

## RISKS ASSOCIATED WITH WORKING WITH DATA DISPLAY SCREENS (COMPUTERS)

In both the second European survey of working conditions, carried out by the European Foundation for Quality of Life and Work, and the fourth national survey of working conditions, carried out by the National Institute for Safety and Hygiene at Work, 38% of the Spanish population responded that the main risk factors for accidents at work were injuries affecting the muscular and skeletal apparatus.



**MORE THAN 40% OF THE WORKING POPULATION HAS TO MAINTAIN THE SAME POSTURE OR PERFORM REPETITIVE HAND OR ARM MOVEMENTS DURING THEIR WORKING DAY**

The risk factors present at work are grouped into four main groups:

- **The maintenance of awkward postures.**
- **The application of excessive manual force.**
- **Short, repetitive work cycles.**
- **Insufficient rest periods.**

Generally, the solution to the problem involves:

- **A new design of working conditions: (tools, working environment and methods).**
- **Changes in work organisation.**

# MINIMUM ERGONOMIC REQUIREMENTS FOR OFFICE WORK WITH DATA DISPLAY SCREENS (COMPUTERS)

## EQUIPMENT

### The screen

- The characters must be well-defined and clearly laid out, of sufficient size and with adequate space between characters and lines.
- The image must be stable.
- Brightness and contrast must be adjustable.
- It must be orientable and tiltable.
- It should be free of glare and reverberation.
- The top of the screen should be at eyebrow level.
- The distance between the screen and the eyes should be between 45-65 cm.

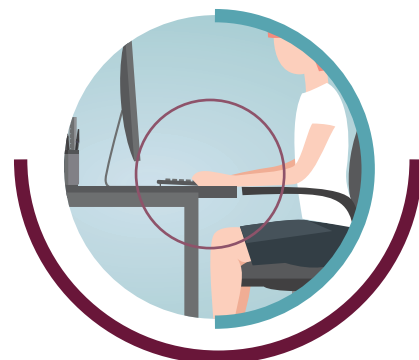


### The keyboard and mouse

- The keyboard should be tiltable between 0° and 25° from the horizontal plane and independent of the screen.
- There should be enough space in front of the keyboard to support the forearms and hands.
- Its surface should be matt to avoid reflections.
- The symbols on the keys should be visible.
- The mouse should be comfortably shaped so that it can be used by both right-handed and left-handed users.

### The document holder

- The use of document holders is recommended when it is necessary to work with documents on a regular basis.
- The document holder should be stable and adjustable to minimise head and eye movements, and should be at the same height as the screen and next to it.
- It shall be adjustable in height and be strong enough to support the weight of the documents.



## The chair

- It should be stable and adjustable in depth and height.
- The backrest should be reclining and height adjustable.
- Easy-to-use adjustment mechanisms, which can be manipulated in the seated position.
- It is recommended to use chairs with five wheels to facilitate movement.
- It should be made of a material that allows breathability and heat exchange.

## The footrest

It is advisable that the legs form an angle with the knees of between 90° and 100°, otherwise a footrest with the following characteristics should be used:

- Adjustable inclination between 0° and 15° in relation to the horizontal plane.
- Minimum dimensions of 45 cm wide by 35 cm deep.
- With non-slip surface.

## The table

- It shall be low-reflecting, matt and neither too light nor too dark.
- It should be large enough to accommodate the working elements.
- The space should be sufficient and should allow for a comfortable posture.
- The edges of the boards should be rounded.



Sit so that the space between the front side of the chair and the lower legs is 2-3 cm from the curve.



Adjust the backrest of the chair so that it supports the kidneys.



Adjust the work surface to the height of your elbows, with your arms outstretched on both sides of your body. If it is not possible to adjust the height of the chair and table so that your feet do not touch the floor, use a footrest.

## ENVIRONMENT

### Place

- The workstation must be of sufficient size and must allow for changes in posture and movements appropriate to the work to be carried out.
- The configuration of the workstation must take into account the variability of the anthropometric dimensions of the potential users, i.e. an ergonomic analysis of the workstation must be carried out in order to adapt it to the characteristics of the people who will use it.

### Noise

- The site design shall take into account the noise generated by the installed equipment to ensure that neither attention nor communication is disturbed.
- The ambient sound pressure (noise) level that is considered reasonable for satisfactory communication is between 30 and 50 dB. It is relatively easy to know whether we are in the acoustic comfort zone if, when talking to other people in the environment, we do not need to strain our voice.
- Noisy equipment such as printers, fax machines, etc. should be placed as far away as possible or separated from the workstations by partitions.



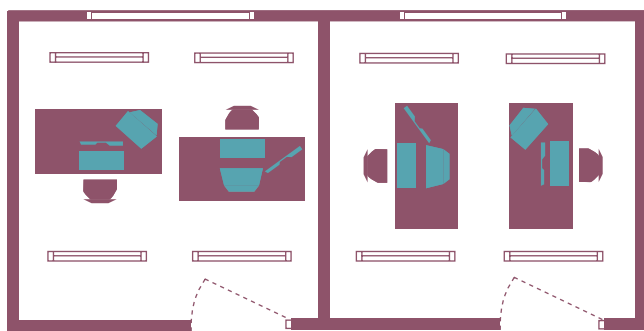
## Illumination

■ There should always be uniform general lighting at workstations, which can be reinforced when necessary with localised lighting. Adequate lighting levels, which in the case of offices should be between 500 and 1,000 lux, should be ensured over the surface to be read or keyboarded.

General lighting shall be between 200 and 500 lux.

■ Workstations should be located in such a way that there is no direct glare or distracting reflections on the screen. A sharp difference in illumination between neighbouring areas should also be avoided.

■ The workstation should be suitably oriented with respect to windows to avoid glare and reflections, and sunlight should be attenuated by appropriate and adjustable shading devices such as curtains, blinds, or screens.



Incorrect installation      Correct installation



## Thermal comfort

■ Equipment installed at the workstation shall not cause additional heat that could disturb workers.

■ Comfortable temperature, humidity, and air velocity conditions should be created and maintained.

■ The temperature of office workrooms is recommended to be between 20-21 °C in winter and between 23-24 °C in summer. These recommendations shall be considered if a relative humidity of approximately 60 % is maintained.

■ Temperature differences of more than 3 °C between the head and foot area should be avoided. Individual heaters or radiators are not advisable, both to avoid this temperature difference and to control the possible risk of fire.



## WORK ORGANISATION AND MENTAL WORKLOAD

The nature of risk factors is extensive, and we will now look at those that relate work, its environment, job satisfaction and organisational conditions to the worker's capabilities, needs, culture and personal situation outside work.

Behaviours as commonplace as adopting one or another posture at the workplace, making an effort that allows us to successfully carry out our work activity, handling or transporting loads, are really risk factors that can sometimes cause accidents at work or occupational illnesses.

On other occasions, they produce alterations that can have an influence not only on work performance (poor performance, reduced attention span or absenteeism), but also on the private life of workers (stress, fatigue, tiredness, depression, insomnia, etc.).

Measures to avoid these risk factors depend to a large extent on appropriate work organisation, adapting work to the individual, in particular as regards the design of jobs and the choice of working methods, avoiding or reducing monotonous and repetitive work in order to reduce the effects on health.

### Preventive measures that improve job satisfaction:

- Breaks should be introduced to avoid or at least minimise the impact of mental fatigue.
- Whenever possible, tasks that require a high level of attention and concentration should be alternated with tasks that make lower demands.
- Excessive efforts to memorise and retain information should be avoided, replacing them whenever possible with the use of a documentary or computer support that allows the information to be recorded and consulted.
- It is recommended that coordination mechanisms be established with other jobs that carry out similar tasks, in order to better synchronise the development of the activities that affect them.
- The worker must be trained to know how to establish for himself the degree of importance and urgency of the activities to be carried out, and thus be able to manage his time with the best efficiency.



## MENTAL WORKLOAD

It is the level of mental activity necessary to carry out our work.

### FACTORS DETERMINING MENTAL WORKLOAD:

#### ■ Amount and complexity of information:

<b>Overload</b>	Excessive or complex information to be processed, assessing response accuracy and margin of error.
<b>Infraload</b>	Insufficient information. Performance of monotonous and repetitive tasks that do not require mental effort.

#### ■ Time available to respond.

#### ■ Individual characteristics.

#### ■ Influence of the workplace environment:

<b>Noise</b>	Decreased attention Lack of concentration Stress
<b>Temperature</b>	General discomfort Affects ability to move Lack of concentration
<b>Illumination</b>	Visual fatigue Lack of performance



If you want more information access the [Manual of data visualisation screens](#)