1 Identification

- Product identifier
- Trade name: Formic Acid Neat
- Part number: PE-1019
- CAS Number:
  64-18-6
- EC number:
  200-579-1
- Index number:
  607-001-00-0
- Application of the substance / the mixture Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:
  ULTRA Scientific, Inc.
  250 Smith Street
  North Kingstown, RI 02852
  USA
- Information department:
  Telephone: (401) 294-9400
  Fax: (401) 295-2300
  E-mail: regulatory@ultrasci.com
- Emergency telephone number:
  US: (800) 424-9300
  Outside US: (703) 527-3887

2 Hazard(s) identification

- Classification of the substance or mixture
  GHS02 Flame
  Flam. Liq. 3 H226 Flammable liquid and vapor.
  GHS06 Skull and crossbones
  Acute Tox. 3 H331 Toxic if inhaled.
  GHS05 Corrosion
  Skin Corr. 1A H314 Causes severe skin burns and eye damage.
  Eye Dam. 1 H318 Causes serious eye damage.
  GHS07
  Acute Tox. 4 H302 Harmful if swallowed.

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

(Contd. on page 2)
Trade name: Formic Acid Neat

- Hazard pictograms
  
  ![Pictograms](image)
  
  GHS02  GHS05  GHS06

- Signal word Danger

- Hazard-determining components of labeling:
  formic acid

- Hazard statements
  Flammable liquid and vapor.
  Harmful if swallowed.
  Toxic if inhaled.
  Causes severe skin burns and eye damage.

- Precautionary statements
  Keep away from heat/sparks/open flames/hot surfaces. No smoking.
  Ground/bond container and receiving equipment.
  Use explosion-proof electrical/ventilating/lighting/equipment.
  Use only non-sparking tools.
  Take precautionary measures against static discharge.
  Do not breathe dusts or mists.
  Wash thoroughly after handling.
  Do not eat, drink or smoke when using this product.
  Use only outdoors or in a well-ventilated area.
  Wear protective gloves/protective clothing/eye protection/face protection.
  IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
  If swallowed: Rinse mouth. Do NOT induce vomiting.
  If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  If INHALED: Remove person to fresh air and keep comfortable for breathing.
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
  Continue rinsing.
  Immediately call a POISON CENTER/doctor.
  Specific treatment (see on this label).
  Wash contaminated clothing before reuse.
  In case of fire: Use for extinction: CO2, powder or water spray.
  Store in a well-ventilated place. Keep container tightly closed.
  Store in a well-ventilated place. Keep cool.
  Store locked up.
  Dispose of contents/container in accordance with local/regional/national/international regulations.

- Classification system:
  - NFPA ratings (scale 0 - 4)
    
    ![NFPA Ratings](image)
    
    Health = 3
    Fire = 2
    Reactivity = 0

  - HMIS-ratings (scale 0 - 4)
    
    ![HMIS Ratings](image)
    
    Health = 4
    Fire = 2
    Reactivity = 0
Trade name: Formic Acid Neat

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

3 Composition/information on ingredients

- Chemical characterization: Substances
- CAS No. Description
  - 64-18-6 formic acid
- Identification number(s)
  - EC number: 200-579-1
  - Index number: 607-001-00-0

4 First-aid measures

- Description of first aid measures
- General information:
  Immediately remove any clothing soiled by the product.
  Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours
  after the accident.
  Remove breathing apparatus only after contaminated clothing have been completely removed.
  In case of irregular breathing or respiratory arrest provide artificial respiration.
- After inhalation:
  Supply fresh air or oxygen; call for doctor.
  In case of unconsciousness place patient stably in side position for transportation.
- After skin contact:
  Rinse opened eye for several minutes under running water. Then consult a doctor.
- After eye contact:
  Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing:
  Immediately call a doctor.
  Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- 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.
- Special hazards arising from the substance or mixture
  - During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
  - Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures
  - Mount respiratory protective device.
Trade name: Formic Acid Neat

Wear protective equipment. Keep unprotected persons away.

- **Environmental precautions:**
  Dilute with plenty of water.
  Do not allow to enter sewers/surface or ground water.

- **Methods and material for containment and cleaning up:**
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Use neutralizing agent.
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.

- **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</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC-1</td>
<td>3 ppm</td>
</tr>
<tr>
<td>PAC-2</td>
<td>25 ppm</td>
</tr>
<tr>
<td>PAC-3</td>
<td>250 ppm</td>
</tr>
</tbody>
</table>

**7 Handling and storage**

- **Handling:**
  - **Precautions for safe handling**
    Ensure good ventilation/exhaustion at the workplace.
    Open and handle receptacle with care.
    Prevent formation of aerosols.
  - **Information about protection against explosions and fires:**
    Keep ignition sources away - Do not smoke.
    Protect against electrostatic charges.
    Keep respiratory protective device available.

- **Conditions for safe storage, including any incompatibilities**
  - **Storage:**
    - **Requirements to be met by storerooms and receptacles:** No special requirements.
    - **Information about storage in one common storage facility:** Not required.
    - **Further information about storage conditions:** Keep receptacle tightly sealed.
  - **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:**
    | 64-18-6 formic acid |
    |---------------------|
    | PEL: Long-term value: 9 mg/m³, 5 ppm |
    | REL: Long-term value: 9 mg/m³, 5 ppm |
45.2.5 TLV

Short-term value: 19 mg/m³, 10 ppm
Long-term value: 9.4 mg/m³, 5 ppm

· Additional information: The lists that were valid during the creation were used as basis.

· Exposure controls
· Personal protective equipment:
· General protective and hygienic measures:
  Keep away from foodstuffs, beverages and feed.
  Immediately remove all soiled and contaminated clothing.
  Wash hands before breaks and at the end of work.
  Store protective clothing separately.
  Avoid contact with the eyes.
  Avoid contact with the eyes and skin.
· Breathing equipment:
  In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
· Protection of hands:
  Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· Material of gloves
  The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· 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:
  Tightly sealed goggles

* 9 Physical and chemical properties

· Information on basic physical and chemical properties
· General Information
· Appearance:
  Form: Liquid
  Color: Colorless
· Odor: Pungent
· Odor threshold: Not determined.
· pH-value: Not determined.
· Change in condition
  Melting point/Melting range: -9°C (°F)
Boiling point/Boiling range: 107°C (°F)
- Flash point: 59°C (°F)
- Flammability (solid, gaseous): Not applicable.
- Ignition temperature: 520°C (°F)
- Decomposition temperature: Not determined.
- Auto igniting: Not determined.
- Danger of explosion: Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

Explosion limits:
  - Lower: 14 Vol %
  - Upper: 33 Vol %

Vapor pressure at 20°C (68 °F): 30 hPa (mm Hg)

Density at 20°C (68 °F): 1.2 g/cm³ (lbs/gal)
- Relative density Not determined.
- Vapor density Not determined.
- Evaporation rate Not determined.

Solubility in / Miscibility with Water: Fully miscible.

Partition coefficient (n-octanol/water): Not determined.

Viscosity:
  - Dynamic: Not determined.
  - Kinematic: Not determined.
- VOC content: 0.00 %
  - 0.0 g/l / 0.00 lb/gl

Other information No further relevant information available.

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: No further relevant information available.
  - Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- Information on toxicological effects
- Acute toxicity:
  - LD/LC50 values that are relevant for classification:
    - ATE (Acute Toxicity Estimate)
      Oral LD50 730 mg/kg (rat)
      Inhalative LC50/4 h 7.4 mg/L (rat)
Trade name: Formic Acid Neat

<table>
<thead>
<tr>
<th>64-18-6 formic acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
</tr>
<tr>
<td>Inhalative LC50/4 h</td>
</tr>
</tbody>
</table>

- Primary irritant effect:
  - on the skin: Strong caustic effect on skin and mucous membranes.
  - on the eye: Strong caustic effect. Strong irritant with the danger of severe eye injury.
  - Sensitization: No sensitizing effects known.

- Additional toxicological information:
  Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

- Carcinogenic categories
  - IARC (International Agency for Research on Cancer)
    Substance is not listed.
  - NTP (National Toxicology Program)
    Substance is not listed.
  - OSHA-Ca (Occupational Safety & Health Administration)
    Substance is not listed.

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
  - Behavior in environmental systems:
    - Bioaccumulative potential: No further relevant information available.
  - Mobility in soil: No further relevant information available.
  - Additional ecological information:
  - General notes:
    Water hazard class 1 (Assessment by list): slightly hazardous for water
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
    Must not reach bodies of water or drainage ditch undiluted or unneutralized.

- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.

- Other adverse effects: No further relevant information available.

13 Disposal considerations

- Waste treatment methods
  - Recommendation:
    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.
Trade name: Formic Acid Neat

- **Recommended cleansing agent**: Water, if necessary with cleansing agents.

### 14 Transport information

<table>
<thead>
<tr>
<th><strong>UN-Number</strong></th>
<th>UN1779</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DOT, IMDG, IATA</strong></td>
<td><strong>UN proper shipping name</strong></td>
</tr>
<tr>
<td><strong>DOT</strong></td>
<td><strong>IMDG, IATA</strong></td>
</tr>
<tr>
<td><strong>class</strong></td>
<td><strong>Formic acid</strong></td>
</tr>
<tr>
<td><strong>Label</strong></td>
<td><strong>FORMIC ACID</strong></td>
</tr>
</tbody>
</table>

- **Transport hazard class(es)**
  - **DOT**
    - **Class**: 8 Corrosive substances
    - **Label**: 8, 3
  - **IMDG**
    - **Class**: 8 Corrosive substances
    - **Label**: 8/3
  - **IATA**
    - **Class**: 8 Corrosive substances
    - **Label**: 8 (3)

- **Packing group**
  - **DOT, IMDG, IATA**: II

- **Environmental hazards**: Not applicable.

- **Special precautions for user**: Warning: Corrosive substances
- **Danger code (Kemler)**: 80
- **EMS Number**: 8-05
- **Segregation groups**: Acids
- **Stowage Category**: A
- **Stowage Code**: SW2 Clear of living quarters.

- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**: Not applicable.
Trade name: Formic Acid Neat

<table>
<thead>
<tr>
<th>Transport/Additional information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>· DOT</td>
</tr>
<tr>
<td>· Quantity limitations</td>
</tr>
<tr>
<td>On passenger aircraft/rail: 1 L</td>
</tr>
<tr>
<td>On cargo aircraft only: 30 L</td>
</tr>
<tr>
<td>· Hazardous substance:</td>
</tr>
<tr>
<td>5000 lbs, 2270 kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Limited quantities (LQ)</td>
</tr>
<tr>
<td>1L</td>
</tr>
<tr>
<td>· Excepted quantities (EQ)</td>
</tr>
<tr>
<td>Code: E2</td>
</tr>
<tr>
<td>Maximum net quantity per inner packaging: 30 ml</td>
</tr>
<tr>
<td>Maximum net quantity per outer packaging: 500 ml</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UN &quot;Model Regulation&quot;:</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN 1779 FORMIC ACID, 8 (3), II</td>
</tr>
</tbody>
</table>

15 Regulatory information

<table>
<thead>
<tr>
<th>Safety, health and environmental regulations/legislation specific for the substance or mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Sara</td>
</tr>
<tr>
<td>· Section 355 (extremely hazardous substances):</td>
</tr>
<tr>
<td>Substance is not listed.</td>
</tr>
<tr>
<td>· Section 313 (Specific toxic chemical listings):</td>
</tr>
<tr>
<td>Substance is listed.</td>
</tr>
<tr>
<td>· TSCA (Toxic Substances Control Act):</td>
</tr>
<tr>
<td>Substance is listed.</td>
</tr>
<tr>
<td>· Proposition 65</td>
</tr>
<tr>
<td>· Chemicals known to cause cancer:</td>
</tr>
<tr>
<td>Substance is not listed.</td>
</tr>
<tr>
<td>· Chemicals known to cause reproductive toxicity for females:</td>
</tr>
<tr>
<td>Substance is not listed.</td>
</tr>
<tr>
<td>· Chemicals known to cause reproductive toxicity for males:</td>
</tr>
<tr>
<td>Substance is not listed.</td>
</tr>
<tr>
<td>· Chemicals known to cause development toxicity:</td>
</tr>
<tr>
<td>Substance is not listed.</td>
</tr>
<tr>
<td>· Carcinogenic categories</td>
</tr>
<tr>
<td>· EPA (Environmental Protection Agency)</td>
</tr>
<tr>
<td>Substance is not listed.</td>
</tr>
<tr>
<td>· TLV (Threshold Limit Value established by ACGIH)</td>
</tr>
<tr>
<td>Substance is not listed.</td>
</tr>
<tr>
<td>· NIOSH-Ca (National Institute for Occupational Safety and Health)</td>
</tr>
<tr>
<td>Substance is not listed.</td>
</tr>
<tr>
<td>· GHS label elements</td>
</tr>
<tr>
<td>The substance is classified and labeled according to the Globally Harmonized System (GHS).</td>
</tr>
</tbody>
</table>
Trade name: Formic Acid Neat

- **Hazard pictograms**
  
  ![GHS02](image1) ![GHS05](image2) ![GHS06](image3)

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  formic acid

- **Hazard statements**
  Flammable liquid and vapor.
  Harmful if swallowed.
  Toxic if inhaled.
  Causes severe skin burns and eye damage.

- **Precautionary statements**
  Keep away from heat/sparks/open flames/hot surfaces. No smoking.
  Ground/bond container and receiving equipment.
  Use explosion-proof electrical/ventilating/lighting/equipment.
  Use only non-sparking tools.
  Take precautionary measures against static discharge.
  Do not breathe dusts or mists.
  Wash thoroughly after handling.
  Do not eat, drink or smoke when using this product.
  Use only outdoors or in a well-ventilated area.
  Wear protective gloves/protective clothing/eye protection/face protection.
  IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
  IF inhaled: Use for extinction: CO2, powder or water spray.
  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**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Date of preparation / last revision** 08/23/2017 / -

- **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
  DOT: US Department of Transportation
  IATA: International Air Transport Association
  ACGIH: American Conference of Governmental Industrial Hygienists
Trade name: Formic Acid Neat

EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
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. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Acute Tox. 3: Acute toxicity – Category 3
Skin Corr. 1A: Skin corrosion/irritation – Category 1A
Eye Dam. 1: Serious eye damage/eye irritation – Category 1

* Data compared to the previous version altered.