

Reverse Osmosis Seawater Desalination

Planning, Process Design and Engineering

A Manual for Study and Practice

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Seawater reverse osmosis (SWRO) is the dominant desalination process worldwide for obtaining fresh water from the sea. The subject matter and scope of this book is the conceptual and advanced planning, design and engineering of plants of this desalination process together with the associated treatment systems for the pretreatment of the seawater and the post-treatment of the produced product water. It describes comprehensively and in- depth the basics and practice of planning, design and engineering and presents determination of costs of produced water and economic/contractual backgrounds in realization and operation and also addresses the ecological aspects and the measures and techniques necessary for sustainable operation of seawater RO.

Volume 1 includes

- Strategic considerations regarding the role of seawater desalination in an integrated water management consisting of natural water resources, water recycling and desalination
- Composition of seawater in different marine regions as well as its physical and physicochemical properties and their dependence on salinity and temperature
- Description of the methodology used in the overall planning, design and implementation of an SWRO project, as well as in the associated site selection and the development of an ecological concept for the plant
- Explanation of the design basics and their application in the dimensioning of the RO units of an SWRO and its energy recovery processes

Volume 2 covers

- Design of the pretreatment and post-treatment processes as well as of the sea water extraction and outfall systems of SWRO - explanation of the basic principles and design approaches and their application in the practical dimensioning of the units
- Description of the wastewater treatment facilities of an SWRO and their design.
- Liquid and solid residues of SWRO, their amount and environmental aspects and regulations of their discharge and disposal and possibilities of their recovery and reuse
- Material selection for the SWRO components
- Description of the control systems of an SWRO and their interaction with manual sampling and analysis for operation control of the plant
- Determination of specific energy consumption of an SWRO and the influence of design and plant operation on its optimization
- Contractual structures and economic aspects of planning and implementation an SWRO, calculation of the capital, operating and water production costs of the plant