

Hot water cascade system for sterilizing liquids

The sterilization of liquids plays a large role in pharmaceutical and biotechnological production. This is just as important in research and development and in the production of sterile goods as it is in handling parenteral solutions in hospital pharmacies.

The hot water cascade system developed by MMM Münchener Medizin Mechanik GmbH enables liquids in closed receptacles made of glass or other temperature-resistant materials (such as ampoules) to be sterilized quickly, reliably and gently.

The advantage of the hot water cascade system lies in its very short cycle times, which are achieved through a high circulation rate and cascade density in combination with short heating up and cooling down times.

Operating principle

First, the chamber containing the item to be sterilized is filled to a pre-defined level (below the item being sterilized) with deionized sterilization water. This water then circulates through a steam-heated heat exchanger and cascades over the item being sterilized at a continuously rising temperature. This efficient method of transferring heat enables the item to be heated up in a quick and gentle way.

In the subsequent cooling phase, the sterilization water flows through the now water-cooled heat exchanger and cools the item being sterilized down to a specific temperature.

Throughout the process, temperature-controlled supporting pressure generated by sterile-filtered compressed air prevents the tightly closed receptacle from bursting or deforming.



Chamber of the hot water cascade sterilizer



GEMÜ 554 angle seat globe valve

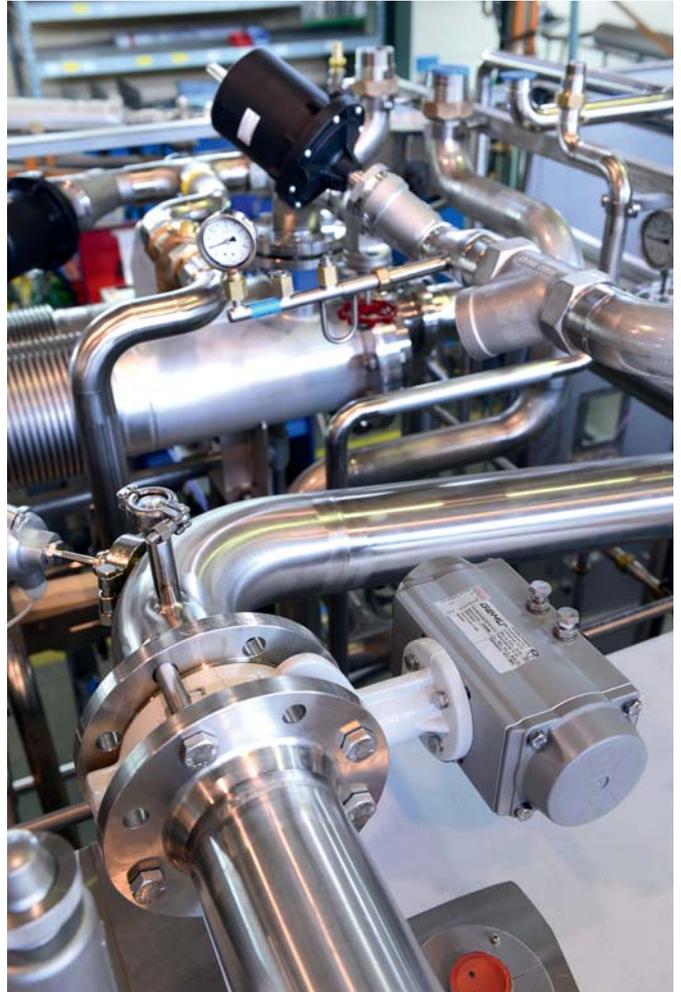


*GEMÜ 554 angle seat globe valve
and GEMÜ 490 butterfly valve*

Liquids are usually sterilized at 121 °C for 20 minutes, however the handling time can be adjusted depending on product requirements or a customer request.

Area of use of GEMÜ products

Pneumatically actuated GEMÜ 554 globe valves control the filling of the sterilization chamber with water and the way in which the heat exchanger is heated by steam and cooled using water. By contrast, GEMÜ 490 butterfly valves are used in the circulation line, as these have significantly more compact installation dimensions yet very high flow rates in comparison with pneumatically operated angle seat globe valves of the same nominal diameter. Furthermore, to meet these stringent requirements, they are fitted with highly resistant TFM plastics™ and FDA-approved silicone as a sealing material.



GEMÜ 490 butterfly valve in the supply line



GEMÜ 554



GEMÜ 490