



Ergonomics and Seating

Allsteel strives to design human-centric seating, incorporating ergonomics seamlessly. This article outlines Allsteel's human-centric design criteria.

Ergonomic seating should fully consider posture, pressure distribution, intuitiveness, and movement to create a comfortable experience for the user.

Posture

Seating should be designed to properly support postures that promote health, which in turn encourages **productivity and comfort**.

The workforce is made of individuals of different shapes and sizes. In order to create products that support this diversity, adjustment and thoughtful design is key. Adjustment ranges are not arbitrary, but instead are intentional to meet the needs of the 5th to 95th percentile. We use the latest anthropometric data to understand specific measurements that are related to ergonomic chair design, going beyond simply looking at overall height and weight.

- Anthropometrics: The science of measuring humans, and the application of population size and weight in product design.
- 5th – 95th percentile: Considerations of users on the small end of the spectrum (5th percentile) to the large end of the spectrum. We consider overall dimensions such as weight and height, but also more specific measurements in product development. No one is 50th percentile on all dimensions, some individuals have long torsos and shorter legs or vice versa. Therefore, it is important to have a more refined view of the data. For example, seat height adjustments are based on the measurement needed to support the 5th to 95th popliteal height.



Pressure Distribution

When designing seating, we utilize pressure mapping technology, as well as subjective feedback, to better understand the interaction between the user and the product. Properly considering pressure distribution will create a comfortable initial and long-term sit.

Seat Support

- What we want: Evenly distributed pressure
- What we try to avoid: High pressure on buttocks and front of thighs
- Seat curvature, material properties, and dimensions can all be engineered to optimize pressure distribution.

Intuitive

The philosophy of designing products to align with user expectations. That is, users do not need to consciously think about how controls or adjustments are manipulated, but instead the design communicates appropriate interaction instinctively.

When you approach a door, the handle should communicate to you how the door operates. You can usually tell by the shape of the handle if you should push, pull, or slide the door handle. Intuitiveness is important because people need to understand how to use their seating without a manual. Adjustments are useless unless they are intuitive.

We can make products intuitiveness in four different ways:

- 1.Consistency in location: Expected location of controls (e.g. seat height adjustment is always on the right)
- 2.Orientation of controls: Paddles/levers are positioned in a way that makes their movement instinctive
- 3.Graphic indicators when needed
- 4Automatic adjustments

An example of intuitive adjustments is a weight-activated control. A Weight-activated control adjusts the recline tension to automatically meet the needs of whichever user is sitting. The benefits of this type of control are:

- The user never has “free-fall” feeling or forceful recline
- Adapts to small and large users by using the sitter’s weight to adjust tension
- Promotes movement by encouraging supported recline

Movement

Most of us sit a lot – we sit during our commute, while eating, at work, and in our free time.

There is a great deal of research that tells us that excessive sitting can be harmful, and that it can contribute to development of hypertension, diabetes, and early mortality.

These statistics hold true regardless of age, smoking status, weight classification, calorie intake, and previous illness. Additionally, even an hour a day of exercise is not protective if you sit for the remainder of the day (we call these individuals ‘active couch potatoes’) – the fact is that prolonged sedentary behaviors can be harmful.

This means that sitting still for long, uninterrupted periods can be harmful to our health. So sitting for too long is dangerous, but standing still for too long is dangerous as well. Prolonged standing has been shown to contribute to varicose veins, cardiac issues, and fatigue. For that reason, sitting in moderation is very important. Sitting allows us to transfer weight off our feet and legs, rest, reduce pressure on our circulatory systems, and stabilize ourselves for our work.

Consider the following related to movement and sitting:

- Active Sitting: reclining, changing postures, and fidgeting in your chair
- Adaptive Support: Moves with you as you change postures
- Personalized Reclining: Assisted by proper tension adjustment and synchronized movement between the seat and the back (synchro-tilt)
- Seating Options: Variety of chair styles made to meet work needs and encourage movement throughout the office

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