

Standing Workstations

Many jobs in industry are performed most efficiently when workers can stand, rather than sit, at their workstations. A standing workstation gives workers better mobility and allows them to apply more strength. However, it can also increase fatigue in the legs, back, neck, and arms. Continuous discomfort can eventually lead to disability.

Standing workstations are preferred when the job regularly requires workers to:

- Lift objects weighing more than 10 lbs.,
- Push downward,

- Push or pull laterally, and/or
- Move between operations frequently.

Standing workstations are also recommended when adequate knee space is not available for workers to be seated. Figure 1 shows some general guidelines for standing workstations.

Work Surface

The most important consideration when setting up a standing workstation is the height of the work surface (e.g., table, conveyor, or platen). There is no one correct height. Appro-

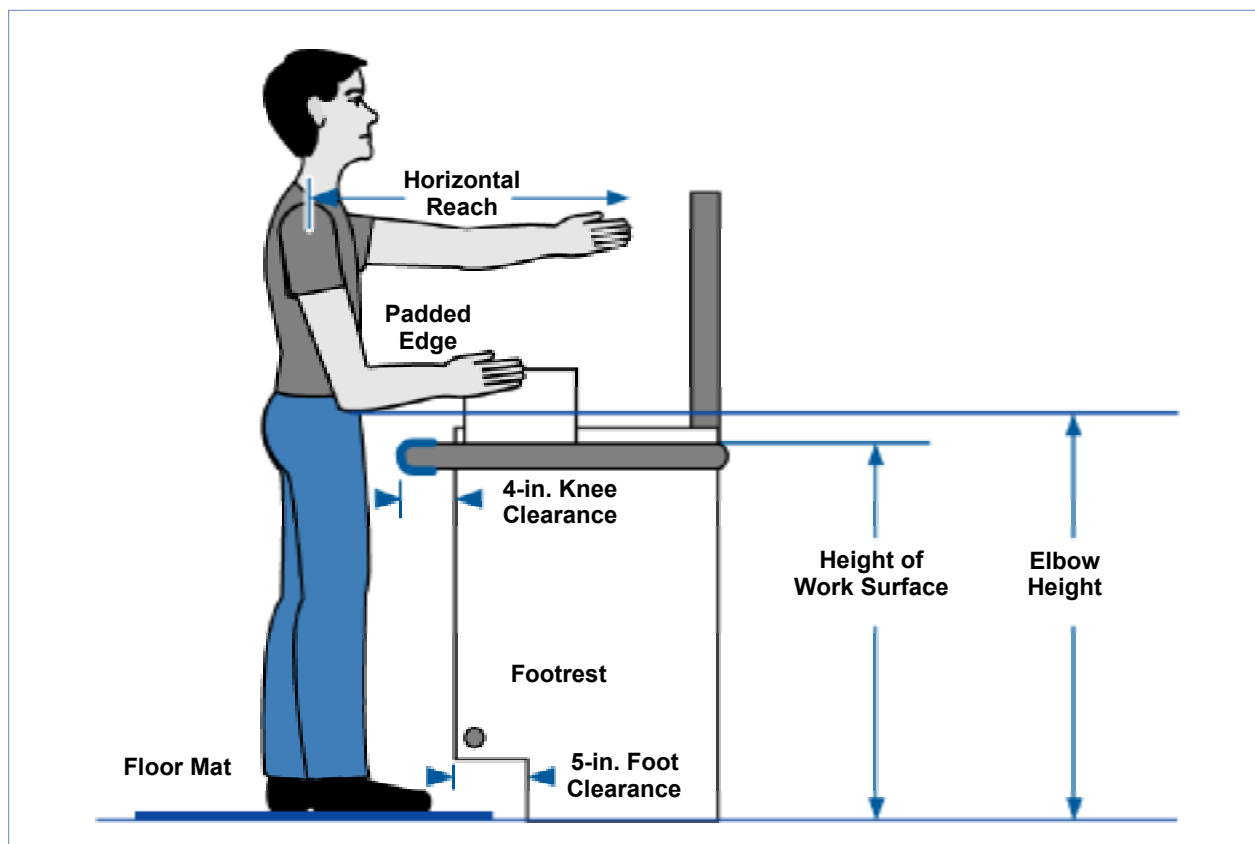


Figure 1. Guidelines for standing workstations.

priate work surface height is dictated by the type of work being done, the materials and tools used, and the height of the worker. For this reason, easily adjustable workstations are recommended so that the worker can change the height to accommodate different types of work.

Setting the Work Surface Height

To determine the *approximate* height of the work surface, use the guidelines below. Actual work surface height should be determined by *experimenting* near these suggested heights while workers perform their jobs.

- ❑ Determine whether the job primarily involves precision, light, or heavy work.
- ❑ For **precision work** (weights or forces <2 pounds or visually exacting work), raise the work surface 2 to 4 inches (5-10 cm) above elbow height and provide padded rests for forearm.
- ❑ For **light or normal work** (weights or forces exerted <10 pounds) lower the work surface 2 to 4 inches (5-10 cm) below elbow height.
- ❑ For **heavy work** (large downward or upward forces or weights >10 pounds) lower the work surface 4 to 8 inches (10-20 cm) below elbow height.

Table 1. provides additional information for fixed and adjustable workstations heights. Work surface heights for standing workstations should be adjustable whenever possible. Fixed height work surfaces should be designed to accommodate the largest users with platforms provided to raise smaller users to the appropriate height.

It is sometimes financially or operationally impractical to provide for easy height adjustment. In such cases, it is usually possible to make some relatively permanent adjustment that is comfortable for the worker. It is better to provide a platform to raise shorter workers to the proper height than to require taller workers to bend over their work.

Horizontal Reach and Grasp Dimensions**

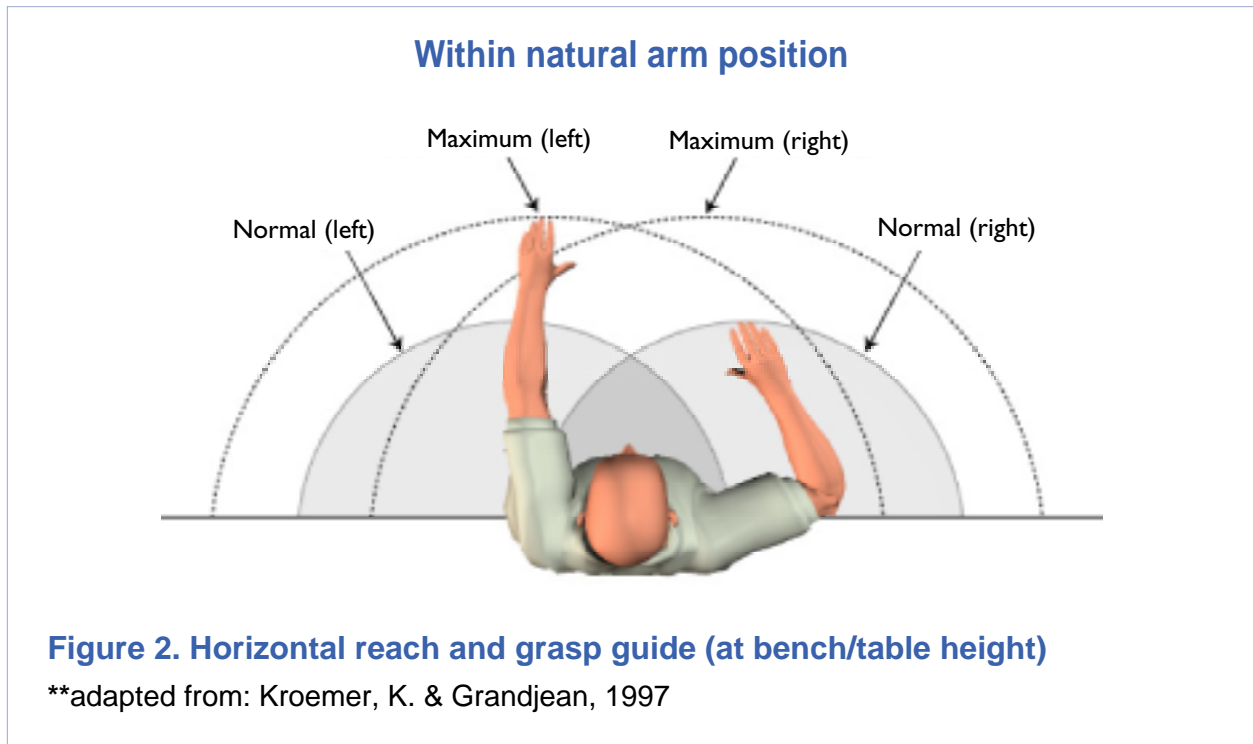
The ideal work posture is with the elbows resting alongside of the body with the forearms extended. Frequently-used materials, tools, and controls should be kept close to the worker as shown in Figure 2 on page 3.

- ❑ Frequent reaches should be within normal range or within 14-18" (35-45 cm) from the center of the shoulder and front edge of the table. For the smallest individuals, items will

Table 1. Guidelines for fixed and adjustable height workstations*

	Fixed surface height in inches (cm)	Adjustable surface height in inches (cm) [male]	Adjustable surface height in inches (cm) [female]
Light assembly work	38 (96) – 42 (107)	34.5 (88) – 42 (107)	32 (81) – 38 (96)
Precision work	45.5 (116) - 49.5 (126)	42 (107) - 49.5 (126)	37 (94) - 45.5 (116)
Heavy work	35 (89) – 39 (99)	31.5 (80) – 39 (99)	29 (74) – 35 (89)

*adapted from: Sanders & McCormick (1993)



need to be brought even closer to avoid excessive reaching.

- ❑ Reaches between 22-26" (55-65 cm) should only be made occasionally.
- ❑ Avoid reaches over 26" (65 cm).

General Guidelines

- ❑ Place parts bins, dispensers, and tools within the arm-reach radius.
- ❑ Use a table cutout if the operator must reach beyond the normal reach space to place or retrieve items (e.g., placing finished parts on a conveyor).
- ❑ Angle parts, bins, and dispensers toward the operator, or cut down the front edge of the bins so that workers can reach them with a straight wrist.
- ❑ Place the most frequently used parts, bins, or trays directly in front of the arm that will be reaching for them. Provide tiered bins if necessary.
- ❑ Suspend and counterbalance heavy tools.
- ❑ Provide a multi-level table if successive task steps require application of high

force and precise motions. A small stand may also serve this purpose.

- ❑ Use a tilting surface for assembly and inspection operations.
- ❑ Furnish a chair, jump seat, or prop stool when the duration of the job is greater than four hours. Consider designing the job as a sitting task.
- ❑ Supply a cushioned floor mat. When mats are impractical, cushioned shoes can make standing more comfortable.
- ❑ Provide an armrest if one arm doesn't move much during a work cycle, especially if the arm supports the work object.
- ❑ Be sure that the workstation lighting provides good contrast and clarity.
- ❑ Use matte finishes to reduce glare.
- ❑ If a display must be referred to repeatedly, place it in front of the worker at a viewing angle 5 to 30 degrees below the eye height plane.
- ❑ Cushion the edge of the work surface, and furnish a footrest or rail to allow workers to rest their legs.

References

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- Sanders, Mark S. and Ernest J. McCormick, *Human Factors in Engineering and Design*, 7th Edition. New York: McGraw-Hill, 1993.
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