1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product name</th>
<th>Acetaldehyde</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Number</td>
<td>402788</td>
</tr>
<tr>
<td>Brand</td>
<td>Sigma-Aldrich</td>
</tr>
<tr>
<td>Company</td>
<td>Sigma-Aldrich</td>
</tr>
<tr>
<td>Company Address</td>
<td>3050 Spruce Street</td>
</tr>
<tr>
<td></td>
<td>SAINT LOUIS MO 63103</td>
</tr>
<tr>
<td>Telephone</td>
<td>+1 800-325-5832</td>
</tr>
<tr>
<td>Fax</td>
<td>+1 800-325-5052</td>
</tr>
<tr>
<td>Emergency Phone #</td>
<td>(314) 776-6555</td>
</tr>
</tbody>
</table>

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid, Carcinogen, Target Organ Effect, Harmful by ingestion., Skin sensitiser, Irritant

Target Organs
Blood, Kidney, Lungs, Cardiovascular system., Liver, Central nervous system

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
- H224 Extremely flammable liquid and vapour.
- H302 Harmful if swallowed.
- H313 + H333 May be harmful in contact with skin or if inhaled.
- H316 Causes mild skin irritation.
- H317 May cause an allergic skin reaction.
- H318 Causes serious eye damage.
- H351 Suspected of causing cancer.
- H371 May cause damage to organs.
- H402 Harmful to aquatic life.

Precautionary statement(s)
- P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P280 Wear protective gloves/eye protection/face protection.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

HMIS Classification
- Health hazard: 2
- Chronic Health Hazard: *
- Flammability: 4
- Physical hazards: 2

NFPA Rating
- Health hazard: 2
Fire: 4  
Reactivity Hazard: 2

**Potential Health Effects**

<table>
<thead>
<tr>
<th>Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>May be harmful if inhaled. Causes respiratory tract irritation.</td>
</tr>
<tr>
<td>Skin</td>
<td>May be harmful if absorbed through skin. Causes skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Causes eye irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Harmful if swallowed.</td>
</tr>
</tbody>
</table>

3. **COMPOSITION/INFORMATION ON INGREDIENTS**

- **Synonyms**: Ethanal
- **Formula**: C₂H₄O
- **Molecular Weight**: 44.05 g/mol

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-07-0</td>
<td>200-836-8</td>
<td>605-003-00-6</td>
<td>-</td>
</tr>
</tbody>
</table>

4. **FIRST AID MEASURES**

**General advice**
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**
If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. **FIRE-FIGHTING MEASURES**

**Suitable extinguishing media**
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

**Specific hazards arising from the chemical**
May explode when heated. Closed containers may rupture and explode during runaway polymerization. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

**Special protective equipment for fire-fighters**
Wear self contained breathing apparatus for fire fighting if necessary.

**Further information**
Use water spray to cool unopened containers.

6. **ACCIDENTAL RELEASE MEASURES**

**Personal precautions**
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

**Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
7. HANDLING AND STORAGE

**Precautions for safe handling**
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. Use explosion-proof equipment.

**Conditions for safe storage**
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in cool place.
Recommended storage temperature: 2 - 8 °C
Store under inert gas. Air sensitive.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>75-07-0</td>
<td>C</td>
<td>25 ppm</td>
<td>2007-01-01</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

**Remarks**
Confirmed animal carcinogen with unknown relevance to humans: The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure. Eye & Upper Respiratory Tract irritation

<table>
<thead>
<tr>
<th></th>
<th>TWA</th>
<th>STEL</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100 ppm</td>
<td>150 ppm</td>
<td>1989-01-19</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td>180 mg/m3</td>
<td>270 mg/m3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>200 ppm</td>
<td>1997-08-04</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>360 mg/m3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The value in mg/m3 is approximate.

**Personal protective equipment**

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**
Handle with gloves.

**Eye protection**
Face shield and safety glasses

**Skin and body protection**
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

**Hygiene measures**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**

- Form: liquid, clear
- Colour: colourless

**Safety data**

- pH: no data available
- Melting point: -125 °C (-193 °F)
- Boiling point: 21 °C (70 °F)
- Flash point: -40 °C (-40 °F) - closed cup
- Ignition temperature: 175 °C (347 °F)
- Lower explosion limit: 4 % (V)
- Upper explosion limit: 60 % (V)
- Vapour pressure: 1,008.5 hPa (756.4 mmHg) at 20 °C (68 °F)
  
  1,451 hPa (1,088 mmHg) at 30 °C (86 °F)
  
  2,660 hPa (1,995 mmHg) at 55 °C (131 °F)
- Density: 0.785 g/mL at 25 °C (77 °F)
- Water solubility: completely miscible
- Partition coefficient: log Pow: 0.5
- Relative vapour density: 1.52 - (Air = 1.0)

10. STABILITY AND REACTIVITY

**Chemical stability**

Stable under recommended storage conditions.

**Possibility of hazardous reactions**

Vapours may form explosive mixture with air.

**Conditions to avoid**

- Air
- Heat, flames and sparks.

**Materials to avoid**

- Oxidizing agents, Reducing agents, acids, Nitric acid, Peroxides, Bases, Sodium Hydroxide, Amines, Ammonia, Oxygen.
- Warning: acetaldehyde is oxidized rapidly and exothermically by air, to acetic acid, Acid anhydrides, Alcohols, Halogens, Ketones, Phenol, Hydrogen cyanide (hydrocyanic acid)

**Hazardous decomposition products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION

**Acute toxicity**

- LD50 Oral - rat: 661 mg/kg

- LC50 Inhalation - rat: 4 h - 13300 ppm

- LD50 Dermal - rabbit: 3,540 mg/kg

**Skin corrosion/irritation**

Skin - rabbit - Mild skin irritation
Serious eye damage/eye irritation
Eyes - rabbit - Severe eye irritation

Respiratory or skin sensitization
May cause allergic skin reaction.

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.

Carcinogenicity
This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.
Limited evidence of carcinogenicity in animal studies

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Acetaldehyde)
NTP: Reasonably anticipated to be a human carcinogen (Acetaldehyde)
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Specific target organ toxicity - single exposure (GHS)
May cause damage to organs.

Specific target organ toxicity - repeated exposure (GHS)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation May be harmful if inhaled. Causes respiratory tract irritation.
Ingestion Harmful if swallowed.
Skin May be harmful if absorbed through skin. Causes skin irritation.
Eyes Causes eye irritation.

Signs and Symptoms of Exposure
Blurred vision, Unconsciousness

Additional Information
RTECS: AB1925000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish
LC50 - Pimephales promelas (fathead minnow) - 31 mg/l - 96 h
LC100 - Leuciscus idus (Golden orfe) - 124 - 156 mg/l - 48 h

Toxicity to daphnia and other aquatic invertebrates.
EC50 - Daphnia magna (Water flea) - 48 mg/l - 48 h

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
13. DISPOSAL CONSIDERATIONS

**Product**
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging**
Dispose of as unused product.

14. TRANSPORT INFORMATION

**DOT (US)**
- UN-Number: 1089  Class: 3  Packing group: I
- Proper shipping name: Acetaldehyde
- Reportable Quantity (RQ): 1000 lbs
- Marine pollutant: No
- Poison Inhalation Hazard: No

**IMDG**
- UN-Number: 1089  Class: 3  Packing group: I  EMS-No: F-E, S-D
- Proper shipping name: ACETALDEHYDE
- Marine pollutant: No

**IATA**
- UN-Number: 1089  Class: 3  Packing group: I
- Proper shipping name: Acetaldehyde
- IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

**OSHA Hazards**
Flammable liquid, Carcinogen, Target Organ Effect, Harmful by ingestion., Skin sensitiser, Irritant

**DSL Status**
All components of this product are on the Canadian DSL list.

**SARA 302 Components**
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**
- Acetaldehyde  CAS-No. 75-07-0  Revision Date 2007-07-01

**SARA 311/312 Hazards**
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**
- Acetaldehyde  CAS-No. 75-07-0  Revision Date 2007-07-01

**Pennsylvania Right To Know Components**
- Acetaldehyde  CAS-No. 75-07-0  Revision Date 2007-07-01

**New Jersey Right To Know Components**
- Acetaldehyde  CAS-No. 75-07-0  Revision Date 2007-07-01
Acetaldehyde 75-07-0 2007-07-01

**California Prop. 65 Components**

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-07-0</td>
<td>2007-09-28</td>
</tr>
</tbody>
</table>

**WARNING!** This product contains a chemical known to the State of California to cause cancer.

16. OTHER INFORMATION

**Further information**

Copyright 2010 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.