

Product: **HYDRAZINE HYDRATE 24%-35%**

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SDS No.: 001798-001 (Version 3.1)

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1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Generic Safety Data Sheet

1.1. Identification of the product

Identification of the mixture: HYDRAZINE HYDRATE 24%-35%

Grades : HYDRAZINE HYDRATE 24%, HYDRAZINE HYDRATE 35%

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture :

Sector of use :	Product category :
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU8,9: Manufacture of bulk, large scale substances (including petroleum products); manufacture of fine chemicals	PC19: Intermediate
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen) SU23: Electricity, steam, gas water supply and sewage treatment	PC37: Water treatment chemicals
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU23: Electricity, steam, gas water supply and sewage treatment	PC37: Water treatment chemicals
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU24: Scientific research and development	PC21: Laboratory chemicals
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen) SU24: Scientific research and development	PC21: Laboratory chemicals
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU8,9: Manufacture of bulk, large scale substances (including petroleum products); manufacture of fine chemicals	PC32: Polymer preparations and compounds
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU8,9: Manufacture of bulk, large scale substances (including petroleum products); manufacture of fine chemicals	PC20: Products such as ph-regulators, flocculants, pre-cipitants, neutralization agents

1.3. Details of the supplier of the safety data sheet

Supplier	Arkema THIOCHIMIE 420 rue d'Estienne d'Orves 92705 Colombes Cedex, France Téléphone : +33 (0)1 49 00 80 80 Télécopie : +33 (0)1 49 00 83 96 http://www.arkema.com
E-mail address	pars-drp-fds@arkema.com
E-mail address : Exposure scenario	arkema.reach-oxygenes3@arkema.com

1.4. Emergency telephone number

+33 1 49 00 77 77
European emergency phone number : 112

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (Regulation (EC) No 1272/2008):

Carcinogenicity, 1B, H350
Inhalation: Acute toxicity, 3, H331
Dermal: Acute toxicity, 3, H311
Oral: Acute toxicity, 4, H302
Skin corrosion, 1B, H314
Eye irritation, 1, H318
Skin sensitisation, 1A, H317
Acute aquatic toxicity, 1, H400
Chronic aquatic toxicity, 1, H410

Classification according to EU Directives 1999/45/EC :

T; Carc.Cat.2; R45
C; R34
Xn; R20/21/22
Xi; R43
N; R50/53

Additional information:

For the full text of the R, H, EUH-phrases mentioned in this Section, see Section 16.

2.2. Label elements

Label elements (REGULATION (EC) No 1272/2008):

Hazardous components which must be listed on the label:

hydrazine

Hazard pictograms:



Signal word:

Danger

Hazard statements:

H311 : Toxic in contact with skin.
H331 : Toxic if inhaled.
H350 : May cause cancer.
H302 : Harmful if swallowed.
H314 : Causes severe skin burns and eye damage.
H317 : May cause an allergic skin reaction.
H410 : Very toxic to aquatic life with long lasting effects.

Precautionary statements:

Prevention:

P201 : Obtain special instructions before use.
P260 : Do not breathe gas/mist/vapours/spray.
P273 : Avoid release to the environment.
P280 : Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P303 + P361 + P353 : IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 : Immediately call a POISON CENTER or doctor/ physician.

Storage:

P403 + P233 : Store in a well-ventilated place. Keep container tightly closed.

Additional information:Restricted to professional users.

2.3. Other hazards

Potential health effects:

Causes burns. May cause sensitisation by skin contact.
Inhalation: At high concentrations headache Drowsiness confusion Neurological disorders Risk of irritation of respiratory system
Chronic exposure: May cause cancer.

Environmental Effects:

Very toxic to aquatic organisms. Readily biodegradable. Not bioaccumulable.

Physical and chemical hazards:

Contact with incompatible products can create flammable or explosive atmospheres
Decomposition products: See chapter 10

Other:

Results of PBT and vPvB assessment : According to REACH regulation, annex XIII, this mixture contains no substance meeting PBT and vPvB criteria.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Chemical nature of the mixture¹:

Aqueous solution

Hazardous components (according to Regulation (EC) No. 1907/2006 and its amendment (453/2010)) :

Chemical Name ¹ & REACH Registration Number ²	EC-No.	CAS-No.	Concentration	Classification Directive 67/548/EEC	Classification Regulation (EC) No 1272/2008
Hydrazine, monohydrate (01-2119492624-31)	206-114-9	7803-57-8	24 - 35%	T; R23/24/25 C; R34 R43 Carc.Cat.2; R45 N; R50/53	Acute Tox. 3 (Oral); H301 Acute Tox. 3 (Dermal); H311 Acute Tox. 2 (Inhalation); H330 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1A; H317 Carc. 1B; H350 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor Acute = 10

Correspond to 15-22% hydrazine.

¹: See chapter 14 for Proper Shipping Name

²: See the text of the regulation for applicable exceptions or provisions : The transition time according to REACH Regulation, Article 23, is still not expired.

For the full text of the R, H, EUH-phrases mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1. & 4.2. Description of necessary first-aid measures & Most important symptoms/effects, acute and delayed:

General advice:

Under the shower: Take off immediately all contaminated clothing. including shoes.

Inhalation:

Inhalation of vapours/mists Move to fresh air. Oxygen or artificial respiration if needed. Hospitalize immediately.
Delayed effects possible Effects of breathing high concentrations of vapour may include: Neurological disorders headache Drowsiness confusion Coma

Skin contact:

Wash immediately, abundantly and thoroughly with water. Consult a doctor quickly. In case of extensive burns: Hospitalize immediately.

Eye contact:

Wash open eyes immediately, abundantly and thoroughly for at least 15 minutes. Consult an ophthalmologist immediately.

Ingestion:

Do not induce vomiting, rinse mouth and lips with plenty of water if the subject is conscious, then hospitalize.

Protection of first-aiders:

For any intervention, wear appropriate breathing apparatus. Protective suit

4.3. Indication of immediate medical attention and special treatment needed, if necessary

Treatment: In case of major exposure or if neurological symptoms appear., As for any chemical burn, take off immediately all contaminated clothing and rinse abundantly and thoroughly with water, Contact the nearest poison control center, Hospitalize as soon as possible in the intensive care unit

Specific treatment, Vitamin B6, Perfusion, within 5 to 10 minutes, of 70 mg/kg in 100ml of 5% glycol serum solution. Repeat every 20 minutes as long as any convulsions persist or recur

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media: Water spray, foam, powder

5.2. Special hazards arising from the substance or mixture:

Contact with incompatible products can create flammable or explosive atmospheres (formation of : Hydrogen)

5.3. Advice for firefighters:

Specific methods:

Evacuate non-essential staff and those not equipped with individual protection apparatus. Cool containers / tanks with water spray. Ensure a system for the rapid emptying of containers. In case of fire, remove exposed containers.

Special protective actions for fire-fighters:

Wear self-contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Evacuate non-essential staff and those not equipped with individual protection apparatus. Prohibit contact with skin and eyes and inhalation of vapours. Remove all sources of ignition. In case of insufficient ventilation, wear suitable respiratory equipment

6.2. Environmental precautions:

Do not release into the environment. Do not let product enter drains. Dam up with sand or inert earth (do not use combustible materials).

6.3. Methods and materials for containment and cleaning up:

Recovery:

Pump into a labelled inert emergency tank. Dilute with water. Do not mop up (risk of decomposition) (do not use sawdust, prohibit the use of cloths or rags)

Elimination:

Destroy product by oxidation with dilute solutions of : Hypochlorites (sodium - calcium)

6.4. Reference to other sections: None.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling:

Technical measures/Precautions:

Storage and handling precautions applicable to products: Liquid. Toxic. Corrosive. Sensitizing. Dangerous for the environment Provide appropriate exhaust ventilation at machinery. Provide showers, eye-baths. Provide water supplies near the point of use. Provide self-contained breathing apparatus nearby. Well ventilate empty vats and tanks before entering.

Safe handling advice:

Avoid splashing when handling. Use only explosion-proof equipment. Strictly limit the quantities of product in the work area to those which are absolutely necessary for the work in hand.

Hygiene measures:

Prohibit contact with skin and eyes and inhalation of vapours. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

Wash hands after handling. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities:

Keep in a cool, well-ventilated place. Provide facilities to capture any vapours. Store away from heat and ignition sources. Provide impermeable floor. Provide a catch-tank in a bunded area. Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres. Consult ARKEMA before storage design.

Incompatible products:

Oxidizing agents, Nitrites, Metallic oxides, Finely divided substances (decomposition catalysts)

Packaging material:

Recommended: Stainless steel, Epoxy resin coated steel, Polyethylene (specific for hydrazine)

To be avoided: Ordinary steel, Ordinary metals

7.3. **Specific end use(s):** None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. **Control parameters:**

Exposure Limit Values

Hydrazine

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
ACGIH (US)	2007	TWA	0,01	–	–
ACGIH (US)	2007	SKIN	–	–	Can be absorbed through the skin.

Derived No Effect Level (DNEL): HYDRAZINE :

End Use	Inhalation	Ingestion	Skin contact
Workers	0,1332 mg/m3 (ST, LE, SE) 0,01 ppm (LT, SE)		6,4 µg/kg bw/day (LT, SE)

LE : Local effects, SE : Systemic effects, LT : Long term, ST : Short term

Predicted No Effect Concentration: HYDRAZINE :

Compartment:	Value:
Water	0,0006 mg/l
Marine water	0,00006 mg/l
Effects on waste water treatment plants	0,055 mg/l

8.2. **Exposure controls:**

General protective measures:

Ensure sufficient air exchange and/or exhaust in work areas, Frequently monitor and control the working atmosphere., Use material of high integrity for loading and unloading., Investigate engineering techniques to reduce exposures., Routine monitoring and inspections for leaks to reduce fugitive emissions.

Personal protective equipment:

Respiratory protection:

In case of leak, wear a self-contained breathing apparatus., In case of insufficient ventilation, wear suitable respiratory equipment.

Hand protection:

PVC gloves
Protective gloves complying with EN 374.

Eye/face protection:

Safety glasses with side-shields, Face-shield

Skin and body protection:

Protective suit, Boots

Environmental exposure controls: See chapter 6

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. **Information on basic physical and chemical properties**

Appearance:

Physical state (20°C):	liquid
Colour:	colourless
Odour:	ammoniacal
Olfactory threshold:	No data available.
pH:	Concentration 1 %, pH approximately 10,6 - 10,7, In solution in water
Melting point/range :	-24 - -12 °C
Boiling point/boiling range :	102 - 104 °C
Flash point:	Has no measurable flash point up to the boiling point(open cup)
Evaporation rate:	No data available.
Flammability (solid, gas):	
Flammability:	not applicable
Vapour pressure:	15 - 20 hPa , at 20 °C
Vapour density:	No data available.
Density:	1.010 - 1.020 kg/m3 , at 20 °C
Water solubility:	completely soluble at 20 °C

Partition coefficient: n-octanol/water: HYDRAZINE : log Kow : -0,16 (OECD Test Guideline 107)
Auto-ignition temperature: No data available.
Decomposition temperature: > 250 °C
Viscosity: No data available.
Explosive properties:
Explosivity: Not explosive (A14 Method)
Oxidizing properties: Not relevant (due to the chemical structure)

9.2. Other data:

Solubility in other solvents: Soluble in: , Ethanol
Henry constant : HYDRAZINE : 960E+00 Pa.m³/mol (calculated)

10. STABILITY AND REACTIVITY

10.1. & 10.2. Reactivity & Chemical stability:

The product is stable under normal handling and storage conditions., Powerful reducer

10.3. Possibility of hazardous reactions: No data available.

10.4. Conditions to avoid:

Keep away from heat and sources of ignition.

10.5. Incompatible materials to avoid:

Oxidizing agents, Nitrites, Metallic oxides, Finely divided substances (decomposition catalysts)
• Corrosion with , Ordinary metals

10.6. Hazardous decomposition products:

Thermal decomposition:
Decomposition temperature: > 250 °C
Nitrogenous derivatives, Hydrogen

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects:

Acute toxicity:

Inhalation: According to its composition : Toxic by inhalation.

HYDRAZINE :

- In man : Effects of breathing high concentrations of vapour may include:, Neurological disorders, headache, Drowsiness, confusion, Coma
Difficulty in breathing, Risk of pulmonary oedema
Metabolic problems, acidosis, Hypoglycemia
Liver disorders
- In animals : LC50/4 h/rat: 0,75 mg/l
LC50/4 h/mouse: 0,33 mg/l

Ingestion: According to its composition : Harmful if swallowed.

HYDRAZINE :

- In animals : LD50/rat: 108 mg/kg

Dermal: According to its composition : Toxic in contact with skin.

HYDRAZINE :

- In animals : LD50/rabbit: 91 mg/kg

Local effects (Corrosion / Irritation / Serious eye damage):

Skin contact: According to its composition : Causes burns.

HYDRAZINE :

Corrosive to skin

Eye contact: According to its composition : Causes serious eye damage.

HYDRAZINE :
Vapour at high concentrations and direct contact with liquid ; Risk of serious damage to eyes.
• In animals :
Severely irritating, or even corrosive, to eyes

Respiratory or skin sensitisation:

Inhalation: No data available.

Skin contact: **According to its composition : Skin sensitizer**

HYDRAZINE :
• In man :
• In man :
• In man :
Proven human sensitizer
Eczema-like dermatitis possible
Possible cross sensitization with hydrazine derivatives

CMR effects :

Mutagenicity:

In vivo

HYDRAZINE :
Several in vivo and in vitro tests indicate potential genotoxicity

Carcinogenicity: **According to its composition : May cause cancer.**

HYDRAZINE :
Exposure to vapours
Nasal tumours only observed at high concentrations in association with permanent irritating lesions of the epithelium in the upper respiratory tract induced by the exposure
Absence of causal relationship between incidence of cancer and exposure to product in epidemiological studies
Slight carcinogenic effects in animals
No Observed Adverse Effect Level (NOAEL) (rodent, 1 year) (1,3 mg/m3)
Lowest Observed Adverse Effect Level (LOAEL) Neoplastic lesion (0,3 mg/m3)

Reproductive toxicity:

Fertility:

HYDRAZINE :
According to available experimental data:, Absence of toxic effects on fertility

Foetal development:

HYDRAZINE :
Absence of congenital malformations and embryotoxic effects in rodents at non-toxic doses for the mothers

Specific target organ toxicity :

Single exposure :

Inhalation:

HYDRAZINE :
Risk of severe irritation of respiratory system

HYDRAZINE :
Target organs: Target organs at high doses:, Liver, Kidney, Nervous system
By inhalation: Target organs: nasal tissues, site of contact, LOAEL= 0.066 mg/m3 (rat) (various animal species, Chronic)
By oral route: NOAEL= 1,92 mg/kg (rat, Subacute)

Aspiration hazard: No data available.

12. ECOLOGICAL INFORMATION

12.1. Toxicity :

Fish: **According to its composition : , Very toxic to fish.**

HYDRAZINE :
LC50, 96 h (Lebistes reticulatus) : 0,61 mg/l (Test substance: Active ingredient)

Aquatic invertebrates: According to its composition : , Very toxic to daphnia.
HYDRAZINE : EC(I)50, 48 h (Daphnia pulex (Water flea)) : 0,16 mg/l (Immobilization, Test substance: Active ingredient)

Aquatic plants: According to its composition : , Very toxic to algae.
HYDRAZINE : IC50, 72 h (Pseudokirchneriella subcapitata) : = 0,017 mg/l (Method: OECD Test Guideline 201, growth rate, Test substance: Active ingredient)
NOEC : = 0,006 mg/l

Microorganisms: Very toxic to bacteria.
HYDRAZINE : EC 5, 16 h (Pseudomonas putida) : 0,019 mg/l

Aquatic toxicity / Long term toxicity:

Aquatic invertebrates:
HYDRAZINE : NOEC, 21 d (Daphnia magna (Water flea)) : = 0,01 mg/l (Method: OECD Test Guideline 211, Reproduction inhibition, Test substance: Active ingredient)
NOEC : = 0,123 mg/l (Immobilization)

12.2. Persistence and degradability :

Biodegradation (In water): According to its composition : , Readily biodegradable
HYDRAZINE : Zahn-Wellens Test: 100 % after 1 d (Method: OECD Test Guideline 302 B)

Photodegradation (In air): Overall half-life time: 6,3 h

12.3. Bioaccumulative potential :

Bioaccumulation: According to its composition : , Not bioaccumulable
HYDRAZINE : Partition coefficient: n-octanol/water: log Kow : -0,16 (Method: OECD Test Guideline 107)

12.4. Mobility in soil - Distribution among environmental compartments:

Henry constant:
HYDRAZINE : 960E+00 Pa.m³/mol, , (Method: calculated)

12.5. Results of PBT and vPvB assessment :

According to REACH regulation, annex XIII, this mixture contains no substance meeting PBT and vPvB criteria.

12.6. Other adverse effects: None known.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment:

Disposal of product: Destroy product by oxidation with dilute solutions of : Hypochlorites (sodium - calcium)
Disposal of packaging: Clean container with water. Recover waste water for processing later.

14. TRANSPORT INFORMATION

Regulation	UN number	Proper shipping name	Class	Label	PG	Environmentally hazardous	Other information
ADR	3293	HYDRAZINE, AQUEOUS SOLUTION	6.1	6.1	III	yes	
RID	3293	HYDRAZINE, AQUEOUS SOLUTION	6.1	6.1	III	yes	
IATA Cargo	3293	Hydrazine, aqueous solution	6.1	6.1	III	yes	
IATA Passenger	3293	Hydrazine, aqueous solution	6.1	6.1	III	yes	
IMDG	3293	HYDRAZINE, AQUEOUS SOLUTION	6.1	6.1	III	Marine pollutant	EmS Number: F-A, S-A Mark: MP

15. REGULATORY INFORMATION

Safety data sheets: according to Regulation (EC) No. 1907/2006 and its amendment (453/2010)

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture:

Listed in:

EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC): hydrazine Number 28
Restriction for the placing on the market intended to the general public.
Candidate List of Substances of Very High Concern for Authorisation: hydrazine

15.2. Chemical Safety Assessment:

A Chemical Safety Assessment has been carried out for this substance.

INVENTORIES:

EINECS: Conforms to
TSCA: Conforms to
AICS: Conforms to
DSL: All components of this product are on the Canadian DSL.
ENCS (JP): Conforms to
KECI (KR): Conforms to
PICCS (PH): Conforms to
IECSC (CN): Conforms to

16. OTHER INFORMATION

Full text of R, H, EUH-phrases referred to under sections 2 and 3

R20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
R23/24/25	Toxic by inhalation, in contact with skin and if swallowed.
R34	Causes burns.
R43	May cause sensitisation by skin contact.
R45	May cause cancer.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

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Bibliography Fiche toxicologique INRS : N° 121 : HYDRAZINE, HYDRATE D'HYDRAZINE

Further information This product must be handled only by personnel well informed of safety conditions., When used in formulations, contact us for labelling.

Update:

Safety datasheet sections which have been updated:		Type:
1	Company/Undertaking Identification	Revisions
2	Classification and labelling	Revisions
4	4. FIRST AID MEASURES	Additions
7	Safe handling advice	Revisions
15	Safety, health and environmental regulations/legislation specific for the substance or mixture	Additions
16	Chemical Safety Assessment	Revisions

Thesaurus:

NOAEL : No Observed Adverse Effect Level (NOAEL)
LOAEL : Lowest Observed Adverse Effect Level (LOAEL)
bw : Body weight
food : oral feed
dw : Dry weight
vPvB : very Persistent and very Bioaccumulative
PBT : Persistent, Bioaccumulative and Toxic

This information applies to the PRODUCT AS SUCH and conforming to specifications of ARKEMA. In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear. The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes. The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive. It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product. It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes) the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.

NB: In this document the numerical separator of the thousands is the "." (point), the decimal separator is "," (comma).