

ScinoPharm Pharmaceutical Manufacturing Facility

Application: Complete water solutions for a pharmaceutical company, including feedwater, ultrapure water, and wastewater treatment

Capacity: 65,000 gpd (250 m3/d)

Location: Shan-Hua, Tainan County, Taiwan

Commissioned: December 2002



Challenge

Located in Taiwan, ScinoPharm is a large generic pharmaceutical company. With a new manufacturing facility located within an industrial park, the company realized that the raw water supply within the park was not of high enough quality to support a pharmaceutical facility.

ScinoPharm needed to treat the raw water supply to WHO potable water standards, provide different levels of ultrapure water through the facility, and treat all facility wastewater to meet discharge standards. They wanted to find a single supplier that could design, fabricate and supply an effective and economical solution for all of these problems, in a timely and efficient manner.

Solution

In order to find a reputable water company that could provide such a complete, complex and unique solution, ScinoPharm contracted a design-engineering firm. After an in-depth evaluation of many systems, ZENON Membrane Solutions, part of GE Water & Process Technologies, was selected to be the full service supplier. With an extensive product line and proven installations in a variety of applications, ZENON was able to best meet the various requirements for this pharmaceutical company.

The final solution consisted of the following:

- Centralized raw water supply treatment system to meet WHO water standards
- Multiple laboratory point-of-use (POU) water purification units for the entire facility
- Centralized USP water system with IQ/OQ validation documentation
- Denitrification membrane bioreactor (MBR) wastewater system for variable solvent laden wastewaters.

The complete package was successfully designed and installed in a matter of months, and ScinoPharm was the first pharmaceutical R&D and manufacturing facility in Taiwan to meet USP requirements.

Typical Treated Water Results		
	Influent Average	Effluent Average
BOD (mg/L)	10 - 150	< 1
COD (mg/L)	16 - 30	< 0.2
TSS (mg/L)	15 - 80	< 0.2
TKN (mg/L)	70 - 300	< 0.003
NO3-N (mg/L)	44 - 220	< 0.003

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Process Overview

Centralized raw water supply treatment is achieved with a packaged treatment system, incorporating duplexed media filtration and water softening with pre-chlorination chemical injection at the treatment system. Fine tuning chlorination also occurs at the plants potable water storage facility.

The POU systems requirements are fulfilled using several Ultra-70 benchtop laboratory systems. These systems incorporate prefiltration for chlorine removal, reverse osmosis (RO) for Type III water generation and storage with a POU discharge port. The Type III water reservoir is the supply source for the post IX, ultrafiltration (UF) for Pyrogen removal and final absolute filtration prior to a second Type I water POU discharge port. The ability of these systems to manufacture Type III and Type I water simultaneously provides each of the laboratories with ultimate flexibility in an economical package.

The centralized USP water system is comprised of a patented high resistivity double-pass reverse osmosis (DPRO) system that can achieve USP XXIV water quality requirements without post-treatment. A 30 USgpm UF system was included for loop distribution to ensure Pyrogen-free distributed water. The packaged system is complete with a SIP/CIP skid mounted system for in-situ sanitization and/or cleaning as required by the process. This system was supplied with a complete IQ/OQ validation support package.

The 65,000 gpd (250 m³/d) wastewater treatment system treats all R&D and production wastewaters aerobically with a ZeeWeed* MBR system, including denitrification. The wastewater is highly variable with high solvent concentrations. The influent COD of 50,000 mg/L is effectively degraded to a final effluent concentration of < 500 mg/L.

Process Flow Diagram

