STERLITECH

Corporation

INSIDE CERAMIC DISC HOLDERS AND DISCS

TECHNICAL DIRECTIONS

22027 70th Ave. S.
Kent, WA 98032-1911
Tel: 253-437-0844 / 877-544-4420 Fax: 253-437-0845
info@sterlitech.com * www.sterlitech.com

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1. INTRODUCTION

To meet your filtration application needs, Sterlitech offers a ceramic membrane for Microfiltration, Ultrafiltration, and Nanofiltration. These ceramic disc membranes are 2.5mm thick and available in two diameters, 47mm and 90mm. The active layer for the MF membranes is Titania and for the UF/NF membranes it is Zirconia. All the ceramic membranes use an ATZ (alumina, titania, zirconia) support layer.

ADVANTAGES:

- Absolutely inert.
- Autoclaveable.
- Easily cleaned.
- Resistant to high temps (350°C).
- Resistant to acids & bases.
- Solvent resistant.
- Can withstand high pressures.
- Re-usable, long working life.

APPLICATIONS:

- Sterile concentrations or purifications of cells, yeasts, proteins, bacteria, serums, broth and enzymes.
- Separations of micro-organisms from culture medium or active products.

We offer two disc-holders for operating the ceramic membranes:

- **Standard disc-holder (47mm or 90mm)**:

With standard disc-holders, filtration is achieved in a dead-end frontal mode. The permeate (or filtrate) is recovered or eliminated directly on top of the disc.

- **Tangential disc-holder (90mm)**:

Filtration is performed in a tangential mode. A spiral shaped piece is placed inside the holder and forces the substance to circulate tangentially.

The disc-holders are made of sanitary stainless steel and have standard connectors. An O-ring gasket ensures a tight fit between the disc and disc-holder. The disc-holder is supported by three legs, which provide excellent stability on all working surfaces.

Connections:
Male serrated connectors of external diameter 6mm (0.25inch).

2. DISCS AND DISC HOLDERS CHARACTERISTICS

Ceramic discs of 47 and 90mm diameter:

Maximum Filtration Area	
Diameter 47mm:	13.1 cm^2
Diameter 90mm:	56.3 cm^2
Material:	Alumina/Titania/Zirconia
Membrane:	$ZrO_2 – TiO_2$
Thickness:	2.5mm (0.0411)
Bursting Pressure:	90 bars/1300 psi
Average Pore Diameter:	3.5 um
Cut off:	1-3-5-8-15-50-150-300 KD and 0.14-0.2-0.45-0.8-1.4um
Running Pressure:	4 bar/58 psi maixmum
pH Range:	0.14
Autoclave Sterilization:	Yes
Oxidant Sterilization	Yes
Solvents:	Resistant
Operating Temperatures:	<350°C(662°F)
Regeneration	
Cleaning	
Alkaline (NaOH):	15 g/l – 85°C
Acid (HNO3):	5 ml/l - 50°C
Steam sterilization:	121°C – 30min
Strong Cleaning	
Alkaline (NaOH)	pH = 14-85°C
Acid (HNO3)	pH = 0-50°C
Oxidants	
H202 in solution at ph<3:	2.10-3 V/V
NaOCI:	300 ppm CI

Ceramic Membrane Flow Rates (water) *

Cut-Off	Min	Max
1.4 um	1500	1600
0.8 um	1300	1450
0.45 um	1150	1250
0.2 um	1000	1150
0.14 um	800	1100
300 KD	450	600
150 KD	250	350
50 KD	200	240
15 KD	70	100
8 KD	55	65
5 KD	40	50
3 KD	25	25
1 KD	15	20

*Values in L/h/m^2

Note: The above is the water flux at 1 bar of TMP (Transmembrane Pressure), at 25 degrees Celsius for 1 m^2 of membrane surface.

Procedure is based on French standard AFNOR NFX45-101.

Ceramic Disc Holders

Disc Holders in 47mm or 90mm Diameter

Material:	Stainless Steel 316L
Surface Quality:	Glacial Polish
Operating pH Range:	0-14
Operating Temperature:	<130°C (266°F)

Disc Holders SPIRLAB in 90mm Diameter

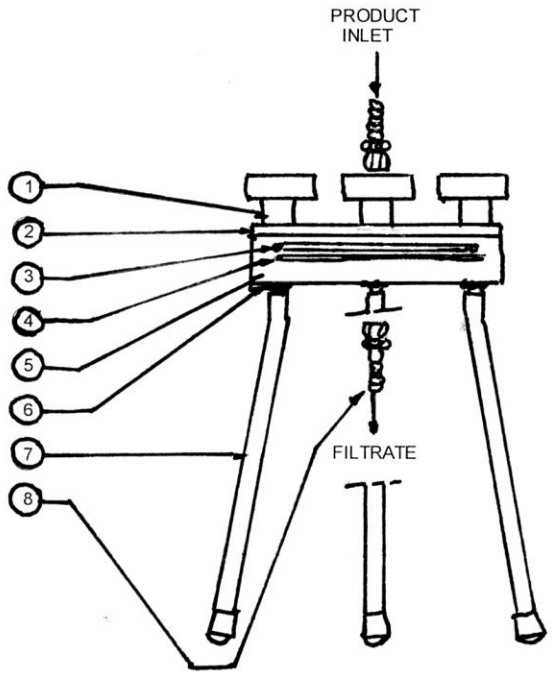
Material:	Teflon & Stainless Steel 316L
Surface Quality:	Glacial Polish
Operating pH Range:	0-14
Operating Temperature:	<130°C (266°F)

Connections

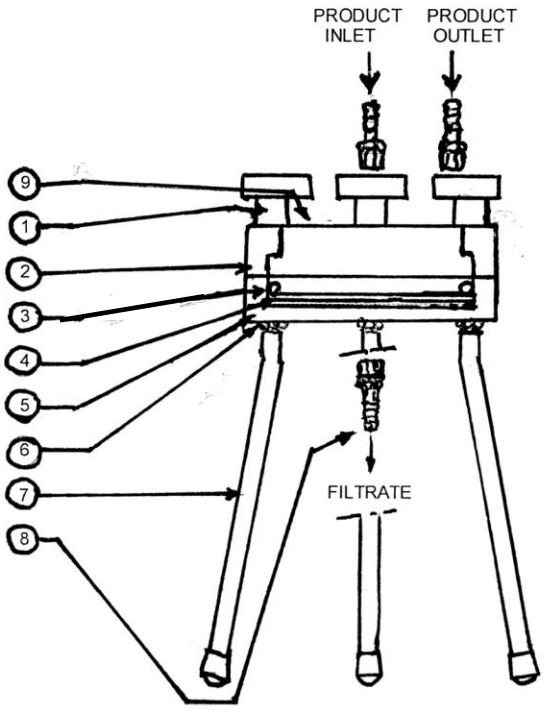
Male serrated connectors of 6mm diameter.

Diameter	Area
47mm	13.1 cm^2
90mm	56.3 cm^2

3. ASSEMBLING



Standard disc holder



Spirlab crossflow disc holder

Mark	Design	Material	Number on standard disc holder	Number on Spirlab disc holder
1	Screw button M6	Stainless steel 304 L+ autoclave plastic	3	3
2	Stainless steel cover or Stainless steel ring	Stainless steel 316 L Stainless steel 316 L	1	1
3	O-ring seal	EPDM/Silicone/FPM	1	1
4	Evacuation spiral	EPDM/Silicone/FPM	1	1
5	Disc holder seat	Stainless steel 316 L	1	1
6	HM M6 nut	Stainless steel 304 L	3	3
7	Leg	Stainless steel 304 L	3	3
8	Fluted outlet	Stainless steel 304 L	2	3
9	Circulation spiral	PTFE	0	1

A) Screw the fluted filtrate outlet (part 8) on the disc holder seat.
B) Install the three legs (part 7) on the disc holder seat. Tighten the nuts (part 6) to tighten the legs.
C) Install the evacuation spiral (part 4) inside the seat.
D) Put a ceramic disc on the spiral (bright/white side up).
E) Install the O-ring seal (part 3) on the disc.
F) For the Standard disc holders:
    - Screw the fluted inlet on the stainless steel cover (part 2).
    - Install the cover on the disc holder seat.
    - Install and tighten the screws

For the **Crossflow** disc holders:
- Screw the fluted inlet and the fluted outlet on the cover (part 9).
- Position the cover.
- Install the stainless steel ring (part 2) on the cover.
- Install and tighten the screws (part 1).

4. MAINTENANCE EQUIPMENT

Recommended spare parts per disc holder:

- 1 O-ring seal (part 3)

- 1 evacuation spiral (part 4)