



Table of Contents - Lincoln University Standards for Office Chairs

- 1. Introduction.....Page 2
 - 1.1 Objective
 - 1.2 Summary
- 2. Importance of Adhering to Chair Specifications.....Page 2
 - 2.1 Proper Seat Fit
 - 2.2 Proper Backrest Size
 - 2.3 Essential Armrest Features
- 3. Ergonomic Standards for Task Intensive Computer Chairs.....Page 2
 - 3.1 Comparison of Guidelines/Standards
 - 3.1.1 BIFMA G1-2013
 - 3.1.2 CSA Z7412-175
 - 3.1.3 Other Standards Comparison
- 4. Utilizing the Civilian American and European Surface
 - Anthropometry Resource (CAESAR) Dataset.....Page 3
 - 4.1 Advantages of CAESAR Dataset
 - 4.2 Relevance to Today's Office Workers
- 5. Budget and ADA Accommodation Considerations.....Page 4
 - 5.1 Recommended Chair Price Range
 - 5.2 Ergonomics and Support for ADA Accommodation
- 6. Pool of Chairs for Global Use.....Page 4
 - 6.1 Selections Suitable for Global Deployment
 - 6.2 Considerations for Warranty and Service
- 7. Conclusion.....Page 6

Lincoln University Standards for Office Chairs

Objective:

The objective of this report is to provide University-approved standard selections of office chairs that meet the required specifications for proper ergonomics and support.

Summary:

Adhering to guidelines for chair specifications is essential to ensure the well-being and comfort of office workers. A properly fitted seat, in terms of height, depth, and width, reduces pressure on leg tissues, allows users to sit properly and receive full back support, ensures easy entry and exit from the chair, and provides even weight distribution. A properly sized backrest supports the natural curves of the spine, reducing the risk of back pain by minimizing muscular activity and loading on the back. Properly fitted armrests are crucial for resting the arms, relieving shoulder and back strain, and aiding users with reduced strength, excessive weight, or joint issues.

Importance of Adhering to Chair Specifications:

1. Proper Seat Fit:

Adhering to guidelines for seat dimensions, height, depth, and width ensures reduced pressure on leg tissues, proper user positioning, and even weight distribution.

2. Proper Backrest Size:

A correctly sized backrest supports the natural spinal curves, minimizing the risk of back pain and reducing muscular strain.

3. Essential Armrest Features:

Suitable armrests provide a restful position for the arms, alleviate the load on the upper shoulders and back, and aid users with reduced strength or joint problems.

Ergonomic Standards for Task Intensive Computer Chairs:

Three guidelines/standards were compared to select ergonomic chairs for tasks that involve extensive computer use. The BIFMA G1-2013 and CSA Z7412-175 standards were found to be the most accurate representation of today's population. These standards utilize the Civilian American and European Surface Anthropometry Resource (CAESAR) dataset, which is more recent and representative of typical office workers compared to the datasets from the Natick Anthropometric Survey of US Army Personnel ANSI_HFES 100-2007.



Figure 1. Distance

These are the ergonomic standards to guide the selection of task intensive computer chairs. The stature dimensions that are estimated to be most affected are the forearm-forearm breadth, and hip breadth in sitting. This estimation places an emphasis on the importance of armrest width and seat pan width guidelines with respect to chair designs.



Figure 2. Seated Hip Breadth

The width of a seat pan should be wider than the width of the hips during sitting. This guideline for seat pan width ensures users can easily enter and exit the chair and allows users to evenly distribute their weight across the seat, while giving a small allowance for movement within the seat.



Figure 3. Seat Height (vertical distance between floor and back of the knee)

Proper seat height is an important parameter to consider when fitting a chair. The appropriate height for the seat pan is determined by the distance between the floor and the back of the knee (popliteal fossa) height, plus the thickness of footwear (Figure 3). A proper seat height is critical in reducing pressure on the soft tissue of the back of the thigh (if seat is too high)³ and in reducing pressure on the hip bones (ischial tuberosities), a consequence of a small torso-to-thigh angle (if seat is too low)². Overall, a proper height while seated will help to promote good blood flow and decrease discomfort to the lower limbs.



Figure 4. Seat Depth (horizontal distance between the buttock and the back of the knee)

The appropriate seat depth for a chair is determined by measuring the horizontal distance between the buttock and the back of the knee (popliteal fossa) (Figure 4). Seat depth is important to provide full support to the thighs, as well as ensure the user is seated properly in the chair to get appropriate back support. A space of at least 10mm (0.4inches) needs to be present behind the knees to prevent compression of the unprotected vessels behind the knee.



Figure 5. Appropriate seat pan angle



Seat pan angles are responsible for providing users with support through a variety of different seated postures (Figure 5). It is important to have a variety of postures available so that blood flow can be promoted and the spine can be altered³. Appropriate seat pan angles are important to avoid users sliding forward and out of the chair (angle too far forward) and to avoid compromised lumbar curvatures (angle too far rearward creating a small torso-to-thigh angle), and compression of soft-tissue behind the knees². See table 2 for guidelines on seat requirements for work chairs.



Budget and ADA Accommodation Considerations:

To provide suitable chairs that are ergonomic and supportive for ADA accommodation, allocate a budget of \$500-\$1300 per chair. This price range ensures the inclusion of features that meet the required standards.

Pool of Chairs for Global Use:

Consideration was given to selecting chairs suitable for universal deployment. The chosen chairs meet the established standards and are suitable for universal use. Warranty and service considerations were also factored into the chair selections to ensure long-term support.

Picture	Manufacturer	Name	Price	Dealer	Specifications
	Humanscale	Ocean Chair	\$890	Trans American POC: Carla Driver	Black w/ Black Trim Monofilament Stripe Black Fourtis Black No Leather Selected Standard Foam Seat Pan Std 5" Cylinder Std Hard Casters Std Foam and Plastics Standard Base to Match Trim Color Standard Base Individually Boxed
	Haworth	Fern Chair	\$1285	Office Environments, POC: Pam Motter	Fern, Task, Fabric Seat, Mesh back, 4D Arm, Lumbar, Pneu w forward tilt and Bk stop, sliding seat, plastic base, Sft Cst, SR.

	Knoll	Remix	\$828	CFI POC: Meredith J. McGinnis	KNOLL 66WHP2SLHC--DK-01-XOB01-USF~-(XU)-XU07-(XB)-XB07 Remix work chair, high performance arms, plastic base, standard cylinder, with lumbar, hard casters, knockdown OPTION: DK:FINISH-Dark OPTION: 01:STRAP-Storm OPTION: XOB01:OUTER- Storm OPTION: USF:SEAT-Ultra Seat Foam OPTION: ~:Standard Textile or Leather OPTION: (XU):SEAT-Delite OPTION: XU07:COL-Cinder OPTION: (XB):INNER BACK- Delite OPTION: XB07:COL-Cinder
	Raynor	Eurotech	\$1183	DSO Furniture POC: Matt Terrell	Raynor Eurotech iOO Mesh Back & Seat Task Chair - Black Frame 1 876.00 876.00 Raynor Eurotech iOO White HeadRest with Black Mesh 1 57.00 57.00 Charges for shipping, receiving, delivery, assembly, and installation.
	Alternate	Varies	>\$500	YOC	Lower budget contender from Your Office Connection that is under \$500 to use if a department's budget is very tight. Not a first choice as it may not address all ergonomic criteria.

Conclusion:

This standards report outlines the University-approved standard selections of office chairs to ensure the well-being and comfort of office workers. Adhering to guidelines for chair specifications, including proper seat fit, backrest size, and essential armrest features, is crucial for maintaining good posture, reducing the risk of pain and strain, and accommodating individuals with special needs. The selection process involved comparing different guidelines/standards, prioritizing the most accurate and representative datasets. Additionally, budget considerations and the need for global compatibility, warranties, and service were taken into account for the final chair selections.