SAFETY DATA SHEET

FORMALDEHYDE (37% SOLUTION)

CAS No.: 50-00-0

This Safety Data Sheet is issued by Suraj Chemicals as the distributor/supplier of record, based on manufacturer and published GHS / regulatory reference data for this substance. Users should also consult the specific manufacturer's SDS where available.

1. IDENTIFICATION

GHS Product identifier

FORMALDEHYDE (37% SOLUTION)
Synonyms: Formalin; Methanal solution; Formic aldehyde solution (typically stabilized with 10–15% methanol)
CAS: 50-00-0

Other means of identification

Not relevant

Recommended use of the chemical and restrictions on use

Relevant uses: Resin manufacture (urea-formaldehyde, phenol-formaldehyde), disinfectant/biocide, tanning agent, chemical intermediate, industrial preservative. For industrial user only.

Uses advised against: All uses not specified in this section or in section 7.3.

Supplier's details

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Acute Tox. 3	Acute oral toxicity, Category 3, H301
Acute Tox. 3	Acute dermal toxicity, Category 3, H311
Acute Tox. 3	Acute inhalation toxicity, Category 3, H331
Skin Corr. 1B	Skin corrosion, Category 1B, H314
Skin Sens. 1	Skin sensitisation, Category 1, H317
Carc. 1B	Carcinogenicity, Category 1B, H350
Muta. 2	Germ cell mutagenicity, Category 2, H341

GHS label elements, including precautionary statements

GHS: Danger

Hazard statements

Acute Tox. 3: H301 – Toxic if swallowed.
Acute Tox. 3: H311 – Toxic in contact with skin.
Acute Tox. 3: H331 – Toxic if inhaled.
Skin Corr. 1B: H314 – Causes severe skin burns and eye damage.
Skin Sens. 1: H317 – May cause an allergic skin reaction.
Carc. 1B: H350 – May cause cancer.
Muta. 2: H341 – Suspected of causing genetic defects.

Precautionary statements

P201: Obtain special instructions before use.
P260: Do not breathe vapours/mist.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P272: Contaminated work clothing should not be allowed out of the workplace.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P284: Wear respiratory protection.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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/doctor.
P405: Store locked up.
P501: Dispose of the contents/containers in accordance with regulations on hazardous waste.

Other hazards which do not result in classification

Contains methanol as stabiliser (10–15%, itself toxic/flammable). Pungent, highly irritating vapours even at low concentrations. Does not meet the PBT/vPvB criteria for formaldehyde itself.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Chemical description: Formaldehyde, aqueous solution (37% w/w, methanol-stabilized)

In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 50-00-0	Formaldehyde (37% soln.) — Acute Tox. 3: H301, H311, H331; Skin Corr. 1B: H314; Skin Sens. 1: H317; Carc. 1B: H350; Muta. 2: H341 – Danger	~37% formaldehyde in water (balance water and ~10–15% methanol stabiliser)

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

Mixtures

Non-applicable

4. FIRST AID MEASURES

Description of necessary first-aid measures

Request medical assistance immediately, showing the SDS of this product.

By inhalation

Remove the person affected from the area of exposure immediately, provide fresh air and keep at rest. Vapours are highly irritating/corrosive to the respiratory tract. Seek immediate medical attention.

By skin contact

Remove contaminated clothing immediately, rinse skin thoroughly with plenty of water for at least 15 minutes. Causes severe burns – seek immediate medical attention.

By eye contact

Rinse eyes immediately and thoroughly with lukewarm water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek IMMEDIATE medical attention.

By ingestion/aspiration

Do NOT induce vomiting. Rinse the mouth with water – do not give anything by mouth if the person is unconscious. Seek IMMEDIATE medical attention, showing the SDS of the product.

Most important symptoms/effects, acute and delayed

Acute and delayed effects are indicated in sections 2 and 11.

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

Treat as a corrosive/chemical burn injury. Specialist medical evaluation is required without delay; formaldehyde ingestion is a medical emergency.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Suitable: Water spray/fog, foam, carbon dioxide, dry chemical powder
Unsuitable: None known

Specific hazards arising from the chemical

Aqueous solution is not readily flammable itself, but the methanol stabiliser content can contribute combustible vapours near an ignition source, especially if concentrated by evaporation. Combustion/decomposition produces toxic formaldehyde and carbon monoxide fumes.

Special protective actions for fire-fighters

Evacuate all non-essential personnel. Intervention only by capable personnel who are trained and aware of the hazards of the product. In all cases wear self-contained breathing apparatus. When intervention in close proximity, wear full protective chemical-resistant suit. After intervention, proceed to clean the equipment (take a shower, remove clothing carefully, clean and check).

Additional provisions

Cool fire-exposed containers with water spray from a safe distance. Use self-contained breathing apparatus and full protective (acid-resistant) clothing due to toxic/corrosive fume risk.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Ventilate the area – vapours are highly irritating. Contain the spill (bunding/absorbent), provided there is no additional risk – product is corrosive/toxic. Use appropriate PPE (see section 8).

For emergency responders

Wear protective equipment. Keep unprotected persons away. See section 8.

Environmental precautions

Avoid release to drains, watercourses or soil. Notify the relevant authority in case of significant environmental release.

Methods and materials for containment and cleaning up

Absorb with inert non-combustible absorbent material (sand, vermiculite) and place in a labelled, closed, corrosion-resistant container for disposal. Do not use combustible absorbents.

Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use

Use only in well-ventilated areas with local exhaust ventilation. Avoid inhalation of vapours and contact with skin and eyes. Contaminated work clothing should not leave the workplace.

B. Technical recommendations for the prevention of fires and explosions

Keep away from heat and ignition sources due to methanol stabiliser content. Keep containers tightly closed.

C. Technical recommendations on general occupational hygiene

Do not eat or drink during the process; wash hands afterwards with suitable cleaning products.

D. Technical recommendations to prevent environmental risks

Provide tight electrical equipment well protected against corrosion. Avoid atmospheric emissions. Warn people about the dangers of the product. Follow the protective measures given in the exposure controls/personal protection section. In industrial installations, apply the rules for the prevention of major accidents (consult an expert).

Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Minimum Temp.	5°C (avoid freezing/polymer precipitation)
Maximum Temp.	25°C (cool, avoid elevated temperature which accelerates polymerisation/paraformaldehyde precipitation)
Maximum time	6 Months in original sealed packaging

B. General conditions for storage

Store in a cool, dark, well-ventilated, locked area in corrosion-resistant, tightly closed containers, away from heat, oxidizing agents and strong alkalis/acids. For additional information see subsection 10.5.

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Specific end use(s)

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):

Identification	Occupational Exposure Limit Type	Value
Formaldehyde CAS: 50-00-0	ACGIH TLV – Ceiling (C)	0.3 ppm

Appropriate engineering controls

It is recommended to use localized extraction in the work area as a collective protection measure to avoid exceeding occupational exposure limits, in addition to individual protective equipment (PPE) as needed. Consult the manufacturer's information leaflet for storage, use, cleaning and maintenance of PPE.

B. Respiratory protection

Full-face respirator with formaldehyde/organic vapour combination cartridge; supplied-air respirator for high concentrations or confined spaces.

C. Specific protection for the hands

Chemical-resistant gloves (e.g. butyl rubber, nitrile of appropriate thickness). Replace at any sign of damage.

D. Eye and face protection

Chemical splash goggles and face shield – risk of serious eye damage.

E. Bodily protection

Chemical-resistant apron/coveralls; full protective clothing for operations with splash potential.

F. Additional emergency measures

Emergency shower (ANSI Z358-1, ISO 3864-1:2011, ISO 3864-4:2011) and eyewash stations (DIN 12 899, ISO 3864-1:2011, ISO 3864-4:2011) should be available.

Environmental exposure controls

Avoid environmental spillage of both the product and its container. See subsection 7.1.D.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state at 20°C	Liquid
Appearance	Clear, mobile liquid
Color	Colorless
Odor	Pungent, sharp, irritating
Odour threshold	~0.5–1 ppm (low, well below irritation threshold)
Volatility	
Boiling point at atmospheric pressure	~96–100°C (solution)
Vapour pressure at 20°C	Available on request (formaldehyde gas partial pressure increases with temperature)
Evaporation rate at 20°C	Available on request
Product Description	
Density / Relative density at 20°C	~1.09–1.10 g/cm³
Dynamic / Kinematic viscosity at 20°C	~1.5 mPa·s (approx.)
Concentration	~37% formaldehyde
pH (as supplied, 20°C)	~2.8–4.0 (acidic, due to formic acid formation on ageing)
Vapour density (air = 1)	~1.03 (formaldehyde gas)
Partition coefficient n-octanol/water (log Pow, formaldehyde)	0.35
Solubility in water at 20°C	Miscible (supplied as aqueous solution)
Decomposition temperature	Polymerises to paraformaldehyde on cooling/concentration
Melting point/freezing point	~-15°C (solution, approx., grade dependent)
Flammability	
Flash Point	~83–85°C (closed cup, solution; may be lower depending on methanol content)
Flammability (solid, gas)	Non-applicable (liquid); combustible due to methanol stabiliser content
Autoignition temperature	Available on request
Lower / Upper flammability limit	Not established for the solution (formaldehyde gas itself: 7–73% vol.)
Particle Characteristics	
Median equivalent diameter	Non-applicable (liquid)

Other information

Explosive properties	Not classified as explosive
Oxidising properties	Not an oxidizer
Corrosive to metals	May corrode certain metals over prolonged contact (mildly acidic solution)
Heat of combustion	Available on request
Surface tension at 20°C	Available on request
Refraction index	~1.376 (approx.)

10. STABILITY AND REACTIVITY

Reactivity

Can self-polymerise, especially at low temperature or high concentration, forming paraformaldehyde precipitate. Reacts with strong oxidizers, strong acids and strong bases; reacts with amines, amides, phenols and other reactive compounds, sometimes exothermically.

Chemical stability

Chemically stable under the indicated conditions of storage, handling and use.

Possibility of hazardous reactions

Slow oxidation to formic acid occurs on ageing/exposure to air, lowering pH over time. Contact with strong oxidizers, acids or bases can cause a vigorous, exothermic reaction. Under recommended storage conditions no other hazardous reactions are expected.

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Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Slow oxidation to formic acid	Avoid high heat (polymerisation/precipitation on cooling; combustible methanol content near heat)	Not applicable	Not applicable (aqueous solution)

Incompatible materials

Strong Oxidizing Agents	Strong Acids/Bases	Amines / Phenols / Reactive Organics
Avoid contact – vigorous reaction	Avoid contact	Avoid contact – may react exothermically

Hazardous decomposition products

Formaldehyde vapour, carbon monoxide and formic acid on decomposition/combustion.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect)

Toxic if swallowed. Corrosive – causes severe burns to the mouth, throat and gastrointestinal tract; may cause nausea, vomiting, abdominal pain and, in severe cases, systemic toxicity.

B. Inhalation (acute effect)

Toxic if inhaled. Vapours are highly irritating/corrosive to the eyes, nose, throat and respiratory tract even at low concentrations; can cause coughing, breathing difficulty and, at high concentrations, pulmonary oedema.

C. Contact with skin and eyes (acute effect)

Causes severe skin burns and serious eye damage on contact. May cause allergic skin reaction (sensitisation) on repeated contact.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)

May cause cancer (Carc. 1B, H350) – associated with nasopharyngeal cancer in occupational inhalation studies. IARC: Group 1 (carcinogenic to humans, inhalation route). Suspected of causing genetic defects (Muta. 2, H341). Classification criteria for reproductive toxicity are not met based on available data.

E. Sensitizing effects

May cause an allergic skin reaction (Skin Sens. 1, H317) on repeated or prolonged contact.

F. Specific target organ toxicity (STOT) – single exposure

Primary acute hazard is corrosivity and acute systemic toxicity (see section 2); respiratory irritation is a hallmark early symptom of exposure.

G. Specific target organ toxicity (STOT) – repeated exposure

Repeated inhalation exposure has been linked to respiratory tract irritation and, at higher exposures, nasal effects in occupational/animal studies; formal STOT RE classification criteria under GHS are addressed via the carcinogenicity classification for this substance.

H. Aspiration hazard

Classification criteria are not met based on available data.

Product-specific toxicological information

Identification	Acute Toxicity	Genus
Formaldehyde, aqueous solution (37% w/w, methanol-stabilized) CAS: 50-00-0	LD50 oral: 100 mg/kg (as formaldehyde)	Rat
	LD50 dermal: 270 mg/kg	Rabbit
	LC50 inhalation: 0.578 mg/L (4h)	Rat

12. ECOLOGICAL INFORMATION

Toxic to aquatic organisms; exerts significant biochemical/chemical oxygen demand.

Toxicity

Identification	Acute Toxicity	Species	Genus
Formaldehyde CAS: 50-00-0	LC50: 24 mg/L (96h)	Pimephales promelas	Fish
	EC50: 21 mg/L (48h)	Daphnia magna	Crustacean

Persistence and degradability

Readily biodegradable under standard OECD test conditions; also rapidly hydrolyses/oxidises in aqueous environments.

Bioaccumulative potential

Low bioaccumulation potential (log Pow 0.35).

Mobility in soil

Koc	Henry	Dry Soil	Moist Soil
Low	Low	No	Miscible, disperses readily

Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of Annex XIII.

Other adverse effects

Not described

13. DISPOSAL CONSIDERATIONS

Disposal methods

Incinerate in a licensed hazardous waste incinerator with emission control, or treat via chemical destruction/biological treatment under a permitted process, in accordance with local regulations. For packaging: do not rinse into drains; manage as hazardous waste.

Refer to national and local regulations on waste management, including the Hazardous and Other Wastes (Management and Transboundary Movement) Rules.

14. TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023)

14.1 UN number	UN2209
14.2 UN proper shipping name	FORMALDEHYDE SOLUTION (flammable, >25% formaldehyde)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22)

14.1 UN number	UN2209
14.2 UN proper shipping name	FORMALDEHYDE SOLUTION (flammable, >25% formaldehyde)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
14.5 Marine pollutant	No
14.6 Special precautions for user	EmS Codes: F-A, S-B | Limited quantities: 5 L | Segregation group: Not relevant
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024)

14.1 UN number	UN2209
14.2 UN proper shipping name	FORMALDEHYDE SOLUTION (flammable, >25% formaldehyde)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation

Manufacture, Storage and Import of Hazardous Chemicals Rules 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
Public Liability Insurance Act, 1991

16. OTHER INFORMATION

Legislation related to safety data sheets

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3

H301: Toxic if swallowed.
H311: Toxic in contact with skin.
H331: Toxic if inhaled.
H314: Causes severe skin burns and eye damage.
H317: May cause an allergic skin reaction.
H350: May cause cancer.
H341: Suspected of causing genetic defects.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources

The United Nations Economic Commission for Europe (UNECE); European Chemicals Agency (ECHA) classification and labelling inventory; ACGIH Threshold Limit Values.

Abbreviations and acronyms

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | COD: Chemical Oxygen Demand | BOD5: 5-day biochemical oxygen demand | BCF: Bioconcentration factor | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

Disclaimer: The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

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