danger areas

All persons in the enterprise, whether on foot or in vehicles, must be able to circulate without danger to their lives or the lives of others, including on stairs, fixed ladders, loading bays and ramps.

It is therefore necessary to calculate:

- the number of users;
- the quantities of goods transported;
- the dimensions of traffic routes, having regard to these uses.

Sufficient clearance must be allowed between vehicles and doors, gates, passages for pedestrians, corridors and staircases.

It may be useful or necessary to provide markings on the ground identifying traffic routes.

Danger areas (owing to the nature of the work):

- must be clearly indicated;
- must be equipped with devices preventing unauthorized workers from entering them; and
- measures must be taken to protect workers authorized to enter them.

12. Escalators and travelators

These must function safely, i.e. they must pose no danger to workers.

They must be equipped with safety devices and emergency shut-down devices which are easy to access, identify and operate if necessary.

13. Loading bays and ramps

These must be suitable for the dimension of the loads to be transported.

They must have **at least one exit point**, and two exit points when they are relatively long.

Loading ramps must be fitted with safety systems to avoid the risk of accidents or of workers falling off.

14. Room dimensions and air space in rooms: Freedom of movement at the workstation

Workrooms must have sufficient floor area, height and air space to allow workers to perform their work without risk to their safety, health or well-being.

NB: Many national regulations give precise specifications.

Room dimensions or areas must be properly calculated so as to allow workers sufficient freedom of movement around their workstation. If this is not possible for reasons specific to the workplace, another space with sufficient freedom of movement must be created nearby.

15. Rest rooms

An easily accessible rest room must be provided for workers where the safety or health of workers or the number of workers so requires, having regard to the type of activity carried out.

NB: The room to be used for this purpose can be decided upon after consultation with the workers or their representatives; a canteen, for example, could be used as a rest room after being cleaned and outside meal times.

Rest rooms must be equipped with an adequate number of tables and seats with backs, having regard to the number of workers concerned.

Rest rooms must be large enough for the number of workers.

Measures must be taken for the protection of non-smokers.

If there is no rest room and work is frequently interrupted (as in glassworks, steelworks, etc.), other rooms must be provided in which workers can stay during such interruptions, again with appropriate measures being taken to protect non-smokers.

16. Pregnant women and nursing mothers

Pregnant women and nursing mothers must be provided with facilities at work where they can lie down to rest in appropriate conditions.

NB: On this subject, see the national legislations authorizing (or not) breastfeeding during work and the measures devised for pregnant women at work.

17. Sanitary facilities

Changing rooms and lockers

These must be provided if workers have to wear special work clothes and cannot be expected, for reasons of health or propriety, to change in another room.

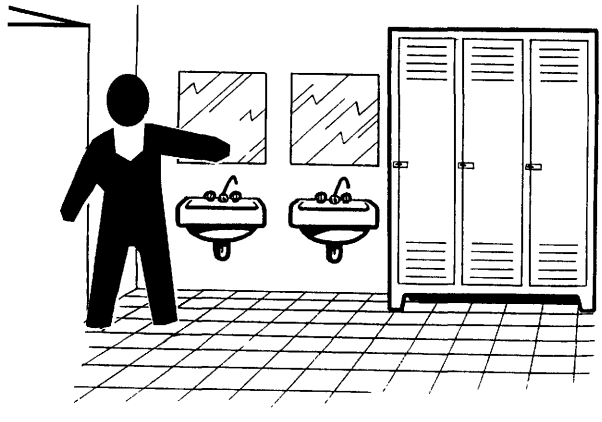
Changing rooms must be sufficiently large and have facilities enabling normal clothes to be locked away during working hours.

If circumstances so require (dangerous products or substances, dirt, etc.), lockers for work clothes must be separate from those for normal clothes.

If changing rooms are not necessary, workers must be provided with a place to store their normal clothes.

Showers and washbasins

These must be provided for workers if required by the nature of the work or for health reasons.



They must be sufficiently large.

They must be sufficient in number for each worker to be able to use them without hindrance and in conditions of an appropriate standard of hygiene.

Showers must be equipped with hot and cold running water.

If necessary, washbasins (with hot and cold running water) must be provided in the vicinity of workstations.

There must be easy access between shower rooms, washbasins and changing rooms.

Lavatories and washbasins

Workers must be provided with lavatories and washbasins in the vicinity of their workstations (to avoid having to make long trips up and down the corridors).

These facilities must also be provided in the vicinity of rest rooms, changing rooms and shower or wash rooms.

Important: Separate changing rooms, shower rooms, lavatories and washbasins must be provided for male and female workers; failing this, a system must be organized for separate, alternating use of shared facilities.

18. First-aid rooms and their equipment

(a) **Rooms:** One or more first-aid rooms must be provided depending on the type of activity carried out in the enterprise (and also on the number of workers).

They must be signposted as first-aid rooms.

They must be easily accessible to stretchers.

They must be fitted with appropriate installations and equipment.

(b) **Equipment:** First-aid equipment must be provided in the vicinity of workstations.

It must be marked as first-aid equipment.

It must be easily accessible.

Generally speaking, the equipment will be in the form of first-aid boxes.

19. Handicapped workers

The measures specified in the Directive apply to all workplaces, whether new or old. Every effort must be made to make life easier for handicapped workers.

Consequently: Doors, passageways, staircases, showers, washbasins, lavatories, workstations, traffic routes, etc. must be organized to take account of handicapped workers. (See individual Member States' legal provisions on this subject.)

20. Outdoor workplaces (special provisions)

Measures must be taken to ensure that outdoor work can be performed with a minimum of risk and danger.

Consequently: workstations,
traffic routes,
other areas and installations outdoors
must be organized safely.

More precisely: danger areas,
doors and gates (automatic or not),
escalators and travelators,
loading bays and ramps
must be organized appropriately.

In addition, workplaces outdoors must be adequately lit by artificial lighting if daylight is not adequate.

Finally, outdoor workplaces must, as far as possible, be arranged so that workers:

- are protected against inclement weather conditions and falling objects;
- are not exposed to harmful noise levels or to harmful agents (gases, fumes, dust, etc.);
- are able to leave their workstations swiftly in the event of danger or are able to be rapidly assisted;
- cannot slip or fall.

For workplaces already in use, the Annex to the Directive stipulates that outdoor and indoor workplaces must be organized in such a way that pedestrians and vehicles can circulate in a safe manner.

Conclusions

Directive 89/654/EEC of 30 November 1989 contains many detailed provisions. Each Member State must transpose the provisions of the Directive into its own legislation.

However, many national laws have already been adopted in this field. So what exactly needs to be done?

It is sufficient to augment the national legislation by incorporating the elements of the Directive or adapting them to fit local circumstances. National legislation must be aligned and harmonized with the European Directive, which basically **sets out employers' obligations** with regard to the design and arrangement of workplaces. Employers must also maintain workplaces in an excellent state of operation, which will further help to ensure the safety and health of workers.

A safe, healthy, well-run firm is in the best interests of employer and employees alike!

The use of work equipment

Just over a quarter of European workers claim to use **potentially dangerous work equipment** for more than 25% of their working time.[1]

Two thirds of workers feel that the **enterprise has main responsibility for the prevention** of occupational accidents and diseases. The general feeling in enterprises with fewer than 10 employees, which do not have the same resources to spend on prevention as larger enterprises, is that some of the responsibility lies with **the workers themselves** and with government.[1]

What is the purpose of this Directive?

The purpose of Directive 89/655/EEC is to respond to workers' expectations concerning the minimum safety and health requirements for the use of **work equipment** by workers at work. The Directive provides for active worker participation in the firm's safety and health policy, while imposing certain obligations on both employer and workers.

What is meant by work equipment?

'Work equipment' is defined in the Directive as being any tool, machine, apparatus, or installation used at work.

The **operator** is the worker given the task of using work equipment, whatever the circumstances. When operating, work equipment may present a danger to **exposed workers** within a **danger zone**, the extent of which depends on the types of risk generated by the work equipment.

Work equipment

Work equipment bought new after 31 December 1992 must comply with the requirements of all the earlier directives which apply to such equipment, and in particular Directive 89/392/EEC. Generally speaking, therefore, it must bear the EC label certifying that the equipment conforms with Community directives. In the case of second-hand equipment or equipment already in use on that date, the employer has until 31 December 1996 to adapt it to comply with the minimum requirements.

Before selecting the work equipment which he proposes to provide for his employees, the employer must make a thorough assessment of the **specific working conditions and characteristics** which exist in the enterprise and of the **hazards** posed by the use of the equipment in question. These hazards must be **eliminated** if possible, or at least **minimized**.

Where the use of work equipment is likely to involve **specific risks** to safety or health, use must be restricted to workers who have been given proper training and information. This applies not only to normal use of the equipment but also to maintenance and repair work.

Work equipment may not be used for tasks for which it has not been designed, or in conditions for which it has not been designed. Additionally, it must bear the **warnings** and **markings** essential to ensure the safety of workers, and these must be clearly visible.

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1 'Europeans and health and safety at work', Eurobarometer survey (1991), Commission of the European Communities, DG V/E/5.

There must be safe access to all areas of the equipment where maintenance or repair work may be necessary.

In all cases, work equipment must be correctly **maintained.**

What are the principal minimum requirements?

The principal minimum requirements cover:

(a) ***Control systems***

These must be **clearly visible and identifiable**, equipped with **remote control devices** located outside the danger zone wherever possible, and equipped with an **emergency stop device** in addition to the normal stop control.

The system must be so designed that the equipment can only be started by a **deliberate action.** It should not be possible to start it accidentally.

The operator must have an **unobstructed view** of the danger zone and/or give an agreed signal an adequate length of time before starting the equipment.

A breakdown in, or damage to, control systems must not result in a dangerous situation.

The **stop control must have priority** over the start controls.

(b) ***Safety devices and protection devices***

These must be robust, solidly attached and yet designed to be dismantleable to permit access to the danger zone or the equipment when necessary, and must not give rise to any additional hazard.

They must be fitted where there are risks of falling objects or projections, emissions of gas, disintegration or rupture of equipment, electrical injury, etc.

They must prevent workers from coming into contact with very hot or very cold parts of the equipment or being caught up in moving parts of the equipment.

Work equipment must be stabilized if necessary and access to the danger zone must be prevented.

(c) ***Lighting***

Areas where equipment is worked on or maintained must be **adequately lit** in line with the work to be carried out there.

(d) ***Warning devices***

Warning devices must be easily perceived (for example, an acoustic warning signal should be clearly audible above the ambient noise) and must be unambiguous and understood immediately.

(e) ***Maintenance***

Maintenance operations must be carried out when the equipment is **shut down.** If this is not possible, appropriate protective measures must be taken.

Worker training and information

Workers must be given **training appropriate to the tasks** which the employer wishes them to perform.

Information and written instructions must cover the **normal conditions of use** of equipment, **foreseeable abnormal situations**, and the **conclusions to be drawn** from the behaviour of the equipment in normal operation or following **incidents**.

Worker consultation and participation

The idea is to allow everyone to benefit from the **experience** acquired by workers. Well-trained and well-informed workers can help to raise the general level of safety and health within the firm by providing advice to the employer.

Workers may be consulted directly or through the intermediary of **worker representatives.**

SMEs do not have the resources of larger firms to invest in consultation and participation but there tends to be a closer relationship between employer and employees, thus facilitating an **interactive, collective approach** to safety and health at work.

Specific work equipment

The present provisions will shortly be supplemented by additional minimum requirements applicable to certain specific types of work equipment.

Conclusions

Work equipment makes an essential contribution to a firm's productivity. Judiciously chosen, correctly used and well maintained, it can help to protect workers and improve their working conditions.

This Directive introduces an additional dimension:

It ensures that minimum rules will be observed throughout the Community during the use of work equipment, thus underlining the importance of safety and health at work.

Personal protective equipment

The basic philosophy behind the European Community's safety and health directives is to **anticipate and eliminate** the possibility of potentially dangerous situations at source by ensuring that safety and health considerations are taken into account at the **equipment design** and **work planning** stages.

These directives not only set out minimum requirements for equipment but also stipulate that consultations must be held before commencement of work and that workers must be trained and properly informed about their allotted tasks and the technical means to be employed for performing these tasks.

Despite all these measures, there remains an inevitable or unforeseeable **residual risk,** and workers therefore need to be protected in order to mitigate the consequences of any incident or accident resulting from such risk. This final barrier against injury is **personal protective equipment (PPE).**

What is personal protective equipment?

It is defined as all equipment[1] designed to be worn or held by the worker to protect him against one or more hazards likely to endanger his safety and health at work.

The equipment must therefore be **specifically** designed to protect the safety and health of the worker **at work,** regardless of whether it serves any other purpose of general interest to the company (such as the wearing of uniforms).

1 Excluding equipment used by emergency and rescue services, sports and self-defence equipment, and personal protective equipment used in road transport.

What are the contents of the Directive?

Directive 89/656/EEC of 30 November 1989, supplemented by Commission communication 89/C328/02, lays down the minimum safety and health requirements for the use by workers of personal protective equipment at work.

These minimum requirements in no way prevent owners of SMEs from taking or applying more stringent protective measures within their companies, whether pursuant to obligations arising from the relevant national legislation or pursuant to decisions taken within the company after consultation with the workers or their representatives.

The Directive lays down **employers' obligations** and contains **guideline annexes.** The Commission communication contains **non-exhaustive information for the evaluation of PPE.**

PPE must comply with the relevant provisions on design and manufacture and must be supplied **free of charge** to workers by the employer and be **in good working order.** PPE must:

- **be appropriate** for the risks involved,
- not in itself lead to **any new risks**,
- take account of **personal parameters** relating to the user and the nature of his work.

The rule is one item of PPE for each exposed worker! If several items of PPE are supplied to a worker they must be compatible, and if a single item of PPE is to be worn by more than one worker **the rules of hygiene must be strictly complied with.**

The employer must ensure that the necessary **information** for the use of the PPE is **made available** within the company in a form comprehensible to the workers concerned and is brought to the attention of these workers. The employer must organize training and demonstrations for the workers concerned in order to ensure that the PPE is used in accordance with the instructions.

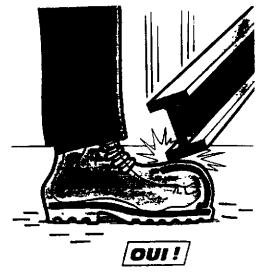
PPE must be worn by the worker exclusively for the purposes specified, and only after the employer has informed the worker of the nature of the risks against which the PPE is designed to afford protection.

Workers and/or their representatives must be **informed** by their employer of the measures to be taken with regard to their health and safety when using PPE. They must be **consulted** and encouraged to **participate** in discussions to establish the best possible way of implementing the provisions contained in the various legislative texts governing the protection of workers.

How to assess whether the use of PPE is necessary

A study must be made of the parts of the body likely to be exposed to risks. The main risks are as follows.

Physical



Mechanical:
- falls
- blows, cuts, impact, crushing
- stabs, cuts, grazes
- vibration
- slipping

Thermal:
- heat, fire
- cold

Electrical

Radiation:
- non-ionizing
- ionizing

Noise

Chemical

Aerosols:
- dust
- fumes
- mists

Liquids:
- immersion
- splashes, spurts

Gases, vapours

Biological

Harmful bacteria

Harmful viruses

Mycotic fungi

Non-microbe biological antigens

For example, a worker operating in an environment with very high noise levels which cannot be reduced by collective measures (e.g. machinery soundproofing) is exposed to **noise,** and the organ which may be affected is the **ear.** The PPE solution is therefore to provide **hearing protection.** Other measures should also be implemented at the same time, such as reducing the duration of exposure or purchasing quieter machinery.

The SME owner must carry out a methodical analysis of the risks, to which end he may enlist the help of various parties, for example the occupational physician, the consulting engineer, various inspectors or experts, the works safety, hygiene and working conditions committee or its equivalent, the workers' representatives and the workers themselves.

The Directive also contains guide lists of items of PPE and of activities and sectors of activities where the provision of PPE may be necessary. The SME owner may find these lists useful.

How can the safety aspects of PPE be assessed?

Practical rules are given in the Commission communication published in the ***Official Journal of the European Communities*** C 328 of 30 December 1989.

The annex to this communication deals in turn with nine categories of PPE, classed according to the organ to be protected or the risk to be prevented. These categories, which are presented in the form of tables, are examined systematically.

Each category is divided into three headings:

- risks to be covered;
- risks arising from the equipment;
- risks arising from the use of the equipment.

The following aspects are considered under each of these headings:

- the risks;
- the origin and types of risk;
- the safety and performance criteria for selection of equipment.

Take, for example, 'risks arising from the use of the equipment', which has the same headings for all categories of equipment:

- 'the risks' indicate what the PPE chosen does not protect adequately,
- the 'origin and types of risk' consist of a wrong choice of equipment, incorrect use of equipment, or dirty, worn or deteriorated equipment. Remedies are indicated for each situation, varying according to the category of PPE in question.

Conclusions

PPE is chosen after mature reflection.

It must:

- bear the EC label,
- be appropriate to the risks involved,
- afford real protection,
- be comfortable, well maintained and correctly used.

It must not hamper the wearer in the performance of his work and above all **it must be worn for the whole time that he is exposed to the risk in question.**

Remember that the main priority should be given to collective protection. PPE is the last line of defence against risks!

Manual handling of loads

'Oh, my back!'

Unfortunately, this is a cry we hear far too often.

The European Community has concerned itself with this problem. Directive 90/269/EEC of 29 May 1990 lays down the minimum health and safety requirements for the manual handling of loads where there is a risk, particularly of back injury, to workers.

Under the terms of this Directive, **manual handling of loads** means any transporting or supporting of a load, including lifting, putting down, pushing, pulling, carrying or moving of a load, which involves a risk, particularly of back injury, to workers.

Employer's obligations

The employer must assess the risks involved in load-handling activities. He must take appropriate organizational measures (ergonomic design of workstations) or use appropriate means, in particular mechanical equipment, to avoid the need for the manual handling of loads by workers.

Where manual load handling cannot be avoided, the employer must, among other things:

- organize workstations with due regard to the loads involved, the physical effort required of workers and personal factors such as physical aptitude, build, work clothing, etc.;
- inform workers on this subject, seek their opinions and train them in correct load-handling techniques.

Those responsible for safety and health questions will be required to ensure in particular that such training and information is given.

Specifically, workers and their representatives must:

(a) be given information on all the protective and preventive measures implemented by the company with regard to manual handling of loads. They must be given information on:

- the **weight** of the load,
- the **centre of gravity** of the load (or the heaviest side);

(b) be taught how to handle loads correctly (in principle, always bend the knees, back straight, arms outstretched to take the weight, etc.).

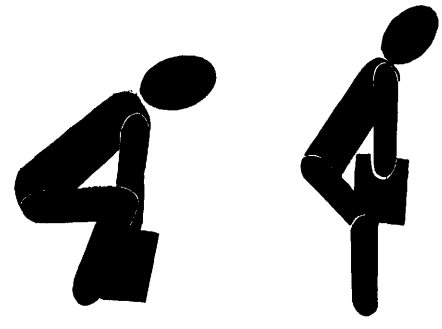
'Safety first' should be the order of the day.

Correct foot positioning

To avoid loss of balance the feet should never be together but be placed 50 cm apart, one facing the direction of the intended movement, the other in a position to give thrust to the body.

Correct back position

Never rounded but rather tilted whilst kept straight; knees bent. As soon as the knees have straightened the back should be restored to the upright position.



Correct arm position

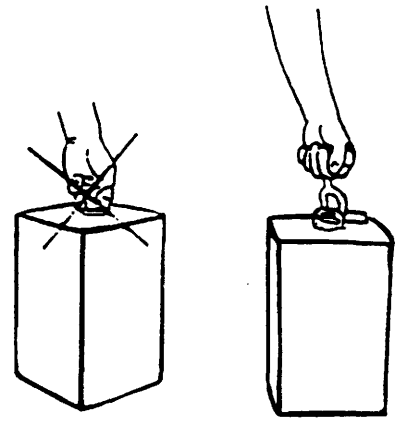
Elbows never bent, arms kept close to the body and braced as much as possible.

Chin tucked in

As soon as the lifting movement commences, the top of the head should be gently raised, the chin tucked in and the spinal column tensed (not only the neck!). Why? In order to raise the chest automatically and to prepare the shoulders for more effective arm action.

Correct grip

Loads should never be gripped using the fingertips because this puts damaging strains on certain muscles and tendons. Loads must be gripped using the full hand. In the drawing on the left the handle should not be used (grippable by three fingers only). On the right the handle is gripped by the entire hand, thus reducing the muscular effort in the forearm.



Using one's body weight

When lifting an object from the ground, thrust from the back foot and straightening of the knees combine to move the body upwards and forwards. For a brief moment the body is out of balance, but this is immediately compensated for by advancing the back leg (as in walking).

As soon as balance has been restored, the lifting action is completed. The forward movement has thus made it possible to move smoothly from a lifting action to a carrying one.

NB: Weight is only one aspect of the load.
The employer does not always know the weight, and it is frequently not marked on the packages or items to be lifted.
Precautions should therefore be taken before lifting these loads.

Factors other than weight include:

The volume of the load

The handleability of the load

The vertical lift involved

The distance to be covered

The possibility of dividing the load into smaller loads

The task is also a factor:

Is it only an occasional task?

Is it a repetitive task with scheduled or unscheduled rest periods during the carrying of the load?

Is it an ordinary, continuous handling job?

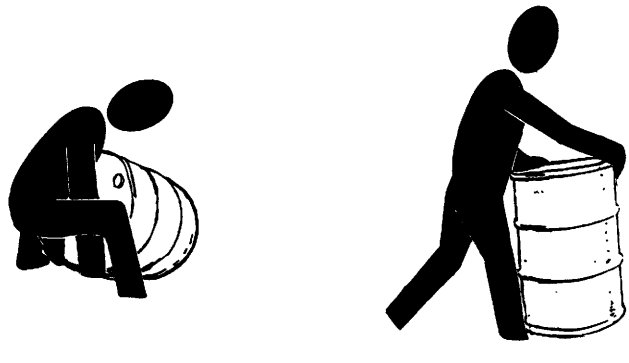
In other words, weight is not the only aspect to consider!

Above all, body posture must be correct because back injuries are often the result of poor positioning or of an inappropriate body posture.

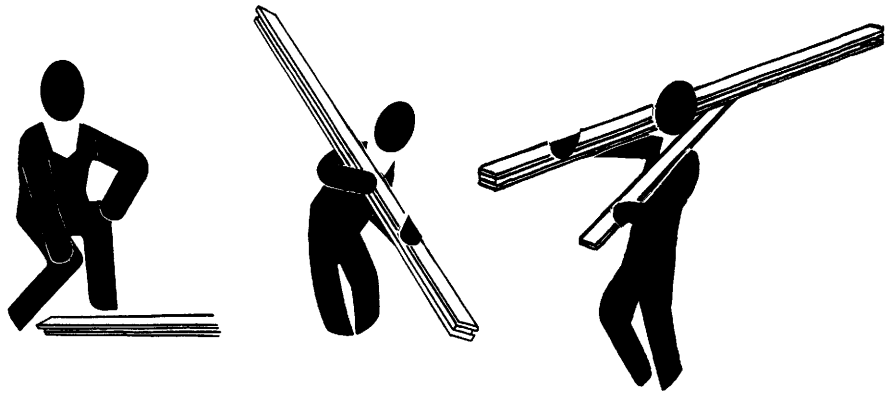
What are the best ways of carrying loads?

For example:

Handling an oil drum



Lifting long objects



Remarks

1. Contrary to what many may think, there is a difference between a kilogram of feathers and a kilogram of lead!

   The difference lies in the volume and the technique required for gripping the load.

   The rules are:

   - **never grip loads using the fingertips,** because this puts damaging strain on certain muscles and tendons;
   - **grip loads with the arms outstretched**, to reduce muscular effort in the forearm;
   - **train workers** to use the correct grip on loads.

2. For the sake of completeness, the importance of other factors involved in the handling of loads should also be emphasized. In addition to the characteristics of the load itself, these factors include the physical effort demanded of workers, the characteristics of the working environment in which the loads are handled, the demands of the activity itself (muscles involved, frequency of the carrying operation, distance to be covered, etc.), the ambient temperature, etc.

   But above all, the keys to **avoiding back problems** are:

   - a correct and properly learnt posture;
   - a well-informed worker properly trained for the task;
   - an alert and responsible safety staff.

Conclusions

Avoid manual handling of loads!

This Directive contains a fundamental principle.

While requiring employers to take appropriate organizational measures and to use appropriate means or provide workers with such means in order to reduce the risks involved in the manual handling of loads, the Directive nevertheless **requires employers first and foremost to:**

use or provide workers with appropriate means in order to avoid the need for the manual handling of loads!

Display-screen equipment

Are screens[1] used at workplaces harmful?

Many complain about them without being more specific.

Others complain of fatigue, irritability, eye problems, and headaches.

Some say that screens are 'bad' for pregnant women.

What is the reality?

The radiation generated by screens is not sufficient to cause the problems or disorders of which operators complain.

There is no direct link between work on screen and the problems or disorders of which pregnant women complain.

There are, however, certain rules and requirements which must be complied with in order to avoid the problems and disorders genuinely suffered by the workers concerned.

Complaints about work on screen may stem from other problems such as:

- poor screen characteristics (reflections, poor legibility, etc.),
- amount of time spent working on screen,
- unsatisfactory lighting or inadequate shielding from the sun,
- spectacles used, etc.,
- noise made by printers,
- unsuitable office furniture,
- screen height and positioning *vis-à-vis* the office lighting.

---

1 *Remarks*

1. This Directive applies to all screens used at the workplace. It applies to new workstations first put into service after 31 December 1992.
2. Other workstations (i.e. those already in service before that date) must be adapted to comply with the minimum requirements within four years from that date, i.e. by 31 December 1996.
3. For the purposes of the Directive, 'screens' are defined as alphanumeric or graphic display screens regardless of the display process employed.
4. The workstation includes all apparatus normally used there in addition to the screen itself, such as printers, etc.

What does Community legislation stipulate in this field?

Directive 90/270/EEC of 29 May 1990 lays down the minimum safety and health requirements in this field.

1. The employer must evaluate the risks involved in work on screen and reduce them by combating them at source.

2. The employer must **inform** workers and **train** them to use the screens.

3. The employer must **consult** workers and invite them to **participate** in implementing the measures taken for work on screen.

4. Measures must be taken to safeguard the health of workers (eye and eyesight tests, wearing of protective spectacles, etc.).

Analysis of workstations

This will cover the demands made on the operator at the workstation and the risks entailed, i.e.:

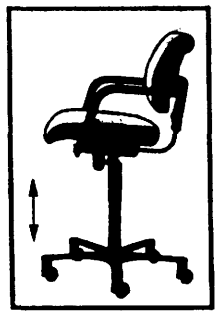
(a) the **physical problems posed by the equipment:**

- the position of the worker in front of the screen,
- the position and design of the keyboard (matt colour, angle of tilt, distance from the operator's chair, etc.);

(b) the **mental fatigue** associated with the work to be performed;

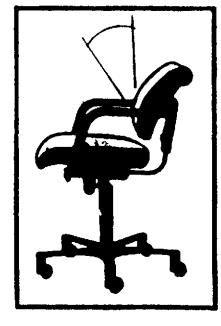
(c) the **eyesight risks:** room lighting, position of the screen *vis-à-vis* the windows, height of the work desk, etc.;

(d) the **practical organization of the work:** continuous work, with or without breaks, etc.

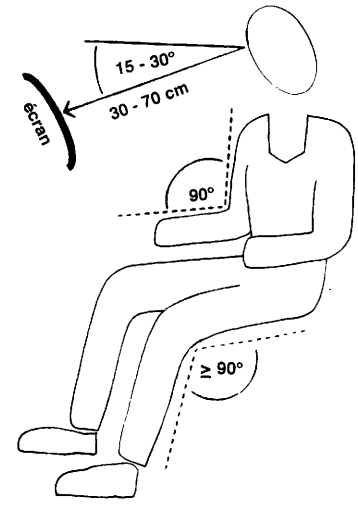


Seat height adjustable

Chair-back height adjustable



Chair-back tiltable



Correct position for work on screen!

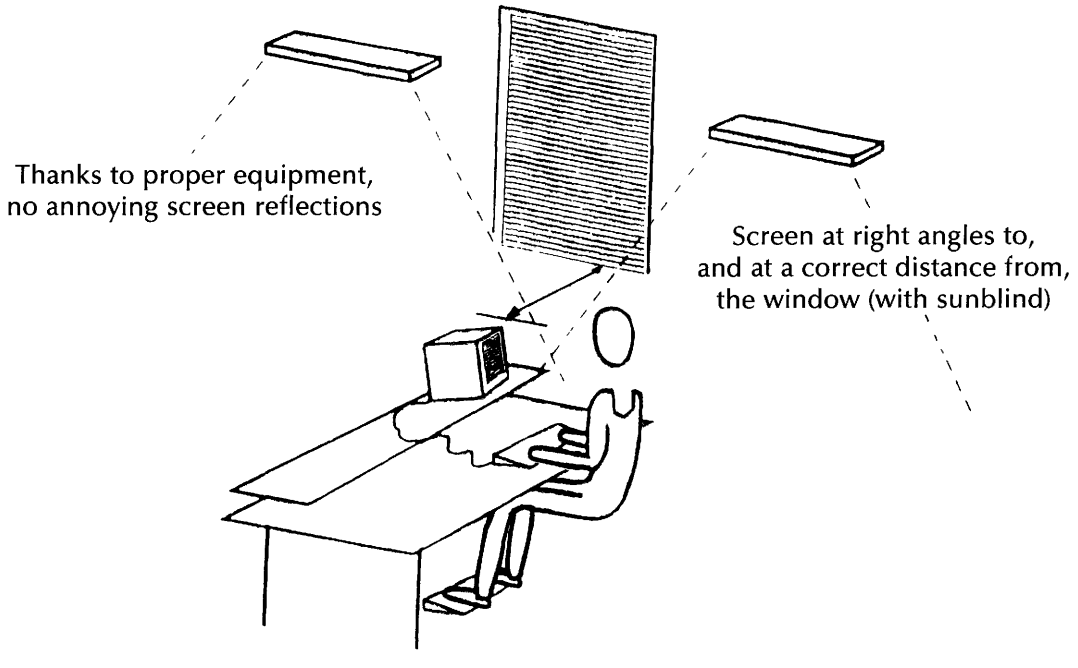
How is the employer to comply with such requirements?

He can enlist the help of VDU installation specialists, doctors competent in this field, safety consultants, and workers and/or their representatives (participation and consultation, as discussed in Chapter 2).

1. The employer must **inform** and **train** workers who use display screens.

In particular, he must provide workers who use screens with proper equipment:

Suitable chairs (height-adjustable, with footrest if requested, adjustable backs, etc.); special lighting; non-glare paint on office walls; elimination or regular interruption of machine noise; tiltable screens; etc.



He must also organize **training:** before commencing work on screen, the worker must have been given the opportunity to **receive appropriate training for the job.** Fresh training must be given whenever the organization of the workstation is substantially modified or whenever a change of job occurs.

2. The employer must **consult** workers and invite them to **participate** in deciding on the measures to be taken: this is a **general principle imposed by the framework Directive** in the field of safety and health.

Consultation must be either with the workers themselves or with their representatives, in accordance with national practice.

In other words, a **dialogue** is required whenever display screens are installed or changes in their use are introduced.

Conclusions

The employer must take appropriate measures to safeguard the health of workers

(a) As far as possible, work on a display screen should be interspersed with breaks or with changes of activity. The daily work can be organized in such a way that the operator alternates work on screen with other activities, such as filing, answering the telephone, examining the mail, etc.

(b) The employer must, if requested by screen workers, arrange for them to be given **eye and eyesight tests** before commencing display-screen work (e.g. on recruitment) and at regular intervals thereafter, and particularly if they experience visual difficulties which may be due to display-screen work.

If the results of these tests show that it is necessary, workers must be provided with **corrective appliances;** in other words, if the problem cannot be resolved by normal corrective appliances (e.g. spectacles), specialist ones must be provided. Any measures taken must not involve any financial cost to the workers involved.

Workers' eyesight must be protected. It is possible — and, under the Directive, a requirement — to organize the equipment (screen, keyboard, desk, room, software) and the work time in such a way as to reduce the burden of working on screen.

Safety and health signs at work

Directive 92/58/EEC of 24 June 1992 on the minimum requirements for the provision of safety and/or health signs at work[1] is the ninth individual Directive adopted pursuant to the framework Directive 89/391/EEC of 12 June 1989.

The provision of safety signs applies to workplaces

The purpose of a safety sign is to **draw attention, swiftly and intelligibly,** to objects or situations involving hazards or liable to cause danger.

No access for unauthorized persons

Types of sign

Signs must be **permanent** when indicating:

prohibitions,

warnings,

mandatory requirements,

escape routes and first-aid facilities,

fire-fighting equipment,

containers and pipelines,

risks of falls or collision with obstacles,

traffic routes.

They must be **occasional** when:

indicating dangers,

summoning persons (fire-fighters, nurses, etc.),

indicating emergency evacuation of persons,

guiding workers carrying out manoeuvres.

Interchanging and combining signs

Assuming they are equally effective, a choice must be made between:

- a safety **colour** or a **pictogram** to indicate risks (e.g. of tripping or stumbling);
- **illuminated** signs, **acoustic** signals or **verbal** communication;
- **verbal** communication or a **hand signal** (to convey the message over a large distance).

---

1 These are minimum requirements. However, the use of safety signs does not absolve the employer from his obligation to assess the safety and health risks and take **all** necessary preventive measures (framework Directive). The employer must **provide** appropriate safety signs when risks **cannot be avoided or adequately reduced** by techniques for collective protection or by methods or procedures used in the organization of work.

The following types of sign may be used together:

- **illuminated signs and acoustic signals**: beacon, bulb, spotlight, siren, horn, etc.;
- **illuminated signs and verbal communication**: human voice (loudspeaker) or synthesized voice;
- **hand signals and verbal communication**: hand or arm movements to guide workers performing dangerous manoeuvres.

Certain types of signal are **interchangeable**. The key word is **effectiveness.**

The worker must understand the safety sign at a glance, **with no possibility of confusion.**

The following instructions apply to all signs incorporating a safety colour

Table 1

Colour	*Meaning or purpose*	*Instruction and information*
Red	Prohibitory sign	Dangerous behaviour
	Danger alarm	Stop, shutdown, emergency cutout devices Evacuate
	Fire-fighting equipment	Identification and location
Yellow or amber	Warning sign	Be careful, take precautions Examine
Blue	Mandatory sign	Specific behaviour or action Wear personal protective equipment
Green	Emergency escape, first-aid sign	Doors, exits, routes, equipment, facilities
	No danger	Return to normal

What are the minimum general requirements concerning the characteristics and use of signboards?

Signboards must:

correspond to the specifications defined in Table 1,

be simple,

be resistant,

be visible and comprehensible,

be removed once the danger ceases to exist.

Safety signboards

Prohibitory signs

Intrinsic features:

- round shape;
- black pictogram on white background, red edging and diagonal line (the red part to take up at least 35% of the area of the sign).

No smoking

Smoking and naked flames forbidden

No access for pedestrians

Do not extinguish with water

Not drinkable

No access for unauthorized persons

No access for industrial vehicles

Do not touch

Warning signs

Intrinsic features:

- triangular shape;
- black pictogram on a yellow background with black edging (the yellow part to take up at least 50% of the area of the sign).


Flammable material or high temperature[1]


Explosive material


Toxic material


Corrosive material


Radioactive material


Overhead load


Industrial vehicles


Danger: electricity


General danger


Laser beam


Oxidant material


Non-ionizing radiation


Strong magnetic field


Obstacles


Drop


Biological risk[2]


Low temperature


Harmful or irritant material[3]

Mandatory signs

Intrinsic features:

- round shape;
- white pictogram on a blue background (the blue part to take up at least 50% of the area of the sign).


Eye protection must be worn


Safety helmet must be worn


Ear protection must be worn


Respiratory equipment must be worn


Safety boots must be worn


Safety gloves must be worn


Safety overalls must be worn


Face protection must be worn


Safety harness must be worn


Pedestrians must use this route

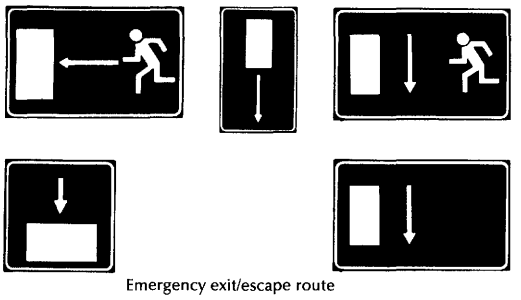

General mandatory sign (to be accompanied where necessary by another sign)

1 In the absence of a specific sign for high temperature.
2 Pictogram laid down in Council Directive 90/679/EEC of 26 November 1990 on the protection of workers from the risks related to exposure to biological agents at work (seventh individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC), OJ L 374, 31.12.1990, p. 1.
3 The background to this sign may exceptionally be amber if justified in order to differentiate it from a similar road safety sign.

Emergency escape or first-aid signs

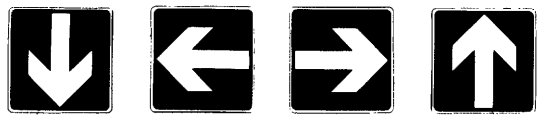
Intrinsic features:

- rectangular or square shape;
- white pictogram on a green background (the green part to take up at least 50% of the area of the sign).

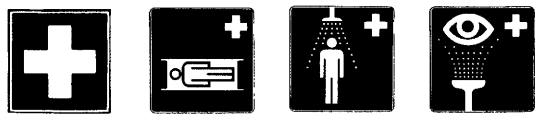


Emergency exit/escape route

Emergency telephone for first aid or escape



This way (supplementary information sign)

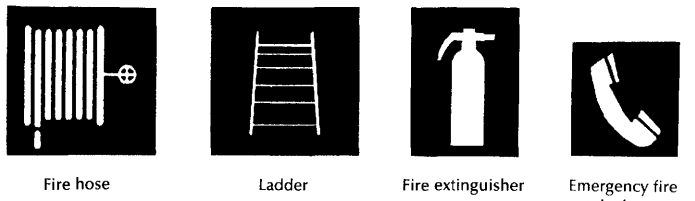


First-aid post | Stretcher | Safety shower | Eyewash

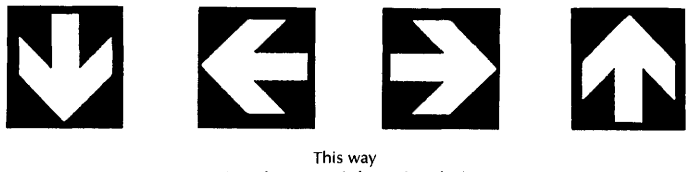
Fire-fighting signs

Intrinsic features:

- rectangular or square shape;
- white pictogram on a red background (the red part to take up at least 50% of the area of the sign).



Fire hose | Ladder | Fire extinguisher | Emergency fire telephone



This way (supplementary information sign)

NB: See 'Identification and location of fire-fighting equipment' on p. 50.

Signs on containers and pipes

1. Labelling of containers which hold dangerous substances or preparations

For substances defined in Directive 67/548/EEC see OJ L 196, 16.8.1967, and for substances defined in Directive 88/379/EEC see OJ L 187, 16.7.1988 and the brochure *Working with dangerous products,* Office for Official Publications of the European Communities, ISBN 92-826-4511-8.

This concerns:

- containers used at work,
- containers used for storage,
- visible pipes containing or transporting dangerous substances or preparations.

What type of labelling?

A pictogram or symbol on a dark background, as provided for in the abovementioned directives,

or

warning signboards as shown earlier, i.e. those for toxic, corrosive, harmful or irritant materials (black triangle on a yellow background).

The labelling may be supplemented by information containing the name of the dangerous substance or preparation and details of the risk.

Where should the labelling be mounted?

On the visible side of the container or pipe.

In unpliable, self-adhesive or painted form (the material used must be shock- and weather-resistant and suitable for the surrounding environment).

2. Pipes

In the vicinity of the most dangerous points, such as valves and joints.

Labelling must be highly visible (if necessary use phosphorescent colours or reflective materials or artificial lighting).

3. Storage areas

Areas, rooms or enclosures used for the storage of significant quantities must be indicated by appropriate warning signboards as described above and must be clearly visible and unambiguously comprehensible.

Identification and location of fire-fighting equipment

The colour red must be used to identify equipment, locations and location access points.

Signboards as described above must be used.

Signs used for obstacles and dangerous locations

Obstacles and dangerous locations should be signalled by means of bands of equal width, either in alternating yellow and black stripes or alternating red and white stripes.

Where should these be placed?

Wherever there is a risk of colliding with obstacles, of falling or of objects falling.

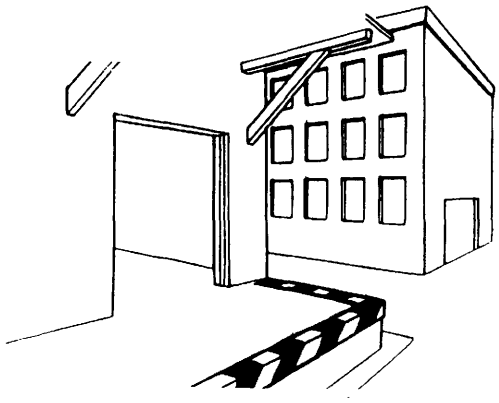
In built-up zones in the enterprise.

Examples:

staircases

changes of level

clearance of an automatic door



Minimum requirements for illuminated signs

1. Characteristics

(a) A luminous **contrast** appropriate to its environment, neither so intense as to produce glare nor so feeble as to produce poor visibility.

(b) A **single, harmonized** colour (Table 1), or a pictogram against a specific background corresponding to the specifications described earlier:

Red:	**prohibitory sign** **danger, alarm, evacuation, etc.**
Yellow:	**warning sign** **precaution, verification**
Blue:	**obligation**
Green:	**safety situation, escape, first aid**

with contrasting colours, in accordance with the requirements set out for corresponding signboards.

2. Use of illuminated signs

(a) Signal may be **continuous** or **intermittent,** the latter indicating a higher level of danger or a more urgent need for the imposed intervention or action.

(b) **Duration** of each flash must be such as to:
ensure the proper perception of the message,
avoid any confusion between different signals.

(c) If a **flashing sign** is used instead of, or together with, an **acoustic signal,** identical codes must be used.

(d) Illuminated signs indicating serious danger **must be kept under surveillance** or be fitted with an auxiliary lamp.

Minimum requirements for acoustic signs

1. Characteristics

(a) Must have a sound level considerably higher than the level of ambient noise, without being excessive or painful.

(b) Must be easily recognizable, by virtue of:

- duration,
- the interval between pulses or groups of pulses,
- characteristics distinguishing them from other ambient noises or acoustic signals.

(c) Signals emitted at markedly varying intensities or at variable frequencies: this indicates a higher level of danger or a more urgent need for the required intervention.

2. Code

The signal for evacuation must be continuous.

Minimum requirements for verbal communication

Verbal communication is possible only when ambient noise is low. Where there is noise liable to render it inaudible or unintelligible, it is wiser to use hand signals or coded signals.

The Directive (Article 6) also provides that Member States may derogate from the application of certain rules on the following two conditions:

(a) the employers' and workers' organizations must be consulted,

(b) alternative measures guaranteeing the same level of protection must be applied.

1. Characteristics

(a) The communication must take the form of **short texts**, groups of words and/or individual words (possibly coded).

(b) The communication must be **reliable:** simple words, short and clear.

(c) The communication may be **direct** or **indirect** (e.g. parlophone or megaphone).

NB: When an appliance or an indirect means is used, the speaker should speak slowly. For example, when using a microphone (in a place or room where the voice echoes) the message must be enunciated slowly and clearly, and be repeated if necessary.

2. Use

(a) The significance of coded words must be made **widely known.**

(b) Checks must be made to ensure that the 'hearers' **understand precisely** the meanings of the codes used.

Minimum requirements for hand signals

The Directive describes the hand signals to be used on sites, in enterprises or in any other industrial activities. However, Article 6.2 provides that Member States may **be exempted** from applying these provided that the employers' and workers' organizations are first consulted and that alternative measures guaranteeing the same level of protection are taken. This is because in many areas of product/materials handling familiar traditional signals will obviously be better than unfamiliar new ones.

1. Characteristics

(a) Hand signals must be simple, precise, easy to make and to understand, and clearly distinct from other such signals.

(b) Where both arms are used at the same time they must be used symmetrically and for giving one sign only.

(c) Other hand signals may be used, **but** they must be equally comprehensible and have equivalent meanings.

2. Use

Hand signals involve at least two parties:

(a) ***The signalman***

He must be able to **monitor all manoeuvres visually** without being endangered by them (or must take protection against them). If necessary, an extra signalman should be deployed to repeat the signals.

The signalman's duties must consist **exclusively** of directing manoeuvres (he must not be performing another task at the same time).

(b) ***The operator***

This is the person who receives the signals and who executes the manoeuvre (crane driver, etc.).

He must interrupt the ongoing manoeuvre to request new instructions when he is unable to carry out the manoeuvre safely. (NB: the Directive does not expand on the concept of 'requesting new instructions'.)

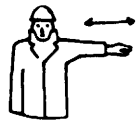
(c) ***Accessories***

The signalman must wear a distinctive item (jacket, helmet, sleeves, armbands, etc.) which can easily be seen by the operator, or must carry brightly coloured bats.

3. Coded signals to be used

The hand signals proposed by the Directive do not exclude the use of other coded signals or other hand signals used in Member States for the same manoeuvres.

Meaning	Description	Illustration
A. General signals		
START Attention Start of command	both arms are extended horizontally with the palms facing forward	
STOP Interruption End of movement	the right arm points upwards with the palm facing forwards	
END of the operation	both hands are clasped at chest height	
B. Vertical movements		
RAISE	the right arm points upwards with the palm facing forward and slowly makes a circle	
LOWER	the right arm points downwards with the palm facing inwards and slowly makes a circle	
VERTICAL DISTANCE	the hands indicate the relevant distance	

Meaning	Description	Illustration
C. Horizontal Movements		
MOVE FORWARDS	both arms are bent with the palms facing upwards, and the forearms make slow movements towards the body	
MOVE BACKWARDS	both arms are bent with the palms facing downwards, and the forearms make slow movements away from the body	
RIGHT to the signalman's	the right arm is extended more or less horizontally with the palm facing downwards and slowly makes small movements to the right	
LEFT to the signalman's	the left arm is extended more or less horizontally with the palm facing downwards and slowly makes small movements to the left	
HORIZONTAL DISTANCE	the hands indicate the relevant distance	
D. Danger		
DANGER Emergency stop	both arms point upwards with the palms facing forwards	
QUICK	all movements faster	
SLOW	all movements slower	

Here too the hand signals traditionally used and well understood by operators are sometimes more useful in particular circumstances.

The derogation provided by the Directive in this respect may be applied after consultation with the employers' and workers' organizations and provided that the alternative signals are equally effective, i.e. offer the same level of protection to workers.

Conclusions

It is the employer who is responsible for introducing all the necessary signals, after evaluating the risks within his enterprise, but here more than elsewhere worker **training and information** is crucial. Only by consulting workers can the employer be certain that they **understand all the signals precisely.** Negligence can compromise the safety and health of everyone.

At all events, Member States must transpose all the abovementioned signs and signals into national legislation, thus ensuring a truly European system of safety and health signs!

This document has been produced by Pierre Lorent of Sefmep with the collaboration of André Cordy, occupational safety and health consultant, on the basis of the observations of a working group composed of:

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