Safety Data Sheet
ThermaFRAC Stabilizer J599

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name ThermaFRAC Stabilizer J599
Product code J599

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

Recommended use Used as a fracturing additive in oilfield applications

Uses advised against No information available

1.3 Details of the supplier of the safety data sheet

Supplier identification
Schlumberger Oilfield Australia Pty Ltd
ABN: 74 002 459 225
ACN: 002 459 225
256 St. Georges Terrace, Perth WA 6000
SDS@slb.com

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, MiddleEastand Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

2. Hazards Identification

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards

Acute oral toxicity	Category 4
Acute dermal toxicity	Category 4
Skin corrosion/irritation	Category 1 Subcategory 1B
Skin sensitisation	Category 1

Environmental hazards

Chronic aquatic toxicity	Category 2

Physical Hazards Not classified

2.2 Label Elements

Signal word
DANGER

Hazard statements
H302 - Harmful if swallowed
H312 - Harmful in contact with skin
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H411 - Toxic to aquatic life with long lasting effects

Precautionary Statements - EU (28, 1272/2008)
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing and eye/face protection
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P391 - Collect spillage

Supplementary precautionary statements
P270 - Do no eat, drink or smoke when using this product
P264 - Wash face, hands and any exposed skin thoroughly after handling
P391 - Collect spillage
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P501 - Dispose of contents/container to an approved waste disposal plant
P272 - Contaminated work clothing should not be allowed out of the workplace
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
P405 - Store locked up

Indication of danger
C - Corrosive
N - Dangerous for the environment

R-code(s)
R21/22 - R34 - R43 - R51/53

Contains
Tetraethylenepentamine

Pentaethylenehexamine

Triethylenetetramine

Classification according to EU Directives 67 /548/EEC or 1999/45/EC

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16.

2.3 Other data

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Hazardous according to the criteria of NOHSC.
HAZARDOUS SUBSTANCE. DANGEROUS GOODS.

3. Composition/information on Ingredients

3.1 Substances

Component	EC-No.	CAS-No	Weight % - range	Classification (67/548)	Classification (Reg. 1272/2008)	REACH registration number
Tetraethylenepentamine	203-986-2	112-57-2	60 - 100	Xn; R21/22 C; R34 R43 N; R51-53	Acute Tox. 4 (H302) Acute Tox. 4 (H312) Skin Corr. 1B (H314) Skin Sens. 1 (H317) Aquatic Chronic 2 (H411)	No data available
Pentaethylenehexamine	223-775-9	4067-16-7	1 - 5	C; R34 R43 N; R50-53	par Skin Corr. 1B (H314) Skin Sens. 1 (H317) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)	No data available
Triethylenetetramine	203-950-6	112-24-3	1 - 5	Xn; R21 C; R34 R43 R52-53	par Acute Tox. 4 (H312) Skin Corr. 1B (H314) Skin Sens. 1 (H317) Aquatic Chronic 3 (H412)	No data available

3.2 Mixtures

4. First aid measures

4.1 Description of first-aid measures

Inhalation Move to fresh air. Get medical attention if any discomfort continues.

Ingestion Rinse mouth. Do NOT induce vomiting. Seek medical attention at once. Never give anything by mouth to an unconscious person.

Skin contact Take off contaminated clothing and shoes immediately. Rinse immediately with plenty of water for at least 15 minutes. Seek medical attention at once.

Eye contact Immediately flush eyes with water for 15 minutes while holding eyelids open. Seek medical attention at once.

4.2 Most important symptoms and effects, both acute and delayed

Main symptoms

Inhalation Vapors may irritate throat and respiratory system.

Ingestion	HARMFUL IF SWALLOWED.
Skin contact	Corrosive. Causes burns.
Eye contact:	Corrosive to the eyes and may cause severe damage including blindness.

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
Use dry chemical, CO2, water spray or "alcohol" foam.

Extinguishing media which shall not be used for safety reasons
High volume water jet.

5.2 Special hazards arising from the substance or mixture

Precautions against fire and explosion
none.

Hazardous combustion products
Nitrogen oxides (NOx), Carbon oxides (COx), See also section 10.

5.3 Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Hazchem code ADG
2X

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid contact with the skin and the eyes. Do not breathe vapors or spray mist. Use personal protective equipment. See also section 8. Keep unnecessary personnel away.

6.2 Environmental precautions

Prevent further leakage or spillage. Keep out of waterways. Do not allow material to contaminate ground water system. Prevent entry into sewage. Prevent product from entering drains.

Enviromental exposure controls
Avoid release to the environment. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up
Dam up. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and Storage

7.1 Precautions for safe handling

Ensure adequate ventilation. Keep away from open flames, hot surfaces and sources of ignition. Avoid contact with skin and eyes. Personal protective equipment. See also Section 8.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Remove contaminated clothing. Do no eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation.

Storage Do not store and transport with oxidizers, acids and bases. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition

Packaging material High density polyethylene (HDPE) drum or can

7.3 Specific end uses

See also Section 1.2.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Component	EU OEL - Third List	Austria	Australia	Denmark
Tetraethylenepentamine	Not determined	Not determined	Not determined	Not determined
Pentaethylenehexamine	Not determined	Not determined	Not determined	Not determined
Triethylenetetramine	Not determined	Not determined	Not determined	Not determined

Component	Finland	France	Germany	Hungary
Tetraethylenepentamine	Not determined	Not determined	Not determined	Not determined
Pentaethylenehexamine	Not determined	Not determined	Not determined	Not determined
Triethylenetetramine	Not determined	Not determined	Not determined	Not determined

Component	Ireland	Italy	Netherlands	Norway
Tetraethylenepentamine	Not determined	Not determined	Not determined	Not determined
Pentaethylenehexamine	Not determined	Not determined	Not determined	Not determined
Triethylenetetramine	Not determined	Not determined	Not determined	1 ppm 6 mg/m³

Component	Poland	Portugal	Romania	Russia
Tetraethylenepentamine	Not determined	Not determined	Not determined	Not determined
Pentaethylenehexamine	Not determined	Not determined	Not determined	Not determined
Triethylenetetramine	Not determined	Not determined	Not determined	Not determined

Component	Spain	Switzerland	Turkey	UK
Tetraethylenepentamine	Not determined	Not determined	Not determined	Not determined
Pentaethylenehexamine	Not determined	Not determined	Not determined	Not determined
Triethylenetetramine	Not determined	Not determined	Not determined	Not determined

Component Information

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation.

Personal protective equipment

Eye protection	Chemical splash goggles and face shield.
Hand protection	Impervious gloves, Nitrile, Viton.
Respiratory protection	In case of insufficient ventilation wear suitable respiratory equipment, Use respirator with organic vapor protection (A, brown), Half mask with a particle filter P2 (BS EN 143).
Skin and body protection	Chemical resistant boots, Chemical resistant suit.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	No information available
Odour	Amine
Colour	Yellow
Odor threshold	No information available

Property	Values	Remarks
pH	10	
pH regulating agent	No information available	
Melting/freezing point	-30 °C	
Boiling point/range	~340 °C	

Flash Point	163 °C	Tag Open Cup
Evaporation rate		
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability Limit	4.6%	
Lower flammability limit	0.8%	
Vapor pressure	<0.01 kPa	@ 20 °C
Vapor density	6.5 (air = 1)	
Specific gravity	1.0	
bulk density	No information available	Not Applicable
Relative density	1.0	
Water solubility	Soluble	
Solubility in other solvents	No information available	
Autoignition temperature	300 °C	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Viscosity, dynamic	96 mPa s	
Log Pow	Does not bioaccumulate	

Explosive properties	No information available
Oxidizing properties	None known.

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	100
Density VALUE	No information available

10. Stability and Reactivity

10.1 Reactivity

Not known to occur.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerisation does not occur.

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

Oxidizing agents. Strong reducing agents. Incompatible with strong acids and bases.

10.6 Hazardous decomposition products

When heated strongly or burned, oxides of carbon, nitrogen oxides, ammonia and harmful organic chemical fumes are released.

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Product information .

Inhalation Vapors may irritate throat and respiratory system.

Eye contact: Corrosive to the eyes and may cause severe damage including blindness.

Skin contact Corrosive. Causes burns.

Ingestion HARMFUL IF SWALLOWED.

Acute toxicity .

Component	LD50 Oral	LD50 Dermal	LD50 Inhalation
Tetraethylenepentamine	= 2100 mg/kg (Rat)	= 660 mg/kg (Rabbit)	
Pentaethylenehexamine	= 1600 mg/kg (Rat)		
Triethylenetetramine	= 2500 mg/kg (Rat)	= 550 mg/kg (Rabbit)	

Sensitisation May cause sensitization by skin contact.

Mutagenic effects Not known to cause heritable genetic damage.

carcinogenicity None known.

Reproductive toxicity Not known to adversely affect reproductive functions and organs.

Developmental toxicity Not known to cause birth defects or have a deleterious effect on a developing fetus.

Routes of exposure Skin contact. Eye contact:. Respiratory system.

Routes of entry Skin contact.

Specific target organ toxicity (single exposure) No information available.

Specific target organ toxicity (repeated exposure) No information available.

Aspiration hazard No information available.

12. Ecological Information

12.1 Toxicity

Ecotoxicity effects

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Toxicity to algae
Toxic to aquatic life with long lasting effects. See component information below.

Toxicity to fish
See component information below.

Toxicity to daphnia and other aquatic invertebrates
See component information below.

Component	Freshwater fish species data	Freshwater fish species data	Water flea data
Tetraethylenepentamine	420 mg/L LC50 (Poecilia reticulata) = 96 h	2.1 mg/L EC50 (Pseudokirchneriella subcapitata) = 72 h	24.1 mg/L EC50 (Daphnia magna) = 48 h
Pentaethylenehexamine	No information available	No information available	No information available
Triethylenetetramine	570 mg/L LC50 (Poecilia reticulata) = 96 h 495 mg/L LC50 (Pimephales promelas) = 96 h	20 mg/L EC50 (Pseudokirchneriella subcapitata) = 72 h 3.7 mg/L EC50 (Pseudokirchneriella subcapitata) = 96 h 2.5 mg/L EC50 (Desmodesmus subspicatus) = 72 h	31.1 mg/L EC50 (Daphnia magna) = 48 h

12.2 Persistence and degradability

The product is not biodegradable.

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

Mobility
The product is water soluble, and may spread in water systems.

12.5 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects.

None known.

13. Disposal Considerations

13.1 Waste treatment methods

Waste from residues / unused products — Should not be released into the environment. Dispose of as hazardous waste in compliance with local and national regulations.

Contaminated packaging — Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWC waste disposal No.	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. The following Waste Codes are only suggestions: 16 03 05

14. Transport Information

14.1 UN number

UN/ID no. (ADR/RID/ADN/ADG)	UN 2320
UN/ID no	UN 2320
UN No. (ICAO)	UN 2320

14.2 Proper shipping name
TETRAETHYLENEPENTAMINE,

14.3. Hazard class(es)
8

IMDG Page	8
ICAO = International Civil Aviation Organization	8

14.4 Packing group
III

Packing group	III
ICAO Packing group	III

14.5 Environmental hazard
Marine pollutant Yes

14.6 Special precautions

Hazard ID	80
EmS	F-A, S-B
Hazchem code ADG	2X

14.7 Transport in bulk according to MARPOL 73/78 and IBC Code
Not Applicable

15. Regulatory Information

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

Australian Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP)

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)].

National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition].

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)].

Safe Work Australia.

ADG Code – Australian Dangerous Goods Code.

International inventories

USA, Toxic Substances Control Act inventory (TSCA)	Complies
European Union - EINECS and ELINCS	Complies
Canada, Domestic Substance List (DSL)	Complies
Philippines (PICCS)	Complies
Inventory - Japan - Existing and New Chemicals list	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korea (KECL)	Complies
Inventory - New Zealand - Inventory of Chemicals (NZIoC)	Complies

15.2 Chemical Safety Report

No information available

16. Other Information

Supercedes date

Revision date	05/Nov/2013
Version	1

HMIS classification

Health	3
Flammability	1
Physical	0

Text of R phrases mentioned in Section 3

R34 - Causes burns
R43 - May cause sensitization by skin contact
R53 - May cause long-term adverse effects in the aquatic environment
R50 - Very toxic to aquatic organisms
R52 - Harmful to aquatic organisms
R21 - Also harmful through contact with skin

R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R21/22 - Harmful in contact with skin and if swallowed

Full text of H-Statements referred to under sections 2 and 3

H302 - Harmful if swallowed
H312 - Harmful in contact with skin
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H411 - Toxic to aquatic life with long lasting effects

N/A - Not Applicable, N/D - Not Determined.

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