

- ▶ Large filtration area offers economical tangential flow filtration (TFF)
- ▶ Two membrane types provide a choice of either low protein binding or a broad range of chemical compatibility
- ▶ Built to withstand process pressure upsets

# Helicon<sup>®</sup> SS50 Ultrafiltration Cartridges and Systems

## **For large volume concentration and desalting applications**

Helicon SS50 cartridges are spiral-wound ultrafiltration membrane devices designed for the concentration and desalting of solutions of macromolecules. Helicon SS50 cartridges combine the advantages of efficient tangential flow filtration with Millipore ultrafiltration (UF) membrane technology to cost-effectively process large volumes of pharmaceutical products.

All process feed streams possess unique filtration requirements. To meet your process requirements Helicon SS50 cartridges are offered in two ultrafiltration membrane types and a variety of size exclusion cut-offs. Ultra-low protein binding Ultracel<sup>®</sup> PL membranes, made of regenerated cellulose, optimize recovery of valuable proteins. High flux PT series membranes, made of polyethersulfone, filter quickly and perform well across a wide pH range.

### **Robust Cartridges Withstand Large-scale Process Conditions**

A reinforced cartridge structure helps the filter tolerate reverse pressure pulses, making it more resistant to certain process upset conditions. Helicon SS50 cartridges provide reliable filtration and stable hydraulic performance when used in a variety of applications, including: concentrating and desalting

peptides, proteins, such as albumin and IgG, hormones, bacterial toxins, viruses; removing pyrogens from solutions of small molecules; and crude fractionation of dilute protein mixtures.

Helicon SS50 cartridges are designed to process particle-free solutions. Prefiltration is necessary for feed solutions containing suspended particles.



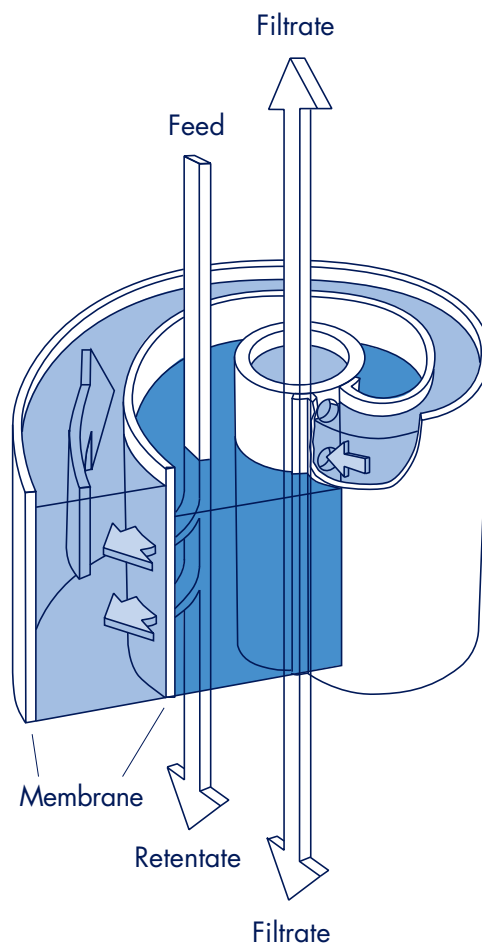
## Economical Design

Helicon SS50 cartridges have an efficient spiral structure that minimizes housing size and maximizes available filtration area.

Comprised of alternating layers of Millipore UF membranes and polymeric separator screens wrapped concentrically around a hollow core, Helicon SS50 cartridges offer your process an efficient tangential flow filter in a small footprint.

Product to be processed enters one end of the cartridge under pressure and flows tangentially down the cartridge. Permeate (salts, water, species not retained by the membrane) passes through the membrane into permeate channels and then spirals to the central core for removal. Retentate flows out the opposite end of the module.

## Fluid Flow Paths in Helicon SS50 Modules



## Choose from Two UF Membrane Types for Your Application

Millipore ultrafiltration membranes are constructed of robust materials that minimize extractables and assure the highest purity and cleanliness.

*Ultracel PL membranes* – regenerated cellulose membranes that are ideal for applications where initially dilute streams are present, or where very high protein recovery is required. The ultra-low protein binding membranes are resistant to fouling and are easy to clean.

*PT Series membranes* – polyethersulfone membranes that are ideal for applications where high flux is necessary, or where compatibility with a wide pH range and harsh cleaning procedures is desired.

## Regulatory Compliance

Helicon SS50 cartridges are designed, developed, and manufactured in accordance with a Quality Management System approved by an accredited registering body to an ISO® 9000 Quality Systems Standard. They are shipped with a Certificate of Analysis. Each cartridge is supported by a Validation Guide for compliance with regulatory requirements. For traceability and easy identification, each cartridge is labeled with the product name and identifying characteristics.

## Specifications

### Nominal Dimensions

<i>Filtration Area:</i>	3.7 m <sup>2</sup> (40 ft <sup>2</sup> )
<i>Length:</i>	635 mm (25 in.)
<i>Diameter:</i>	99 mm (3.9 in.)

### Operating Temperature

<i>Minimum:</i>	4 °C (39 °F)
<i>Maximum:</i>	55 °C (131 °F)

### Pressure

<i>Maximum Inlet Pressure:</i>	6.9 bar (100 psi); if housing permits
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### Recommended Retentate Crossflow

40 – 57 L/min per housing

### pH Range

<i>Regenerated Cellulose:</i>	Continuous: 2 – 12
	Intermittent: (up to 250 hours) 2 – 13
<i>Polyethersulfone:</i>	Continuous: 2 – 14
	Intermittent: (up to 250 hours) 1 – 14

### Materials of Construction

<i>Membrane:</i>	Ultracel PL: Regenerated Cellulose PT Series: Polyethersulfone
<i>Feed/Retentate Screen:</i>	Polyethylene
<i>Permeate Screen:</i>	Polypropylene
<i>Center Tube, Shell and Chevron Support Disk:</i>	Polysulfone
<i>Fold Reinforcement:</i>	Polyethylene
<i>Adhesive:</i>	Epoxy
<i>Preservative:</i>	2 – 3% formaldehyde in glycerin and water
<i>Chevron Brine Seal and O-rings:</i>	EPDM

## Ordering Information



**Helicon SS50 Cartridge**

### Ultrafiltration Membrane Type Regenerated Cellulose

LA = 1000 NMWL  
LC = 5000 NMWL  
LG = 10,000 NMWL  
LT = 30,000 NMWL

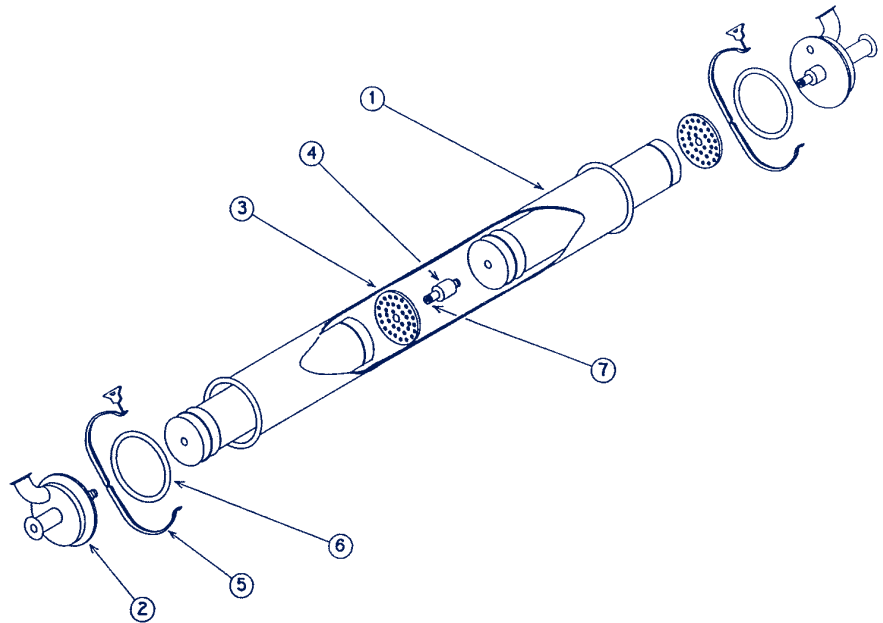
### Polyethersulfone

G1 = 10,000 NMWL  
T1 = 30,000 NMWL  
H1 = 100,000 NMWL

## Helicon SS50 Cartridges Meet Your Production Scale System Needs

Millipore offers standard and custom-engineered tangential flow filtration systems that incorporate Helicon SS50 cartridges. Helicon SS50 cartridges designed for these scalable systems feature membrane filtration areas ranging in size from a nominal 3.7 square meters (40 ft<sup>2</sup>) to several hundred square meters. Systems can also be supplied with integrated process vessels in manual or fully automatic versions.

## Helicon SS50 Housing and Components



- |                            |                                  |
|----------------------------|----------------------------------|
| 1. Housing                 | 5. Triclover clamp               |
| 2. Dual manifold           | 6. TC silicone gasket            |
| 3. Anti-telescoping device | 7. Interconnector O-ring (Viton) |
| 4. Interconnector          |                                  |

### Ordering Information

Description	Catalogue No.
Helicon SS50 Housings	
Helicon SS504-1 for one Helicon-UF50 cartridge	MSD1 301 W8
Helicon SS504-1 for two Helicon-UF50 cartridges	MSD1 302 W8

### To Place an Order or Receive Technical Assistance

For additional information call your nearest Millipore office:

In the U.S. and Canada, call toll-free 1-800-MILLIPORE (1-800-645-5476)

In the U.S., Canada and Puerto Rico, fax orders to

1-800-MILLIFX (1-800-645-5439)

Internet: [www.millipore.com](http://www.millipore.com)

Technical Service: [www.millipore.com/techservice](http://www.millipore.com/techservice)

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