

Checklist for Identifying Odor Sources in the Plant

Peracetic acid (PAA) is a stabilized mixture of hydrogen peroxide, acetic acid and peracetic acid. The acetic acid portion is commonly at higher levels than the PAA. The two ingredients smell quite similar, so it is usually difficult for the average person to discern the differences. Currently no official maximum odor threshold has been established for PAA and those for acetic acid are moderately placed. The combined odor of PAA/acetic acid can be barely noticeable for some individuals on the one hand and irritating to others under the same conditions. Therefore, it is important to identify sources of the potential odor so that mitigation measures can be implemented to keep the workplace atmosphere as neutral and as pleasant as possible even to those sensitive individuals. Below we identify the primary sources of any fugitive odors and make suggestions as to how to minimize the source.

By far the most common potential origin for odor problems comes from the largest open source: the poultry chiller. The second most common source comes from various spray systems, such as in secondary processing or for OLR units. OLR is the primary problem source for these spray uses primarily due to the relative size of the system compared to other minor spraying operations.

A. THE CHILLER:

1. Make sure the PAA injection is below the water surface and is not injected in a turbulent area of the chiller that will force the concentrated PAA to the surface. It is recommended to inject the PAA into a pipe or intake area of a recirculating pump which will dilute the PAA prior to entering the main chiller. Prediluting the PAA in a water return line or using multiple injection points are also viable options.
2. PAA and acetic acid are very volatile at pH's less than 6.5. Raising the chiller pH with a caustic solution to about ± 7.5 or higher will drastically reduce the partition ratio (tendency to volatilize). The reason is that all of the acetic acid changes to acetate ion at these higher pH ranges, which has about 8-10 times less tendency to vaporize than does acetic acid. Bactericidal efficacy of the PAA will not be compromised because it has a pKa constant of pH 8.2 in chilled water.

B. SPRAYS:

Evaluating spray systems for potential volatility can be somewhat more complex than chiller systems. The particle size of the water being sprayed is the most important factor in reducing potential fugitive vapor. Commonly too high a water pressure is used or the spray nozzles that are too small (or both) are equally important causes of excessive vapors. Higher pressures and small flow nozzles are a major source of fugitive vapors, due to the small particle size created by these conditions. Usually, concentrations of PAA below 150-200 ppm are not a problem for the surrounding area workers in most cases. Also be aware of the OLR cabinet drip collection system. Sometimes a simple catch tray with a drain line placed below the OLR cabinet prevents significant fugitive odors. If higher impingement (impact velocity) applications are necessary, i.e. for certain types of OLR cabinets or process objectives, then ventilation hoods may be required. And lastly, consider the pH adjustment scenario discussed in A(2) above as an alternate option for reducing fugitive odors. (Keep in mind the odor potential of acetic acid/PAA can be reduced by >50% by adjusting the solution to about pH 7).

Enviro Tech has extensive experience in evaluating technical and safety issues, and we are available for support from distributors, FSIS inspectors and end users/producers alike, and we encourage anyone who may have questions or need technical assistance to call us at any time.

Thank you. The Enviro Tech Team.