FORMIC ACID 98-100%

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
FORMIC ACID 98-100%

OTHER NAMES

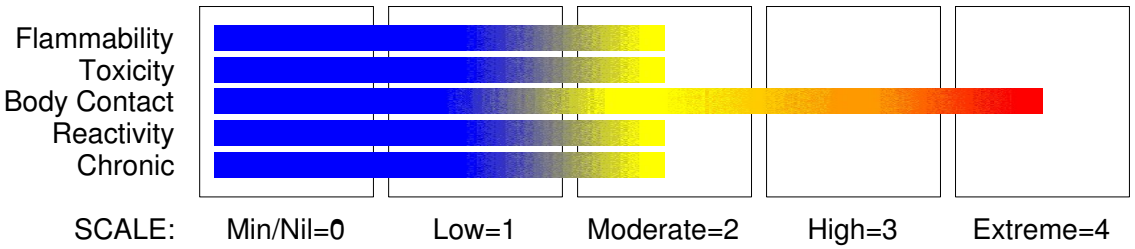
C-O2-H2, CHOOH, "aminic acid", "formylic acid", "hydrogen carboxylic acid", "methanoic acid", "RCRA Waste Number U123"

PROPER SHIPPING NAME
FORMIC ACID with more than 85% acid by mass
FORMIC ACID

PRODUCT USE
Used as a decalcifier and reducer in dyeing wool fast colours.
Used in tanning to dehair and plump hides, in rubber latex coagulation and old rubber regeneration, in electroplating, in sizes and in chemical analysis.

SUPPLIER
Company: S D FINE- CHEM LIMITED
Address:
315- 317, T.V. INDUSTRIAL ESTATE,
248, WORLI,
MUMBAI- 400030.INDIA.
technical@sdfine.com
Telephone: 91- 22- 24959898
Telephone: 91- 22- 24959899
Fax: 91- 22- 24937232

HAZARD RATINGS



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Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Inhalation) Category 3
Acute Toxicity (Oral) Category 4
Flammable Liquid Category 3
Metal Corrosion Category 1
Skin Corrosion/Irritation Category 1B

EMERGENCY OVERVIEW

HAZARD

DANGER
Determined using GHS criteria:
H226 H227 H331 H302 H290 H314
Flammable liquid and vapour
Combustible Liquid
Toxic if inhaled
Harmful if swallowed
May be corrosive to metals
Causes severe skin burns and eye damage

PRECAUTIONARY STATEMENTS

Prevention

Keep away from flames and hot surfaces.
Do not breathe dust/fume/gas/mist/vapours/spray.
Wash hands thoroughly after handling.
Do not eat, drink or smoke when using this product.
Do not breathe dust or mist.
Use explosion-proof electrical/ventilating/lighting/equipment
Wash thoroughly after handling.
Wear protective gloves/clothing and eye/face protection.
Use only outdoors or in a well ventilated area.
Avoid breathing dust/fume/gas/mist/vapours/spray.

Response

Call a POISON CENTER or doctor/physician if you feel unwell.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
Keep container tightly closed.
Immediately call a POISON CENTER or doctor/physician.
If on skin or hair: remove/take off immediately all contaminated clothing. Rinse with water/shower.
In case of fire, use alcohol-type foam for extinction.

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IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
In case of fire, use dry agent for extinction.
Specific treatment: refer to Label or MSDS.
Wash contaminated clothing before reuse.
Absorb spillage to prevent material damage.

Storage

Store in a corrosive resistant container with a resistant inliner.
Store away from other materials
Store locked up.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
formic acid	64-18-6	>98
water	7732-18-5	<2

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.
· If swallowed do NOT induce vomiting.
· If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
· Observe the patient carefully.
· Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious
· Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
· Seek medical advice.

EYE

If this product comes in contact with the eyes:
· Immediately hold eyelids apart and flush the eye continuously with running water.
· Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
· Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
· Transport to hospital or doctor without delay.
· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:
· Immediately remove all contaminated clothing, including footwear.
· Flush skin and hair with running water (and soap if available).

continued...

· Seek medical attention in event of irritation.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area.
· Lay patient down. Keep warm and rested.
· Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
· Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
· Transport to hospital, or doctor.
If exposure has been severe and/or symptoms marked, observation in hospital for 48 hours should be considered due to possibility of delayed pulmonary oedema.

NOTES TO PHYSICIAN

For acute or short term repeated exposures to strong acids:
· Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
· Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
· Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
· Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:
· Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
· DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
· Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
· Charcoal has no place in acid management.
· Some authors suggest the use of lavage within 1 hour of ingestion.
SKIN:
· Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
· Deep second-degree burns may benefit from topical silver sulfadiazine.
EYE:
· Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjuctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralising agents or any other additives. Several litres of saline are required.
· Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
· Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).
[Ellenhorn and Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Dry chemical powder.

continued...

· Alcohol stable foam.
Water spray or fog.
Carbon dioxide.

FIRE FIGHTING
· Alert Fire Brigade and tell them location and nature of hazard.
· May be violently or explosively reactive.
· Wear full body protective clothing with breathing apparatus.
· Prevent, by any means available, spillage from entering drains or water course.
· If safe, switch off electrical equipment until vapour fire hazard removed.
· Use water delivered as a fine spray to control fire and cool adjacent area.
· Avoid spraying water onto liquid pools.
· DO NOT approach containers suspected to be hot.
· Cool fire exposed containers with water spray from a protected location.
· If safe to do so, remove containers from path of fire.

FIRE/EXPLOSION HAZARD
· Liquid and vapour are flammable.
· Moderate fire hazard when exposed to heat or flame.
· Vapour forms an explosive mixture with air.
· Moderate explosion hazard when exposed to heat or flame.
· Vapour may travel a considerable distance to source of ignition.
· Heating may cause expansion or decomposition leading to violent rupture of containers.
· On combustion, may emit toxic fumes of carbon monoxide (CO).

FIRE INCOMPATIBILITY
Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Personal Protective Equipment
Breathing apparatus.
Gas tight chemical resistant suit.
Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS
Clean up all spills immediately.
Wear protective clothing, impervious gloves and safety glasses.
Avoid breathing vapours and contact with skin and eyes.
Remove all ignition sources.
Wipe up and absorb small quantities with vermiculite or other absorbent material.
Allow absorbed spillage to evaporate in an open top container, away from habitation.

MAJOR SPILLS
· Clear area of personnel and move upwind.
· Alert Fire Brigade and tell them location and nature of hazard.
· May be violently or explosively reactive.
· Wear full body protective clothing with breathing apparatus.
· Prevent, by any means available, spillage from entering drains or water course.
· No smoking, naked lights or ignition sources.

continued...

· Increase ventilation.
· Stop leak if safe to do so.
· Water spray or fog may be used to disperse vapour.
· Contain or absorb spill with sand, earth or vermiculite.
· Use only spark-free shovels and explosion proof equipment.
· Collect recoverable product into labelled containers for recycling.
· Collect solid residues and seal in labelled drums for disposal.
· Wash area and prevent runoff into drains.
· After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
· If contamination of drains or waterways occurs, advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)
The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:
formic acid 30 ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
formic acid 10 ppm

other than mild, transient adverse effects without perceiving a clearly defined odour is:
formic acid 10 ppm

The threshold concentration below which most people will experience no appreciable risk of health effects:
formic acid 5 ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

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SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

+	X	X	X	X	+

+: May be stored together
O: May be stored together with specific preventions
X: Must not be stored together

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

continued...

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

Handle and open container with care.
· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of overexposure occurs.
· Use in a well-ventilated area.
· Prevent concentration in hollows and sumps.
· DO NOT enter confined spaces until atmosphere has been checked.
· Avoid smoking, naked lights or ignition sources.
· Avoid generation of static electricity.
· DO NOT use plastic buckets.
· Earth all lines and equipment.
· Use spark-free tools when handling.
· Avoid contact with incompatible materials.
· When handling, DO NOT eat, drink or smoke.
· Keep containers securely sealed when not in use.
· Avoid physical damage to containers.
· Always wash hands with soap and water after handling.
· Work clothes should be laundered separately.
· Use good occupational work practice.
· Observe manufacturer's storing and handling recommendations.
· Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
DO NOT add water to product, dilute according to suppliers instructions.

SUITABLE CONTAINER

DO NOT repack. Use only containers as originally supplied by manufacturer.
DO NOT use aluminium, galvanised or tin-plated containers.
Container to have vented cap.

STORAGE INCOMPATIBILITY

Segregate from alkalies, oxidising agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.
Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.
Formic acid reacts explosively with hydrogen peroxide, furfuryl alcohol, thallium nitrate, nitromethane.
Formic acid reacts with concentrated sulfuric acid to produce carbon dioxide.

STORAGE REQUIREMENTS

Handle and open container with care.
Rotate all stock to prevent ageing. Use on FIFO (First In-First Out) basis.
WARNING: Decomposition may occur after prolonged storage.
Pure formic acid slowly decomposes releasing toxic carbon monoxide and may pressurise containers. Water in less concentrated acid improves stability.
Extreme care needed in opening containers of unknown age.

continued...

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

• formic acid:	CAS:64- 18- 6 CAS:16499- 21- 1 CAS:8006- 93- 7 CAS:82069- 14- 5
• water:	CAS:7732- 18- 5 CAS:558440- 53- 2 CAS:558440- 22- 5

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
formic acid		30 [Unch]

MATERIAL DATA

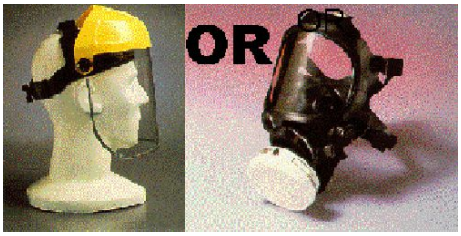
Odour Threshold Value: 20-40 mg/m3 (detection)
NOTE: Detector tubes for formic acid, measuring in excess of 1 ppm, are available commercially.
Th TLV-TWA is thought to be protective against the risk of respiratory and eye irritation and possible skin irritation.

INGREDIENT DATA

WATER:
No exposure limits set by NOHSC or ACGIH.

PERSONAL PROTECTION



EYE

· Chemical goggles.
· Full face shield may be required for supplementary but never for primary protection of eyes
· Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

continued...

HANDS/FEET
Butyl rubber gloves or Neoprene rubber gloves.
PVC boots.
When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

The selection of appropriate respiratory protection (organic vapour respirator with a full facepiece - with dust and mist filter in case of fuming liquid, supplied-air respirator, self-contained breathing apparatus) should be based upon the actual or potential airborne contaminants and their concentrations present.

OTHER
Acid-resistant overalls.
· Impervious protective clothing.
PVC apron.
Ensure there is ready access to a safety shower.
· Eyewash unit.

GLOVE SELECTION INDEX
Glove selection is based on a modified presentation of the:
" Forsberg Clothing Performance Index" .
The effect(s) of the following substance(s) are taken into account in the computer- generated selection: formic acid

Protective Material CPI *.

BUTYL	A
NATURAL RUBBER	A
NEOPRENE	A
NEOPRENE/NATURAL	A
NITRILE	A
PVC	A
SARANEX- 23	A
NATURAL+NEOPRENE	C
PE	C

A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.
For further information consult
your
Occupational Health and Safety Advisor.

continued...

ENGINEERING CONTROLS

DO NOT add water to product, dilute according to suppliers instructions.
Use in a well-ventilated area.
Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25- 0.5 m/s (50- 100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

continued...

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Clear corrosive and combustible liquid with pungent, penetrating odour.
Miscible with water, alcohol, ether and glycerol.
99% material freezes @ 8 deg C. Use care in remelting.
The pure substance with little or no water is described as "glacial formic acid".
Concentrated (90%) but not glacial acid has improved stability.
Physical properties, flash point etc varies with concentration.

PHYSICAL PROPERTIES

Liquid.
Mixes with water.
Corrosive.
Acid.

Molecular Weight: 46.03
Melting Range (°C): 8.4
Solubility in water (g/L): Miscible
pH (1% solution): 2.2
Volatile Component (%vol): Not available.
Relative Vapour Density (air=1): 1.6
Lower Explosive Limit (%): 12
Autoignition Temp (°C): 480
State: Liquid

Boiling Range (°C): 100.8
Specific Gravity (water=1): 1.22 @ 20 deg.C
pH (as supplied): Not applicable
Vapour Pressure (kPa): 4.5 @ 20 deg.C
Evaporation Rate: 0.4 (CCl4 = 1)
Flash Point (°C): 68.89 OC @ 90%
Upper Explosive Limit (%): 57
Decomposition Temp (°C): Not available
Viscosity: Not available

log Kow: -1.55- -0.22

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

Presence of heat source and ignition source.
- Presence of incompatible materials.
- Product is considered stable under normal handling conditions.
- Prolonged exposure to heat.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

continued...

The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion.
Considered an unlikely route of entry in commercial/industrial environments.
Ingestion may result in nausea, abdominal irritation, pain and vomiting.

EYE
The material can produce severe chemical burns to the eye following direct contact.
Vapours or mists may be extremely irritating.
When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation.
Direct eye contact with acid corrosives may produce pain, lachrymation, photophobia and burns. Mild burns of the epithelia generally recover rapidly and completely. Severe burns produce long-lasting and possible irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply vascularised and opaque resulting in blindness.
Dilute solutions of low-molecular organic acids cause conjunctival hyperaemia, prompt pain and corneal injury.
The material may produce severe irritation to the eye causing pronounced inflammation.
Repeated or prolonged exposure to irritants may produce conjunctivitis.

SKIN
The material can produce severe chemical burns following direct contact with the skin.
and contact may cause tissue destruction.
if contact is prolonged.
Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.
The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

INHALED
Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system in a substantial number of individuals following inhalation.

CHRONIC HEALTH EFFECTS
Principal routes of exposure are by accidental skin and eye contact and by inhalation of vapours especially at higher temperatures.
Repeated or prolonged exposure to acids may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis.
Chronic occupational exposures may produce nausea and albumin or blood in the urine.

TOXICITY AND IRRITATION

TOXICITY	IRRITATION
Oral (rat) LD50: 1100 mg/kg	Skin (rabbit): 610 (open) - Mild
Inhalation (rat) LC50: 15000 mg/m^3/15m	Eye (rabbit): 122 mg - SEVERE

WATER:
No significant acute toxicological data identified in literature search.

continued...

Section 12 - ECOLOGICAL INFORMATION

log Kow: -1.55- -0.22
BOD 5 if unstated: 0.02-0.27
ThOD: 0.35
BCF: 0.22
Degradation Biological: sig
processes Abiotic: RxnOH*
In the atmosphere, formic acid reacts with photochemically produced hydroxyl radicals (half-life 34 days).
Formic acid is highly soluble in water, it is non-persistent (half-life 2-20 days).
Leaches into some soils where it is expected to be biodegradable.
Does not concentrate in food chain.

Section 13 - DISPOSAL CONSIDERATIONS

Recycle wherever possible.
Incinerate residue at an approved site.
Used containers should be left upside down with bungs out.
Decontaminate empty containers with a lime slurry.

Section 14 - TRANSPORTATION INFORMATION

Labels Required: CORROSIVE
HAZCHEM: 2X

UNDG:

Dangerous Goods Class:	8	Subrisk:	None
UN Number:	1779	Packing Group:	II

Shipping Name:FORMIC ACID with more than 85% acid by mass
FORMIC ACID

Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	None
UN/ID Number:	1779	Packing Group:	II
ERG Code:	8L		

Shipping name:FORMIC ACID with more than 85% acid by mass
FORMIC ACID

Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	3
UN Number:	1779	Packing Group:	II
EMS Number:	F- E, S- C		

continued...

Shipping name:FORMIC ACID with more than 85% acid by mass
FORMIC ACID

Section 15 - REGULATORY INFORMATION

REGULATIONS

formic acid (CAS: 64-18-6) is found on the following regulatory lists;
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
International Council of Chemical Associations (ICCA) - High Production Volume List
OECD Representative List of High Production Volume (HPV) Chemicals

No data available for formic acid as CAS: 16499-21-1, CAS: 8006-93-7, CAS: 82069-14-5.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
formic acid	64- 18- 6, 16499- 21- 1, 8006 - 93- 7, 82069- 14- 5
water	7732- 18- 5, 558440- 53- 2, 558440- 22- 5

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 04-Nov-2017