1. Product and company identification

Trade Name

**Formaldehyde 44% / Methanol 1.5%, solution**

Manufacturer, importer, supplier

Celanese Ltd.
222 W. Las Colinas Blvd., Suite 900N
Irving, TX  75039
United States
Phone:  972 443 4000
Internet:  www.celanese.com

Transportation emergency phone numbers:
For Chemical Emergency:  Spill Leak Fire Exposure or Accident
Call CHEMTREC Day or Night
DOMESTIC NORTH AMERICA:  800-424-9300
INTERNATIONAL, CALL +1 703-527-3887 (collect calls accepted)

Identified uses
Chemical intermediate (including monomers)

2. Hazard Identification

GHS Classification

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Category</th>
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<tbody>
<tr>
<td>Flammable liquid</td>
<td>Category 4</td>
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<tr>
<td>Acute oral toxicity</td>
<td>Category 3</td>
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<tr>
<td>Acute dermal toxicity</td>
<td>Category 3</td>
</tr>
<tr>
<td>Acute inhalation toxicity</td>
<td>Category 3</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 1B</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>Category 1</td>
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<tr>
<td>Germ cell mutagenicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Category 1B</td>
</tr>
<tr>
<td>Specific target organ systemic toxicity (single exposure)</td>
<td>Category 1</td>
</tr>
<tr>
<td>Acute aquatic toxicity</td>
<td>Category 2</td>
</tr>
</tbody>
</table>

Label elements

Signal Word  
Danger
Hazard Statements

Combustible liquid
Toxic if swallowed
Toxic in contact with skin
Toxic if inhaled
Causes severe skin burns and eye damage
May cause an allergic skin reaction
Suspected of causing genetic defects
May cause cancer
May cause damage to organs
Toxic to aquatic life

Precautionary statements

Keep away from flames and hot surfaces - No smoking
In case of fire:
Use foam, dry chemical, carbon dioxide (CO2) to extinguish.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Wash face, hands and any exposed skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Contaminated work clothing should not be allowed out of the workplace.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Immediately call a POISON CENTER or doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Immediately call a POISON CENTER or doctor.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Store locked up.
Store in a well-ventilated place. Keep cool.
Keep container tightly closed.
Dispose of contents/ container to an approved waste disposal plant.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No</th>
<th>Percent %</th>
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</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>44</td>
</tr>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>1.5</td>
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</tbody>
</table>

4. First aid measures
4. First aid measures

**General Information**
Remove contaminated, soaked clothing immediately and dispose of safely.

**Skin**
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Obtain medical attention. Destroy contaminated shoes.

**Eyes**
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

**Inhalation**
Move to fresh air. Call a physician immediately.

**Ingestion**
Call a physician immediately. Do not induce vomiting without medical advice. Risk of product entering the lungs on vomiting after ingestion.

5. Fire-fighting measures

**NFPA:**
- Health: 3
- Flammability: 2
- Instability: 0

**Suitable extinguishing media**
Dry chemical, Carbon dioxide (CO2), Aqueous film forming foam, Foam

**Extinguishing media which must not be used for safety reasons**
Do not use a solid water stream as it may scatter and spread fire.

**Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases**
Under conditions giving incomplete combustion, hazardous gases produced may consist of
- Carbon monoxide
- Carbon dioxide (CO2)

**Special protective equipment for fire-fighters**
Self-contained breathing apparatus (EN 133).

**Environmental precautions**
Dike and collect water used to fight fire

**Other Information**
Cool containers / tanks with water spray.

6. Accidental release measures

**Personal precautions**
Do not breathe vapors, aerosols. Do not get in eyes, on skin, or on clothing. Keep away from heat and sources of ignition. Provide adequate ventilation.

**Isolation**
Keep unnecessary people away; isolate hazard area and deny entry.
Environmental precautions
Prevent further leakage or spillage. Do not discharge into the drains/surface waters/groundwater.

Methods for cleaning up
Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Dispose of in accordance with local regulations. Contaminated equipment (brushes, rags) must be cleaned immediately with water. Remove all sources of ignition. Keep people away from and upwind of spill/leak.

Authority Notification
Within the United States, call the National Response Center (800-424-8802) and appropriate state and local authorities if the quantity released over 24 hours is equal to or greater than the reportable quantity listed below:

200 lb/90kg

7. Handling and storage

Advice on safe handling
Provide sufficient air exchange and/or exhaust in work rooms. Handle in accordance with good industrial hygiene and safety practice. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Keep containers tightly closed in a dry, cool and well-ventilated place. Do not breathe vapours/dust. Always open containers slowly to allow any excess pressure to vent. Decontaminate soiled clothing thoroughly before re-use. Destroy contaminated leather clothing.

Protection - fire and explosion:
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge. Ground and bond containers when transferring material. In case of fire, emergency cooling with water spray should be available.

Technical measures/Storage conditions
Keep tightly closed in a dry, cool and well-ventilated place. Handle an open container with care. Take measures to prevent the build up of electrostatic charge.

Material storage
Store locked up.

Incompatible products
Keep away from: Acids, Bases, amines, oxygen, oxidizing agents, reducing agents

8. Exposure controls / personal protection

OSHA Exposure Limits

<table>
<thead>
<tr>
<th>Components</th>
<th>TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>0.75 PPM</td>
</tr>
<tr>
<td>Methanol</td>
<td>200 PPM</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>2 PPM</td>
</tr>
<tr>
<td>Methanol</td>
<td>250 PPM</td>
</tr>
</tbody>
</table>

ACGIH Exposure Limits
Components TWA

Methanol 200 PPM

Components STEL

Methanol 250 PPM

Components Ceiling Limit Value:

Formaldehyde 0.3 PPM

Components 2005 NIOSH IDLH

Formaldehyde 20 ppm
Methanol 25,000 PPM

Mexico National Exposure Limits

Components LMPE - PPT

Methanol 260 mg/m³ 200 PPM

Components STEL

Methanol 310 mg/m³ 250 PPM

Components Mexican Carcinogen Category

Formaldehyde A2

Components Mexican Ceiling Exposure Limit

Formaldehyde 3 mg/m³ 2 PPM

Exposure controls

Engineering measures
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Protective equipment
A safety shower and eyewash should be readily available.

General advice
Do not breathe vapors or spray mist. Do not get in eyes, on skin, or on clothing. Remove and wash contaminated clothing before re-use.
Respiratory protection
For formaldehyde concentrations > 1 and < 10 times the occupational exposure level: Use air-purifying respirator with full facepiece fitted with either cartridge(s) or canister specifically approved for protection against formaldehyde, or a full facepiece powered air-purifying respirator fitted with either cartridge(s) or canister specifically approved for protection against formaldehyde. The air purifying element must have an end of service life indicator, or a documented change out schedule must be established. Otherwise, use supplied air.

For concentrations more than 10 times the occupational exposure level and less than the lower of either 100 times the occupational exposure level or the IDLH: Use Type C full facepiece supplied-air respirator operated in positive-pressure or continuous-flow mode.

For concentrations > 100 times the occupational exposure level or greater than the IDLH level or unknown concentrations (such as in emergencies): Use self-contained breathing apparatus with full facepiece in positive-pressure mode or Type C positive-pressure full facepiece supplied-air respirator with an auxiliary positive-pressure self-contained breathing apparatus escape system.

For escape: Use positive-pressure self-contained breathing apparatus with full facepiece or full facepiece mask with chin style or front or back mounted type industrial size canister specifically approved for protection against formaldehyde.

Skin protection:
Wear impervious clothing and gloves to prevent contact. Butyl rubber is recommended. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Eye/face protection:
In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face..

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Form</th>
<th>liquid</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Color</td>
<td>colourless</td>
</tr>
<tr>
<td></td>
<td>Odor</td>
<td>pungent</td>
</tr>
<tr>
<td>Flash point</td>
<td>Method</td>
<td>closed cup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80°C(176.0°F)</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td></td>
<td>99 °C(calculated)</td>
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<tr>
<td>pH</td>
<td></td>
<td>3.0 - 6.0; 1% @ 25°C</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td></td>
<td>calculated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.117 @ 41 deg C</td>
</tr>
<tr>
<td>Water solubility</td>
<td></td>
<td>completely soluble at 20 deg C</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

Chemical stability
Stable under normal conditions
Conditions to avoid
Avoid any source of ignition. Avoid contact with heat, sparks, open flame, and static discharge.

Incompatible Materials
Keep away from:
- oxygen
- oxidizing agents
- reducing agents
- Acids
- Bases

Hazardous Combustion or Decomposition Products:
Toxic emissions may be released in a fire situation. Thermal decomposition products may include formaldehyde vapors and oxides of carbon.

Possibility of hazardous reactions
Will not occur.

11. Toxicological information

Potential health effects

Routes of exposure
Skin, eyes, inhalation, ingestion.

Immediate effects

Skin
Causes skin burns. Harmful if absorbed through skin. Prolonged or repeated contact may dry skin and cause irritation. May cause allergic skin reaction. Symptoms of overexposure include: Central nervous system depression with headache, stupor, uncoordinated or strange behavior or unconsciousness. Redness or discoloration, swelling, itching, burning or blistering of skin. Drying, cracking or inflammation of skin. Prolonged and/or repeated skin contact with methanol-soaked material has produced toxic effects including vision effects and death.

Eyes
Exposure to vapors and liquid Causes severe eye burns, damage irreversible. Symptoms of exposure may include: Eye irritation, burning sensation, pain, watering, and/or change of vision. Eye injury which may persist for several days. Loss of vision.

Inhalation
Harmful if inhaled. Causes respiratory tract burns. May cause allergic respiratory reaction. Symptoms of exposure may include: Central nervous system depression with nausea, dizziness, headache, stupor, uncoordinated or strange behavior or unconsciousness. Nasal discharge, hoarseness, coughing, chest pain and breathing difficulty. Accumulation of fluid in the lungs (pulmonary edema); symptoms can be delayed for several hours.
Ingestion

Causes digestive tract burns. May be fatal if swallowed. Symptoms of exposure may include: Central nervous system depression with nausea, dizziness, headache, stupor, uncoordinated or strange behavior, or unconsciousness. Severe damage to the mouth, throat esophagus and/or stomach. A small amount of Methanol (usually two or more ounces) can cause mental sluggishness, nausea and vomiting leading to severe illness, and may produce adverse effects on vision with possible blindness or death if treatment is not received.

Other:

Formaldehyde is listed as a potential cancer hazard by OSHA, a known human carcinogen by The International Agency for Research on Cancer (IARC, Group 1), and is listed in the 12th Report on Carcinogens (RoC) released by The National Toxicology Program (NTP).

Medical conditions which may be aggravated by exposure:

Significant exposure to this chemical may adversely affect people with acute or chronic disease of the:
- Skin
- Eyes
- Central nervous system
- Digestive tract
- Respiratory Tract

Formaldehyde

- **Acute oral toxicity**: LD50: 460 mg/kg
- **Acute dermal toxicity**: Data waiving: formaldehyde has corrosive properties.
- **Acute inhalation toxicity**: LC50 (30 min): 1000 mg/m³
  - **Method**: OECD 403
- **Skin corrosion/irritation**: corrosive
  - **Species**: rabbit
  - **Method**: OECD 404
- **Skin Sensitization**: sensitizing
  - **Species**: mouse female
  - **Method**: OECD 429
- **Serious eye damage/eye irritation**: corrosive
  - **Species**: rabbit eye
  - **Method**: OECD 405
  - **Species**: rats
- **Carcinogenic Effects**
  - **Species**: oral
  - **Study**: rats
  - **Study**: oral (drinking water) lifetime study
  - **Method**: NOAEL: 82 mg/kg
- **in vitro Mutagenicity**
  - Ames Test: positive - with and without metabolic activation
  - **Method**: OECD 471
- **in vivo Mutagenicity**
  - Formaldehyde is a direct acting locally effective mutagen, with genotoxic effects limited to those cells in direct contact with formaldehyde (OECD SIDS). Did not cause chromosomal damage in rat bone marrow
  - **Method**: EU B.12
12. Ecological Information

Formaldehyde

Acute fish toxicity
Species: Danio rerio (Zebra fish)

LC50: 6.7 mg/l (96h)
12. Ecological Information

**Method**

**Acute daphnia toxicity**
- Species: Desmodesmus subspicatus
- Method: OECD 201

**Biodegradation**
- Method: OECD 301 C

**Bioconcentration factor (BCF)**
- 0.396 l/kg

**Bioaccumulation**
- Bioaccumulative potential - low

**Other potential hazards**
- The substance does not meet the criteria for PBT / vPvB according to REACH, Annex XIII

**Methanol**

**Acute fish toxicity**
- Species: Pimephales promelas (Fathead minnow)
- Method: Flow-through

**Chronic fish toxicity**
- Species: Lepomis macrochirus (Bluegill sunfish)
- Method: Flow-through

**Acute daphnia toxicity**
- Species: Daphnia magna

**Toxicity to aquatic plants**
- Species: Selenastrum capricornutum (green algae)

**Biodegradation**
- 48 %
- (5d)

**Bioconcentration factor (BCF)**
- Bioconcentration factor (BCF)

**Bioaccumulation**
- Bioaccumulative potential - low

**Other potential hazards**
- The substance does not meet the criteria for PBT / vPvB according to REACH, Annex XIII
13. Disposal considerations

Disposal considerations
Dispose of spilled material in accordance with state and local regulations for hazardous waste. Recommended methods are incineration or biological treatment at a federally or state-permitted disposal facility. Note that this information applies to the material as manufactured; processing, use, or contamination may make this information inappropriate, inaccurate, or incomplete.

Note that this handling and disposal information may also apply to empty containers, liners and rinsate. State or local regulations or restrictions are complex and may differ from federal regulations. This information is intended as an aid to proper handling and disposal; the final responsibility for handling and disposal is with the owner of the waste.

EPA Hazardous Waste Code(s): U112

14. Transport information

US Department of Transportation

<table>
<thead>
<tr>
<th>UN/NA Number:</th>
<th>UN 2209</th>
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<tbody>
<tr>
<td>Proper Shipping Name</td>
<td>Formaldehyde, solutions</td>
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<tr>
<td>Hazard class</td>
<td>8</td>
</tr>
<tr>
<td>Packing Group</td>
<td>III</td>
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<td>Reportable Quantity (RQ)</td>
<td>200 lb/90kg</td>
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<tr>
<td>Emergency Resp. Guide</td>
<td>132</td>
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TDG

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Mexico Transport Information

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<td>Formaldehyde, solutions</td>
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<tr>
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<td>Emergency Response</td>
<td>132</td>
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<td>Guide</td>
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ICAO/IATA

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<th>UN 2209</th>
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<td>(Formaldehyde, Methanol)</td>
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<td>Hazard Class</td>
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<td>Packing group</td>
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IMDG

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<td>FORMALDEHYDE SOLUTION</td>
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<tr>
<td>Hazard Class</td>
<td>8</td>
</tr>
</tbody>
</table>
15. Regulatory Information

US State Regulations
Chemicals associated with the product which are subject to the state right-to-know regulations are listed along with the applicable state(s):

**Formaldehyde 50-00-0**
- Pennsylvania: Listed
- New York: Listed
- New Jersey: Listed
- Illinois: Listed
- Louisiana: Listed
- Massachusetts: Listed
- Rhode Island: Listed

**Methanol 67-56-1**
- Pennsylvania: Listed
- New York: Listed
- New Jersey: Listed
- Illinois: Listed
- Massachusetts: Listed
- Rhode Island: Listed

**California Prop. 65**
WARNING: This product contains the following chemicals that are known to the State of California to cause cancer, birth defects or other reproductive harm.

Formaldehyde (50-00-0)
Methanol (67-56-1)

**Formaldehyde 50-00-0**
Listed

**U.S. FEDERAL REGULATIONS**

**TSCA Inventory:**
We certify that all components are either on the TSCA inventory or qualify for an exemption.

OSHA FORMALDEHYDE STANDARD: This product is capable of emitting free formaldehyde and is covered by the OSHA Formaldehyde Standard, 29 CFR 1910.1048.

Environmental Regulations:
Safety Data Sheet

Product name: Formaldehyde 44%/ Methanol 1.5%, solution
MSDS number: 80157
Revision Number: 0
Issuing date: Feb.23.2017
Revision Date: Jun.15.2015

Formaldehyde 50-00-0
- EPCRA Section 313: Listed
- CERCLA Hazardous Substance: Listed
- Extremely Hazardous Substance: Listed

Methanol 67-56-1
- EPCRA Section 313: Listed
- CERCLA Hazardous Substance: Listed

SARA 311:
- Acute health: Yes
- Chronic health: Yes
- Fire: Yes
- Sudden release of pressure: No
- Reactive: No

INTERNATIONAL REGULATIONS
International Inventories
- Australia (AICS)
- Canada (DSL)
- China (IECSC)
- Europe (EINECS)
- Japan (ENCS)
- Korea (KECI)
- Philippines (PICCS)

16. Other information

NFPA:
- Health: 3
- Flammability: 2
- Instability: 0

HMIS:
- Health: 3(*)
- Flammability: 2
- Physical Hazard: 0

Prepared By
Product Stewardship Department
Celanese

For more information, other material safety data sheets or technical data sheets please consult the Celanese homepage (www.celanese.com)

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on Celanese owned data and public sources deemed valid or acceptable. The absence of data elements required by ANSI or 1907/2006/EC indicates that no data meeting these requirements is available.

Other Information:
Observe national and local legal requirements
Changes against the previous version are marked by ***
For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Celanese makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. This material may be released from gas, liquid, or solid materials made directly or indirectly from it. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards. Material safety data sheets are provided on the Internet by Celanese as a service to its customers. Possession of an Internet MSDS does not indicate that the possessor of the MSDS was a purchaser or user of the subject product.

<table>
<thead>
<tr>
<th>Product name</th>
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<tr>
<td>MSDS number</td>
<td>80157</td>
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<tr>
<td>Revision Number</td>
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<td>Issuing date</td>
<td>Feb.23.2017</td>
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