TechNotes

CO_2 Incubators + Aqua-Tec Water Preservation Cell

How does Thermo Scientific™ Aqua-Tec™ Water Preservation Cell help protect against microbial contaminants in a cell culture incubator water reservoir while saving time and money and without using chemicals, which could harm sensitive cultured cells?

The Aqua-Tec Water Preservation Cell uses natural ionic silver as an oxidation catalyst to work with naturally occurring oxygen in the water, creating free radicals that attack and destroy microorganisms. Aqua-Tec is easy to use: simply remove it from the package and drop it into the incubator water reservoir. It will last for up to six months, and it self-regulates, only releasing silver ions into the water as needed to maintain the proper concentration. Ongoing use of an Aqua-Tec Water Preservation Cell means you spend less time fighting common incubator contaminants including bacteria and fungi. You should still regularly clean the water reservoir to remove dirt and spilled media, which could interfere with the activity of the Aqua-Tec Water Preservation Cell. Start with sterilized distilled water and use the Aqua-Tec Water Preservation Cell to keep the water clean while your cultures grow, uninterrupted.

Ongoing use of chemical disinfectants in the water of a CO_2 incubator can have negative effects.[1] Chemical disinfectants often include volatile organic chemicals and leave residues that can elicit stress responses and induce toxicity in cultured cells.[2] Many of these disinfectants can also cause corrosion and pitting of stainless steel, damaging the CO_2 incubator over time.

Ultraviolet light, while effective in reducing microbial load in a number of applications, is not a good option for CO_2 incubators because it is not effective in high humidity.[3]

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Aqua-Tec Water Preservation Cell Is Effective

The Aqua-Tec Water Preservation cell uses a silver metal catalyst and naturally occurring oxygen in water to create reactive oxygen species (ROS), which attack organic species and molecules in the water, breaking them down with a micro-electric potential of 800 mV. It has broad-spectrum efficacy, unlike many chemical disinfectants. The Aqua-Tec Water Preservation Cell is registered with the United States Environmental Protection Agency and the European Union BioProducts Regulation as a biocidal product. It has been shown in multiple tests to be effective against common laboratory water microbial contaminants.

Start with sterilized distilled water. But, since indoor room air and humans working in the lab normally carry and spread microorganisms, contaminants can enter any CO_2 incubator whenever the door is opened. The Aqua-Tec Water Preservation Cell will help to eliminate microorganisms that enter the incubator and settle into the water pan, and will continue to minimize contaminants for months. If an overwhelming contamination occurs, we recommend to discard the water, use a chemical disinfectant to eliminate the contaminant, sterilize the removable pan in an autoclave, and refill it with fresh, sterilized distilled water. If an automated high-temperature cycle designed to provide 6-12-log sterilization is available on the incubator, we also recommend to run that cycle.

Aqua-Tec Water Preservation Cell Is Safe

Many labs use chemical disinfectants diluted in the CO_2 incubator humidity water to minimize growth of microorganisms. However, as shown in Table 1, most of these chemicals have negative effects on the incubator over time, causing corrosion, and some can induce stress responses in cultured cells.[2] All chemical disinfectants require manual measuring and dilution, and many are hazardous at the stock concentrations. In contrast, the Aqua-Tec Water Preservation Cell requires no handling: simply remove it from the package and drop it into the water reservoir. It will continuously help protect the incubator water for up to six months and has no negative effects on cultured cells or incubator components, unlike many chemical disinfectants.

Summary

Aqua-Tec Water Preservation Cell easily and safely helps protect the water in your cell culture incubator and is safe for cultured cells.

References

1. Thermo Scientific Technical Note: Proper care and maintenance for a cell culture incubator. Thermo Fisher Scientific TNCO2CARE 1217, 2018.
2. Croute F et al. Volatile organic compounds cytotoxicity and expression of HSP72, HSP90 and GRP78 stress proteins in cultured human cells. Biochim Biophys Acta 1591, 2002.
3. Burgener J. Position paper on the use of ultraviolet lights in biological safety cabinets. Appl Biosafety 11(4), 2006.

Table 1. Comparison of Water Disinfectants

Example	Type	Handling/Use	Efficacy in CO_2 Incubator	Effects on CO_2 Incubator
Aqua-Tec Water Preservation Cell	**Oxidation catalyst**	**None/As-is**	**++**	**None**
Lysol No Rinse, CONFLIKT, Fermacidal D-2	10% or less quaternary ammonium	Manually dilute 1:100	++	None
Copper Sulfate	Solid crystals	Manually dissolve to 1ppm	+	Incubator corrosion over time
AquaClear, SigmaClean	25%-70% quaternary ammonium	Manually dilute 1:100	++	Incubator corrosion within months[1]
100% solid copper	Water pan	None/As-is	+++	None
Ultraviolet light	Electromagnetic radiation	None/As-is	--[3]	None
Bleach	Chlorine disinfectant	Manually dilute 1:100	+++	Incubator corrosion within months, stress responses from cultured cells[1,2]

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