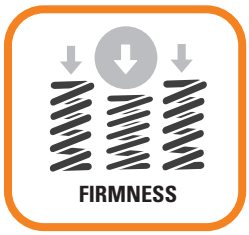
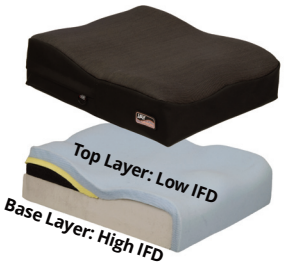
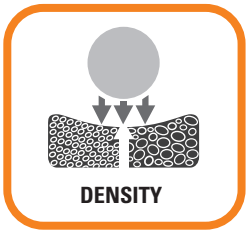
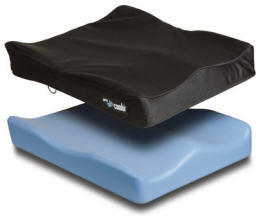
Cushion Properties

Why is this cushion made like this and is it right for my client? Wheelchair cushions are created using scientific properties to address the needs of wheelchair users. Understanding these properties will help the clinician select a cushion based on the desired effect that they are trying to achieve. The Cushion Properties Table explains the technology used in cushions and the clinical application that should be considered when choosing a cushion. Examples of cushions which demonstrate these properties are also provided, however all cushions use these properties and are key to making your cushion selection.

JAY® Fusion Cushion with available options displayed here.

Cushion Properties (Continued)

PROPERTY	Technology	Clinical Application	Example Cushion
	**Foam firmness** relates to the amount of stiffness or softness in a foam. Indentation Force Deflection (IFD), also referred to as Indentation Load Deflection (ILD), is a measurement of foam firmness. High IFD is stiff Low IFD is soft	Firmness does not describe density or durability, it describes the spring (ability to compress and rebound) of a foam. The softness/firmness of the foam will impact positioning and pressure. The clinician must select foams that are durable, yet provide the level of stiffness or softness to achieve the positioning goals. The clinician must also consider the foam's reaction to heat (including body heat) because foam (i.e. memory foam) may soften when sitting on it, thus reducing the IFD.	**JAY Union®** 
	**Foam density** relates to the durability of a foam. Foam can be either high density or low density and measured in Pounds per Cubic Foot (PCF). Firm foam can be either high density or low density. High PCF is more durable Low PCF is less durable	Density is important to consider when selecting a cushion so it lasts the intended amount of years. Regardless of foam's IFD, it is important that high density foam is used. This is important because density, not firmness, influences durability. Manufacturers who use low density foams may reduce cost, but ultimately sacrifice durability. Cushions that use low density foams may compress over time (bottom out). They harden, lose shape, and no longer provide appropriate support and pressure distribution.	**JAY Soft Combi** 
	**Reaction force reduction** is the ability of the material to reduce the resulting force from compressing or deforming a solid elastic material. The maximum reaction force occurs at the area of highest compression (i.e. when you push a finger down into a block of foam, the highest reaction force is at your fingertip).	It is important to have a cushion which reduces reaction force as much as possible. When a pelvis is seated, the ischial tuberosity bones are positioned at the maximum point of compression, resulting in high reaction force that often contributes to tissue breakdown and the formation of pressure injuries.	**JAY Ion®** 
	**Hydrostatic force** is the amount of force of a fluid at rest. It is the force that occurs in objects that immerse in fluids (liquid or gas). Hydrostatic forces that are in balance or equally distributed will have less pressure against the tissue.	Hydrostatic loading evenly distributes pressure to reduce buildup under sensitive areas of the pelvis, which helps prevent the formation of pressure injuries. Hydrostatic forces that are in balance give the feeling of weightlessness or floating in a pool. It's important to provide the correct amount of fluid to enable proper reduction of hydrostatic forces.	**JAY Fusion®** 

Cushion Properties (Continued)

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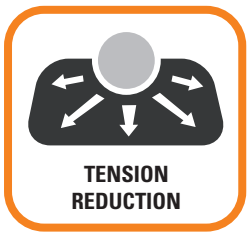	**Tension reduction** is the use of materials to reduce the effects of creating tension on the tissue. Tension is the state of being stretched or strained when the materials attempt to accept the body. The more stretch within a material, the more tension is reduced. An example is comparing stretch denim with original denim.	Tension can cause increased forces at the point of greatest immersion usually the area around the ischial tuberosities. Foam is a prime example of a tension producing cushion material, whereas fluids are tension reducing. Using materials such as 4-way stretch in covers reduces tension on the tissues. Although tension is a common concern in cover materials, it can also be a problem with the actual cushion material. Sinking the pelvis into a cushion fluid (JAY fluid or air) or a pre-molded shape significantly increases contact area and helps reduce peak pressure areas.	**JAY J2® Deep Contour** 
	**Microclimate** is the temperature and moisture created in a particular area. Too much heat may cause sweating, leading to moisture. Too much cooling may interfere with healing.	The microclimate of an area while sitting on a cushion must be monitored to prevent temperature buildup which leads to moisture, maceration and pressure injury. Clinicians should consider microclimatic materials which cool the area and delay temperature build up. Microclimatic materials will also reduce perspiration (moisture). Although tissue breakdown has been attributed to excess heat and moisture, skin that is too dry is also more prone to pressure injury. Microclimatic material encourages the passage of air, heat, and water vapor from the user; therefore, materials that promote a stable microclimate in the cushion should be considered.	**JAY Fusion® with CryoFluid™ Insert** 
	**Vibration dampening** is the use of material to disperse the energy caused by vibrations by reducing the amplitude and frequency of the vibration. Whole-body vibration (WBV) is the vibration transmitted by supporting surfaces to the entire human body. Some materials can reduce or dampen this effect of WBV.	Cushions which provide vibration dampening to reduce the WBV are important for those who experience pain, fatigue and nerve damage. A vibration-reducing material should be able to perform over a wide range of temperatures, while still absorbing shock and vibration energy. Visco foam is an example of a material that performs well in absorbing shock and vibration.	**JAY X2®** 

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