Material Safety Data Sheets

Revision 2

1. IDENTIFICATION

Product Name	**Formaldehyde Extra pure**
Other Names	Formaldehyde Solution
Code No	100-FA-2
Uses	Used as disinfectant, biocide and in manufacture of phenolic resins and adhesives. Renders casein, albumin and gelatin insoluble.
Chemical Family	No Data Available
Chemical Formula	CH_2O
Chemical Name	Formaldehyde
Product Description	No Data Available
Contact Information	info@armansina.com www.armansina.com

2. HAZARD IDENTIFICATION

Hazard Categories	Toxic
Risk Phrases	Toxic by inhalation, in contact with skin and if swallowed.
	Causes burns.
	May cause sensitisation by skin contact.
	May cause cancer by inhalation.
	Harmful to aquatic organisms.
	Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.
Safety Phrases	Keep away from food, drink and animal feeding stuffs.
	Do not breathe fumes/gas/spray/vapour.
	Avoid contact with eyes.
	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
	Take off immediately all contaminated clothing.
	Wear suitable protective clothing and gloves.
	In case of insufficient ventilation, wear suitable respiratory equipment.
	To clean the floor and all objects contaminated by this material use water.
	To clean the floor and all objects contaminated by this material, use water to wet product then collect with broom or shovel.
	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
	Use only in well ventilated areas.

Symbol

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Formaldehyde	CH_2O	50-00-0	37.0 %
Methanol	CH_3OH	67-56-1	10.0 %
Water	H_2O	7732-18-5	BALANCE %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	If swallowed do NOT induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. Immediately give a glass of water.
Eye	Immediately hold eyelids apart and flush the eye continuously with running water while holding eye lids open. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin	Immediately flush body and clothes with large amounts of water, using safety shower if available. Quickly remove all contaminated clothing, including footwear. Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. Transport to hospital, or doctor.
Inhaled	Remove from contaminated area. Lay patient down. Keep warm and rested. Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. Transport to hospital, or doctor, without delay.
Advice to Doctor	For acute or short-term repeated exposures to formaldehyde: INGESTION: Patients present early with severe corrosion of the gastro- intestinal tract and systemic effects. Inflammation and ulceration may progress to strictures. Severe acidosis results from rapid conversion of formaldehyde to formic acid. Coma, hypotension, renal failure and apnoea complicate ingestion. Decontaminate by dilution with milk or water containing ammonium acetate; vomiting should be induced. Follow with gastric lavage using a weak ammonia solution (converts formaldehyde to relatively inert pentamethylenetetramine). Gastric lavage is warranted only in first 15 minutes following ingestion. SKIN: Formaldehyde can combine with epidermal protein to produce a hapten- protein couple capable of sensitising Tlymphocytes. Subsequent exposures cause a type IV hypersensitivity reaction (i.e allergic contact dermatitis). [Ellenhorn & Barceloux: Medical Toxicology].
Medical Conditions Aggravated by Exposure	Inhalation of vapour may aggravate a pre-existing respiratory condition. CHRONIC HEALTH EFFECTS: Principal routes of exposure are usually by inhalation of vapour and skin contact/absorption. Sensitisation may give severe responses to very low levels of exposure, i.e. hypersensitivity. Sensitised persons should not be allowed to work in situations where exposure may occur. As with any chemical product, contact with unprotected bare skin; inhalation of vapour, mist or dust in work place atmosphere; or ingestion in any form, should be avoided by observing good occupational work practice.

5. FIRE FIGHTING MEASURES

Flammability Conditions	Product is a Combustible Liquid.
Extinguishing Media	In case of fire, use Water spray or fog, foam, Dry chemical powder, BCF (Where regulations permit), or Carbon dioxide. Use water delivered as a fine spray to control fire and cool adjacent area. Avoid spraying water onto liquid pools. Cool fire exposed containers with water spray from a protected location.
Hazardous Products of Combustion	Combustible liquid and vapour. Incompatible with oxidizing agents, acids, alkalis, active organic materials such as phenol and sources of ignition. Heating may cause expansion or decomposition leading to violent rupture of containers. May emit flammable vapour if involved in fire. At elevated temperatures, oxidation of formaldehyde produces formic acid. Decomposition products may include toxic fumes of carbon monoxide and carbon dioxide. Acid catalysis can produce impurities: methylal, methyl formate. Undergoes non-hazardous self-polymerization to form paraformaldehyde (Methanol reduces precipitation.)
Personal Protective Equipment	Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves), gas tight chemical resistant suit. Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do not approach containers suspected to be hot. Equipment should be thoroughly decontaminated after use. When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 500 metres in all directions. Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.
Flash Point	62ºC
Lower Explosion Limit	7%
Upper Explosion Limit	73 %
Auto Ignition Temperature	No Data Available
Hazchem Code	X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Personnel involved in the clean up should wear full protective clothing as listed in section 8. Avoid accidents, clean up immediately. Evacuate all unnecessary personnel. Increase ventilation. Avoid walking through spilled product as it is slippery when spilt. Stop leak if safe to do so. Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management. Use clean, non-sparking tools and equipment. Shut off all possible sources if ignition.
Clean Up Procedures	Soak up spilled product using absorbent non-combustible material such as sand or soil. Avoid using sawdust or cellulose. When saturated collect material, transfer to suitable, labelled, dry chemical-waste containers and dispose of promptly as hazardous waste. Neutralise spill with aqueous ammonia, or complex with sodium bisulphite. Place in suitable containers for disposal. Wash residue with dilute ammonia to eliminate vapour. After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.

7. HANDLING AND STORAGE

Handling	Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Take precautionary measures against static discharges by bonding and grounding equipment. Avoid all personal contact, including inhalation. Use in a well-ventilated area. Avoid smoking, naked lights, heat or ignition sources. Vapour may travel a considerable distance to source of ignition. Avoid contact with incompatible materials. When handling, DO NOT eat, drink or smoke. Wash hands with soap and water after handling. Work clothes should be laundered separately: NOT at home. Avoid prolonged or repeated exposure. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained. Personnel must be made aware of the hazards of handling formaldehyde solutions and trained to deal with emergency situations involving the material.
Storage	Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Protect from direct sunlight. Store away from foodstuff containers. This product has a UN classification of 2209 and a Dangerous Goods Class 8 Corrosive) according to The Australian Code for the Transport of Dangerous Goods By Road and Rail.
Container	SUITABLE CONTAINER: Glass container is suitable for laboratory quantities. Plastic drum. Polyethylene or polypropylene container. Metal can. Metal drum. Check that containers are clearly labelled. Packaging as recommended by manufacturer.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	Formaldehyde CAS 50-00-0: TWA = 1ppm (1.2mg/m3) STEL = 2ppm (2.5mg/m3) Carcinogen Category = 2 Notices = Sen Methyl Alcohol CAS 67-56-1: TWA = 200ppm (262mg/m3) STEL = 250ppm (328mg/m3) Notices = Sk NOTE: The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. Notices: Sen = Sensitiser; Sk = Absorption through the skin may be a significant source of exposure These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable.
Exposure Limits	No Data Available
Biological Limits	No information available on biological limit values for this product.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Preplacement and periodic medical examinations are recommended for workers exposed to formalin. Examinations should give consideration to possible irritant effects on the skin, eyes, lungs, especially if the person has a history of allergies. Personnel must be made aware of the hazards of handling formaldehyde solutions and trained to deal with emergency situations involving the material. Use in a completely enclosed system as much as possible. If respirators are used, a program should be instituted to ensure compliance with regulatory guidelines.
Personal Protection Equipment	RESPIRATOR: If inhalation risk exists, wear organic vapour respirator, full- face or air-supplied breathing apparatus (AS1715/1716). EYES: Safety glasses with side shields or chemical goggles (AS1336/1337). HANDS: Plastic gloves, PVC gloves, Rubber gloves, (AS2161). CLOTHING: Chemical-resistant coveralls, PVC apron and safety footwear (AS3765/2210).
Work Hygienic Practices	No Data Available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	**Liquid**
Appearance	**Liquid. On standing, especially when cold, may become cloudy.**
Odour	**Pungent Odour**
Colour	**Clear, water-white.**
pH	**2.5 - 4.0**
Vapour Pressure	**1.3 hpa**
Relative Vapour Density	**No Data Available**
Boiling Point	**94ºC**
Melting Point	**-15ºC**
Freezing Point	**No Data Available**
Solubility	**No Data Available**
Specific Gravity	**1.09 (approx)**
Flash Point	**62ºC**
Auto Ignition Temp	**No Data Available**
Evaporation Rate	**No Data Available**
Bulk Density	**No Data Available**
Corrosion Rate	**No Data Available**
Decomposition Temperature	**No Data Available**
Density	**No Data Available**
Specific Heat	**No Data Available**
Molecular Weight	**No Data Available**
Net Propellant Weight	**No Data Available**
Octanol Water Coefficient	**No Data Available**
Particle Size	**No Data Available**
Partition Coefficient	**No Data Available**
Saturated Vapour Concentration	**No Data Available**
Vapour Temperature	**No Data Available**
Viscosity	**No Data Available**
Volatile Percent	**>44%**
VOC Volume	**No Data Available**
Additional Characteristics	**No Data Available**
Potential for Dust Explosion	**Product is a liquid.**
Fast or Intensely Burning Characteristics	**No Data Available**
Flame Propagation or Burning Rate of Solid Materials	**No Data Available**
Non-Flammables That Could Contribute Unusual Hazards to a Fire	**No Data Available**
Properties That May Initiate or Contribute to Fire Intensity	**No Data Available**
Reactions That Release Gases or Vapours	**May emit flammable vapour if involved in fire.**
Release of Invisible Flammable Vapours and Gases	**No Data Available**

10. STABILITY AND REACTIVITY

Chemical Stability	**Product is stable under normal conditions of use, storage and temperature. Corrosive Liquid. Combustible liquid and vapour. Product is stabilized with methanol. (Methanol reduces precipitation.)**
Conditions to Avoid	**Avoid excessive heat, ignition, direct sunlight, moisture, static discharges and high temperatures.**
Materials to Avoid	**Incompatible with oxidizing agents.**
Hazardous Decomposition Products	**Heating may cause expansion or decomposition leading to violent rupture of containers. May emit flammable vapour if involved in fire. At elevated temperatures, oxidation of formaldehyde produces formic acid. Decomposition products may include toxic fumes of carbon monoxide and carbon dioxide. Acid catalysis can produce impurities: methylal, methyl formate. Undergoes non-hazardous self-polymerization to form paraformaldehyde (Methanol reduces precipitation.)**
Hazardous Polymerisation	**Undergoes non-hazardous self-polymerization to form paraformaldehyde. (Methanol reduces precipitation.) Will polymerize with active organic materials such as phenol. Concentrated solutions containing formaldehyde are unstable, both oxidising slowly to form formic acid and polymerising. In the presence of air and moisture, polymerisation takes place readily in concentrated solutions at room temperature to form paraformaldehyde, a solid mixture of linear polyoxymethylene glycols containing 90-99% formaldehyde.**

11. TOXICOLOGICAL INFORMATION

General Information	**FORMALDEHYDE: Oral (woman) LDLo:108mg/Kg Oral (man) TDLo: 643mg/Kg Oral (rat) LD50: 100mg/Kg Inhalation (man) TCLo: 0.3mg/m3 Inhalation (rat) LC50: 203mg/m3 Dermal (rabbit) LD50: 270mg/Kg Skin (human): 0.15 mg/3d- I Mild Skin (rabbit): 2 mg/24H SEVERE Eye (human): 4 ppm/5m Eye (rabbit): 0.75 mg/24H SEVERE CARCINOGEN: Formaldehyde: International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs: Group 1 HSIS Carc. Cat. 2**
EyeIrritant	**Causes burns. The liquid is extremely discomforting to the eyes and is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated. The vapour is highly discomforting and may cause lachrymation (tears) and burning sensation. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The methanol stabiliser in solutions is a cause of visual impairment and possible permanent blindness.**
Ingestion	**Toxic if swallowed. Causes burns. Limited evidence of a carcinogenic effect. Considered an unlikely route of entry in commercial/industrial environments. The liquid is extremely discomforting and is toxic if swallowed. Ingestion may cause immediate severe abdominal pain, with vomiting, nausea, diarrhoea, anuria, dizziness, followed by unconsciousness, convulsions and may result in death.**
Inhalation	**Toxic by inhalation. Causes burns. Limited evidence of a carcinogenic effect. The vapour is highly discomforting to the upper respiratory tract and repeated exposure may cause sensitisation and/or allergic reactions. Respiratory sensitisation may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping. Sensitisation reactions may appear suddenly after repeated exposures. The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function. Inhalation of vapour at relatively low concentrations may cause a tingling sensation in the nose and upper respiratory tract. Slightly higher concentrations may cause a burning sensation**
SkinIrritant	**Toxic in contact with skin. Causes burns. May cause sensitisation by skin contact. The liquid is highly discomforting to the skin and may cause chemical burns if exposure is prolonged. The material is capable of causing allergic skin reactions skin sensitisation. Sensitisation may result in allergic dermatitis responses including rash, itching, hives or swelling of extremities. Toxic effects may result from skin absorption. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.**
Carcinogen Category	**No Data Available**

12. ECOLOGICAL INFORMATION

Ecotoxicity	**FORMALDEHYDE: Harmful to aquatic organisms. The material is classified as an Ecotoxin* because the Fish LC50 (96 hours) is less than or equal to 0.1 mg/L. *Classification of Substances as Ecotoxic (Dangerous to the Environment) Formaldehyde is ubiquitous in the environment as a contaminant of smoke and as photochemical smog. In the atmosphere, formaldehyde both photolyses and reacts with reactive free radicals (primarily hydroxyl radicals); half-lives in the sunlit tropospheres are 1.25 to 6 hours for photolysis, and 7.13-71.3 hours for reaction with hydroxyl radicals. Reaction with nitrate radicals, insignificant during the day, may be an important removal process at night. Due to its solubility, formaldehyde will efficiently transfer to rain and surface water; one model predicts dry deposition and wet removal half-lives of 19 and 50 hours, respectively.**
Persistence/Degradability	**Half-life (hr) air: 19-50 Henry's atm m3/mol: 3.27E-07 BOD 5 if unstated : 0-1.1, 60% COD : 1.06, 100% ThOD : 1.068 In water, formaldehyde will biodegrade to low concentrations within days; adsorption to sediment and volatilisation are not expected to be significant routes. In soil, aqueous solutions of formaldehyde leach through the soil; at high concentrations adsorption to clay minerals may occur. Although bio- degradable under both aerobic and anaerobic conditions the fate of formaldehyde in soil is unclear.**
Mobility	**Formaldehyde is expected to have a high mobility. Miscible in water.**
Environmental Fate	**Do NOT let product reach waterways, drains and sewers.**
Bioaccumulation Potential	**It does not bioconcentrate in the food chain.**
Environmental Impact	**No Data Available**

13. DISPOSAL CONSIDERATIONS

General Information	**Dispose of in accordance with all local regulations. All empty packaging should be disposed of in accordance with Local Regulations or recycled/reconditioned at an approved facility.**
Special Precautions for Land Fill	**Contact a specialist disposal company or the local waste regulator for advice. Recycle wherever possible or consult manufacturer for recycling options. Bury or incinerate residue at an approved site. Recycle containers if possible, or dispose of in an authorised landfill.**

14. TRANSPORT INFORMATION

Land Transport

Proper Shipping Name	**FORMALDEHYDE SOLUTION with not less than 25% formaldehyde**
Class	**8 Corrosive Substances**
Subsidiary Risk(s)	**No Data Available**
ERG	**132 Flammable Liquids - Corrosive**
UN Number	**2209**
Hazchem	**2X**
Pack Group	**III**
Special Provision	**No Data Available**

Sea Transport
IMDG

Proper Shipping Name	**FORMALDEHYDE SOLUTION with not less than 25% formaldehyde**
Class	**8 Corrosive Substances**
Subsidiary Risk(s)	**No Data Available**
UN Number	**2209**
Hazchem	**2X**
Pack Group	**III**
Special Provision	**No Data Available**
EMS	**FA,SB**
Marine Pollutant	**No**

Air Transport
IATA

Proper Shipping Name	**FORMALDEHYDE SOLUTION with not less than 25% formaldehyde**
Class	**8 Corrosive Substances**
Subsidiary Risk(s)	**No Data Available**
UN Number	**2209**
Hazchem	**2X**
Pack Group	**III**
Special Provision	**No Data Available**

16. OTHER INFORMATION

Revision 1
Key/Legend
< Less Than
> Greater Than
atm Atmosphere
CAS Chemical Abstracts Service (Registry Number)
cm Square Centimetres
CO2 Carbon Dioxide
COD Chemical Oxygen Demand
Degrees Celcius
Degrees Farenheit
g Grams
g/cm Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or L Litre
m Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m Milligrams per Cubic Metre
Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight