EASTMAN

SAFETY DATA SHEET

Preparation Date 31-12-2014 **Revision Date** 13-10-2015 **Revision Number** 3

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

1.1. Product Identifier

Product code 51642

Product name **FORMIC ACID 75%**

REACH registration number 012119491174-37-0003

Contains Formic acid

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended use Preparation of ensilage
Pickling of metals
pH adjustment

Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Manufacturer

Taminco Finland Oy
a subsidiary of Eastman Chemical Company
Typpitie 1
FI-90620 Oulu
Finland
T: +358 207 108 300
F: +358 207 108 301

For further information, please contact

E-mail address emnmsds@eastman.com

1.4. Emergency telephone number

(+32) 9 254 10 36

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

Acute Toxicity - Oral	Category 4 - (H302)
Acute toxicity - Inhalation (Vapours)	Category 4 - (H332)
Skin Corrosion/Irritation	Category 1 Sub-category B - (H314)
Serious eye damage/eye irritation	Category 1 - (H318)

2.2. Label Elements

Product Identifier

Contains Formic acid

Signal Word
Danger

hazard statements
H314 - Causes severe skin burns and eye damage
H302 - Harmful if swallowed
H332 - Harmful if inhaled
EUH071 - Corrosive to the respiratory tract

Precautionary Statements - EU (§28, 1272/2008)
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
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 CENTRE or doctor/physician

2.3. Other Hazards

pungent
odor

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical Name	EINECS-No.	CAS-No	Weight %	Classification according to Regulation (EC) No. 1272/2008 [CLP]	REACH registration number	M-Factor
Formic acid	200-579-1	64-18-6	75-78	Flam. Liq. 3 (H226) Acute oral tox. 4 (H302) Acute inhalation tox. 3 (H331) Skin Corr. 1A (H314) Eye Damage 1 (H318)	01-2119491174-37-0003	1

Full text of H- and EUH-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice If symptoms persist, call a physician. Show this material safety data sheet to the doctor in attendance.

Inhalation	Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult a physician.
Skin contact	Take off all contaminated clothing immediately. Wash off immediately with plenty of water for at least 15 minutes. Consult a physician.
Eye contact	Immediate medical attention is required. Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Ingestion	Do not induce vomiting. drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
Protection of first-aiders	Use personal protective equipment.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms See Section 11: TOXICOLOGICAL INFORMATION

4.3. Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

SECTION 5: Fire fighting measures

5.1. Extinguishing media

Suitable extinguishing media
carbon dioxide (CO2), water spray, dry chemical, Alcohol-resistant foam

Extinguishing media which must not be used for safety reasons
high volume water jet

5.2. Special hazards arising from the substance or mixture

In case of fire hazardous decomposition products may be produced such as.

Hazardous combustion products Carbon monoxide

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective suit. Use personal protective equipment as required. Do not allow run-off from fire-fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions
Avoid contact with skin, eyes and clothing. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Wear self-contained breathing apparatus and protective suit. rubber gloves.

For emergency responders
Use personal protection recommended in Section 8.

6.2. Environmental precautions

Should not be released into the environment. Remove immediately adhering matter. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Methods for containment Large spills should be collected mechanically (remove by pumping) for disposal. Keep in suitable, closed containers for disposal.

Methods for cleaning up Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Large spills should be collected mechanically (remove by pumping) for disposal. Keep in suitable, closed containers for disposal. Prevent product from entering drains.

6.4. Reference to other sections

See section 8 for more information. See section 13 for more information.

Section 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Handling
Use only in area provided with appropriate exhaust ventilation. Keep away from heat and sources of ignition. No smoking. Handle and open container with care. wear personal protective equipment. Wash hands after handling. Do not eat, drink or smoke when using this product. Remove contaminated clothing and protective equipment before entering eating areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
Regular cleaning of equipment, work area and clothing. Keep away from food, drink and animal feeding stuffs. Contaminated work clothing should not be allowed out of the workplace. For environmental protection remove and wash all contaminated protective equipment before re-use.

7.2. Conditions for safe storage, including any incompatibilities

Storage
In accordance with local and national regulations. Store in original container. Protect from sunlight and store in well-ventilated place. Keep at temperatures below 30 °C. Keep away from open flames, hot surfaces and sources of ignition. Incompatible with strong acids and oxidizing agents. bases. copper. aluminium. Keep away from combustible material. The product may form CO (carbon monoxide) under prolonged storage. Corrodes base metals.

7.3. Specific end use(s)

Specific use(s)
Preparation of ensilage
Pickling of metals
pH adjustment

Risk Management Methods (RMM)
The information required is contained in this Material Safety Data Sheet.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Chemical Name	Eu	United Kingdom	France	Spain	Germany

Formic acid 64-18-6	5 ppm TWA; 9 mg/m³ TWA	15 ppm STEL; 28.8 mg/m³ STEL 5 ppm TWA; 9.6 mg/m³ TWA	5 ppm TWA [VME] (indicative limit); 9 mg/m³ TWA [VME] (indicative limit)	5 ppm TWA [VLA-ED] (indicative limit value; it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary or biocide compound); 9 mg/m³ TWA [VLA-ED] (indicative limit value; it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary or biocide compound)	5 ppm TWA MAK; 9.5 mg/m³ TWA MAK 5 ppm TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2); 9.5 mg/m³ TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2)

Chemical Name	Italy	Portugal	Netherlands	Finland	Sweden	Denmark	Norway
Formic acid 64-18-6	5 ppm TWA; 9 mg/m³ TWA	5 ppm TWA [VLE-MP] 10 ppm STEL [VLE-CD	5 mg/m³ STEL	3 ppm TWA; 5 mg/m³ TWA 10 ppm STEL; 19 mg/m³ STEL	3 ppm LLV; 5 mg/m³ LLV 5 ppm STV; 9 mg/m³ STV	5 ppm TWA; 9 mg/m³ TWA	5 ppm TWA; 9 mg/m³ TWA 10 ppm STEL; 18 mg/m³ STEL

Chemical Name	Austria	Switzerland	Poland	Latvia	Lithuania	Estonia	Ireland
Formic acid 64-18-6	5 ppm Ceiling; 9 mg/m³ Ceiling 5 ppm TWA [TMW]; 9 mg/m³ TWA [TMW] 5 ppm STEL [KZW]; 9 mg/m³ STEL [KZW]	Developmental Risk Group C 10 ppm STEL [KZW]; 19 mg/m³ STEL [KZW] 5 ppm TWA [MAK]; 9.5 mg/m³ TWA [MAK]	5 mg/m³ TWA [NDS] 15 mg/m³ STEL [NDSCh]	5 ppm TWA; 9 mg/m³ TWA	5 ppm TWA [IPRD]; 9 mg/m³ TWA [IPRD]	5 ppm TWA; 9 mg/m³ TWA	5 ppm TWA; 9 mg/m³ TWA

Chemical Name	Belgium	Luxembourg	Hungary	Slovak Republic	Slovenia	Czech Republic	Greece
Formic acid 64-18-6	5 ppm TWA; 9.5 mg/m³ TWA 10 ppm STEL; 19 mg/m³ STEL	5 ppm TWA; 9 mg/m³ TWA	9 mg/m³ TWA [AK]	5 ppm TWA; 9.0 mg/m³ TWA	5 ppm TWA; 9 mg/m³ TWA	9 mg/m³ TWA 18 mg/m³ Ceiling Irritant	5 ppm TWA; 9 mg/m³ TWA

Derived No Effect Level (DNEL) Long term.

Inhalation 9.5 mg/m³

Derived No Effect Level (DNEL) Short term

Inhalation 19 mg/m³

Predicted No Effect Concentration (PNEC) .

Freshwater 2 mg/l

Freshwater sediment 13.4 mg/kg

Marine water 0.2 mg/l

Marine sediment 1.34 mg/l

Soil 1.5 mg/kg

Impact on Sewage Treatment 7.2 mg/l

8.2. Exposure controls

Engineering measures Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye protection	tightly fitting safety goggles. and. face-shield.
Hand protection	impervious gloves. butyl-rubber. Neoprene gloves. The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it. The suitability for a specific workplace should be discussed with the producers of the protective gloves. The exact break through time can be obtained from the protective glove producer and this has to be observed. Gloves must be disposed of and replaced before the breakthrough time and when they show signs of degradation.
Skin and body protection	Choose body protection according to the amount and concentration of the dangerous substance at the work place. Chemical resistant apron. boots. Complete suit protecting against chemicals.
Respiratory protection	Short term. a respirator with filter for organic vapor. Filter type:. gas. boiling point. > 65 °C. Long term. (in case of higher concentration). Self-contained breathing apparatus.
Recommended Filter type:	A .

Environmental exposure controls Prevent product from entering drains. Do not contaminate surface water. Avoid subsoil penetration.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical State	Clear liquid		
Odor	pungent	**Colour**	Colorless

Property	**Values**	**Remarks • Method**
pH	< 1	-
Melting point/freezing point	< -30 °C / -22 °F	-
Boiling point/range	104 °C / 219 °F	-
Flash point	76 °C / 169 °F	PMCC
Evaporation rate	no data available	-
Flammability (solid, gas)		
Flammability Limit in Air		
Upper flammability limit:	51 % (V) (99 %)	
Lower flammability limit:	18 % (V) (99 %)	
Vapor Pressure	< 4.4 kPa @ 20 °C	-
Vapor Density	no data available	-
Specific Gravity	1.18	-
Water solubility	completely soluble	-
Partition coefficient	log Pow : -2.1 @ 23°C (pH 7)	Formic acid
Autoignition temperature	> 520 °C / 968 °F	-
Decomposition temperature	350°C	Formic acid
Kinematic viscosity	No data available	-
Dissociation constant	pKa: @ 20 °C 3.7	Formic acid
Surface tension	71.5 mN/m @ 20 °C	Formic acid
Oxidising properties	The substance or mixture is not classified as oxidizing	

9.2. Other information

Dynamic viscosity	1.70 mPas @ 20 °C
Density	1.18 g/cm3 @ 20 °C

Section 10: STABILITY AND REACTIVITY

10.1. Reactivity

See Incompatible Materials .

10.2. Chemical stability

Stable under recommended storage conditions. Strong acid decomposes slowly to form CO (carbon monoxide).

Explosion data

Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	None.

10.3. Possibility of hazardous reactions

polymerization
Hazardous polymerization does not occur.

Possibility of hazardous reactions
Exothermic reaction. :. bases. Amines. Risk of violent reaction. :. Strong oxidizing agents.

10.4. Conditions to avoid

temperatures above 30 °C. To avoid thermal decomposition, do not overheat.

10.5. Incompatible materials

Strong acids and oxidizing agents. bases. copper. Aluminum. combustible material.

10.6. Hazardous decomposition products

Thermal decomposition. Carbon monoxide. Strong acid decomposes slowly to form CO (carbon monoxide).

Section 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Product Information

Acute Oral Toxicity	Harmful by ingestion
Acute dermal toxicity	Not classified
Acute Inhalation Toxicity	Harmful by inhalation
Eye irritation	Corrosive, Causes serious eye damage
Skin irritation	Corrosive, Causes severe burns
Chemical Name	**Formic acid**
LD50/oral/rat =	730 mg/kg
LC50/inhalation/4h/rat =	7.85 mg/l
Skin irritation	Corrosive
Eye irritation	Corrosive
sensitisation	negative
Mutagenicity	In vivo tests did not show mutagenic effects In vitro tests did not show mutagenic effects
Reproductive toxicity	Did not show teratogenic effects in animal experiments Information given is based on data obtained from similar substances
Carcinogenicity	Did not show carcinogenic effects in animal experiments Information given is based on data obtained from similar substances
Specific target organ systemic toxicity (repeated exposure)	Repeated Dose Toxicity NOAEL Oral Value 142 mg/kg (rat) Information given is based on data obtained from similar substances

Human experience

Human experience

Inhalation may provoke the following symptoms:
Cough
Skin
Causes burns
May cause skin irritation and/or dermatitis

Chemical Name	LD50 Oral	LD50/dermal/rat	LC50/inhalation/rat (dust)
Formic acid	730 mg/kg	-	7.85mg/l

Section 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Product Information

Toxicity to fish No data is available on the product itself

Toxicity to daphnia No data is available on the product itself
Toxicity to Algae No data is available on the product itself
Toxicity to bacteria No data is available on the product itself

Information given is based on data obtained from similar substances

Chemical Name	Freshwater Algae Data	Freshwater Fish Species Data	Water Flea Data
Formic acid	EC50/72h: 1240 mg/l	LC50/96h/Danio rerio: 130 mg/l	EC50/48h/Daphnia Magna: 365 mg/l

12.2. Persistence and degradability

Formic acid. Readily biodegradable, according to appropriate OECD test.

12.3. Bioaccumulative potential

Formic acid Does not bioaccumulate
Bioconcentration factor (BCF)
3.2

Chemical Name	log Pow
Formic acid	-2.1

12.4. Mobility in soil

Not expected to adsorb on soil
Soluble in water

12.5. Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)
This substance is not considered to be very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

None known based on information supplied

Section 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from residues / unused products	Dispose of in accordance with local regulations Classified as hazardous waste according to national equivalent of EC-Dir. 91/689; disposal of toxic and hazardous waste
Contaminated packaging	Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.
Other information	According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.

Section 14: TRANSPORT INFORMATION

IMDG/IMO

14.1 UN-No	UN3412
14.2 Proper shipping name	Formic acid
14.3 Hazard Class	8
14.4 Packing group	II
14.5 Marine pollutant	No
Environmental hazard	No
14.6 Special Provisions	Not relevant
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	not applicable

RID

14.1 UN-No	UN3412
14.2 Proper shipping name	Formic acid
14.3 Hazard Class	8
14.4 Packing group	II
14.5 Environmental hazard	No
14.6 Special Provisions	Not relevant

ADR

14.1 UN-No	UN3412
14.2 Proper shipping name	Formic acid
14.3 Hazard Class	8
14.4 Packing group	II
14.5 Environmental hazard	No
14.6 Special Provisions	Not relevant

ADN

14.1 UN-No	UN3412
14.2 Proper shipping name	Formic acid
14.3 Hazard Class	8
14.4 Packing group	II
14.5 Environmental hazard	No
14.6 Special Provisions	Not relevant

ICAO/IATA

14.1 UN-No	UN3412
14.2 Proper shipping name	Formic acid
14.3 Hazard Class	8
14.4 Packing group	II
14.5 Environmental hazard	No
14.6 Special Provisions	Not relevant

Section 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

European Union

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

15.2. Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance

Section 16: OTHER INFORMATION

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of H-Statements referred to under section 3
H226 - Flammable liquid and vapour
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H331 - Toxic if inhaled

Legend
SVHC: Substances of Very High
Concern for Authorization:
- Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

Preparation Date 31-12-2014

Revision Date 13-10-2015

Reason for revision	not applicable.
Training Advice	Provide adequate information, instruction and training for operators

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer:
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet