



MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME(S) **KOCHKLEEN® 100**
 CAS NUMBER MIXTURE
 MSDS NUMBER 5705
 PRODUCT CODE ND
 SYNONYM(S) ND



MANUFACTURER / SUPPLIER Koch Membrane Systems, Inc.
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 01887 USA

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TELEPHONE NUMBERS - GENERAL ASSISTANCE

(8-5, M-F EST) Product Assistance 978-657-4250

For technical assistance regarding this product, please contact your local Koch Membrane Systems representative.

2 COMPOSITION / INFORMATION ON INGREDIENTS

| Ingredient Name | CAS Number | Concentration* | Exposure Limits / Health Hazards |
|-----------------|------------|----------------|--|
| PHOSPHORIC ACID | 7664-38-2 | 15 - 30 % | 1 mg/m ³ 8-Hour TWA (OSHA) 1 mg/m ³ 8-Hour TWA (ACGIH) 3 mg/m ³ 15-Min STEL (ACGIH) |
| NITRIC ACID | 7697-37-2 | 15 - 30 % | 2 ppm 8-Hour TWA (OSHA) 2 ppm 8-Hour TWA (ACGIH) 4 ppm 15-Min STEL (ACGIH) |

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

WHMIS Classification: E.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER!

HEALTH HAZARDS

CORROSIVE TO EYES AND SKIN.

MAY CAUSE BLINDNESS

HARMFUL BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.

ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE

**SEE "TOXICOLOGICAL INFORMATION" (SECTION 11) FOR MORE INFORMATION

FLAMMABILITY HAZARDS

NON-COMBUSTIBLE

REACTIVITY HAZARDS

STABLE

POTENTIAL HEALTH EFFECTS, SKIN

CORROSIVE. Contact may cause reddening, itching, inflammation, burns, blistering and possibly severe tissue damage.

POTENTIAL HEALTH EFFECTS, EYE

CORROSIVE. Exposure may cause severe burns, destruction of eye tissue and possible permanent injury or blindness.

POTENTIAL HEALTH EFFECTS, INHALATION

EXTREMELY IRRITATING AND CORROSIVE. Fumes or vapors from the heated material may be severely irritating and corrosive. Symptoms may include throat burns, constriction of the windpipe (bronchospasms), severe pulmonary edema and death, depending on the concentration and duration of exposure. Symptoms may include sore throat, coughing, labored breathing, sneezing and burning sensation, depending on the concentration and duration of exposure.

Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information" (Section 11).

Other specific symptoms of exposure are listed under "Toxicological Information" (Section 11).

POTENTIAL HEALTH EFFECTS, INGESTION

CORROSIVE. May cause painful irritation and burning of the mouth and throat, painful swallowing, labored breathing, burns or perforation of the gastrointestinal tract leading to ulceration and secondary infection. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information" (Section 11).

Other specific symptoms of exposure are listed under "Toxicological Information" (Section 11).

4 FIRST AID MEASURES

SKIN

Immediately flush skin with plenty of water, for at least 15 minutes, while removing contaminated clothing and shoes. GET IMMEDIATE MEDICAL ATTENTION.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. GET IMMEDIATE MEDICAL ATTENTION.

INHALATION

Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

Never give anything by mouth to an unconscious person. Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis.

Have victim rinse mouth thoroughly with water, then drink 8 to 10 oz. of water to dilute material in stomach. If milk is available, it may be administered AFTER the water has been given. If vomiting occurs naturally, have the victim lean forward to reduce risk of aspiration. Repeat administration of water. Quickly transport to emergency care facility.

NOTES TO PHYSICIAN

This product is primarily an irritant and corrosive. As a corrosive, give attention to potential complication of esophagus or stomach perforations if ingested. Use of emetics and lavage are contraindicated. Necrosis and associated inflammatory processes peak at about 48 hours, but may extend up to four days. Initial healing processes occur during the period 4 to 14 days, but the esophageal wall is weakest during this period. Signs and symptoms of CNS depression, confusion and convulsions should be considered in the assessment and treatment of victims of exposures.

If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

5 FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

Combustion may produce NO_x, PO_x, acid fumes, nitrogen peroxide and hydrogen nitrate.

EXTINGUISHING MEDIA

Material itself will not burn.

BASIC FIRE FIGHTING PROCEDURES

Do not add water to acid. Water applied directly results in evolution of heat and splattering of acid. Acid can react with metals to liberate flammable hydrogen gas, especially when diluted with water. Evacuate area and fight fire from a safe distance. Use extinguishing agent suitable for type of surrounding fire.

Use water spray to cool adjacent structures and to protect personnel. Do not get water inside KOCHKLEEN® 100 containers. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Material will not burn.

May have hazardous or explosive reactions with metallic powders, carbides or sulfides.

| | |
|--|-----------------|
| Flash Point | NA (WATER BASE) |
| Autoignition Temperature | ND |
| Flammability Limits in Air, Lower, % by Volume | ND |
| Flammability Limits in Air, Upper, % by Volume | ND |

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire. Evacuate area endangered by release as required. (See Exposure Control/Personal Protection - Section 8).

ENVIRONMENTAL PRECAUTIONS

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local, provincial and/or federal authorities, if required.

SPILL OR LEAK PROCEDURE

Keep unnecessary people away. Isolate area for at least 25-50 meters (80-160 feet) to preserve public safety. For large spills, consider initial evacuation for at least 300 meters (1000 feet).

Large spills may be neutralized with dilute alkaline solutions of soda ash or lime. Stop leak when safe to do so.

Do not touch or walk through spilled material.

See Exposure Controls/Personal Protection (Section 8).

7 HANDLING & STORAGE

HANDLING

This material should be stored and shipped in plastic or plastic lined containers. Do not use with materials or equipment sensitive to acidic solutions.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Avoid contact with strong oxidizers, bases, chlorine releasers and metals. Store in tightly closed containers in cool, dry area away from heat and incompatibles.

Empty containers may contain product residue. Do not reuse without adequate precautions.

Ship or store only in containers that meet the specifications for corrosives, packing group I.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

General or local exhaust ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. If skin contact is anticipated, protective clothing, including impervious gloves, should be worn.

Additional protection may be necessary to prevent skin contact including use of apron, armcovers, face shield, or boots. Provide safety showers at any location where skin contact can occur.

Use good personal hygiene.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an acid vapor cartridge or canister may be appropriate under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

9 PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

CLEAR, COLORLESS LIQUID WITH AN ACIDIC ODOR

| | |
|---------------------|--|
| Boiling Point | 212 °F (100 °C) |
| Specific Gravity | 1.4 |
| Melting Point | NA |
| Percent Volatile | 50 - 70 % |
| Vapor Pressure | ND |
| Vapor Density | 2 - 3 (NITRIC ACID); 3.4 (PHOSPHORIC ACID) |
| Bulk Density | 10.51 LBS/GAL (1.25 G/L) |
| Solubility in Water | 100 % |
| Octanol/Water Partn | ND |
| Volatile Organic | NA |
| Pour Point | NA |
| pH Value | < 1 |
| Freezing Point | ND |
| Viscosity | ND |
| Evaporation Rate | ND |
| Molecular Formula | NA |
| Molecular Weight | ND |
| Chemical Family | MINERAL ACID |
| Odor Threshold | 0.75 mg/m ³ (NITRIC ACID) |

10 STABILITY & REACTIVITY

STABILITY/INCOMPATIBILITY

Incompatible with bases and chlorine releasers. Avoid contact with metals. See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce NO_x, PO_x, acid fumes, nitrogen peroxide and hydrogen nitrate.

11 TOXICOLOGICAL INFORMATION

ROUTES OF EXPOSURE

Inhalation, ingestion, skin and eye contact.

LD50

ND

TOXICOLOGICAL DATA

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: skin, eye, teeth, blood and respiratory system.

Exposure to components of this material may cause the following specific symptoms, depending on the concentration and duration of exposure: chronic obstructive pulmonary disease, erosion of teeth and chest pains. Other symptoms of exposure may include the following: cardiovascular collapse, acidosis, bloody diarrhea, bloody vomit and shock.

PRE-EXISTING CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, eye respiratory and cardiovascular systems.

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ND

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal regulations (40 CFR 261) due to its corrosivity.. Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

In Canada, wastes should be disposed of according to federal, state, provincial and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)

Corrosive Liquid, Acidic, Inorganic, N.O.S. (Nitric Acid, Phosphoric Acid), 8, UN3264, PG I

BILL OF LADING - NON-BULK (U. S. DOT)

Corrosive Liquid, Acidic, Inorganic, N.O.S. (Nitric Acid, Phosphoric Acid), 8, UN3264, PG I

The above description may not cover shipping in all cases, please consult 49 CFR 172.101 for specific shipping information.

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

All components of this product are listed on the TSCA Inventory.

This product, as supplied, contains phosphoric acid, a Hazardous Substance as per 40 CFR Part 302.4. The reportable quantity for phosphoric acid is 5000 pound(s). Any release of this product that results in a release of phosphoric acid equal to or exceeding the reportable quantity must be reported to the National Response Center (800-424-8802) and appropriate state and local regulatory agencies as described in 40 CFR Part 302.6 and 40 CFR 355.40, respectively.

This product, as supplied, contains nitric acid, a Hazardous Substance as per 40 CFR Part 302.4 and an Extremely Hazardous Substance as per 40 CFR Part 355. The reportable quantity for nitric acid is 1000 pounds. Any release of this product equal to or exceeding the reportable quantity must be reported to the National Response Center (800-424-8802) and appropriate state and local regulatory agencies as described in 40 CFR Part 302.6 and 40 CFR 355.40, respectively. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

This product contains nitric acid which is listed as an extremely hazardous substance and is subject to the notification and inventory reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 302 (40 CFR 355) and Section 311/312, respectively.

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

There may be specific regulations at the local, regional or state/provincial level that pertain to this product.

SARA TITLE III RATINGS

| | | | | | | | |
|--------------------|---|-----------------|---|--------------|---|------------------|---|
| Immediate Hazard: | X | Delayed Hazard: | - | Fire Hazard: | - | Pressure Hazard: | - |
| Reactivity Hazard: | - | | | | | | |

Following ingredients of this product are listed in SARA313

| SARA Listed Ingredient Name | CAS Number | Maximum % |
|-----------------------------|------------|-----------|
| NITRIC ACID | 7697-37-2 | 30.0 |

STATE REGULATIONS

Based on available information this product does not contain any components or chemicals currently known to the State of California to cause cancer, birth defects or reproductive harm at levels which would be subject to Proposition 65. Reformulation, use or processing of this product may affect its composition and require re-evaluation.

PENNSYLVANIA - Non-hazardous ingredients present at >3%: Water, CAS # 7732-18-5

INTERNATIONAL REGULATIONS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

WHMIS Classification: E.

All known major components of this product are listed on the Canadian DSL.

WHMIS RATINGS

| | | | | |
|---------------------|-----------------------|-----------|---|----------------------|
| Compressed Gas | Flammable/Combustible | Oxidizer | | Acutely Toxic |
| Other Toxic Effects | Bio Hazardous | Corrosive | X | Dangerously Reactive |

NFPA RATINGS

| | | | | | | |
|--------|---|--------------|---|------------|---|-----------------|
| Health | 3 | Flammability | 0 | Reactivity | 0 | Special Hazards |
|--------|---|--------------|---|------------|---|-----------------|

HMIS RATINGS

| | | | | | |
|--------|---|--------------|---|------------|---|
| Health | 3 | Flammability | 0 | Reactivity | 0 |
|--------|---|--------------|---|------------|---|

16 OTHER INFORMATION**DISCLAIMER**

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

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