

AMMONIUM HYDROXIDE
AMMONIUM HYDROXIDE
AMMONIUM HYDROXIDE

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY NUMBER: (201) 796-7100
CHEMTREC ASSISTANCE: (800) 424-9300

THIS INFORMATION IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES.

SUBSTANCE IDENTIFICATION

CAS-NUMBER 1336-21-6

SUBSTANCE: **AMMONIUM HYDROXIDE**

TRADE NAMES/SYNONYMS:

AMMONIA AQUEOUS; AMMONIA SOLUTION; AQUA AMMONIA;
AMMONIUM HYDROXIDE ((NH₄)(OH)); AMMONIA WATER; STCC 4935280; UN 2672; A-669;
A-669C; A-669-SI; A-669-S; A-667; A-512; A-470; H5NO;

CHEMICAL FAMILY:
INORGANIC BASE

MOLECULAR FORMULA: N-H4-O-H

MOLECULAR WEIGHT: 35.05

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=1 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=1 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: AMMONIA PERCENT: 28-30

COMPONENT: WATER PERCENT: 70-72

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

AMMONIA, ANHYDROUS:

35 PPM (27 MG/M³) OSHA STEL
25 PPM (18 MG/M³) ACGIH TWA; 35 PPM (27 MG/M³) ACGIH STEL
50 PPM (35 MG/M³) NIOSH RECOMMENDED 5 MINUTE CEILING

500 POUNDS SARA SECTION 302 THRESHOLD PLANNING QUANTITY
100 POUNDS SARA SECTION 304 REPORTABLE QUANTITY
100 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY
SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

AMMONIUM HYDROXIDE:

1000 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY

PHYSICAL DATA

DESCRIPTION: COLORLESS LIQUID WITH A SHARP, PUNGENT ODOR.

BOILING POINT: 97 F (36 C) (APPROX) MELTING POINT: -107 F (-77 C)

SPECIFIC GRAVITY: 0.90 (APPROX) VAPOR PRESSURE: 115 MMHG @ 20 C

PH: 11.6 @ 1N SOLN SOLUBILITY IN WATER: SOLUBLE ODOR THRESHOLD: 50 PPM

VAPOR DENSITY: 1.2

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
SLIGHT FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

UPPER EXPLOSIVE LIMIT: 27% (NH3) LOWER EXPLOSIVE LIMIT: 16% (NH3)

AUTOIGNITION TEMP.: 1204 F (651 C) (NH3)

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR REGULAR FOAM
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR REGULAR FOAM
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FIREFIGHTING:
MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. APPLY COOLING
WATER TO SIDES OF CONTAINERS THAT ARE EXPOSED TO FLAMES UNTIL WELL AFTER FIRE
IS OUT. STAY AWAY FROM ENDS OF TANKS (1990 EMERGENCY RESPONSE GUIDEBOOK,
DOT P 5800.5, GUIDE PAGE 60).

EXTINGUISH USING AGENT INDICATED. USE FLOODING AMOUNTS OF WATER AS A FOG FROM
AS FAR A DISTANCE AS POSSIBLE. USE WATER SPRAY TO ABSORB CORROSIVE VAPORS.
AVOID BREATHING CORROSIVE VAPORS; KEEP UPWIND.

TRANSPORTATION DATA

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49 CFR 172.101:
CORROSIVE MATERIAL

DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49 CFR 172.101 AND
SUBPART E:
CORROSIVE

DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: 49 CFR 173.245
EXCEPTIONS: 49 CFR 173.244

TOXICITY

AMMONIUM HYDROXIDE:

IRRITATION DATA: 750 UG EYE-RABBIT SEVERE; 44 UG EYE-RABBIT SEVERE;
1 MG/30 SECONDS RINSED EYE-RABBIT SEVERE.

TOXICITY DATA: 5000 PPM INHALATION-HUMAN LCLO; 408 PPM INHALATION-HUMAN
TCLO; 43 MG/KG ORAL-HUMAN LDLO; 350 MG/KG ORAL-RAT LD50; 750 MG/KG
ORAL-CAT LDLO; 160 MG/KG SUBCUTANEOUS-MOUSE LDLO; 200 MG/KG
SUBCUTANEOUS-RABBIT LDLO; 10 MG/KG INTRAVENOUS-RABBIT LDLO;

MUTAGENIC DATA (RTECS).

CARCINOGEN STATUS: NONE.

LOCAL EFFECTS: CORROSIVE-- INHALATION, SKIN, EYES, INGESTION.

ACUTE TOXICITY LEVEL: TOXIC BY INGESTION.

TARGET EFFECTS: NO DATA AVAILABLE.

AT INCREASED RISK FROM EXPOSURE: PERSONS WITH CORNEAL DISEASE OR GLAUCOMA,
OR CHRONIC RESPIRATORY DISEASES.

HEALTH EFFECTS AND FIRST AID

INHALATION:

AMMONIUM HYDROXIDE:

CORROSIVE. 500 PPM (NH₃) IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE-- CONCENTRATIONS OF 5 PPM OF AMMONIA VAPOR MAY CAUSE MILD
IRRITATION; 9-50 PPM MAY CAUSE NASAL DRYNESS, OLFACTORY FATIGUE, AND
MODERATE IRRITATION; AND 150 PPM MAY CAUSE LARYNGEAL SPASM. EXPOSURE
TO 500 PPM FOR 30 MINUTES MAY CAUSE CYCLIC HYPERPNEA, INCREASED BLOOD
PRESSURE AND PULSE RATE, AND UPPER RESPIRATORY TRACT IRRITATION, SOMETIMES
PERSISTING FOR 24 HOURS. 700 PPM MAY CAUSE IMMEDIATE IRRITATION;

1500-10,000 PPM MAY CAUSE DYSPNEA, CONVULSIVE COUGHING, CHEST PAIN,
RESPIRATORY SPASM, PINK FROTHY SPUTUM, RAPID ASPHYXIA, AND DELAYED
PULMONARY EDEMA WHICH MAY BE FATAL. OTHER EFFECTS MAY INCLUDE SWELLING
OF THE LIPS, RESTLESSNESS, RUNNY NOSE, HEADACHE, SALIVATION, NAUSEA,
VOMITING, GLOTTAL EDEMA, PHARYNGITIS, TRACHEITIS, AND DIFFICULTY IN
SPEAKING. DEATH MAY BE RESULT FROM BRONCHOPNEUMONIA OR ASPHYXIATION DUE TO
SPASMS, INFLAMMATION, OR EDEMA OF THE LARYNX. RESIDUAL EFFECTS FROM
ACUTE EXPOSURES MAY INCLUDE HOARSENESS, PRODUCTIVE COUGH, DECREASED
RESPIRATORY FUNCTION, CHRONIC AIRWAY DYSFUNCTION, ALVEOLAR DISEASE,
BRONCHIOLITIS, BRONCHIECTASIS, EMPHYSEMA, AND ANXIETY NEUROSES.

CHRONIC EXPOSURE-- DEPENDING ON THE CONCENTRATION AND DURATION OF EXPOSURE,
REPEATED OR PROLONGED EXPOSURE MAY CAUSE INFLAMMATORY AND ULCERATIVE
CHANGES IN THE MOUTH, POSSIBLE BRONCHIAL AND GASTROINTESTINAL
DISTURBANCES, AND EFFECTS SIMILAR TO ACUTE EXPOSURE. TOLERANCE TO
USUALLY IRRITATING CONCENTRATIONS MAY BE ACQUIRED BY ADAPTATION.

FIRST AID-- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING
HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND BLOOD
PRESSURE AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON WARM AND
AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ADMINISTRATION OF OXYGEN
SHOULD BE PERFORMED BY QUALIFIED PERSONNEL. GET MEDICAL ATTENTION
IMMEDIATELY.

SKIN CONTACT:

AMMONIUM HYDROXIDE:

CORROSIVE.

ACUTE EXPOSURE-- VAPORS MAY CAUSE MILD IRRITATION. DIRECT CONTACT WITH THE

LIQUID OR HIGH VAPOR CONCENTRATIONS (>30,000 PPM AMMONIA) MAY CAUSE SEVERE PAIN, A STINGING SENSATION, SEVERE BURNS AND VESICULATION, AND POSSIBLY BROWNISH STAINS. THE CORRODED AREAS ARE SOFT, GELATINOUS, AND NECROTIC, AND THE TISSUE DESTRUCTION MAY BE DEEP. IF BURNS ARE EXTENSIVE, DEATH MAY OCCUR. RARELY, AMMONIA VAPORS MAY CAUSE URTICARIA.
 CHRONIC EXPOSURE-- EFFECTS DEPEND ON THE CONCENTRATION AND DURATION OF EXPOSURE. REPEATED OR PROLONGED CONTACT MAY CAUSE DERMATITIS OR EFFECTS SIMILAR TO ACUTE EXPOSURE.

ALKALINE CORROSIVES:

ACUTE EXPOSURE-- DIRECT CONTACT MAY CAUSE SEVERE PAIN, BURNS AND POSSIBLY BROWNISH STAINS. THE CORRODED AREAS MAY BE SOFT, GELATINOUS AND NECROTIC AND THE TISSUE DESTRUCTION MAY BE DEEP.

CHRONIC EXPOSURE-- EFFECTS DEPEND ON THE CONCENTRATION AND DURATION OF EXPOSURE. REPEATED OR PROLONGED CONTACT MAY CAUSE DERMATITIS OR EFFECTS SIMILAR TO ACUTE EXPOSURE.

FIRST AID-- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). IN CASE OF CHEMICAL BURNS, COVER AREA WITH STERILE, DRY DRESSING. BANDAGE SECURELY, BUT NOT TOO TIGHTLY. GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

AMMONIUM HYDROXIDE:
 CORROSIVE.

ACUTE EXPOSURE-- 1 DROP OF A 9% SOLUTION IN HUMAN EYES CAUSED IMMEDIATE SEVERE PAIN, BLEPHAROSPASM, AND LOSS OF CORNEAL EPITHELIUM DESPITE IRRIGATION. THE FOLLOWING DAY THERE WAS SLIGHT CORNEAL EDEMA AND WRINKLING ON THE POSTERIOR SURFACE; RECOVERY WAS COMPLETE IN 3-4 DAYS. CONTACT WITH THE LIQUID OR HIGH VAPOR CONCENTRATIONS (>2500 PPM AMMONIA) MAY ALSO CAUSE SEVERE IRRITATION, SWELLING OF THE EYELIDS, LACRIMATION, PALPEBRAL EDEMA, INCREASED INTRAOCULAR PRESSURE, OVAL SEMIDILATED FIXED PUPILS, CORNEAL ULCERATION, AND BLINDNESS, POSSIBLY PERMANENT. THE DEGREE OF INJURY DEPENDS ON THE CONCENTRATION AND DURATION OF CONTACT. THERE MAY BE CORNEAL AND AND LENTICULAR OPACIFICATION AND IRITIS, ACCOMPANIED BY HYPOPYON OR HEMORRHAGES AND POSSIBLY EXTENSIVE LOSS OF PIGMENT FROM THE POSTERIOR PIGMENT LAYER OF THE IRIS. CORNEAL ANESTHESIA IS POSSIBLE ALLOWING DAMAGE TO OCCUR BEFORE WARNING DISCOMFORT IS FELT. IN SEVERE BURNS, THE EXTENT OF THE INJURY MAY NOT BE IMMEDIATELY APPARENT. LATE COMPLICATIONS MAY INCLUDE PERSISTENT EDEMA, VASCULARIZATION AND SCARRING OF THE CORNEA, PERMANENT OPACITY, ANGLE CLOSURE, ACUTE-ANGLE GLAUCOMA, STAPHYLOMA, CATARACT, ATROPHY OF THE RETINA AND IRIS, AND SYMPLEPHARON.
 CHRONIC EXPOSURE-- EFFECTS DEPEND ON CONCENTRATION AND DURATION OF EXPOSURE. REPEATED OR PROLONGED CONTACT MAY RESULT IN CONJUNCTIVITIS OR EFFECTS AS IN ACUTE EXPOSURE.

FIRST AID-- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). CONTINUE IRRIGATING WITH NORMAL SALINE UNTIL THE PH HAS RETURNED TO NORMAL (30-60 MINUTES). COVER WITH STERILE BANDAGES. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

AMMONIUM HYDROXIDE:
 CORROSIVE/TOXIC.

SEE INFORMATION ON ALKALINE CORROSIVES.

ALKALINE CORROSIVES:

ACUTE EXPOSURE- MAY CAUSE IMMEDIATE PAIN, CIRCUMORAL BURNS AND CORROSION OF THE MUCOUS MEMBRANES WHICH AT FIRST TURN WHITE AND SOAPY AND THEN BECOME BROWN, EDEMATOUS AND ULCERATED. THERE MAY BE PROFUSE SALIVATION AND DIFFICULTY OR INABILITY TO SWALLOW OR SPEAK. EVEN WHEN THERE IS NO EVIDENCE OF ORAL BURNS, THE ESOPHAGUS AND STOMACH MAY BE INVOLVED WITH BURNING PAIN, VOMITING AND DIARRHEA. THE VOMITUS MAY BE THICK AND SLIMY WITH MUCOUS, AND LATER CONTAIN BLOOD AND SHREDS OF MUCOSA. EPIGLOTTAL EDEMA MAY RESULT IN RESPIRATORY DISTRESS AND POSSIBLY ASPHYXIA. SHOCK WITH MARKED HYPOTENSION, WEAK AND RAPID PULSE, SHALLOW RESPIRATION, AND CLAMMY SKIN MAY OCCUR. CIRCULATORY COLLAPSE MAY ENSUE, AND IF UNCORRECTED, LEAD TO RENAL FAILURE. IN SEVERE CASES, ESOPHAGEAL OR GASTRIC PERFORATION ARE POSSIBLE AND MAY BE ACCOMPANIED BY MEDIASTINITIS, SUBSTERNAL PAIN, PERITONITIS, ABDOMINAL RIGIDITY, AND FEVER. ESOPHAGEAL, AND POSSIBLY GASTRIC OR PYLORIC STRICTURE, MAY OCCUR WITHIN A FEW WEEKS, BUT MAY BE DELAYED FOR MONTHS OR EVEN YEARS. DEATH MAY RESULT WITHIN A SHORT TIME FROM ASPHYXIA, CIRCULATORY COLLAPSE, OR ASPIRATION OF EVEN MINUTE AMOUNTS. IF DEATH IS DELAYED IT MAY BE DUE TO THE COMPLICATIONS OF PERFORATION, PNEUMONIA, OR THE EFFECTS OF STRICTURE FORMATION.

CHRONIC EXPOSURE- DEPENDING ON THE CONCENTRATION, REPEATED INGESTION MAY RESULT IN INFLAMMATORY AND ULCERATIVE EFFECTS ON THE ORAL MUCOUS MEMBRANES AND OTHER EFFECTS AS WITH ACUTE INGESTION.

FIRST AID- DILUTE THE ALKALI BY GIVING WATER OR MILK IMMEDIATELY AND ALLOW VOMITING TO OCCUR. AVOID GASTRIC LAVAGE OR EMETICS. ESOPHAGOSCOPY IS THE ONLY WAY TO EXCLUDE THE POSSIBILITY OF CORROSION IN THE UPPER GASTROINTESTINAL TRACT; IF CORROSION IS SUSPECTED, ESOPHAGOSCOPY SHOULD USUALLY BE PERFORMED WITHIN 24 HOURS (DREISBACH, HANDBOOK OF POISONING, 12TH ED.). MAINTAIN AIRWAY AND TREAT SHOCK. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO HELP PREVENT ASPIRATION. GET MEDICAL ATTENTION IMMEDIATELY.

ANTIDOTE:

THE FOLLOWING ANTIDOTE HAS BEEN RECOMMENDED. HOWEVER, THE DECISION AS TO WHETHER THE SEVERITY OF POISONING REQUIRES ADMINISTRATION OF ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHOULD BE MADE BY QUALIFIED MEDICAL PERSONNEL.

AMMONIA AND AMMONIUM HYDROXIDE POISONING:

GIVE FRUIT JUICE OR VINEGAR BY MOUTH OR USE EXTERNALLY (DREISBACH, HANDBOOK OF POISONING, 11TH ED.). ANTIDOTE SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL.

 REACTIVITY

REACTIVITY:

STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

INCOMPATIBILITIES:

AMMONIUM HYDROXIDE:

ACIDS: VIOLENT, EXOTHERMIC REACTION.

ACROLEIN: TEMPERATURE AND PRESSURE INCREASE IN A CLOSED CONTAINER.

DIMETHYL SULFATE: VIOLENT REACTION.

FLUORINE: IGNITION AND EXPLOSION.

GOLD: FORMS EXPLOSIVE COMPOUNDS.

IODINE: FORMS AN EXPLOSIVE IODIDE.

MERCURY: FORMS EXPLOSIVE COMPOUND.

METALS AND ALLOYS: CORROSIVE.

NITROMETHANE: FORMS EXPLOSIVE MIXTURE.

OLEUM: TEMPERATURE AND PRESSURE INCREASE IN A CLOSED CONTAINER.
PROPIOLACTONE (BETA): TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.
PROPYLENE OXIDE: TEMPERATURE AND PRESSURE INCREASE IN A CLOSED CONTAINER.
SILVER NITRATE + ACETYLENE: FORMS EXPLOSIVE ACETYLIDE.
SILVER NITRATE + SODIUM HYDROXIDE: FORMS SHOCK-SENSITIVE COMPOUND.
SILVER OXIDE: FORMS SHOCK-SENSITIVE SILVER NITRIDE.
SILVER PERMANGANATE: FORMS SHOCK-SENSITIVE MIXTURE.

DECOMPOSITION:
MAY PRODUCE CORROSIVE VAPORS OF AMMONIA AND TOXIC OXIDES OF NITROGEN.

POLYMERIZATION:
HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

STORAGE

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.
STORE IN A DRY, COOL, VENTILATED AREA.

DISPOSAL

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262. EPA HAZARDOUS WASTE NUMBER D002. 100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY.

CONDITIONS TO AVOID

MAY BURN BUT DOES NOT IGNITE READILY. FLAMMABLE, POISONOUS GASES MAY ACCUMULATE IN TANKS AND HOPPER CARS. MAY IGNITE COMBUSTIBLES (WOOD, PAPER, OIL, ETC.).

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR SMALL DRY SPILLS, WITH CLEAN SHOVEL PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER. MOVE CONTAINERS FROM SPILL AREA. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE AWAY. ISOLATE HAZARD AREA AND DENY ENTRY.

REPORTABLE QUANTITY (RQ): 1000 POUNDS
THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS

SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 424-8802 OR (202) 426-2675 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

PROTECTIVE EQUIPMENT

VENTILATION:

PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR:

THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS; NIOSH CRITERIA DOCUMENTS OR BY THE U.S. DEPARTMENT OF LABOR, 29 CFR 1910 SUBPART Z.

THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

AMMONIA:

300 PPM- ANY CHEMICAL CARTRIDGE RESPIRATOR WITH CARTRIDGE(S) PROVIDING PROTECTION AGAINST AMMONIA.

500 PPM- ANY SUPPLIED-AIR RESPIRATOR.
ANY POWERED AIR-PURIFYING RESPIRATOR WITH CARTRIDGE(S) PROVIDING PROTECTION AGAINST AMMONIA.
ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONT- OR BACK-MOUNTED CANISTER PROVIDING PROTECTION AGAINST AMMONIA.
ANY SELF-CONTAINED BREATHING APPARATUS.

ESCAPE- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONT- OR BACK-MOUNTED CANISTER PROVIDING PROTECTION AGAINST AMMONIA.
ANY APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE AND OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING:

EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT ANY POSSIBILITY OF SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:

EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:
EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A
FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE.

EMERGENCY WASH FACILITIES:
WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES AND/OR SKIN MAY BE
EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN
AND QUICK DRENCH SHOWER WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED - FISHER SCIENTIFIC, INC.
CREATION DATE: 11/29/84 REVISION DATE: 10/10/90

-ADDITIONAL INFORMATION-

THIS INFORMATION IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST
INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF
MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO
SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS
SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE
INFORMATION FOR THEIR PARTICULAR PURPOSES.