



Case Study: Ultrafiltration Pumps New Life Into Old UV System

Municipal Utility Upgrades Drinking Water Treatment System



CUSTOMER / USER Kirchberg im Wald municipality (Germany)



THE SITUATION

Turbid natural-spring water, outdated ultraviolet radiation system, insufficient drinking water disinfection, confined space



THE SOLUTION

Seccua Phoenix 4: ultrafiltration removes turbidity and minimizes future retrofit costs

When the small Bavarian town of Kirchberg im Wald realized that its water-treatment practices had become outdated, it was forced to retrofit the system. The Ultraviolet radiation system used to treat the town's water supply was retrofitted with a Seccua ultrafiltration unit, thereby ensuring that the water going to its citizens would be effectively disinfected.

Situated in the rolling hills of the Bavarian Forest about 12 miles northeast of Deggendorf, Kirchberg im Wald has traditionally supplied its community with natural spring water from the nearby Hangenleithen Forest. Until recently, the town had used ultraviolet radiation to disinfect water before feeding it into the system. But the water coming from the spring would become turbid depending on weather conditions. This meant that the UV system intended to disinfect it was no longer fit for purpose. That is because particulates in turbid water actually block ultraviolet rays from reaching the microorganisms they are intended to eliminate. The remaining radiation dose is simply insufficient to destroy all the waterborne genetic materials.

Hygienic and technical standards have become much more rigorous since the last time Kirchberg im Wald upgraded its water-treatment systems back in 2007. Consequently, the regional water management authority issued a mandate requiring Kirchberg im Wald to urgently expand and upgrade its existing treatment plant if it hoped to continue supplying the community's water independently. In order for ultraviolet filtration systems to function properly, water-turbidity levels must be kept below a certain threshold. That meant the solution to Kircherg im Wald's problem was a simple one: just install an ultrafiltration unit ahead of the UV system to effectively remove turbidity, thereby ensuring its correct operation. Kirchberg im Wald also required a solution that would guarantee uninterrupted service since the water it supplied to the community fed into the system immediately after treatment.

Ultrafiltration - Reliable UV-Disinfection Pre-Treatment

To solve their problem, Kirchberg im Wald opted for a Phoenix 4 ultrafiltration system by Seccua. The high-tech membrane does more to ensure maximum water quality than simply removing turbidity, however. It's also an effective barrier against waterborne pathogens, parasites, and other microorganisms. The membranes are based on technology originally developed for use in clinical dialysis. They reduce turbidity-promoting solids and other particles, such as microplastics, to below the 0.15 NTU visibility limit. They also remove 99.99999 % of all waterborne bacteria and parasites as well as up to 99.99 % of all viruses.

Phoenix 4 is the only filtration solution in its class to feature a fouling-detection system based on real time flow-rate and water-pressure data. Phoenix 4's self-flushing mechanism also automatically adapts to fluctuations in water quality. In doing so, it saves precious drinking water because less turbidity means less frequent flush cycles. That particular feature was especially valuable in Kirchberg's case because the only water available for back flushing was already-treated water from a freshwater tank.

The Phoenix system's automated integrity test ensures that contamination retention is ongoing. An integrated integrity test automatically deactivates the system and notifies the water service provider at the first sign of filter damage. Using some of the world's most stringent monitoring and testing standards, the Environmental Protection Agency (EPA) and the California Department of Public Health (CDPH) have tested, verified, and affirmed the efficacy of the system's waterborne-pathogen retention as well as the soundness of its integrity test. Consequently, the integrity test also complies with the guidelines set forth by the German Gas and Water Supply Association (DVGW) in its Workbook W213-5.

Pre-installed in PE Well Casing

The Phoenix system's smart controller directs the entire treatment process. Not only does it make remote access effortless, Phoenix's plug-and-play design allows for seamless integration into existing control systems as well. The system installed in Kirchberg im Wald has a service rate of 55.5 gpm. That's more than 3,300 gallons of pure water filtered every hour! Phoenix is also easy to scale. Should the municipal utility decide it wants to increase output at a later date, it can simply add modules to the system.

The expansion mandated by the regional water managers was too large to fit into the existing water treatment building. Therefore the partner company Schwarzkopf Wassertechnik GmbH, based in nearby Schöllnach, fitted the Seccua ultrafiltration unit and the necessary radon removal system in PE well casing and buried it underground. The well casing and all the technical equipment was preassembled at the Schwarzkopf plant and because of that the expanded water treatment facility went into operation within two weeks of being delivered. The old ultraviolet system was relocated from the original treatment building to a new underground utility room. This not only reduced building time dramatically but the cost to upgrade the public water system as well.

Together, the Seccua ultrafiltration unit and the old UV system are giving the residents of Kirchberg im Wald new peace of mind by providing them with a double layer of protection against pathogen contamination. When the community decided to install a Phoenix system, it opted for a tried-and-true and highly-effective water treatment solution that small and midsize municipal providers all across the region already swear by.



The Phoenix 4 ultrafiltration system by Seccua.



Schwarzkopf Wassertechnik crane hauling PE well casing to its new home.



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