CORTLAND BIOMEDICAL™

CUSTOM-BUILT BIOMEDICAL TEXTILE STRUCTURES:

Heart Valve Fabric Solutions

Cortland Biomedical custom designs high-performance biomedical textile structures applying our expertise in textile engineering and advanced fabric design methods including knitting, braiding and weaving. Never comfortable with the status quo, we tackle complex biomedical textile challenges with innovation and agility.

Developing Heart Valve Fabric with Knitting & Weaving Technologies

Today's cardiovascular surgeries leverage exciting new medical devices that are developed using biomedical textiles and take advantage of their limitless shape and performance possibilities. Textile structures have become more innovative, with complex and fully customizable geometries. Implantable fabrics are no longer limited to traditional applications and can actually support and promote the healing and even the regeneration of damaged cardiovascular tissue. Today, textiles are used to create:

- BIOCOMPATIBLE HEART VALVE FABRIC
- AORTIC ARCH REINFORCEMENT
- STENT GRAFT COVERING
- CAROTID ARTERY REPAIR FABRIC
- TISSUE GRAFTS
- AND MORE

Not only are textile structures for heart valve fabrics highly customizable in shape and form, but also can be created using various biomaterials to enhance their performance (for example, ultra-high molecular weight polyethylene, polyester, polypropylene, etc.). The characteristics of the fabric can be tailored by design engineers to the specific needs of the surgical application. Textiles can also be used for composite products combining polymeric and metallic filaments.

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Knitted Heart Valve Fabric

Knitted heart valve fabric structures are formed by interlocking loops of yarn or metal in a weft or warp pattern to form flat, broad or tubular structures with open spaces to promote native tissue growth as needed. Warp knitting, in particular, is ideal for creating textile products for vascular applications (especially for mitral heart valve replacement) because it can produce very thin, dense textile structures that prevent blood leakage around the valve. Porosity can be tailored to recruit the desired cell by size, creating specialized regions of tissue regeneration. Densities can be rapidly changed so you can transition from dense to porous within a single fabric. For heart valve fabrics, this means blood leakage can be prevented inside the valve while native tissue ingrowth is encouraged outside. Knits are very compliant, allowing the implant to stretch and move with the body, reducing patient discomfort and restoring natural mobility.

Applications of knitted heart valve fabrics include vascular prosthesis, hemostasis, cardiac support devices, and valve sewing cuffs.

Woven Heart Valve Fabric

Weaving technology is rapidly evolving and can be used to create heart valve fabrics by interlacing combinations of two or more monofilament or multifilament non-absorbable yarns in a perpendicular fashion. The various ways that the yarns are interlaced allows textile engineers to create complex architectures, such as the three-layer architecture of the valve leaflets, while tailoring critical characteristics such as density/porosity and thickness. The completed textile structures can be used to promote growth of cells in the scaffold based on the orientation of the yarn.

Woven fabric configurations include tubular, flat, tapered, or near-net fabrics that are beneficial due to their low porosity (which is important for containment and cardiovascular fluid transfer), dimensional stability and high-tensile strength.

Let Cortland Biomedical Work with You to Develop Your Next Heart Valve Fabric Solution

We offer you:

- A proven track record of working with research and development teams in the medical market to provide innovative solutions
- A product development team versed in modern textile forming techniques
- A cross-functional team of engineers available to work on all aspects of the design, process development, quality assurance and validation of a product
- Agile manufacturing

Contact one of our engineers today at 1.607.218.3542, or **info@cortlandbiomedical.com**