Industrial Oil & Gas Solutions

- **Mines:** concentration of saline mine water
- **Chemical process industries:** recovery of effluents with minimum levels of waste discharge
- **Utilities:** concentration of blow-downs, brines, regeneration effluents and wastes
- **Pulp & paper:** reduction of waste volume to zero discharge
- **Textile:** reduction of waste water and minimizing disposal costs
- **Citric acid:** concentration of acid solutions

Reverse Osmosis

Our unique differentiation is the Pressure & Energy Centre designs, delivering very low energy consumption large scale seawater RO plants. AquaSwiss AG Seawater Reverse Osmosis (RO) plants are used for treating a wide variety of water compositions. AquaSwiss AG RO plants combine accumulated knowledge and experience of hundreds of years. AquaSwiss AG is proud of innovative process advances constantly pushing the limits of the Reverse Osmosis process design and efficiency, such as:

- The "Pressure Centre Concept"
- Boron Removal System
- Implementation of Large Scale hydrostatic Energy Recovery devices;
- Direct-on-Line Cleaning System
- Amongst the lowest energy consumption in the industry
- Advanced process simulations & optimization models.

Innovative Energy Recovery Systems Used in Our RO Plants

- The water is supplied to the RO section through the HP Boosters together with the HP Pumps and the Energy Recovery Systems (ERS).
- The HP pumping center, which supplies the HP feed to the RO banks via common feed lines, has been optimized by the selection of a minimal number of large HP pumps working at highest efficiency rates and best operation conditions.
- The pressure centre design allows maximizing the benefits of variable production rates during the day: It allows increasing/decreasing the feed pressure to the RO trains:
- During decrease in production all RO trains are kept in operation and the system recovery is decreased without increasing the total feed to the plant.
- In addition, the pressure center design improves plant flexibility, and therefore availability, in case of variation in flow rates due to different operation regimes or failure of any component of the system.
- Reduction in overall water costs.
- Operation with maximum efficiency and maintenance simplicity;
- Flexibility over different operation regimes;
- Energy recovery devices have been designed to form a unitary block, capable of changing pumping flow independently of high pressure pumps;
- High pressure feeding from both HP Pumps and ERS sides, thus allowing smaller diameter and shorter high pressure pipelines. Considerable CAPEX and OPEX savings are achieved (lower investment costs, less head losses, etc.);
- The ERS sub-system also acts as a high pressure pumping sub-system, with high efficiency;

contact us

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advanced water solutions

company

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references

AquaSwiss - " The Thermal Desalination Experts "ISO Certified

AquaSwiss AG brings world's most advanced thermal desalination technology and experience in the field of sea-water desalination.

The AquaSwiss Desalination Expertise

- Technology and expertise to utilize steam as low as 0.2 bar to build Multi Effect Distillation (MED) plants from sizes of 2000 to 200,000 m3/day and more.
- Can achieve Economy Ratios / GOR (also called product to steam ratio) up to 19 with our MED units, at CAPEX which is significantly lower than in comparable industrial applications.
- Mechanical Vapor Compression (MVC) units are CAPEX and electricity efficient and can be delivered in clustered trains of up to 30,000 m3/day and more.
- Advanced pre-treatments such as Nano-Filtration, biological filters and clarifiers coupled with our thermal units to deliver solutions for complex feed-waters such as very high salinities (150,000 ppm), high temperatures and high silica content.
- Specialized solutions for the Oil & Gas Industry for treatment of Formation Water, Injection Water and Steam injection operations.
- Decades of experience in Reverse Osmosis with our unique Pressure & Energy Centre designs, delivering very low energy consuming large scale RO plants
- AquaSwiss couples Swiss / European quality, standards, and expertise with the world's most advanced thermal desalination technology.

The AquaSwiss Technology

Multi Effect Distillation

Low temperature multi effect distillation is a simple, reliable and efficient process utilizing low cost / low grade heat or waste steam. Vacuum enables operation at unparalleled low distillation temperatures (below 70 °C) minimizing scale and corrosion, and hence maintenance, to an absolute minimum. A large number of effects consequently results in very high economy ratios (product to steam) and the use of aluminum tubes improving the heat transfer results in lower investment cost compared to conventional high temperature processes.

With extremely safe evaporators, evaporation and condensation are achieved by direct transmission of latent heat, avoiding sensible heat pickup, which would decrease the effective temperature differential. Using the falling film concept, static head is eliminated from the flashing process and high evaporation heat transfer coefficients result.

AquaSwiss uses all standard items of equipment in the plant of high quality and reliable design, purchased only from reputable international manufacturers.

Mechanical Vapor Compression

AquaSwiss Mechanical Vapor Compression (MVC) distillation is the most thermodynamically efficient process of single-purpose thermal desalination. The thermodynamic efficiency is derived from the application of the "heat pump" principle by a large volumetric flow compressor acting as the "heat pump", which continuously recycles and keeps the latent heat exchanged in the evaporation and condensation steps within the system.

The heat required to evaporate part of the processed feed, which flows on one side of a heat transfer surface, is supplied through the simultaneous condensation of the distillate, on the other side of the surface. This cycle of evaporation and condensation operates continuously.

The principle is similar to our MED. MVC units are standard, factory-assembled and skid mounted units, proven by strict and thorough prototype testing at an R&D center and by years of satisfactory experience with commercial plants operating throughout the world. The plants are simple, efficient and automatic. The quality of the product water from the MVC unit exceeds public health standards by a wide margin. Typical applications are for downstream oil companies, oil facilities, refineries, petrochemical plants, industries like cement, tourism, factories, chemical plants etc.

AquaSwiss offers advanced pre-treatments such as nano-filtration, biological filters, clarifiers and other fit-for-purpose pre-treatments coupled with our thermal units to deliver solutions for complex feed-waters such as very high salinities (100,000 ppm), high temperatures, an high silica content. Using these solutions we can deliver drinking, agricultural, service, or demineralized water from oil & gas produced (formation) water and industrial effluents. We also work with our clients to help them achieve Zero Liquid Discharge (ZLD).

Specialized Oil and Gas Solutions

- Treating formation (produced water) from oil fields
- Steam generation for injection in heavy oil reservoirs
- Treatment and desalination the water produced after fracking (hydro-fracturing) of tight oil and gas wells
- Treatment and desalination of water produced by de-watering of coal bed methane (CBM) reservoirs

References of AquaSwiss

Projects Completed

1. Larnaca, Cyprus - Reverse Osmosis, RO 64,000 m^3/d
2. Tianjin, China, Phase - I – MED 100,000 m^3/d
3. Vasilikos Desalination Plant, Cyprus – Reverse Osmosis, RO 60,000 m^3/d
4. Tianjin, China, Phase - II – MED 100,000 m^3/d
5. ESPAC Desalination Plant, Saudi Arabia – Reverse Osmosis, Ro 700 m^3/d. (installed capacity and O&M + water sale on a BOT basis)
6. Al-Gharamah Desalination Plant, Saudi Arabia – Reverse Osmosis, RO 1,700 m^3/d (installed capacity O&M + water sale on a BOT basis)
7. Quriyat Desalination Plant, Oman – High Salinity Osmosis, 3,600 m^3/d (installed capacity O&M + water sale of up to 3000 m3/d on a BOT basis)
8. Al Khiran Desalination Plant, Oman – High Salinity Osmosis, 600 m^3/d (installed capacity O&M + water sale of up to 700 m^3/d on a BOT basis)
9. EGPC Desal Plant,Red sea Cost, Egypt, 1,650 m^3/day, EPC & O&MSupport
10. Sulaibya Zero Liquid Discharge Plant,Kuwait
11. West Kuwait Produced Water Treatment & Zero Liquid Discharge (ZLD) Plant, West Kuwait, Kuwait

On Going Projects

1. Aseelah Desal Plant, Aseelah, Oman - 10,000 m^3/day to be installed, O&M + water sale on a BOO basis
2. Qurayyat Desal Plant, Qurayyat, Oman - 8,000 m^3/day to be installed, O&M + water sale on a BOO basis
3. Refinery Upgrade of MVC Plants, Turkmenistan - 3 x 1'500 m^3/day EPC