

Evaluating Task Seating

By Jonathan Puleio

» To most ergonomists and health and safety officers, a well-designed task chair is considered to be one of the most important components of an ergonomic workstation. But, with so many types of task chairs available today, how should you make an informed decision when the time comes to make a purchase? What types of adjustments are critical for maintaining the health and comfort of computer users? These are among the most common questions being raised by today's facility managers with respect to evaluating task seating.

To begin, consider the functional goals of a task chair. First, a well-designed chair should offer sufficient adjustability to accommodate at least 90 percent of the working population (the chair should fit a fifth-percentile female through a 95th-percentile male). Chairs that offer adjustable seat height, seat pan depth, backrest height/lumbar support, and armrest height are often successful in accommodating most users if they adjust within recommended adjustment ranges (see sidebar). Adjustments beyond those mentioned often complicate the operation of the chair and have received little, if any, validation from an ergonomics perspective.

Next, a chair should promote movement of the spine. Fixed, upright postures, no matter how close to optimal, will generate static muscle contractions and subsequent discomfort. Spinal discs lack a direct blood supply and are nourished through osmosis, a process that is best facilitated through movement. It is critical, therefore, that the backrest allows a person to move freely throughout a range of supported postures. This concept is often referred to as "dynamic sitting." Difficult-to-adjust tension-control knobs and back locks are barriers to movement and can complicate

the ergonomic operation of the chair. Today's newer chairs are equipped with self-adjusting recline mechanisms that automatically adjust the amount of backrest tension based on body weight. This technology dramatically simplifies the operation of the chair while maintaining a user's spinal health and comfort.

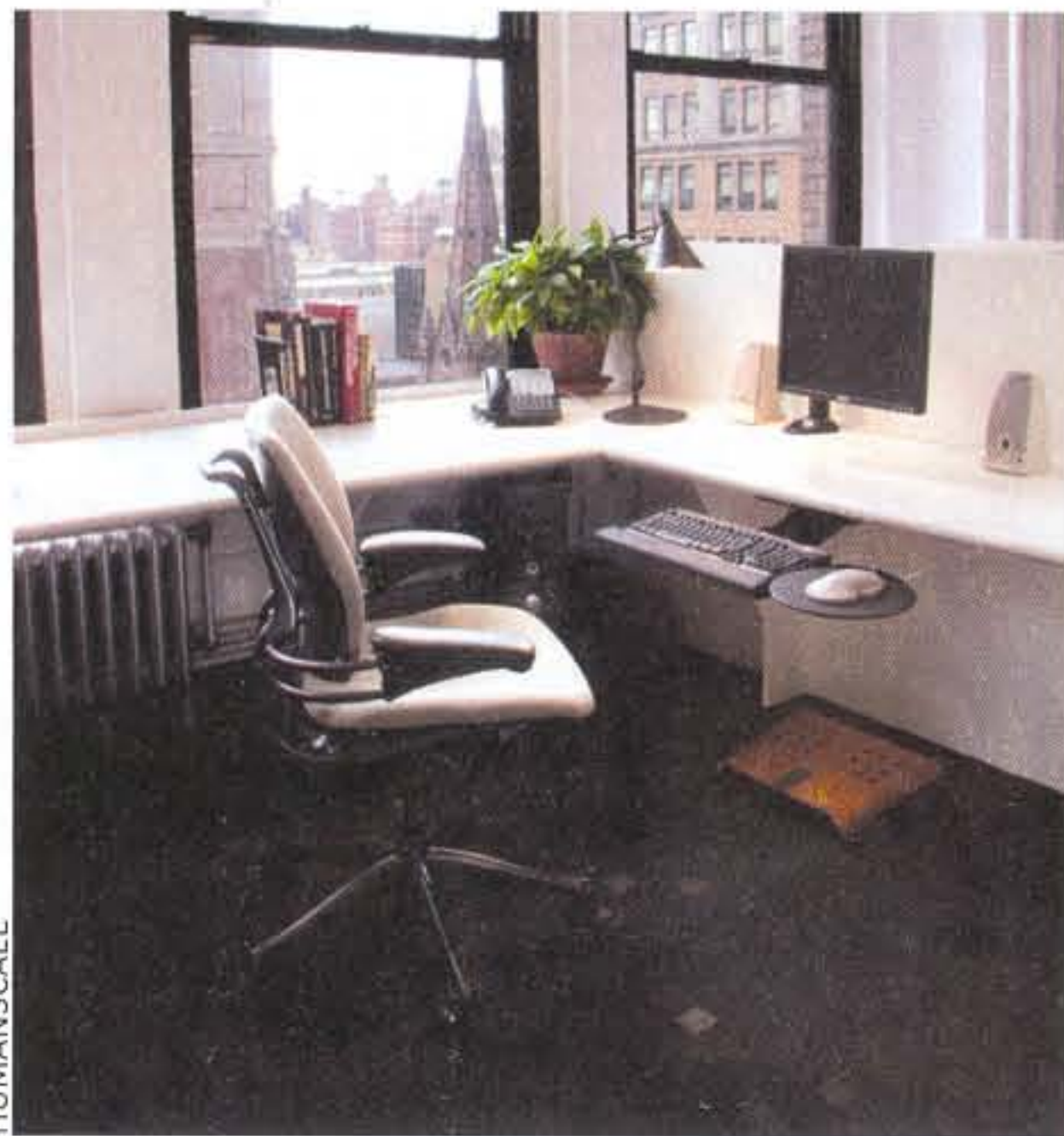
Thirdly, a well-designed chair must be intuitive to use. Chairs of the '80s and '90s became so complicated to adjust that few users could correctly identify a single chair adjustment. A 1995 study conducted by Martin Helander, a renowned professor of ergonomics at Nanyang Technological University in Singapore, found that less than 2 percent of the population surveyed was able to correctly identify the purpose of the tension-control knob. All adjustments should be possible while the user is sitting in the chair. The controls should be positioned within reach and should *never* require excessive force to operate.

The biggest mistake facility managers tend to make when evaluating task seating is to allow employees to make decisions based on short-term usage. Decisions in this case are more likely to be made based on the aesthetics of the chair rather than on the

comfort of the chair. Workers should be given an opportunity to compare each chair over a period of several days.

Ithaca, NY-based Cornell University's Ergonomic Seating Evaluation Form, developed by Professor Alan Hedge, director of Cornell's Human Factors and Ergonomics Research Laboratory, is designed to help workers make informed, objective seating decisions. The form can be downloaded at (<http://ergo.human.cornell.edu/ahSEATING.html>).

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Recommendations for Seating from the Business and Institutional Furniture Manufacturer's Association (BIFMA)

- *Seat Height:* 15 to 19.9 inches.
- *Seat Depth:* Adjustment range should include a seat depth of 16.9 inches or less.
- *Seat-Pan Shape:* A seat cushion with a waterfall edge will reduce compression on the back of the knees.
- *Seat-Pan Width:* No less than 18 inches.
- *Seat Pan-Backrest Angle:* 90 to 115 degrees.
- *Backrest Height:* Greater than 12.2 inches.
- *Backrest Width:* At least 14.2 inches.
- *Distance Between Armrests:* No less than 18 inches.
- *Armrest Height:* 6.9 to 10.8 inches.
- *Lumbar Support:* The height of the most forward point of the lumbar support should fall within 5.9 to 9.8 inches.

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