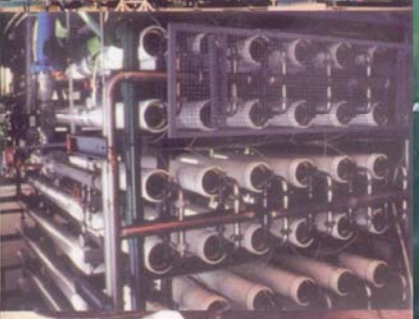
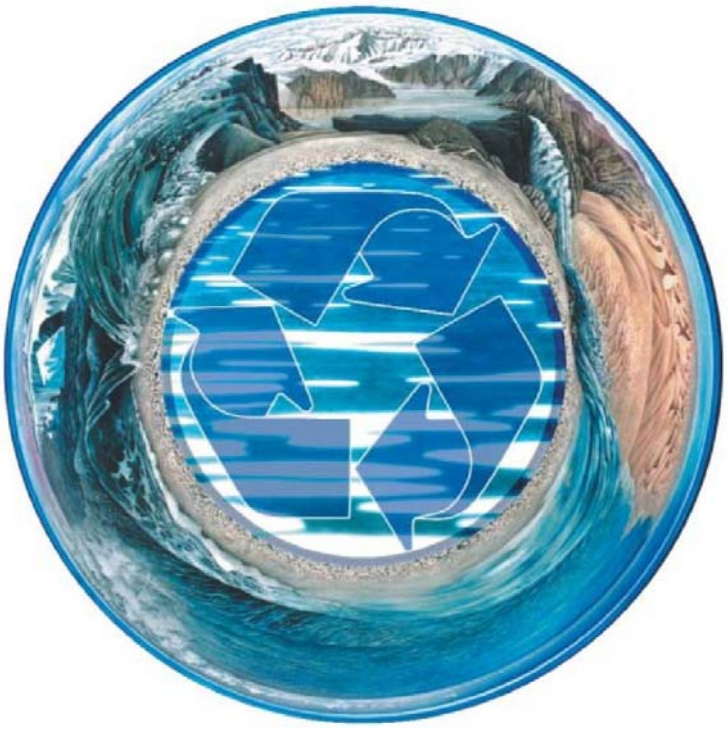
DESWARE PUBLICATIONS CATALOGUE 2016 -2017



DESALINATION AND WATER RESOURCES

COMPENDIUM OF DESALINATION AND WATER RESOURCES (DESWARE)



DESALINATION AND THE CONTINUITY OF HUMAN CIVILIZATION

To support the growing human population, which has already crossed the 6 billion mark and is expected to reach 8.3 billion in 2025, and 10 -12 billion in 2050, humanity must rely on industrial development within a framework of environmental and socio-economic development. The Dublin Principles and also Agenda-21, particularly its Freshwater Chapter, make it clear that water is a key to sustainable development. The World Health Organization (WHO) has estimated that 1000 cubic meters per person per year is the benchmark level below which chronic water scarcity is considered to impede development and harm human health. 97.5% of the total global stock of water is saline and only 2.5% is fresh water. Approximately 70% of this global freshwater stock is locked up in polar icecaps and a major part of the remaining 30% lies in remote underground aquifers. In effect, only a miniscule fraction of freshwater (less than 1% of total freshwater or 0.007% of the total global water stock) that is available in rivers, lakes and reservoirs is readily accessible for direct human use. Furthermore, the spatial and temporal distribution of the freshwater stocks and flows is hugely uneven. Hydrologists estimate the average annual flow of all the world's rivers to be about 41,000 km3/yr. Less than a third of this potential resource can be harnessed for human needs. This is further reduced by pollution such as discharges from industrial processes, drainage from mines and leaching of the residues of fertilizers and pesticides used in agriculture.

Sun is the Source of Renewable Energy and the Oceans are a Major Alternative Source of Water

Just as the sun is an alternative source of energy to meet future demands, the oceans are an alternative water resource. However, extraction of fresh water from the oceans requires significant development of desalination infrastructure. The most arid lands are also those blessed with abundant solar energy and this needs to be exploited for large-scale production of freshwater from the oceans. Human engineered desalination systems actually mimic the hydrologic cycle, which is itself a grand process of distillation. If these systems are driven by the sun, they will augment the fresh water supplies of the global hydrologic cycle. The resulting process will add a human engineered sustainable and very controllable, contribution to the natural hydrological cycle. .

Desalination and Sustainable Development

Desalination has already made a major contribution to quality of life in the most arid regions of the world, particularly the Arab region and North Africa. Without desalination, many of these regions would have remained uninhabited. With rising global demand, uneven distribution of freshwater and increasing population, Malthusian apocalypse would have already come true. Desalination technology is providing safe drinking water even to some 'water-rich' nations where pollution reduced the quality of natural waters. Thus, as a means of augmenting fresh water supplies, desalination contributes significantly to global sustainability. The desalination associations and institutions have a pivotal role to play here, encouraging the scientific and industrial communities to make efforts to meet world water requirements through environmentally sustainable technologies. Investments in this direction are not impossible; the annual global expenditures for arms and advertisement are currently about US$1600 billion (SIPRI 2010) and US$482 billion (ZenithOptimedia) respectively. Just 1% of this over ten years would be a prudent diversion of resources enough to provide safe water and decent sanitation facilities for all human beings. Let us hope that the entire world rises to meet this requirement of faith in the survival of life on earth.

Darwish Al Gobaisi
Editor-in-Chief

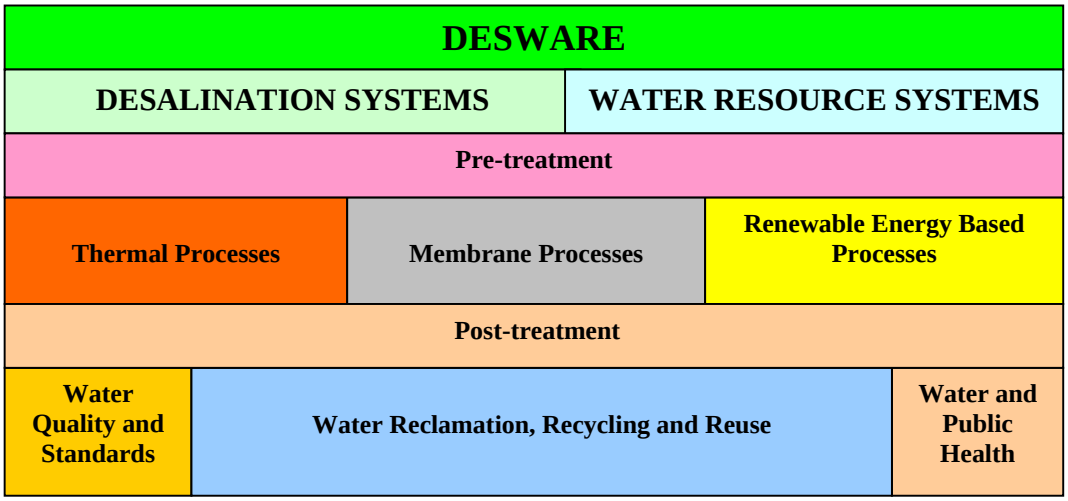
1. Compendium of Desalination and Water Resources (DESWARE)

DESWARE is a subset of the Encyclopedia of Water Sciences, Engineering and Technology Resources, which is part of the UNESCO Encyclopedia of Life Support Systems (EOLSS). If you are interested in the broad area of Water Sciences, Engineering and Technology, please visit http://www.eolss.net

DESWARE meets a long-standing need in the desalination and water resources community for a detailed archival source of knowledge. It covers the science, technology, methodologies, experience and management of this diverse and important subject. DESWARE is designed to fulfill the needs of a wide spectrum of users seeking reliable information, including science and engineering students, university professors and educators, informed specialists and practicing professionals, planners and consultants, plant operators and maintenance staff, managers and policy-makers, researchers, etc. The compendium is organized in 16 categories dealing with education, training, design, planning, research & development, management, operation, and maintenance. Each category contains an organized collection of chapters, graphics and tables, all of which is approximately more than 31 printed volumes

The subject matter is presented in various levels that make the compendium accessible to as wide a readership as possible. For general interest there are background information, historical development, trends, and regional demands. For the specialist there are features on research and development. Non-specialists will benefit from the broad introduction provided to all desalination and water resources topics, and will find answers to specific problems.

DESWARE is an integrated compendium of all aspects of the subject of desalination and water resources as shown below:



2. DESWARE-Online (www.desware.net)

This is the web version of DESWARE which provides the user with an effective and efficient tool to search, navigate and browse through each category, through any combination of the sixteen categories, or through the whole Compendium. The Compendium can be browsed also through the **Table of contents** – an alternative route into the body of knowledge.

3. DESWARE Subject Categories:

1. **History, Development and Management of Water Resources**
2. **Common Fundamentals and Unit Operations in Desalination Systems**
3. **Physical, Chemical and Biological Aspects of Water**
4. **Thermal Desalination Processes**
5. **Membrane Processes**
6. **Renewable Energy Systems and Desalination**
7. **Material Selection and Corrosion**
8. **Plant Operation - Maintenance and Management**
9. **Ancillary Equipment and Electrical Equipment**
10. **Process Instrumentation, Control and Automation**
11. **The Desalination Processes Site selection, layout and Civil Works**
12. **Thermal Power Plant and Co-Generation Planning**
13. **Water and Wastewater Treatment Technologies**
14. **Water and Health**
15. **Environmental and Health Aspects of Water Treatment and Supply**
16. **Water Quality and Standards**

4. Development of the Body of Knowledge of the DESWARE

The contents of the compendium evolved under the guidance provided by the following experts.

5. DESWARE Editorial Board

6. DESWARE e-books and their full color print versions in subject categories:

For the convenience of users' special interests the DESWARE body of knowledge is being made available in e-book (pdf) format with the provision for Print on Demand. **The ISBN numbers are respectively eISBN for e-books and ISBN for print versions. Forthcoming items are without these numbers.**

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