Peracetic Acid (PAA) Fact Sheet

**Peracetic acid (PAA) is a highly corrosive chemical often used in the healthcare industry for instrument disinfection and also for aseptic processing and packaging in the food & beverage industry. Know the facts for worker safety and process management.**

**Uses of PAA**
- Biocide: Healthcare, aseptic packaging, food processing including fruits and vegetables, meat production, water treatment, and cooling water
- Bleach: pulp & paper
- Oxidizer: Epoxidation reagent, etching circuit boards.

**Chemical Properties**
- PAA is an oxidizer: Epoxidation reagent.
- A strong oxidizing agent, and primary irritant but a weak acid (pKₐ = 8.2).
- Acrolein is also a reaction product.
- Mol. Wt 76.05g/mol, CAS 79-71-6, BP 105-110 °C (explodes violently on heating to 110°C, forms an equilibrium mixture with hydrogen peroxide and acetic acid).
- It is highly corrosive. Note: Review on current OELs for PAA.

**Microbiocidal Activity**
- Bacteria: PAA will inactivate gram-positive and gram-negative bacteria, fungi, and yeasts in <5 minutes at <100 ppm. In the presence of organic matter, 200-500 ppm is required.
- For viruses, the dosage range is wide (12-2250 ppm), with poliovirus inactivated in yeast extract in 15 minutes with 1500 to 2250 ppm.
- Bacterial spores in suspension are inactivated in 15 seconds to 30 minutes with 50 to 10,000 ppm (0.05 to 1%).

**Hazard Summary**
- PAA can affect you when inhaled
- PAA is a highly corrosive chemical and contact can severely irritate and burn the skin and eyes leading to eye damage.
- Breathing PAA can irritate the nose and throat.
- Breathing PAA can irritate the lungs causing coughing and/or shortness of breath. Higher exposures can cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.
- High or repeated exposure may affect the liver and kidneys. Note: A detailed summary of health effects of PAA exposure is available from the National Library of Medicine and the ECHA.

**Exposure Limits**
- ACGIH STEL TLV 0.4 ppm, (15 min TWA) 
- US OSHA, => no occupation exposure limit set, there is a PEL for hydrogen peroxide (1 ppm 8 hr TWA) and acetic acid (10 ppm 8 hr TWA).
- Note: PAA is more hazardous than either hydrogen peroxide or acetic acid and the concentration of PAA and the hazard presented cannot be assessed based on measurements of hydrogen peroxide and acetic acid only.
- UK HSE => no occupation exposure limit set, there is a WEL for hydrogen peroxide (1ppm 8 hr TWA, 2ppm STEL 15 min TWA) 
- Note: Review on current OELs for PAA.

**Acute Exposure Guidelines (US-EPA)**
- AEGL 1 - 0.52 mg/m³, 0.17ppm
- AEGL 2 - 1.6 mg/m³, 0.51ppm
- AEGL 3 - 10 min: 60 mg/m³, 19 ppm; 30 min: 30 mg/m³, 9.7ppm; 60 min: 15 mg/m³, 4.8ppm; 4 hrs: 6.3 mg/m³, 2.0ppm; 8 hrs: 4.1 mg/m³, 1.3ppm

**HMIS**
- Health Hazard: 3, Fire Hazard: 2, Reactivity: 4, Personal Protection: 1

**See Reverse for more valuable information.**
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Regulatory Environment
United States
OSHA
- Duties: Employers have a duty to provide a safe work environment and employees have a duty to work safely.20
- Hazard Communication Regulation21, suppliers (labels, safety data sheets). Employers (facilities, work practices, training and personal protective equipment) to enable the safe use of the chemicals.

EPA
- PAA is a registered pesticide under FIFRA. Reports for various products & manufacturers are available.22
- Approved for anthrax spore decontamination23
- PAA has been tested as a green disinfectant,24

FDA/USDA: PAA is exempt from food residual requirements;25 and may be used in organic food production.26

DOT – Class 5.2, organic peroxide.

European Union
Article 1.6. MAINTENANCE - annex 1 of machinery directive 2006/42/EC

§243 Cleaning of internal parts. … Where it is not possible to avoid entering such parts, the necessary protective measures must be taken, such as, for example, the fitting of an adequate ventilation system, the monitoring of the concentration of hazardous substances or of the lack of oxygen in the air and provisions for the surveillance and safe rescue of operators.27

ER Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products.28

Full registration under REACH, & list of registered suppliers29

United Kingdom
COSHH Regulations. (Employers have a duty to assess the workplace, identify chemical health hazards, take necessary measures to protect health, provide information & training to employees, and plan for emergencies).30

CHIP regulations concern hazardous information and packaging (implementing the Dangerous Substances Directive (No. 67/548/EEC), and the Dangerous Preparations Directive (No. 99/45/EC).31 CHIP is being replaced by the European Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP Regs.).32

20 Occupational Safety and Health Act 1970, §5
21 29 CFR 1910.1200
22 http://www.epa.gov/pesticides/chemicals/reports-review/r065201.html
23 http://www.epa.gov/pesticides/chemicals/reports-review/r065201.html
24 40 CFR 119.166 - Peroxyacetic acid: exempt from the requirement of a tolerance; https://www.law.cornell.edu/cfr/text/40/180.1196
25 USDA National Organic Program Rule Summary; Prepared by Jim Riddle, and Miles McEvoy., Updated by Jim Riddle 12/20/06;
30 http://www.epa.gov/pesticides/chemicals/reports-review/r065201.html
31 http://www.hse.gov.uk/coshh/basics.htm
32 http://www.hse.gov.uk/chemicals/classification/legal/chip-regulations.htm

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