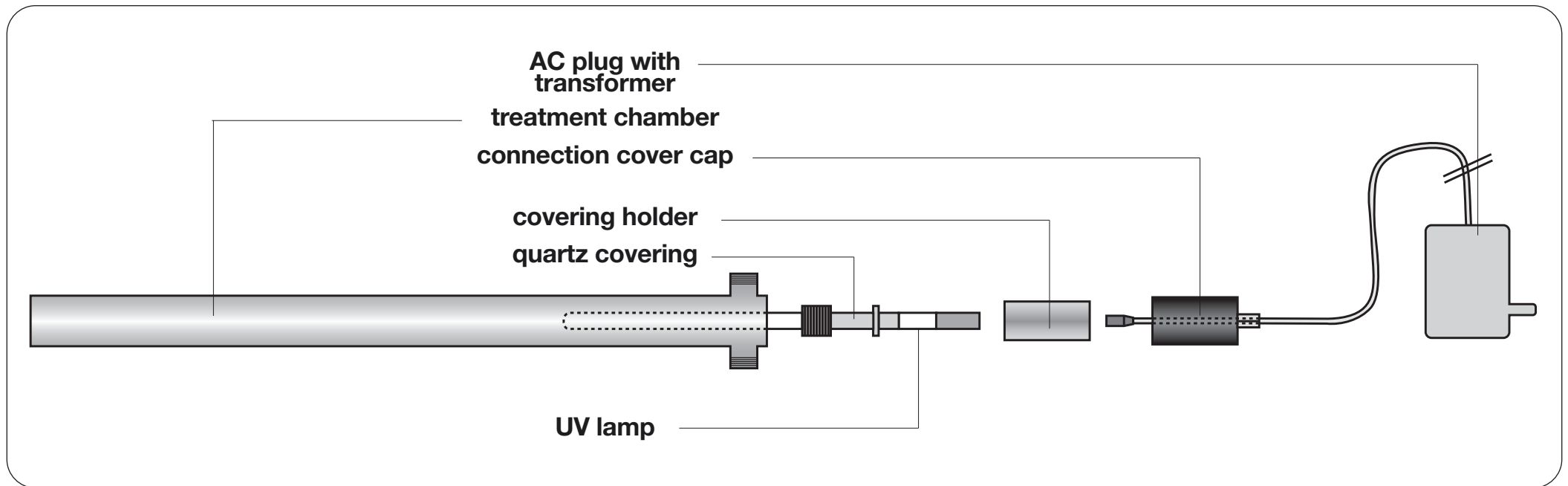


# UV STERILIZATION

CONFIDENTIAL

# UV sterilizers



# removable microorganisms

Some of the microorganisms removable up to 99.99% with radiation energy at 30,000 mWsec/cm<sup>2</sup>

## BACTERIA

*Escherichia coli*  
*Bacterium coli*  
*Salmonella sp*  
*Legionella pneumophila*  
*Mycobacterium tuberculosis*

*Vibrio cholerae*  
*Streptococcus faecalis*  
*Pseudomonas sp*  
*Leptosphaera sp*  
Streptococci  
Staphylococci

## VIRUSES

*Polivirus poliomyelitis*  
Various bacteriophages  
Hepatitis  
Various flu viruses

## YEASTS

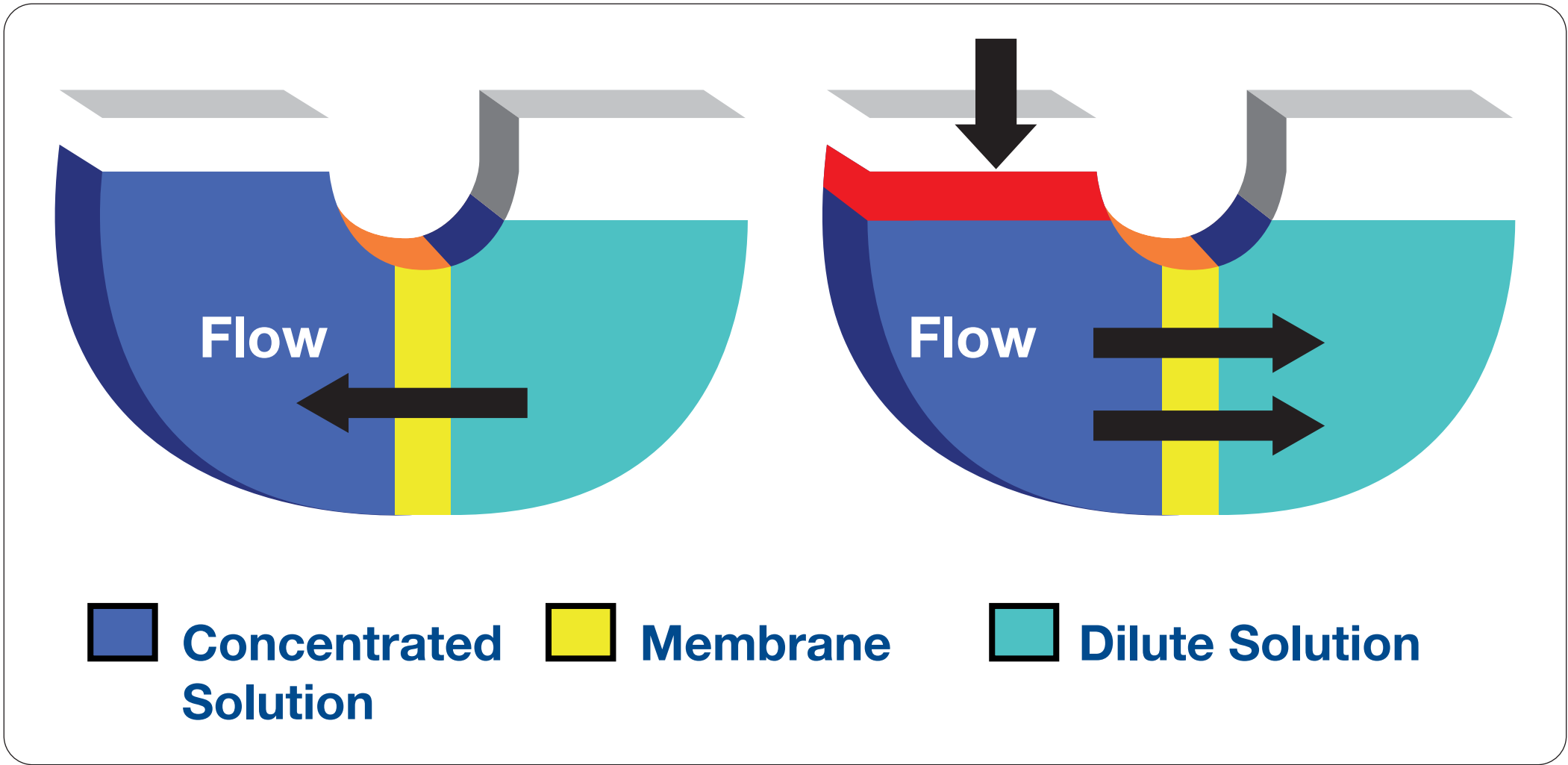
Common cake yeast  
Bread yeast  
Saccharomycetes



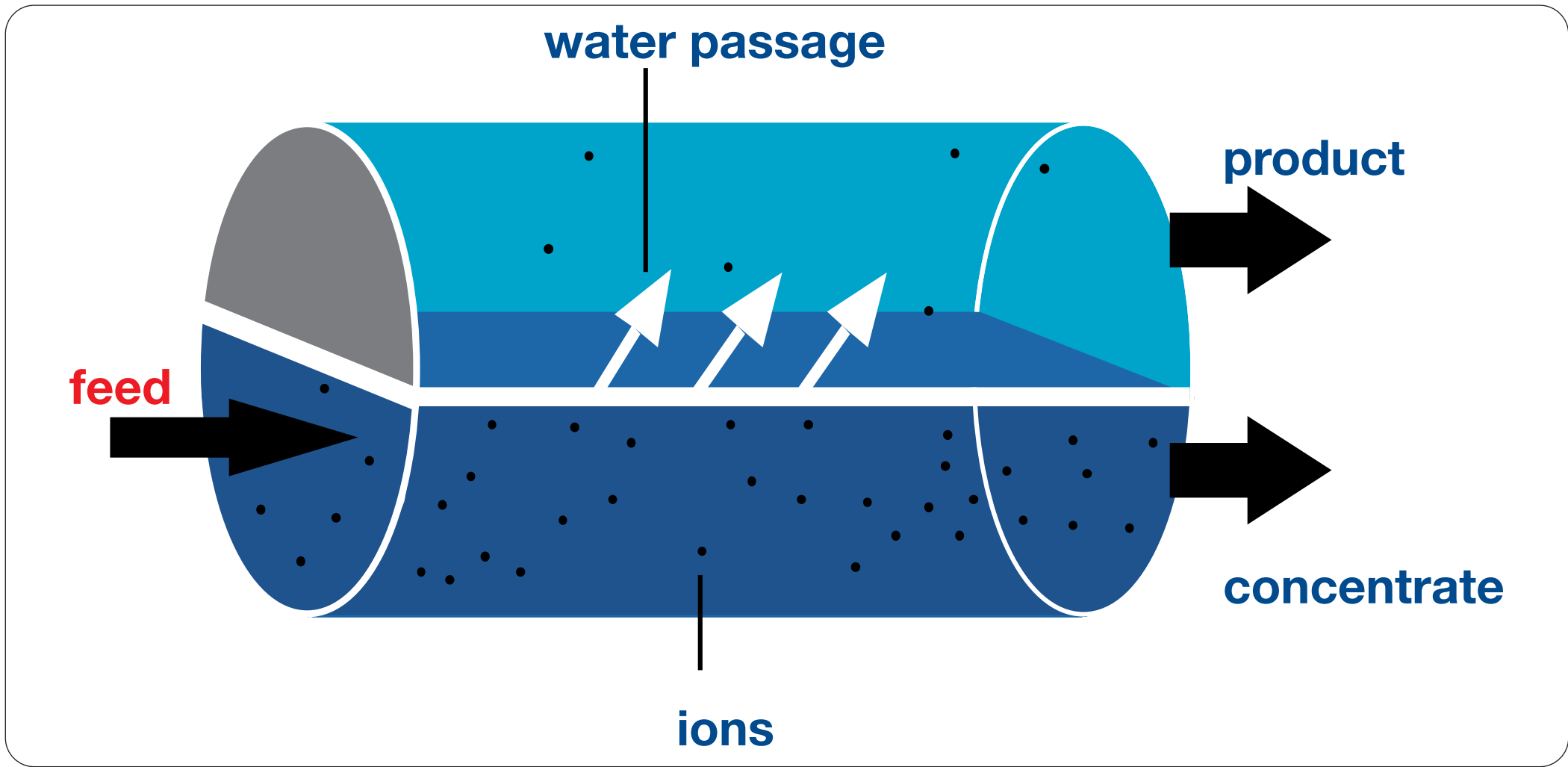
➤ multi-lamp unit

# REVERSE OSMOSIS

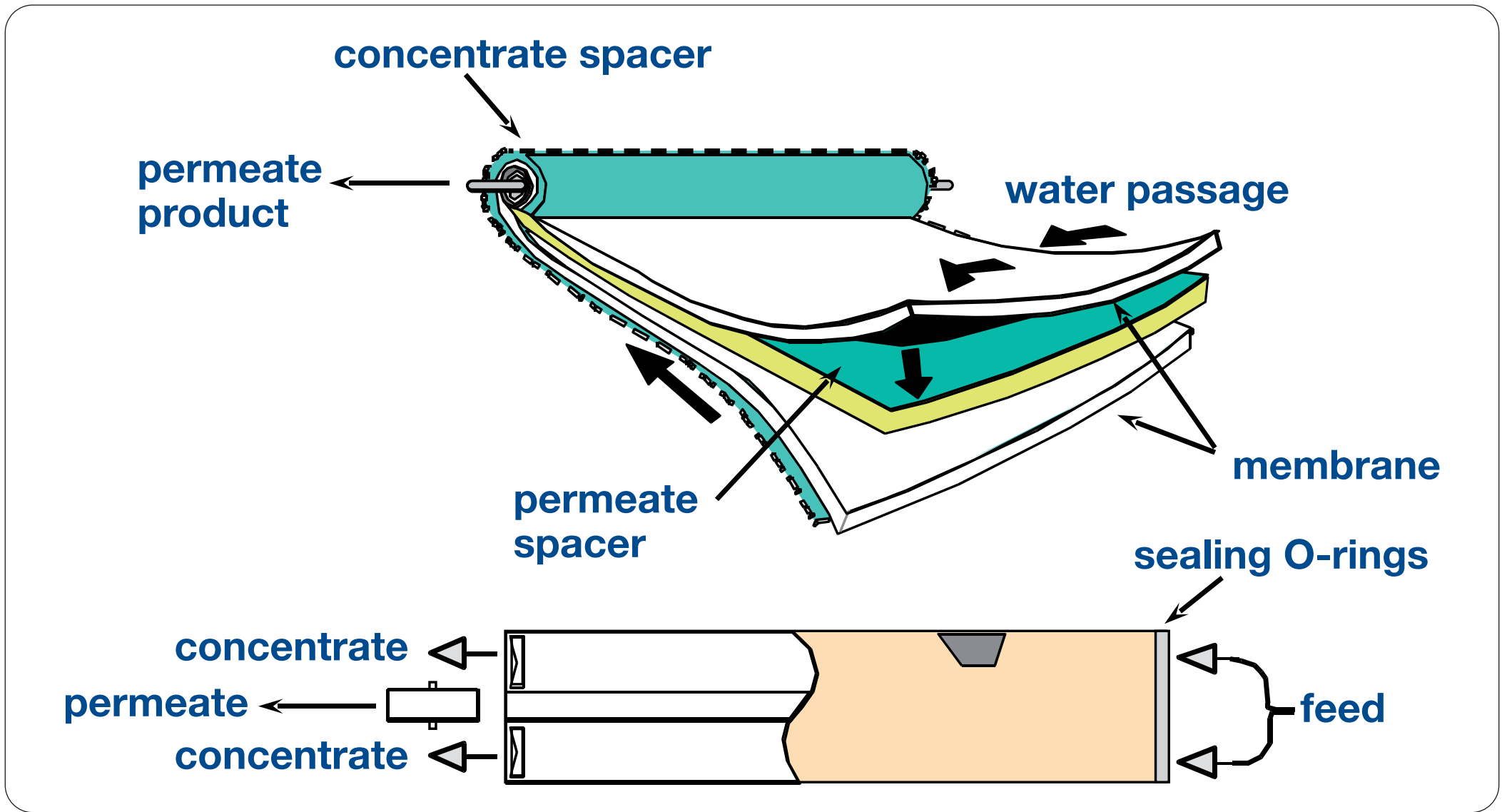
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➤ direct - reverse osmosis



➤ membrane diagram



➤ spiral wound element



# **TW - TABLE (FRESH) WATER**

from 2-3 bar to 18-20 bar

# **BW - BRACKISH WATER**

from 7-8 bar to 35-40 bar

# **SW - SEA WATER**

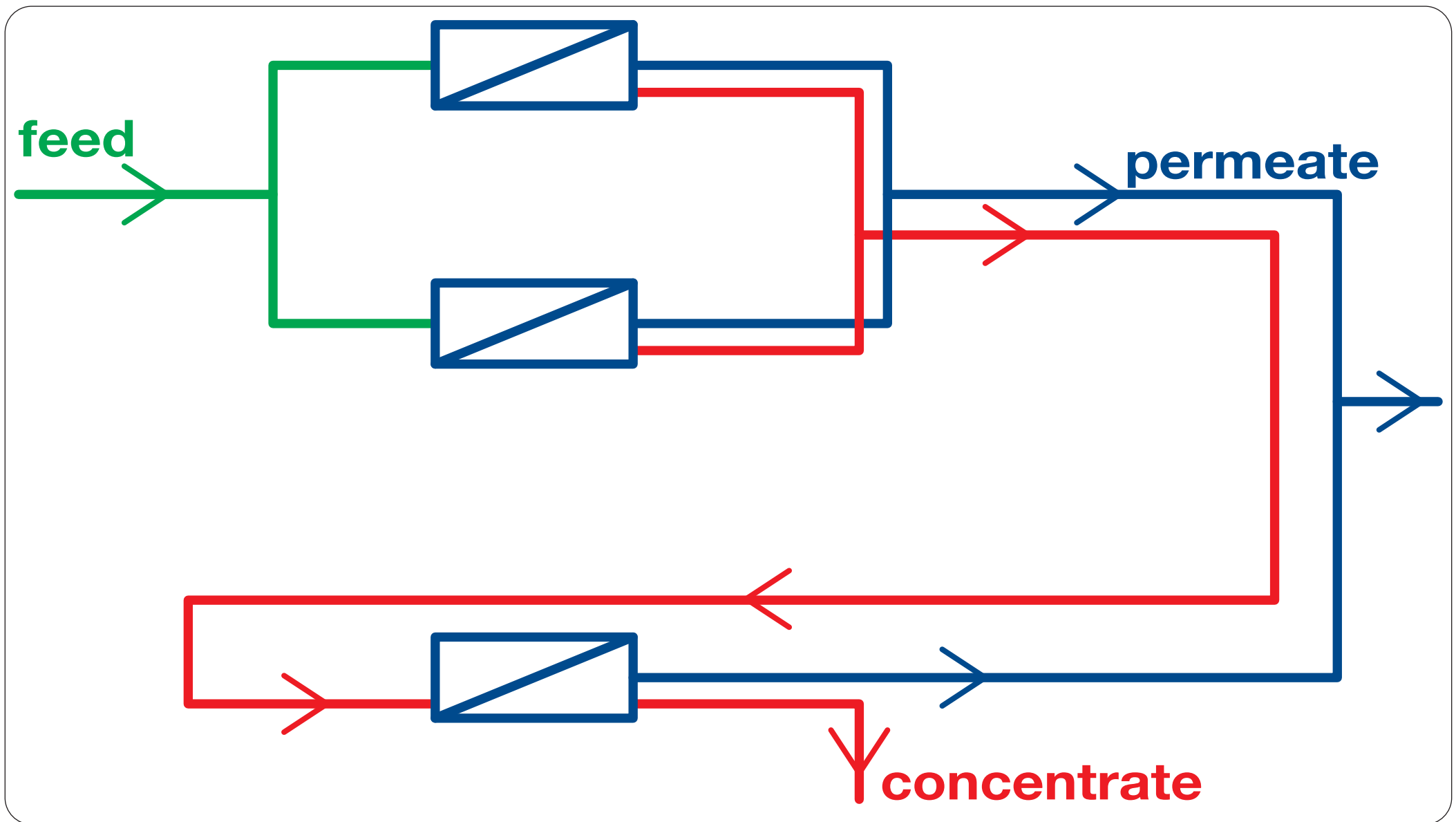
from 50-55 bar to 70-84 bar

› types of membrane

$$\text{Recovery (\%)} = \frac{\text{Flow of permeate}}{\text{Feed flow}} \times 100$$

**Salt rejection (%)**

<b>INCREASING</b>	<b>WATER FLOW PRODUCED</b>	<b>WATER QUALITY</b>
feed pressure	increases	improves
temperature	increases	gets worse
feed salinity	decreases	gets worse



➤ two-stage system

**filtration** → **reduction in turbidity**

**dechlorination** → **protection  
of the membrane**

**pH correction** → **protection  
of the membrane**

**sodium  
metabisulphite** → **protection  
of the membrane**

**antiscalant** → **anti-incrustation**

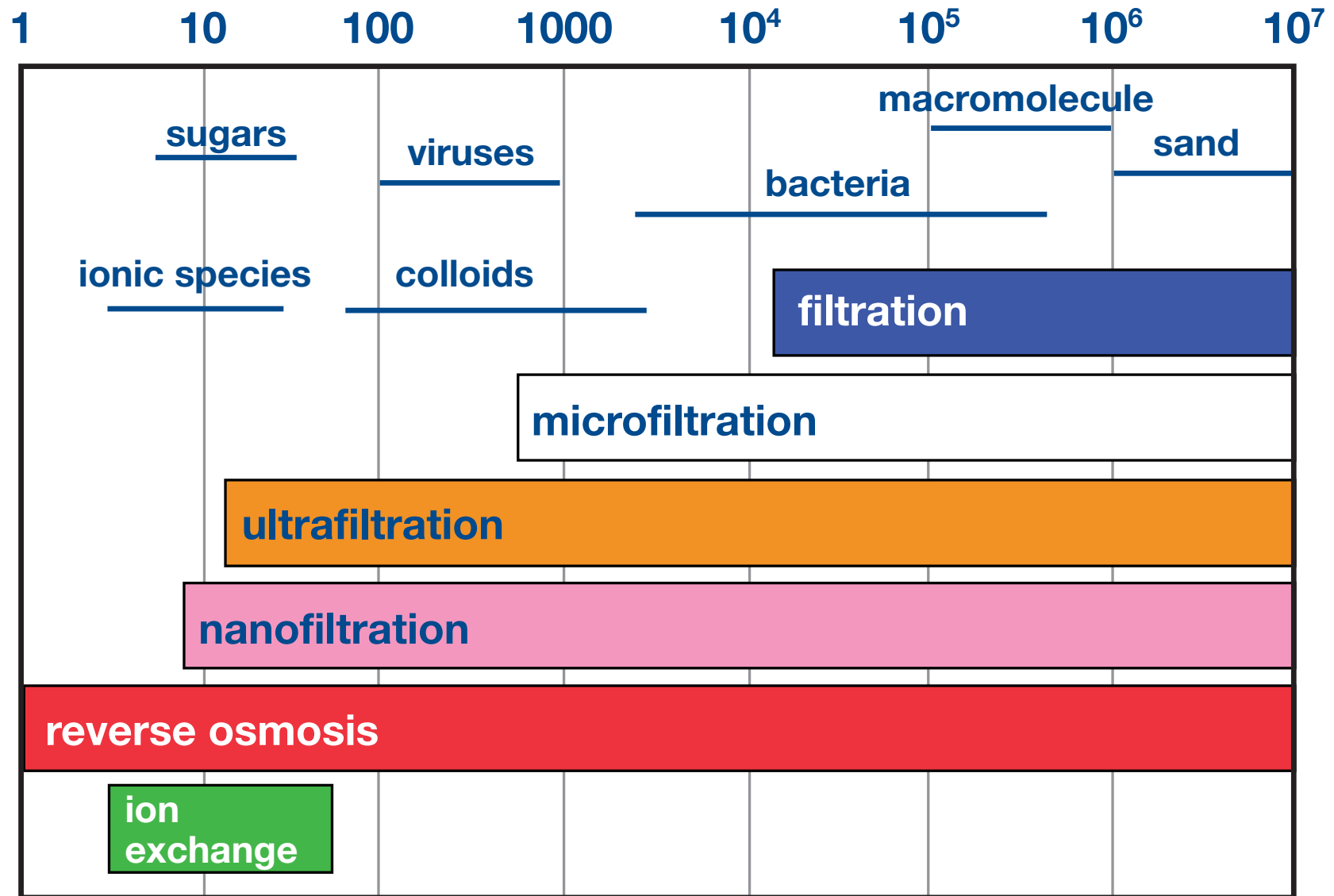
› reverse osmosis pre-treatments

# **maintenance of reverse osmosis plants**

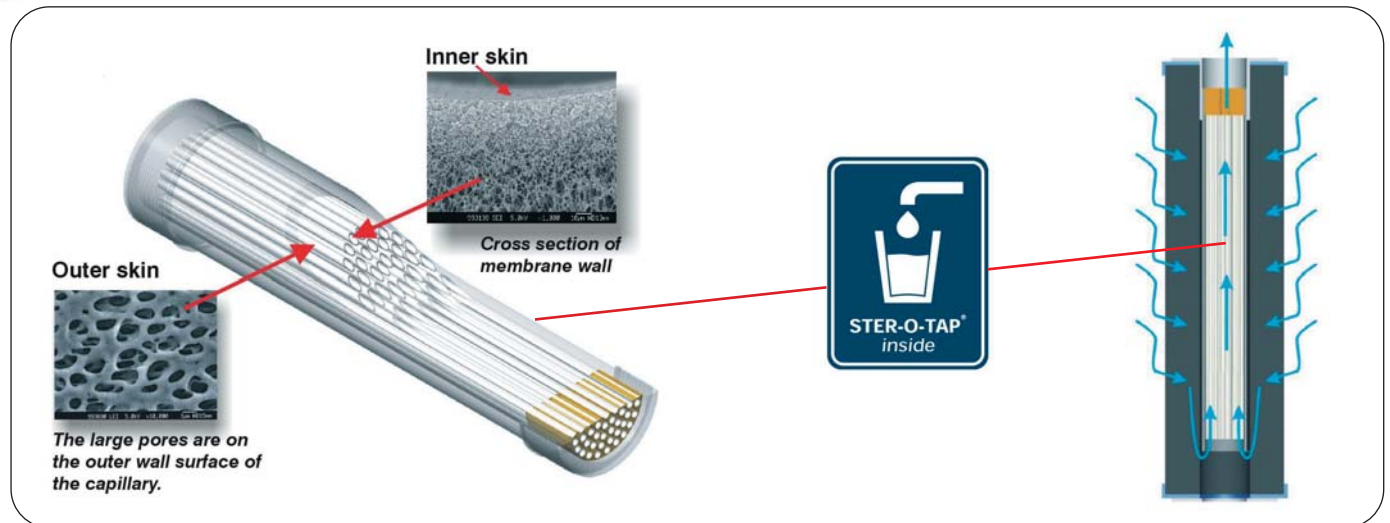
**flushing  
preservation**

➤ **maintenance**

# Angstroms



## > filtration spectrum



## ➤ ultrafiltration