

Proppant Carrier Fluid Data

Total Volume of Carrier Fluid (m ³)	150
% of Water Volume - fresh water	93%
% of Other Fluid Additives	7%
Proppant (kg)	20, 000 to 30,000

Proppant Carrier Products

Product Trade Names	Product Purpose in Well	Concentration per M ³	Volume	Supplier	MSDS Provided
B197	Surfactant	2 ltr	0.3m ³	Schlumberger	Yes
B232	Demulsifier	2 ltr	0.3m ³	Schlumberger	Yes
J564	Gelling Agent	7.6 ltr	1.14m ³	Schlumberger	Yes
B390	BODOXIN AE	0.5 ltr	0.075m ³	Schlumberger	Yes
J218	Breaker	0.601 kg	90.079kg	Schlumberger	Yes
B512	LGD Crosslinker	8 ltr	1.2m ³	Schlumberger	Yes
J475	Breaker	1.201 kg	180.159kg	Schlumberger	Yes
M117	Clay Control Agent	50.024 kg	7,503.611kg	Schlumberger	Yes

Proppant Carrier Constituents

Chemical Substance in Proppant Carrier Fluid	Chemical Abstract Service Number (CAS Number)	Maximum Chemical substance Mass % in Carrier Fluid	Presumed Hazardous or Non-hazardous (EA/WFD)	Basis of Assessment
Sodium hydroxide	1310-73-2	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Alkyl hydroxyethyl benzyl ammonium chloride	61789-68-2	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Propan-2-ol	67-63-0	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Diannonium peroxidisulphate	7727-54-0	<0.12	Non-Hazardous	Refer to JAGDAG Assessment*
2,2'2"-nitrilotriethanol	102-71-6	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
2-butoxyethanol	111-76-2	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Ethoxylated C11 linear/branched alcohols (7eo)	34398-01-1	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Alcohols, C12-15 linear, ethoxylated	68131-39-5	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
(Ethylenedioxy)dimenthanal	3586-55-8	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Patassium Chloride	7447-40-7	5.0	Non-Hazardous	Refer to JAGDAG Assessment*
Sorbitol	50-70-4	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Sodium chloride	7647-14-5	~2.0	Non-Hazardous	Refer to JAGDAG Assessment*
Guar gum	9000-30-0	<1.0	Non-Hazardous	Refer to JAGDAG Assessment*
Poly(tetrafluoroethylene)	9002-84-0	<0.001	Non-Hazardous	Refer to JAGDAG Assessment*
Magnesium silicate hydrate (talc)	14807-96-6	<0.001	Non-Hazardous	Refer to JAGDAG Assessment*
Vinylidene chloride/methylacrylate copolymer	25038-72-6	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Sodium Borate	1333-73-9	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Hydroxypropyl Cellulose	9004-64-2	<0.001	Non-Hazardous	Refer to JAGDAG Assessment*
Alkaline quaternary amonium bentonite	71011-24-0	<0.001	Non-Hazardous	refer to JAGDAG Assessment*

*Assessed using Methodology for the determination of hazardous substances for the purposes of the Groundwater Daughter Directive (2006/118EC), issued by the Joint Agencies Groundwater Directive Advisory Group ("JAGDAG") comprising the Environment Agency, the Scottish Environment Protection Agency, and the Northern Ireland Environment Agency, the Department of Environment, Food & Rural Affairs, Welsh Assembly Government, the Environmental Protection Agency Ireland, Health Protection Agency and industry representatives.

Notes:

All chemical substance data is consistent with the Material Safety Data Sheets (MSDS), which are provided with document number ER-EPRA-W1-FC-009.

Components (CAS No)	Components (Name)	Hazardous Classification	List I (hazardous)	List II (non-Hazardous)	Radioactive substance?	PBT substance? (REACH definition and TGD)	1) High B or High T (REACH/TGD and CLP)	2) vPvB substance? (REACH)	3) CMT substance (CLP)?	4) Is the substance very acutely toxic to aquatic biota? (LC50/EC50<0.1 mg/l)	5) persistent substance and potentially very toxic to human?	Echa data available	JAGDAG hazardous substance?	Comments
1310-73-2	Sodium hydroxide	Met. Corr. 1 (H290) Skin Corr. 1A (H314)	No	No	No	PBT doesn't apply it is inorganic	No	N/A	No	No	No	yes	Non-hazardous according JAGDAG's guidelines	Does not meet criteria for hazardous
61789-68-2	Alkyl hydroxyethyl benzyl ammonium chloride	Skin Corr. 1B (H314) Acute Tox. 4 (H302) Aquatic Acute 1 (H400)	No	No	No	No	No	No	No	No	No	No	Non-hazardous according report AmecFosterWheeler	
67-63-0	Propan-2-ol	Flam. Liq. 2. (H225) STOT SE 3 (H336) Eye Irrit. 2 (H319)	No	No	No	No	No	No	No	No	No	Yes	Non-hazardous according report AmecFosterWheeler	PLONOR
7727-54-0	Diammonium peroxodisulphate	STOT SE 3 (H336) Skin Irrit. 2 (H315) Ox. Sol. 3 (H272) Acute Tox. 4 (H302) Skin Sens. 1 (H317) Eye Irrit. 2 (H319) Resp. Sens. 1 (H334)	No	No	No	PBT doesn't apply it is inorganic	No	N/A	No	No	N/A	Yes	Non-hazardous according JAGDAG's guidelines	
102-71-6	2,2'-nitrioltriethanol	NC	No	No	No	No	No	No	No	No	No		Non-hazardous according JAGDAG's guidelines	
111-76-2	2-butoxyethanol	Acute Tox. 4 (H302) Acute Tox. 4 (H312) Acute Tox. 4 (H332) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319)	No	No	No	No	No	No	No	No	No	Yes	Non-hazardous according report AmecFosterWheeler	
34398-01-1	Ethoxylated C11 linear/branched alcohols (7eo)	Acute toxicity (Oral) Cat.4 (H302) Eye Dam. 1 (H318) Skin Irritation Cat. 2 (H315) Aquatic Chronic Cat. 2 (H411)	No	No	No	No	No	No	No	No	No	No	Non-hazardous	
68131-39-5	Alcohols, C12-15 linear, ethoxylated	Eye Dam. 1 (H318) Aquatic Acute. 1 (H400) Aquatic Chronic. 3 (H412)	No	No	No	No	No	No	No	No	No	Yes	Non-hazardous according report AmecFosterWheeler	
3586-55-8	(Ethylenedioxy)dimethanol	Acute Tox. 4; H302 Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Dam. 1; H318	No	No	No	No	No	No	No	No	No	No	Non-hazardous	
7447-40-7	Potassium Chloride	NC	No	No	No	PBT doesn't apply it is inorganic	No	N/A	No	No	N/A	Yes	Non-hazardous	PLONOR
50-70-4	Sorbitol	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	PLONOR
7647-14-5	Sodium chloride	NC	No	No	No	PBT doesn't apply it is inorganic	No	No	No	No	No	Yes	Non-hazardous	PLONOR
9000-30-0	Guar gum	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	PLONOR
9002-84-0	Poly(tetrafluoroethylene)	NC	No	No	No	No	No	Not known	No	No	No	No	Non-hazardous	
14807-96-6	Magnesium silicate hydrate (talc)	NC	No	No	No	PBT doesn't apply it is inorganic	No	No	No	No	No	No	Non-hazardous	
25038-72-6	Vinylidene chloride/methylacrylate copolymer	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	
1333-73-9	Sodium Borate	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	PLONOR
9004-64-2	Hydroxypropyl Cellulose	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	
71011-24-0	Alkaline quaternary amonium bentonite	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	

*ECHA data
NC: not classified
EA: UK Environmental Agency

Components (CAS No)	Components (Name)	Components in a EA letter	Hazardous Classification (Reg. 1272/2008)	List I (hazardous)	List II (non-Hazardous)	Radioactive substance?	PBT substance? (REACH definition and TGB)	1) High B or High T (REACH/TGD and CLP)	2) vPvB substance? (REACH)	3) CMT substance (CLP)?	4) Is the substance very acutely toxic to aquatic biota? (LC50/EC50 < 0.1 mg/l)	5) persistent substance and potentially very toxic to human?	Echa data available	JAGDAG hazardous substance?	Comments	Biaccumulation (Test Method Report Number)	Biodegradation @ 28 days (Test Method Report Number)	Algae Toxicity EC50 (72h) (Test Method Report Number)	Crustacean Toxicity LC50 (48h) (Test Method Report Number)	Fish Toxicity LC50 (96h) (Test Method Report Number)	REACH Reg. No
9002-84-0	Poly(tetrafluoroethylene)	Poly(tetrafluoroethylene)	NC*	No	No	No	No	No	Not known	No	No	No	No	Non-hazardous							
25038-72-6	Vinylidene chloride/methylacrylate copolymer	Vinylidene chloride/methylacrylate copolymer	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous		Log Pow <0 (OECD 107 1854DS)	8% (OECD 306 1855DS)	>1000mg/l (ISO/DIS 10253 1840DS)	>1000mg/l (ISO TC 147/S/CS/WG2 1841DS)	489mg/l (PARCOM 1995 1842DS)	
3586-55-8	(Ethylendioxy)dimethanol	Ethylendioxy dimethanol	Acute Tox. 4; H302 Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Dam. 1; H318	No	No	No	No	No	No	No	No	No	No	Non-hazardous		Log Pow 0 (OECD 117 R-084/04)	68% (OECD 306 R-084/04)	3.1mg/l (ISO/DIS 10253 R-084/04)	109mg/l (ISO TC 147/S/CS/WG2 R-003/01)	>100mg/l (PARCOM 1995 R-084/04)	
9000-30-0	Guar gum	Guar slurry	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	PLONOR	Substance listed on OSPAR Pose Little OR NO Risk (PLONOR) substance list					
102-71-6	2,2'-nitrioltriethanol	Stabiliser	NC	No	No	No	No	No	No	No	No	No	Non-hazardous according JAGDAG's guidelines		Log Pow -1.4 (OECD 107 0667DS)	20% (OECD 306 0668-DS)	2000mg/l (ISO 10253 1731DS)	3981mg/l (ISO/CD 14669 1732DS)	>1000mg/l (OSPARCOM 1995, Part B 1733DS)		
50-70-4	Sorbitol	Stabiliser	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	PLONOR	Substance listed on OSPAR Pose Little OR NO Risk (PLONOR) substance list					

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