1 Identification

Trade name: 182 Soldering Flux
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

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 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

flammable liquid and vapor.

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.

Label elements
GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS). (Contd. on page 2)
Hazard pictograms

GHS02  GHS07

Signal word Danger

Hazard-determining components of labeling:
Isopropanol
Rosin

Hazard statements
H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H336 May cause drowsiness or dizziness.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
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+P233 Store in a well-ventilated place. Keep container tightly closed.
P501 Dispose of contents/container in accordance with local/ regional/ national/ international regulations.

Classification system:
NFPA ratings (scale 0 - 4)

Health = 1
Fire = 3
Reactivity = 0

HMIS-ratings (scale 0 - 4)

Health = 1
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: 67-63-0</td>
<td>Isopropanol</td>
<td>70-85%</td>
</tr>
</tbody>
</table>

(Flam. Liq. 2, H225 Eye Irrit. 2A, H319; STOT SE 3, H336)
Trade name: 182 Soldering Flux

CAS: 8050-09-7 Rosin

Skin Sens. 1, H317

10-25%

4 First-aid measures

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.
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

Spray water on small quantities to assist in cooling the vessel containing the product for subsequent disposal by a licensed contractor.
Spray water on larger quantities to cool the vessel and reduce the risk of spontaneous combustion.

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
Nitrogen oxides (NOx)
In case of fire, the following can be released:
Carbon monoxide (CO)
Carbon dioxide (CO2)
Aliphatic aldehydes

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
Keep away from ignition sources

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

Methods and material for containment and cleaning up:

Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents.
Absorb with clay, dry sand, or other inert material. Do not use combustible materials such as sawdust. Place in a chemical waste container.

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

PAC-1:

<table>
<thead>
<tr>
<th>CAS:</th>
<th>Material</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-63-0</td>
<td>Isopropanol</td>
<td>400 ppm</td>
</tr>
<tr>
<td>8050-09-7</td>
<td>Rosin</td>
<td>72 mg/m3</td>
</tr>
</tbody>
</table>

PAC-2:

<table>
<thead>
<tr>
<th>CAS:</th>
<th>Material</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-63-0</td>
<td>Isopropanol</td>
<td>2000* ppm</td>
</tr>
</tbody>
</table>
7 Handling and storage

Handling:
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.

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.
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:

<table>
<thead>
<tr>
<th>CAS: 67-63-0 Isopropanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
</tr>
<tr>
<td>REL</td>
</tr>
<tr>
<td>TLV</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS: 8050-09-7 Rosin</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLV I/DSEN, RSEN, L</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.

(Contd. on page 5)
### 9 Physical and chemical properties

<table>
<thead>
<tr>
<th>Information on basic physical and chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Information</strong></td>
</tr>
<tr>
<td><strong>Appearance:</strong>                               Liquid</td>
</tr>
<tr>
<td><strong>Color:</strong>                                   Amber colored</td>
</tr>
<tr>
<td><strong>Odor:</strong>                                     Mild</td>
</tr>
<tr>
<td><strong>pH-value:</strong>                                  Not determined.</td>
</tr>
<tr>
<td><strong>Change in condition</strong></td>
</tr>
<tr>
<td><strong>Melting point/Melting range:</strong> Undetermined.</td>
</tr>
<tr>
<td><strong>Boiling point/Boiling range:</strong> 82°C (179.6 °F)</td>
</tr>
<tr>
<td><strong>Flash point:</strong>                                &lt; 23°C (&lt;73.4 °F)</td>
</tr>
<tr>
<td><strong>Ignition temperature:</strong>                       399°C (750.2 °F)</td>
</tr>
<tr>
<td><strong>Auto igniting:</strong>                              Product is not selfigniting.</td>
</tr>
<tr>
<td><strong>Danger of explosion:</strong>                        Product is not explosive. However, formation of explosive air/vapor mixtures are possible.</td>
</tr>
<tr>
<td><strong>Explosion limits:</strong></td>
</tr>
<tr>
<td><strong>Lower:</strong>                                2Vol %</td>
</tr>
<tr>
<td><strong>Upper:</strong>                                   12Vol %</td>
</tr>
<tr>
<td><strong>Vapor pressure at 20°C (68 °F):</strong> 43hPa (32.3 mm Hg)</td>
</tr>
<tr>
<td><strong>Density at 20°C (68 °F):</strong>                   0.85g/cm³ (7.09 lbs/gal)</td>
</tr>
</tbody>
</table>
Trade name: 182 Soldering Flux

(Contd. of page 5)

Solubility in / Miscibility with
Water at 20°C (68 °F): 75%
Solvent content:
  Organic solvents: 74.9%
  Solids content: 25.1%

10 Stability and reactivity

Reactivity No further relevant information available.
Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
Possibility of hazardous reactions No dangerous reactions known.
Conditions to avoid No further relevant information available.
Incompatible materials: Strong acids, strong oxidizers.
Hazardous decomposition products:
  Carbon monoxide and carbon dioxide
When heated to soldering temperatures, the solvents are evaporated and rosin may be thermally degraded to liberate aliphatic aldehydes and acids.

11 Toxicological information

Information on toxicological effects
Acute toxicity:
LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>CAS: 67-63-0 Isopropanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
</tr>
<tr>
<td>Dermal</td>
</tr>
<tr>
<td>Inhalative</td>
</tr>
</tbody>
</table>

Primary irritant effect:
  on the skin:
    Irritant to skin and mucous membranes.
    Possible local irritation by contact with flux or fumes.
  on the eye:
    Irritating effect.
    Smoke during soldering can cause eye irritation.
  through inhalation:
    Vapors during use may irritate mucous membranes and respiratory system. High concentrations can cause headache, dizziness, and nausea.
    Flux fumes during soldering may cause irritation and damage of mucous membranes and respiratory system.
  through ingestion:
    May cause gastrointestinal irritation.
  Sensitization:
    Sensitization possible through inhalation.

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

Carcinogenic categories
IARC (International Agency for Research on Cancer)

<table>
<thead>
<tr>
<th>CAS: 67-63-0</th>
<th>Isopropanol</th>
</tr>
</thead>
</table>

(Contd. on page 7)
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
UN proper shipping name
DOT
ADR
IMDG, IATA

Transport hazard class(es)
DOT

Class
Label
3 Flammable liquids
3
Trade name: 182 Soldering Flux

ADR, IMDG, IATA

Class 3 Flammable liquids
Label 3
Packing group DOT, IMDG, IATA II
Marine pollutant: No
Special precautions for user Not applicable.
Danger code (Kemler): 33
EMS Number: F-E,S-D
Stowage Category B
Transport in bulk according to Annex II of MARPOL73/78 Not applicable.
and the IBC Code

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

UN "Model Regulation": UN 1219 ISOPROPNOL MIXTURE, 3, II

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.

Section 313 (Specific toxic chemical listings):
CAS: 67-63-0 Isopropanol
California Proposition 65

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

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

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

Hazard pictograms

![GHS02 GHS07]

Signal word Danger

Hazard-determining components of labeling:
Isopropanol
Rosin

Hazard statements
H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H336 May cause drowsiness or dizziness.

Precautionary statements

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<td>P403+P233 Store in a well-ventilated place. Keep container tightly closed.</td>
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<tr>
<td>P501 Dispose of contents/container in accordance with local/regional/national/international regulations.</td>
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</tbody>
</table>

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)
- ICAO: International Civil Aviation Organisation
- 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 (USA)
- 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
- Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
- Skin Sens. 1: Skin sensitisation – Category 1
- STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

* Data compared to the previous version altered.