SAFETY DATA SHEET (SDS)
according to 1907/2006/EC, Article 31

Printing Date: 09.11.2017 Version number 3
Revision: 09.11.2017

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Trade name: 186 Soldering Flux and 186 Flux-Pen
1.2 Relevant identified uses of the substance or mixture and uses advised against
No further relevant information available.

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Kester Inc.
800 West Thordale Avenue
Itasca, IL 60143
Tel 00+1 + 630 616 4000

ITW Specialty Materials (Suzhou) Co., Ltd.
Hengqiao Road, Wujiang Economic Development Zone
Suzhou, Jiangsu Province, China 215200
Tel +86 512 82060807

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

Further information obtainable from:
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

SECTION 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 vapour.

GHS07
Eye Irrit. 2 H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
STOT SE 3 H336 May cause drowsiness or dizziness.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008
The product is classified and labelled according to the CLP regulation.
Hazard pictograms

GHS02 GHS07

Signal word Danger

(Continued on page 2)
SAFETY DATA SHEET (SDS)
according to 1907/2006/EC, Article 31

Trade name: 186 Soldering Flux and 186 Flux-Pen

(Continued from page 1)

Hazard-determining components of labelling:
Isopropanol
Modified Rosin
Benzyl alcohol

Hazard statements
H225 Highly flammable liquid and vapour.
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, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
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.
P312 Call a POISON CENTER/doctor if you feel unwell.
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.

Additional information:
For use in industrial installations only.

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

SECTION 3: Composition/information on ingredients

Description: Mixture of substances listed below with nonhazardous additions.

Chemical components:

| CAS: 67-63-0 | EINECS: 200-661-7 | Isopropanol | Flam. Liq. 2, H225 | Eye Irrit. 2, H319; STOT SE 3, H336 | 55-70% |
| Trade Secret | Modified Rosin | Skin Sens. 1, H317 | 10-25% |
| CAS: 100-51-6 | EINECS: 202-859-9 | Benzyl alcohol | Acute Tox. 4, H302; Acute Tox. 4, H312; Acute Tox. 4, H332 | 3-5% |

SVHC
This product does not contain any Substance of Very High Concern (SVHC) on the European Chemicals Agency (ECHA) candidate list.

SECTION 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.

(Continued on page 3)
4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing agents: CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

For safety reasons unsuitable extinguishing agents: Water with full jet

5.2 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

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

SECTION 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:
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents
Absorb with clay, diatomaceous earth, dry sand, or other inert material. Do not use combustible materials such as sawdust.
Place in a chemical waste container. Flush residual with water.

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.

SECTION 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 fire - and explosion protection:
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 oxidising agents.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
SECTION 8: Exposure controls/personal protection

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

8.1 Control parameters

Ingredients with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>CAS: 67-63-0 Isopropanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PEL</strong></td>
</tr>
<tr>
<td>Short-term value: 1225 mg/m³, 500 ppm</td>
</tr>
<tr>
<td>Long-term value: 980 mg/m³, 400 ppm</td>
</tr>
<tr>
<td><strong>TWA</strong></td>
</tr>
<tr>
<td>Short-term value: 1250 mg/m³, 500 ppm</td>
</tr>
<tr>
<td>Long-term value: 980 mg/m³, 400 ppm</td>
</tr>
<tr>
<td><strong>WEL</strong></td>
</tr>
<tr>
<td>Short-term value: 1250 mg/m³, 500 ppm</td>
</tr>
<tr>
<td>Long-term value: 999 mg/m³, 400 ppm</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Personal protective equipment:

**General protective and hygienic measures:**
The usual precautionary measures are to be adhered to when handling chemicals.
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.

**Respiratory protection:**
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 with Side Shields Required

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

**General Information**

**Appearance:**
Form: Liquid
Colour: Amber coloured
Odour: Mild

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Trade name: 186 Soldering Flux and 186 Flux-Pen

(Continued from page 4)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pH-value:</strong></td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Change in condition</strong></td>
<td></td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>Undetermined.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>82 °C</td>
</tr>
<tr>
<td><strong>Flash point:</strong></td>
<td>18 °C</td>
</tr>
<tr>
<td><strong>Ignition temperature:</strong></td>
<td>399 °C</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature:</strong></td>
<td>Product is not selfigniting.</td>
</tr>
<tr>
<td><strong>Explosive properties:</strong></td>
<td>Product is not explosive. However, formation of explosive air/vapour mixtures are possible.</td>
</tr>
<tr>
<td><strong>Explosion limits:</strong></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>2 Vol %</td>
</tr>
<tr>
<td>Upper</td>
<td>12 Vol %</td>
</tr>
<tr>
<td><strong>Vapour pressure at 20 °C:</strong></td>
<td>43 hPa</td>
</tr>
<tr>
<td><strong>Density at 20 °C:</strong></td>
<td>0.88 g/cm³</td>
</tr>
<tr>
<td><strong>Solubility in / Miscibility with water:</strong></td>
<td>Partly soluble.</td>
</tr>
<tr>
<td>Organic solvents:</td>
<td>64.3 %</td>
</tr>
<tr>
<td>Water</td>
<td>0.0 %</td>
</tr>
<tr>
<td><strong>Solids content:</strong></td>
<td>35.7 %</td>
</tr>
</tbody>
</table>

**SECTION 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:
Carbon monoxide and carbon dioxide
When heated, the solvents are evaporated and rosin may be thermally degraded to liberate aliphatic aldehydes, acids, and terpenes.

**SECTION 11: Toxicological information**

11.1 Information on toxicological effects
Acute toxicity Based on available data, the classification criteria are not met.

<table>
<thead>
<tr>
<th>LD/LC50 values relevant for classification:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAS:</strong> 67-63-0 Isopropanol</td>
<td></td>
</tr>
<tr>
<td>Oral LD50</td>
<td>5,045 mg/kg (rat)</td>
</tr>
<tr>
<td>Dermal LD50</td>
<td>12,800 mg/kg (rabbit)</td>
</tr>
<tr>
<td>Inhalative LC50/4 h</td>
<td>30 mg/l (rat)</td>
</tr>
</tbody>
</table>
TRADE NAME: 186 Soldering Flux and 186 Flux-Pen

<table>
<thead>
<tr>
<th>Modified Rosin</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>&gt;4,000 mg/kg (Rat)</td>
<td></td>
</tr>
<tr>
<td>Dermal LD50</td>
<td>&gt;2,500 mg/kg (rabbit)</td>
<td></td>
</tr>
</tbody>
</table>

**Primary irritant effect:**
- Skin corrosion/irritation: Possible local irritation by contact with flux or fumes.
- Serious eye damage/irritation:
- Smoke during soldering can cause eye irritation.
- Causes serious eye irritation.
- Respiratory or skin sensitisation:
- May cause an allergic skin reaction.
- CMR effects:
- (carcinogenicity, mutagenicity and toxicity for reproduction)
- Germ cell mutagenicity: Based on available data, the classification criteria are not met.
- Carcinogenicity: Based on available data, the classification criteria are not met.
- Reproductive toxicity: Based on available data, the classification criteria are not met.
- STOT-single exposure:
- May cause drowsiness or dizziness.
- STOT-repeated exposure: Based on available data, the classification criteria are not met.
- Aspiration hazard: Based on available data, the classification criteria are not met.

**SECTION 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.

**SECTION 13: Disposal considerations**

13.1 Waste treatment methods
- Recommendation
  - Disposal must be made according to official regulations.
  - Must not be disposed together with household garbage. Do not allow product to reach sewage system.

**European waste catalogue**

14 06 03 other solvents and solvent mixtures

Uncleaned packaging:
- Recommendation: Disposal must be made according to official regulations.

**SECTION 14: Transport information**

14.1 UN-Number
- IMDG, IATA: UN1219

14.2 UN proper shipping name
- ADR
  - 1219 ISOPROPANOL (ISOPROPYL ALCOHOL) mixture
- IMDG, IATA
  - ISOPROPANOL (ISOPROPYL ALCOHOL) mixture

(Continued on page 7)
14.3 Transport hazard class(es)
ADR, IMDG, IATA

Class                         3 Flammable liquids.
Label                         3
14.4 Packing group
ADR, IMDG, IATA               II
14.5 Environmental hazards:
Marine pollutant:             Not applicable.
DANGER code (Kemler):         Not applicable.
EMS Number:                   F-E,S-D
Stowage Category:             B
14.7 Transport in bulk according to Annex II of Marpol
and the IBC Code:             Not applicable.

Transport/Additional information:

ADR
Limited quantities (LQ)      1L
Excepted quantities (EQ)     Code: E2
Transport category            Maximum net quantity per inner packaging: 30 ml
Tunnel restriction code       2

IMDG
Limited quantities (LQ)      1L
Excepted quantities (EQ)     Maximum net quantity per inner packaging: 30 ml
UN "Model Regulation":       Maximum net quantity per outer packaging: 500 ml
UN 1219 ISOPROPANOL (ISOPROPYL ALCOHOL), MIXTURE, 3, II

SECTION 15: Regulatory information

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

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

GHS02  GHS07

(Continued on page 8)
Signal word Danger

Hazard-determining components of labelling:
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Modified Rosin
Benzyl alcohol

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P312 Call a POISON CENTER/doctor if you feel unwell.
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.

REGULATION (EC) No 1907/2006 ANNEX XVII Conditions of restriction: 3
15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

SECTION 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 Safety Data Sheet (SDS) 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 Safety Data Sheet (SDS) as a source for hazard information.

Department issuing SDS: Product Compliance / EHS Department
Contact: EHS_Kester@kester.com

Abbreviations and acronyms:
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
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)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPvB: very Persistent and very Bioaccumulative
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 4: Acute toxicity – Category 4
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
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.