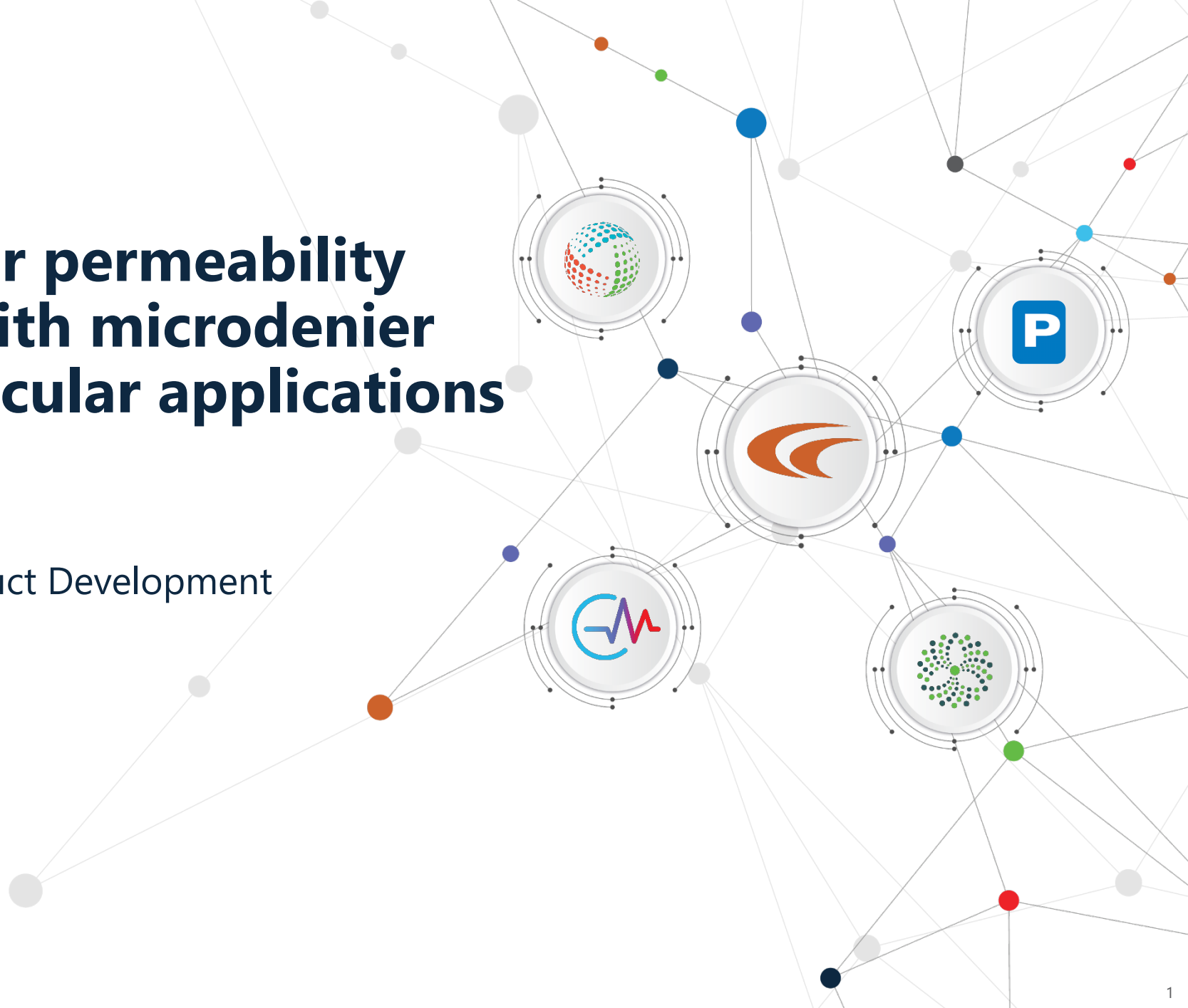


October 1, 2025

Thin and low water permeability textile scaffolds with microdenier fiber for cardiovascular applications

Swati Patel

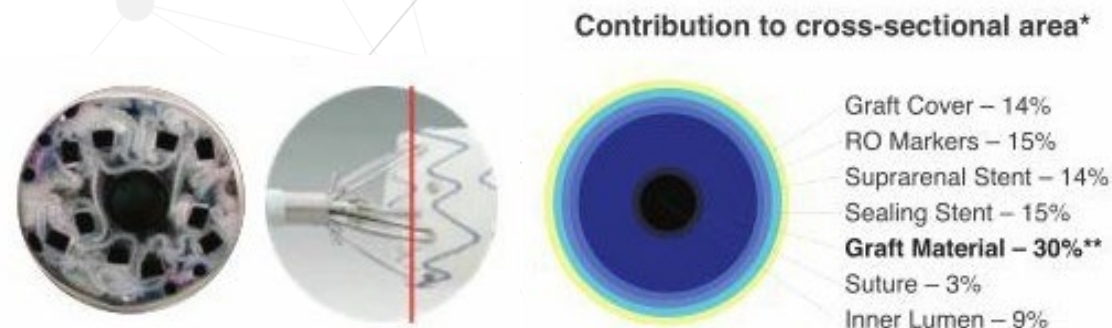
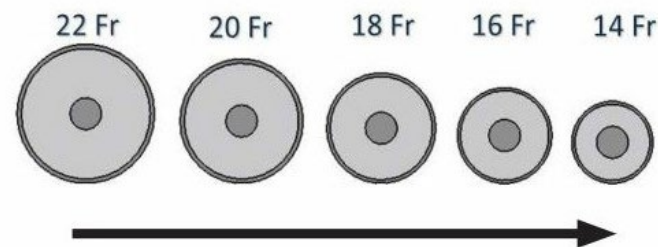
Senior Director, MedTech Product Development



The Push for **Thinner, Lower-permeability Scaffolds**

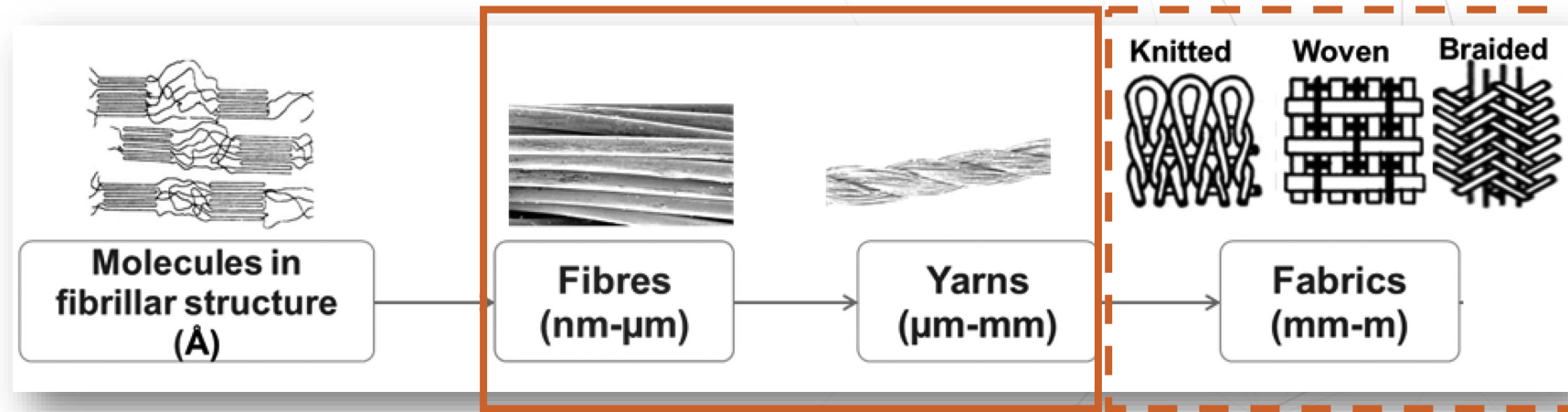
Meeting the Demand for Textile Innovation in Cardiovascular Devices

- Transcatheter devices aim for reduced delivery profiles while still meeting essential functional criteria like blood-tightness and mechanical strength (e.g., suture retention)
- The industry demands thinner fabrics with lower permeability



A Comprehensive **Approach to Textile Design**

Polymers to Fabric



**POLYMER &
CHEMISTRY**

**FIBER &
YARN
PROPERTIES**

**FABRIC
PROPERTIES**



Solutions: From Microfibers to Ultra-fine Filaments

Solution	Result
✗ Lower denier yarn	Compromises durability, strength, and suture retention
✗ Reduced density	Compromises durability, strength, and suture retention
✗ Reduced density + coating	Introduces new material, raising regulatory concerns for immediate needs
✓ Micro-fiber yarn	Traditional macro/micro-fiber textiles (10-12 μm filaments) meet many needs, but demand for greater reductions in thickness and permeability is growing.



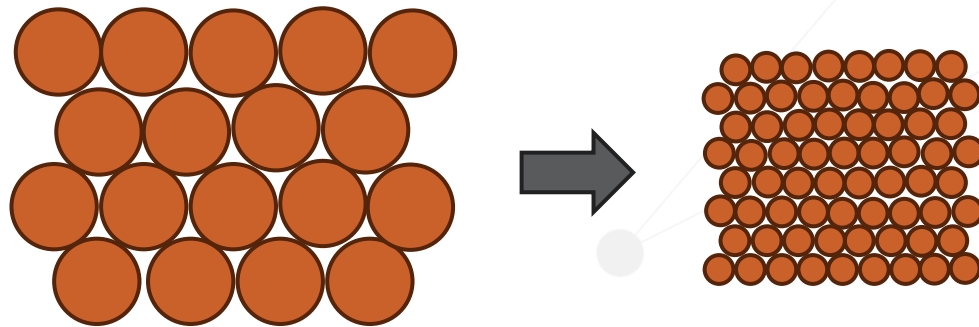
Innovating around the yarn



Transitioning from Standard to Low DPF

Shifting from Microfibers to Ultra-fine Filaments

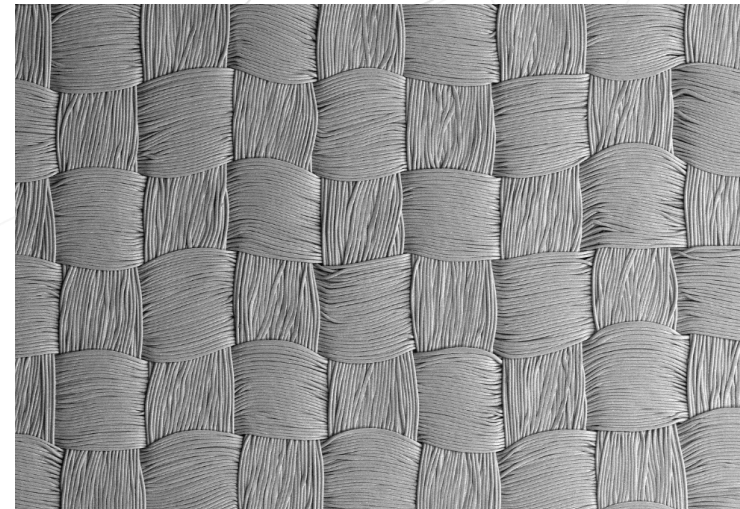
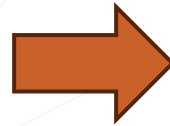
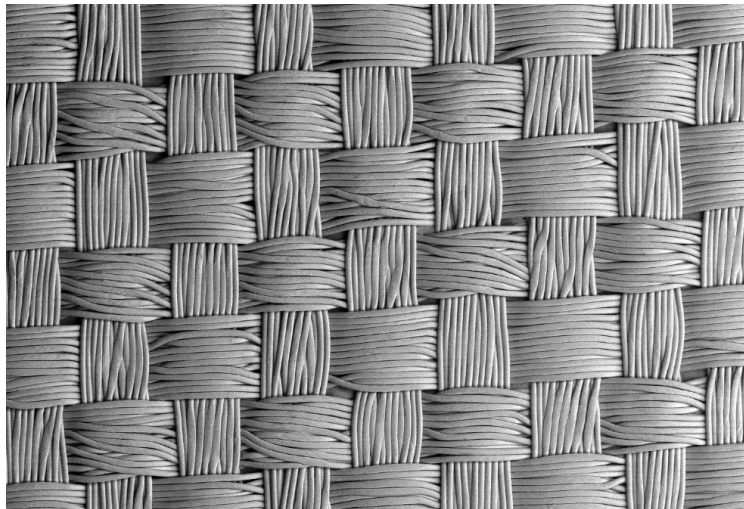
- Traditional low-profile **20/18** PET consists of **18 filaments** with diameters around 10 –12 μm .
- Solesis' low-DPF **20/68** polyester yarn innovation replaces these with **68 filaments**, each measuring roughly **3–5 μm** —*maintaining the same yarn denier but significantly increasing surface area and coverage*



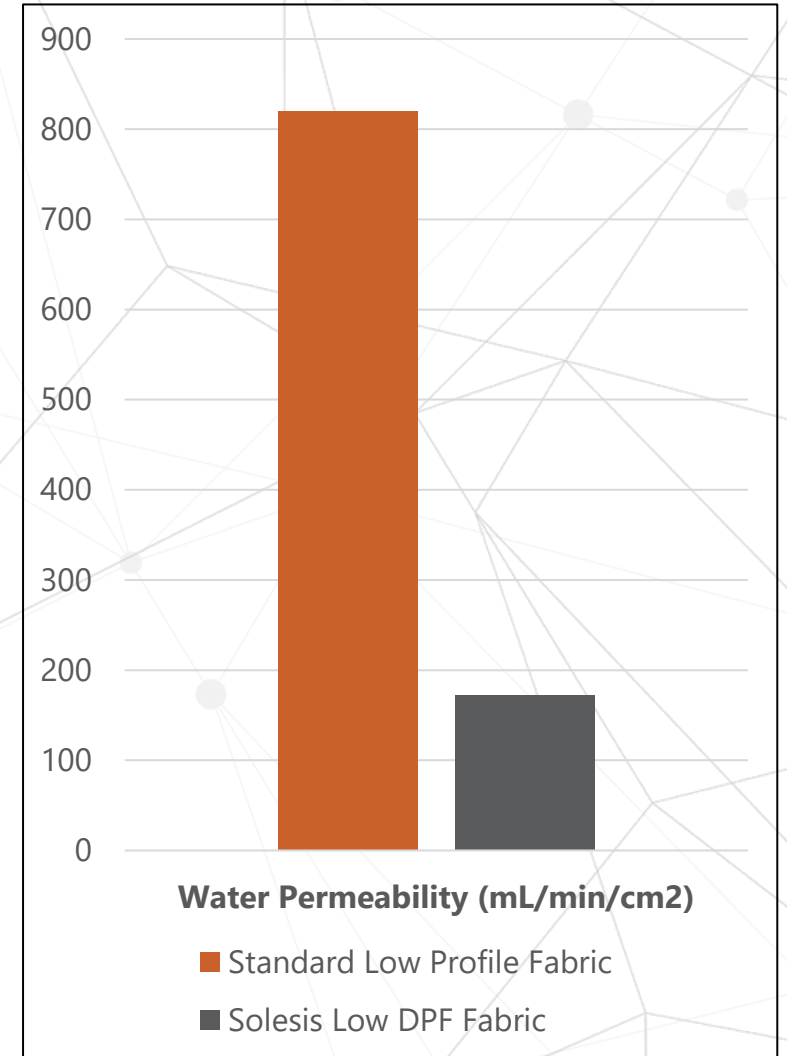
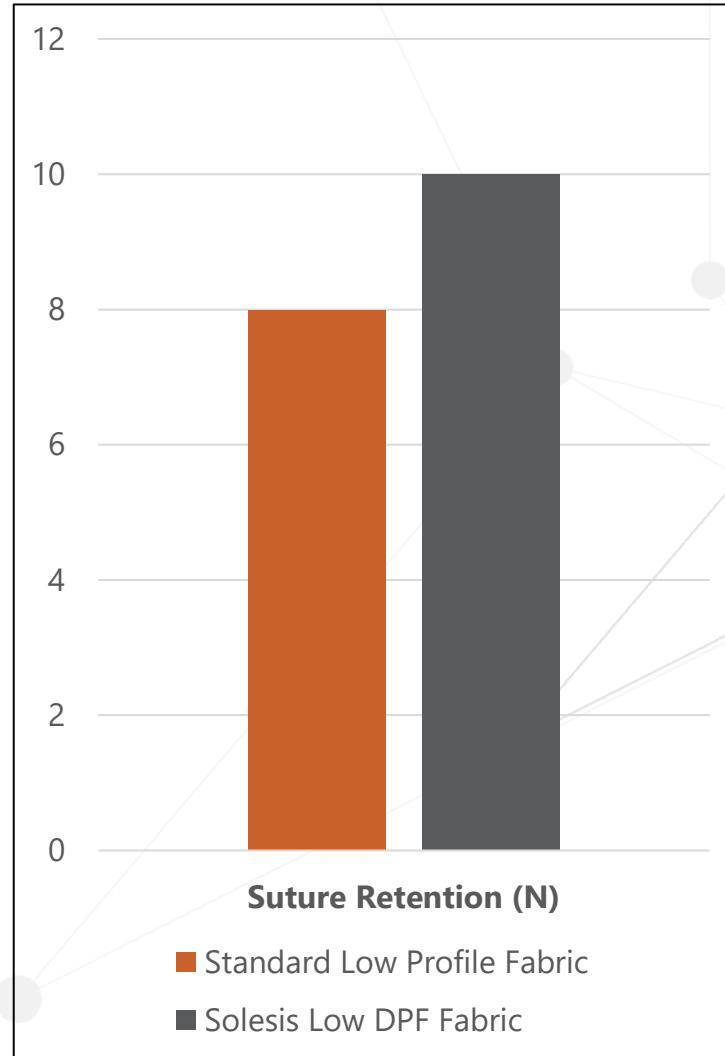
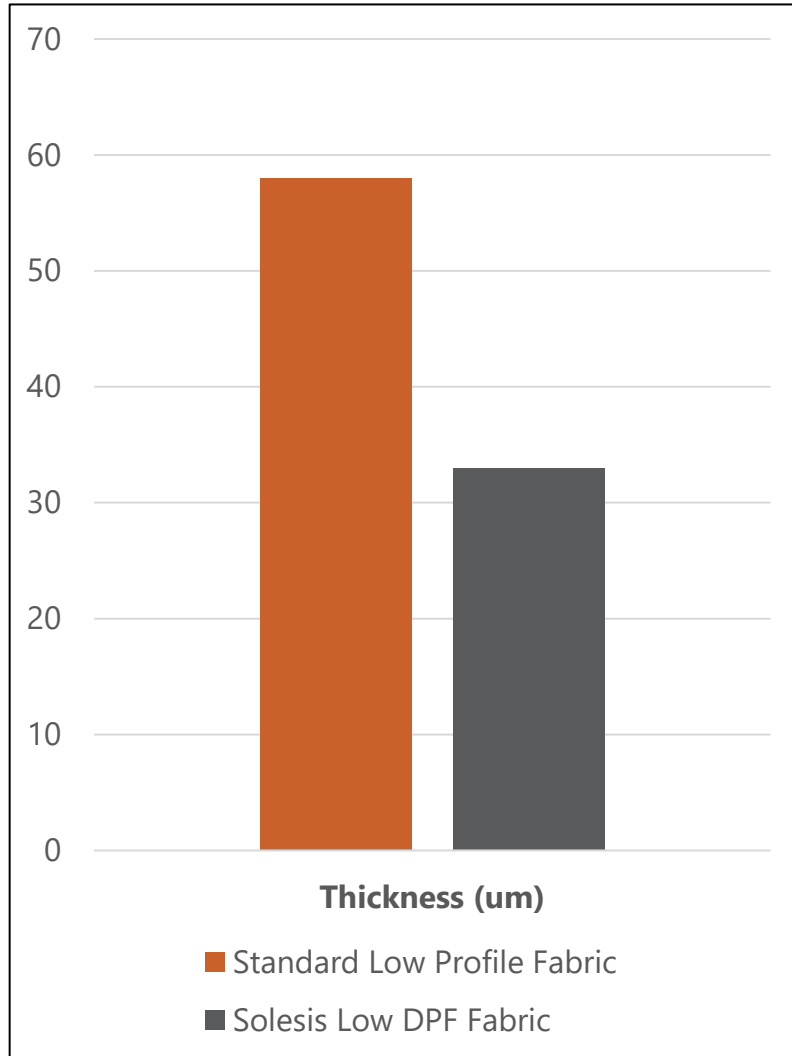
Engineering at the Micron Level

Enabling a New Innovation in Textile Design

- **Higher filament count means:**
 - Smoother, denser coverage
 - Smaller effective pores
 - Reduced pressure-induced pore dilation under permeability test conditions
- **More fiber-to-fiber contacts means:**
 - Increase in-plane filament mobility/packing
 - Enable calendering/compression to lower thickness without sacrificing integrity across a variety of patterns



Optimized for **Thickness, Suture Retention, and Permeability**



Designed for Cardiovascular Applications

Initial Development:

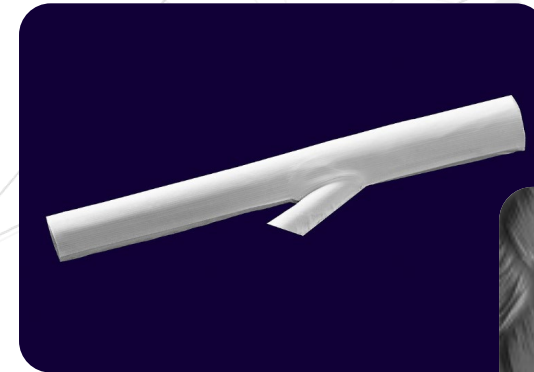
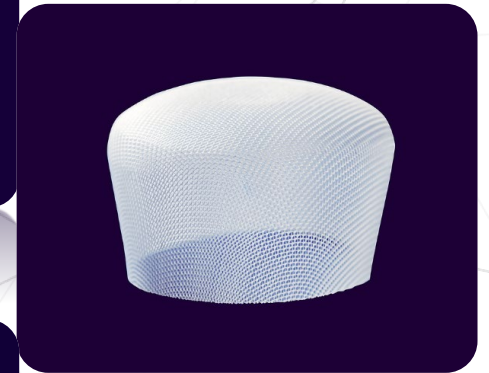
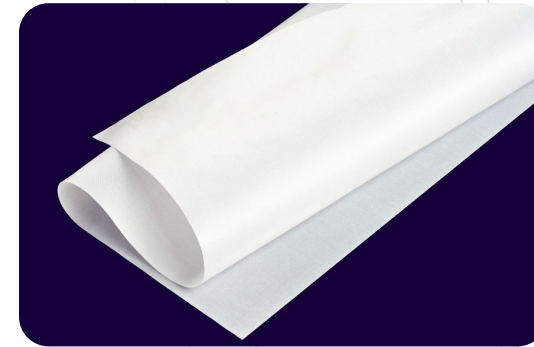
- Focused on creating **next-gen low-profile woven fabrics** for valve skirts and stent-grafts

Benefits:

- High-surface-area, thin, sealing (knits), occlusion, and tissue in-growth

Future opportunities:

- Creating ultra-thin composite materials through the addition of **coatings, laminations, or additive manufacturing techniques** (e.g., electrospinning)
- Enabling the ability to achieve near-zero permeability while maintaining **low profile, flexibility, and strength**



Bringing Ultra-low Profile to the Market

Expanding an Off-the-shelf Platform

Solesis has transitioned this ultra-low-profile technology fiber innovation from concept to product.

- The fabric is now available as part of our quick-ship, off-the-shelf platform of ready-to-use materials.



Low- & Ultra-low-profile Medical Fabric

Secant Group's low-profile medical fabric streamlines the development of next-generation cardiovascular devices to help you meet new and emerging market needs.

The engineered properties of low-profile textiles reduce fabric thickness to enable minimally invasive transcatheter delivery. Low-profile medical fabric can be further customized by Secant Group's design team to meet your device performance requirements.

This off-the-shelf fabric enables medical device engineers to shorten development lead times and optimize speed to market and development costs.

Customization Options Include:


- Density
- Laser-cut shapes
- Permeability
- Polymer coatings
- Pore size
- Stretch properties
- Thickness

Key Product Features:

- Available off the shelf
- Compaction for minimally invasive delivery
- High burst strength
- Low-permeability



 Secant Group is ISO 13485:2016-certified.
551 E. Church Avenue, Telford, PA 18969, USA | 877-774-2835 | www.secant.com



Low- & Ultra-low-profile Medical Fabric

Properties and Characteristics

Part Number	Thickness (μ)	Water Permeability mL/min/cm ²	Probe Burst (kN)	Suture Retention MD (N)	Suture Retention CD (N)
FBMW4941-HS (FBMW0351-HS)	63.5 - 101.6	< 900	≥ 0.165	≥ 4.5	≥ 4.0
FBMW4941-C (FBMW0351-C)	381 - 76.2	< 300	≥ 0.160	≥ 4.0	≥ 4.0
FBMW3976-HS (FBMW0352-HS)	83.4 - 106.7	< 900	≥ 0.285	≥ 7.0	≥ 7.0
FBMW3976-C (FBMW0352-C)	55.9 - 76.2	< 500	≥ 0.235	≥ 7.0	≥ 7.0
FBMW3928-HS (FBMW0353-HS)	111.8 - 142.2	< 400	≥ 0.250	≥ 4.0	≥ 7.5
FBMW3928-C (FBMW0353-C)	76.2 - 101.6	< 100	≥ 0.250	≥ 4.0	≥ 5.0
FBMW4999-C (FBMW0354-C)	50.8 - 76.2	< 300	≥ 0.075	≥ 3.5	≥ 4.0

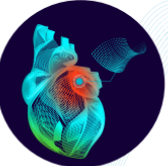
Preliminary Results of Next-generation Ultra-low-profile Fabric

Part Number	Thickness (μ)	Water Permeability mL/min/cm ²	Probe Burst (kN)	Suture Retention MD (N)	Suture Retention CD (N)
FSMW7374	52	< 800	≥ 0.160	≥ 4.5	≥ 4.5
FSMW5471	45	< 350	Contact Us	Contact Us	Contact Us
FSMW5397	52	< 400	Contact Us	Contact Us	Contact Us
FSMW5444 (FSMW2915)	55	< 1000	≥ 0.100	≥ 4.0	≥ 4.0

Information in parentheses denotes obsolete part number


Potential Applications

- Heart Valves
 - Repair
 - Replacement
- Vascular Grafts
 - Bypass
 - EVAR
- Other Cardiovascular Applications
 - Congestive Heart Failure
 - Filtration
 - LAA Occlusion
 - Membrane
 - PFO



Advance Your Project from Sketch to Scale

For more information about our innovative medical textiles capabilities and services, visit www.secant.com or contact us at secant.marketing@secant.com.

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Thank you for your time.

Questions?



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MedTech Product Development

Email: swati.patel@solesis.com

