



Greenbase™ Flowzan® Biopolymer

Version 2.1

Revision Date 2023-10-05

According to Regulation (EC) No. 1907/2006, Regulation (EC) No. 2020/878

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

1.1 Product identifier

Product information

Product Name : Greenbase™ Flowzan® Biopolymer
 Material : 1095064, 1101166, 1077462

EC-No.Registration number

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
Di(Ethylene Glycol) Butyl Ether	112-34-5 203-961-6 603-096-00-8	Chevron Phillips Chemicals International NV 01-2119475104-44-0007
Propylene oxide	75-56-9 200-879-2 603-055-00-4	Chevron Phillips Chemicals International NV 01-2119480483-35-0052

1.2

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

Relevant Identified Uses : Use in Oil and Gas field drilling and production operations –
 Supported Professional
 Use in Oil and Gas field drilling and production operations –
 Professional

1.3

Details of the supplier of the safety data sheet

Company : Chevron Phillips Chemical Company LP
 Drilling Specialties Company LLC
 10001 Six Pines Drive
 The Woodlands, TX 77380

Local : Chevron Phillips Chemicals International N.V.
 Airport Plaza (Stockholm Building)
 Leonardo Da Vincilaan 19
 1831 Diegem
 Belgium

SDS Requests: (800) 852-5530

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Responsible Party: Product Safety Group
 Email:sds@cpchem.com

1.4**Emergency telephone:****Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090

Mexico CHEMTREC 01-800-681-9531 (24 hours)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Argentina: +(54)-1159839431

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)

Belgium: 070 245 245 (24 hours/day, 7 days/week)

Bulgaria: +359 2 9154 233

Croatia: +3851 2348 342 (24 hours/day, 7 days/week)

Cyprus: 1401

Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402

Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212

Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Finland: 0800 147 111 09 471 977 (24 hours/day)

France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)

Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Greece: (0030) 2107793777 (24 hours/day, 7 days/week)

Hungary: +36-80-201-199 (24 hours/day, 7 days/week)

Iceland: 543 2222 (24 hours/day, 7 days/week)

Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Italy: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic

Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)

Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Lithuania: +370 (85) 2362052

Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)

Malta: +356 2395 2000

The Netherlands: NVIC: +31 (0)88 755 8000

Norway: 22 59 13 00 (24 hours/day, 7 days/week)

Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Portugal: CIAV phone number: +351 800 250 250

Romania: +40213183606

Slovakia: +421 2 5477 4166

Slovenia: Phone number: 112

Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)

Sweden: 112 – ask for Poisons Information

Responsible Department : Product Safety and Toxicology Group
 E-mail address : SDS@CPChem.com
 Website : www.CPChem.com

SECTION 2: Hazards identification**2.1****Classification of the substance or mixture**

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REGULATION (EC) No 1272/2008

Eye irritation, Category 2

H319:

Causes serious eye irritation.

2.2**Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms

:



Signal Word

: Warning

Hazard Statements

: H319

Causes serious eye irritation.

Precautionary Statements

: **Prevention:**

P264

Wash skin thoroughly after handling.

P280

Wear eye protection/ face protection.

Response:

P305 + P351 + P338

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313

If eye irritation persists: Get medical advice/ attention.

2.3**Other hazards**

Results of PBT and vPvB assessment

: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Endocrine disrupting properties

: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients**3.1 - 3.2****Substance or Mixture**

Synonyms

: Xanthan Gum Suspension

Molecular formula

: Mixture

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Hazardous ingredients

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]	Specific Conc. Limits, M-factors and ATEs
Di(Ethylene Glycol) Butyl Ether	112-34-5 203-961-6 603-096-00-8	Eye Irrit. 2; H319	55 - 65	
Calcium Stearate	1592-23-0 216-472-8		0,6 - 1	

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

For additional details, see the Exposure Scenario in the Annex portion

SECTION 4: First aid measures**4.1****Description of first-aid measures**

- General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance.
- If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
- In case of eye contact : Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed**Notes to physician**

- Symptoms : No data available.
- Risks : No data available.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : No data available.

SECTION 5: Firefighting measures

- Flash point : 100°C (212°F)
Method: Tag closed cup

- Autoignition temperature : No data available

5.1**Extinguishing media**

- Unsuitable extinguishing media : High volume water jet.

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Special hazards arising from the substance or mixture

Specific hazards during fire fighting : Standard procedure for chemical fires. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.3**Advice for firefighters**

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Standard procedure for chemical fires. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Fire and explosion protection : Normal measures for preventive fire protection.

Hazardous decomposition products : Carbon oxides.

SECTION 6: Accidental release measures**6.1****Personal precautions, protective equipment and emergency procedures**

Personal precautions : Use personal protective equipment.

6.2**Environmental precautions**

Environmental precautions : Prevent further leakage or spillage if safe to do so.

6.3**Methods and materials for containment and cleaning up**

Methods for cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

6.4**Reference to other sections**

Reference to other sections : For personal protection see section 8. For disposal considerations see section 13.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 7: Handling and storage**7.1****Precautions for safe handling
Handling**

Advice on safe handling : Do not breathe vapors/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

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Conditions for safe storage, including any incompatibilities**Storage**

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection**8.1****Control parameters
Ingredients with workplace control parameters****SK**

Zložky	Podstata	Hodnota	Kontrolné parametre	Poznámka
Di(Ethylene Glycol) Butyl Ether	SK OEL	NPEL priemerný	10 ppm, 67,5 mg/m ³	
	SK OEL	NPEL krátkodobý	15 ppm, 101,2 mg/m ³	

SI

Sestavine	Osnova	Vrednost	Parametri nadzora	Pripomba
Di(Ethylene Glycol) Butyl Ether	SI OEL	MV	10 ppm, 67,5 mg/m ³	
	SI OEL	KTV	15 ppm, 101,2 mg/m ³	

SE

Bestandsdelar	Grundval	Värde	Kontrollparametrar	Anmärkning
Di(Ethylene Glycol) Butyl Ether	SE AFS	NGV	10 ppm, 68 mg/m ³	
	SE AFS	KGV	15 ppm, 101 mg/m ³	
Calcium Stearate	SE AFS	NGV	5 mg/m ³	Totalt damm

RS

Компоненты	Основа	Величина	Параметры контроля	Заметка
Ди(этилен гликоль) бутил эфир	RS OEL	GVI	10 ppm, 67,5 mg/m ³	EU**,
	RS OEL	KGVI	15 ppm, 101,2 mg/m ³	EU**,

EU** Substance mentioned in indicative exposure limit values in Directive 2006/15 / EC (second list)

RO

Componente	Sursă	Valoare	Parametri de control	Notă
Di(Ethylene Glycol) Butyl Ether	RO OEL	TWA	10 ppm, 67,5 mg/m ³	
	RO OEL	STEL	15 ppm, 101,2 mg/m ³	

PT

Componentes	Bases	Valor	Parâmetros de controlo	Nota
Di(Ethylene Glycol) Butyl Ether	PT DL 305/2007	oito horas	10 ppm, 67,5 mg/m ³	
	PT DL 305/2007	curta duração	15 ppm, 101,2 mg/m ³	
	PT OEL	VLE-MP	10 ppm,	Fração inalável e vapor
Calcium Stearate	PT OEL	VLE-MP	10 mg/m ³	A4,

A4 Agente não classificável como carcinogénico no Homem.

PL

Składniki	Podstawa	Wartość	Parametry dotyczące kontroli	Uwaga
Di(Ethylene Glycol) Butyl Ether	PL NDS	NDS	67 mg/m ³	
	PL NDS	NDSch	100 mg/m ³	

NO

Komponenter	Grunnlag	Verdi	Kontrollparametrer	Nota
Di(Ethylene Glycol) Butyl Ether	FOR-2011-12-06-1358	GV	10 ppm, 68 mg/m ³	

NL

Bestanddelen	Basis	Waarde	Controleparameters	Opmerking
Di(Ethylene Glycol) Butyl Ether	NL WG	TGG-8 uur	50 mg/m ³	H,
	NL WG	TGG-15 min	100 mg/m ³	H,

H Huidopname

MT

Components	Basis	Value	Control parameters	Note
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Di(Ethylene Glycol) Butyl Ether	MT OEL	TWA	10 ppm, 67,5 mg/m3	
	MT OEL	STEL	15 ppm, 101,2 mg/m3	

MK

Съставки	Основа	Стойност	Параметри на контрол	Бележка
Di(Ethylene Glycol) Butyl Ether	MK OEL	MV	10 ppm, 67,5 mg/m3	

LV

Sastāvdaļas	Bāze	Vērtība	Pārvaldības parametri	Piezīme
Di(Ethylene Glycol) Butyl Ether	LV OEL	AER 8 st	10 ppm, 67,5 mg/m3	
	LV OEL	AER īslaicīgā	15 ppm, 101,2 mg/m3	

LU

Composants	Base	Valeur	Paramètres de contrôle	Note
Di(Ethylene Glycol) Butyl Ether	LU OEL	TWA	10 ppm, 67,5 mg/m3	
	LU OEL	STEL	15 ppm, 101,2 mg/m3	

LT

Komponentai	Šaltinis	Vertė	Kontrolės parametrai	Pastaba
Di(Ethylene Glycol) Butyl Ether	LT OEL	IPRD	10 ppm, 67,5 mg/m3	
	LT OEL	TPRD	15 ppm, 101,2 mg/m3	
Calcium Stearate	LT OEL	IPRD	5 mg/m3	

IT

Componenti	Base	Valore	Parametri di controllo	Nota
Di(Ethylene Glycol) Butyl Ether	IT VLEP	TWA	10 ppm, 67,5 mg/m3	
	IT VLEP	STEL	15 ppm, 101,2 mg/m3	

IS

Komponenter	Grunnlag	Verdi	Kontrollparametrer	Nota
Di(Ethylene Glycol) Butyl Ether	IS OEL	TWA	10 ppm, 67,5 mg/m3	
	IS OEL	STEL	15 ppm, 101,2 mg/m3	

IE

Components	Basis	Value	Control parameters	Note
Di(Ethylene Glycol) Butyl Ether	IE OEL	OELV - 8 hrs (TWA)	10 ppm, 67,5 mg/m3	
	IE OEL	OELV - 15 min (STEL)	15 ppm, 101,2 mg/m3	
Calcium Stearate	IE OEL	OELV - 8 hrs (TWA)	10 mg/m3	

HU

Komponensek	Bázis	Érték	Ellenőrzési paraméterek	Megjegyzés
Di(Ethylene Glycol) Butyl Ether	HU OEL	AK-érték	67,5 mg/m3	T, EU2,
	HU OEL	CK-érték	101,2 mg/m3	T, EU2,

EU2 2006/15/EK irányelvben közölt érték

T Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik. Korrigált ÁK = ÁK x 40/a heti óraszám

HR

Sastojci	Temelj	Vrijednost	Nadzorni parametri	Bilješka
Di(Ethylene Glycol) Butyl Ether	HR OEL	GVI	10 ppm, 67,5 mg/m3	
	HR OEL	KGVI	15 ppm, 101,2 mg/m3	

GR

Συστατικά	Βάση	Τιμή	Παράμετροι ελέγχου	Σημείωση
Di(Ethylene Glycol) Butyl Ether	GR OEL	TWA	10 ppm, 67,5 mg/m3	
	GR OEL	STEL	15 ppm, 101,2 mg/m3	

GB

Components	Basis	Value	Control parameters	Note
Di(Ethylene Glycol) Butyl Ether	GB EH40	TWA	10 ppm, 67,5 mg/m3	
	GB EH40	STEL	15 ppm, 101,2 mg/m3	

FR

Composants	Base	Valeur	Paramètres de contrôle	Note
Di(Ethylene Glycol) Butyl Ether	FR VLE	VME	10 ppm, 67,5 mg/m3	VLR indicatives,
	FR VLE	VLCT (VLE)	15 ppm, 101,2 mg/m3	VLR indicatives,

VLR indicatives Valeurs limites réglementaires indicatives

FI

Aineosat	Peruste	Arvo	Valvontaa koskevat muuttujat	Huomautus
Di(Ethylene Glycol) Butyl Ether	FI OEL	HTP-arvot 8h	10 ppm, 68 mg/m3	

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ES

Componentes	Base	Valor	Parámetros de control	Nota
Di(Ethylene Glycol) Butyl Ether	ES VLA	VLA-ED	10 ppm, 67,5 mg/m3	
	ES VLA	VLA-EC	15 ppm, 101,2 mg/m3	
Calcium Stearate	ES VLA	VLA-ED	10 mg/m3	

EE

Komponendid, osad	Alused	Väärtus	Kontrolliparameetrid	Märkused
Di(Ethylene Glycol) Butyl Ether	EE OEL	Piimorm	10 ppm, 67,5 mg/m3	

DK

Komponenter	Basis	Værdi	Kontrolparametre	Note
Di(Ethylene Glycol) Butyl Ether	DK OEL	GV	10 ppm, 68 mg/m3	

DE

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Di(Ethylene Glycol) Butyl Ether	DE TRGS 900	AGW	10 ppm, 67 mg/m3	Y, Dampf und Aerosole

Y Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden

CZ

Složky	Základ	Hodnota	Kontrolní parametry	Poznámka
Di(Ethylene Glycol) Butyl Ether	CZ OEL	PEL	70 mg/m3	I,
	CZ OEL	NPK-P	100 mg/m3	I,

I dráždí sliznice (oči, dýchací cesty), respektive kůži

CY

Συστατικά	Βάση	Τιμή	Παράμετροι ελέγχου	Σημείωση
Di(Ethylene Glycol) Butyl Ether	CY OEL	TWA	10 ppm, 67,5 mg/m3	
	CY OEL	STEL	15 ppm, 101,2 mg/m3	

CH

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Di(Ethylene Glycol) Butyl Ether	CH SUVA	MAK-Wert	10 ppm, 67 mg/m3	SSc,
	CH SUVA	KZGW	15 ppm, 101 mg/m3	SSc,

SSc Eine Schädigung der Leibesfrucht braucht bei Einhaltung des MAK-Wertes nicht befürchtet zu werden.

BG

Съставки	Основа	Стойност	Параметри на контрол	Бележка
Di(Ethylene Glycol) Butyl Ether	BG OEL	TWA	10 ppm, 67,5 mg/m3	
	BG OEL	STEL	15 ppm, 101,2 mg/m3	

BE

Bestanddelen	Basis	Waarde	Controleparameters	Opmerking
Di(Ethylene Glycol) Butyl Ether	BE OEL	TGG 8 hr	10 ppm, 67,5 mg/m3	
	BE OEL	TGG 15 min	15 ppm, 101,2 mg/m3	
Calcium Stearate	BE OEL	TGG 8 hr	10 mg/m3	

AT

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Di(Ethylene Glycol) Butyl Ether	AT OEL	MAK-TMW	10 ppm, 67,5 mg/m3	
	AT OEL	MAK-KZW	15 ppm, 101,2 mg/m3	

8.2**Exposure controls
Engineering measures**

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), 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.

Personal protective equipment

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- Respiratory protection : If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as:. Air-Purifying Respirator for Dusts and Mists / P100. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
- Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
- Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.
- Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Protective suit. Safety shoes.
- Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 9: Physical and chemical properties**9.1****Information on basic physical and chemical properties****Appearance**

- Physical state : liquid
 Color : Yellow
 Odor : Mild

Safety data

- Flash point : 100°C (212°F)
 Method: Tag closed cup
- Lower explosion limit : Not applicable
- Upper explosion limit : Not applicable
- Oxidizing properties : no
- Autoignition temperature : No data available
- Molecular formula : Mixture

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Molecular weight	: Not applicable
pH	: Not applicable
Freezing point	: Not applicable
Boiling point/boiling range	: 230°C (446°F)
Vapor pressure	: 14,70 PSI at 21°C (70°F)
Relative density	: 1,1
Density	: 1,102 g/l
Water solubility	: soluble
Viscosity, kinematic	: No data available
Relative vapor density	: No data available

SECTION 10: Stability and reactivity**10.1**

Reactivity : Stable at normal ambient temperature and pressure.

10.2

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

10.3**Possibility of hazardous reactions**

Hazardous reactions : Further information: No decomposition if stored and applied as directed.

10.4

Conditions to avoid : No data available.

10.5

Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

10.6

Hazardous decomposition products : Carbon oxides

Other data : No decomposition if stored and applied as directed.

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SECTION 11: Toxicological information**11.1****Information on toxicological effects****Acute oral toxicity**

Di(Ethylene Glycol) Butyl Ether : LD50: 5.530 mg/kg
Species: Mouse
Sex: male

Acute dermal toxicity

Di(Ethylene Glycol) Butyl Ether : LD50: 2.764 mg/kg
Species: Rabbit
Method: OECD Test Guideline 402

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Skin irritation : May cause skin irritation in susceptible persons.

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Eye irritation : May cause irreversible eye damage.

Sensitization

Di(Ethylene Glycol) Butyl Ether : Did not cause sensitization on laboratory animals.

Repeated dose toxicity

Di(Ethylene Glycol) Butyl Ether : Species: Rat, Male and female
Sex: Male and female
Application Route: Oral
NOEL: 250 mg/kg
Lowest observable effect level: 1.000 mg/kg
Method: OECD Test Guideline 408
Target Organs: Blood, Liver, Kidney

Species: Rat, Male and female
Sex: Male and female
Application Route: inhalation (vapor)
NOEL: 94 mg/m³
Method: OECD Guideline 413
Target Organs: Lungs

Species: Rat, Male and female
Sex: Male and female
Application Route: Dermal
NOEL: 2.000 mg/kg
Target Organs: Skin

Genotoxicity in vitro

Di(Ethylene Glycol) Butyl Ether : Test Type: Ames test
Concentration: 0.2, 1.5, 10, 20
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

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Test Type: Chromosome aberration test in vitro
 Metabolic activation: with and without metabolic activation
 Method: OECD Guideline 476
 Result: negative

Genotoxicity in vivo

Di(Ethylene Glycol) Butyl Ether : Test Type: Mouse micronucleus assay
 Species: Mouse
 Route of Application: Oral
 Result: negative

Reproductive toxicity

Di(Ethylene Glycol) Butyl Ether : Species: Mouse
 Sex: male and female
 Application Route: Oral
 Dose: 0, 720, 1340, 2050mg/kg bw
 Number of exposures: continuous
 Test period: 14 weeks
 Method: OECD Test Guideline 416
 NOAEL Parent: 720 mg/kg
 NOAEL F1: 720 mg/kg
 NOAEL F2: 720 mg/kg
 Information given is based on data obtained from similar substances.

Developmental Toxicity

Di(Ethylene Glycol) Butyl Ether : Species: Rat
 Application Route: Oral diet
 Dose: 25, 115, 633 mg/kg/d
 Number of exposures: GD 0 -20 d
 Method: OECD Guideline 414
 NOAEL Teratogenicity: 633 mg/kg
 NOAEL Maternal: 633 mg/kg
 No adverse effects expected

Species: Rabbit
 Application Route: Dermal
 Dose: 25, 115, 633 mg/kg/d
 Exposure time: 4 h/d
 Number of exposures: GD 8 -19 d
 Method: OECD Guideline 414
 NOAEL Teratogenicity: 1.000 mg/kg
 NOAEL Maternal: 1.000 mg/kg
 No adverse effects expected

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Aspiration toxicity : No aspiration toxicity classification.

CMR effects

Di(Ethylene Glycol) Butyl Ether : Carcinogenicity: Not available
 Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects., In vivo tests did not show mutagenic effects
 Teratogenicity: Animal testing did not show any effects on

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fetal development.
 Reproductive toxicity: Animal testing did not show any effects on fertility.

11.2**Information on other hazards****Greenbase™ Flowzan® Biopolymer**

Further information : No data available.
 Endocrine disrupting properties : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 12: Ecological information**12.1****Toxicity****Ecotoxicity effects****Toxicity to fish**

Di(Ethylene Glycol) Butyl Ether : LC50: > 1.000 mg/l
 Exposure time: 96 h
 Species: Scophthalmus maximus (Flatfish, Flounder)
 semi-static test Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

Di(Ethylene Glycol) Butyl Ether : EC50: > 1.000 mg/l
 Exposure time: 48 h
 Species: Acartia tonsa (Marine Copepod)
 static test Method: ISO TC147/SC5/WG2

Toxicity to algae

Di(Ethylene Glycol) Butyl Ether : EC50: > 1.000 mg/l
 Exposure time: 72 h
 Species: Skeletonema costatum (marine diatom)
 Growth inhibition Method: ISO 10253

12.2**Persistence and degradability**

Biodegradability : Taking into consideration the properties of several ingredients, the product is estimated not to be readily biodegradable according to OECD classification.

12.3**Bioaccumulative potential**

Elimination information (persistence and degradability)

Bioaccumulation : This material is not expected to bioaccumulate.

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12.4**Mobility in soil**

Mobility : No data available

12.5**Results of PBT and vPvB assessment**

Results of PBT assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6**Endocrine disrupting properties**

Endocrine disrupting properties : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7**Other adverse effects**

Additional ecological information : This material is not expected to be harmful to aquatic organisms.

No data available

12.8**Additional Information****Ecotoxicology Assessment**

Short-term (acute) aquatic hazard : This material is not expected to be harmful to aquatic organisms.

Long-term (chronic) aquatic hazard : This material is not expected to be harmful to aquatic organisms.

SECTION 13: Disposal considerations**13.1****Waste treatment methods**

The information in this SDS pertains only to the product as shipped.

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.

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- Product : Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
- Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information**14.1 - 14.7****Transport information**

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

Maritime transport in bulk according to IMO instruments

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SECTION 15: Regulatory information**15.1****Safety, health and environmental regulations/legislation specific for the substance or mixture
National legislation**

Commission Regulation (EU) 2020/878 of 18 June 2020 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

15.2**Chemical Safety Assessment**

Components : 2-(2-butoxyethoxy)ethanol 203-961-6

Major Accident Hazard Legislation : ZEU_SEVES3 Update: Not applicable

Other Registrations

Regulation Registration number
Danish PR number: 1711315

Notification status

Europe REACH : A substance or substances in this product is not registered or notified to be registered. Importation or manufacture of this product is still permitted provided that it does not exceed the REACH minimum threshold quantity of the non-regulated substances.

Switzerland CH INV : Not in compliance with the inventory

United States of America (USA) TSCA : On or in compliance with the active portion of the TSCA inventory

Canada DSL : All components of this product are on the Canadian DSL

Australia AIIC : On the inventory, or in compliance with the inventory

New Zealand NZIoC : Not in compliance with the inventory

Japan ENCS : On the inventory, or in compliance with the inventory

Korea KECI : A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance or the exported amount does not exceed the minimum threshold quantity of the non-registered substance(s).

Philippines PICCS : On the inventory, or in compliance with the inventory

Taiwan TCSI : On the inventory, or in compliance with the inventory

China IECSC : On the inventory, or in compliance with the inventory

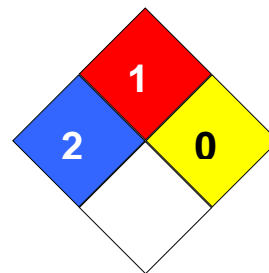
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SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 1
Reactivity Hazard: 0

**Further information**

Legacy SDS Number : CPC00051

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AIIC	Australian Inventory of Industrial Chemicals	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and	TSCA	Toxic Substance Control Act

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	New Chemical Substances		
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%	ATE	Acute toxicity estimate

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

H319 Causes serious eye irritation.

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Annex**1. Short title of Exposure Scenario: Use in Oil and Gas field drilling and production operations – Professional**

Main User Groups	:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sector of use	:	SU 22, SU2b: Professional uses: Public domain (administration, education, entertainment, services, craftsmen), Offshore industries
Process category	:	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities
Environmental release category	:	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Further information	:	Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.

2.1 Contributing scenario controlling environmental exposure for:ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Maximum allowable site tonnage : 575
(MSafe) based on release following total wastewater treatment removal (tonnes/day):
(Msafe)

Frequency and duration of use

Continuous exposure : 16 days/year, Batch process

Environment factors not influenced by risk management

Flow rate : 18.000 m³/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0 %

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Emission or Release Factor: Water : 100 %
 Emission or Release Factor: Soil : 0 %
 Local release rate: Water : 31 tonnes/day
 Local release rate: Soil : 0 kg/day

Technical conditions and measures / Organizational measures

Air : No specific measures required
 Remarks : Prevent environmental discharge consistent with regulatory requirements.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant
 Remarks : Not applicable

Conditions and measures related to external treatment of waste for disposal

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.
 Disposal methods : Dispose of as special waste in compliance with local and national regulations.

Conditions and measures related to external recovery of waste

Remarks : Not applicable

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics

Physical Form (at time of use) : Liquid substance
 Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Frequency and duration of use

Exposure duration : 12 h

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

None

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: CS114: Bulk transfers from tote tanks and supply vessels

Technical conditions and measures

Transfer via enclosed lines., Clear transfer lines prior to de-coupling.

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Organizational measures to prevent /limit releases, dispersion and exposure

Clear spills immediately.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CS45: Filling/ preparation of equipment from drums or containers.**Technical conditions and measures**

Use drum pumps or carefully pour from container.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid spillage when withdrawing pump.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CS115: Drilling mud (re-)formulation**Technical conditions and measures**

Handle substance within a closed system., Provide extraction ventilation at points where emissions occur.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure the ventilation system is regularly maintained and tested.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CS116: Drill floor operations**Conditions and measures related to personal protection, hygiene and health evaluation**

Use suitable eye protection., Wear suitable gloves tested to EN374., Wear suitable coveralls to prevent exposure to the skin., Wear rubber boots.

2.2 Contributing scenario controlling worker exposure for: CS117, CS138, CS111: Operation of solids filtering equipment, With potential for aerosol generation., elevated temperature**Technical conditions and measures**

Local exhaust ventilation, Provide extraction ventilation at points where emissions occur., Re-circulation of exhaust air is not recommended. (Effectiveness: 90 %)

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Organizational measures to prevent /limit releases, dispersion and exposure

Ensure the ventilation system is regularly maintained and tested.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CS120: Cleaning of solids filtering equipment**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure the ventilation system is regularly maintained and tested.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CS121: Treatment and disposal of filtered solids**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure the ventilation system is regularly maintained and tested.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CS2: Process sampling**Conditions and measures related to personal protection, hygiene and health evaluation**

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CSxx: In line injection of process chemicals by fixed dose pumping.**Conditions and measures related to personal protection, hygiene and health evaluation**

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CSxx: Application of process chemicals by pouring from a jug into systems.

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Technical conditions and measures

Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc.
Controlled ventilation means air is supplied or removed by a powered fan.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CSxx: Scale squeeze operations.**Conditions and measures related to personal protection, hygiene and health evaluation**

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CS39: Equipment cleaning and maintenance**Technical conditions and measures**

Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc.
Controlled ventilation means air is supplied or removed by a powered fan., Drain or remove substance from equipment prior to break-in or maintenance.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CS15, CS56, CS67: General exposures (closed systems), with sample collection, Storage**Technical conditions and measures**

Store substance within a closed system., Ensure dedicated sample points are provided., Avoid dip sampling.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection.

3. Exposure estimation and reference to its source**Environment**

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Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
ERC4	CHARM Model		Air			
			Freshwater			
			Freshwater sediment			
			Sea water		0,00539 mg/L	0,0539
			Marine sediment		0,000511 µg/kg dry weight (d.w.)	0,000013
			Sewage treatment plant			

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Remarks:

- Air
- No data available
- Freshwater
- Not applicable
- Freshwater sediment
- Not applicable
- Sewage treatment plant
- Not applicable

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
CS114	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,9 ppm	0,39
			Worker – dermal, long-term – systemic	1,78 mg/kg/d	0,09
CS45	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,9 ppm	0,39
			Worker – dermal, long-term – systemic	1,78 mg/kg/d	0,09
CS115	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,6 ppm	0,26
			Worker – dermal, long-term – systemic	0,442 mg/kg/d	0,022
CS116	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,5 ppm	0,65
			Worker – dermal, long-term – systemic	1,78 mg/kg/d	0,09
CS117, CS138, CS111	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,5 ppm	0,65
			Worker – dermal, long-term – systemic	1,78 mg/kg/d	0,09
CS120	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,3 ppm	0,63
			Worker – dermal, long-term – systemic	3,565 mg/kg/d	0,18
CS121	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,6 ppm	0,26
			Worker – dermal, long-term – systemic	0,442 mg/kg/d	0,022
CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,6 ppm	0,26
			Worker – dermal, long-term – systemic	0,442 mg/kg/d	0,022
CSxx	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,013 ppm	0,001
			Worker – dermal, long-term – systemic	0,442 mg/kg/d	0,022
CSxx	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,3 ppm	0,63
			Worker – dermal, long-term – systemic	3,565 mg/kg/d	0,178

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			term – systemic		
CSxx	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,5 ppm	0,65
			Worker – dermal, long-term – systemic	1,78 mg/kg/d	0,09
CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,3 ppm	0,63
			Worker – dermal, long-term – systemic	3,565 mg/kg/d	0,178
CS15, CS67, CS56	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,9 ppm	0,39
			Worker – dermal, long-term – systemic	1,78 mg/kg/d	0,089

CS114: Bulk transfers from tote tanks and supply vessels

CS45: Filling/ preparation of equipment from drums or containers.

CS115: Drilling mud (re-)formulation

CS116: Drill floor operations

CS117: Operation of solids filtering equipment

CS138: With potential for aerosol generation.

CS111: elevated temperature

CS120: Cleaning of solids filtering equipment

CS121: Treatment and disposal of filtered solids

CS2: Process sampling

CSxx: In line injection of process chemicals by fixed dose pumping.

CSxx: Application of process chemicals by pouring from a jug into systems.

CSxx: Scale squeeze operations.

CS39: Equipment cleaning and maintenance

CS15: General exposures (closed systems)

CS67: Storage

CS56: with sample collection

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Available hazard data do not enable the derivation of a DNEL for eye irritant effects. Risk management measures described will protect against acute exposure. Since exposures have been assessed on a task basis, exposure assessments will cover both long and short term exposures.

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario: **Use in Oil and Gas field drilling and production operations – Professional**

Main User Groups : **SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)**

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Sector of use	: SU 22 ,: Professional uses: Public domain (administration, education, entertainment, services, craftsmen), Onshore industries
Process category	: PROC1 : Use in closed process, no likelihood of exposure PROC2 : Use in closed, continuous process with occasional controlled exposure PROC3 : Use in closed batch process (synthesis or formulation) PROC4 : Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a : Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b : Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities
Environmental release category	: ERC8d : Wide dispersive outdoor use of processing aids in open systems
Further information	: Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.

2.1 Contributing scenario controlling environmental exposure for:ERC8d: Wide dispersive outdoor use of processing aids in open systems

Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):(MSafe) : 2.000

Frequency and duration of use

Continuous exposure : 30 days/year, Continuous process

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Emission or Release Factor: Air : 0,05 %
Emission or Release Factor: Water : 7 %
Emission or Release Factor: Soil : 0 %
Remarks : Release fraction to wastewater wide dispersive use
Local release rate: Water : 46,2 kg/day
Local release rate: Air : 0,33 kg/day
Local release rate: Soil : 0 kg/day

Technical conditions and measures / Organizational measures

Air : Not applicable
Water : Treat onsite wastewater (prior to receiving water discharge) to

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- Remarks : provide the required removal efficiency of \geq (%):
(Effectiveness: 87,4 %)
- Remarks : Bund storage facilities to prevent soil and water pollution in the event of spillage.
- Remarks : Prevent environmental discharge consistent with regulatory requirements.
- Remarks : Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
- Remarks : A leak prevention plan is needed to prevent low level continual releases.
- Remarks : Soil emission controls are not applicable as there is no direct release to soil.
- Remarks : Onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

- Type of Sewage Treatment Plant : Onsite sewage treatment plant
- Flow rate of sewage treatment plant effluent : 2.000 m3/d
- Remarks : Not applicable

Conditions and measures related to external treatment of waste for disposal

- Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.
- Disposal methods : Dispose of waste product or used containers according to local regulations.

Conditions and measures related to external recovery of waste

- Recovery Methods : Estimated amount entering waste treatment no greater than:
(Effectiveness: 0 %)
- Remarks : Not applicable

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics

- Physical Form (at time of use) : Liquid substance
- Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used

- Remarks : Not applicable

Frequency and duration of use

- Exposure duration : 12 h
- Remarks : Inhalation exposure, To scale from an exposure of 1-4 hours to 12 hours, multiply by 2.1
- Remarks : Dermal exposure, No corrections required as all exposure are assumed to be substance concentration of up to 100%.

Other operational conditions affecting workers exposure

- Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above

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ambient temperature, unless stated differently.

Technical conditions and measures

None

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: CS114: Bulk transfers from tote tanks and supply vessels**Technical conditions and measures**

Transfer via enclosed lines., Clear transfer lines prior to de-coupling., Clear spills immediately

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CS45: Filling/ preparation of equipment from drums or containers.**Technical conditions and measures**

Use drum pumps or carefully pour from container.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid spillage when withdrawing pump.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CS115: Drilling mud (re-)formulation**Technical conditions and measures**

Handle substance within a closed system., Provide extraction ventilation at points where emissions occur.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure the ventilation system is regularly maintained and tested.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CS116: Drill floor operations**Conditions and measures related to personal protection, hygiene and health evaluation**

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Use suitable eye protection., Wear suitable gloves tested to EN374., Wear suitable coveralls to prevent exposure to the skin., Wear rubber boots.

2.2 Contributing scenario controlling worker exposure for: CS117, CS138, CS111: Operation of solids filtering equipment, With potential for aerosol generation., elevated temperature
Technical conditions and measures

Provide extraction ventilation at points where emissions occur., Re-circulation of exhaust air is not recommended., Local exhaust ventilation (Effectiveness: 90 %)

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure the ventilation system is regularly maintained and tested.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CS120: Cleaning of solids filtering equipment
Technical conditions and measures

Provide extraction ventilation at points where emissions occur.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure the ventilation system is regularly maintained and tested.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CS121: Treatment and disposal of filtered solids
Technical conditions and measures

Provide extraction ventilation at points where emissions occur.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure the ventilation system is regularly maintained and tested.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CS2: Process sampling
Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

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2.2 Contributing scenario controlling worker exposure for: CSxx: In line injection of process chemicals by fixed dose pumping.**Conditions and measures related to personal protection, hygiene and health evaluation**

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CSxx: Application of process chemicals by pouring from a jug into systems.**Technical conditions and measures**

Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc.
Controlled ventilation means air is supplied or removed by a powered fan.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CSxx: Scale squeeze operations.**Conditions and measures related to personal protection, hygiene and health evaluation**

Wear suitable gloves tested to EN374., Use suitable eye protection.

2.2 Contributing scenario controlling worker exposure for: CS39: Equipment cleaning and maintenance**Technical conditions and measures**

Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc.
Controlled ventilation means air is supplied or removed by a powered fan., Drain or remove substance from equipment prior to break-in or maintenance.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 4 hours.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: CS15, CS67, CS56: General exposures (closed systems), Storage, with sample collection

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Technical conditions and measures

Store substance within a closed system., Ensure dedicated sample points are provided., Avoid dip sampling.

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection.

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
ERC8d	CHARM Model		Air		0,00882 µg/m ³	
			Freshwater		0,297 mg/L	0,297
			Freshwater sediment		1,35 mg/kg dry weight (d.w.)	0,338
			Sea water		0,0297 mg/L	0,297
			Marine sediment		0,135 mg/kg dry weight (d.w.)	0,338
			Sewage treatment plant		23,3 mg/L	0,117

ERC8d: Wide dispersive outdoor use of processing aids in open systems

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
CS114	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,9 ppm	0,39
			Worker – inhalation, long-term – systemic	1,78 mg/kg/d	0,09
CS45	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,9 ppm	0,39
			Worker – inhalation, long-term – systemic	1,78 mg/kg/d	0,09
CS115	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,6 ppm	0,26
			Worker – inhalation, long-term – systemic	0,422 mg/kg/d	0,022
CS116	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,5 ppm	0,65
			Worker – inhalation, long-term – systemic	1,78 mg/kg/d	0,09
CS117, CS138, CS111	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,5 ppm	0,65
			Worker – inhalation, long-term – systemic	1,78 mg/kg/d	0,09
CS120	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,3 ppm	0,63
			Worker – inhalation, long-term – systemic	3,565 mg/kg/d	0,18
CS121	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,6 ppm	0,26
			Worker – inhalation, long-term – systemic	0,442 mg/kg/d	0,022
CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,6 ppm	0,26

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			Worker – inhalation, long-term – systemic	0,442 mg/kg/d	0,022
CSxx			Worker – inhalation, long-term – systemic	0,013 ppm	0,001
			Worker – inhalation, long-term – systemic	0,442 mg/kg/d	0,022
CSxx	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,3 ppm	0,63
			Worker – dermal, long-term – systemic	3,565 mg/kg/d	0,178
CSxx	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,5 ppm	0,65
			Worker – dermal, long-term – systemic	1,78 mg/kg/d	0,09
CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,3 ppm	0,63
			Worker – inhalation, long-term – systemic	3,565 mg/kg/d	0,178
CS15, CS67, CS56	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,9 ppm	0,39
			Worker – inhalation, long-term – systemic	1,78 mg/kg/d	0,089

CS114: Bulk transfers from tote tanks and supply vessels

CS45: Filling/ preparation of equipment from drums or containers.

CS115: Drilling mud (re-)formulation

CS116: Drill floor operations

CS117: Operation of solids filtering equipment

CS138: With potential for aerosol generation.

CS111: elevated temperature

CS120: Cleaning of solids filtering equipment

CS121: Treatment and disposal of filtered solids

CS2: Process sampling

CSxx: In line injection of process chemicals by fixed dose pumping.

CSxx: Application of process chemicals by pouring from a jug into systems.

CSxx: Scale squeeze operations.

CS39: Equipment cleaning and maintenance

CS15: General exposures (closed systems)

CS67: Storage

CS56: with sample collection

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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Available hazard data do not enable the derivation of a DNEL for eye irritant effects. Risk management measures described will protect against acute exposure. Since exposures have been assessed on a task basis, exposure assessments will cover both long and short term exposures.

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.