



Reducing Chemicals and Waste with Advanced Water Purification Technology



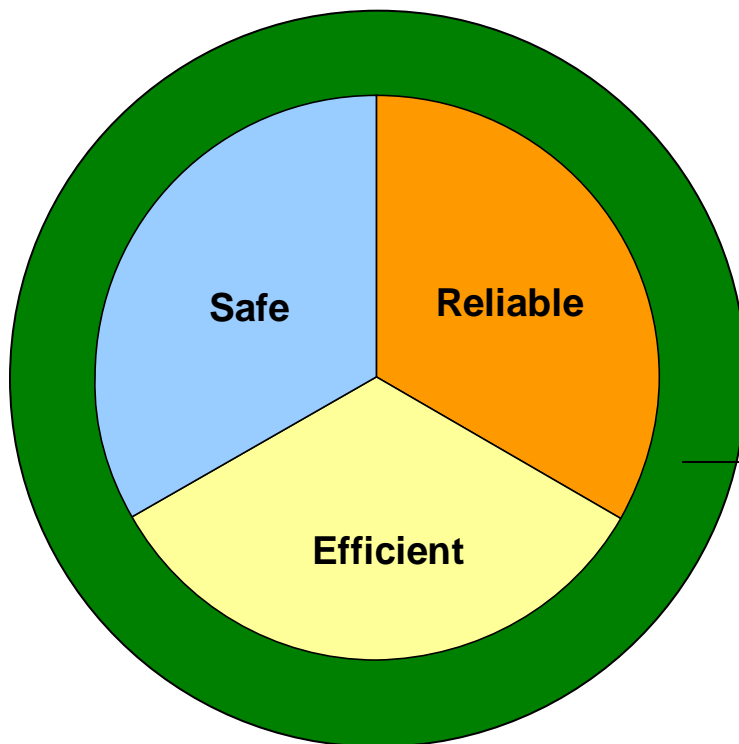
Gregg Poppe

Dow Water & Process Solutions





Going “Green”



- Less chemicals
- Less waste

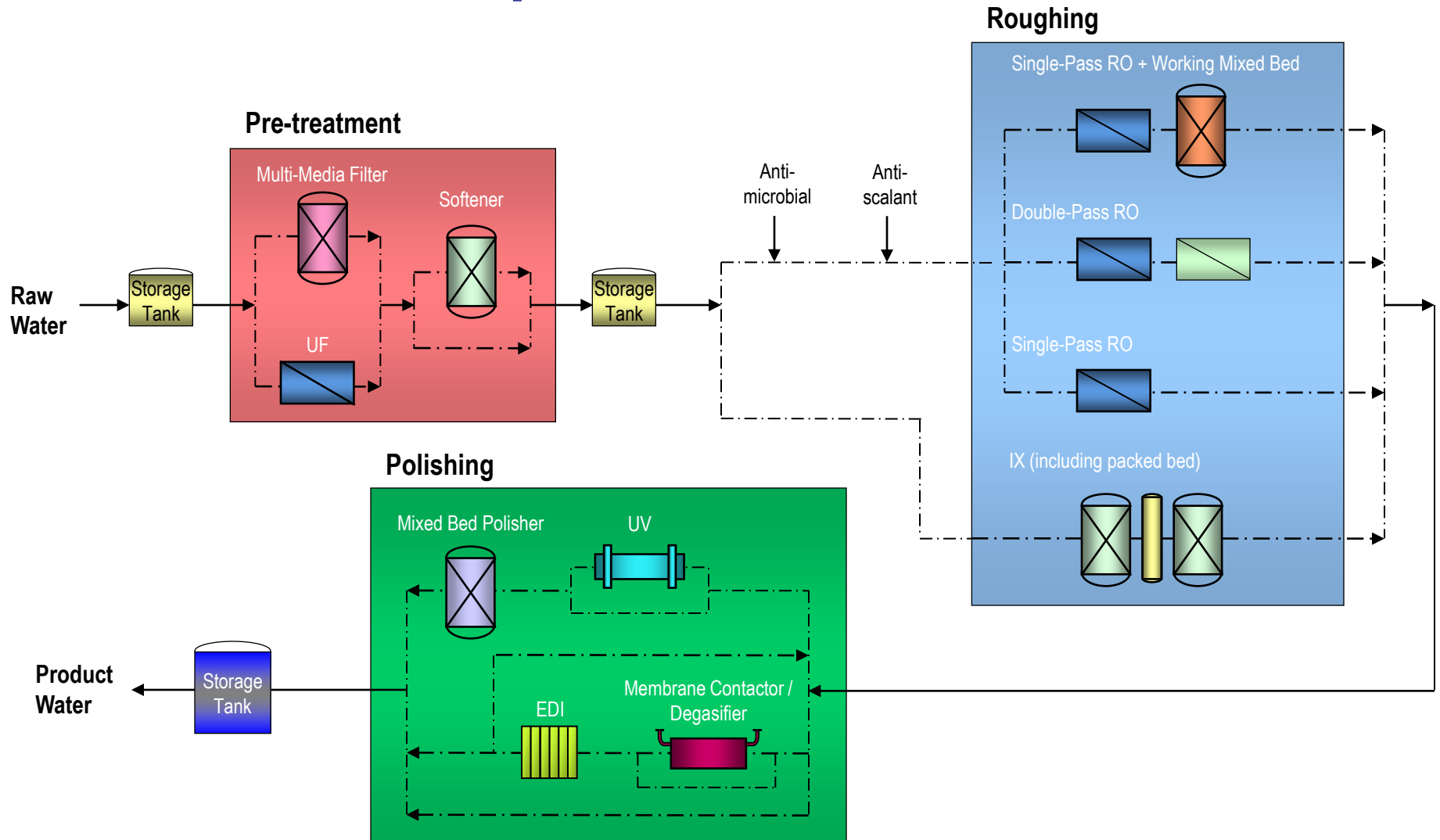


- UF
- EDI





Make-up Demin Overview





Ultrafiltration (UF) for Pre-treatment





Purpose of Pre-treatment

- Provide treated feed water to the RO System that allows for successful and cost-effective long-term operation
- Dampens variations in raw water quality (e.g., Turbidity)
- Minimize Scaling (chemical) and Fouling (biological) of the RO
- Extend RO membrane life





Comparison: Dual Media Filter vs. UF

DMF

- Widely used
- OK for RO feed
- Prefer 2-pass DMF
- **Floc/Coag/pH Chem**
- **Discharge sludge**

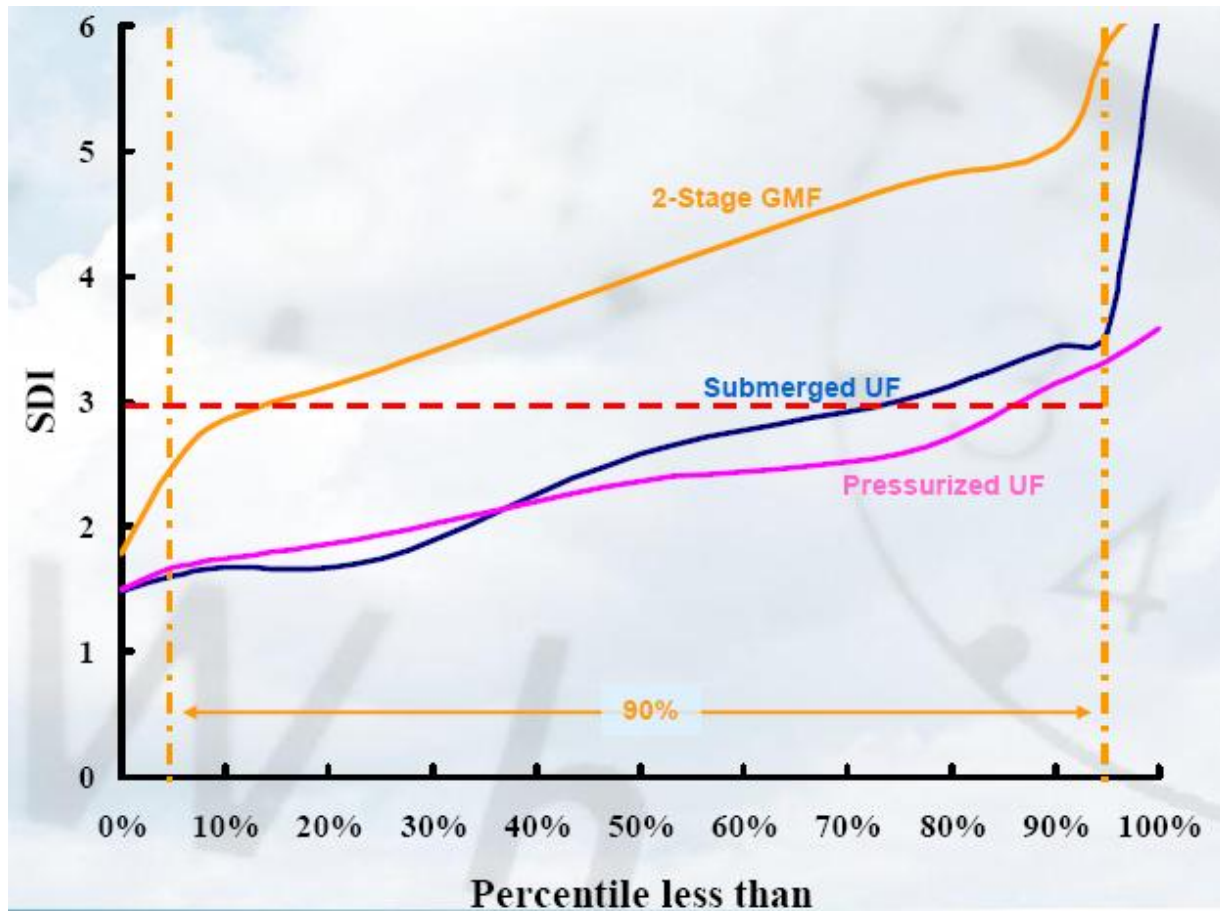
UF

- Gaining acceptance
- Very good for RO feed
- Footprint low
- **Low chemical dosage**
- **Little sludge disposal**





Better Water Quality to the RO System

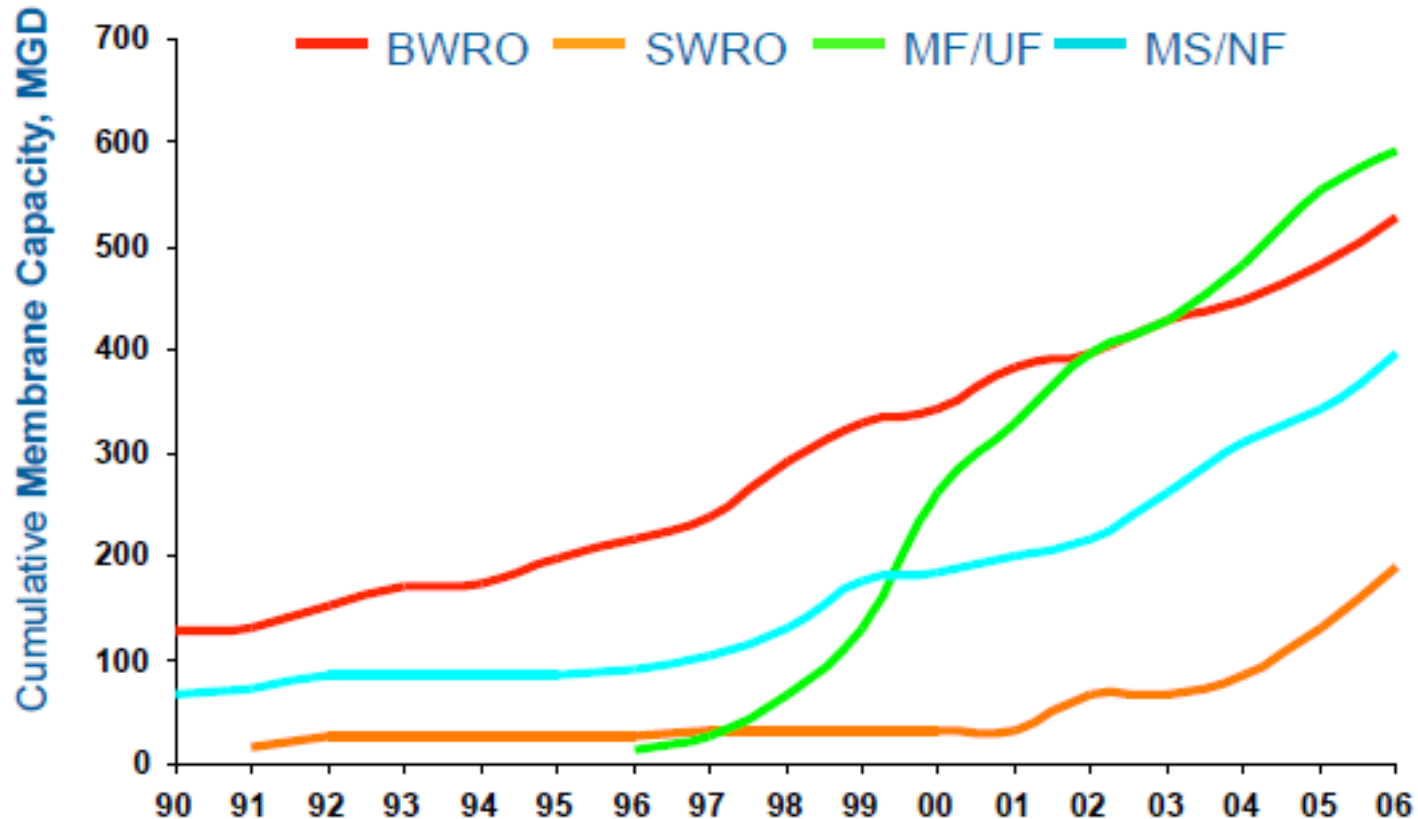


Ref: CH2M HILL, 2009





US Membrane Capacity

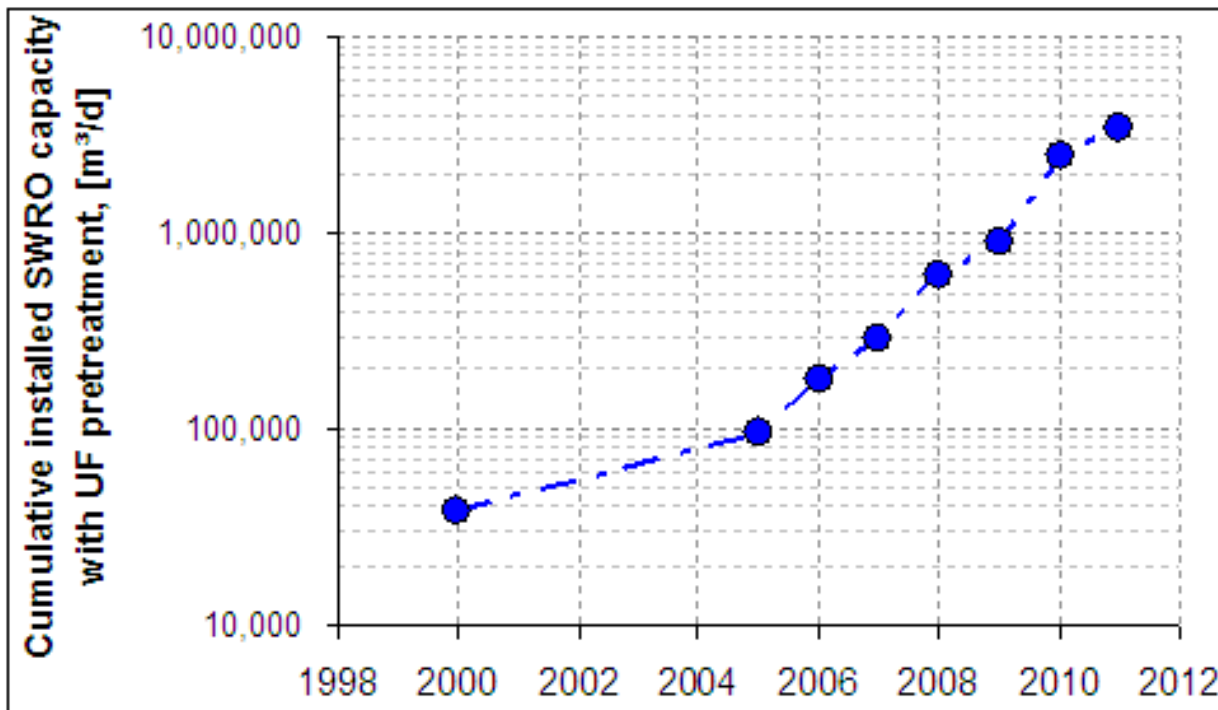


Ref: Global Water Intelligence, SEDA Fall Symposium, Oct. 2009.





SWRO Pre-treat by UF



Ref: Busch, M., Rosenberg, S., Chu, R., “Novel trends in dual membrane systems for seawater desalination: minimum primary pretreatment and low environmental impact treatment schemes”, IDA World Congress - Atlantis, The Palm - Dubai, UAE November 7-12, 2009, Dubai, United Arab Emirates, DB09-019.



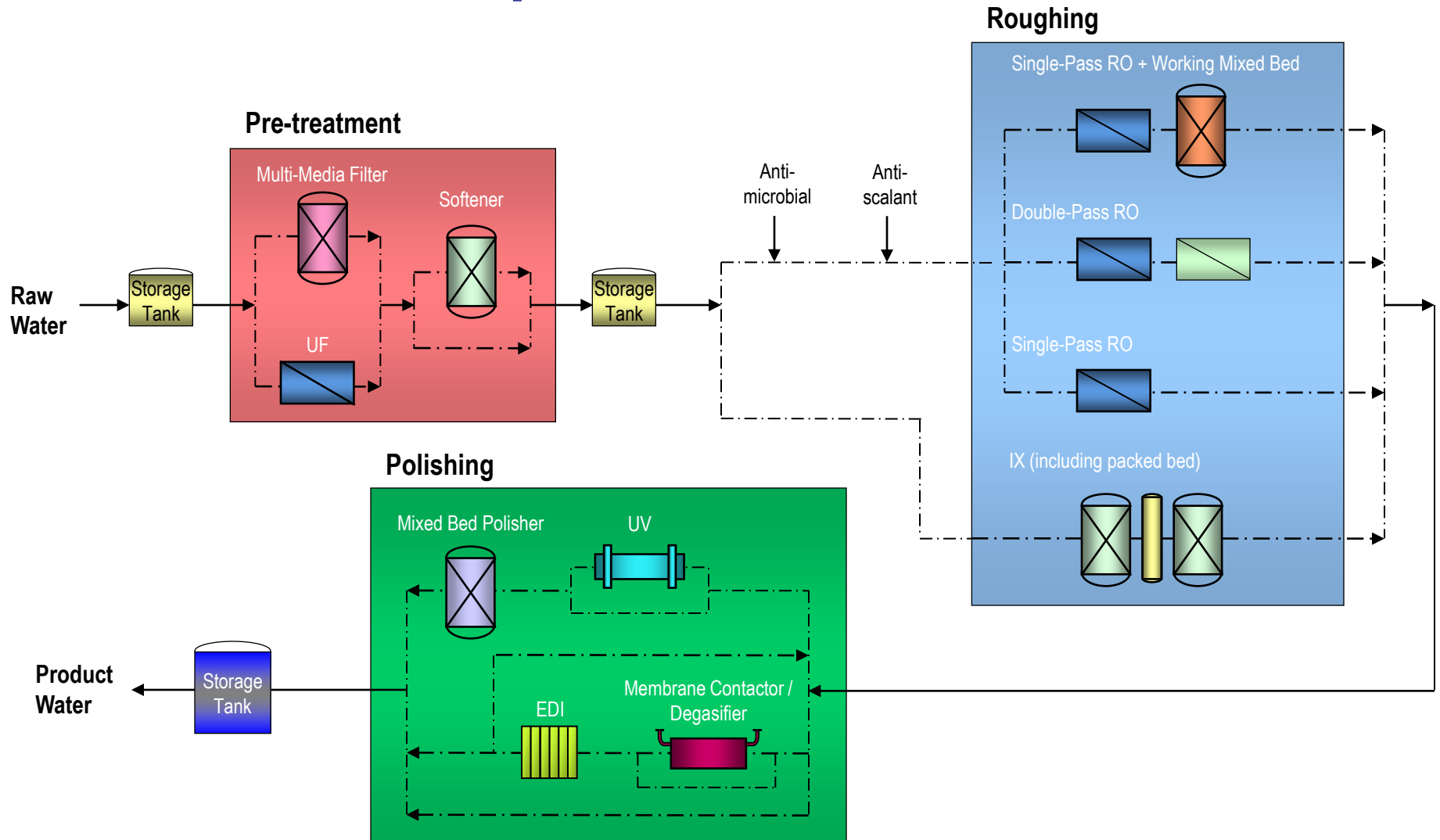


Electrodeionization (EDI) for Polishing





Make-up Demin Overview





EDI Advantages

- Eliminates the need for hazardous regeneration/neutralization chemicals
- Is a clean technology, the only consumable is electricity
- Is a continuous process, no need for offline regeneration
- Smaller footprint than conventional DI
- Situational cost advantages





EDI Construction

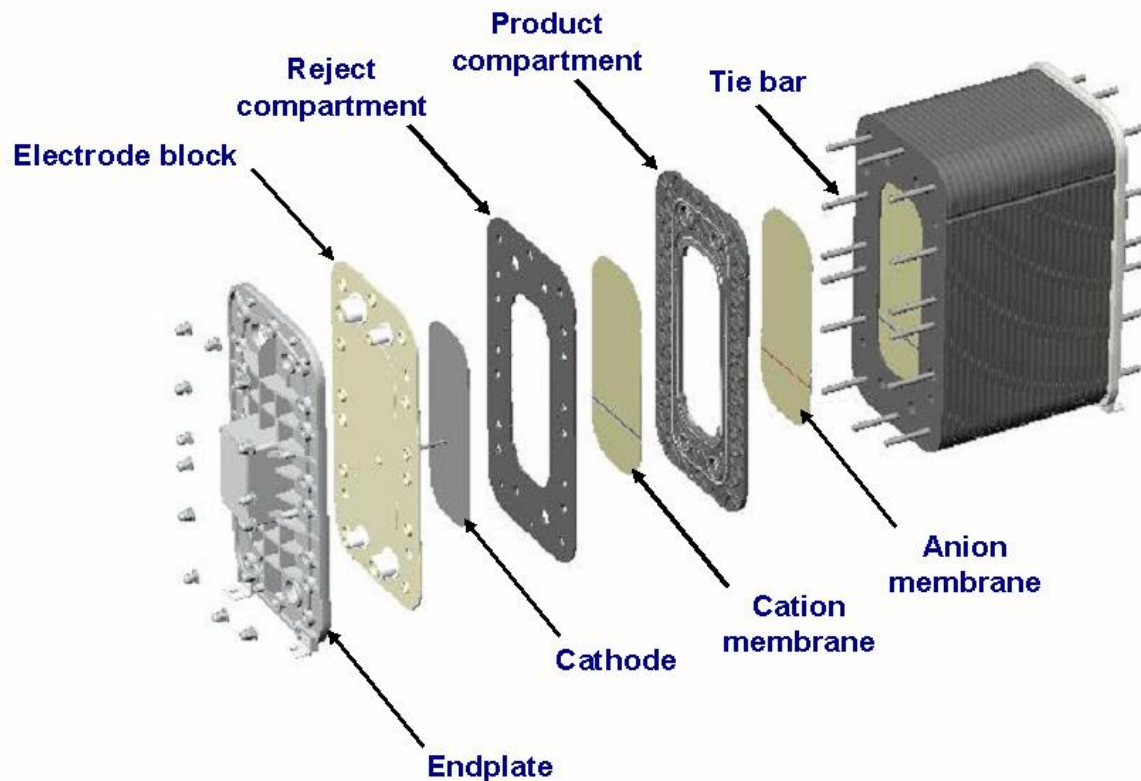
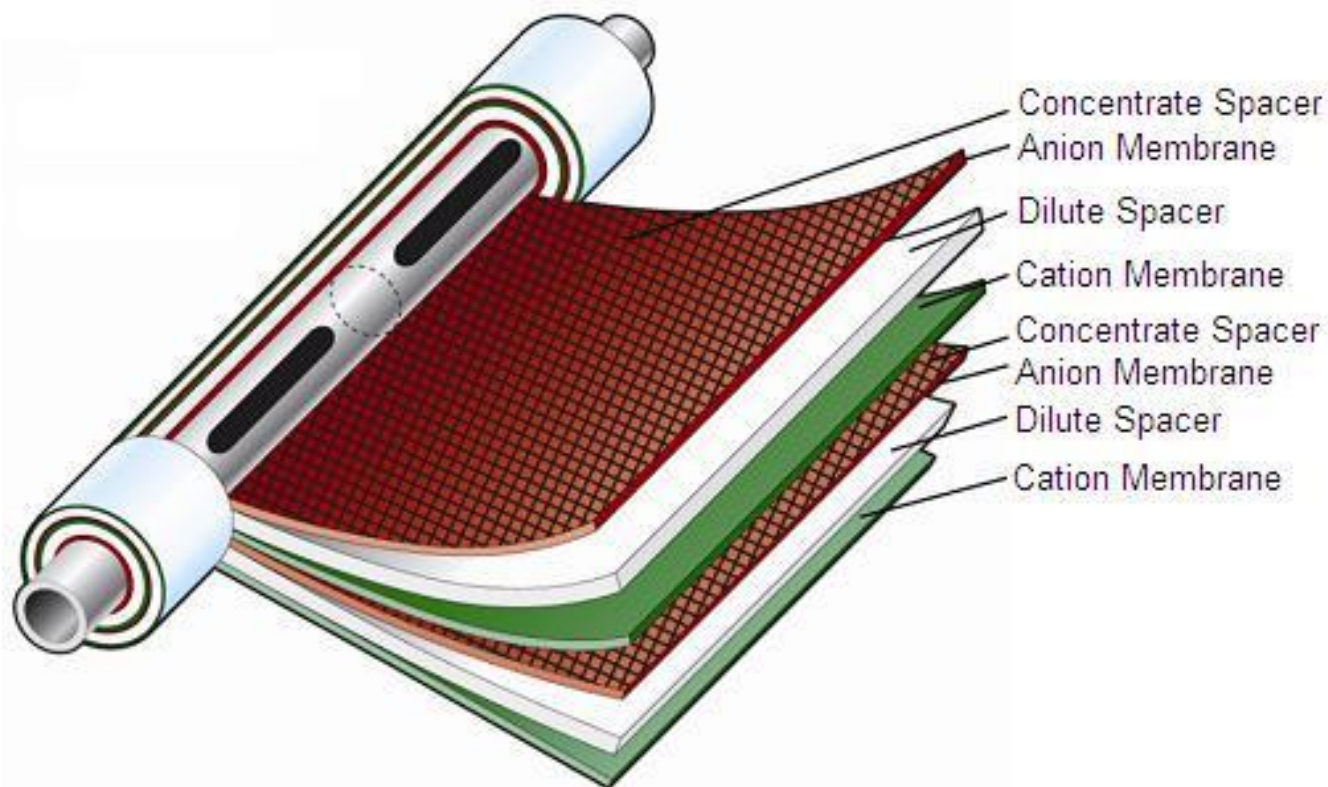


Plate and Frame





EDI Construction

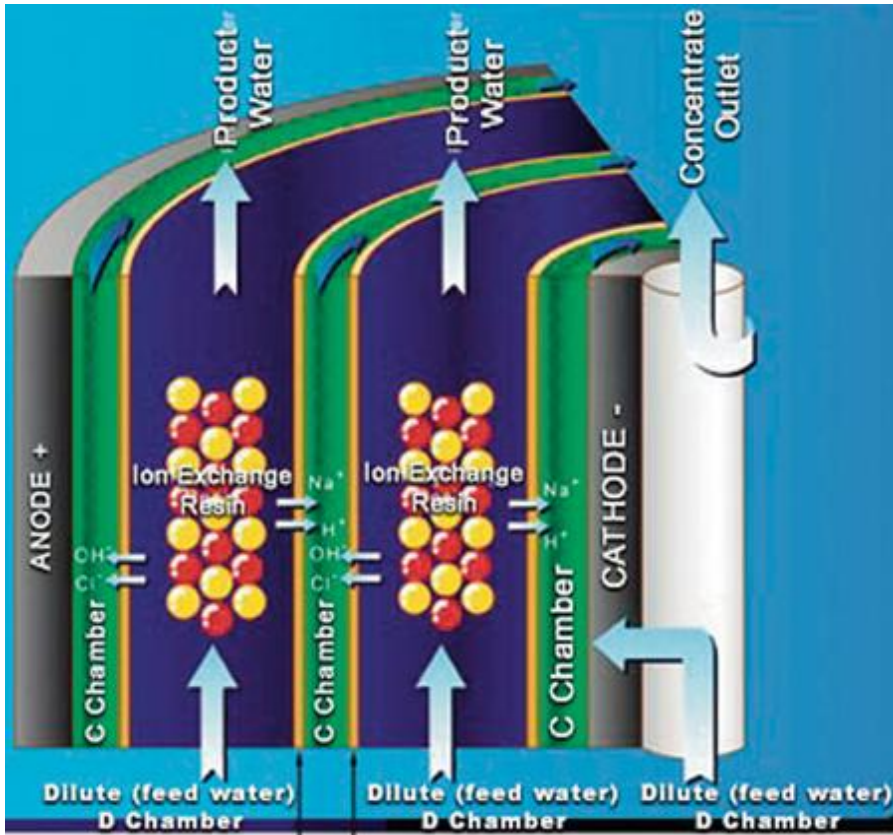


Spiral Wound





Electrodeionization





DOW™ EDI System

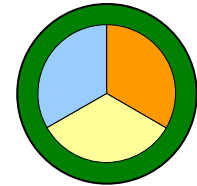
EDI 100





Summary

- Safe, reliable, efficient, and **Green**
- UF
 - Only infrequent chemical usage vs. continuous coagulation/flocculation with MMF
 - Little sludge disposal vs. MMF
- EDI
 - Only uses electricity; no regeneration or neutralization chemicals required vs. IX MB





Water & Process Solutions

www.dowwaterandprocess.com

