

## Ultra purification of high purity water / Polisher and distribution



**Step 1**  
**UV sterilisation and TOC reduction**  
 Any unused high purity water is collected in a buffer container and the used amount is replenished with high purity water.

### Application

The quality of the high purity water used in the production facilities of a research laboratory where special wafers and test wafers are produced is of paramount importance. The water required is used in the most varied steps of wafer production. The quality of usual high purity water is not sufficient for these special application criteria with regard to particles and harmful ions. As the number of the harmful residual molecules contained in the medium can be too high, the purified water has to be further purified. The water is carried in a ring main, where contamination is prevented. Water that is not used is conveyed back via a buffer container (5 m<sup>2</sup>) and re-treated. The amount of water used is replaced by adding pre-purified water.



**Step 2**  
**Polisher**  
 In an ion exchanger the high purity water is retreated by using a resin which cannot be regenerated in place.

### Plant technology

The additional purification process is carried out by using a polisher and secondary ultrafiltration (0.04 µm). The polisher is an ion exchanger filled with a special resin which is equipped with relevant anchor groups and which cannot be regenerated in place. When the resin is saturated, it has to be completely exchanged. To avoid an interruption of the installation, a change-over between two ion exchangers is possible. The secondary ultrafiltration washes out residual particles as well as germs and unwanted molecules. An UV light station is installed before the whole application to avoid organism germination and to reduce the TOC value. The distribution of the ultrapurified water to the different production areas takes place in a closed and minimal deadleg ring main / loop running at usually 4.5 bar.



**Step 3**  
**Ultrafiltration**  
 Using a filter with a retention of 0.04 µm, the smallest particles are captured.

### Solution

GEMÜ valves in PVDF-HP for all treatment processes, distribution and recirculation. The valves are straight through or T design and are manually or pneumatically operated. Sizes are DN 15 to 65.



**Step 4**  
**Ring mains**  
 In a loop consisting of PVDF pipes, fittings and valves the ultrapurified high purity water is conducted to the different production sectors. The unused water circulates back to the buffer container and is ultra purified again.

