Premium PAA

Sanitation with Peracetic Acid

SOLVENT SYSTEMS International, Inc.
Environmental Services

Outline

Chemistry

Microbiology – efficacy

Regulatory Approvals

Safety

Handling – how to use

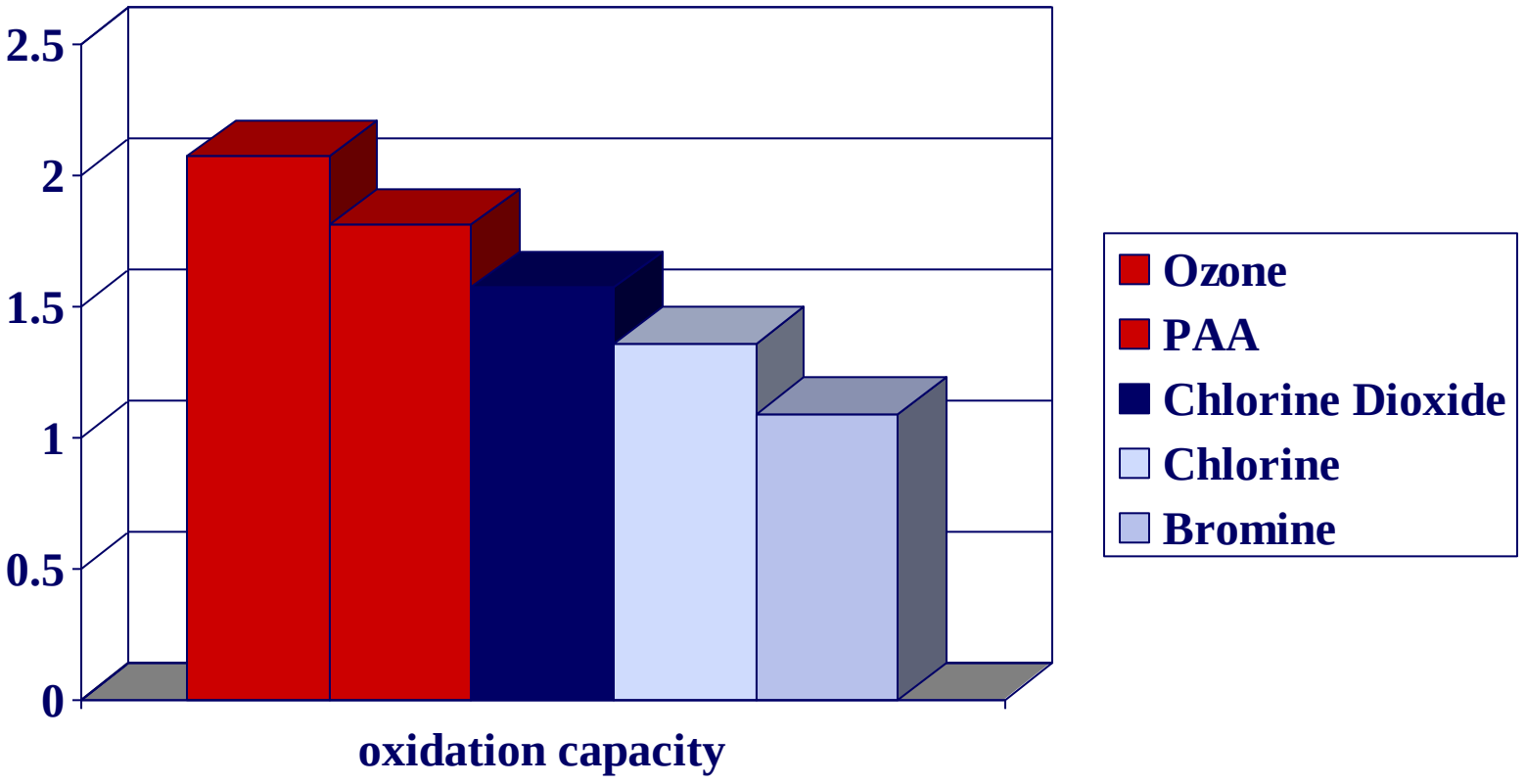
Q & A

What Is Premium PAA?

	Activity
• **Peracetic acid (PAA)**	**15%**
• **Hydrogen peroxide**	**22%**
• **Specific Gravity**	**1.12**

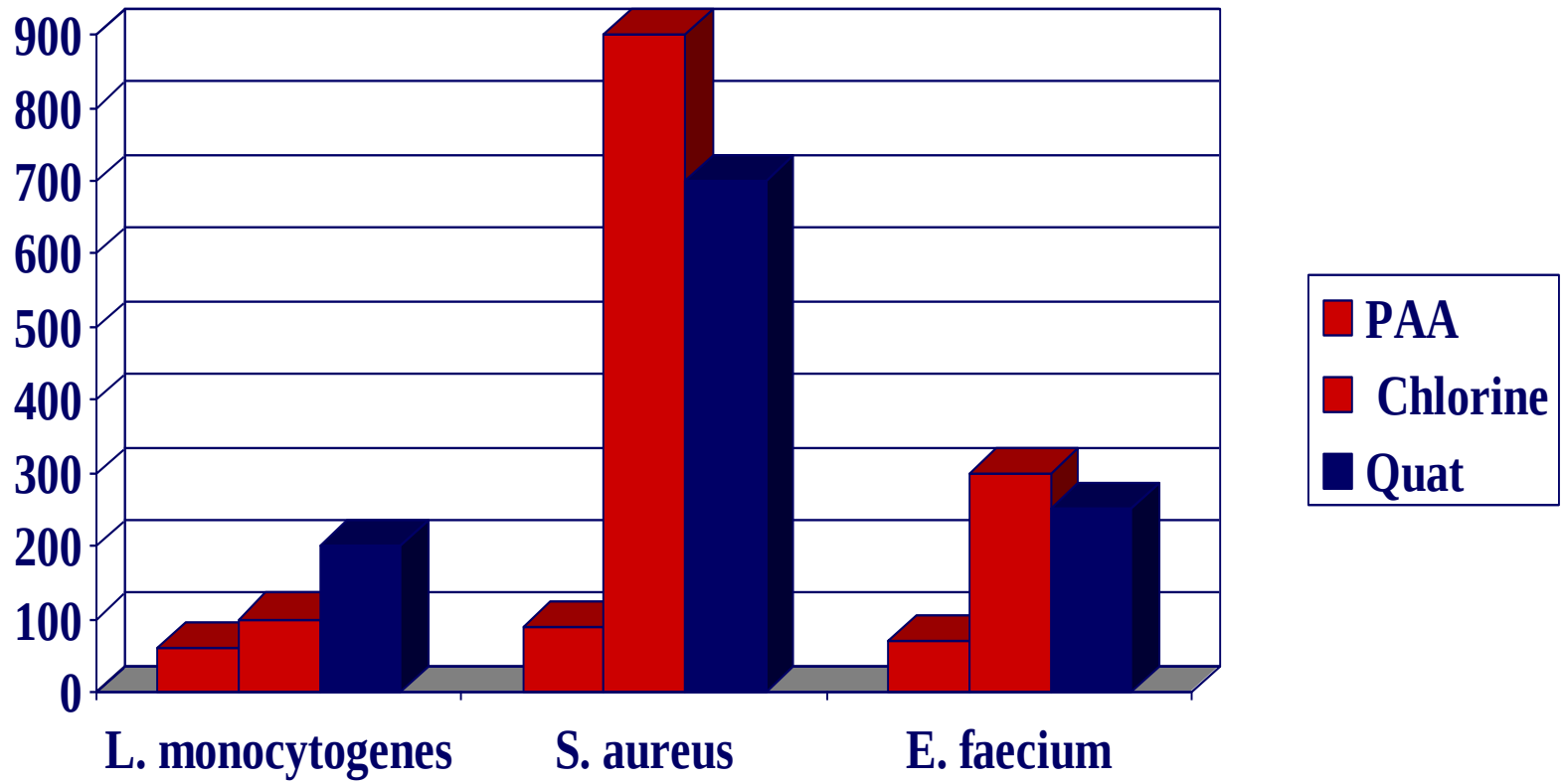
$H_2O_2 + CH_3COOH \leftrightarrow CH_3COO\text{-}OH + H_2O$

OXIDATION POTENTIAL
PAA VS OTHER OXIDANTS (e^- VOLTS)



PAA Efficacy (Bacteria)

In the Presence of Hard Water and High Organic Load
ppm required for lethality in < five minutes



Conclusion

PAA is less affected by organic load (soil) than either chlorine or Quaternary (Quat) sanitizers.

Premium PAA
Efficacy on Food Bacteria

80 ppm PAA (1 oz per 6 gal water)

Species	***log kill****	***time (sec)***
Salmonella choleraesuis	>7.04	30
Listeria monocytogenes	>5.0	30
Staphylococcus aureus	>6.88	30
Escherichia coli	>6.94	30

* All organisms pass the AOAC Germicidal and Detergent Sanitizing Action of Disinfectants Test

Premium PAA Efficacy on Food Microorganisms

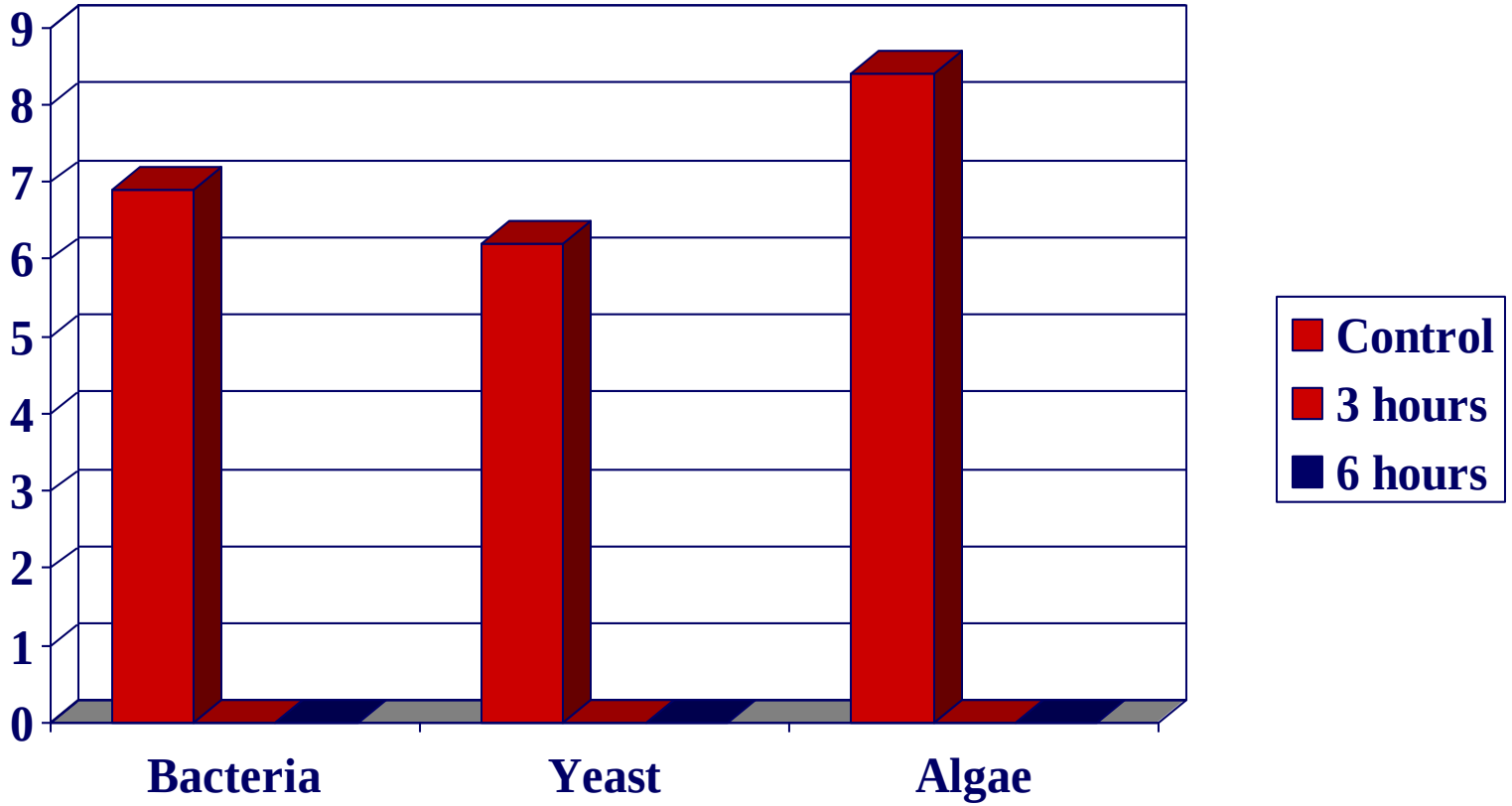
1000 ppm PAA at 46° C

Species	*Control**	*Log kill**	*time (sec)*
Bacillus subtilis **(Spoilage bacteria)**	**6.2**	**>6.2**	**15**
Byssochlamys fulva **(Fungus)**	**5.1**	**>5.1**	**15**
Aspergillus niger **(Yeast)**	**5.1**	**> 5.1**	**15**

*** Log 10**

Premium PAA

SHOWS A COMPLETE KILL AT 9 PPM, IN 3 HOURS (LOG REMAINING)



Premium PAA

Sanitation of Food Processing Equipment

Fruit & vegetable processing

Beverage plants – high level sanitation of bottles

Wineries, breweries

Meat, poultry, seafood and egg plants

Used in High Pressure Kobe systems in all the above

Premium PAA

Sanitation Properties

- Disperses/penetrates biofilms
- Kills bacteria, mold, fungus, and yeast
- Very fast acting
- Unaffected by hardness and soil
- Non-foaming
- Does not contribute taste, odor or color
- No rinse required

Premium PAA

Sanitation Properties

- Does not form disinfection byproducts
- Breaks down into carbon dioxide and water
- Does not add conductivity (TDS)
- Non-corrosive to stainless steel, aluminum
- No RMP requirement
- Easily dispensed as a liquid
- Easy to test for

Premium PAA

PAA Sanitation-Regulatory

- **EPA approved as a pesticide**
  - **40 CFR 152.25 (a) EPA #63838-1**
- **FDA approved for *direct* food contact**
  - **21 CFR 173.315 (fruits, vegetables)**
  - **21 CFR 173.370 (meat, poultry, seafood)**
- **FDA approved as sanitizer on food contact surfaces**
  - **21 CFR 178.1010**

Premium PAA

PAA In/On Food

- **Approved for direct fruit and vegetable contact without a final rinse.**
  - ✓ **Limit is 80 ppm as PAA for direct food contact**
  - ✓ **Limit is 500 ppm as equipment sanitizer (without a potable water rinse) (40 CFR 180.1197)**
- **Other uses include dip (wash) tanks, sprays, continuous belt sprays, cooling water, etc.**

Premium PAA

Approvals

- National Organic Program
  - Approved Nov 17, 2000
- NSF approved for fruit and vegetable washing without a final rinse
  - Registration No. 122280
- Kosher approved including Passover
  - Pareve, Kashruth Certification

Premium PAA

Safety and Handling

Storage:

- PAA solutions should be kept in cool environments when possible.
- **Never** store a PAA drum outdoors in a **bright sunlight** without protecting the tops from direct sun. Sunlight will increase the temperature in the headspace of a drum, and the gas may expand faster than the venting membrane devices will allow.

Premium PAA

Safety and Handling

Miscellaneous safety:

- NEVER place or pour *concentrated* PAA solutions into any type of other holding device, such as 'shot' feeders, day tanks, or any other type of container, unless it is dedicated for PAA and is made of compatible materials.
- As a rule, add PAA solutions to water only.

Premium PAA

Safety and Handling

- NEVER return PAA solutions back to the original container once it is removed. The slightest contamination may degrade the product remaining in the drum, or may set off a decomposition reaction, which evolves oxygen and heat.
- ALWAYS wear gloves, goggles or faceshield, and other appropriate chemical resistant gear when handling peroxyacetic acid products.