1 Identification

Trade name: 951 Soldering Flux and Flux Pen

Relevant identified uses of the substance or mixture and uses advised against

No further relevant information available.

Application of the substance / the preparation: Soldering Flux

Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Kester Inc.
800 West Thormdale 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 Gernlinden Germany
Tel +49 (0) 8142 4785 0

Information department: Product Compliance: EHS_Kester@kester.com

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 Hazard(s) identification

Classification of the substance or mixture

Flame

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

Skull and crossbones

Acute Tox. 3 H331 Toxic if inhaled.

Health hazard

STOT SE 2 H371 May cause damage to organs.

Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H336 May cause drowsiness or dizziness.
Label elements
GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).

Hazard pictograms

GHS02  GHS06  GHS07  GHS08

Signal word Danger

Hazard-determining components of labeling:
methanol
Isopropanol
Aliphatic ketone

Hazard statements
H225 Highly flammable liquid and vapor.
H331 Toxic if inhaled.
H319 Causes serious eye irritation.
H371 May cause damage to organs.
H336 May cause drowsiness or dizziness.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P333 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.
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Classification system:
NFPA ratings (scale 0 - 4)

Health = 2
Fire = 3
Reactivity = 0

HMIS-ratings (scale 0 - 4)

Health = 2
Fire = 3
Reactivity = 0

Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
3 Composition/information on ingredients

Description: Mixture of the substances listed below with nonhazardous additions.

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Description</th>
<th>% Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 64-17-5</td>
<td>ethanol</td>
<td>Flam. Liq. 2, H225</td>
</tr>
<tr>
<td>CAS: 67-63-0</td>
<td>Isopropanol</td>
<td>Flam. Liq. 2, H225; Eye Irrit. 2A, H319; STOT SE 3, H336</td>
</tr>
<tr>
<td>Trade Secret</td>
<td>Aliphatic ketone</td>
<td>Flam. Liq. 3, H226; STOT SE 3, H336</td>
</tr>
<tr>
<td>CAS: 67-56-1</td>
<td>methanol</td>
<td>Flam. Liq. 2, H225; Acute Tox. 2, H330; STOT SE 1, H370</td>
</tr>
<tr>
<td>Trade Secret</td>
<td>Proprietary Carboxylic Acid</td>
<td>Eye Irrit. 2A, H319</td>
</tr>
</tbody>
</table>

4 First-aid measures

Description of first aid measures
General information: Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident. Follow general first aid procedures.

After inhalation: In case of unconsciousness place patient stably in side position for transportation. Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist. 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.

Information for doctor:
Most important symptoms and effects, both acute and delayed No further relevant information available.
Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents: CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
For safety reasons unsuitable extinguishing agents: Water with full jet
Special hazards arising from the substance or mixture In case of fire, the following can be released:
Advice for firefighters
Protective equipment: No special measures required.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Environmental precautions: Do not allow product to reach sewage system or any water course.
Do not allow to enter sewers/ surface or ground water.
Methods and material for containment and cleaning up:
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents

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

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC-1:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS: 64-17-5</td>
<td>ethanol</td>
<td>1,800 ppm</td>
</tr>
<tr>
<td>CAS: 67-63-0</td>
<td>isopropanol</td>
<td>400 ppm</td>
</tr>
<tr>
<td></td>
<td>Aliphatic ketone</td>
<td>5 ppm</td>
</tr>
<tr>
<td>CAS: 67-56-1</td>
<td>methanol</td>
<td>530 ppm</td>
</tr>
<tr>
<td>PAC-2:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS: 64-17-5</td>
<td>ethanol</td>
<td>3300* ppm</td>
</tr>
<tr>
<td>CAS: 67-63-0</td>
<td>isopropanol</td>
<td>2000* ppm</td>
</tr>
<tr>
<td></td>
<td>Aliphatic ketone</td>
<td>200 ppm</td>
</tr>
<tr>
<td>CAS: 67-56-1</td>
<td>methanol</td>
<td>2,100 ppm</td>
</tr>
<tr>
<td>PAC-3:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS: 64-17-5</td>
<td>ethanol</td>
<td>15000* ppm</td>
</tr>
<tr>
<td>CAS: 67-63-0</td>
<td>isopropanol</td>
<td>12000** ppm</td>
</tr>
<tr>
<td></td>
<td>Aliphatic ketone</td>
<td>3000* ppm</td>
</tr>
<tr>
<td>CAS: 67-56-1</td>
<td>methanol</td>
<td>7200* ppm</td>
</tr>
</tbody>
</table>

7 Handling and storage

Handling:
Precautions for safe handling Prevent formation of aerosols.

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

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: Not required.
Further information about storage conditions:
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
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.

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.
Trade name: 951 Soldering Flux and Flux Pen

At this time, the remaining constituent has no known exposure limits.

### CAS: 64-17-5 ethanol

<table>
<thead>
<tr>
<th></th>
<th>Long-term value: 1900 mg/m³, 1000 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td></td>
</tr>
<tr>
<td>TLV</td>
<td>Short-term value: 1880 mg/m³, 1000 ppm</td>
</tr>
</tbody>
</table>

### CAS: 67-63-0 Isopropanol

<table>
<thead>
<tr>
<th></th>
<th>Long-term value: 980 mg/m³, 400 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>Short-term value: 1225 mg/m³, 500 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: 980 mg/m³, 400 ppm</td>
</tr>
<tr>
<td>TLV</td>
<td>Short-term value: 984 mg/m³, 400 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: 492 mg/m³, 200 ppm</td>
</tr>
<tr>
<td></td>
<td>BEI</td>
</tr>
</tbody>
</table>

### Aliphatic ketone

<table>
<thead>
<tr>
<th></th>
<th>Long-term value: 710 mg/m³, 150 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>Long-term value: 950 mg/m³, 200 ppm</td>
</tr>
<tr>
<td>TLV</td>
<td>Short-term value: 712 mg/m³, 150 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: 238 mg/m³, 50 ppm</td>
</tr>
</tbody>
</table>

### CAS: 67-56-1 methanol

<table>
<thead>
<tr>
<th></th>
<th>Long-term value: 260 mg/m³, 200 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>Short-term value: 325 mg/m³, 250 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: 260 mg/m³, 200 ppm</td>
</tr>
<tr>
<td>Skin</td>
<td></td>
</tr>
<tr>
<td>TLV</td>
<td>Short-term value: 328 mg/m³, 250 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: 262 mg/m³, 200 ppm</td>
</tr>
<tr>
<td>Skin; BEI</td>
<td></td>
</tr>
</tbody>
</table>

**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

**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 all 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

(Contd. of page 4)
9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:
Form: Liquid
Color: Colorless
Odor: Alcohol-like
pH-value: Not determined.
Change in condition
Melting point/Melting range: Undetermined.
Boiling point/Boiling range: 78 °C (172 °F)
Flash point: 16 °C (60.8 °F)
Ignition temperature: 370 °C (698 °F)
Auto igniting: Product is not selfigniting.
Danger of explosion: Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
Explosion limits:
Lower: 2.0 Vol %
Upper: 15.0 Vol %
Vapor pressure at 20 °C (68 °F): 59 hPa (44 mm Hg)
Density at 20 °C (68 °F): 0.81 g/cm³ (6.759 lbs/gal)
Solubility in / Miscibility with Water: Not miscible or difficult to mix.
Solvent content:
Organic solvents: 94.8 %
Water: 3.1 %
Solids content: 2.0 %
11 Toxicological information

Information on toxicological effects

Acute toxicity:

<table>
<thead>
<tr>
<th>LD/LC50 values that are relevant for classification:</th>
<th>CAS: 64-17-5 ethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>7080 mg/kg (rat)</td>
</tr>
<tr>
<td>Oral LC50/4h</td>
<td>20000 mg/l (rat)</td>
</tr>
<tr>
<td>CAS: 67-63-0 Isopropanol</td>
<td></td>
</tr>
<tr>
<td>Oral LD50</td>
<td>5045 mg/kg (rat)</td>
</tr>
<tr>
<td>Dermal LD50</td>
<td>12800 mg/kg (rabbit)</td>
</tr>
<tr>
<td>Oral LC50/4h</td>
<td>30 mg/l (rat)</td>
</tr>
<tr>
<td>CAS: 67-56-1 methanol</td>
<td></td>
</tr>
<tr>
<td>Oral LD50</td>
<td>5628 mg/kg (rat)</td>
</tr>
<tr>
<td>Dermal LD50</td>
<td>15800 mg/kg (rabbit)</td>
</tr>
<tr>
<td>Inhalative LC50/4h</td>
<td>0.5 mg/l (ATE)</td>
</tr>
</tbody>
</table>

Primary irritant effect:
- on the skin: No irritant effect.
- on the eye: Irritating effect.
- Sensitization: Sensitization possible through inhalation.

Additional toxicological information:
The product shows the following dangers according to internally approved calculation methods for preparations:
- Harmful
- Irritant

Carcinogenic categories

IARC (International Agency for Research on Cancer)
| CAS: 64-17-5 ethanol | 1 |
|CAS: 67-63-0 Isopropanol | 3 |

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

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.
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.
13 Disposal considerations

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.

14 Transport information

UN-Number
DOT, ADR, IMDG, IATA UN1992

UN proper shipping name
DOT Flammable liquids, toxic, n.o.s. (Ethanol, Methanol)
ADR 1992 Flammable liquids, toxic, n.o.s. (Ethanol, Methanol)
IMDG FLAMMABLE LIQUID, TOXIC, N.O.S. (ETHYL ALCOHOL, METHANOL)
IATA FLAMMABLE LIQUID, TOXIC, N.O.S. (ETHANOL, METHANOL)

Transport hazard class(es)

DOT

<table>
<thead>
<tr>
<th>Class</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Flammable liquids</td>
</tr>
<tr>
<td>6.1</td>
<td></td>
</tr>
</tbody>
</table>

ADR

<table>
<thead>
<tr>
<th>Class</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Flammable liquids</td>
</tr>
<tr>
<td>6.1</td>
<td></td>
</tr>
</tbody>
</table>

IMDG

<table>
<thead>
<tr>
<th>Class</th>
<th>Label</th>
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<tbody>
<tr>
<td>3</td>
<td>Flammable liquids</td>
</tr>
<tr>
<td>6.1</td>
<td></td>
</tr>
</tbody>
</table>

(Contd. on page 9)
IATA

Class 
Label 
Packing group 
DOT, IMDG, IATA 
Marine pollutant: 
Special precautions for user 
Danger code (Kepler): 
EMS Number: 
Stowage Category 
Stowage Code 
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code 

Transport/Additional information:

DOT 
Quantity limitations 
On passenger aircraft/rail: 1 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) 
1 L
Excepted quantities (EQ) 
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 500 ml

UN "Model Regulation":

15 Regulatory information

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)

Section 355 (extremely hazardous substances):
None of the ingredient is listed.
Trade name: 951 Soldering Flux and Flux Pen

Section 313 (Specific toxic chemical listings):
CAS: 67-63-0 Isopropanol
CAS: 67-56-1 methanol

California Proposition 65
Chemicals known to cause cancer:
None of the ingredients is listed.
Chemicals known to cause reproductive toxicity:
None of the ingredients is listed.

Carcinogenic categories
EPA (Environmental Protection Agency)
None of the ingredients is listed.
NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients is listed.

CANADA:
Not classified.

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

GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).

Hazard pictograms

GHS02  GHS06  GHS07  GHS08

Signal word Danger

Hazard-determining components of labeling:
methanol
Isopropanol
Aliphatic ketone

Hazard statements
H225 Highly flammable liquid and vapor.
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H319 Causes serious eye irritation.
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H336 May cause drowsiness or dizziness.

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P240 Ground/bond container and receiving equipment.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P264 Wash thoroughly after handling.
P267 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
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.
Trade name: 951 Soldering Flux and Flux Pen

P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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

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

Abbreviations and acronyms:
RID: Règlement 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
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
HMIS: Hazardous Materials Identification System (USA)
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
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 2: Acute toxicity – Category 2
Acute Tox. 3: Acute toxicity – Category 3
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
STOT SE 1: Specific target organ toxicity (single exposure) – Category 1
STOT SE 2: Specific target organ toxicity (single exposure) – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

* Data compared to the previous version altered.