

Clean water supply in the laboratories



In 2024 the Department of Geoscience had a new water system installed, ensuring high-quality TYPE 1 water according to the ASTM standard [D1193-99e1](#). The system is remarkable because it uses a minimum of resources (energy, salt and water) compared to older technologies. In total 600 liters can be produced per hour. Some of the already processed water is recirculated, providing a stable and very clean demineralized and ion-free water supply for our laboratories.

This specific setup (currently one of its kind at Aarhus University) is designed as a double pass reverse osmosis (RO) system, *Silhorko RO B1-2/2 EWLE*. Here the feed water is led through a set of membranes under pressure. Different steps involve removal of particles (particle filter), removal of organic material and bacteria (UV lamp), softening the water (addition of salt, unit *SM22-F*) and finally polishing (by ion exchange, *Demi-Mix*) – all ensuring that no residual traces of impurities (minerals, gases, CO₂) are left in the water.

The final conductivity of this type of water is <5 µS/cm and the hardness guaranteed <0.5 dH.

Demineralized and ion-free water is necessary for many laboratory processes, including cleaning glassware. It is also required by several instruments and laboratory processes containing clay: here it is necessary to ensure that no ions are present which ultimately can affect mineralogy and thus data acquisition. In most geochemical laboratories this water is available in specific green water taps labelled DVI. Demineralized water is also used in some areas (e.g. the Isotope lab) for humidifying the atmosphere of the room: it prevents build-up of static electricity and ensures stable work and measurement conditions.

For making solutions or dilutions the demineralized water is further refined in some laboratories by 3 individual Milli-Q systems from Merck. Our Advantage A10 systems are configured with a Q-Guide T1 pack and a Quantum Text cartridge, as well as an UV lamp, removing ionic and organic impurities down to trace levels. These Milli-Q systems produce ultra-pure water with a resistivity of 18.2 (“Ohm-18 water”). It is tapped using one of 5 Q-pod dispensers, each equipped with an additional Millipak particulate filter.

Our Milli-Q systems deliver ultrapure water with TOC values ≤ 5 ppb.

DEMINERALISERET VAND OG ULTRARENT VAND, 1670-1675 (Institut for Geoscience)

