

Product application for water

Softening water for pharmaceuticals according to USP/ EP



Application

The production of water for pharmaceuticals always consists of a series of treatment processes. The softening of the water is normally the first step of the chain of treatment. It ensures that hardness formers such as calcium and magnesium are removed and the following processes are not influenced by them. As the softening system is fed with raw water, it is the largest source of germs in the full process run. However, it is possible to reduce germs to a reasonable level using appropriate countermeasures, making full sterilisation during the following treatment phases easier to realise. Ion exchange serves as the softening process. This occurs due to the resin granulate stored in containers which is provided with anchor groups. After a corresponding operation period, the resin is saturated and must be regenerated. The mixed bed containers for small systems are all exchanged and replaced by a service provider. The regeneration process is realised statically in a reverse rinsing process for large systems as shown above.

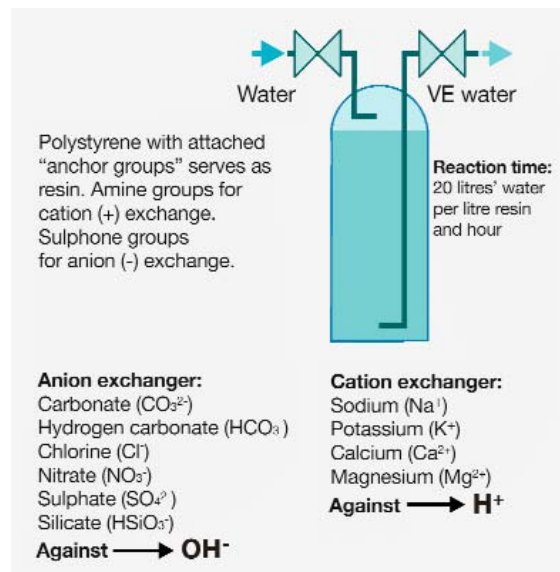
Plant design

In order to minimise germination and the formation of a biofilm as far as possible, the system illustrated is sanitised at regular intervals without using chemicals. This process takes place approx. once per week and is triggered fully automatically. For this purpose, the highly disinfectant effect of the saline solution (approx. 1.5 molar NaCl solution) needed to regenerate the resin is used in synergy with increased temperatures (60°C). Disinfectants such as chlorine are not needed at all. It has transpired that the regenerated section is already disinfected after 15 minutes. The plant can provide the softened water continuously as a result of two

independent systems which can be switched together. Moreover, the plant works using higher flow speeds, making the depositing of micro-organisms harder.

Solution

The pipes and valves are made of PP (polypropylene). The tried and tested GEMÜ 690 diaphragm valves are used, as far as possible pneumatically operated, "normally closed" and occasionally "normally open". The devices are equipped with GEMÜ 1201 – 1232 electrical position indicators (depending on the valves' stroke). Moreover, GEMÜ 800 flowmeters and manually operated GEMÜ 677 diaphragm valves are used.



GEMÜ® VALVES, MEASUREMENT AND CONTROL SYSTEMS

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