HALLIBURTON

SAFETY DATA SHEET

according to Regulation (EC) No. 453/2010

VERSENATE HARDNESS BUFFER SOLUTION (50705, 50708, 50717)

Revision Date: 08-Sep-2015 **Revision Number:** 17

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

1.1. Product Identifier

Product Name VERSENATE HARDNESS BUFFER SOLUTION (50705, 50708, 50717)
Internal ID Code HM003997

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

Recommended Use Reagent

1.3. Details of the supplier of the safety data sheet

Halliburton Energy Services
Halliburton House, Howemoss Place
Kirkhill Industrial Estate
Dyce
Aberdeen, AB21 0GN
United Kingdom

www.halliburton.com

For further information, please contact
E-Mail address: fdunexchem@halliburton.com

1.4. Emergency telephone number

+44 8 08 189 0979 / 1-760-476-3961

Emergency telephone - §45 - (EC)1272/2008	
Europe	**112**
Croatia	Centar za kontrolu otrovanja (CKO): (+385 1) 23-48-342 (Poison Control Center (PCC) - Institute for Medical Research and Occupational Health)
Cyprus	+210 7793777
Denmark	Poison Control Hotline (DK): +45 82 12 12 12
France	ORFILA (FR): + 01 45 42 59 59
Germany	Poison Center Berlin (DE): +49 030 30686 790
Italy	Poison Center, Milan (IT): +39 02 6610 1029
Netherlands	National Poisons Information Center (NL): +31 30 274 88 88 (NB: this service is only available to health professionals)
Norway	Poisons Information (NO):+ 47 22 591300
Poland	Poison Control and Information Centre, Warsaw (PL): +48 22 619 66 54; +48 22 619 08 97
Romania	+40 21 318 36 06
Spain	Poison Information Service (ES): +34 91 562 04 20
United Kingdom	NHS Direct (UK): +44 0845 46 47

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Acute Oral Toxicity	Category 4 - H302
Skin Corrosion / irritation	Category 1 A - H314
Serious Eye Damage / Eye Irritation	Category 1 - H318
Specific Target Organ Toxicity - (Single Exposure)	Category 3 - H335
Acute Aquatic Toxicity	Acute 1 - (H400)

Substances/mixtures corrosive to metal.	Category 1 - H290

2.2. Label Elements

Hazard Pictograms

Signal Word **Danger**

Hazard Statements
H290 - May be corrosive to metals
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation
H400 - Very toxic to aquatic life

Precautionary Statements - EU (§28, 1272/2008)
P280 - Wear protective gloves/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/shower
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position 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
P310 - Immediately call a POISON CENTER or doctor/physician

Contains

Substances	**CAS Number**
Ammonium hydroxide	1336-21-6
Ammonium chloride	12125-02-9

2.3. Other Hazards
This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).
This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on Ingredients

3.2. Mixtures Mixture

Substances	EINECS	CAS Number	PERCENT (w/w)	EU - CLP Substance Classification	REACH No.
Ammonium hydroxide	215-647-6	1336-21-6	30 - 60%	Acute Tox. 4 (H302) Skin Corr. 1B (H314) Eye Corr. 1 (H318) STOT SE 3 (H335) Aquatic Acute 1 (H400) Met. Corr. 1 (H290)	No data available
Ammonium chloride	235-186-4	12125-02-9	5 - 10%	Acute Tox. 4 (H302) Eye Irrit. 2 (H319)	No data available

For the full text of the H-phrases mentioned in this Section, see Section 16

SECTION 4: First aid measures

4.1. Description of first aid measures
Inhalation If inhaled, move victim to fresh air and seek medical attention.

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	Remove contaminated clothing and launder before reuse. Destroy or properly dispose of contaminated shoes. 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	Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

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

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction. May cause respiratory irritation. Harmful if swallowed.

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

Notes to Physician Treat symptomatically

SECTION 5: Firefighting 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

None known.

5.2. Special hazards arising from the substance or mixture

Special Exposure Hazards

Use water spray to cool fire exposed surfaces. Closed containers may explode in fire. Decomposition in fire may produce harmful gases. May form explosive mixtures with strong acids.

5.3. Advice for firefighters

Special Protective Equipment for Fire-Fighters

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

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Evacuate all persons from the area.
See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas. Consult local authorities.

6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Neutralize to pH of 6-8. Scoop up and remove.

6.4. Reference to other sections

See Section 8 and 13 for additional information.

SECTION 7: Handling and Storage

7.1. Precautions for Safe Handling

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse. Ensure adequate ventilation. Use appropriate protective equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Store in a manner to prevent commingling with incompatible materials. Store away from direct sunlight. Store in a cool well ventilated area. Keep container closed when not in use.

7.3. Specific End Use(s)

Exposure Scenario No information available
Other Guidelines No information available

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

Exposure Limits

Substances	CAS Number	EU	UK	Netherlands	France
Ammonium hydroxide	1336-21-6	Not applicable	Not applicable	Not applicable	Not applicable
Ammonium chloride	12125-02-9	Not applicable	TWA: 10 mg/m³ STEL: 20 mg/m³	Not applicable	10 mg/m³

Substances	CAS Number	Germany	Spain	Portugal	Finland
Ammonium hydroxide	1336-21-6	Not applicable	Not applicable	Not applicable	STEL: 50 ppm STEL: 36 mg/m³
Ammonium chloride	12125-02-9	Not applicable	TWA: 10 mg/m³ 20 mg/m³ STEL [VLA-EC] (fume)	TWA: 10 mg/m³ STEL: 20 mg/m³	Not applicable

Substances	CAS Number	Austria	Ireland	Switzerland	Norway
Ammonium hydroxide	1336-21-6	Not applicable	Not applicable	Not applicable	Not applicable
Ammonium chloride	12125-02-9	Not applicable	10 mg/m³ TWA (fume) 20 mg/m³ STEL (fume)	TWA: 3 mg/m³	TWA: 10 mg/m³ STEL: 20 mg/m³

Substances	CAS Number	Italy	Poland	Hungary	Czech Republic
Ammonium hydroxide	1336-21-6	Not applicable	Not applicable	Not applicable	Not applicable
Ammonium chloride	12125-02-9	Not applicable	TWA: 10 mg/m³ STEL: 20 mg/m³	Not applicable	TWA: 5 mg/m³

Substances	CAS Number	Denmark	Romania	Croatia	Cyprus
Ammonium hydroxide	1336-21-6	Not applicable	Not applicable	Not applicable	Not applicable
Ammonium chloride	12125-02-9	TWA: 10 mg/m³	TWA: 5 mg/m³ STEL: 10 mg/m³	TWA: 10 mg/m³ STEL: 20 mg/m³	Not applicable

Derived No Effect Level (DNEL) No information available.

Worker

General Population

Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Engineering Controls Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

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 Ammonia respirator.
Hand Protection Impervious rubber gloves.
Skin Protection Rubber apron.
Eye Protection Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions Eyewash fountains and safety showers must be easily accessible.

Environmental Exposure Controls Do not allow material to contaminate ground water system

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid
Color: Clear colorless
Odor: Pungent ammonia
Odor Threshold: No information available

Property Remarks/ - Method	Values
pH:	12.2
Freezing Point/Range	No data available
Melting Point/Range	No data available
Boiling Point/Range	27 °C / 82 °F
Flash Point	193 °C / 380 °F PMCC
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	546 mmHg
Vapor Density	<1
Specific Gravity	0.89
Water Solubility	Miscible with water
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

9.2. Other information

VOC Content (%) No data available

SECTION 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

Keep away from heat, sparks and flame.

10.5. Incompatible Materials

Strong acids. Halogenated compounds. Amphoteric metals such as aluminum, magnesium, lead, tin, or zinc.

10.6. Hazardous Decomposition Products

Ammonia. Oxides of nitrogen.

SECTION 11: Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity

Inhalation Causes severe respiratory irritation. May cause convulsions. Coughing, chest pains, and breathing difficulty may occur.

Eye Contact Causes severe eye burns.

Skin Contact Causes severe burns.

Ingestion Causes burns of the mouth, throat and stomach. Harmful if swallowed.

Chronic Effects/Carcinogenicity Prolonged, excessive exposure may cause erosion of the teeth.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ammonium hydroxide	1336-21-6	350 mg/kg (Rat)	No data available	No data available
Ammonium chloride	12125-02-9	1410 mg/kg (Rat) 1220 mg/kg (Rat) 1630 mg/kg (Rat) 1300 mg/kg (Mouse)	> 2000 mg/kg (Rat)	No data available

Substances	CAS Number	Skin corrosion/irritation
Ammonium hydroxide	1336-21-6	Causes severe skin irritation with tissue destruction. (Rabbit)
Ammonium chloride	12125-02-9	Non-irritating to the skin (Rabbit)

Substances	CAS Number	Eye damage/irritation
Ammonium hydroxide	1336-21-6	Causes severe eye irritation.
Ammonium chloride	12125-02-9	Causes moderate eye irritation. (Rabbit)

Substances	CAS Number	Skin Sensitization
Ammonium hydroxide	1336-21-6	Not applicable due to corrosivity of the substance.
Ammonium chloride	12125-02-9	Did not cause sensitization on laboratory animals (guinea pig)

Substances	CAS Number	Respiratory Sensitization
Ammonium hydroxide	1336-21-6	No information available
Ammonium chloride	12125-02-9	No information available

Substances	CAS Number	Mutagenic Effects
Ammonium hydroxide	1336-21-6	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects. (similar substances)
Ammonium chloride	12125-02-9	Not regarded as mutagenic.

Substances	CAS Number	Carcinogenic Effects
Ammonium hydroxide	1336-21-6	Did not show carcinogenic effects in animal experiments
Ammonium chloride	12125-02-9	Did not show carcinogenic effects in animal experiments

Substances	CAS Number	Reproductive toxicity
Ammonium hydroxide	1336-21-6	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)
Ammonium chloride	12125-02-9	Did not show teratogenic effects in animal experiments. Animal testing did not show any effects on fertility. (similar substances)

Substances	CAS Number	STOT - single exposure
Ammonium hydroxide	1336-21-6	May cause respiratory irritation.
Ammonium chloride	12125-02-9	No information available

Substances	CAS Number	STOT - repeated exposure
Ammonium hydroxide	1336-21-6	No significant toxicity observed in animal studies at concentration requiring classification. (similar substances)
Ammonium chloride	12125-02-9	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
Ammonium hydroxide	1336-21-6	No information available
Ammonium chloride	12125-02-9	Not applicable

SECTION 12: Ecological Information

12.1. Toxicity

Ecotoxicity Effects

Very toxic to aquatic organisms.

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Ammonium hydroxide	1336-21-6	EC50 (18d) 2700 mg/L (Chlorella vulgaris)	LC50 8.2 mg/L (Pimphales promelas) LC50 (96h) 0.45 mg/L (Coho salmon) LC50 (96h) 0.75 - 3.4 mg/L (Pimphales promelas)	No information available	LC50 (48h) 101 mg/L (Daphnia magna)
Ammonium chloride	12125-02-9	EC50 40-70 mg/L (Skeletonema costatum) EC50 (10d) 90.4 mg/L (Navicula sp.) NOEC (10d) 26.8 mg/L	LC50 (96h) 275 mg/L (Cyprinus carpio) LC50 (96h) 163 mg/L (Pimephales promelas) LC50 (96h) 218 mg/L	EC50 (30m) 1618 mg/L (activated sludge, domestic)	TLM96 16 mg/L (Crangon crangon) EC50 (48h) 101 mg/L (Daphnia magna) NOEC (21d) 14.6 mg/L

		(growth rate) (Navicula sp.) EC50 (5d) 1300 mg/L (growth rate) (Chlorella vulgaris)	(Lepomis cyanellus) LC50 (96h) 34 mg/L (Oncorhynchus mykiss) NOEC (28d) 11.8 mg/L (Pimephales promelas)		(Daphnia magna)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Ammonium hydroxide	1336-21-6	No information available
Ammonium chloride	12125-02-9	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Substances	CAS Number	Log Pow
Ammonium hydroxide	1336-21-6	-2.66
Ammonium chloride	12125-02-9	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Ammonium hydroxide	1336-21-6	No information available
Ammonium chloride	12125-02-9	No information available

12.5. Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

Substances	PBT and vPvB assessment
Ammonium hydroxide	No data available
Ammonium chloride	Not applicable

12.6. Other adverse effects

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

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

Contaminated Packaging Follow all applicable national or local regulations.

SECTION 14: Transport Information

IMDG/IMO

UN Number: UN2672
UN Proper Shipping Name: Ammonia Solution
Transport Hazard Class(es): 8
Packing Group: III
Environmental Hazards: Marine Pollutant

RID

UN Number: UN2672
UN Proper Shipping Name: Ammonia Solution
Transport Hazard Class(es): 8
Packing Group: III
Environmental Hazards: Marine Pollutant

ADR

UN Number: UN2672
UN Proper Shipping Name: Ammonia Solution
Transport Hazard Class(es): 8
Packing Group: III
Environmental Hazards: Marine Pollutant

IATA/ICAO

UN Number:	UN2672
UN Proper Shipping Name:	Ammonia Solution
Transport Hazard Class(es):	8
Packing Group:	III
Environmental Hazards:	Marine Pollutant

14.1. UN Number: UN2672

14.2. UN Proper Shipping Name: Ammonia Solution

14.3. Transport Hazard Class(es): 8

14.4. Packing Group: III

14.5. Environmental Hazards: Marine Pollutant

14.6. Special Precautions for User: None

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory Information

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

International Inventories

EINECS Inventory	This product, and all its components, complies with EINECS
US TSCA Inventory	All components listed on inventory or are exempt.
Canadian DSL Inventory	All components listed on inventory or are exempt.

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

Germany, Water Endangering Classes (WGK) WGK 2: Hazard to waters.

15.2. Chemical Safety Assessment
No information available

SECTION 16: Other Information

Full text of H-Statements referred to under sections 2 and 3
H290 - May be corrosive to metals
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H319 - Causes serious eye irritation
H318 - Causes serious eye damage
H335 - May cause respiratory irritation
H400 - Very toxic to aquatic life

Key or legend to abbreviations and acronyms
bw – body weight
CAS – Chemical Abstracts Service
CLP – REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Classification, Labelling and Packaging of substances and mixtures
EC – European Commission
EC10 – Effective Concentration 10%
EC50 – Effective Concentration 50%
EEC – European Economic Community
ErC50 – Effective Concentration growth rate 50%
IBC Code – International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%

LL0 – Lethal Loading 0%
LL50 – Lethal Loading 50%
MARPOL – International Convention for the Prevention of Pollution from Ships
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NOEC – No Observed Effect Concentration
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
PC – Chemical Product category
PEL – Permissible Exposure Limit
ppm – parts per million
PROC – Process category
REACH – REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL – Short Term Exposure Limit
SU – Sector of Use category

Key literature references and sources for data
www.ChemADVISOR.com/
OSHA
ECHA C&L

Revision Date: 08-Sep-2015
Revision Note
SDS sections updated: 1

This safety data sheet complies with the requirements of Regulation (EC) No. 453/2010

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End of Safety Data Sheet