MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT CODE	N0052
PRODUCT NAME	NAT. FORMIC ACID
SUPPLIER	Shanghai M & U International Trade Co., Ltd. Rm 1717, No 598 North NuJiang Road 200333 Shanghai, China +86-21-32515501 32515502 sales@mu-intel.com

FOR EMERGENCIES CALL CHEMTREC: 800-424-9300 (24-HOURS)

2. HAZARD IDENTIFICATION:

Emergency Overview
OSHA Hazards
Combustible Liquid, Target Organ Effect, Harmful by ingestion., Corrosive.
Target Organs
Kidney, Liver, Central nervous system, Blood.
GHS Classification
Flammable liquids (Category 3)
Acute toxicity, Oral (Category 4)
Acute toxicity, Inhalation (Category 3)
Skin corrosion (Category 1A)
Serious eye damage (Category 1)
Acute aquatic toxicity (Category 3)
GHS Label elements, including precautionary statements
Pictogram
Signal word Danger
Hazard statement(s)

H226	Flammable liquid and vapor.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H331	Toxic if inhaled.
H402	Harmful to aquatic life.

Precautionary statement(s)

P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P280	Wear protective gloves/protective clothing/eye protection/ face protection.
P305 P351 P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310	Immediately call a POISON CENTER or doctor/physician.

HMIS Classification

Health hazard	2
Flammability	2
Physical hazards	2

NFPA Rating

Health hazard	2
Fire	2
Reactivity Hazard	0

Potential Health Effects

Inhalation	May be May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	Harmful if absorbed through skin. Causes skin burns.
Eyes	Causes eye burns. Causes severe eye burns.
Ingestion	Harmful if swallowed.

3. COMPOSITION AND INFORMATION ON INGREDIENTS:

Formula	C H2 O2
Molecular Weight	46.03 g/mol

CAS-No	EC-No	Index-No.	Concentration
64-18-6	200-579-1	6007-001-00-0	

4. FIRST-AID GUIDE:

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING GUIDE:

Conditions of flammability
Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.
Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Further information
Use water spray to cool unopened containers

6. ACCIDENTAL RELEASE GUIDE:

Personal precautions
Wear protective protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE:

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge.
Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Vent periodically. Over time, pressure may increase causing containers to burst. Handle and open container with care. Hygroscopic.

8. EXPOSURE AND PERSONAL PROTECTION:

Personal protective equipment:
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of

contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection

Tightly fitting safety goggles. Face shield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance

Form	LIQUID
Color	COLORLESS TO PALE YELLOW

Safety data

pH	2.2 at 2.2 g/l at 20°C
Melting point (°C)	8.5
Boiling point (°C)	75
Flash point (°F) Closed cup	156
Ignition temperature (°C)	540
Auto ignition temperature	no data available
Lower explosion limit	18 %(V)
Upper explosion limit	57% (V)
Vapour pressure (mmHg@20°C)	31.50
Density @25 °C	1.218
Water solubility	INSOLUBLE
Partition coefficient:	
n-octanol/water	log Pow: -0.54
Relative vapor density	1.218
Odor	CHARACTERISTIC

10. STABILITY AND REACTIVITY:

Chemical stability

Stable under recommended storage conditions.

Conditions to avoid

Heat, flames and sparks.

Materials to avoid

Strong oxidizing agents, Strong bases, Powdered metals.

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION:

Acute toxicity
Oral LD50
LD50 Oral - rat - 1,100 mg/kg
Inhalation LC50
LC50 Inhalation - rat - 4 h - 7.4 mg/l
LC50 Inhalation - rat - 0.25 h - 15,000 mg/m3
Skin corrosion/irritation
Skin - rabbit - Severe skin irritation - Draize Test.
Serious eye damage/eye irritation
Eye -rabbit - Severe eye irritation.
Respiratory or skin sensitization
Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.
Carcinogenicity
IARC:
No component of this product present at levels greater than or equal to 0.1% is identified as probable. possible or confirmed human carcinogen by IARC.
ACGIH:
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:
No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Potential health effects

Inhalation	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion	Harmful if swallowed.
Skin	Harmful if absorbed through skin. Causes skin burns.
Eyes	Causes eye burns. Causes severe eye burns.

Signs and Symptoms of Exposure
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting.
Additional Information
RTECS: LQ4900000

12. ECOLOGICAL INFORMATION:

Toxicity
Toxicity to fish LC50 - Leuciscus idus (Golden orfe) - 46 - 100 mg/l - 96 h.

Toxicity to daphnia and other aquatic invertebrates.	EC50 - Daphnia magna (Water flea) - 34.2 mg/l - 48 h.
Toxicity to bacteria	Pseudomonas putida - 46.7 mg/l - 17 h.

Persistence and degradability

Biodegradability	Result: >90% - Readily biodegradable.

Bioaccumulative potential

Bioaccumulation is unlikely.

Other adverse effects

Biochemical Oxygen Demand (BOD)	86 mg/g.
Chemical Oxygen Demand (COD)	348 mg/g

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life.

13. DISPOSAL RECOMMENDATIONS:

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORTATION INFORMATION:

DOT (US)

UN number: 1779 Class: 8 (3) Packing group: II
Proper shipping name: Formic acid

IMDG

UN number: 1779 Class: 8 (3) Packing group: II EMS-No: F-E, S-C
Proper shipping name: FORMIC ACID

IATA

UN number: 1779 Class: 8 (3) Packing group: II
Proper shipping name: Formic acid

15. REGULATORY INFORMATION:

OSHA Hazards

Combustible Liquid, Target Organ Effect, Harmful by ingestion., Corrosive.

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No	Revision Date
Formic acid	64-18-6	2007-07-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

	CAS-No	Revision Date
Formic acid	64-18-6	2007-07-01

Pennsylvania Right To Know Components

	CAS-No	Revision Date
Formic acid	64-18-6	2007-07-01

New Jersey Right To Know Components

	CAS-No	Revision Date
Formic acid	64-18-6	2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION:

The information in this MSDS was obtained from current and reliable sources. However, the data is provided without any warranty, expressed or implied, regarding its correctness or accuracy. Since the conditions for use, handling, storage and disposal of this product are beyond M&U's control, it is the responsibility of the user both to determine safe conditions for use of this product and to assume liability for loss, damage, or expense arising out of the products improper use. No warranty expressed or implied regarding the product described herein will be created by or inferred from any statement or omission in the MSDS. Various federal, state, or provincial agencies may have specific regulations concerning the transportation, handling, storage, use, or disposal of this product which may not be reflected in the MSDS. The user should review these regulations to ensure full compliance.