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OUT-OF-THE-BOX SEATING, OUTSIDE-THE-BOX RESULTS

How a New Generation of Seating Technology Can Achieve a Custom Fit Without a Custom Build

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Custom is an often-used word in complex rehab seating & wheeled mobility discussions, and for good reason.

Yes, there is absolutely a need to differentiate complex rehab technology clients — those with severe, permanent, possibly progressive conditions, often with a neuromuscular or genetic component — from clients with temporary loss of mobility, and from able-bodied seniors experiencing age-related strength and stamina changes.

But even within the realm of complex rehab clients, there are different levels of client complexity. There are situations so rare that an ATP or seating & mobility clinician may see it only once in a career — for instance, building a seating system for conjoined twins.

In most cases, though, the seating & mobility team works with clients with familiar diagnoses — spinal cord injury, cerebral palsy, muscular dystrophy, ALS, multiple sclerosis — but unique presentations, since each client differs in medical history, height and weight, environments, mobility goals, etc.

For some clients, a custom-built seating system is absolutely required. But given the range of options, materials and sizes now available, is it possible to start building a seating system using “out-of-the-box” products and then size and adjust them to achieve a one-of-a-kind fit?

A WIDER RANGE OF MATERIALS

One of the factors that has made it possible to achieve better fit and better results is today’s wide range of materials.

Foam, of course, has long been a staple of wheelchair seating. But now there are different types of foam, including foam that does a far superior job of returning to its original shape when the client transfers off the cushion. Foams are also available



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in different stiffnesses, and different types of foam can be used in combination. Foam or foam layers can be contoured to produce different shapes and assist with positioning and stability.

In addition, seat cushions today include materials such as —



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- **Air:** In the form of multiple air cells that are stationary (e.g., ROHO Inc., Star Cushion); multiple air cells that are movable within the cushion (e.g., Vicair technology, Comfort Company); air bladders or compartments (e.g., Aquila Corp., VARILITE); or cushions whose single or main chamber is filled with air (e.g., EHOB).
- **Gel or Fluid:** Contained in inserts or bladders used in combination with other materials, such as foam (e.g., Alex Orthopedic, Blue Chip Medical, Drive Medical, Invacare Corp./Motion Concepts, Ottobock, Quantum Rehab, JAY from Sunrise); or gel formed into stationary cells (e.g., AliMed).
- **Honeycomb:** e.g., Supracor. To maximize the effectiveness of the different media, cushion engineers have also used different media in tandem — for example, adding air cells to a foam base to provide greater skin protection for high-risk areas (e.g., Ottobock's Terra Flair, Quantum Rehab's Synergy Spectrum Air, ROHO's Hybrid Elite, Sunrise Medical's JAY Fusion).

Varying the types of materials and using them in combination have enabled engineers to create products that offer both skin protection and positioning support, or to offload weight from high-risk areas.

It's also enabled cushion manufacturers to offer more targeted, but still out-of-the-box products for clients who not long ago might have required a custom-made seating solution.

CREATING A CUSTOM FIT: MATERIALS

So given the greater range of materials, of materials used in combination, and of the manufacturer's ability in some cases to place contours, cells or bladders in custom-configured locations, is it possible to achieve a one-of-a-kind fit using products that are not custom made?

"If you take a look around, no two butts are the same, and in order for an 'out-of-the-box' cushion or back to work, you need the system to be flexible and forgiving in order to accommodate as many people as possible," says Jeff Rogers, senior product manager for Sunrise Medical's JAY seating division.

Rogers says versatility is critical to this strategy.

"At JAY, we rely on fluid to help with this, as it is able to conform to countless body types to properly support and protect against daily sitting," he explains. "We have also learned that the means by which you support the fluid is important to be as forgiving as possible. For instance, in some cushions we provide a soft, forgiving foam top layer, but it's supported by a harder structural foam. This combination of fluids and foams allows us to handle numerous types of bodies while remaining comfortable and supportive.

"But we understand that other mediums are also important. For instance, air inserts can also provide a flexible alternative to fluid — thus we made our products flexible enough to easily change from one system to the next."

In addition to paying attention to the customizable properties of seat cushions, a seating professional who factors backrests into the equation can further fine-tune the seating system fit.

Asked how a wider range of materials makes it possible to accommodate a wider range of seating & positioning needs — for example, how a seat cushion that is customfit, but not custom-made, could help reduce a client’s future risk of skin breakdown at the ischial tuberosities, Nick Everington, national training director for Matrix Seating USA, says, “My first thought is that this cannot be achieved by using a standard seat or standard cushion that does not have customizable parts. Seating and positioning needs are not easily met just by simply adding a cushion. What would make it customizable would be the addition of an adjustable back, such as a JAY J2 deep contour system, to accommodate an obliquity, for example.”

Katherine Sims, director of marketing for Matrix Seating USA, adds another wrinkle into the materials discussion: a medium that she says mimics the customizability of a traditional custom-molded seating system, but is also adjustable to accommodate a client’s growth or changes in size.

“If presented with a client who has a history of skin breakdown and is at high risk of future pressure ulcers, our recommendation would be utilizing adjustable micro-modular seating (AMMS),” she says. “The leading AMMS system consists of interlocking nylon segments that create a custom mold with an open design. The open design allows for airflow, heat and moisture reduction. The pressure and shear-relieving thermo-elastic polymer cover (surface modules) allows for proper pressure distribution during incremental shape changes. These shape changes can be incrementally adjusted to reduce pressure in appropriate areas while maintaining proper pressure distribution elsewhere.”

CREATING A CUSTOM FIT: CUSHION DESIGN

Seat cushions have come a long way from the flat, uniform slabs of foam they once were. Many of today’s cushions for complex rehab clients use more than one type of foam, often layering the foams so, for example, a softer layer is closer to the client-cushion interface, and a stiffer layer is underneath to provide support (e.g., Dynamic Seating).

Foam that is specially molded or contoured further enables a manufacturer to provide more aggressive support, stability and positioning, and to achieve a more customized fit.

“Just as in custom seating, one seat doesn’t fit everyone,” Rogers notes. “The same applies to out-of-the-box seating. That is why multiple cushions, back styles, shapes and contours are a must.

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