GUIDELINES ON
OFFICE ERGONOMICS

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Acknowledgement
The purpose of the Guidelines on Office Ergonomics is to provide guidance on good occupational health practices in offices.

Many of us spend a significant amount of time working in modern offices. With the rapid pace of computerisation and development of information technology, the use of Visual Display Units (VDUs) has become prevalent. Often, VDUs have been placed in offices without sufficient attention to ergonomic principles. This, together with poor environmental conditions and work stress may contribute to a variety of health problems, sickness absenteeism and loss of productivity.

Most of the problems can be prevented through the application of ergonomic principles in work environment and workstation design, work posture and work practices. A checklist \[\text{(Annex A)}\] can be used to identify any ergonomic problems in your office.

Ergonomics can be regarded as the science of designing a workplace to match our physical and psychological needs, limitations and capabilities. “Office Ergonomics” is the application of ergonomic principles to an office setting.

In office work, we use computers and other equipment and may be subjected to a combination and interaction of three types of loads: physical, environmental and psychosocial. The interaction between the user and the loads can be depicted as a load triangle (Figure1).

Excessive loads in any of the three areas may affect our health, comfort and productivity. The objective of Office Ergonomics is to reduce these “loads” so as to make work more comfortable and improve both health and productivity.
• Physical factors

Office equipment and furniture which are not ergonomically designed to fit the user and which not properly arranged or used can result in strenuous or prolonged static postures and forceful or awkward movements. This can lead to muscle fatigue and strain. Poorly designed displays on monitors can also contribute to eye strain.

• Environmental factors

Temperatures which are too high or too low, contaminants in the air, noise, poor quality lighting and poor housekeeping are environmental factors which by themselves or in combination with other factors contribute to distraction, discomfort, stress, ill health and loss of productivity. In addition, poor quality lighting can contribute to glare and eye strain.
• Psychosocial factors

Excessive work load, repetitive and monotonous tasks, unrealistic work expectations, constant adaptation to new technology, the perceived lack of meaningful job content, lack of control over the work, lack of organisational support and poor relationships at work are factors which can contribute to mental or psychosocial stress.
HEALTH ASPECTS OF OFFICE WORK
The following are some health concerns associated with office work:

- **Musculoskeletal Disorders**

  VDU users commonly report musculoskeletal problems (e.g., fatigue, pain and stiffness) in the neck, shoulders, and upper limbs. Risk factors include awkward postures, prolonged or uninterrupted work, repetitive work and/or poor workstation design. Psychosocial factors such as stress and dissatisfaction with the job may increase the risk of musculoskeletal disorders.

  Neck-shoulder complaints are the most common. These are mainly caused by prolonged fixed and sometimes awkward postures, such as the excessive use of the mouse with the arm extended. Wrist pain may be due to prolonged work on the keyboard or mouse. In addition, prolonged sitting and awkward postures may contribute to low backache.

- **Visual Discomfort**

  Work with VDUs does not cause permanent impairment to the eyes. However, eyestrain and visual discomfort such as tired, dry or irritated eyes, and blurring of vision are common complaints among VDU users.

  Factors that may increase the risk of visual discomfort include lack of contrast and sharpness in display, undue amount of flicker, poor workplace lighting and glare, uncorrected vision among users, and prolonged close vision work.

  Please refer to [Annex B](#) for recommended medical examinations for VDU users.
• **Reproductive Effects and Radiation from VDU**

To date, there is insufficient evidence that electromagnetic radiations (x-ray, ultraviolet, infrared, microwave and radiofrequency) and the electromagnetic fields (EMF) emitted from VDUs affects pregnancy outcomes adversely. Such levels were found to be either non-detectable or insignificant compared with recommended permissible exposure limits.

Pregnant women who are still concerned about EMF can further minimise their exposure by sitting at one arm’s length away from the VDU screen as the strength of EMF drops off quickly at this distance.

• **Work Stress**

Mental stress may present with a variety of symptoms such as tension headache, irritability, anxiety, insomnia, decreased concentration, increased mistakes and depression. Prolonged stress may result in “burnout”. Stress may arise from the work itself or from difficult relationships at work.

• **Sick Building Syndrome**

Sick Building Syndrome (SBS) is usually due to poor indoor air quality resulting in a significant number of building occupants experiencing non-specific symptoms that are relieved upon leaving the premises. The symptoms include lethargy, headache, blocked or stuffy nose, dry throat, eye irritation and skin problems. Persons with existing medical conditions (eg asthma, rhinitis, migraine) may be more prone.
The main components of an office workstation are work surface, chair and VDU. The following factors should be considered in workstation design and equipment selection:

- **Fit**
  Ideally, workstations should be designed such that it could be adjusted to suit all individuals. If this is not possible, it should be designed to accommodate at least 90% of the population based on anthropometric dimensions.

- **Flexibility**
  A workstation should enable its users to perform a range of tasks comfortably and efficiently. A flexible workstation can be easily adapted or re-configured to suit a variety of tasks.

- **Posture**
  The workstation should be designed to place users in the best working posture. It should not restrict movement and change of posture as this can lead to fatigue and discomfort.

Users should be given an opportunity to try out the workstation and give their feedback.

3.1 **Work Surface**

The size and shape of a work surface or desk are mainly determined by the tasks and the equipment needed.

**Height of Work surface:** The height of the work surface, if adjustable, should be between 65 cm and 75 cm. If the work surface height is not adjustable, the height should be 70 cm.
Legroom: There should be sufficient knee clearance and legroom underneath the work surface (Figure 2).

Distance between Users: The minimum distance between two adjacent users should be at least 1.2 m (measured from the centres of the workstations).

Position of Monitor: If the job consists mainly of direct work on the terminal, the best position for the monitor is directly in front of the user, with access to additional working surface to the side (Figure 3).

If the job consists largely of other tasks and VDU work is not a main task, it is best to place the monitor on the left-hand of the table if the user is right-handed, or on the right-hand side for the left-handed user (Figure 4).
Surface: The desk surface should not be reflective and should be large enough to allow for a flexible arrangement of stationary and equipment i.e. screen, keyboard, mouse and documents so as to enable the user to work comfortably.

Document Holders: Stable and adjustable document holders should be used for data entry and text processing tasks. They should be positioned so as to minimize the need for uncomfortable head and eye movements.

Organisation of Workstation: The workstation should be organised to minimise frequent awkward posture or over-reach. Keep all items within easy reach by locating frequently used items in the primary reach zone and less frequent items in the secondary zone (Figure 5).
3.2 Chairs

The chair should be adjustable, stable and provide good back support. The adjustment controls should be easy to locate and operate.

- **Chair height:** The chair height should be adjustable between 35 cm and 50 cm.

- **Backrest:** The backrest should be adjustable in the frontward and backward directions (i.e., seatback angle) to allow for a slight reclining position which reduces the pressure on the spine. Vertical adjustability of the backrest can help provide support at the lumbar region.

- **Seat Depth:** The seat depth should be between 38 cm and 43 cm (Figure 6).

- **Seat Width:** The minimum seat width should be 45 cm (Figure 6).

**Figure 6. Seat depth and width requirements**

**Seat Pan:** The seat pan should be reasonably firm and support the body weight at the buttock and not through the thighs. The edge of the seat should not touch the back of the knees and have a rounded “waterfall” forward edge.
• **Seat Surface:** The surface of the seat should be made of permeable and non-slippery material.

• **Armrests:** Armrests, if provided, should not prevent the users from moving their chairs closer to their workstation. The armrests help to reduce load in the back, neck and shoulders.

• **Stability and Mobility:** Chairs should be fitted with five castors and able to revolve.

• **Provision of Footrest:** A non-slip footrest should be provided when the chair is too high for the feet to rest flat on the floor.

Users should know how to adjust and use their chairs. Please refer to the section on [Work Posture (Section 4.1)](#).

### 3.3 Visual Display Unit (VDU)

A VDU consists of a display screen or monitor, an input device such as a keyboard or mouse and a central processing unit (CPU).

• **Monitor**

The quality of the display has a significant impact on the performance and comfort of the user. The screen should be designed so as to give clear, sharp and steady images which are readable. The monitor should be adjustable with tilt and swivel mechanism to enable users to adopt correct postures, viewing distances and angles. Users should also be able to adjust screen brightness and contrast.

• **Image quality:** Characters and figures should be readable in terms of size, shape, colour and line spacing.
♦ **Image Polarity:** Users vary in their preference for image polarity. Either dark characters on a bright background (positive image polarity) or bright characters on a darker background (negative image polarity) are acceptable. However, positive image polarity is preferred as it reduces the contrast between the screen and surroundings and is less subject to reflection glare.

![Positive polarity](image1.jpg) ![Negative polarity](image2.jpg)

♦ **Flicker:** Flicker is the perception of brightness varying over time. The screen should be flicker free.

♦ **Image Contrast:** This is the ratio of the brightness or luminance of the image to its surroundings. The minimum ratio should be 3:1 (bright characters on dark background) or 1:3 (dark characters on bright background). The optimum contrast is 10:1.

♦ **Screen size:** The screen size should not be less than 35.6 cm (14", measured diagonally) if intensive VDU work is required.

♦ **Viewing Angle:** The best viewing angle is in the range of 10° to 30° below the horizontal plane at the worker’s eye level. The top edge of the VDU screen should not be higher than the eye level and the bottom edge should not be lower than 40° below the eye level (Figure 7).

**Viewing Distance:** The proper viewing distance is between 45 and 70 cm (Figure 7). The line of sight should be approximately at right angle to the screen which should also avoid reflecting light.
- **Input Devices**

Input devices such as keyboard and mouse should be designed to allow users to adopt the natural hand position.

- **Keyboard:** The keyboard should be as thin as possible, preferably not more than 3 cm. The keyboard angle should be less than 15°. The spacing of keys should be 18 to 20 mm between key top centres.

  The surfaces of the keyboard and key tops should be reflection free. The letters and symbols on the key tops should be clear and easily recognisable.

- **Mouse:** The mouse should fit into the palm without any undue strain on the wrist and forearm muscles. The pressure needed to click the buttons should not be excessive.
Place the mouse at the same level and as close to the side of the keyboard as possible to reduce discomfort and muscle fatigue on arms and shoulders.

Hold it loosely in your hand, and relax your grip at frequent intervals to reduce any strain.

Adjust the mouse speed setting to user’s preference.

♦ **Wrist Rest:** A wrist rest may be used to support the user’s wrists while typing or when using a mouse.

**Software**

Software components such as menu commands, icons, windows, information feedback, navigation systems and messages can affect the well-being and productivity of users.

The following factors should be considered in the design or selection of software:

♦ **Performance** – users are able to perform the task efficiently
♦ **Reliability** – reduce risk of errors and malfunction
♦ **User friendliness** – shorter training time and easy to use.
♦ **Satisfaction** – users feel satisfied
3.3 Other Office Equipment

Certain office equipment eg printers and photocopiers may emit noise, heat and pollutants. Health and safety factors should be considered in the installation and use of the equipment.

Photocopier

- Place photocopiers in a well-ventilated area to prevent accumulation of airborne contaminants eg ozone.
- Maintain the equipment regularly.
- Provide a table for placing documents.
- Place the cover properly when photocopying to prevent glare.
- Handle toner cartridges with care to prevent spillage.

Printers

- Select a printer with low noise level eg inkjet and laser printers.
- Where blueprint machines are used, control measures (eg. ammonia absorbers or local exhaust ventilation) shall be used to minimise emission of ammonia into the work environment.
- Maintain the equipment regularly.
Prolonged working in a fixed posture or adopting incorrect postures can cause muscle fatigue and musculoskeletal problems. Providing ergonomically designed workstations and adopting correct working postures can minimise such problems.

4.1 Correct Working Postures

**Sitting posture**

Sit in a slight reclining and relaxed position with the back supported and the feet resting comfortably on the floor or foot rest (Figure 8).

![Figure 8. Recommended sitting posture](image)

**How to adjust the chair**

1. Stand in front of the chair. Adjust the height so that the top of the seat pan is just below the knee cap.
2. Sit on the chair and keep your feet flat on the floor with the thighs horizontal and the legs vertical. Check that there is sufficient clearance between the front edge of the seat and the inner part of the legs.

3. Adjust the chair backrest forward / backward tilt so that the angle between the trunk and the thigh is between 90° and 120°. Adjust the backrest up and down to support the lower back.

4. Adjust the table height so that the top surface is just below elbow height. The elbow angle should be between 90° and 120°. If the table is not height adjustable, it may be necessary to adjust the chair height instead. If the table is too high, raise the chair height to achieve the above elbow angle. A foot rest may be required to support the feet in this case.

**Wrist-hand posture**

Keep the wrists straight while using the keyboard or mouse. A wrist rest may be used to support the user’s wrists while typing or when using a mouse.

**Changing posture**

Avoid sitting in a fixed posture for long periods. Change position, stand up, stretch or walk around whenever you feel tired.
4.2 Preventing Poor Working Postures

Poor workstation design and work practices can result in incorrect working postures. Some examples of poor postures, their causes and solutions are listed below:

- **Working with the neck bent backwards**

  ![Image](image1.png)
  ![Image](image2.png)
  ![Image](image3.png)
  ![Image](image4.png)

  - User wearing bifocal glasses
  - Use dedicated computer eye-glasses
  - Monitor is too high
  - Adjust monitor or chair height

- **Working with the neck bent forwards**

  ![Image](image5.png)
  ![Image](image6.png)
  ![Image](image7.png)
  ![Image](image8.png)

  - Monitor is too low or chair is too high
  - Adjust monitor or chair height
- Work with arm raised and elbow extended
  - Mouse located too far from the keyboard
    ![Wrong posture example]
    ![Correct posture example]
  - Locate input device in front of user and within easy reach

- Seating with the lower back unsupported
  - Seat pan is too deep
    ![Wrong posture example]
    ![Correct posture example]
  - Use chair with shorter seat pan
  - Seat back rest not adjusted properly
    ![Wrong posture example]
    ![Correct posture example]
  - Adjust back rest angle and lumbar support
    ![Correct posture example]
4.3 Manual Handling

Correct manual handling practices can prevent injuries to the back and other parts of the body.

- Avoid manual handling of heavy and bulky objects. Use a trolley or cart to move heavy objects.
• Store heavy and more frequently used items at waist level to avoid reaching below knee or above shoulder.

• Use a step ladder to avoid reaching above shoulder height.

• If manual handling of heavy objects is required, follow the steps below:

  **Step 1:** Assess the load and plan the lift. Do you need help? Can you use some lifting equipment? Clear the path of any obstructions.
Step 2: Bend the knees and keep the back straight. Grasp the object firmly.

Step 3: Lift without jerking. Avoid twisting the back.

Step 4: Move the feet and avoid twisting the back. Keep the load close to the body.
Environmental factors such as lighting, noise and indoor air quality can affect health, comfort and productivity.

5.1 Lighting

Sufficient lighting should be provided for users to perform their tasks. However, high illumination levels can contribute to glare problems for VDU users.

The recommended illumination levels for specific areas and activities in the office environment are shown in Table 1. Local lighting can be provided to supplement general lighting if it does not meet the recommended levels.

<table>
<thead>
<tr>
<th>Area or activity</th>
<th>Illumination level (Lux)</th>
<th>Range</th>
<th>Recommended design value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference rooms</td>
<td></td>
<td>300-750</td>
<td>500</td>
</tr>
<tr>
<td>General offices</td>
<td></td>
<td>300-750</td>
<td>500</td>
</tr>
<tr>
<td>Computer workstation</td>
<td></td>
<td>300-750</td>
<td>500</td>
</tr>
<tr>
<td>Computer and data preparation rooms</td>
<td></td>
<td>500-1000</td>
<td>750</td>
</tr>
<tr>
<td>Filing print rooms</td>
<td></td>
<td>200-500</td>
<td>300</td>
</tr>
<tr>
<td>Drawing office (general)</td>
<td></td>
<td>300-750</td>
<td>500</td>
</tr>
<tr>
<td>Drawing boards</td>
<td></td>
<td>500-1000</td>
<td>750</td>
</tr>
</tbody>
</table>

*source: CP 38: 1999 Code of Practice for Artificial Lighting in Buildings*

Table 1: Recommended illumination levels for office areas and activity

Glare

Glare is caused by an excessive bright light source or brightness contrast to which the eye cannot adapt comfortably. It can cause discomfort. Glare can come from the daylight or artificial light sources. Glare can be direct from the light source or reflected from the VDU screen or work surfaces.

Glare from daylight can be reduced by:

- installing curtains, blinds or other shielding devices at windows and skylights
- placing monitors perpendicular to windows (Figure 9).

![Figure 9. Positioning of monitor to avoid glare from windows](image)

Glare from artificial lighting can be reduced by:

- installing diffusers or louvers to general and local lighting units to direct light downwards and away from the VDU screens and the user’s field of view
- using recessed or indirect lighting
- positioning the monitor parallel to and in between (not directly below) overhead lights (Figure 10).

![Figure 10. Positioning of monitor with respect to the overhead lights](image)
Glare can also be reduced by:

- Selecting monitors with anti-glare treatment or flat screens with a matt surface
- Placing glare shields or filters on the monitor (the use of such filters may reduce the brightness of the display)
- Tilting the monitor and adjusting the brightness and contrast of the display
- Installing a screen hood (it should not cast shadows or cause the user to adopt an awkward posture)
- Treating walls with neutral-tone colours
- Selecting furniture and equipment with matt surface

5.2 Ambient Noise

Noise produced by VDUs and other office equipment is usually below levels that damage hearing. However, a noisy environment can be annoying. The ambient noise level should not exceed 55 dBA. Wherever possible, noise sources (e.g., printers and photocopiers) should be isolated or enclosed.

5.3 Indoor Air Quality (IAQ)

Indoor Air Quality (IAQ) refers to the quality of air inside a building. The main causes of poor IAQ are: inadequate ventilation, contamination from within the building and contamination from outside the building. Sources of indoor contamination include the occupants themselves, the activities carried out, the building materials and furnishings, office equipment, and consumer products used.

The main contaminants and physical factors that can be measured as indicators of indoor air quality are:

- **Carbon Dioxide**: The major source of carbon dioxide comes from the exhaled air of the building occupants and the levels will increase with inadequate ventilation. Other sources include vehicle exhaust fumes and products of combustion.
- **Carbon Monoxide**: Carbon monoxide is a by-product of any combustion process such as cooking, tobacco smoking and vehicle exhaust.

- **Ozone**: Ozone is produced by electrical discharges from equipment such as photocopiers.

- **Formaldehyde**: Formaldehyde is found in insulation material and office furniture.

- **Volatile Organic Compounds (VOCs)**: VOCs are found in paints, glues and cleaning solvents.

- **Bacteria and Fungi Count**: Bacterial and fungi may cause allergies in certain individuals resulting in rhinitis, asthma or skin rash.

- **Suspended Particulate Matters**: These are airborne dusts and particulate of size less than 10 micrometers.

**Temperature and Relative Humidity**: When ambient temperature is too low, occupant experiences discomfort and may need to wear warm clothing. A higher energy cost is also incurred. Too low a humidity may cause dryness of the skin and itch while too high a humidity may promote growth of fungi.

The acceptable limits for contaminants and physical factors are summarised in [Annex C](#).

**Prevention of IAQ Problems**

Some good practices to prevent indoor air quality problems are shown below:

- **Reducing Indoor Pollutants**
  - prohibit smoking indoors
  - select materials and products that emit less contaminants eg water-instead of solvent-based paints and cleaning agents
♦ install effective local exhaust ventilation for localised sources such as blue print machine
♦ discourage cooking in pantry
♦ cover containers that emit volatile organic compounds such as solvent based cleaners, glues and paints

- **Reducing Outdoor Pollutants**
  ♦ Locate air intake away from sources of pollution
  ♦ Install a filter at the air intake point

- **Ventilation**
  ♦ Provide sufficient outdoor fresh air
  ♦ Improve air distribution by balancing airflow
  ♦ Inspect, maintain and audit the air conditioning system regularly
  ♦ Ensure that air handling unit (AHU) room is not used as a storage room

More detailed coverage of IAQ in office premises can be found in the “Guidelines for Good Indoor Air Quality in Office Premises” published by the Ministry of the Environment.
The work content, workload, work pace and work activities can contribute to mental and physical stress. Proper design of tasks and the inclusion of job variation, training, rest breaks and exercises can enhance the efficiency and well-being of users.

6.1 Task Design and Planning

Where practicable, tasks should be designed and planned so as to provide users with:

- variety in the activities and skills used;
- control over priority, pace and procedure of work;
- opportunities to use their skills and experience and gain new skills;
- understanding of the task in relation to the mission of the organisation;

6.2 Variation of activities

It is a good practice to vary activities and posture from time to time to allow tired muscles a chance to rest and recover. For example:

- alternate between work activities which use different muscle groups
- change from a sitting to standing position
- take a walk to talk to colleagues instead of using the phone

6.3 Instruction and Training

Sufficient instruction and training should be provided to enable users to carry out their work efficiently and safely. Users experience stress when they have insufficient knowledge on the use of office equipment and when these equipment breakdown. Training should be provided for new employees and whenever new tasks, equipment and software are introduced.
6.4 Rest Breaks and Exercises

A short pause is recommended for every hour of continuous work done at close distance eg reading, writing and using a VDU. Short frequent pauses are more effective than occasional pauses of longer interval.

Give the eyes a rest by closing them momentarily, looking at a distant object and blinking frequently.

Annex A

The Office Ergonomics Checklist

The purpose of this checklist is to help identify any problems in the workplace design, work environment, work posture or work practices in your office.

If you have answered “no” to any of the questions, it may indicate an area for improvement.

Please refer to the relevant sections in the guidelines for more details. You may be able to take some simple measures to correct them yourself or refer them to your management.
<table>
<thead>
<tr>
<th>Work Surface (Refer to section 3.1)</th>
<th>Yes</th>
<th>No</th>
<th>N.A*</th>
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</thead>
<tbody>
<tr>
<td>Are you able to adjust the height of your work surface?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Do you have sufficient knee clearance and leg room?</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>If VDU work is your main task, is the monitor positioned in front of you?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Is your work surface large enough to perform the required tasks and to hold all the equipment?</td>
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<tr>
<td>Are frequently accessed items (e.g. phone and files) within easy reach?</td>
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<table>
<thead>
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<th>N.A*</th>
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<td>Is your chair height adjustable?</td>
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<tr>
<td>Is your chair backrest adjustable (backward, forward and vertically)?</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Is your seat pan size suitable for you?</td>
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<tr>
<td>Does your seat pan have a rounded &quot;waterfall&quot; edge?</td>
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<tr>
<td>Does your arm rest allow you move closer to your workstation?</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Does your chair have five castors?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Is your chair able to revolve?</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Are all the chair adjustments easy to locate and operate?</td>
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<table>
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<td>Is your monitor at least 14 in. in size?</td>
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<td>Is the top of your monitor screen at or slightly below your eye level?</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Is your monitor located at about an arm’s length in front of you?</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>If you use a document holder, can you position it at the same height and the same distance from the screen?</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Can your monitor be tilted forward, backward and rotated?</td>
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<td>☐</td>
<td>☐</td>
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<tr>
<td>Is your monitor free from any noticeable flicker?</td>
<td>☐</td>
<td>☐</td>
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<th>No</th>
<th>N.A*</th>
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<td>Is your mouse located beside or close to the keyboard?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Is your mouse at the same height as your keyboard?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Do you keep your wrists straight while using the input devices?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td><strong>Ergonomics Checklist</strong></td>
<td>Yes</td>
<td>No</td>
<td>N.A</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----</td>
<td>----</td>
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</tr>
<tr>
<td><strong>Software</strong> <em>(Refer to section 3.3)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the software help you perform your task efficiently?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Is the software easy to use?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><strong>Work Posture</strong> <em>(Refer to Section 4.1 and 4.2)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you sit in a slightly reclining and relaxed posture with the back supported and the feet resting comfortably on the floor or foot-rest?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Are you able to avoid adopting poor working postures (eg neck bending or twisting or unsupported back)?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><strong>Manual Handling</strong> <em>(Refer to Section 4.3)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you free from frequent reaching above the shoulder or below the knee level?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Do you use the trolleys or carts to move heavy objects instead of carrying them?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><strong>Lighting</strong> <em>(Refer to section 5.1)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the lighting adequate?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Are you free from glare problems?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><strong>Ambient Noise</strong> <em>(Refer to section 5.2)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is your work environment free from annoying noise?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Are the noise sources isolated or enclosed?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><strong>Indoor Air Quality</strong> <em>(Refer to section 5.3)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the work environment temperature comfortable?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Are you usually free from any of the following symptoms, which occur during work and are relieved upon leaving the premises?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Eye irritation, dry throat, blocked or stuffy nose, itch or skin rash</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td><strong>Work Practices</strong> <em>(Refer to section 6)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have sufficient control over the way you do your work?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Does your work allow variation of activities and frequent posture change?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Do you receive sufficient training for the task to be carried out?</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
</tbody>
</table>

* not applicable
Annex B

Medical Examinations for VDU users

Wrongly corrected or uncorrected vision may be an important cause of eyestrain among VDU users. In correcting the vision, it is important to remember that the viewing distance for VDU images (45-75 cm) is usually greater than the distance for reading a hard copy. Therefore lenses should be prescribed which takes this viewing distance into account. Bifocal lenses are not recommended as users would require extension of the neck in order to read the screen.

Pre-employment examination

Eye tests for visual acuity (near and far vision) are recommended before starting work with VDUs.

Subsequent examinations

Subsequent eye tests are recommended for VDU users who experience eye problems and those above the age of 40.
Annex C

**Acceptable limits for contaminants and physical factors**  
(source: Ministry of the Environment)

<table>
<thead>
<tr>
<th>Contaminants &amp; Physical Factors</th>
<th>Acceptable Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Carbon Dioxide</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>2  Carbon Monoxide</td>
<td>9 ppm</td>
</tr>
<tr>
<td>3  Ozone</td>
<td>0.05 ppm</td>
</tr>
<tr>
<td>4  Formaldehyde</td>
<td>0.1 ppm</td>
</tr>
<tr>
<td>5  Volatile Organic Compounds</td>
<td>3 ppm</td>
</tr>
<tr>
<td>6  Bacterial Count</td>
<td>500 CFU/m³</td>
</tr>
<tr>
<td>7  Fungi Count</td>
<td>500 CFU/m³</td>
</tr>
<tr>
<td>8  Suspended Particulate Matter</td>
<td>0.15 mg/m³</td>
</tr>
<tr>
<td>9  Temperature</td>
<td>22.5 °C to 25.5 °C</td>
</tr>
<tr>
<td>10 Relative Humidity</td>
<td>&lt;= 70%</td>
</tr>
<tr>
<td>11 Air Movement</td>
<td>&lt;=0.25 m/s</td>
</tr>
</tbody>
</table>
Useful References

Occupational Health Department, Ministry of Manpower, Guidelines for Work with Visual Display Units (1997).


Acknowledgement

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