

Process & Makeup World Market Update



By Robert McIlvaine

Overview
of process
and makeup
water market

The world market for water and wastewater treatment equipment and services was \$263 billion in 2013, up 6% from 2012. Process and makeup (intake) revenues in 2012 were \$69.7 billion—28% of the total—including expenditures of \$9.9 billion for water reuse.

In 2013, revenues were \$74 billion; this includes service, consulting and systems. Instrumentation and controls, ranging from field devices to enterprise management, also are included in this total. The flow segment includes pumps, valves, seals and couplings. Treatment includes consumables, such as chemicals, and hardware and repair parts for all technologies except filtration, which is included separately.

Process- or product-related revenues involve slurries and pure liquids, which must be heated, purified or extracted from the product. Some of the highest growth rates in this segment were in pharmaceuticals and biotechnology. In these segments, cartridges and crossflow membranes separate the product from process liquid.

Meeting Unique Needs

Many process applications have unique demands in terms of corrosion, temperature, pressure, abrasion and contamination control. This has resulted in the development of unique separation equipment, which has advantages in a fairly narrow segment. Examples include the inverting filter centrifuge, permanent media filter, rotating reverse osmosis (RO) crossflow membrane module and self-cleaning sintered metal tubular filter.

Water intake filtration needs are identical, whether the water will be used for beverage manufacturing or cooling. The initial step is to eliminate larger particles, which can foul cartridges or crossflow membrane filters. Screens typically are used at the intake from a lake or river to remove particles 200 μ in diameter and larger. The next step is to eliminate particles between 10 and 200 μ in diameter. Clarifiers take up more space than alternatives, but are simple to operate. Hydro-cyclones require the least space, but are limited in the size of particles they can remove. Automatic backwash and granular media filters often are selected for initial intake filtration.

Creating ultrapure water—water used for semiconductor chip washing or boiler feedwater— involves the most steps. Additional treatment may include microfiltration, ultrafiltration, membrane degasification, ion exchange and RO.

In 2012, the power industry and “other industries” spent \$113 billion on water and wastewater treatment. Expenditures by the oil and gas industry boosted the “other” category to \$83 billion. The industrial segment grew by more than 7% in 2013.

Oil & Gas

The U.S. market experienced higher-than-average industrial sector growth in 2013, largely due to oil and gas activities. Unconventional oil and gas production require more water and wastewater treatment than conventional supplies. The percentage of unconventional extraction is rising as conventional resources disappear and costs of new extraction techniques decline. Hydraulic fracturing requires injection of chemicals, sand and several millions of gallons of water per well. The flowback contains up to 10 times the salts found in seawater. Treatment is therefore expensive.

The extraction of oil and gas from under the sea also has increased the market for specialized pumps; however, pumps used to inject fracturing fluid are expensive.

Oil sands are one unconventional resource requiring water and wastewater treatment. Oil-bearing sands are excavated and processed in large plants that require lots of water and then discharge wastewater, which must be extensively treated.

The \$70-billion intake and process water treatment market contrasts the standard technologies used for intake treatment with the specialized technologies used for the process treatment. Due to emphasis on reuse, the intake segment will grow more slowly than the process segment. Where once-through cooling is used, there is a significant expenditure for treatment of intake water due to large volumes. If cooling water is recycled up to 10 times through cooling towers, however, intake revenues are reduced—so internal recycling will decrease the intake market.

Key Takeaways

To sum it up, the technology for the initial treatment of makeup water is nearly identical among the different industries. Screens provide the removal of large particles, followed by clarifiers, automatic backwash or gravity media filters for removing smaller particles. Then, depending on the ultimate use, additional treatment steps involving crossflow membranes, cartridges and chemical treatment may be required. Process treatment varies considerably by industry. In mining and pharmaceuticals, for example, separation is the heart of the process to make the final product. The oil and gas industry has expanded its use of process treatment due to the use of hydraulic fracturing to release the gas and oil from the shale in which it is encapsulated. **iwwd**

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