

OZONATION

WHAT IS THIS USED FOR?

As sanitizer/disinfectant to inactivate microbes in air, water, beverages, and on food. Reducing microbial load in the food processing environment.

HOW DOES IT WORK?

Ozone is a short-lived molecule that rapidly reverts to harmless atmospheric oxygen. During the process of reverting to oxygen it generates active oxygen species that oxidize/disintegrate different organic molecules; for example, (i) molecules necessary for survival of microbes, (ii) residues on surfaces, (iii) mycotoxins and similar.

APPLICATION


A device generates ozone gas on-site from either atmospheric, gas mixture, or pure oxygen. The generated ozone gas can be directly used in different applications as sanitizer/disinfectant or it can be introduced into water to create ozonated water that can be used in similar applications. Some of the common applications include treatment of water, treatment of process air, flushing headspace in packaging, gassing or washing of food (fruits, vegetables, beverages, spices, meat, and fish). Applications for treating fluid milk, milk powders and cheese have been developed in the past.

ASSESSMENT OF EFFECTIVENESS

Broad spectrum activity of ozone has the potential to effectively inactivate microbes including bacterial spores and microbes in biofilms, however effectiveness depends on number of different factors; e.g., type of product, type of microbes, expected microbial loads, physiological state of microbes, presence of organic material, concentration of ozone and time of treatment. For this reason, a well validated method of using ozone must be developed if this method is to be used for inactivation of microbes in specific food application. Detrimental effect of ozone on treated surfaces (e.g., equipment) and food has to be also taken into consideration when using this strong oxidizer.

REGULATORY IMPLICATIONS

Ozone is approved by FDA to be used as an antimicrobial agent in food processing, however, because of its toxicity and risk to the workers it is regulated by OSHA and usually requires a continuous ozone detection/warning system in place to protect the employees

 <https://www.tandfonline.com/doi/full/10.1080/10408398.2017.1308313>

<https://onlinelibrary.wiley.com/doi/pdf/10.1111/1471-0307.12302>