thermo scientific

CASE STUDY: Sourcing ultrapure water for analytical laboratory experiments

How limited resources led to finding a flexible water purification system

General overview

Finding the right laboratory water purification system when space and resources are limited can be a challenge. Life science applications are often demanding and highly sensitive to contamination. Water used for such applications must be free of interferents, such as ions, particulates, organic molecules, nucleases, and bacteria. Purification systems built to meet these demands are often bulky and expensive. A cost-effective laboratory water purification system can be a good solution when a flexible footprint and smart budgeting are required.

Challenge

A public research university in the southeastern United States received a grant and the opportunity to set up a new laboratory. Large institutions typically have in-house water purification systems that provide ASTM Type II or Type III water for general laboratory applications. This institution was a smaller university with a limited number of shared resources. They did not have an in-house system, and the laboratory needed a cost-effective and high-quality system to produce ultrapure water from tap water. The system also had to have storage capacity and the ability to convert tap water to Type II water for general laboratory use or Type I water for analytical applications.

ThermoFisher SCIENTIFIC

thermo scientific

Solution

The team selected the Thermo Scientific™ Barnstead™ Smart2Pure™ Pro 16 LPH system with a 60 L storage tank. They also purchased installation and an extended warranty. The leak detection and automatic shutoff features of the Smart2Pure Pro 16 system were highly appealing to the team. The hand dispenser that dispensed Type II water from the storage tank was a great feature, because the team wanted to use water from the system for other tasks like washing labware. This more than made up for the lack of a shared in-house system. The extended warranty for the system was also very important to the team, because they would not have to worry about potential wear and tear during periods of heavy use.

Installation of the system was flexible, so they were able to put the pretreatment module under the sink and mount the storage tank on the wall with the dispenser above the sink. The Smart2Pure Pro system was placed on the counter by the sink, which was where they normally dispensed water.

Application

The laboratory needed Type I ultrapure water for high-performance liquid chromatography (HPLC) and mass spectrometry (MS) experiments. Irradiation by the ultraviolet lamp in the system removed organic compounds that could interfere with HPLC-MS analysis. A water supply free of contaminants was critical for analyzing samples, so the team was particularly interested in the two built-in dispensers on the Smart2Pure Pro system. They could obtain Type I water from the system dispenser, and water from the storage reservoir could be used when they needed Type II water for general applications.

The laboratory was studying microbes in soil samples, so nucleases and bacteria could seriously interfere with their experiments. The built-in ultrafilter in the Smart2Pure Pro system was important for the laboratory, because it was designed to remove nucleases. Periodic flushing extended the life of the ultrafilter. The water purification system also came with a 0.1 micron filter that prevented the contamination of Type I water by bacteria, including mycoplasma. Since the laboratory had tap water, the Smart2pure Pro system had the advantage of producing each type of water they needed.

Product features

Compact Barnstead Smart2Pure Pro systems convert tap water to ASTM Type I water. The Smart2Pure Pro UV/UF 16 LPH system comes with a choice of a 30 L or 60 L reservoir for customizable water storage, and it dispenses both ASTM Type I and Type II water.

- Leak sensor shuts off the water supply when a leak is detected
- Inline ultrafilter with a large surface area removes endotoxins and nucleases
- Reverse osmosis monitor extends cartridge life
- Sterile venting filter/reservoir overflow prevents contamination of stored water
- Optional wall mounts minimize laboratory footprint

Find out more at **thermofisher.com/waterpurification**

ThermoFisher SCIENTIFIC