



# S3D Polymer Materials Science

---

# Syvek® S3D Polymer Manufacturing Process

The patented Syvek® bio-engineering process optimizes the isolation, growth, purification and harvest of highly concentrated strands of the poly-N-acetylglucosamine (p-GlcNAc) polymer-containing fiber we call Syvek® S3D. The unique three-dimensional structure of S3D fibers presents a vast array of densely packed bonding sites, each of which activate the natural clotting agents in blood, accelerating hemostasis. These complex strands can be formulated into a wide range of product configurations – membranes, sponges, films, filaments, and gels – for a variety of hemostatic applications.



**Syvek®**  
Hemostasis Innovation™

Syvek® S3D is bio-engineered and manufactured in a highly controlled environment to exacting standards for unparalleled product uniformity.

STAGE  
**01**

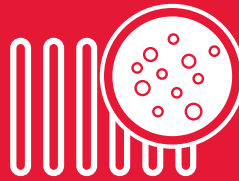
**Cultivate  
Microalgal  
Cell Cultures**



Bio-engineered growth of cells rich in S3D microfibers.

STAGE  
**02**

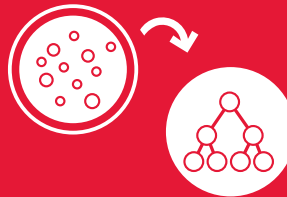
**Isolate the  
S3D  
Polymeric  
Fiber**



Separation of the S3D fibers from the microalgal cells.

STAGE  
**03**

**Engineer  
Application-  
Specific  
Products**



Configure the S3D fibers for distinct clinical roles.

STAGE  
**04**

**Final Product  
Formulation**



Use state of the art technologies to optimize product performance.

STAGE  
**05**

**Packaging and  
Sterilization Prior  
to Shipment**



Easily managed single unit packages improve end-user inventory control and shelf-life.

Syvek® S3D development process is protected by over a dozen patents.

US Patents include: 6,864,245; 6,743,783; 6,686,342; 6,630,459; 6,610,668; 6,599,720; 6,063,911; 5,858,350; 5,846,952; 5,686,115; 5,635,493; 5,624,679; 5,623,064; 5,622,834

**Syvek®**



Marine Polymer Technologies, Inc.  
107 Water Street  
Danvers, MA 01923  
1-888-666-2560  
fax: 877-270-8500