

SAFETY DATA SHEET

Product Trade Name: 10% Formic Acid Blend

Revision Date: 22-Dec-2021

Revision Number: 1

1. Identification

1.1. Product Identifier

Product Trade Name: 10% Formic Acid Blend
Synonyms: None
Chemical Family: Blend
Internal ID Code: HM009753

1.2 Recommended use and restrictions on use

Application: Not determined
Uses advised against: No information available

1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier

Halliburton Energy Services, Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Telephone: 1-281-871-6107

Halliburton Group Canada
645 - 7th Ave SW Suite 1800
Calgary, AB, T2P 4G8, Canada
Telephone: 1-403-231-9300

Prepared By

Chemical Stewardship
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:

Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962 (accessible 24 hours a day / 7 days a week)
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

Skin Corrosion / Irritation	Category 1 - H314
Serious Eye Damage/Irritation	Category 1 - H318
Skin Sensitization	Category 1 - H317
Specific Target Organ Toxicity - (Single Exposure)	Category 3 - H335

2.2. Label Elements

Hazard Pictograms



Signal Word: Danger

Hazard Statements
 H314 - Causes severe skin burns and eye damage
 H317 - May cause an allergic skin reaction
 H318 - Causes serious eye damage
 H335 - May cause respiratory irritation

Precautionary Statements

Prevention
 P260 - Do not breathe dust/fume/gas/mist/vapors/spray
 P264 - Wash face, hands and any exposed skin thoroughly after handling
 P271 - Use only outdoors or in a well-ventilated area
 P272 - Contaminated work clothing should not be allowed out of the workplace
Response
 P280 - Wear protective gloves/protective clothing/eye protection/face protection
 P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
 P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
 P363 - Wash contaminated clothing before reuse
 P310 - Immediately call a POISON CENTER or doctor/physician
 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
Storage
 P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
 P405 - Store locked up
Disposal
 P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

2.3 Hazards not otherwise classified

None known

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Formic acid	64-18-6	5 - 10%	Acute Tox. 4 (H302) Acute Tox. 3 (H331) Skin Corr. 1A (H314) Eye Corr. 1 (H318) STOT SE 3 (H335) Flam. Liq. 3 (H226) Met. Corr. 1 (H290)
Ammonium chloride	12125-02-9	1 - 5%	Acute Tox. 4 (H302) Eye Irrit. 2 (H319) Aquatic Acute 3 (H402)
Ammonium salt	Proprietary	0.1 - 1%	Acute Tox. 4 (H302) Acute Tox. 4 (H312) Skin Irrit. 2 (H315) Eye Corr. 1 (H318) Skin Sens. 1 (H317) STOT RE 2 (H373)

			Aquatic Acute 1 (H400) Met. Corr. 1 (H290)
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The specific chemical identity of the composition has been withheld as proprietary. The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Seek immediate medical attention/advice. Suitable emergency eye wash facility should be immediately available
Skin	In case of contact, immediately flush skin with plenty of soap and water for at least 30 minutes and remove contaminated clothing, shoes and leather goods immediately. Get medical attention immediately.
Ingestion	Rinse mouth with water many times. Get medical attention, if symptoms occur

4.2 Most important symptoms/effects, acute and delayed

Causes severe skin irritation with tissue destruction. Causes severe eye irritation which may damage tissue. May cause allergic skin reaction. May cause respiratory irritation.

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

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

Do NOT spray pool fires directly with water. A solid stream of water directed into hot burning liquid can cause splattering.

5.2 Specific hazards arising from the substance or mixture

Special exposure hazards in a fire

Decomposition in fire may produce harmful gases.

5.3 Special protective equipment and precautions for fire-fighters

Special protective equipment for firefighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use appropriate protective equipment. Do not breathe dust/fume/gas/mist/vapors/spray. Avoid contact with skin, eyes and clothing. See Section 8 for additional information.

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Dike far ahead of liquid spill for later disposal. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

7. Handling and storage**7.1. Precautions for safe handling****Handling Precautions**

Do not breathe dust/fume/gas/mist/vapors/spray. Ensure adequate ventilation. Use appropriate protective equipment. Avoid contact with eyes, skin, or clothing.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities**Storage Information**

Store in a well ventilated area.

8. Exposure Controls/Personal Protection**8.1 Occupational Exposure Limits**

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Formic acid	64-18-6	TWA: 5 ppm TWA: 9 mg/m ³	TWA: 5 ppm STEL: 10 ppm
Ammonium chloride	12125-02-9	Not applicable	TWA: 10 mg/m ³ STEL: 20 mg/m ³
Ammonium salt	Proprietary	Not applicable	Not applicable

8.2 Appropriate engineering controls**Engineering Controls**

Ensure adequate ventilation, especially in confined areas

8.3 Individual protection measures, such as personal protective equipment**Personal Protective Equipment**

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.

Hand Protection

Manufacturer's directions for use should be observed because of great diversity of types. Oil-resistant gloves. Impervious gloves

Skin Protection

Wear impervious protective clothing, including boots, gloves, lab coat, apron, rain jacket, pants or coverall, as appropriate, to prevent skin contact.

Eye Protection

Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions

Eyewash fountains and safety showers must be easily accessible.

9. Physical and Chemical Properties**9.1. Information on basic physical and chemical properties**

Physical State: Liquid

Color

Not determined

Odor: Not determined

Odor

No information available

Threshold:

<u>Property</u> <u>Remarks/ - Method</u>	<u>Values</u>
pH:	No data available
Freezing Point / Range	No data available
Melting Point / Range	No data available
Pour Point / Range	No data available
Boiling Point / Range	No data available
Flash Point	> 93 °C / > 200 °F
Flammability (solid, gas)	No data available
Upper flammability limit	No data available
Lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	No data available
Water Solubility	No data available
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available
<u>9.2. Other information</u>	
VOC Content (%)	No data available

10. Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

None anticipated

10.5. Incompatible materials

Strong oxidizers. Strong alkalis.

10.6. Hazardous decomposition products

Acids. Oxides of nitrogen.

11. Toxicological Information

11.1 Information on likely routes of exposure

Principle Route of Exposure Ingestion. Skin contact. Eye contact. Inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics

Acute Toxicity

Inhalation	May cause respiratory irritation.
Eye Contact	Causes serious eye damage.
Skin Contact	Causes severe burns. May cause an allergic skin reaction.
Ingestion	Causes burns of the mouth, throat and stomach.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Formic acid	64-18-6	730 mg/kg (rat)	>2000 mg/kg (similar substance)	7.4 mg/L (rat, 4 hr, vapour)
Ammonium chloride	12125-02-9	1220 mg/kg bw (rat)	> 2000 mg/kg (Rat)	No data available
Ammonium salt	Proprietary	600 mg/kg bw (rat)	>250 mg/kg-bw (guinea pig)	No data available

Substances	CAS Number	Skin corrosion/irritation
Formic acid	64-18-6	Corrosive to skin (Rabbit)
Ammonium chloride	12125-02-9	Non-irritating to the skin (Rabbit)
Ammonium salt		Skin, rabbit: Causes moderate skin irritation. (80 % solution) Irritating to skin.

Substances	CAS Number	Serious eye damage/irritation
Formic acid	64-18-6	Corrosive to eyes (Rabbit)
Ammonium chloride	12125-02-9	Causes moderate eye irritation (Rabbit)
Ammonium salt		Eye, rabbit: Causes severe eye irritation Causes severe irritation and or burns

Substances	CAS Number	Skin Sensitization
Formic acid	64-18-6	Did not cause sensitization on laboratory animals (guinea pig)
Ammonium chloride	12125-02-9	Did not cause sensitization on laboratory animals (guinea pig)
Ammonium salt		Skin sensitizer in guinea pig.

Substances	CAS Number	Respiratory Sensitization
Formic acid	64-18-6	No information available
Ammonium chloride	12125-02-9	No information available
Ammonium salt		No information available

Substances	CAS Number	Mutagenic Effects
Formic acid	64-18-6	In vitro tests did not show mutagenic effects. In vivo tests did not show mutagenic effects.
Ammonium chloride	12125-02-9	In vitro tests have shown mutagenic effects ; and in vivo
Ammonium salt		No data of sufficient quality are available.

Substances	CAS Number	Carcinogenic Effects
Formic acid	64-18-6	Did not show carcinogenic effects in animal experiments (similar substances)
Ammonium chloride	12125-02-9	Did not show carcinogenic effects in animal experiments
Ammonium salt		No data of sufficient quality are available.

Substances	CAS Number	Reproductive toxicity
Formic acid	64-18-6	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)
Ammonium chloride	12125-02-9	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)
Ammonium salt		Did not show teratogenic effects in animal experiments.

Substances	CAS Number	STOT - single exposure
Formic acid	64-18-6	May cause respiratory irritation.
Ammonium chloride	12125-02-9	No information available
Ammonium salt		No data of sufficient quality are available.

Substances	CAS Number	STOT - repeated exposure
Formic acid	64-18-6	No significant toxicity observed in animal studies at concentration requiring classification.
Ammonium chloride	12125-02-9	No significant toxicity observed in animal studies at concentration requiring classification.

Ammonium salt		Causes damage to organs through prolonged or repeated exposure if swallowed: (Blood)
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Substances	CAS Number	Aspiration hazard
Formic acid	64-18-6	Not applicable
Ammonium chloride	12125-02-9	Not applicable
Ammonium salt		Not applicable

12. Ecological Information

12.1. Toxicity

Ecotoxicity effects

Product is not classified as hazardous to the environment.

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Formic acid	64-18-6	EC50(72 h)=1240 mg/L (Pseudokirchneriella subcapitata)	LC50(96 h)=130 mg/L (Danio rerio)	NOEC (13 d) 72 mg/L (Activated sludge, domestic)	EC50(48 h)=365 mg/L (Daphnia magna) NOEC(21 d)=100 mg/L (Daphnia magna)
Ammonium chloride	12125-02-9	EC50 (5d) 1300 mg/L (Chlorella vulgaris)	LC50 (96h) 34.6 mg/L (Oncorhynchus mykiss) NOEC (28d) 11.8 mg/L (Pimephales promelas)	EC50 (0.5h) 1618 mg/L (activated sludge, domestic)	LC50 (96h) > 100 mg/L (Gammarus fasciatus) EC10 (70d) 0.66 mg/L (Hyalella azteca)
Ammonium salt	Proprietary	EC50 (96 h) =0.72 mg/L (Desmodesmus subspicatus)	LC50 (96 h) =7.2 mg/L (Pimephales promelas)	No information available	EC50 (48 h) =1.62 mg/L (Daphnia magna)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Formic acid	64-18-6	Readily biodegradable (100% @ 14d)
Ammonium chloride	12125-02-9	The methods for determining biodegradability are not applicable to inorganic substances.
Ammonium salt	Proprietary	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Substances	CAS Number	Bioaccumulation
Formic acid	64-18-6	LogKow-2.1
Ammonium chloride	12125-02-9	No information available
Ammonium salt	Proprietary	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Formic acid	64-18-6	KOC = 31
Ammonium chloride	12125-02-9	No information available
Ammonium salt	Proprietary	No information available

12.5 Other adverse effects

No information available

13. Disposal Considerations

13.1. Waste treatment methods

Disposal methods

Disposal should be made in accordance with federal, state, and local regulations.

Contaminated Packaging

Follow all applicable national or local regulations.

14. Transport Information

US DOT

UN Number UN3412
 UN proper shipping name: Formic Acid Solution
 Transport Hazard Class(es): 8
 Packing Group: III
 Environmental Hazards: Not applicable
 NAERG: NAERG 153

Canadian TDG

UN Number UN3412
 UN proper shipping name: Formic Acid Solution
 Transport Hazard Class(es): 8
 Packing Group: III
 Environmental Hazards: Not applicable

IMDG/IMO

UN Number UN3412
 UN proper shipping name: Formic Acid Solution
 Transport Hazard Class(es): 8
 Packing Group: III
 Environmental Hazards: Not applicable
 EMS: EmS F-A, S-B

IATA/ICAO

UN Number UN3412
 UN proper shipping name: Formic Acid Solution
 Transport Hazard Class(es): 8
 Packing Group: III
 Environmental Hazards: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable
Special Precautions for User None

15. Regulatory Information

US Regulations

US TSCA Inventory All components listed on inventory or are exempt.

TSCA Significant New Use Rules - S5A2

Substances	CAS Number	TSCA Significant New Use Rules - S5A2	TSCA Section 5(E) Consent Orders
Formic acid	64-18-6	Not applicable	Not applicable
Ammonium chloride	12125-02-9	Not applicable	Not applicable
Ammonium salt	Proprietary	Not applicable	Not applicable

EPA SARA Title III Extremely Hazardous Substances

Substances	CAS Number	EPA SARA Title III Extremely Hazardous Substances
Formic acid	64-18-6	Not applicable
Ammonium chloride	12125-02-9	Not applicable
Ammonium salt	Proprietary	Not applicable

EPA SARA (311,312) Hazard Class

Skin Corrosion or Irritation
 Respiratory or Skin Sensitization
 Serious eye damage or eye irritation
 Specific target organ toxicity (single or repeated exposure)

EPA SARA (313) Chemicals:

Substances	CAS Number	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Formic acid	64-18-6	1.0%	Not applicable
Ammonium chloride	12125-02-9	1.0%	Not applicable
Ammonium salt	Proprietary	Not applicable	Not applicable

EPA CERCLA/Superfund Reportable Spill Quantity

Substances	CAS Number	CERCLA RQ
Formic acid	64-18-6	5000 lb 2270 kg
Ammonium chloride	12125-02-9	5000 lb 2270 kg
Ammonium salt	Proprietary	Not applicable

EPA RCRA Hazardous Waste Classification

Corrosivity D002

California Proposition 65

Substances	CAS Number	California Proposition 65
Formic acid	64-18-6	Not applicable
Ammonium chloride	12125-02-9	Not applicable
Ammonium salt	Proprietary	Not applicable

U.S. State Right-to-Know Regulations

Substances	CAS Number	MA Right-to-Know Law	NJ Right-to-Know Law	PA Right-to-Know Law
Formic acid	64-18-6	Present	Present	Environmental hazard
Ammonium chloride	12125-02-9	Present	Present	Environmental hazard
Ammonium salt	Proprietary	Not applicable	Not applicable	Not applicable

Canadian Regulations

Canadian Domestic Substances List (DSL) Product contains one or more components not listed on the inventory.

16. Other information**Preparation Information**

Prepared By

Chemical Stewardship
 e-mail: fdunexchem@halliburton.com

Revision Date:

22-Dec-2021

Reason for Revision

Initial Release

Additional information:

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

NFPA Ratings:

Health 3, Flammability 1, Reactivity 0

HMIS Ratings: Health 3, Flammability 1, Physical Hazard 0 , PPE: X

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

bw – body weight

CAS – Chemical Abstracts Service

d - day

EC50 – Effective Concentration 50%

ErC50 – Effective Concentration growth rate 50%

h - hour

LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%

LL50 – Lethal Loading 50%

mg/kg – milligram/kilogram

mg/L – milligram/liter

mg/m³ - milligram/cubic meter

mm - millimeter

mmHg - millimeter mercury

NIOSH – National Institute for Occupational Safety and Health

NTP – National Toxicology Program

OEL – Occupational Exposure Limit

PEL – Permissible Exposure Limit

ppm – parts per million

STEL – Short Term Exposure Limit

TWA – Time-Weighted Average

UN – United Nations

w/w - weight/weight

Key literature references and sources for data

www.ChemADVISOR.com/

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet