1 PRODUCT AND COMPANY IDENTIFICATION

Trade name: 952-D6 Flux-Pen
Relevant identified uses of the substance or mixture and uses advised against
Soldering Flux
Professional use of Solder

Application of the substance / the preparation: Soldering flux

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Kester Inc.
800 West Thorndale Avenue
Itasca, IL 60143 USA
Tel (630) 616-4000
Tel International 00 1 630 616-4000

ITW Specialty Materials (Suzhou) Co., Ltd.
Heng Qiao Road
Wujiang Economic Development Zone
Suzhou, Jiangsu 215200 China
Tel +86 512 82060808

Kester GmbH
Ganghofer Strasse 45
D-82216 Gerlindien Germany
Tel +49 (0) 8142 4785 0

Information department: Product Compliance: EHS_Kester@kester.com

1.4 Emergency telephone number:
CHEMTREC 24-Hour Emergency Response Telephone Number : (800) 424-9300
CHEMTREC 24-Hour Emergency Response (Outside US & Canada) Telephone Number : (703) 527-3887

2 HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008

GHS02 Flame

Flam. Liq. 2  H225  Highly flammable liquid and vapor.

GHS08 Health hazard

Resp. Sens. 1  H334  May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Carc. 2   H351  Suspected of causing cancer.

GHS07

Acute Tox. 4  H332  Harmful if inhaled.
Eye Irrit. 2A  H319  Causes serious eye irritation.
Skin Sens. 1  H317  May cause an allergic skin reaction.
STOT SE 3  H336  May cause drowsiness or dizziness.

(Contd. on page 2)
2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008
The product is classified and labeled according to the CLP regulation.

Hazard pictograms

GHS02  GHS07  GHS08

Signal word Danger

Hazard-determining components of labeling:
- Isopropanol
- Methanol
- 4-methylpentan-2-one
- Aliphatic ketone
- Rosin

Hazard statements
H225 Highly flammable liquid and vapor.
H332 Harmful if inhaled.
H319 Causes serious eye irritation.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H336 May cause drowsiness or dizziness.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P280 Wear protective gloves / eye protection / face protection.
P243 Take precautionary measures against static discharge.
P303 + P361 + P353 IF ON SKIN (or hair): 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.
P405 Store locked up.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard description:
WHMIS Symbols

Classification system:
NFPA ratings (scale 0 - 4)

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET (SDS)
According to 1907/2006/EC, Article 31

Trade name: 952-D6 Flux-Pen

HMIS-ratings (scale 0 - 4)

- **Health**: *1
- **Fire**: 3
- **Reactivity**: 0

2.3 Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 COMPOSITION OF MIXTURE

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Description</th>
<th>% Range</th>
<th>活泼物质 (列表)</th>
<th>%范围</th>
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</thead>
<tbody>
<tr>
<td>CAS: 67-63-0</td>
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<td>Flam. Liq. 2, H225</td>
<td>40-55%</td>
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<tr>
<td>EINECS: 200-661-7</td>
<td>Eye Irrit. 2A, H319; STOT SE 3, H336</td>
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<td></td>
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<tr>
<td>CAS: 64-17-5</td>
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<td>25-40%</td>
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<tr>
<td>EINECS: 200-578-6</td>
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</tr>
<tr>
<td>Trade Secret</td>
<td>Aliphatic ketone</td>
<td>Flam. Liq. 3, H226</td>
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<tr>
<td></td>
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<td>STOT SE 3, H336</td>
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<td></td>
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<td>CAS: 67-56-1</td>
<td>Methanol</td>
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<tr>
<td>EINECS: 200-659-6</td>
<td>Acute Tox. 2, H330</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STOT SE 1, H370</td>
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<td></td>
</tr>
<tr>
<td>Trade Secret</td>
<td>Proprietary organic acids</td>
<td>Eye Irrit. 2A, H319</td>
<td>1.0-3.0%</td>
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</tr>
<tr>
<td>CAS: 108-10-1</td>
<td>4-methylpentan-2-one</td>
<td>Flam. Liq. 2, H225</td>
<td>0.1-&lt;1%</td>
<td></td>
</tr>
<tr>
<td>EINECS: 203-550-1</td>
<td>Acute Tox. 3, H331</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carc. 2, H351</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eye Irrit. 2A, H319; STOT SE 3, H335</td>
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<td></td>
</tr>
<tr>
<td>Trade Secret</td>
<td>Rosin</td>
<td>Resp. Sens. 1, H334</td>
<td>0.1-&lt;1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin Sens. 1, H317</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acute Tox. 5, H303; Acute Tox. 5, H313</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 FIRST AID MEASURES

4.1 Description of first aid measures

**General information:** Follow general first aid procedures.
**After inhalation:** Supply fresh air; consult doctor in case of complaints.
**After skin contact:** Immediately wash with water and soap and rinse thoroughly.
**After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
**After swallowing:** Seek immediate medical advice.

4.2 Most important symptoms and effects, both acute and delayed
No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

5 FIREFIGHTING MEASURES

5.1 Extinguishing media

**Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
SAFETY DATA SHEET (SDS)
According to 1907/2006/EC, Article 31

Trade name: 952-D6 Flux-Pen

5.2 Special hazards arising from the substance or mixture
Nitrogen oxides (NOx)
In case of fire, the following can be released:

5.3 Advice for firefighters
Protective equipment: No special measures required.

6 ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources

6.2 Environmental precautions: Do not allow to enter sewers/ surface or ground water.

6.3 Methods and material for containment and cleaning up:
Ensure adequate ventilation.
Absorb with clay, dry sand, or other inert material. Do not use combustible materials such as sawdust. Place in a chemical waste container.

6.4 Reference to other sections
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

Protective Action Criteria for Chemicals

<table>
<thead>
<tr>
<th>PAC-1:</th>
<th></th>
<th>PAC-2:</th>
<th></th>
<th>PAC-3:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 67-63-0</td>
<td>Isopropanol</td>
<td>CAS: 67-63-0</td>
<td>Isopropanol</td>
<td>CAS: 67-63-0</td>
<td>Isopropanol</td>
</tr>
<tr>
<td>CAS: 64-17-5</td>
<td>Ethanol</td>
<td>CAS: 64-17-5</td>
<td>Ethanol</td>
<td>CAS: 64-17-5</td>
<td>Ethanol</td>
</tr>
<tr>
<td>CAS: 67-56-1</td>
<td>Aliphatic ketone</td>
<td>CAS: 67-56-1</td>
<td>Aliphatic ketone</td>
<td>CAS: 67-56-1</td>
<td>Aliphatic ketone</td>
</tr>
<tr>
<td>CAS: 108-10-1</td>
<td>4-methylpentan-2-one</td>
<td>CAS: 108-10-1</td>
<td>4-methylpentan-2-one</td>
<td>CAS: 108-10-1</td>
<td>4-methylpentan-2-one</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 ppm</td>
<td></td>
<td>2000 ppm</td>
<td></td>
<td>12000 ppm</td>
</tr>
<tr>
<td></td>
<td>1,800 ppm</td>
<td></td>
<td>3300 ppm</td>
<td></td>
<td>15000 ppm</td>
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<td>5 ppm</td>
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<td>200 ppm</td>
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<td></td>
<td>530 ppm</td>
<td></td>
<td>2,100 ppm</td>
<td></td>
<td>7200 ppm</td>
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<tr>
<td></td>
<td>75 ppm</td>
<td></td>
<td>500 ppm</td>
<td></td>
<td>3000 ppm</td>
</tr>
</tbody>
</table>

7 HANDLING AND STORAGE

7.1 Precautions for safe handling
Store in cool, dry place in tightly closed receptacles.
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.

Information about protection against explosions and fires:
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

7.2 Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: Store in a cool location.
Information about storage in one common storage facility: Store away from oxidizing agents.
Further information about storage conditions:
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
7.3 Specific end use(s) No further relevant information available.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Additional information about design of technical systems: No further data; see item 7.

8.1 Control parameters
Components with limit values that require monitoring at the workplace:
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.

**CAS: 67-63-0 Isopropanol**
- PEL: Long-term value: 980 mg/m³, 400 ppm
- REL: Short-term value: 1225 mg/m³, 500 ppm
  - Long-term value: 980 mg/m³, 400 ppm
- TLV: Short-term value: 984 mg/m³, 400 ppm
  - Long-term value: 492 mg/m³, 200 ppm
  - BEI

**CAS: 64-17-5 ethanol**
- PEL: Long-term value: 1900 mg/m³, 1000 ppm
- REL: Long-term value: 1900 mg/m³, 1000 ppm
- TLV: Short-term value: 1880 mg/m³, 1000 ppm

**Aliphatic ketone**
- PEL: Long-term value: 710 mg/m³, 150 ppm
- REL: Short-term value: 950 mg/m³, 200 ppm
  - Long-term value: 710 mg/m³, 150 ppm
- TLV: Short-term value: 712 mg/m³, 150 ppm
  - Long-term value: 238 mg/m³, 50 ppm

**CAS: 67-56-1 methanol**
- PEL: Long-term value: 280 mg/m³, 200 ppm
- REL: Short-term value: 325 mg/m³, 250 ppm
  - Long-term value: 260 mg/m³, 200 ppm
  - Skin
- TLV: Short-term value: 328 mg/m³, 250 ppm
  - Long-term value: 262 mg/m³, 200 ppm
  - Skin; BEI

Proprietary organic acids
- TLV: Long-term value: 5 mg/m³

**CAS: 108-10-1 4-methylpentan-2-one**
- PEL: Long-term value: 410 mg/m³, 100 ppm

(Contd. of page 4)
Trade name: 952-D6 Flux-Pen

| REL | Short-term value: 300 mg/m³, 75 ppm  
|     | Long-term value: 205 mg/m³, 50 ppm  
| TLV | Short-term value: 307 mg/m³, 75 ppm  
|     | Long-term value: 82 mg/m³, 20 ppm  
| BEI |

Additional information:
PEL = Permissible Exposure Limit (OSHA)  
TLV = Threshold Limit Value (ACGIH)  
OSHA = Occupational Safety and Health Administration  
ACGIH = American Conference of Governmental Industrial Hygienists

8.2 Exposure controls
Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.  
Keep away from foodstuffs, beverages and feed.  
Immediately remove any soiled and contaminated clothing.  
Wash hands before breaks and at the end of work.  
Avoid contact with the eyes and skin.  

Breathing equipment:
When ventilation is not sufficient to remove fumes from the breathing zone, a safety approved respirator or self-contained breathing apparatus should be worn.  
Not necessary if room is well-ventilated.  
Use suitable respiratory protective device in case of insufficient ventilation.  

Protection of hands:

![Protective gloves]

Material of gloves:
Nitrile rubber, NBR  
Natural rubber, NR

Penetration time of glove material:
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.  

Eye protection:

![Safety glasses]

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties
General Information
Appearance:
Form: Liquid  
Color: Colorless  
Odor: Alcohol-like

pH-value at 20 °C (68 °F): 3.3

Change in condition
Melting point/Melting range: Undetermined.

(Contd. on page 7)
10 STABILITY AND REACTIVITY

10.1 Reactivity No further relevant information available.

10.2 Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.

10.3 Possibility of hazardous reactions No dangerous reactions known.

10.4 Conditions to avoid No further relevant information available.

10.5 Incompatible materials: Strong acids, strong oxidizers.

10.6 Hazardous decomposition products:
When heated to soldering temperatures, solvents will be evaporated and organic material may release aliphatic aldehydes and acids.

11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Acute toxicity: Harmful if inhaled.

LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>CAS: 67-63-0 Isopropanol</th>
<th>Oral LD50: 5045 mg/kg (rat)</th>
<th>Dermal LD50: 12800 mg/kg (rabbit)</th>
<th>Inhalative LC50/4 h: 30 mg/l (rat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 64-17-5 ethanol</td>
<td>Oral LD50: 7060 mg/kg (rat)</td>
<td>Inhalative LC50/4 h: 20000 mg/l (rat)</td>
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</tr>
<tr>
<td>CAS: 67-56-1 methanol</td>
<td>Oral LD50: 5628 mg/kg (rat)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Trade name: 952-D6 Flux-Pen

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dermal</td>
<td>LD50 15800 mg/kg (rabbit)</td>
</tr>
<tr>
<td></td>
<td>Inhalative</td>
<td>LC50/4 h 0.5 mg/l (ATE)</td>
</tr>
</tbody>
</table>

**Primary irritant effect:**
- **on the skin:** Based on available data, the classification criteria are not met.
- **on the eye:** Causes serious eye irritation.
- **through inhalation:** Vapors during use may irritate mucous membranes and respiratory system. High concentrations can cause headache, dizziness, and nausea.
- **through ingestion:** May cause gastrointestinal irritation.

**Sensitization:**
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.

**Additional toxicological information:**

**Carcinogenic categories**

<table>
<thead>
<tr>
<th>IARC (International Agency for Research on Cancer)</th>
<th>CAS: 67-63-0 Isopropanol</th>
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<tbody>
<tr>
<td></td>
<td>CAS: 64-17-5 ethanol</td>
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<tr>
<td></td>
<td>CAS: 108-10-1 4-methylpentan-2-one</td>
<td>2B</td>
</tr>
</tbody>
</table>

**NTP (National Toxicology Program)**

None of the ingredients is listed.

**OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

---

**12 ECOLOGICAL INFORMATION**

12.1 Toxicity

Aquatic toxicity: No further relevant information available.

Additional ecological information:

General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

---

**13 DISPOSAL CONSIDERATIONS**

13.1 Waste treatment methods

Recommendation:
Disposal must be made according to official regulations.
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

Uncleaned packagings:

Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agent: Water, if necessary with cleansing agents.
### 14 TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>14.1 UN-Number</th>
<th>UN1987</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2 UN proper shipping name DOT, ADR, IMDG, IATA</td>
<td>Alcohols, n.o.s. (Isopropanol, Ethanol)</td>
</tr>
<tr>
<td>ADR</td>
<td>1987 Alcohols, n.o.s. (Isopropanol, Ethanol)</td>
</tr>
<tr>
<td>IMDG</td>
<td>ALCOHOLS, N.O.S. (ISOPROPYL ALCOHOL), ETHANOL (ETHYL ALCOHOL)</td>
</tr>
<tr>
<td>IATA</td>
<td>ALCOHOLS, N.O.S. (ISOPROPANOL (ISOPROPYL ALCOHOL), ETHANOL)</td>
</tr>
<tr>
<td>14.3 Transport hazard class(es)</td>
<td>DOT Class 3 Flammable liquids</td>
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<tr>
<td>ADR, IMDG, IATA</td>
<td>DOT Label 3</td>
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<td>14.4 Packing group</td>
<td>3 Flammable liquids</td>
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<td>DOT, IMDG, IATA</td>
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<td>Marine pollutant:</td>
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<td>14.6 Special precautions for user</td>
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<tr>
<td>Danger code (Kemler):</td>
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<td>EMS Number:</td>
<td>F-E,S-D</td>
</tr>
<tr>
<td>Stowage Category</td>
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</tr>
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</table>

#### Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- Not applicable.

### Transport/Additional information:
- **DOT**
  - **Quantity limitations**
    - On passenger aircraft/rail: 5 L
    - On cargo aircraft only: 60 L
- **ADR**
  - **Excepted quantities (EQ)**
    - Code: E2
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 500 ml
- **IMDG**
  - **Limited quantities (LQ)**
    - 1L
  - **Excepted quantities (EQ)**
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 500 ml

(Contd. on page 10)
15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

All ingredients are listed on the following Government Inventories:

China: Inventory of Existing Chemical Substances in China (IECSC)
Korea: Korea Existing Chemicals List (ECL)
Europe: European Inventory of Existing Commercial Chemical Substances (EINECS)
Japan: Inventory of Existing and New Chemical Substances (ENCS)
Philippines: Philippine Inventory of Chemicals and Chemical Substances (PICCS)
USA: TSCA (Toxic Substances Control Act) TSCA Inventory of Chemical Substances

USA: The following information relates to product regulation specific to the USA.

SARA (Superfund Amendments and Reauthorization Act)

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<th>Section 355 (extremely hazardous substances):</th>
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<table>
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<th>Section 313 (Specific toxic chemical listings):</th>
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<tbody>
<tr>
<td>CAS: 67-63-0</td>
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<tr>
<td>CAS: 67-56-1</td>
</tr>
<tr>
<td>CAS: 108-10-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemicals known to cause cancer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-methylpentan-2-one</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Chemicals known to cause reproductive toxicity:</th>
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<tbody>
<tr>
<td>None of the ingredients is listed.</td>
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</table>

Carcinogenic categories

<table>
<thead>
<tr>
<th>EPA (Environmental Protection Agency)</th>
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<tbody>
<tr>
<td>CAS: 108-10-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NIOSH-Ca (National Institute for Occupational Safety and Health)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the ingredients is listed.</td>
</tr>
</tbody>
</table>

CANADA:

Workplace Hazardous Materials Identification (WHMIS):
This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR) and the Safety Data Sheet (SDS) contains all of the information required by the CPR.

Labelling according to Regulation (EC) No 1272/2008
The product is classified and labeled according to the CLP regulation.

Hazard pictograms

GHS02  GHS07  GHS08

Signal word Danger

Hazard-determining components of labeling:
Isopropanol
Methanol
4-methylpentan-2-one
Aliphatic ketone
Rosin

**Hazard statements**
H225 Highly flammable liquid and vapor.
H332 Harmful if inhaled.
H319 Causes serious eye irritation.
H344 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H336 May cause drowsiness or dizziness.

**Precautionary statements**
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P280 Wear protective gloves / eye protection / face protection.
P243 Take precautionary measures against static discharge.
P303+P361+P337 IF ON SKIN (or hair): 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.
P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P403+P235 Store in a well-ventilated place. Keep cool.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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**16 OTHER INFORMATION**

The information contained herein is based on data considered accurate and is offered solely for information, consideration and investigation. Kester extends no warranties, makes no representations and assumes no responsibility as to the accuracy, completeness or suitability of this data for any purchaser’s use. The data on this Material Safety Data Sheet relates only to this product and does not relate to use with any other material or in any process. All chemical products should be used only by, or under the direction of, technically qualified personnel who are aware of the hazards involved and the necessity for reasonable care in handling. Hazard communication regulations require that employees must be trained on how to use a Material Safety Data Sheet as a source for hazard information.

**Department issuing Safety Data Sheet (SDS):** Product Compliance / EHS Department
**Contact:** EHS_Kester@kester.com
**Date of preparation / last revision** 04/07/2017 / 7

**Abbreviations and acronyms:**
RID: Reglement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the “International Air Transport Association” (IATA)
ICAO: International Civil Aviation Organisation
ICAO-TI: Technical Instructions by the “International Civil Aviation Organisation” (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
<table>
<thead>
<tr>
<th>TLV: Threshold Limit Value</th>
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<tr>
<td>PEL: Permissible Exposure Limit</td>
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<td>REL: Recommended Exposure Limit</td>
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<tr>
<td>Flam. Liq. 2: Flammable liquids – Category 2</td>
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<td>Acute Tox. 5: Acute toxicity – Category 5</td>
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<td>Acute Tox. 4: Acute toxicity – Category 4</td>
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<tr>
<td>Resp. Sens. 1: Respiratory sensitisation – Category 1</td>
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<td>Carc. 2: Carcinogenicity – Category 2</td>
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<td>Carc. 2: Carcinogenicity – Category 2</td>
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<td>STOT SE 1: Specific target organ toxicity (single exposure) – Category 1</td>
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<tr>
<td>STOT SE 3: Specific target organ toxicity (single exposure) – Category 3</td>
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*Data compared to the previous version altered.*