



European
Desalination Society

4-Day Advanced Course on Pre-treatment, Membrane Fouling and Scaling

Lecturer Prof. Jan C. Schippers, MSc, PhD

April 2–5, 2012, Genoa, Italy



The course includes practice and theory on pre-treatment, fouling and scaling in micro- and ultrafiltration, nanofiltration and reverse osmosis applied for the production of drinking and industrial water production. The impact of the water source — seawater, river water, brackish ground water and treated domestic waste water — will be discussed in depth.

Topics:

- Introduction to desalination and membrane related technologies
- Principles of micro- and ultrafiltration (MF/UF)
- Overview of commercial micro – and ultrafiltration membranes, elements and systems
- MF/UF membrane fouling, controlling, cleaning and pre-treatment
- Principles of reverse osmosis (RO) and nanofiltration (NF). Normalizing data
- Overview RO and NF membranes and elements
- Fouling in RO and NF membrane systems
- Particulate (suspended and colloidal) fouling and pre-treatment
- Inorganic fouling: Iron and manganese in ground water. Aluminum in coagulation. Pre-treatment and control
- Biofouling prediction and pre-treatment
- Organic fouling
- Chemistry and solubility of inorganic compounds (salts)
- Scaling calculations and prediction
- Scaling control, monitoring. Antiscalants
- Remedial actions
- Recent advances in RO technology



Venue

Hotel Mediterranee

Via Lungomare 69, 16155 Genoa Pegli, Italy
Tel. +39 (010) 69 73 850; Fax +39 (010) 69 69 850

The courses will be held in an 18th century building with sea-front accommodation on the picturesque Italian Riviera, just 3 km from C. Colombo Airport and 1 km from the motorway tollgate.

Located in Pegli, near the historical town of Genoa, this former residence of the Lomellini family is sheltered from the winds, enjoying a mild climate in winter and temperate in summer.

The beach is nearby and there is a frequent bus service to the centre of Genoa. There is a nearby port and railway station for making a day trip to the beautiful areas of Portofino and Rapallo.



Lecturer



Jan Schippers, Professor Em. in Water Supply Technology at UNESCO-IHE in Delft and private consultant, will give the course. He has extensive professional experience in drinking and industrial water supply projects in Morocco, Qatar, United Emirates, Libya, Gabon, Cab Verde, Namibia, Uzbekistan, France and the Netherlands.

His specializations are: consultancy, research, training and education in the fields of integral drinking water treatment systems and desalination/membrane related technologies.

Jan advised (and still advises) World Bank and Ministries in the Netherlands. Is active in reviewing research projects and publications being a member of the Editorial Board of the Journals Desalination and Water Treatment, Desalination and Aqua, Technical Advisor of the Executive Council of the Middle East Desalination Research Center, Chairman of the Scientific Advisory Board of IWW (Germany) and Past President of EDS.

He is principal author of the book Integrated Membrane Systems, published by AWWA Research Foundation (2004)

Gave (and still giving) courses on Membrane Technology, Aquatic Chemistry and Fouling, scaling and pre-treatment in membrane technology in The Netherlands, Cyprus, Italy, Jordan, Yemen, Bahrain, Iran and Oman.

Advance program

Monday 2 April 2012

- 09.00 Registration and coffee
- 09.45 Welcome
- 10.00 Introduction to desalination and membrane related technologies. Main applications, resources and capacities
- 11.00 Principles of micro-, and ultrafiltration. Membrane materials flux, normalizing flux, fouling mechanisms
- 12.00 Coffee/tea
- 12.15 Overview of commercial micro- and ultrafiltration membranes, elements and systems. Back washing
- 13.00 Lunch
- 13.45 MF/UF membrane fouling, fouling controlling, cleaning and pre-treatment with coagulants
- 15.30 Coffee/tea
- 15.45 Principles reverse osmosis and nanofiltration. Flux, salt passage and concentration polarization
- 17.00 Discussion

Tuesday 3 April 2012

- 08.30 Coffee/tea
- 09.00 Overview of RO and NF membranes and elements.
- 09.45 Process design in RO systems. Normalized flux, salt passage and pressure drop in feed/concentrate channel.
- 10.30 Coffee/tea.
- 10.45 Process design. Normalizing data.
- 12.30 Lunch
- 13.15 Fouling in RO and NF systems.
- 14.45 Coffee/tea
- 15.00 Particulate fouling. Fouling parameters. SDI and MFI
- 16.30 Discussion

Wednesday 4 April 2012

- 08.30 Coffee/tea
- 09.00 Particulate fouling. Pre-treatment schemes in RO/NF. Rapid sand filtration, coagulation, micro- and ultrafiltration.
- 11.00 Coffee/tea
- 11.15 Inorganic fouling. Iron and manganese removal from ground water
- 12.30 Lunch
- 13.15 Biofouling. Parameters AOC and BDOC. Membrane fouling simulator
- 15.30 Biofouling. Pre-treatment
- 17.00 Discussion

Thursday 5 April 2012

- 08.30 Coffee/tea
- 09.00 Organic fouling
- 10.00 Salinity, solubility, conductivity, pH
- 11.00 Coffee/tea
- 11.15 Salinity, solubility, conductivity, pH (continued)
- 11.45 Solubility calculations and scaling prediction
- 12.45 Lunch
- 13.15 Scaling control, monitoring. Anti-scalants.
- 14.00 Remedial actions
- 14.30 Recent advances in RO technology
- 15.30 Awarding of Certificates of participation and closing

Pre-treatment, membrane fouling and scaling

Lecturer Prof. Jan C. Schippers

April 2–5, 2012, Genoa, Italy

REGISTRATION FORM

Surname _____ Name _____

Address _____

Country _____ Telephone _____

Fax _____ Email _____

Registration fee:

- EDS members **€2,500**
 Non-members **€2,700**

The fee includes 5 nights accommodation, lunches, coffee, dinners and course material.

Payment can be made by:

Cheque

Bank Transfer to be sent to the address below and a copy emailed to us
Please take care of your own bank charges

Account name: European Desalination Society
Account No. 11863.19
Banca Monte dei Paschi di Siena
L'Aquila, Italy
ABI: 01030 CAB: 03600
Swift code: PASCITMMAQU
IBAN code: IT 92 | 01030 03600 000001186319

Credit card

Visa Mastercard

Card N° _____

Exp. date _____ Security code _____

Cardholder name _____

Signature _____

Please fill in the form and send as an attachment to: miriambalaban@yahoo.com

or fax to +1 928 5433066