



GUIDEBOOK

MEMBRANE DESALINATION TECHNOLOGY

Reverse Osmosis, Nanofiltration and Hybrid Systems Process, Design, Applications and Economics

*by Mark Wilf with chapters by Leon Awerbuch, Craig Bartels,
Mike Mickley, Graeme Pearce and Nikolay Voutchkov*

This is a process and application guidebook that encompasses the latest state of the art of commercial membrane desalination technology. This unique book provides a thorough overview and understanding of the RO, NF, and hybrid system, all with a detailed discussion on how to apply, design and operate potable systems and how to evaluate project economics using innovative membrane technologies. A must-read for all project engineers, plant designers, planners, utility directors, and operation managers, involved in municipal and industrial membrane projects. Also scientists and academics interested in membrane desalination will find in this guidebook an insight into latest trends in commercial membrane desalination technologies for potable water applications. A step by step approach to design, operates and cost evaluation of membrane systems is explained in simple practical terms, all backed up by sample process calculations and case studies.

The contents of the book provides information, education and real life examples of the following major subjects:

Principles of membrane separation – provides explanation of membrane technology and factors that affect membrane element performance in field operation.

RO/NF system configurations and system design parameters – provides information on major components, process steps and configuration of desalination plants and modern approach to membrane plant design process including optimization of power consumption.

Application of RO and nanofiltration technology in wastewater reclamation plants – provides an overview of suitable membrane technology for wastewater processing, a practical range of design parameters and experience based performance expectation.

Cost estimation and planning process of membrane desalination projects – provides detailed information on cost factors to be considered in preparation of a desalination project budget. It also includes detailed discussion on their relative importance in different types of desalination project alternatives such as turn-key, DBB, DBO and BOOT.

Concentrate disposal – described in terms of concentrate disposal constraints and engineering solutions presently available. A detailed evaluation of economics of various concentrate disposal alternatives is included.

Hybrid systems – provides information on this new emerging technology and system configurations. It describes various alternatives of hybrid process configurations, potential economic benefits and provides a range of operating parameters.

Appendixes – includes examples of process configurations, budgeting of RO seawater systems and detailed evaluation of a specific case of concentrate disposal.

The contributors to the book are well known professionals in the desalination field with extensive involvement in research and development of membrane products and desalination processes. The book contents reflect their R&D work and experience in design, procurement and operation of numerous membrane systems. The information included in this guidebook represents the current state of the art of commercial membrane desalination technology.

TABLE OF CONTENTS

| | |
|---|---|
| Introduction to reverse osmosis – basic terms | Organic matter |
| Water salinity – concentration units | Biofouling |
| The osmotic process | Permeate recovery ratio |
| Permeate recovery | Permeate flux rate |
| Average feed salinity | Membrane age |
| Net driving pressure | RO/NF system design |
| Salt separation in reverse osmosis process | System design guidelines |
| Water transport | The design process of RO/NF system |
| Salt transport | Site and feed water supply |
| Salt passage and salt rejection | Selection of pretreatment process |
| Temperature effect on transport rate | Energy consumption of RO process |
| Average permeate flux | Pumping equipment for RO applications |
| Specific permeability of a membrane | Optimization of energy consumption |
| Concentration polarization | Configuration of RO trains |
| Commercial RO-NF membrane technology | Control and monitoring system |
| Cellulose acetate membranes | Permeate processing |
| Composite polyamide membranes | Special design cases |
| Membrane module configurations | Achieving low boron limits with seawater |
| Plate and frame membrane elements | RO technology |
| Hollow fine fiber membrane elements | Nitrate reduction with brackish RO |
| Spiral wound membrane elements | membranes |
| Spiral wound elements categories | System design verification through operation of a |
| RO system configuration | pilot unit. |
| Membrane assembly unit | System commissioning |
| Concentrate staging | System operation |
| Flow distribution | Membrane fouling and performance restoration |
| Permeate staging | Membrane elements fouling process |
| Partial two pass configuration | Performance restoration |
| Calculation of system performance | Nanofiltration technology and applications |
| Manual method of membrane system performance | (by Craig Bartels) |
| calculations | Nanofiltration overview |
| Use of computer programs for projection | Nanofiltration membrane characteristics |
| of membrane performance | Membrane types |
| Normalization of system performance | Separation mechanism |
| Feed water supply systems and pretreatment | Membrane properties |
| Well water | Nanofiltration process consideration |
| Surface water | Pretreatment requirements |
| Raw water intake and concentrate discharge | Process design features |
| Conventional filtration pretreatment | Nanofiltration applications |
| Membrane filtration pretreatment | Potable water |
| (by Graeme Pearce) | Industrial process fluid purifications |
| Chemical stabilization of permeate | Other applications |
| RO/NF system design parameters | Wastewater treatment and reclamation by |
| Feed water types | RO and NF process (by Craig Bartels) |
| Feed water composition | Introduction |
| Feed water temperature | Background |
| Sparingly soluble constituents | Membrane selection |
| Particulate matter | Wastewater reclamation process design |
| | Permeate flux rate |

- Biofouling control
- Recovery rate
- Commercial plant data and design
 - Singapore wastewater treatment plants
 - Southern California wastewater treatment plants
- Operating cost advantages
- Other wastewater treatment applications
- Conclusions
- Acknowledgements

Budgeting of membrane desalination projects
(by Nikolay Voutchkov)

- Overview of desalination cost estimating procedure and practice
 - Project cost definition
 - Definition of capital cost
 - Definition of operating and maintenance cost
 - Definition of cost of water
- Key factors influencing water cost
 - Cost factors within the control of plant owner
 - Project risk profile
 - Cost factors beyond the control of plant owner
- Types and accuracy of project cost estimates
 - Conceptual cost estimates
 - Preliminary cost estimates
 - Budgetary cost estimates
 - Detailed cost estimates
 - Cost models
- Preparation for project budgeting
- Project cost estimation and analysis
 - Capital cost
 - Construction cost
 - Costs for project engineering services
 - Project development costs
 - Project financing costs
 - Operation and maintenance cost
 - Waste stream disposal
 - Environmental and performance monitoring
 - Indirect O&M cost
- Cost of water
 - Fixed components of water cost
 - Other fixed costs
 - Variable components of water cost
- Trends of water cost
- Project implementation
 - Project delivery alternative
 - Design-Bid-Build (DBB)
 - Design-Bid-Operate (DBO)
 - Build-Own-Operate-Transfer (BOOT)
- Project schedule

Hybrid systems (by Leon Awerbuch)

- Introduction
- Distillation
- Description
- SWRO/Thermal
- RO membrane like
- Hybrid variations

Examples

- Dual purpose facilities
- Hybrid using NF
- Hybrid using vapor compression
- Hybrid using MSF–MED
- Hybrid and desalination aquifer storage recovery
- Resource conservation
- Environmental impact

RO concentrate management (by Mike Mickley)

- Nature of concentrate
- Concentrate management options
- Traditional concentrate disposal options
- Concentrate disposal challenges
- Consideration of concentrate management options
 - Beneficial use
 - Volume reduction
 - Zero liquid discharge
- Seawater desalination discharge
- Nanofiltration concentrate disposal
- Other topics related to concentrate disposal
 - Presence of contaminants
 - Major ion toxicity

References

Appendixes

- Examples of RO membrane unit configurations
- Example of desalination plant cost estimate.
(Nikolay Voutchkov)
- Example of feasibility evaluation of RO concentrate disposal alternatives (Mike Mickley)
- Units conversion table
- Common symbols used in process and instrumentation diagrams.



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