

Fiches signalétiques

Expandol

Mercaptan

Gaz odorants

Solution hypochlorite

Sodium bicarbonate

Expandol

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY

1.1 Product Identification EXPANDOL LT (LOW TEMPERATURE GRADE)

1.2 Application and Use

Fire Fighting Foam Concentrate. **NOT FOR RECREATIONAL USE.**

1.3 Manufacturer/Supplier

Angus Fire Armour Ltd, Thame Park Road, Thame, Oxfordshire, OX9 3RT

Telephone: (01844) 214545 Fax: (01844) 213511/2

Emergency Telephone Number (24 hours)

For information and supply: Angus Fire (015242) 61166

1.4 Product Description

Hydrocarbon surfactants, glycol solvents and foam stabiliser.

2. COMPOSITION

Substance	Synonyms	Concentration %	Health class	Cas-No.
Ethylene glycol monobutyl ether	Butoxyethanol	20-30	X _n , R20,21,22-37	111-76-2
Ethylene glycol Primary alcohol ether sulphates	1,2-Ethanediol	10- 20 5-15	X _n , R22 X _i , R36,38	107-21-1
Sulphosuccinate		<10	X _i , R36	
Primary alcohol blend		<5		
Water		Balance		

3. HAZARDS IDENTIFICATION

Human health hazards: Harmful by inhalation, in contact with skin and if swallowed. Irritating to eyes.

4. FIRST AID MEASURES

4. 5.1 General

First aiders should know and take the precautions appropriate to avoid danger to themselves and the casualty.

Take casualty together with material safety data sheet of this product to hospital or doctor, if necessary.

First Aid - Skin: Remove contaminated clothing. If there is skin contact, wash immediately with plenty of clean, gently flowing water. If persistent irritation occurs, obtain medical attention.

First Aid - Eye: If there is eye contact, wash immediately with plenty of clean, gently flowing water for 10 minutes.

First Aid - Ingestion: If ingestion is suspected, do not induce vomiting, send casualty to hospital immediately.

First Aid - Inhalation: Remove casualty from exposure. If there is breathing difficulty or cough keep patient at rest seated in

position of maximum comfort.

5. FIRE FIGHTING MEASURES

General Hazards

Fire Fighting Measures Fire fighting measures are not applicable as Expandol LT is a fire extinguishing medium. If product containers are involved in fire, then a suitable extinguishing agent should be applied.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Avoid contact with skin, eyes and clothing. Do not breathe mists, aerosols.
Personal protection:	Wear protective clothing specified for normal operations.
Environmental precautions:	SPILLAGE: The practice of washing spills into drains should be avoided if at all possible and should under no circumstances be allowed without first consulting the local Water Authority and the Environment Agency.
Clean-up methods - small spillage:	Absorb or contain liquid with sand, earth or spill control material. Shovel up and place in a labelled, sealable container for subsequent safe disposal.

7. HANDLING AND STORAGE

No special handling techniques required. For best results, the product should be stored in sealed, original containers above -10°C and below 40°C. Freezing and thawing do not affect the substance properties but care must be taken to avoid freezing the container and its contents since the expansion of the container contents may cause cracking of a completely rigid container as ice forms.

Personal Protective Equipment - Fire Fighting

Angus Fire Foam Concentrates will be used by professional fire-fighters to control and extinguish flammable liquid fires. The nature of this process may involve exposure to heat, flame and possibly toxic vapours and fumes. It is normal procedure to wear appropriately designed personal protective equipment designed for use in firefighting situations. Angus Fire advises that this form of personal protective equipment should be used if the packaging materials become involved in fire.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Engineering control measures: Use only in well ventilated areas

Occupational Exposure Limit:

Pure ethylene glycol monobutyl ether: Maximum Exposure Limit (MEL):
Long term exposure limit (8 hour time weighted average): 25 ppm
Pure ethylene glycol (vapour): Occupational Exposure Standard (OES)
Long term exposure limit (8 hours time weighted average): 60 mgm³
Short term exposure limit (10 minutes): 125 mgm³

Personal Protective Equipment - Other Handling

Avoid prolonged, extensive or repeated inhalation or contact to eyes and skin.

Hand Protection Wear impervious gloves of an approved type (e.g. neoprene).

Eye Protection Wear safety goggles of an approved type (BS 2092).

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid	pH at 20 ⁰ C:	7
Colour: Pale yellow	Boiling point:	100 ⁰ C at 760 mm Hg
Odour: Organic solvent	Freeze point:	-14 ⁰ C
	Flash point:	>98 ⁰ C
	Flammability:	Not flammable
	Solubility:	Miscible with water in all proportions
	Viscosity at 20 ⁰ C:	10cs
	Specific Gravity:	1.0

10. STABILITY/REACTIVITY
Stability

Generally stable. As with all aqueous solutions Expandol LT should be excluded from contact with any materials which have violent reactions with water.

Hazardous Decomposition Products

Do not expose containers to heat or flame, since the containers are made from high density polyethylene and will burn. Thermal decomposition of containers and/or products may generate acrid smoke and fumes and traces of Na₂O, Cl⁻, SO_x, NO_x and HF.

11. TOXICOLOGICAL INFORMATION
Inhalation

Inhalation of hazardous amounts is unlikely when used as intended. Is irritant to respiratory tract when inhaled.

Ingestion

Low oral risk when used as intended. May cause nausea, vomiting and diarrhoea when ingested.

Contact to eyes or skin

Low risk if appropriate precaution measures are taken (see section 6). Can cause skin and eye irritation when contact to eyes or skin.

Aquaticity (DIN 38412 test methods 11 & L20)

Goldfish		Water Flea (Daphnia magna)
LC ₅₀ (48 hrs)	1000 ppm	LC ₅₀ 50 ppm

12. ECOLOGICAL INFORMATION

Persistence/degradability:	Biodegradable.
Bioaccumulation:	Bioaccumulation is unlikely to occur due to metabolism and excretion.

Biodegradation

Biodegradable:	COD	0.41 gg ⁻¹	
	BOD (5 day)	0.29 gg ⁻¹	(70%)

Sewage treatment:	Bacterial sewage sludge
	LC ₅₀ 5000ppm

13. DISPOSAL CONSIDERATIONS

Disposal

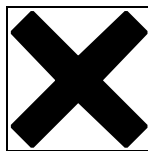
Waste should be disposed via local authority waste collection service or registered waste carrier. Ensure the destination is a licensed facility.

Local legislation: Control of Pollution Act 1974
Special Waste Regulations 1996
Environmental Protection Act 1990

14. TRANSPORT INFORMATION

Label for conveyance: **No Transport Warning Sign Required**
Road:
UN No: N/C
Rail:
Rail Transport Class No: N/C
Sea:
Sea Transport Class No: N/C EmS No: N/C
MFAG Table No: N/C
Air:
Air Transport Class No: N/C

15. REGULATORY INFORMATION



Label For Supply:

Harmful

Risk Phrases: R-20,21,22-37 Harmful by inhalation, in contact with skin and if swallowed. Irritating to respiratory system. Avoid contact with skin and eyes.
Safety Phrases: S-24, 25
EEC-Label: 203-905-0
CHIP classification and label for carriage: Harmful substance
Substance identification no: 2369
Packing group: III

UK Regulatory References:

Health and Safety at work Act 1974.

Chemicals (Hazard Information & Packaging for Supply) Regulations 1994 / Amendment Regulations 1996.

EC Directives: Substances Directive 67/548/EEC as amended by 69/81/EEC, 70/189/EEC, 73/146/EEC, 75/409/EEC, 79/831/EEC General Preparations Directive 88/379/EEC.

Statutory Instruments: Chemicals (Hazard Information and Packaging for Supply) Regulations.

Approved Code of Practice:

Classification and Labelling of Substances and Preparations Dangerous for Supply.

Guidance Notes: Occupational Exposure Limits EH40.

16. OTHER INFORMATION

Uses and restrictions:

Sources of Information

Clayton, G.D. and F.E. Clayton: Patty's Industrial Hygiene and Toxicology. Fourth edition volumes I - III (1991).

Sax, N.I. and R.J. Lewis, Sr: Dangerous Properties of Industrial Materials. Seventh edition volumes I - III (1991).

Health & Safety Executive: Occupational Exposure Limits (EH 40/96).

Note: EH40 is revised on an annual basis and newest issue should be applied.

German Institute for Industrial Water Management and Pollution: LM910623.

Other information:

DISCLAIMER: This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Expandol

Expandol is a superior quality high expansion fire fighting foam concentrate for extinguishing and securing flammable hydrocarbon liquid fires.

Its unique formulation is a blend of high activity synthetic foaming agents and foam stabilisers specially formulated to produce an extremely stable long-lasting foam. Expandol has been formulated primarily for use at medium and high expansion, and it is effective on a wide variety of Class A and Class B fire risks. The finished foam has drainage characteristics far superior to those of standard detergents which increase its ability to carry water to the fire, acting as a positive aid to effective fire extinguishment.

Expandol used at medium and high expansion combats fires in three ways:

- Initial contact with fire generates a large volume of steam reducing the available oxygen to create an inert atmosphere.
- The high water content of medium expansion foam produces a valuable cooling effect.
- The large volume of foam generated engulfs the area and totally seals off and extinguishes any remaining fires.

Expandol is extremely economical. For example, when used with the Hi-Combat Turbex Mk2 high expansion foam generator 200 m³ min⁻¹ (7000 ft³ min⁻¹) of finished

foam can be produced at an expansion of 1200:1 for a consumption rate of nominally 5 l min⁻¹.

ENVIRONMENT

Expandol is biodegradable and virtually non-toxic to aquatic organisms.

APPLICATIONS

Expandol is the ideal foam to use at medium expansion at minor incidents such as small hydrocarbon liquid spill fires where close approach to the fire allows hand-held apparatus to be used. It can also be used in conjunction with fixed installations to provide bund protection, where it can achieve extinction of fires or suppression of toxic vapour release after chemical spillage.

At medium and high expansion, Expandol is used for the total flooding of fire areas involving Class A and Class B fires: medium expansion for small areas such as cellars and basements of buildings, and high expansion for large areas such as ships' holds, machinery spaces, and LNG storage tank bunds. Medium and high expansion foams are most effective when dealing with outbreaks of fire in inaccessible locations, where direct application of conventional agents such as water is difficult or impossible due to smoke or restricted access.

PERFORMANCE

The fire performance of Expandol is measured primarily against Lloyds Register NFPA 11A.

APPROVALS

Expandol has numerous approvals.

EQUIPMENT

Expandol is intended for use at 1 - 3% (high expansion) to 3 - 6% (medium expansion).

Expandol gives best results when used with the Angsu Fire range of high and medium expansion foam-making equipment. It may also be used satisfactorily with other manufacturers' equipment.

COMPATIBILITY

Expandol is suitable for use in combination with:

- Soft or hard, fresh, brackish or sea water.
- Dry powder extinguishing agents either separately or as twin agent systems.
- Expanded protein-based or synthetic foams for application to a fire in sequence or simultaneously.

PHYSICO-CHEMICAL PROPERTIES

Appearance		Amber liquid
Specific gravity @ 20°C (68°F)		1.00 - 1.02
pH @ 20°C (68°F)		6.0 - 8.0
Viscosity @ 20°C (68°F)	mm ² sec ⁻¹	7.0
Viscosity @ 0°C (32°F)	mm ² sec ⁻¹	15.0
Maximum continuous storage temperature	°C (°F)	40 (104)
Maximum intermittent storage temperature	°C (°F)	60 (140)
Effect of freeze/thaw		No performance loss
Lowest use temperature	°C (°F)	-3 (27)
Sediment as shipped	% v/v	≤ 0.1
Sediment after ageing	% v/v	≤ 0.5

FOAM PROPERTIES

As with any foam, the foam properties of Expandol vary depending on the performance characteristics of foam equipment used and the operating conditions. When tested with Angus Fire equipment it gives the following properties:

	Hi-Combat MEX 225 & 450	Hi-Combat Turbex Mk2
Induction Rate %	3 - 6	1 - 2
Expansion Ratio	65:1	500:1 - 1250:1

STORAGE

Expandol is exceptionally stable in long-term storage. A shelf-life of at least ten years can be expected if it is stored properly.

DISPOSAL

Expandol can be successfully treated in biological waste water treatment systems.

RELIABILITY

Expandol is produced to rigorous quality control standards to ensure consistent fire performance and excellent product reliability. Angus Fire operates a quality management system which complies with the requirements of BS EN ISO 9001:2000.

TYPICAL PACKING SPECIFICATION

	Plastic Square		Plastic Cylindrical		Ecobulk MX
	25 litres	5 US gallons	200 litres	55 US gallons	
Capacity	25 litres	5 US gallons	200 litres	55 US gallons	1000 litres
Empty Weight (kg)	1.2	0.8	9.0		70
Filled Weight (kg)	26	20	211	219	1080
Dimensions (mm)	448 x 286 x 286	402 x 293 x 240	580 D x 922 H		1200 L x 1000 W x 1160 H

EMERGENCY DELIVERY

For emergency supplies of Expandol phone +44 (0) 15242 61166

Mercaptan

PHYSICAL PROPERTIES

Product	Formula	Molecular Weight	Boiling Point	Vapor ² Pressure	Specific Gravity	Density ⁴ of Liquid	Flash Point	Freezing Point	Sulfur Content (Wt. %)	Typical Purity (Wt. %)	Viscosity ⁵	Coefficient of Expansion/°C
Ethyl Mercaptan	C ₂ H ₆ SH	62	95 °F 35 °C	16.2 psia 111.7 Kpa	0.845	7.02 lb/gal. 0.842 Kg/dm ³	- 55 °F - 48 °C	-234 °F -148 °C	51.4	99	0.293	1.14 × 10 ⁻³
Normal Propyl Mercaptan	C ₃ H ₇ SH	76	154 °F 68 °C	5.1 psia 35.2 Kpa	0.847	7.04 lb/gal. 0.845 Kg/dm ³	- 5 °F - 20 °C	-172 °F -113 °C	41.9	99	0.399	1.10 × 10 ⁻³
Isopropyl Mercaptan	C ₃ H ₇ SH	76	127 °F 53 °C	8.8 psia 60.7 Kpa	0.820	6.83 lb/gal. 0.819 Kg/dm ³	- 30 °F - 34 °C	-203 °F -130 °C	41.1	97	0.369	1.06 × 10 ⁻³
Normal Butyl Mercaptan	C ₄ H ₉ SH	90	209 °F 98 °C	1.6 psia 11.0 Kpa	0.847	7.05 lb/gal. 0.845 Kg/dm ³	35 °F 2 °C	-176 °F -116 °C	35.2	99	0.497	1.03 × 10 ⁻³
Isobutyl Mercaptan	C ₄ H ₉ SH	90	148 °F 64 °C	5.9 psia 40.7 Kpa	0.806	6.71 lb/gal. 0.800 Kg/dm ³	- 15 °F - 26 °C	34 °F 1 °C	35.5	99	0.638	1.03 × 10 ⁻³
Tertiary Butyl Mercaptan	C ₄ H ₉ SH	90	191 °F 88 °C	2.4 psia 16.6 Kpa	0.839	6.99 lb/gal. 0.840 Kg/dm ³	15 °F - 9 °C	-220 °F -140 °C	35.2	97	0.506	—
Isobutyl Mercaptan	C ₄ H ₉ SH	90	185 °F 85 °C	2.7 psia 18.6 Kpa	0.834	6.94 lb/gal. 0.832 Kg/dm ³	- 10 °F - 23 °C	-220 °F -140 °C	35.0	97	0.463	1.03 × 10 ⁻³
Secondary Butyl Mercaptan	C ₆ H ₁₃ SH	118	307 °F 153 °C	< 1 psia < 7 Kpa	0.847	7.05 lb/gal. 0.846 Kg/dm ³	> 80 °F > 27 °C	-113 °F - 81 °C	26.9	96	0.813	7.60 × 10 ⁻⁴
Normal Hexyl Mercaptan	C ₆ H ₁₃ SH	116	316 °F 158 °C	< 1 psia < 7 Kpa	0.85	7.94 lb/gal. 0.950 Kg/dm ³	110 °F 43 °C	—	27.5	99	—	1.20 × 10 ⁻³

Note (1) °F at 14.7 psia °C at 101.3 Kpa (2) psia at 100°F Kpa at 37.8 (3) @ 60/60°F (4) lb/gal at 60°F Kg/dm³ at 15.6°C (5) Centipoise at 68°F or 20°C

Product	Formula	Molecular Weight (Average) @ 5 mm Hg	Boiling Range 95%	Boiling Point @ 760 mm Hg	Specific Gravity	Density ⁽²⁾ of Liquid	Flash Point	Mercaptan Sulfur (Wt. %)	Typical Purity (Wt. %)	Viscosity ⁽³⁾	Coefficient of Expansion/°C
Normal Octyl Mercaptan	C ₈ H ₁₇ SH	146	—	390 °F 199 °C	0.848	7.06 lb/gal 0.847 Kg/dm ³	156 °F 69 °C	21.8	97	—	7.8 × 10 ⁻⁴
Tertiary Octyl Mercaptan	C ₈ H ₁₇ SH	(146)	—	307 °F 153 °C	0.846	7.05 lb/gal 0.846 Kg/dm ³	105 °F 41 °C	21.3	96	—	8.7 × 10 ⁻⁴
Pinanyl Mercaptan Type 2	C ₁₀ H ₁₇ SH	169	—	419 °F 215 °C	0.974	8.10 lb/gal 0.972 Kg/dm ³	>190 °F >88 °C	18.3	96	—	—
Normal Dodecyl Mercaptan	C ₁₂ H ₂₅ SH	202	—	531 °F 277 °C	0.849	7.07 lb/gal 0.848 Kg/dm ³	>200 °F >93 °C	15.6	91	2.98	7.4 × 10 ⁻⁴
Tertiary Nonyl Mercaptan (Sulfole - 90)	C ₉ H ₁₉ SH	(160.3)	125 °F 52 °C	148 °F 65 °C	0.855	7.12 lb/gal 0.854 Kg/dm ³	154 °F 68 °C	19.4	97.4 ⁽⁴⁾	—	8.3 × 10 ⁻⁴
Normal Dodecyl Mercaptan (Sulfole - 100)	C ₁₀ H ₂₁ SH	(171.3)	126 °F 52 °C	217 °F 103 °C	0.855	7.12 lb/gal 0.854 Kg/dm ³	150 °F 66 °C	18.0	96.4 ⁽⁴⁾	1.77	—
Tertiary Nonyl Mercaptan (Sulfole - 120)	C ₁₂ H ₂₅ SH	(199)	190 °F 88 °C	225 °F 107 °C	0.861	7.17 lb/gal 0.860 Kg/dm ³	230 °F 110 °C	15.5	96.0 ⁽⁴⁾	2.84	7.2 × 10 ⁻⁴
Mixed Tertiary Mercaptan (Sulfole - 120)	C ₁₃ H ₂₇ SH	(212)	190 °F 88 °C	270 °F 132 °C	0.864	7.21 lb/gal 0.863 Kg/dm ³	235 °F 113 °C	13.8	91.0 ⁽⁴⁾	3.98	8.0 × 10 ⁻⁴
Tertiary Dodecyl Mercaptan (Sulfole - 132)	C ₁₆ H ₃₃ SH	(258)	253 °F 123 °C	301 °F 150 °C	0.875	7.28 lb/gal 0.870 Kg/dm ³	290 °F 143 °C	10.5	81.5 ⁽⁴⁾	—	—

(1) @ 60/60°F (2) lb/gal at 60°F Kg/dm³ at 15.6°C (3) Centipoise at 68°F or 20°C (4) Mercaptan Purity

See page 19 for sulfur chemical test methods

Gaz odorants



Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

SCENTINEL[®] F-20 Gas Odorant

Product Use: Odorant

Product Number(s): 0001024690, 0001024691, 0001024692, 0001024693, 0001024694, 0001024789

Synonyms: MERCAPTAN MIXTURE; GAS ODORANT

Product Cas No.: Mixture

Company Identification:

Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The Woodlands TX 77380

Product Information:

MSDS Requests: (800) 852-5530
Technical Information: (918) 661-0877

CHEVRON PHILLIPS CHEMICAL COMPANY LP
10001 Six Pines Drive
The Woodlands, TX 77380

PHONE NUMBERS

HEALTH:

Chevron Phillips Emergency
Information Center 866.442.9628
(North America) and
1.832.813.4984(International)

TRANSPORTATION:

North America: CHEMTREC 800.424.9300
or 703.527.3887
ASIA: 1.703.527.3887
EUROPE: BIG .32.14.584545 (phone)
or .32.14.583516 (telefax)
SOUTH AMERICA SOS-Cotec
Inside Brazil: 0800.111.767
Outside Brazil: 55.19.3467.1600
Technical Services: (832) 813-4862
For Additional MSDSs: (800) 852-5530

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASES
TERTIARY BUTYL MERCAPTAN	75-66-1	79 % weight	200-890-2	F Xn	R65, R43, R11, R51
DIMETHYL SULFIDE	75-18-3	20 % weight	200-846-2	F Xn	R36, R65, R52, R11
RELATED MATERIALS	VARIOUS	1 % weight	NA	NA	NA

Occupational Exposure Limits:

Component	Limit	TWA	STEL / Peak	Ceiling	Notation
TERTIARY BUTYL MERCAPTAN	ACGIH_TLV	0.5 ppm	NA	NA	n-BUTYL MERCAPTAN
TERTIARY BUTYL MERCAPTAN	CPCHEM	0.5 ppm	NA	NA	n-BUTYL MERCAPTAN
TERTIARY BUTYL MERCAPTAN	OSHA_PEL	10 ppm	NA	NA	n-BUTYL MERCAPTAN
DIMETHYL SULFIDE	CPCHEM	10 ppm	NA	NA	NA

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Clear liquid, repulsive odor.

- EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
- MAY CAUSE SKIN IRRITATION
- MAY CAUSE NAUSEA, DIZZINESS, OR HEADACHE
- CAUSES EYE IRRITATION
- MAY CAUSE AN ALLERGIC SKIN REACTION
- TOXIC TO AQUATIC ORGANISMS

IMMEDIATE HEALTH EFFECTS:

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision. Not expected to cause prolonged or significant eye irritation.

Skin: This material may be slightly irritating to the skin. The degree of the injury will depend on the amount of material that gets onto the skin and the speed and thoroughness of the first aid treatment. Contact with the skin may cause an allergic skin reaction. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include nausea, vomiting, and diarrhea.

Inhalation: Not expected to be harmful if inhaled. This material has a strong objectionable odor that may cause nausea, dizziness, or headache.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms continue.

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Extremely flammable liquid.

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: < -18 °C (-0.4°F) Estimated

Autoignition: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: NDA Upper: NDA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form: Sulfur Oxides

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible sorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Spill residues and contaminated soil may be deodorized using dilute (5%) aqueous solutions of bleach (sodium hypochlorite). Alternatively, household bleach (Clorox, Purex) in a dilute solution may be used. Do not use concentrated or dry bleach. Absorb in dry, inert material. Do not attempt to neutralize or deodorize bulk liquid mercaptan. Concentrated bleach will cause heating and possible ignition. Attempts to neutralize bulk liquid mercaptan with bleach solutions will be ineffective and only serve to increase the amount of liquid to dispose.

Reporting: U.S.A. regulations require reporting spills of this material that could reach any surface waters. Report spills to local authorities and/or the U.S. Coast Guard National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .

Precautionary Measures: This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Avoid breathing vapors or fumes which

may be released during thermal processing. Do not get in eyes.

General Handling Information: Avoid work practices that may release volatile components in the atmosphere. Local air pollution regulations should be consulted to determine if the release of volatile components is regulated or restricted in the area in which this material is used. Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).

General Storage Information: DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use. Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or disposed of properly.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits. If heated material generates vapor or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing.

Consider physical requirements and other substances present when selecting protective clothing.

Suggested materials for protective gloves include: Barricade, or Neoprene, or Responder

Respiratory Protection: Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known. Air-purifying respirators are not recommended due to potential olfactory fatigue.

Occupational Exposure Limits:

Component	Limit	TWA	STEL / Peak	Ceiling	Notation
TERTIARY BUTYL MERCAPTAN	ACGIH_TLV	0.5 ppm	NA	NA	n-BUTYL MERCAPTAN
TERTIARY BUTYL MERCAPTAN	CPCHEM	0.5 ppm	NA	NA	n-BUTYL MERCAPTAN
TERTIARY BUTYL MERCAPTAN	OSHA_PEL	10 ppm	NA	NA	n-BUTYL MERCAPTAN
DIMETHYL SULFIDE	CPCHEM	10 ppm	NA	NA	NA

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Clear liquid, repulsive odor.

pH: NA

VAPOR PRESSURE: 8.2 psia @ 38 °C (100.4°F)

VAPOR DENSITY (AIR=1): >2

BOILING POINT: 51 °C (123.8°F) - 66°C (150.8°F)

SOLUBILITY (in water): Negligible

PERCENT VOLITILE: 100 % volume

SPECIFIC GRAVITY: 0.816 @ 15.6 °C (60.1°F)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Not Applicable

Incompatibility With Other Materials: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: Sulfur and carbon oxides formed when burned.

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: The oral LD50 in the rat is 8.4 g/kg. The acute oral toxicity is based on test results for TERTIARY BUTYL MERCAPTAN.

Acute Dermal Toxicity: The dermal LD50 in the rabbit is 20.8 g/kg. The acute dermal toxicity is based on test results for TERTIARY BUTYL MERCAPTAN.

Acute Inhalation Toxicity: The inhalation LC50 in the rat is 26,432 ppm after 4 hour(s) exposure. The acute inhalation toxicity is based on test results for TERTIARY BUTYL MERCAPTAN.

Eye Irritation: This material is irritating to the eyes. The eye irritation hazard is based on test results for DIMETHYL SULFIDE.

Skin Irritation: May cause skin irritation. The skin irritation hazard is based on data for a similar

material. The dermal irritation hazard is based on test results for DIMETHYL SULFIDE.

Sensitization: Dermal - This material is a sensitizer in the guinea pig which is based on test results for TERTIARY BUTYL MERCAPTAN.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains TERTIARY BUTYL MERCAPTAN (TBM).

Genotoxicity: Negative (AMES test and In Vitro Sister Chromatid Exchange using Chinese Hamster Ovary Cells); Positive Mouse Lymphoma Forward Mutational Assay

Developmental/reproductive: Doses (11,99, 195 ppm) Rat and Mice - NOAEL >195 ppm

Target Organ Toxicity: Doses (9,97, 196 ppm - 13 weeks) Rats - LOAEL 9 ppm (kidney lesion)

This product contains DIMETHYL SULFIDE.

Target Organ Toxicity: Doses (2.5, 25, 250 mg/kg/day/14week) Rat NOAEL >250 mg/kg/day

Genotoxicity: Negative results for (AMES test and Micronucleus test)

Reprotoxicity: Doses (2.5,25,250 mg/kg/day/14week) Rat NOAEL >250mg/kg/day

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:

This material is expected to be toxic to aquatic organisms.

The 48 hour(s) EC50 for water flea (*Daphnia magna*) is 6.7 mg/l. This information is based on test data from the component: TERTIARY BUTYL MERCAPTAN.

The 96 hour(s) LC50 for rainbow trout (*Salmo gairdneri*) is 34 mg/l. This information is based on test data from the component: TERTIARY BUTYL MERCAPTAN.

The 48 hour(s) EC50 for water flea (*Daphnia magna*) is 23 mg/l. This information is based on test data from the component: DIMETHYL SULFIDE.

The 72 hour(s) EC50 for green algae (*Selenastrum capricornutum*) is 24 mg/l. This information is based on test data from the component: TERTIARY BUTYL MERCAPTAN.

ENVIRONMENTAL FATE:

This material is expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

Shipping Descriptions per regulatory authority.

US DOT

FLAMMABLE LIQUIDS, N.O.S., (tert-Butyl Mercaptan and Dimethyl Sulfide), 3, UN1993, III

ICAO / IATA

FLAMMABLE LIQUIDS, N.O.S., (tert-Butyl Mercaptan and Dimethyl Sulfide), 3, UN1993, III

IMO / IMDG

FLAMMABLE LIQUIDS, N.O.S., (tert-Butyl Mercaptan and Dimethyl Sulfide), 3, UN1993, III, (-18 °C)

RID / ADR

UN1993, FLAMMABLE LIQUIDS, N.O.S., (tert-Butyl Mercaptan and Dimethyl Sulfide), 3, III, ADR

SECTION 15 REGULATORY INFORMATION**SARA 311/312 CATEGORIES:**

1. Immediate (Acute) Health Effects:	YES
2. Delayed (Chronic) Health Effects:	NO
3. Fire Hazard:	YES
4. Sudden Release of Pressure Hazard:	NO
5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

04A = IARC Group 1	12 = TSCA Section 8(a) PAIR	21 = TSCA Section 5(a)
04B = IARC Group 2A	13 = TSCA Section 8(d)	25 = CAA Section 112 HAPs
04C = IARC Group 2B	15 = SARA Section 313	26 = CWA Section 311
05 = NTP Carcinogen	16 = CA Proposition 65	28 = CWA Section 307
06 = OSHA Carcinogen	17 = MA RTK	30 = RCRA Waste P-List
09 = TSCA 12(b)	18 = NJ RTK	31 = RCRA Waste U-List
10 = TSCA Section 4	19 = DOT Marine Pollutant	32 = RCRA Appendix VIII
11 = TSCA Section 8(a) CAIR	20 = PA RTK	33 = MN Hazardous Substance

The following components of this material are found on the regulatory lists indicated.

TERTIARY BUTYL MERCAPTAN	17, 20
DIMETHYL SULFIDE	17, 18, 20, 25

WHMIS CLASSIFICATION:

Class B, Division 2: Flammable Liquids
 Class D, Division 2, Subdivision B: Toxic Material
 Skin Sensitization
 Skin or Eye Irritation

CHEMICAL INVENTORY LISTINGS:

AUSTRALIA: All the components of this material are listed on the Australian Inventory of Chemical Substances (AICS).

CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL).

PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the draft Inventory of Existing Chemical Substances in China.

EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh

Amendment Directive 92/32/EEC.

JAPAN: All the components of this product are on the Existing & New Chemical Substances (ENCS) inventory in Japan, or have an exemption from listing.

KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.

PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

EU RISK AND SAFETY PHRASES:

R11: Highly flammable.

R36: Irritating to eyes.

R43: May cause sensitization by skin contact.

R51: Toxic to aquatic organisms.

R65: Harmful: may cause lung damage if swallowed.

S2: Keep out of the reach of children.

S9: Keep container in a well-ventilated place.

S16: Keep away from sources of ignition - No smoking.

S24: Avoid contact with skin.

S25: Avoid contact with eyes.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S37: Wear suitable gloves.

S51: Use only in well-ventilated areas.

S62: If swallowed do not induce vomiting: seek medical advice immediately and show this container or label.

S36/37: Wear suitable protective clothing and gloves.

EU Symbols: F Xn

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: This revision updates all sections please review.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	Threshold Limit Value	TWA	- Time Weighted Average
-	-	-	-
STEL	Short-term Exposure Limit	PEL	- Permissible Exposure Limit
-	-	-	-
ACGIH	American Conference of - Government Industrial Hygienists	OSHA	- Occupational Safety & Health
NIOSH	National Institute of Safety & Health	NFPA	- National Fire Protection Agency
-	-	-	-
WHMIS	Workplace Hazardous Materials - Information System	IRAC	- Intl. Agency for Research on Cancer
EINECS	European Inventory of existing	RCRA	- Resource Conservation Recovery Act

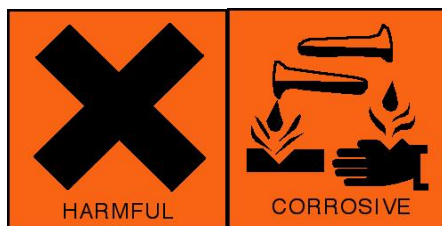
SARA	- Commercial Chemical Sales Superfund Amendments and Reauthorization Act.	TSCA	- Toxic Substance Control Act
EC50	Effective Dose	LC50	- Lethal Concentration
LD50	Lethal Dose	CAS	- Chemical Abstract Service Number
NDA	No Data Available	NA	- Not Applicable
<=	Less Than or Equal To	>=	- Greater Than or Equal To
CNS	Central Nervous System	MAK	- Germany Maximum Concentration Values

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Solution hypochlorite

Safety (MSDS) data for sodium hypochlorite solution



Click here for data on sodium hypochlorite in [student-friendly format](#), from the [HSci](#) project

General

Synonyms: hypochlorous acid sodium salt, sodium hydrochlorite, clorox [also sold as a solution under a variety of trade names for use as liquid bleach]

Use: Liquid bleach

Molecular formula: ClONa

CAS No: 7681-52-9

EC No: 231-668-3

Physical data

Appearance: colourless liquid with strong odour

Melting point:

Boiling point: typically 40 C (decomposes)

Vapour density:

Vapour pressure:

Specific gravity: ca. 1.21

Flash point: n/a

Explosion limits: n/a

Autoignition temperature: n/a

Stability

Stable. **Contact with acids releases poisonous gas (chlorine).** Light sensitive. Incompatible with strong acids, amines, ammonia, ammonium salts, reducing agents, metals, aziridine, methanol, formic acid, phenylacetonitrile.

Toxicology

Corrosive, causes burns to skin and eyes. Harmful by ingestion, inhalation and through skin contact. Skin irritant.

Toxicity data

(The meaning of any abbreviations which appear in this section is given [here.](#))

ORL-MUS LD50 5800 mg kg⁻¹

ORL-WMN TDLO 1000 mg kg⁻¹

IVN-MAN TDLO 45 mg kg⁻¹

Risk phrases

(The meaning of any risk phrases which appear in this section is given [here.](#))

R20 R21 R22 R34 R41.

Transport information

(The meaning of any UN hazard codes which appear in this section is given [here.](#))

UN Major hazard class 8. Packing group III

Personal protection

Use in well-ventilated areas only. Protect eyes. Do not mix with acids.

Safety phrases

(The meaning of any safety phrases which appear in this section is given [here.](#))

S1 S2 S28 S45 S50.

[Return to [Physical & Theoretical Chemistry Lab. Safety home page.](#)]

This information was last updated on April 11, 2005. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

Sodium bicarbonate

Material Safety Data Sheet

Sodium Bicarbonate

ACC# 20970

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Bicarbonate**Catalog Numbers:** S71986, S71986-1, S78284, S78284-1, S93354, BP328-1, BP328-500, FLS23350LC, NC9053555, NC9240918, NC9695834, NC9957622, S233-10, S233-3, S233-300LB, S233-50, S233-500, S2333LC, S23350LC, S631-10, S631-3, S631-50, S631-500, S635-50LC, S63712, S637212, S637212LC, S63750, XXS233225LB, XXS233PD225L**Synonyms:** Baking soda; Sodium acid carbonate; Sodium hydrogen carbonate; Monosodium carbonate; Bicarbonate of soda.**Company Identification:**Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
144-55-8	Sodium bicarbonate	>99.7	205-633-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Caution! Causes eye irritation. May cause skin and respiratory tract irritation.**Target Organs:** Eyes.**Potential Health Effects****Eye:** Causes eye irritation. Causes redness and pain.**Skin:** May cause skin irritation. Repeated or prolonged exposure may cause drying and cracking of the skin.**Ingestion:** May cause irritation of the digestive tract.**Inhalation:** May cause respiratory tract irritation.**Chronic:** Prolonged or repeated skin contact may cause irritation.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Do NOT allow victim to rub eyes or keep eyes closed.**Skin:** Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before

reuse.

Ingestion: Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid prolonged or repeated contact with skin. Avoid breathing vapors from heated material. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium bicarbonate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium bicarbonate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by

OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 8.3 (0.1M solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 270 deg C

Decomposition Temperature: 270 deg C

Solubility: Soluble.

Specific Gravity/Density: 2.16

Molecular Formula: NaHCO₃

Molecular Weight: 83.995

Section 10 - Stability and Reactivity

Chemical Stability: Stable in dry air, but slowly decomposes in moist air.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Moisture.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 144-55-8: VZ0950000

LD50/LC50:

CAS# 144-55-8:

Draize test, rabbit, eye: 100 mg/30S Mild;

Oral, mouse: LD50 = 3360 mg/kg;

Oral, rat: LD50 = 4220 mg/kg;

Carcinogenicity:

CAS# 144-55-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Other Studies: See actual entry in RTECS for complete information.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 144-55-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 144-55-8: 0

Canada - DSL/NDSL

CAS# 144-55-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 2/26/1999

Revision #3 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: This chemical released into the environment is not expected to have a significant impact.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 144-55-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

