HYDRAZINE HYDRATE 55%

1. PRODUCT AND COMPANY IDENTIFICATION

Company

Arkema Inc.
900 First Avenue
King of Prussia, Pennsylvania 19406

Thio and Fine Chemicals

Customer Service Telephone Number: (800) 628-4453
(Monday through Friday, 8:30 AM to 5:30 PM EST)

Emergency Information

Transportation: CHEMTREC: (800) 424-9300
(24 hrs., 7 days a week)
Medical: Rocky Mountain Poison Center: (866) 767-5089
(24 hrs., 7 days a week)

Product Information

Product name: HYDRAZINE HYDRATE 55%
Synonyms: Hydrazine
Molecular formula: H2NNH2*H2O
Chemical family: Diamines
Product use: Raw material for organic synthesis

2. HAZARDS IDENTIFICATION

Emergency Overview

Color: colourless
Physical state: liquid
Odor: ammoniacal

DANGER!
MAY BE FATAL IF ABSORBED THROUGH SKIN.
CAUSES EYE AND SKIN BURNS.
MAY CAUSE BLINDNESS.
HARMFUL IF SWALLOWED.
HARMFUL IF INHALED.
MAY CAUSE ALLERGIC SKIN REACTION.
CAUSES RESPIRATORY TRACT IRRITATION.
MAY CAUSE HEADACHE, NAUSEA, DIZZINESS, DROWSINESS, LOSS OF CONSCIOUSNESS.
SUSPECT CANCER HAZARD - MAY CAUSE CANCER.
PROLONGED OR REPEATED EXPOSURE CAN CAUSE EFFECTS ON: LUNGS, UPPER RESPIRATORY TRACT, LIVER, KIDNEY

Potential Health Effects

Primary routes of exposure:
Inhalation and skin contact.

Signs and symptoms of acute exposure:

Corrosive to skin and eyes. Causes burns. Irritates the respiratory organs. Prolonged or repeated exposure may cause: Allergic skin reaction: redness, rash. If swallowed, may cause gastrointestinal irritation including nausea and vomiting. May also cause: Central Nervous System effects: drowsiness, fatigue, tremors. (severity of effects depends on extent of exposure) .

Skin:
Moderately to highly toxic. Corrosive. (based on animal studies)

Inhalation:
Slightly toxic to moderately toxic. (based on animal studies)

Eyes:
Corrosive. (based on animal studies)

Ingestion:
Moderately toxic. (based on animal studies)

Repeated exposure:
Data for the main component: Listed by the National Toxicology Program as: Reasonably anticipated to be a human carcinogen. Classified by the International Agency for Research on Cancer as: Group 2B: Possibly carcinogenic to humans. Repeated exposures may produce: upper respiratory tract effects, lung effects, kidney effects, liver effects.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Wt/Wt	OSHA Hazardous
Hydrazine, monohydrate	7803-57-8	55 %	Y
Water	7732-18-5	45 %	N

The substance(s) marked with a "Y" in the Hazard column above, are those identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

This material is classified as hazardous under Federal OSHA regulation.

4. FIRST AID MEASURES

General advice:
POISON! Get medical attention immediately. Call a Poison Control Center immediately.

Inhalation:
If inhaled, remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Skin:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eyes:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.

Ingestion:

If swallowed, DO NOT induce vomiting. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

5. FIREFIGHTING MEASURES

Flash point Has no measurable flash point up to the boiling point

Auto-ignition temperature: Not determined

Lower flammable limit (LFL): 4.7 %(V)

Upper flammable limit (UFL): 100 %(V)

Extinguishing media (suitable):
water spray, Foam, powder

Protective equipment:
Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand / NIOSH approved or equivalent).

Further firefighting advice:
Use flooding amounts of water from a protected location.
Fire fighting equipment should be thoroughly decontaminated after use.

Fire and explosion hazards:
Explosion hazard
Contact with metals liberates hydrogen gas.
When in aqueous solution, hydrazine forms a monohydrate form, also called hydrazine hydrate, which contains 64% hydrazine and 36% water. The conversion factor between percent hydrazine and percent hydrazine hydrate is 0.64. For example, a 55% hydrazine hydrate solution contains 35% hydrazine (55% x 0.64) and 65% water.

6. ACCIDENTAL RELEASE MEASURES

In case of spill or leak:
Stop the leak if you can do so without risk. Evacuate area of all unnecessary personnel. Keep people away and stay on the upwind side. Extinguish sources of ignition nearby and downwind. Ventilate the area. See section 8 - Exposure control and personal protection. Dike spillage. Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Avoid generation of vapors. Do not allow to enter drains or waterways. Notify the responsible authorities of reportable releases to the air, into waterways, soil or sewers. Collect wash water for approved disposal. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7. HANDLING AND STORAGE

Handling

General information on handling:
Do not taste or swallow.
Do not get in eyes, on skin, or on clothing.
Avoid breathing vapor or mist.
Keep container tightly closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.
Emptied container retains vapor and product residue.
Store away from combustibles and materials to avoid.

Storage

General information on storage conditions:
Store out of direct sunlight in a cool well-ventilated place. Store away from combustibles and materials to avoid.

Storage stability – Remarks:
Stable under recommended storage conditions.

Storage incompatibility – General:
Keep away from combustible materials. Store separate from:

Metallic oxides

Strong oxidizing agents

Metallic salts

Strong acids

Nitrites

Alkali metals

Do not store this material in containers made of: Ordinary metals

Ordinary steel

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

Hydrazine (302-01-2)

US. ACGIH Threshold Limit Values

Time Weighted Average (TWA):	0.01 ppm
Skin designation	
Remarks:	Can be absorbed through the skin.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

PEL:	1 ppm (1.3 mg/m3)
Skin designation	
Remarks:	Can be absorbed through the skin.

Hydrazine, monohydrate (7803-57-8)

US. ACGIH Threshold Limit Values

Skin designation	
Remarks:	Can be absorbed through the skin.
Time Weighted Average (TWA):	0.01 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Skin designation	
Remarks:	Can be absorbed through the skin.
PEL:	1 ppm (1.3 mg/m3)

Only those components with exposure limits are printed in this section. Limits with skin contact designation above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required. Limits with a sensitizer designation above mean that exposure to this material may cause allergic reactions.

Engineering controls:
Investigate engineering techniques to reduce exposures below airborne exposure limits or to otherwise reduce exposures. Provide ventilation if necessary to minimize exposures or to control exposure levels to below airborne exposure limits (if applicable see above).If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Respiratory protection:
Avoid breathing vapor or mist. Where airborne exposure is likely or airborne exposure limits are exceeded (if applicable, see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical goggles. Consult respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure or where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Skin protection:
Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear chemical goggles, a face shield, and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse immediately if skin is contaminated. Remove contaminated clothing immediately and wash before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Eye protection:
Where there is potential for eye contact, wear a face shield, chemical goggles, and have eye flushing equipment immediately available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	colourless
Physical state:	liquid
Odor:	ammoniacal
pH:	10.7 (1 % In solution in water)
Density:	not determined
Specific Gravity (Relative density):	1.02 (68 °F(20 °C))
Vapor pressure:	11 - 15 mmHg (68 °F (20 °C))
Vapor density:	0.64 kg/m3
Boiling point/boiling range:	228 °F (109 °C)
Freezing point:	-80 °F (-62 °C)
Melting point/range:	not determined
Evaporation rate:	no data available
Solubility in water:	68 °F (20 °C) completely soluble
Solubility in other solvents: [qualitative and quantative]	Soluble in: Ethanol
Thermal decomposition	> 482 °F (> 250 °C)

10. STABILITY AND REACTIVITY

Stability:
This material is chemically stable under normal and anticipated storage, handling and processing conditions.
Powerful reducer

Materials to avoid:
Strong acids and oxidizing agents
Nitrites
Alkali metals
Metallic salts
Metallic oxides
Combustible material
Corrosion with : light metals and alloys

Conditions / hazards to avoid:
Avoid flames, welding arcs, potential ignition sources, or other high temperature sources which induce thermal decomposition.

Hazardous decomposition products:

Thermal decomposition giving flammable and toxic products
Nitrogenous derivatives
Hydrogen

11. TOXICOLOGICAL INFORMATION

Data on this material and/or a similar material are summarized below.

Data for Hydrazine (302-01-2)

Acute toxicity

Oral:
Moderately toxic. (rat) LD50 between 60 - 129 mg/kg.

Dermal:
Moderately toxic to highly toxic. (rabbit) LD50 between 91 - 238 mg/kg.

Moderately toxic. (rabbit) LD50 > 200 mg/kg. (48 %)

Moderately toxic. (rabbit) LD50 960 mg/kg. (15.5 %)

Inhalation:
Toxic. (rat) 4 h LC50 = 0.75 mg/l.

Slightly toxic. (rat) 1 h LC50 6.5 mg/l. (64 %) signs: Difficulty in breathing (Aerosol)

Skin Irritation:
Corrosive. (rabbit) (48 - 100 %)

Slightly irritating. (rabbit) Irritation Index: 2 / 8. (35 %)

Slightly to moderately irritating. (rabbit) Irritation Index: 1.8 / 8. (15.5 %)

Eye Irritation:
Corrosive. (rabbit) (100 %)

Slightly irritating. (rabbit) Irritation Index: 5 / 110. (15.5 %)

Repeated dose toxicity
Repeated oral, inhalation administration to various animal species / affected organ(s): Liver, Kidney, Nervous system

Carcinogenicity
Chronic oral administration to various animal species / affected organ(s): lung, liver, kidney / Increased incidence of tumors was reported.

Chronic inhalation administration to rat and hamster / affected organ(s): upper respiratory tract / Increased incidence of tumors was reported.
Classified by the International Agency for Research on Cancer as: Group 2B: Possibly carcinogenic to humans.
Listed by the National Toxicology Program as: Reasonably anticipated to be a human carcinogen.

Genotoxicity

Assessment in Vitro:
Genetic changes were observed in laboratory tests using: bacteria, yeast, animal cells

Genotoxicity

Assessment in Vivo:
Genetic changes were observed in a laboratory test using: fruit flies

No genetic changes were observed in a laboratory test using: rodent

Developmental toxicity
Exposure during pregnancy. dermal application (rodent) / No birth defects were observed. (levels produced toxic effects in the mothers and offspring)

Human experience
General:
Epidemiology studies have not shown an increase in cancer . Irritating to eyes, respiratory system and skin.

Human experience
Skin contact:
Skin: Irritation. Skin allergy was observed.

Human experience
Ingestion:
Gastro-intestinal tract: irritation, vomiting, nausea.

Liver, kidney, cardiovascular system: changes in organ structure or function.

Nervous system: Drowsiness, lethargy, tremors.

12. ECOLOGICAL INFORMATION

Chemical Fate and Pathway
Data on this material and/or a similar material are summarized below.

Data for Hydrazine (302-01-2)

Octanol Water Partition Coefficient:
log Pow -0.16 (OECD Test Guideline 107)

Ecotoxicology
Data on this material and/or a similar material are summarized below.

Data for Hydrazine (302-01-2)

Aquatic toxicity data:
Moderately toxic. Lepomis macrochirus (Bluegill sunfish) 96 h LC50 = 1.2 mg/l
Moderately toxic. Pimephales promelas (fathead minnow) 96 h LC50 = 5.98 mg/l
Moderately toxic. Poecilia reticulata (guppy) 96 h LC50 = 3.85 mg/l

Aquatic invertebrates:
Highly toxic. Daphnia pulex (Water flea) 48 h EC50 = 0.18 mg/l
Highly toxic. Daphnia magna (Water flea) 96 h EC50 = 0.85 mg/l

Algae:
Highly toxic. Algae 96 h EC50 = 0.075 mg/l

13. DISPOSAL CONSIDERATIONS

Waste disposal:
Destroy the product by oxidation with a dilute solution of hypochlorites (sodium - calcium). Hypochlorites (sodium - calcium) Clean container with water. Recover waste water for processing later. Dispose of in accordance with federal, state and local regulations. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14. TRANSPORT INFORMATION

US Department of Transportation (DOT)

UN Number	:	3293
Proper shipping name	:	Hydrazine, aqueous solution
Class	:	6.1
Packaging group	:	III
Marine pollutant	:	yes
Reportable quantity	:	1 lbs (Hydrazine hydrate)

International Maritime Dangerous Goods Code (IMDG)

UN Number	:	3293
Proper shipping name	:	HYDRAZINE, AQUEOUS SOLUTION
Class	:	6.1
Packaging group	:	III
Marine pollutant	:	yes

15. REGULATORY INFORMATION

Chemical Inventory Status

EU. EINECS	EINECS	Conforms to
US. Toxic Substances Control Act	TSCA	This product complies with TSCA Inventory requirements. For the TSCA Inventory, hydrates of a chemical substance are considered to be mixtures of the anhydrous form of the chemical substance and water.
Australia. Industrial Chemical (Notification and Assessment) Act	AICS	Conforms to
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)	DSL	All components of this product are on the Canadian DSL list.
Japan. Kashin-Hou Law List	ENCS (JP)	Conforms to
Korea. Existing Chemicals Inventory (KECI)	KECI (KR)	Conforms to
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	PICCS (PH)	Conforms to
China. Inventory of Existing Chemical Substances	IECSC (CN)	Conforms to
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	NZIOC	Conforms to

United States – Federal Regulations

SARA Title III – Section 302 Extremely Hazardous Chemicals:

Chemical Name	CAS-No.	SARA Reportable Quantities	SARA Threshold Planning Quantity
Hydrazine, monohydrate	7803-57-8	1 lbs	1000 lbs

SARA Title III - Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard

SARA Title III – Section 313 Toxic Chemicals:

Chemical Name	CAS-No.	De minimis concentration	Reportable threshold:
Hydrazine	302-01-2	0.1 %	10000 lbs (Otherwise used (non-manufacturing/processing)) 25000 lbs (Manufacturing and processing)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - Reportable Quantity (RQ):

Chemical Name	CAS-No.	Reportable quantity
Hydrazine, monohydrate	7803-57-8	1 lbs

OSHA Regulated Carcinogens (NTP, IARC, OSHA Listed):

NTP:

Chemical Name	CAS-No.	Attribute
Hydrazine, monohydrate	7803-57-8	Anticipated carcinogen.

IARC:

Chemical Name	CAS-No.	Attribute
Hydrazine, monohydrate	7803-57-8	Group 2B (Possible carcinogen.)

OSHA:
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

United States – State Regulations

New Jersey Right to Know

Chemical Name	CAS-No.
Hydrazine	302-01-2

New Jersey Right to Know – Special Health Hazard Substance(s)

Chemical Name	CAS-No.
Hydrazine	302-01-2

Pennsylvania Right to Know

Chemical Name	CAS-No.
Hydrazine	302-01-2
Water	7732-18-5

Pennsylvania Right to Know – Environmentally Hazardous Substance(s)

Chemical Name	CAS-No.
Hydrazine	302-01-2

Pennsylvania Right to Know – Special Hazardous Substance(s)

Chemical Name	CAS-No.
Hydrazine	302-01-2

California Prop. 65
WARNING! This product contains a chemical known to the State of California to cause cancer.

Chemical Name	CAS-No.
Hydrazine, monohydrate	7803-57-8

California Prop. 65
WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Chemical Name	CAS-No.
Methanol	67-56-1

16. OTHER INFORMATION

Miscellaneous:

Grades:	HYDRAZINE HYDRATE 40%, HYDRAZINE HYDRATE 55%
Use restrictions:	Reserved for industrial and professional use.

Latest Revision(s):

Revised Section(s):	Prop. 65
Reference number:	000000023655
Date of Revision:	01/16/2013
Date Printed:	01/16/2013

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