

What role does water quality play **in reprocessing?**



In the reprocessing procedure for instruments, rinsing with water is often required to prevent the formation of stains, spots, marks and **corrosion**. If conventional tap water instead of de-mineralized water is used during the final phases (rinsing and disinfection) of the thermal washer-disinfector process, this can result in deposits on the load, thereby possibly impairing functionality of instruments. If contact is made with these deposits and left-over protein residues, this can impair the health of both the user and the patient. The use of **de-mineralized**, purified water provides a high degree of protection from deposits of mineral origin, as well as from the associated reductions in functionality of instruments and devices.

Water quality in steam sterilization

In steam sterilization, saturated steam is used for the sterilization of medical instruments.

All products in the autoclave must be fully in contact with the saturated steam. This is the only way to guarantee sterilization. This also applies to wrapped instruments; here, too, the steam penetrates the packaging and comes into contact with the instruments. In order to achieve sterile conditions it is important that the water is free from contamination (like e.g. chemicals, mineralization, etc.).

The use of poor-quality (e.g. hardness of water) of water can also substantially impair the lifespan of the autoclave or the sterilized instrument. Regular cleaning of the water container and the autoclave's chamber also provides protection from additional contamination and possible corrosion of the steam-producing parts of the autoclave. Some standards (EN 13060/EN 285; ANSI/AAMI ST55, ...) provide information regarding the desired optimized water quality through the respective water treatment.

The table below provides examples of the possible effects of several contaminants:

Contamination	Effect
Metals	Stains or blemishes on instruments; reduction of heat transfer (steam will not get in direct contact)
Bacteria and their products	Endotoxins can be deposited; can result in adverse effects for the patient (e.g. impaired wound healing)
Chlorides	Reduce the efficiency of the steam generation by corroding the steam providing parts of the steam generator
Ions	Calcium and magnesium salts; because of their low solubility in warm water, precipitation of the salts occurs. Result in coatings in chamber/on instruments. Compromise the lifespan of instruments/autoclaves. Reduce the efficiency of the steam
Deposits like lime scale or proteins	Deposits – exposure to contamination – reduction of lifespan of instruments and steam sterilizer

Several manufacturers offer **water treatment systems** that filter out the relevant contaminants and thereby produce demineralised water. The quality of the water vapour is thereby also heavily dependent on the quality of the water in terms of the hardness of water. Water reservoirs in autoclaves should be cleaned regularly, at least once per week, to avoid possible accumulations of particles and germs.

Bibliography:

The European standard EN 285:2006 (please check for updated version)

United States standard ANSI/AAMI ST79:2006 (please check for updated version)