SDS no. J596
Version 4
Revision date 12-May-2015
Supersedes date 16-May-2011

Safety Data Sheet
ThermaFRAC High Temperature Crosslinker J596

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

1.1 Product identifier

Product name ThermaFRAC High Temperature Crosslinker J596
Product code J596

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

Recommended Use Cross-linking agent

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
Schlumberger Oilfield Australia Pty Ltd
ABN: 74 002 459 225
ACN: 002 459 225
256 St. Georges Terrace, Perth WA 6000
+47 5157 7424

SDS@slb.com

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Asia Pacific +65 3158 1074, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, USA +1 281 595 3518/+1 866 928 0789 , Canada +1 800 579 7421 , Argentina: +54 11 5984 3690, Brazil : 0800-720-8000 /0800-777-2323 (WGRA)

Netherlands	National Poisons Information Center (NL): +31 30 274 88 88 (NB: this service is only available to health professionals)
Croatia	01-23-48-342(for medical information) -Center for Poison

2. Hazards Identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Health hazards

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Reproductive toxicity	Category 1B

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements

Signal word
DANGER

Hazard statements
H315 - Causes skin irritation
H318 - Causes serious eye damage
H360FD - May damage fertility. May damage the unborn child

Precautionary Statements - EU (§28, 1272/2008)
P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective gloves and eye/face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Supplementary precautionary statements
P264 - Wash face, hands and any exposed skin thoroughly after handling
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention
P362 - Take off contaminated clothing and wash before reuse
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

Indication of danger
T - Toxic
Xi - Irritant

R-code(s)
R38, R41, R60/61

Contains
2,2`,2`-nitrilotriethanol

Sodium tetraborate

Zirconium dichloride oxide

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

2.3 Other hazards

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. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical Name	EC No	CAS No	Weight-%	Regulation (EC) No 1272/2008	REACH registration number
2,2`,2`-nitrilotriethanol	203-049-8	102-71-6	<30	Not classified	No data available
Sodium tetraborate	215-540-4	1330-43-4	<10	Repr. 1B (H360FD)	No data available
Zirconium dichloride oxide	231-717-9	7699-43-6	1-5	Skin Corr. 1B (H314) Met. Corr.1(H290)	No data available

Ingredient notes
EU - Control of Exports of Dual Use Items (428/2009)
Listed on SVHC = CAS 1330-43-4,
Comments
The product contains other ingredients which do not contribute to the overall classification.

4. First aid measures

4.1 First aid measures

Inhalation Move the exposed person to fresh air at once. If breathing is difficult, (trained personnel should) give oxygen. If not breathing, give artificial respiration. Seek medical attention at once.

Ingestion Do NOT induce vomiting. Get immediate medical attention. Rinse mouth. Risk of product entering the lungs on vomiting after ingestion. Never give anything by mouth to an unconscious person.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye Contact Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. Get immediate medical attention.

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

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

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 extinguishing media appropriate for surrounding material.

Extinguishing media which must not be used for safety reasons
None known.

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards
None known.

Hazardous combustion products
Thermal decomposition can lead to release of irritating and toxic gases and vapors

5.3 Advice for firefighters

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

Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Do not get on skin or clothing. Wash thoroughly after handling. Do not breathe vapors or spray mist. Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for containment
Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up
Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local/national regulations (see Section 13).

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Do not get in eyes, on skin or on clothing. Do not breathe vapors or spray mist. Avoid spills and splashing during use. Not to be used by pregnant workers and workers who have recently given birth or who are breastfeeding.

Hygiene Measures
Use good work and personal hygiene practices to avoid exposure. Wash hands and face before breaks and immediately after handling the product Remove contaminated clothing. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from direct sunlight. Store away from incompatibles, Oxidizing agents

Storage class Toxic storage.

Packaging materials Use specially constructed containers only.

7.3 Specific end uses

See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits No biological limit allocated

Chemical Name	EU OEL	Austria	Australia	Denmark
2,2`,2`-nitrilotriethanol	Not determined	1.6 ppm STEL 10 mg/m³ STEL inhalable fraction 0.8 ppm TWA 5 mg/m³ TWA inhalable fraction Sensitizer	5mg/m³TWA	0.5 ppm TWA 3.1 mg/m³ TWA
Sodium tetraborate	Not determined	Not determined	1mg/m³TWA	1 mg/m³ TWA
Zirconium dichloride oxide	Not determined	Not determined	10mg/m³STEL 5mg/m³TWA	Not determined
Chemical Name	**Malaysia**	**France**	**Germany**	**Hungary**
2,2`,2`-nitrilotriethanol	5 mg/m³ TWA	Not determined	5 mg/m³ TWA	Not determined
Sodium tetraborate	1 mg/m³ TWA	1 mg/m³TWA	Not determined	Not determined
Zirconium dichloride oxide	Not determined	Not determined	Not determined	Not determined
Chemical Name	**New Zealand**	**Italy**	**Netherlands**	**Norway**
2,2`,2`-nitrilotriethanol	5 mg/m³ TWA	Not determined	Not determined	5 mg/m³ TWA 10 mg/m³ STEL
Sodium tetraborate	1 mg/m³ TWA	Not determined	Not determined	1 mg/m³ TWA 2 mg/m³ STEL
Zirconium dichloride oxide	Not determined	Not determined	Not determined	Not determined
Chemical Name	**Poland**	**Portugal**	**Romania**	**Russia**
2,2`,2`-nitrilotriethanol	Not determined	5 mg/m³ TWA	Not determined	Not determined
Sodium tetraborate	Not determined	6 mg/m³ STEL VLE-CD 2 mg/m³ TWA inhalable fraction	Not determined	2 mg/m³ MAC
Zirconium dichloride oxide	Not determined	Not determined	Not determined	Not determined
Chemical Name	**Spain**	**Switzerland**	**Turkey**	**UK**
2,2`,2`-nitrilotriethanol	5 mg/m³ TWA VLA-ED	20 mg/m³ STEL	Not determined	Not determined

		inhalable dust 5 mg/m³ TWA MAK		
Sodium tetraborate	6 mg/m³ STEL 2 mg/m³ TWA VLA-ED	1 mg/m³ TWA MAK water free	Not determined	3 mg/m³ STEL calculated 1 mg/m³ TWA
Zirconium dichloride oxide	Not determined	Not determined	Not determined	Not determined

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 Controls
Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection — It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles. Face-shield.

Hand protection — Wear chemical resistant gloves such as nitrile or neoprene. Be aware that liquid may penetrate the gloves. Frequent change is advisable.

Respiratory protection — Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations, Respirator with a vapor filter (EN 141), Type A/P2, At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.

Skin and body protection — Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.

Hygiene Measures — Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	No information available
Odor	Odorless
Color	Light yellow
Odor threshold	Not applicable

Property	Values	Remarks
pH	8 - 8.5	
pH @ dilution		
Melting / freezing point	No information available	
Boiling point/range	>100 °C	
Flash point	No information available	
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not applicable	
Flammability Limit in Air		

Upper flammability limit	Not applicable	
Lower flammability limit	Not applicable	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	1.16 - 1.19 g/cm³	
Bulk density	No information available	
Relative density	1.1	@ 25°C.
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	10 mPa s	@ 25 °C
log Pow	No information available	

Explosive properties	Not applicable
Oxidizing properties	None known.

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density	No information available

Comments
The data listed above are typical physical and chemical properties and should not be construed as product specification.

10. Stability and reactivity

10.1 Reactivity

Stable under recommended storage conditions.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerization does not occur.

10.4 Conditions to avoid

Keep away from direct sunlight.

10.5 Incompatible materials

Oxidizing agents.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product information May damage fertility or the unborn child.

Inhalation May be toxic if inhaled. May cause additional affects as listed under "Ingestion".

Eye contact Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact Causes skin irritation.

Ingestion Toxic if swallowed.

Unknown acute toxicity Not applicable.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
2,2`,2`-nitrilotriethanol	= 4190 mg/kg (Rat)	> 16 mL/kg (Rat) > 20 mL/kg (Rabbit)	No data available
Sodium tetraborate	= 2660 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	No data available
Zirconium dichloride oxide	= 2950 mg/kg (Rat) = 3500 mg/kg (Rat)	No data available	No data available

Sensitization This product does not contain any components suspected to be sensitizing.

Mutagenic effects This product does not contain any known or suspected mutagens.

Carcinogenicity This product does not contain any known or suspected carcinogens.

Reproductive toxicity May damage fertility or the unborn child.

Routes of exposure Skin contact. Eye contact. Ingestion.

Routes of entry Skin contact. Eye contact.

Specific target organ toxicity - Single exposure Not classified

Specific target organ toxicity - Repeated exposure Not classified.

Aspiration hazard Not classified.

12. Ecological information

12.1 Toxicity

The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae
See component information below.

Toxicity to fish
See component information below.

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

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
2,2`,2`-nitrilotriethanol	450 - 1000 mg/L LC50 Lepomis macrochirus 96 h > 1000 mg/L LC50 Pimephales promelas 96 h 10600 - 13000 mg/L LC50 Pimephales promelas 96 h	= 169 mg/L EC50 Desmodesmus subspicatus 96 h = 216 mg/L EC50 Desmodesmus subspicatus 72 h	= 1386 mg/L EC50 Daphnia magna 24 h
Sodium tetraborate	= 340 mg/L LC50 Limanda limanda 96 h	2.6 - 21.8 mg/L EC50 Pseudokirchneriella subcapitata 96 h = 158 mg/L EC50 Desmodesmus subspicatus 96 h	1085 - 1402 mg/L LC50 Daphnia magna 48 h
Zirconium dichloride oxide	= 15 mg/L LC50 Lepomis macrochirus 96 h = 18 mg/L LC50 Pimephales promelas 96 h	No information available	No information available

12.2 Persistence and degradability

No product level data available.

Chemical Name	Persistence and degradability
2,2`,2`-nitrilotriethanol 102-71-6	Readily biodegradable
Sodium tetraborate 1330-43-4	Not readily biodegradable
Zirconium dichloride oxide 7699-43-6	No information available

12.3 Bioaccumulative potential

No product level data available.

Chemical Name	Bioaccumulation
2,2`,2`-nitrilotriethanol 102-71-6	Does not bioaccumulate
Sodium tetraborate 1330-43-4	Does not bioaccumulate
Zirconium dichloride oxide 7699-43-6	Not likely to 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	Dispose of in accordance with local regulations.
Contaminated packaging	Empty containers should be taken for local recycling, recovery or waste disposal.
EWC Waste Disposal No	According to the European Waste Catalog, 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: EWC waste disposal No: 16 10 01 - aqueous liquid wastes containing dangerous substances

14. Transport information

14.1. UN number
Not regulated

14.2. UN proper shipping name
The product is not covered by international regulation on the transport of dangerous goods

14.3 Hazard class(es)

ADR/RID/ADN/ADG Hazard class	Not regulated
IMDG/ANTAQ Hazard class	Not regulated
ICAO/ANAC Hazard class/division	Not regulated

14.4 Packing group

ADR/RID/ADN/ADG Packing group	Not regulated
IMDG/ANTAQ Packing group	Not regulated
ICAO/ANAC Packing group	Not regulated

14.5 Environmental hazard

Marine pollutant
No

14.6 Special precautions
Not applicable

14.7 Transport in bulk according to Annex I/II of MARPOL 73/78 and the IBC Code
Please contact SDS@slb.com for info regarding transport in Bulk.

15. Regulatory information

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

Germany, Water Endangering Classes (VwVwS)	Hazardous to water/Class 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons

2,2`,2`-nitrilotriethanol
Schedule 4
Schedule 5

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). 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.

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

Not classified as dangerous goods in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG).

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

International inventories

USA (TSCA)	Complies
European Union (EINECS and ELINCS)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

Europe - REACH
All products supplied from the European Economic Area (EEA) are compliant with the REACH Regulation EC 1907/2006.For products supplied from the EEA, Schlumberger and/or its suppliers have pre-registered and is registering all of the substances that it and/or its suppliers manufactures in or imports into the EEA that are subject to Title II of the REACH Regulation. All products supplied from outside the EEA are subject to REACH only if imported into the EEA. The importer of the products must comply with REACH for each imported substance. Contact REACH@slb.com for REACH information.

15.2 Chemical Safety Report

No information available

16. Other information

Prepared by	Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Nicola Anderson
Supersedes date	16-May-2011
Revision date	12-May-2015
Version	4

This SDS has been revised in the following section(s) All sections Updated according to GHS/CLP.

Text of R phrases mentioned in Section 3
R38 - Irritating to skin
R41 - Risk of serious damage to eyes
R60 - May impair fertility
R61 - May cause harm to the unborn child
R34 - Causes burns

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

H315 - Causes skin irritation
H318 - Causes serious eye damage
H360FD - May damage fertility. May damage the unborn child
H314 - Causes severe skin burns and eye damage

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