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----------ISO 9001: 2015----------

MATERIAL SAFETY DATA SHEET

1.Identification
1.1GHS Product identifier
Paraldehyde, 97%
Code P 1338

2.Hazard identification
2.1Classification of the substance or mixture
Flammable liquids, Category 3
2.2GHS label elements, including precautionary statements
Pictogram(s)

Signal word	Warning
Hazard statement(s)	H226 Flammable liquid and vapour
Precautionary statement(s)	
Prevention	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233 Keep container tightly closed. P240 Ground and bond container and receiving equipment. P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment. P242 Use non-sparking tools. P243 Take action to prevent static discharges. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Response	P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. P370+P378 In case of fire: Use ... to extinguish.
Storage	P403+P235 Store in a well-ventilated place. Keep cool.
Disposal	P501 Dispose of contents/container to ...

2.3Other hazards which do not result in classification
none

3.Composition/information on ingredients
3.1Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
paraldehyde	paraldehyde	123-63-7	none	100%

4.First-aid measures
4.1Description of necessary first-aid measures
General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.
If inhaled
Fresh air, rest. Refer for medical attention.
In case of skin contact
Remove contaminated clothes. Rinse and then wash skin with water and soap.
In case of eye contact
First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.
If swallowed
Do NOT induce vomiting. Give one or two glasses of water to drink. Refer for medical attention .
4.2Most important symptoms/effects, acute and delayed
INHALATION AND INGESTION: Irritation, headache, bronchitis, pulmonary edema. Irritating to digestive tract. Hypnotic and analgesic properties. Incoordination and drowsiness, followed by sleep. Larger doses-coma-weak pulse and shallow respiration, cyanosis-death from respiratory paralysis. EYES: irritation-can cause serious injury. SKIN: Dermatitis (skin inflammation). (USCG, 1999)
4.3Indication of immediate medical attention and special treatment needed, if necessary
Treatment is directed toward maintenance of airway, breathing, and circulation. Supportive care is the mainstay of therapy. Patients are often critically ill and must be under constant supervision.

5.Fire-fighting measures
5.1Extinguishing media
Suitable extinguishing media
Use water spray, dry chemical, "alcohol resistant" foam, or carbon dioxide. Water may be ineffective. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.
5.2Specific hazards arising from the chemical
Special Hazards of Combustion Products: Emits toxic fumes on heating. Behavior in Fire: Can react vigorously when exposed to heat or flame. Vapor is heavier than air and may travel a considerable distance to source of ignition and flash back. (USCG, 1999)
5.3Special protective actions for fire-fighters
Wear self-contained breathing apparatus for firefighting if necessary.

6.Accidental release measures
6.1Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.
6.2Environmental precautions
Remove all ignition sources. Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Collect leaking and spilled liquid in sealable non-plastic containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.
6.3Methods and materials for containment and cleaning up
Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7.Handling and storage
7.1Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.
7.2Conditions for safe storage, including any incompatibilities
Fireproof. Separated from food and feedstuffs, bases and oxidants.PARALDEHYDE SHOULD BE STORED IN WELL-FILLED, TIGHT, LIGHT-RESISTANT GLASS CONTAINERS WITH A CAPACITY OF NO MORE THAN 30 ML, AT A TEMP NOT EXCEEDING 25 DEG C.

8.Exposure controls/personal protection
8.1Control parameters
Occupational Exposure limit values
no data available
Biological limit values
no data available
8.2Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
8.3Individual protection measures, such as personal protective equipment (PPE)
Eye/face protection
Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin protection
Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique(without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.
Respiratory protection
Wear dust mask when handling large quantities.
Thermal hazards
no data available

9.Physical and chemical properties

Physical state	Colourless to yellowish clear liquid
Colour	COLORLESS, TRANSPARENT LIQUID
Odour	CHARACTERISTIC AROMATIC ODOR
Melting point/ freezing point	12\u00baC
Boiling point or initial boiling point and boiling range	124\u00baC
Flammability	Highly flammable.
Lower and upper explosion limit / flammability limit	LOWER LIMIT, 1.3%.
Flash point	27\u00baC
Auto-ignition temperature	237.78\u00b0C (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	1.128 centipoise at 70 deg F
Solubility	In water:125 g/L (25 \u00baC)

Partition coefficient n-octanol/water (log value)	Log Kow = 0.67
Vapour pressure	25.89 psi (55 \u00b0C)
Density and/or relative density	0.992
Relative vapour density	1.52 (vs air)
Particle characteristics	no data available

10.Stability and reactivity
10.1Reactivity
no data available
10.2Chemical stability
ON EXPOSURE TO LIGHT & AIR, IT DECOMP TO ACETALDEHYDE & IS OXIDIZED TO ACETIC ACID
10.3Possibility of hazardous reactions
DANGEROUS, WHEN EXPOSED TO HEAT, FLAME OR OXIDIZERS.The vapour is heavier than air and may travel along the ground; distant ignition possible.PARALDEHYDE is an ether derivative. This compound is decomposed by light and air, on prolonged storage, to acetaldehyde and acetic acid. Incompatible with alkalis, hydrocyanic acid iodides and oxidizers.
10.4Conditions to avoid
no data available
10.5Incompatible materials
Paraldehyde is incompatible with many plastics
10.6Hazardous decomposition products
EMITS TOXIC FUMES ON HEATING.

11.Toxicological information
Acute toxicity
Oral: LD50 Dog oral (acute) 3.0 to 4.0 g/kg
Inhalation: no data available
Dermal: no data available
Skin corrosion/irritation
no data available
Serious eye damage/irritation
no data available
Respiratory or skin sensitization
no data available
Germ cell mutagenicity
no data available
Carcinogenicity
no data available
Reproductive toxicity
no data available
STOT-single exposure
no data available
STOT-repeated exposure
no data available
Aspiration hazard
no data available

12.Ecological information
12.1Toxicity
Toxicity to fish: no data available
Toxicity to daphnia and other aquatic invertebrates: no data available
Toxicity to algae: no data available
Toxicity to microorganisms: no data available
12.2Persistence and degradability
Japanese MITI, initial concn 100 ppm, 14 days <30% BODT, activated sludge inoculum(1). A bacterium isolated from sewage, C. paraldehydium KY 4359, was found to degrade paraldehyde to acetaldehyde and acetic acid(2).
12.3Bioaccumulative potential
Based on a water solubility of 125,000 mg/l at 25\u00b0C and a log Kow of 0.67, bioconcentration factors (BCF) of 0.8-2 were estimated for paraldehyde(1,2,3,SRC). These BCF values suggest that paraldehyde would not bioaccumulate significantly in aquatic organisms(SRC).
12.4Mobility in soil
Soil adsorption coefficients (Koc) of 7-55 were estimated for paraldehyde using linear regression equations based on a water solubility of 125,000 mg/l at 25\u00b0C and a log Kow of 0.67(1,2,3,SRC). These Koc values suggest that paraldehyde would be very highly mobile in soil and that adsorption to suspended solids and sediments in water would be insignificant(4,SRC).
12.5Other adverse effects
no data available

13.Disposal considerations
13.1Disposal methods
Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.
Contaminated packaging
Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14.Transport information
14.1UN Number
ADR/RID: UN1264 IMDG: UN1264 IATA: UN1264
14.2UN Proper Shipping Name
ADR/RID: PARALDEHYDE
IMDG: PARALDEHYDE
IATA: PARALDEHYDE
14.3Transport hazard class(es)
ADR/RID: 3 IMDG: 3 IATA: 3
14.4Packing group, if applicable
ADR/RID: II IMDG: II IATA: II
14.5Environmental hazards
ADR/RID: no IMDG: no IATA: no
14.6Special precautions for user
no data available
14.7Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
no data available

15.Regulatory information
15.1Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
paraldehyde	paraldehyde	123-63-7	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information
This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.