

MATERIAL SAFETY DATA SHEET

VigorOx® Antimicrobial Agent



MSDS Ref. No.: 79-21-0-6
Date Approved: 11/10/2006
Revision No.: 18

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200; the Canada's Workplace Hazardous Materials Information System (WHMIS) and, the EC Directive, 2001/58/EC.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: VigorOx® Antimicrobial Agent

SYNONYMS: Peroxyacetic Acid and Peracetic Acid Solutions

ALTERNATE PRODUCT NAME(S): VigorOx - SP Paper System Biocide, VigorOx 395 Cooling Water System Biocide, VigorOx PG Coating Preservation Biocide, VigorOx RP Pulp System Biocide

GENERAL USE: EPA Registration No. 65402-2

VigorOx® Antimicrobial Agent has been formulated for use:

In controlling bacterial, fungal and yeast growth in pulp, paper and paperboard mills.

For the control of slime forming bacterial and fungi growth in water based paper coatings.

For the control of slime forming bacteria in cooling water systems (e. g., cooling towers and evaporative condensers).

MANUFACTURER

FMC CORPORATION
FMC Peroxygens
1735 Market Street
Philadelphia, PA 19103
(215) 299-6000 (General Information)

EMERGENCY TELEPHONE NUMBERS

(303) 595-9048 (Medical - U.S. - Call Collect)

For leak, fire, spill, or accident emergencies, call:
(800) 424-9300 (CHEMTREC - U.S.A. & Canada)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- Clear liquid with a sharp, pungent, vinegar-like odor.
- Oxidizer.
- Stabilized peracetic acid, an ingredient in this product, decomposes under fire conditions to release oxygen that intensifies the fire.
- Use water to keep fire exposed containers cool.
- Severely irritating to skin and eyes.

POTENTIAL HEALTH EFFECTS: Liquid and mist are corrosive (causing burns); direct contact could cause irreversible damage to eyes including blindness and/or irreversible destruction of skin tissue. Vapor/mist will irritate nose, throat and lungs but will usually subside when exposure ceases.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Peroxyacetic Acid	79-21-0	5 - 6	201-186-8	O, C; R7-10-34; S1/2-3/7-14-36/37/39-45-61
Hydrogen Peroxide	7722-84-1	22 - 23	231-765-0	Xn, R22-4; S1/2-3-17-26-28-36/37/39-45
Acetic Acid	64-19-7	10 - 11	200-580-7	R10-34-35-36/38; S1/2-23-26-45
Water	7732-18-5	63 - 65	231-791-2	Not classified

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor immediately.

SKIN: Immediately flush with plenty of water while removing contaminated clothing and/or shoes, and thoroughly wash with soap and water. See a medical doctor immediately.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, see a medical doctor. If breathing has stopped, give artificial respiration and see a medical doctor immediately.

NOTES TO MEDICAL DOCTOR: This product can be corrosive to skin, eyes and mucous membranes. Consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Observation may be warranted. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water spray to keep fire exposed containers cool. Extinguish fire using agents suitable for nearby fires.

FIRE / EXPLOSION HAZARDS: Oxygen that can initiate or promote combustion.

FIRE FIGHTING PROCEDURES: Use flooding quantities of water only. Use water spray to keep fire exposed containers cool. Fight fire from protected location or maximum distance. Chemical type extinguishers are not effective with peracetic acid or hydrogen peroxide, which are ingredients in this product. Use proper personal protective equipment and positive pressure self contained breathing apparatus.

FLAMMABLE LIMITS: Not available

SENSITIVITY TO IMPACT: Not available

SENSITIVITY TO STATIC DISCHARGE: Not available

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Approach release from upwind. Stop or control leak using special protective clothing and positive pressure self-contained breathing apparatus. Control run off and isolate discharged material for proper disposal. Do not allow undiluted material to enter storm or sanitary sewer systems.

Combustible materials exposed to hydrogen peroxide, an ingredient in this product, should be immediately submerged in, or rinsed with, large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

7. HANDLING AND STORAGE

HANDLING: Transfer product from drums to process in closed system (hermetically) and if not possible use effective local exhaust ventilation. Empty drum as thoroughly as possible. Triple rinse before disposal. Avoid contamination; impurities accelerate decomposition. Never return product to original container.

STORAGE: Do not store near reducing agents, fuels or other non-compatible materials. Store in a cool, dry, well ventilated area. For quality purposes, avoid temperatures above 86° F. Higher temperatures will accelerate decomposition resulting in a loss of assay. Do not store in direct sunlight, or near sources of ignition or heat. Do not double stack. Use first in, first out storage system. Containers must be vented. Expected shelf life - 1 year.

COMMENTS: VENTILATION: Provide mechanical local exhaust ventilation to prevent release of mist into the work area. If ventilation is inadequate or not available use acid gas cartridge or canister with full face-piece.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Hydrogen Peroxide	1 ppm (TWA)	1 ppm (PEL)	
Acetic Acid	15 ppm (STEL)	10 ppm (PEL)	

ENGINEERING CONTROLS: Provide mechanical local exhaust ventilation to prevent release of mist into the work area. If release is expected use respiratory protection.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Use cup type chemical goggles. Full face shield may be used.

RESPIRATORY: For normal use as directed, respiratory protection is not required. However, if exposures are anticipated to be above the limits as indicated in the "Exposure Limit" table, an approved full-face acid/gas cartridge or canister respirator should be used. If concentrations are unknown (e.g., significant spill or other emergencies), or if they are anticipated to be above 5 ppm for hydrogen peroxide or 50 ppm for acetic acid, the use of a full-face airline supplied respirator or self-contained breathing apparatus (SCBA) is recommended.

PROTECTIVE CLOTHING: Aluminized fiberglass flame-retardant full protective clothing. Rubberized steel toe safety boots. Hydrogen peroxide is an ingredient in this product; completely submerge hydrogen peroxide contaminated clothing or other materials in water prior to drying. Residual hydrogen peroxide, if allowed to dry on materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

GLOVES: Heavy rubber gloves. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Sharp, pungent, vinegar like odor
APPEARANCE:	Colorless liquid
AUTOIGNITION TEMPERATURE:	270 °C (518 °F)
BOILING POINT:	About 99 °C (210 °F)
COEFFICIENT OF OIL / WATER:	Not available
DENSITY / WEIGHT PER VOLUME:	9.17 lb/gal
EVAPORATION RATE:	Above 1 (Butyl Acetate = 1)
FLASH POINT:	Approximately 83 °C (181 °F) (CC)
MELTING POINT:	-25.9 °C (-15 °F)
ODOR THRESHOLD:	Not available
OXIDIZING PROPERTIES:	Oxidizer
pH:	Less than 1
SOLUBILITY IN WATER:	100 % @ 25 °C (by wt.)
SPECIFIC GRAVITY:	1.10 @ 20 °C (H ₂ O=1)
VAPOR DENSITY:	Not available (Air = 1)
VAPOR PRESSURE:	22 mm Hg @ 25 °C (77 °F)

COMMENTS:

pH (1% solution) @ 25°C: 2-3

Self Accelerating Decomposition Temperature (SADT) > 55°C (55 gallon drum)

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Open flames, elevated temperatures, any source of heat, combustibles such as paper and wood and contamination. For quality purposes, avoid temperatures above 86°F. Higher temperatures will accelerate decomposition resulting in a loss of assay.
STABILITY:	Stable (expected shelf life - 1 year, when stored at temperatures below 86°F).
POLYMERIZATION:	Will not occur
INCOMPATIBLE MATERIALS:	Dirt, alkali, reducing agents, organics and heavy metals such as iron, copper, chromium, aluminum, cobalt and caustic.

HAZARDOUS DECOMPOSITION PRODUCTS: Acetic acid and oxygen that supports combustion.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Severely irritating [FMC Study I95-2036]

SKIN EFFECTS: Severely irritating [FMC Study I95-2036]

DERMAL LD₅₀: No data available for the product.
Peracetic Acid: > 200 mg/kg (rabbit) [FMC I83-721]

ORAL LD₅₀: 1,922 mg/kg (rat)

INHALATION LC₅₀: No data available for the product.
5% Peracetic Acid: 4,080 mg/m³ (4157 ppm) (4 h) (rat) [FMC Study I96-2138]
100% Peracetic Acid: 204 mg/m³ (66 ppm) (4 h) (rat) [FMC Study I96-2138]

TARGET ORGANS: Eyes, skin, nose, throat, lungs

ACUTE EFFECTS FROM OVEREXPOSURE: Liquid may cause severe burns and irreversible tissue damage to eyes, including blindness. Product contains peracetic acid. Inhalation of peracetic acid vapors causes lacrimation and irritation of the mucous membranes, eyes and nasal passages.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the product. Product contains hydrogen peroxide. The International Agency for Research on Cancer (IARC) has concluded that there is inadequate evidence for carcinogenicity of hydrogen peroxide in humans, but limited evidence in experimental animals (Group 3 - not classifiable as to its carcinogenicity to humans). The American Conference of Governmental Industrial Hygienists (ACGIH) has concluded that hydrogen peroxide is a 'Confirmed Animal Carcinogen with Unknown Relevance to Humans' (A3).

CARCINOGENICITY:

Chemical Name	IARC	NTP	OSHA	Other
Hydrogen Peroxide	Listed	Not listed	Not listed	(ACGIH) Listed (A3, Animal Carcinogen)

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

96-hour LC₅₀ = 1.6 mg/L (Rainbow trout) [FMC I95-2023]
96-hour LC₅₀ = 1.1 mg/L (Bluegill sunfish) [FMC I95-2029]
48-hour EC₅₀ = 0.73 mg/L (Daphnia magna) [FMC I95-2021]
120-hour EC₅₀ = 0.18 mg/L (Selenastrum, green algae) [FMC I95-2027]

CHEMICAL FATE INFORMATION: No data available for the product. Peracetic acid is completely miscible with water. Aqueous solutions of peracetic acid hydrolyze to acetic acid and hydrogen peroxide.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Discharge as a hazardous waste into a suitable treatment system in accordance with local, state and federal governmental agencies.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME:	Hydrogen Peroxide and Peroxyacetic Acid Mixtures, Stabilized with Acids, Water and not more than 6% Peroxyacetic Acid
PRIMARY HAZARD CLASS / DIVISION:	5.1 (Oxidizer)
HAZARD CLASS, SUBSIDIARY:	8 (Corrosive)
UN/NA NUMBER:	UN 3149
PACKING GROUP:	II
LABEL(S):	5.1 Oxidizer and Subsidiary Risk: 8 (Corrosive)
PLACARD(S):	Bulk: 5.1 Oxidizer
MARKING(S):	Hydrogen Peroxide and Peroxyacetic Acid Mixtures, Stabilized with Acids, Water and not more than 6% Peroxyacetic Acid, UN 3149
REPORTABLE QUANTITY (RQ):	Not applicable
ADDITIONAL INFORMATION:	49 STCC Number: Not required - no rail shipments Material is shipped in 5 gal. (45 lb.), 30 gal. (250 lb.) and 55 gal. (450 lb.) vented linear (not cross linked) polyethylene drums and IBCs. Do not ship on wooden pallets.

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PROPER SHIPPING NAME:	Hydrogen Peroxide and Peroxyacetic Acid
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Mixtures, Stabilized with Acids, Water and not more than 6% Peroxyacetic Acid

**INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) /
INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)**

PROPER SHIPPING NAME: Hydrogen Peroxide and Peroxyacetic Acid Mixtures, Stabilized with Acids, Water and not more than 6% Peroxyacetic Acid

ADDITIONAL INFORMATION: NOTE: Venting of packages is not permitted for air transport.

OTHER INFORMATION:

Protect against physical damage. Use proper personal protective equipment and positive pressure self-contained breathing apparatus when handling spills or leaks. Dike any spills.

If this material is ever shipped via vessel, the container requires subsidiary placarding in addition to main hazard class placards.

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):
Listed

SECTION 311 HAZARD CATEGORIES (40 CFR 370):
Fire Hazard, Immediate (Acute) Health Hazard

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):
The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.:
500 lb

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):
Peracetic acid

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):
5% Peracetic Acid (Unlisted), RQ = 100 lbs., Corrosivity, Reactivity
Listed

<u>Chemical Name</u>	<u>RQ</u>	
Acetic Acid	5,000 lb	Category D

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA INVENTORY STATUS (40 CFR 710):

Listed

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):

Waste Number: D001 (ignitability), D002 (corrosivity)

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):

Product Identification Number: 9183
Hazard Classification / Division: Class D, Div. 2, Subdiv. B. (Toxic), Class E (Corrosive), Class C (Oxidizer)
Ingredient Disclosure List: Listed

INTERNATIONAL LISTINGS

Peroxyacetic acid:
Australia (AICS): Listed
China: Listed
Japan (ENCS): (2)-689
Philippines (PICCS): Listed

Hydrogen peroxide:
China: Listed
Japan (ENCS): (1)-419
Korea: KE-20204
Philippines (PICCS): Listed

Acetic acid:
Australia (AICS): Listed
China: Listed
Japan (ENCS): (2)-688
Korea: KE-00013

HAZARD, RISK AND SAFETY PHRASE DESCRIPTIONS:

Peroxyacetic acid:

EC Symbols: O (Oxidizer)
C (Corrosive)

EC Risk Phrases:	R7	(May cause fire)
	R10	(Flammable)
	R34	(Causes burns)
EC Safety Phrases:	S1/2	(Keep locked up and out of reach of children.)
	S3/7	(Keep in a cool place and keep container tightly closed)
	S14	(Keep away from: see Incompatible Materials in Section 10 above)
	S36/37/39	(Wear suitable protective clothing, gloves and eye/face protection.)
	S45	(In case of accident or if you feel unwell, seek medical advice immediately - show the label where possible.)
	S61	(Avoid release to the environment. Refer to special instructions/safety data sheets.)

Hydrogen Peroxide, (Index #008-003-00-9):

EC Symbols:	Xn	(Harmful)
EC Risk Phrases:	R22	(Harmful if swallowed.)
	R41	(Risk of serious damage to eyes.)
EC Safety Phrases:	S1/2	(Keep locked up and out of reach of children.)
	S3	(Keep in a cool place.)
	S17	(Keep away from combustible material.)
	S26	(In case of contact with eyes, rinse immediately with plenty of water and seek medical advice)
	S28	(After contact with skin, wash immediately with plenty of water and soap.)
	S36/37/39	(Wear suitable protective clothing, gloves and eye/face protection.)
	S45	(In case of accident or if you feel unwell, seek medical advice immediately - show the label where possible.)

Acetic acid:

EC Symbols:	C	(Corrosive)
	Xi	(Irritant)

EC Risk Phrases:	R10	(Flammable)
	R35/34	(Causes severe burns / causes burns)
	R36/38	(Irritating to eyes and skin.)
EC Safety Phrases:	S1/2	(Keep locked up and out of reach of children.)
	S23	(Do not breathe gas, fumes, vapor, or spray)
	S26	(In case of contact with eyes, rinse immediately with plenty of water and seek medical advice)
	S45	(In case of accident or if you feel unwell, seek medical advice immediately - show the label where possible.)

16. OTHER INFORMATION

HMIS

Health	3
Flammability	1
Physical Hazard	2
Personal Protection (PPE)	H

Protection = H (Safety goggles, gloves, apron and a vapor respirator)

HMIS = Hazardous Materials Identification System

Degree of Hazard Code:

- 4 = Severe
- 3 = Serious
- 2 = Moderate
- 1 = Slight
- 0 = Minimal

NFPA

Health	3
Flammability	1
Reactivity	2
Special	OX

SPECIAL = OX (Oxidizer)

NFPA = National Fire Protection Association

Degree of Hazard Code:

- 4 = Extreme
- 3 = High
- 2 = Moderate
- 1 = Slight
- 0 = Insignificant

REVISION SUMMARY:

This MSDS replaces Revision #17, dated June 15, 2006.

Changes in information are as follows:

Section 14 (Transport Information)

Section 16 (Other Information)

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