**VigorOx® Oil & Gas Plus**

EPA Reg. No. 65402-8  
EPA Est. 65402-NY-001

For Industrial Use Only

**ACTIVE INGREDIENTS:**  
Peroxyacetic Acid .................................. 15%  
Hydrogen Peroxide ............................... 23%  
**TOTAL:** ........................................ 100%

**OTHER INGREDIENTS:** .......................... 62%

**KEEPI OUT OF REACH OF CHILDREN**  

**DANGER**

VigorOx® Oil & Gas Plus is for biofouling and slime control in
- Recirculating process and cooling water systems  
- Pulp and paper mill systems  
- Coating preservation  
- Dispersed pigment preservation

VigorOx® Oil & Gas Plus is for use in the sanitization of ultra filtration and reverse osmosis (RO) membranes and their associated distribution systems.

VigorOx® Oil & Gas Plus is for use in oilfield and gas-field well operations.

**First Aid**

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

If in eyes
- Hold eye open and rinse slowly and gently with water for 15-20 minutes.  
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.  
- Call a poison control center or doctor for treatment advice.

If on skin or clothing
- Take off contaminated clothing.  
- Rinse skin immediately with plenty of water for 15-20 minutes.  
- Call a poison control center or doctor for treatment advice.

If inhaled
- Move person to fresh air.  
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible.  
- Call a poison control center or doctor for further treatment advice.

If swallowed
- Call poison control center or doctor immediately for treatment advice.  
- Have person sip a glass of water if able to swallow.  
- Do not induce vomiting unless told to do so by a poison control center or doctor.  
- Do not give anything by mouth to an unconscious person.

**Note to Physician:** Probable mucosal damage may contraindicate the use of gastric lavage.

**Precautionary Statements**

**Hazards to Humans and Domestic Animals**

**DANGER**

Corrosive, causes eye and skin damage. Harmful if swallowed. Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Wash thoroughly with soap and water after handling. Do not breathe vapor or spray mist. Do not enter an enclosed area without proper respiratory protection.

**Physical or Chemical Hazards**

Strong oxidizing agent. Mix only with water. VigorOx® Oil & Gas Plus is not combustible; however, at temperatures exceeding 156°F, decomposition occurs releasing oxygen. The oxygen released could initiate or promote combustion of other materials.

**Environmental Hazards**

This pesticide is toxic to birds, mammals, fish, aquatic invertebrates, shrimp, clams, and oysters. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. In developing the NPDES permit, restrictions on the release of waters containing this product during low-flow periods and/or mixing zones, especially during maximum discharge should be considered.

Manufactured by:  
PeroxyChem, LLC  
2005 Market St Ste 3200  
Philadelphia PA 19103-7014

Net Contents: 55 Gallons (208 L) 495 lbs (224 kg)
STORAGE AND DISPOSAL

STORAGE: NEVER RETURN VigorOx® Oil & Gas Plus TO THE ORIGINAL CONTAINER AFTER IT HAS BEEN REMOVED. Avoid all contaminants, especially dirt, caustic, reducing agents, and metals. Contamination and impurities will reduce shelf life and can induce decomposition. In case of decomposition, isolate container, douse container with cool water and dilute with large volumes of water.

Avoid damage to containers. Keep container closed at all times when not in use. Keep container out of direct sunlight. To maintain product quality, store at temperatures below 86°F. Do not store on wooden pallets.

Procedure for Leak or Spill
Stop leak if this can be done without risk. Shut off ignition sources; no flames, smoking, flames, or spark producing tools. Keep combustible and organic materials away. Flush spilled material with large quantities of water. Undiluted material should not enter confined spaces.

DISPOSAL
Pesticide Disposal: If material has been spilled, an acceptable method of disposal is to dilute with at least 20 volumes of water followed by discharge into suitable treatment system in accordance with all local, state, and Federal environmental laws, rules, regulations, standards, and other requirements. Because acceptable methods of disposal may vary by location, regulatory agencies should be contacted prior to disposal.

VigorOx® Oil & Gas Plus which is to be discarded should be disposed of as hazardous waste after contacting the appropriate local, state, or Federal agency to determine proper procedures.

Container Disposal
Nonrefillable containers less than 5 gallons. Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinseate into application equipment or a mix tank or store rinseate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Nonrefillable containers greater than or equal to 5 gallons. Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinseate into application equipment or a mix tank or store rinseate for later use or disposal. Repeat this procedure two more times. Empty drums are not returnable to PeroxyChem, LLC unless special arrangements have been made. Dispose of drums in accordance with local, state, and Federal regulations.

All Refillable containers. Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinseate into application equipment or rinseate collection system. Repeat this rinsing procedure two more times. Return to PeroxyChem, LLC for reuse.

DIRECTIONS FOR USE
It is a violation of Federal law to use this product in a food or food contact.

Biofouling Control in Pulp and Paper Mill Systems
For use in the manufacture of paper and paperboard intended for food and non-food contact.

VigorOx® Oil & Gas Plus can be used to control bacterial, fungal and yeast growth in pulp, paper and paperboard mills.

1. Severely fouled systems should be cleaned before initial treatment with VigorOx® Oil & Gas Plus. Refer to the plant operations manual for directions for cleaning severely fouled systems. The product should be added directly to the system and not mixed with any other chemicals or additives. Other chemicals can be added separately. Contamination with other chemicals could result in product decomposition.

2. Add the VigorOx® Oil & Gas Plus at a point in the system where it can be mixed uniformly with the pulp, e.g., the beater, hydro pulper, fan pump, broke pump etc.

3. Intermittent feed method: Apply 0.5 lb to 1.2 lb (7 to 16 fluid ounces) of VigorOx® Oil & Gas Plus per ton (dry basis) of pulp or paper produced for two to three hours every eight-hour shift. Maintain a concentration that provides adequate control. This will provide 37.5-90 ppm of peroxyacetic acid and 57.5-138 ppm of hydrogen peroxide. Daily rate could change depending on the severity of the biofouling.

4. Continuous feed method: Initially, use the intermittent feed method to achieve control. When control is accomplished, apply VigorOx® Oil & Gas Plus continuously at the rate determined adequate for intermittent control. Then reduce the rate of addition to the lowest level sufficient to maintain control. Depending on the severity of the biofouling, control usually can be maintained using a continuous rate of 0.2 to 1.2 lb (2.6 to 16 fluid ounces) of VigorOx® Oil & Gas Plus solution per ton (dry basis) of pulp or paper produced on a continuous basis. This will provide 15-90 ppm of peroxyacetic acid and 23-138 ppm of hydrogen peroxide.


VigorOx® Oil & Gas Plus is for use in treating raw (make-up) and process waters, closed and opened loop systems such as heat exchanges, wet scrubbers, cooling towers, evaporative condensers and recirculating industrial process waters, such as pulp and paper mill water systems.

1. Severely fouled systems should be cleaned before adding the VigorOx® Oil & Gas Plus solution. Refer to the system operation manual for directions to clean severely fouled systems. The product should be added directly to the system and not mixed with any other chemicals or additives. Other chemicals should be added separately. Contamination with other chemicals could result in product decomposition.

2. Add the VigorOx® Oil & Gas Plus solution at a point in the system where uniform mixing and even distribution will occur.

3. Intermittent feed method: When the system is noticeably fouled, apply 0.8 to 1.2 lb (10 to 16 fluid ounces) of VigorOx® Oil & Gas Plus solution per 1000 gallons of water in the system (provides 15-23 ppm of peroxyacetic acid and 23-35 ppm of hydrogen peroxide). Repeat until control is achieved. When microbial control is evident, add 1.0 lb (14 fluid ounces) of the solution per 1000 gallons of water in the system every day, or as needed, to maintain control. The daily dose rate could vary depending upon the severity of the biofouling.

4. Continuous feed method: Initial dose – When the system is just noticeably fouled, apply 0.8 to 1.2 lb (10 to 16 fluid ounces) of VigorOx® Oil & Gas Plus solution per 1000 gallons of water in the system. When microbial control is achieved, start adding VigorOx® Oil & Gas Plus solution continuously at a rate of 1.0 lb (14 fluid ounces) per 1000 gallons of water (provides 17 ppm peroxyacetic acid and 26 ppm of hydrogen peroxide). Then reduce the rate of addition to a level sufficient to maintain control. The dose rate may have to be adjusted to account for losses due to blowdown and evaporation. Add 1.4 fluid ounces of VigorOx® Oil & Gas Plus for every 100 gals of make-up water.
Control of Bacteria and Fungi in Dispersed Pigments

VigorOx® Oil & Gas Plus can be used to control bacteria and fungi in the manufacture and storage of dispersed pigments used in paint and paper production such as kaolin clay, titanium dioxide, calcium carbonate, calcium sulfate, barium sulfate, magnesium silicate and kieselguhr.

Apply 0.2 to 1.2 lb (2.6 to 16 fluid ounces) of VigorOx® Oil & Gas Plus solution to each 1,000 lb (454 Kg) of fluid. This will provide 200 to 1200 ppm of product (30 to 180 ppm of peroxyacetic acid and 46 to 275 ppm of hydrogen peroxide).

Batch Sanitization of Ultra-Filtration and Reverse Osmosis (RO) Membranes

VigorOx® Oil & Gas Plus is for use in the sanitization of ultra filtration, medical and non-medical institutional/industrial reverse osmosis (RO) membranes and their associated distribution systems. This product is not for use in kidney dialysis reprocessing equipment.

This product has been shown to be an effective disinfectant when tested by AOAC and EPA methods. This product may not totally eliminate all vegetative microorganisms in reverse osmosis membranes and their associated piping systems due to their construction and/or assembly, but can be relied upon to reduce the number of microorganisms to acceptable levels when used as directed. Check with equipment manufacturer for membrane compatibility with VigorOx® Oil & Gas Plus.

1. Remove biological or organic fouling from the membrane or other parts of the system with an appropriate cleaner.
2. Flush the system with RO permeate or similar quality water.
3. Remove mineral deposits with an acidic cleaner prior to sanitizing the membranes.
4. Flush the system with RO permeate or similar quality water.
5. Prepare an appropriate volume of 1% solution of the product (6.4 fl. oz. per 5 gallons of water). This will provide 1745 ppm of peroxyacetic acid and 2678 ppm hydrogen peroxide.
6. Fill the entire water circuit to be sanitized with the dilute solution and allow the solution to reach a minimum of 20°C (69°F).
7. Recirculate the dilute solution of VigorOx® Oil & Gas Plus for a minimum of 10 minutes.
8. Allow membrane elements to soak in the solution for a minimum of 20 minutes.
9. Rinse the RO system and test for residuals to ensure that there is less than 3 ppm peroxygen. Residuals can be reduced by diverting product water to drain.

Batch Sanitization of Piping Systems Associated with RO Membranes

1. Isolate incompatible equipment from piping system. This Includes activated carbon filters and ion exchange equipment. Turn off power to ultraviolet light units.
2. Estimate total volume of water contained in the system (tanks, rinse stations and piping). Prepare an appropriate volume of 1.0 to 1.5% VigorOx® Oil & Gas Plus solution by adding 1.0 to 1.5 gallons of the product for every 100 gallons of solution prepared. Use RO permeate or similar quality water for dilution. This will provide 1745-2618 ppm peroxyacetic acid and 2676-4014 ppm hydrogen peroxide.
3. Recirculate the dilute VigorOx® Oil & Gas Plus solution through the system for a minimum of 4 hours. Process usage valves should be opened and closed to expose internals to the VigorOx® Oil & Gas Plus solution.
4. Completely drain the system of dilute VigorOx® Oil & Gas Plus solution. Thoroughly rinse the system by filling with RO permeate or similar quality water and recirculate before drainage. Repeat the process until test for residuals indicates there is less than 3 ppm peroxygen.

Continuous/Intermittent Addition to Minimize the Accumulation of Biological Matter Between Intermittent Sanitizing Episodes in Piping Systems Associated with RO Membranes.

1. VigorOx® Oil & Gas Plus, as received or diluted, may be added continuously to the feed water stream between system sanitizing episodes, to aid in minimizing the regrowth/accumulation of biological matter. The peroxygen residual in the system that is effective will vary with the design and usage characteristics of the system. Adjust the addition rate of VigorOx® Oil & Gas Plus or the solution and periodically monitor residual peroxygen so that the desired effect is obtained.
2. For continuous addition do not exceed 20 ppm VigorOx® Oil & Gas Plus (0.1 fl. oz. per 40 gallons of water). This will give 3.4 ppm peroxyacetic acid and 5.2 ppm hydrogen peroxide.
3. For intermittent feed do not exceed 2000 ppm VigorOx® Oil & Gas Plus (10 fl. oz. per 40 gallons of water). This will give 341 ppm peroxyacetic acid and 523 ppm hydrogen peroxide.

For antimicrobial use with aqueous treatment fluids in subterranean oilfield and gas-field well operations such as well drilling, formation fracturing, productivity enhancement and secondary recovery.

VigorOx® Oil & Gas Plus can be for control of slime forming and spoilage bacteria, yeast and fungi and anaerobic sulfate reducing bacteria, Desulfovibrio vulgaris, that lead to reservoir souring and metal corrosion. This product must be introduced through a closed mixed/loading and delivery transfer system equipped with a metering device that is appropriate for its intended uses.

Drilling Muds, Fracturing Fluids, Well Squeezed Fluids

For the preservation of drilling muds, workover and completion fluids and other product susceptible to contamination, pre-mix with the fluid or add directly at the point of use at 3.75 fluid ounces per 1000 gallons of water (5.1 ppm of Peroxyacetic acid and 7.8 ppm of Hydrogen Peroxide) to 75.5 fluid ounces per 1000 gallons of water (102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide) as required. Depending on the severity of the contamination, initial application may be added up to 755 fluid ounces per 1000 gallons of water (1029.4 ppm of Peroxyacetic acid and 1578.4 ppm of Hydrogen Peroxide).

Flooding, Injection and Produced Water

For Water Flooding operations, add initially at 3.75 fluid ounces per 1000 gallons of water (5.1 ppm of Peroxyacetic acid and 7.8 ppm of Hydrogen Peroxide) to 75.5 fluid ounces per 1000 gallons of water (102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide) and repeat until control is achieved. Subsequent treatment may be continued on a weekly or bi-weekly basis or as required.

Injection wells associated with gas storage systems may be treated up to 102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide when diluted in the formation water. Any additional top-up water should be treated as required.

For hydrostatic systems, apply 3.75 fluid ounces per 1000 gallons of water (5.1 ppm of Peroxyacetic acid and 7.8 ppm of Hydrogen Peroxide) to 75.5 fluid ounces per 1000 gallons of water (102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide) depending on the water quality and the duration of the shut-in.

Pipeline and Tank Maintenance

For microbial control in water-bottoms in crude and refined hydrocarbon storage tanks, piping and transportation systems: Apply 3.75 fluid ounces per 1000 gallons of water (5.1 ppm of Peroxyacetic acid and 7.8 ppm of Hydrogen Peroxide) to 75.5 fluid ounces per 1000 gallons of water (102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide) in the aqueous phase, directly injected into the water-bottom, pipeline or may be added to the hydrocarbon phase. Treatment may be applied daily or monthly for both storage and transportation systems as needed.

Note: May cause bleaching of treated surfaces

Note: Before using VigorOx® Oil & Gas Plus to sanitize metal surfaces, it is recommended that the diluted solution be tested on a small area to determine compatibility.

In all applications always prepare a new solution daily to ensure effectiveness. Do not re-use solutions. Dispose of unused solution.

EMERGENCY TELEPHONE NUMBERS (24 HOURS)
MEDICAL: COLLECT 303-389-1409
CHEMTREC: 800-424-9300
OTHER: COLLECT 716-879-0400