

The valve market

Ultrapure water valve purchasers concentrated in a few companies



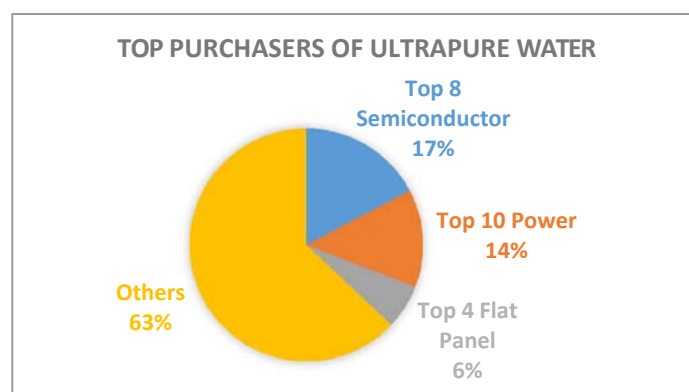
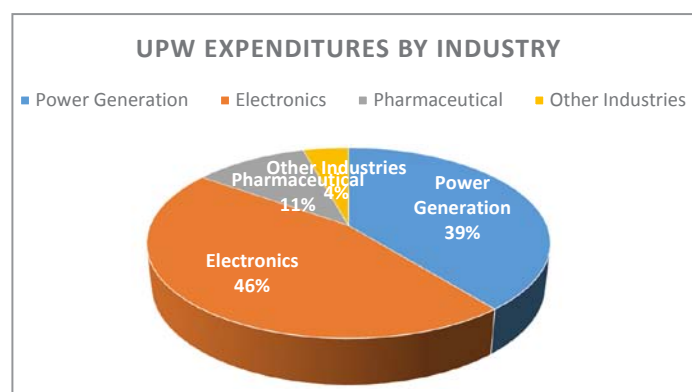
Bob McIlwaine is President of the McIlwaine Company which he founded in 1974. The company provides technical and market analyses of valves and many other components. It also analyzes the air, water, energy and contamination control industries throughout the world. Bob can be reached at rmcilwaine@mcilwainecompany.com

The purchases will be concentrated among relatively few companies. The top 20 companies will purchase 37% of the ultrapure water valves and the top 50 companies will average more than 1% each. The top eight semiconductor companies will account for 17% of the purchases. The top 10 power generator purchasers will average 1.4% each. Samsung will be the leading ultrapure water valve purchaser due to its production of both semiconductors and flat panel displays. Intel and EDF (power) are the only non-Asian purchasers in the top 10. Pfizer is the top pharmaceutical purchaser but is only ranked #23 on the list of the 40 largest purchasers. Roche is #24, Sanofi #25 and Merck #26.

Valves for ultrapure water applications have to be specially designed and also specially manufactured. The materials have to eliminate risks of contamination of the fluids. Assembly of the valves in cleanrooms prevents contamination from the ambient air. Ultrapure water is also required to clean the valves during assembly. So cleanroom valve companies are also purchasers of their own products. Bray Control's butterfly valves, Flow-Tek's ball valves, RitePro's check valves, as well as actuation and controls for ultrapure water services are assembled in a Class 1000 cleanroom. The room includes production, assembly, cleaning, and bagging of ultra-clean valves.

Top Ten Purchasers				
#	Company	semi	Other electronic	Power
1	Samsung	x	x	
2	Intel	x		
3	TSMC	x		
4	EDF			x
5	LGE		x	
6	Sony	x	x	
7	SK Hynix	x		
8	Micron	x		
9	China Datang			x
10	China Guodian			x

Power plants, electronics manufacturers, and pharmaceutical producers will spend \$200 million in 2015 for valves used in ultrapure water service. Most of the purchases will be made in Asia. This is due to the concentration of electronics plants as well as the large number of new coal fired power generators under construction. The only sector where Asia is not leading is pharmaceutical.



Crane valves for ultrapure applications are assembled in a 120m² ISO 14644-1 compliant cleanroom with integrated ultrasonic cleaning system, air locks for material and employees, a test stand combination for strength and leakage tests as well as helium test stand to determine the gas tightness of bellows and body. The individual valve components are first cleaned in the ultrasonic cleaning system and then moved into the cleanroom through the air lock. After the cleaning process the valves are exposed to UV-light, as an initial examination for the presence of undesired oil and grease. During the subsequent assembly process, any contamination of the valve interior is ruled out. Because of the process optimized sequence. Various tests for leak tightness and strength, by using nitrogen and helium, as well as another cleanliness inspection under UV-light take place before the finished and vacuum sealed valves leave the cleanroom.



Gemü Type 650 pneumatic aseptic metal diaphragm valve. Photo courtesy of GEMÜ Valves, Inc.



Gemü Type 677 manual PVDF plastic diaphragm valve. Photo courtesy of GEMÜ Valves, Inc.

Diaphragm valves are used primarily in control applications where heavy duty switching cycles and precise reliability and repeatability of the control of the process media(s) are required. The technical design of Gemü's aseptic weir style stainless steel diaphragm valves makes them sterilizable and autoclavable. If a plastic material is required, the Gemü PurePlus® High Purity line of PVDF weir style diaphragm valves are cleaned, assembled and bagged in a cleanroom which complies with ISO 8 (in operation) and GMP class C for assembly technology making them suitable for ultrapure water and/or DI Water applications.

Malema M-VF-F Series pressure relief valves are designed with an all-PFA molded body suitable for semiconductor, ultrapure water and aggressive chemical applications. Georg Fischer LLC is a major international supplier of valves for ultrapure water. It has cleanrooms in various locations including a class 10,000 cleanroom in the U.S. KSB-Amri ACRISS PFA lined butterfly valves are used in ultrapure applications such as 18 Mega ohm DI water and ultrapure HF acid. All wetted parts are PFA Teflon® and are molded in a separated clean room area of the Houston facility, with assembly and additional cleaning in a Class 100 environment.

Plast-O-Matic Valves, Inc. for ultrapure liquids are assembled in a class 100 cleanroom where the following cleanliness steps are taken

1. Rinse components with DI water.
2. Flush component with 18 megohm DI water for a minimum of five minutes under 60 psi of water pressure. Optional 8 and 16 hour hot DI water flush under 60 psi water pressure are available.
3. Scrub and clean component interior with designated soft nylon brush.
4. Inspect component for smooth clean interior.
5. Rinse component in clean DI water while rotating or otherwise agitating component.
6. While under purge, place component in a clean 6 Mil polyethylene sleeve and heat seal. Double bagging and label per customer requirements.



KSB-Amri ACRISS PFA lined butterfly valve

The large ultrapure water valve purchasers are moving toward global sourcing for several reasons. One is the importance of the products to the plant operations. A single small particle can cause rejection of a \$300 chip. Contaminated drugs are one of the biggest concerns of pharmaceutical companies. The ultra-supercritical power plants which are now under construction require water purity levels far greater than the sub critical plants which they are replacing.

The second reason for global sourcing is to facilitate evaluations on total cost of ownership. The high cost of these evaluations is spread out among a number of purchases. The benefits of buying the best rather than lowest price products far outweigh the costs.

The combination of concentration of buying power and emphasis on highest quality products creates a new and major opportunity for ultrapure valve providers. Mcllvaine has introduced a program incorporating detailed forecasting of total potential sales revenue for each major prospect, project and OEM purchaser or valves in each industry. This article has been extracted from information available in this program.