INSTRUCTION MANUAL

Dialysis Tubing VISKING®, SERVAPOR®, MEMBRA-CEL®

SERVA
serving scientists

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Ordering Information:

VISKING® Dialysis Tubing: regenerated cellulose MWCO 12.000 – 14.000, pore diameter ca. 25 Å					
Cat.-No.	Diameter / Length	Cat.-No.	Diameter / Length	Cat.-No.	Diameter / Length
44104.01	6 mm / 5 m	44104.02	6 mm / 30 m	44104.04	6 mm /152 m
44110.01	16 mm / 5 m	44110.02	16 mm / 30 m	44110.04	16 mm / 152 m
44114.01	21 mm / 5 m	44114.02	21 mm / 30 m	44114.04	21 mm / 152 m
44120.01	27 mm / 5 m	44120.02	27 mm / 30 m	44120.05	27 mm / 152 m
44126.01	49 mm / 5 m	44126.02	49 mm / 30 m	44126.03	49 mm / 152 m
44130.01	75 mm / 5 m	44130.02	75 mm / 30 m	44130.03	75 mm / 152 m

SERVAPOR® Dialysis Tubing: regenerated cellulose MWCO 12.000 – 14.000, pore diameter ca. 25 Å					
Cat.-No.	Diameter / Length	Cat.-No.	Diameter / Length		
44139.01	6 mm / 5 m	44139.02	6 mm / 25 m		
44145.01	16 mm / 5 m	44145.04	16 mm / 25 m		
44144.01	21 mm / 5 m	44144.02	21 mm / 25 m		
44146.01	29 mm / 5 m	44146.04	29 mm / 25 m		
44148.01	50 mm / 5 m	44148.02	50 mm / 25 m		

MEMBRA-CEL® Dialysis Tubing: regenerated cellulose MWCO 3.500					
Cat.-No.	Diameter / Length	Cat.-No.	Diameter / Length	Cat.-No.	Diameter / Length
44310.01	16 mm / 5 m	44310.02	16 mm / 30 m	44310.03	16 mm / 152 m
44311.01	22 mm / 5 m	44311.02	22 mm / 30 m	44311.03	22 mm / 152 m

MEMBRA-CEL® Dialysis Tubing: regenerated cellulose MWCO 7.000					
Cat.-No.	Diameter / Length	Cat.-No.	Diameter / Length	Cat.-No.	Diameter / Length
44313.01	16 mm / 5 m	44313.02	16 mm / 30 m	44313.03	16 mm / 152 m
44314.01	22 mm / 5 m	44314.02	22 mm / 30 m	44314.03	22 mm / 152 m

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Applications

- Desalting of protein solutions, e.g. for further purification by ion exchange chromatography.
- Concentration of protein solutions by embedding the filled tubing in dry PEG 20000 (cat.-# 33138) or SEPHADEX G-25, e.g. before further separation by gel permeation chromatography.
- Separation of high molecular weight proteins from low molecular weight peptides and other substances.
- Buffer exchange with solutions of proteins or other macromolecules.
- Desalting of metallo colloids

Properties

All VISKING, SERVAPOR and MEMBRA-CEL dialysis tubings are made of regenerated cellulose. They show good chemical resistance against numerous solvents, e.g.:

- Alcohols
- Esters
- Ketones
- Hydrocarbons
- Halogenated hydrocarbons
- Formic acid, acetic acid, diluted strong acids (e.g. 5% HCl)
- Dimethylsulfoxide, Pyridine
- 30% hydrogen peroxyde
- Silicon oil

They are **not** ressistant against strong acids and strong alkalis.

The tubings are stable between pH 5 – 9 and can be stored for long term in this range, provided microbial degradation is prevented (see below). Dialysis (1 – 2 days) can even be performed in the pH range of 2 – 12.

The tubings can be sterilized by autoclave. Once moistened, shey should not be allowed to dry out unless reglycerinated. Tubings containing aqueous solutions can be frozen.

All dialysis tubings made on the basis of cellulose are sensitive against Cellulase and Cellulase producing microorganisms, especially when moistened. Therefore they have to be stored refrigerated in aqueous media supplemented with 0.05% Na-azide or other anti-microbial substances.

VISKING and SERVAPOR dialysis tubings have a molecular weight cutt-off (MWCO) of 12000 – 14000, that means: proteins of this size are excluded from the membrane at about 90% and do not penetrate through the pores. Beside the molecular weight, the three-dimensional form, the charge and the state of hydration are important factors which influence the penetration of a protein through the membrane. To be sure that

proteins do not diffuse through the membrane into the outer medium, one should not select a MWCO of the tubing which is closely below the molecular weight of the protein.

MEMBRA-CEL have a MWCO of 3500 and 7000.

Adsorption of protein is below 1 ng/g dry weight of the tubing.

Handling

To avoid contamination (e.g. with nucleases), tubings should only be touched with gloves.
The tubings are delivered dry. They are treated with glycerol as humectant to prevent them from drying out. Due to the manufacturing process, they contain traces of heavy metals (<50 ppm) and sulfur compounds (<0.3%). For most biochemical applications, it is suggested to remove these compounds by boiling and washing. Several methods have been described in the literature, e.g.:

1) Boiling successively (each time 15 minutes) in 5% Na_2CO_3, 50 mM EDTA pH 8, and dist. water; between each step, the tubings have to be rinsed with dist. water (Meth. Enzymol. XX, 1971, p. 72).
2) Boiling 30 minutes in 10 mM EDTA pH 7.5. Storage at 4° C in 1 mM EDTA pH 7.5 (Meth. Enzymol. XXX, 1974, p. 425
3) Heating to 70° - 80° C for 2 hours in heavy metal free water with occasional gentle stirring. The water is decanted and this procedure is repeated 3 more times. The tubings are stored in heavy metal free water or in water with Na-azide (Meth. Enzymol. 158, 1988, p. 13).

It is advisable to prepare a larger stock in one of these ways and to store it in the refrigerator. Before use, tubings have to be thoroughly washed with dist. water.
The samples are filled with a pipette into the tubings – closed at the lower end with a clamp. Closing by knots is not recommended, as it may damage the membrane and result in loss of material during dialysis.
As the volume of the protein solution will increase during the dialysis process due to penetration of water, the tubing should be filled only by 2/3.
For dialysis, the tubing, closed on both ends, is placed into a sufficiently large vessel filled with buffer and stirred on a magnetic stirrer. Depending on the concentration gradient and the requirements of the following procedures, we recommend 1 – 3 buffer exchanges.