

Beyond Clean Low Temp Sterilization Expert™:

JOURNEY BY VAPORIZATION

Jean-Luc Lemyre | Senior Manager R&D | Stryker

When a hydrogen peroxide solution is vaporized, its molecules are freed from one another to travel the world in gaseous form. In an SPD, this world they travel is the chamber of a low temperature sterilizer and the medical devices it contains. This gaseous state allows the reactive H₂O₂ molecules to reach deep into these medical devices and find bugs hidden in lumens, cracks, and crevices.

Hydrogen peroxide sterilizers start their cycles by removing air from the sterilization chamber to achieve a deep vacuum. The H₂O₂ solution is then vaporized with heat and introduced inside the sterilization chamber, followed by a waiting period allowing the H₂O₂ molecules to do their remarkable job. The vacuum within the chamber aids the vaporization of the solution and the absence of air helps H₂O₂ molecules to go everywhere. Some sterilizer cycles also include the use of plasma or ozone as a means of further reducing H₂O₂ residuals and/or to enhance the cycle lethality. A vacuum is applied again to remove the sterilant from the sterilization chamber. The previous steps are repeated to provide a sterilization process with an appropriate safety margin. Finally, the chamber is evacuated and filled with air for the sterilized load to be safely retrieved. Note that the evacuated H₂O₂ is broken down into oxygen and water vapor by a catalyst before being released safely into the room.

Despite the heat used to vaporize the hydrogen peroxide solution, the process remains at relatively low temperatures (<55°C or <131°F), making it suitable for heat sensitive devices that would otherwise be damaged by steam sterilization. Contrary to liquid H₂O₂ disinfection, vaporized H₂O₂ sterilization achieves Sterility Assurance Level (SAL) and leads to packaged devices that remain sterile until use. We'll talk about SAL in our next installment.

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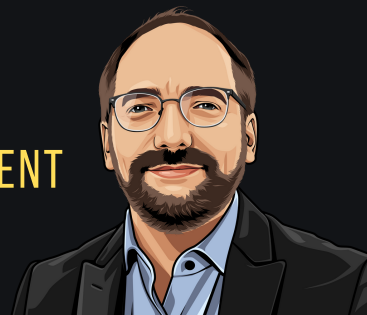
Have more low temp sterilization questions? Contact Jean-Luc at: jeanluc.lemyre@stryker.com

Beyond Clean Low Temp Sterilization Expert™ Biography:

JEAN-LUC LEMYRE

SENIOR MANAGER RESEARCH & DEVELOPMENT

stryker



Jean-Luc is passionate about science and innovation and has been involved in R&D for two decades, ranging from fundamental academic research to product development. He joined TSO₃ in 2016 where he was introduced to low-temperature sterilization of medical devices using hydrogen peroxide and ozone. Today, Jean-Luc is a Senior Manager of R&D at Stryker following the acquisition of TSO₃. In this role, he leads a team of scientists and engineers dedicated to innovating for the benefit of sterile processing professionals. During his career, Jean-Luc has been involved in several product improvements along with the associated regulatory clearances. He is also an active member of standards development committees with AAMI and ISO.

Before discovering his passion for sterile processing, he started his career doing R&D in the field of personal protective equipment. He has a PhD in chemistry from Université Laval in the beautiful Québec City, where he still lives with his family.

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