

SAFETY DATA SHEET

according to Regulation (EC) No. 453/2010

DFS-XFL

Revision Date: 23-Sep-2015

Revision Number: 2

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

1.1. Product Identifier

Product Name DFS-XFL
Internal ID Code HM008124

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

Recommended Use Additive
Sector of use SU2 - Mining, (including offshore industries)
Product category PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents, other unspecific
Process categories PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises

1.3. Details of the supplier of the safety data sheet

Halliburton Energy Services
Halliburton House, Howemoss Place
Kirkhill Industrial Estate
Dyce
Aberdeen, AB21 0GN
United Kingdom

www.halliburton.com

For further information, please contact

E-Mail address: fdunexchem@halliburton.com

1.4. Emergency telephone number

+44 8 08 189 0979 / 1-760-476-3961

Emergency telephone - §45 - (EC)1272/2008	
Europe	112
Croatia	Centar za kontrolu otrovanja (CKO): (+385 1) 23-48-342 (Poison Control Center (PCC) - Institute for Medical Research and Occupational Health)
Cyprus	+210 7793777
Denmark	Poison Control Hotline (DK): +45 82 12 12 12
France	ORFILA (FR): + 01 45 42 59 59
Germany	Poison Center Berlin (DE): +49 030 30686 790
Italy	Poison Center, Milan (IT): +39 02 6610 1029
Netherlands	National Poisons Information Center (NL): +31 30 274 88 88 (NB: this service is only available to health professionals)
Norway	Poisons Information (NO): +47 22 591300
Poland	Poison Control and Information Centre, Warsaw (PL): +48 22 619 66 54; +48 22 619 08 97
Romania	+40 21 318 36 06
Spain	Poison Information Service (ES): +34 91 562 04 20
United Kingdom	NHS Direct (UK): +44 0845 46 47

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Serious Eye Damage / Eye Irritation	Category 2 - H319
-------------------------------------	-------------------

2.2. Label Elements**Hazard Pictograms****Signal Word****Warning****Hazard Statements**

H319 - Causes serious eye irritation

Precautionary Statements - EU (§28, 1272/2008)

P264 - Wash face, hands and any exposed skin thoroughly after handling

P280 - Wear protective gloves/protective clothing/eye protection/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

P337 + P313 - If eye irritation persists: Get medical advice/attention

Contains**Substances**

Sodium persulfate

Calcium chloride, dihydrate

Sodium thiosulfate

CAS Number

7775-27-1

10035-04-8

7772-98-7

2.3. Other Hazards

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on Ingredients**3.2. Mixtures****Mixture**

Substances	EINECS	CAS Number	PERCENT (w/w)	EU - CLP Substance Classification	REACH No.
Sodium persulfate	231-892-1	7775-27-1	0.1 - 1%	Acute Tox. 4 (H302) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Resp. Sens. 1 (H334) Skin Sens. 1 (H317) STOT SE 3 (H335) Ox. Sol. 3 (H272)	01-2119495975-15
Calcium chloride, dihydrate	233-140-8	10035-04-8	30 - 60%	Eye Irrit. 2A (H319)	01-2119494219-28
Sodium thiosulfate	231-867-5	7772-98-7	1 - 5%	STOT SE 3 (H335)	No data available

For the full text of the H-phrases mentioned in this Section, see Section 16**SECTION 4: First aid measures****4.1. Description of first aid measures****Inhalation**

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Skin

Wash with soap and water.

Ingestion

Under normal conditions, first aid procedures are not required.

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

Causes eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician

Treat symptomatically

SECTION 5: Firefighting Measures**5.1. Extinguishing media****Suitable Extinguishing Media**

All standard fire fighting media

Extinguishing media which must not be used for safety reasons

None known.

5.2. Special hazards arising from the substance or mixture**Special Exposure Hazards**

Not applicable.

5.3. Advice for firefighters**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

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

Use appropriate protective equipment. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.

See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

6.4. Reference to other sections

See Section 8 and 13 for additional information.

SECTION 7: Handling and Storage**7.1. Precautions for Safe Handling**

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Ensure adequate ventilation. Use appropriate protective equipment. Wash hands after use. Launder contaminated clothing before reuse.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Store away from oxidizers. Store in a cool well ventilated area. Keep container closed when not in use. Product has a shelf life of 24 months.

7.3. Specific End Use(s)**Exposure Scenario**

No information available

Other Guidelines

No information available

SECTION 8: Exposure Controls/Personal Protection**8.1. Control parameters****Exposure Limits**

Substances	CAS Number	EU	UK	Netherlands	France
Sodium persulfate	7775-27-1	Not applicable	2 mg/m ³	1 mg/m ³	Not applicable
Calcium chloride, dihydrate	10035-04-8	Not applicable	10 mg/m ³	Not applicable	Not applicable
Sodium thiosulfate	7772-98-7	Not applicable	Not applicable	Not applicable	Not applicable

Substances	CAS Number	Germany	Spain	Portugal	Finland
Sodium persulfate	7775-27-1	Not applicable	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	Not applicable
Calcium chloride, dihydrate	10035-04-8	Not applicable	Not applicable	Not applicable	Not applicable
Sodium thiosulfate	7772-98-7	Not applicable	Not applicable	Not applicable	Not applicable

Substances	CAS Number	Austria	Ireland	Switzerland	Norway
Sodium persulfate	7775-27-1	Not applicable	0.1 mg/m ³ TWA 0.3 mg/m ³ STEL (calculated)	Not applicable	TWA: 2 mg/m ³ STEL: 4 mg/m ³
Calcium chloride, dihydrate	10035-04-8	Not applicable	Not applicable	Not applicable	Not applicable
Sodium thiosulfate	7772-98-7	Not applicable	Not applicable	Not applicable	Not applicable

Substances	CAS Number	Italy	Poland	Hungary	Czech Republic
Sodium persulfate	7775-27-1	Not applicable	Not applicable	Not applicable	Not applicable
Calcium chloride, dihydrate	10035-04-8	Not applicable	Not applicable	Not applicable	TWA: 5 mg/m ³
Sodium thiosulfate	7772-98-7	Not applicable	Not applicable	Not applicable	Not applicable

Substances	CAS Number	Denmark	Romania	Croatia	Cyprus
Sodium persulfate	7775-27-1	TWA: 2 mg/m ³	Not applicable	Not applicable	Not applicable
Calcium chloride, dihydrate	10035-04-8	Not applicable	Not applicable	Not applicable	Not applicable
Sodium thiosulfate	7772-98-7	Not applicable	Not applicable	Not applicable	Not applicable

Derived No Effect Level (DNEL)

No information available.

Worker

Substances	Long-term exposure - systemic effects, Inhalation	Acute / short term exposure - systemic effects, Inhalation	Long-term exposure - local effects, Inhalation	Acute / short term exposure - local effects, Inhalation	Long-term exposure - systemic effects, Dermal	Acute / short term exposure - systemic effects, Dermal	Long-term exposure - local effects, Dermal	Acute / short term exposure - local effects, Dermal	Hazards for the eyes - local effects
Sodium persulfate	2.06 mg/m ³	590 mg/m ³	2.06 mg/m ³	Not available	18.2 mg/kg bw/day	400 mg/kg bw/day	0.102 mg/cm ²	2.248 mg/cm ²	Not available
Calcium chloride, dihydrate	Not available	Not available	5 mg/m ³	10 mg/m ³	Not available	Not available	Not available	Not available	Not available

General Population

Substances	Long-term exposure - systemic effects, Inhalation	Acute / short term exposure - systemic effects, Inhalation	Long-term exposure - local effects, Inhalation	Acute / short term exposure - local effects, Inhalation	Long-term exposure - systemic effects, Dermal	Acute / short term exposure - systemic effects, Dermal	Long-term exposure - local effects, Dermal	Acute / short term exposure - local effects, Dermal	Long-term exposure - systemic effects, Oral	Acute / short term exposure - local effects, Oral	Hazards for the eyes - local effects
Sodium persulfate	1.03 mg/m ³	295 mg/m ³	1.03 mg/m ³	295 mg/m ³	9.1 mg/kg bw/day	200 mg/kg bw/day	0.051 mg/cm ²	1.124 mg/cm ²	9.1 mg/kg bw/day	30 mg/kg bw/day	Not available
Calcium chloride, dihydrate	Not available	Not available	2.5 mg/m ³	5 mg/m ³	Not available	Not available	Not available	Not available	Not available	Not available	Not available

Predicted No Effect Concentration (PNEC)

No information available.

Substances	Freshwater	Marine water	Intermittent release	Sewage treatment plant	Sediment (freshwater)	Sediment (marine water)	Air	Soil	Secondary poisoning
Sodium persulfate	0.0763 mg/L	0.011 mg/L	0.763 mg/L	3.6 mg/L	0.275 mg/kg sediment dw	0.0396 mg/kg sediment dw	Not available	0.015 mg/kg soil dw	No potential for bio-accumulation

8.2. Exposure controls**Engineering Controls**

Use in a well ventilated area.

Personal protective equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

Not normally necessary.

Hand Protection

Nitrile gloves.

Skin Protection

Not normally necessary.

Eye Protection

Wear safety glasses or goggles to protect against exposure.

Other Precautions

None known.

Environmental Exposure Controls Do not allow material to contaminate ground water system

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid **Color:** White to light straw
Odor: Characteristic **Odor Threshold:** No information available

Property Remarks/ - Method	Values
pH:	9
Freezing Point/Range	No data available
Melting Point/Range	No data available
Boiling Point/Range	No data available
Flash Point	No data available
Flammability (solid, gas)	No data available
upper flammability limit	No data available
lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	1
Water Solubility	Soluble in water
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

VOC Content (%) No data available

SECTION 10: Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical Stability

Stable

10.3. Possibility of Hazardous Reactions

Will Not Occur

10.4. Conditions to Avoid

None anticipated

10.5. Incompatible Materials

Strong oxidizers.

10.6. Hazardous Decomposition Products

Oxides of nitrogen. Oxides of phosphorus. Carbon monoxide and carbon dioxide.

SECTION 11: Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity

Inhalation	May cause respiratory irritation.
Eye Contact	Causes eye irritation.
Skin Contact	May cause mild skin irritation.
Ingestion	Irritation of the mouth, throat, and stomach.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium persulfate	7775-27-1	895 mg/kg (Rat) 1200 mg/kg 930 mg/kg 1000 mg/kg	> 10000 mg/kg (Rat)	19.0 mg/L (Rat) 4h > 5.1 mg/L (Rat) 4h

		920 mg/kg		
Calcium chloride, dihydrate	10035-04-8	2301 mg/kg (Rat)	> 5000 mg/kg (Rabbit)	No data available
Sodium thiosulfate	7772-98-7	> 2000 mg/kg (Rat) (similar substance)	> 2000 mg/kg (Rat) (similar substance)	> 2.6 mg/L (Rat) 4h (similar substance)

Substances	CAS Number	Skin corrosion/irritation
Sodium persulfate	7775-27-1	Causes skin irritation. (Rabbit)
Calcium chloride, dihydrate	10035-04-8	Causes mild skin irritation (Rabbit)
Sodium thiosulfate	7772-98-7	Non-irritating to the skin (Rabbit) (similar substances)

Substances	CAS Number	Eye damage/irritation
Sodium persulfate	7775-27-1	Causes severe eye irritation. (Rabbit)
Calcium chloride, dihydrate	10035-04-8	May cause moderate to severe eye irritation. (Rabbit)
Sodium thiosulfate	7772-98-7	Non-irritating to the eye (Rabbit) (similar substances)

Substances	CAS Number	Skin Sensitization
Sodium persulfate	7775-27-1	Skin sensitizer in guinea pig.
Calcium chloride, dihydrate	10035-04-8	No data of sufficient quality are available.
Sodium thiosulfate	7772-98-7	Did not cause sensitization on laboratory animals (mouse) (similar substances)

Substances	CAS Number	Respiratory Sensitization
Sodium persulfate	7775-27-1	May cause sensitization by inhalation
Calcium chloride, dihydrate	10035-04-8	No information available
Sodium thiosulfate	7772-98-7	No information available

Substances	CAS Number	Mutagenic Effects
Sodium persulfate	7775-27-1	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects.
Calcium chloride, dihydrate	10035-04-8	In vitro tests did not show mutagenic effects
Sodium thiosulfate	7772-98-7	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects. (similar substances)

Substances	CAS Number	Carcinogenic Effects
Sodium persulfate	7775-27-1	Did not show carcinogenic effects in animal experiments (similar substances)
Calcium chloride, dihydrate	10035-04-8	No information available.
Sodium thiosulfate	7772-98-7	Did not show carcinogenic effects in animal experiments (similar substances)

Substances	CAS Number	Reproductive toxicity
Sodium persulfate	7775-27-1	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)
Calcium chloride, dihydrate	10035-04-8	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.
Sodium thiosulfate	7772-98-7	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)

Substances	CAS Number	STOT - single exposure
Sodium persulfate	7775-27-1	May cause respiratory irritation.
Calcium chloride, dihydrate	10035-04-8	No significant toxicity observed in animal studies at concentration requiring classification.
Sodium thiosulfate	7772-98-7	No significant toxicity observed in animal studies at concentration requiring classification. (similar substances)

Substances	CAS Number	STOT - repeated exposure
Sodium persulfate	7775-27-1	No significant toxicity observed in animal studies at concentration requiring classification.
Calcium chloride, dihydrate	10035-04-8	No significant toxicity observed in animal studies at concentration requiring classification.
Sodium thiosulfate	7772-98-7	No significant toxicity observed in animal studies at concentration requiring classification. (similar substances)

Substances	CAS Number	Aspiration hazard
Sodium persulfate	7775-27-1	Not applicable
Calcium chloride, dihydrate	10035-04-8	Not applicable
Sodium thiosulfate	7772-98-7	Not applicable

SECTION 12: Ecological Information

12.1. Toxicity Ecotoxicity Effects

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Sodium persulfate	7775-27-1	EC50 (72h) 116 mg/L (biomass) (Pseudokirchnerella subcapitata)	LC50 (96h) 163 mg/L (Oncorhynchus mykiss)	EC10 (18h) 36 mg/L (Pseudomonas putida)	EC50 (48h) 133 mg/L (Daphnia magna)
Calcium chloride, dihydrate	10035-04-8	EC50 (72h) 2900 mg/L (Pseudokirchnerella subcapitata) EC50 (72h) >4000 mg/L (Pseudokirchnerella subcapitata)	LC50 (96h) 4630 mg/L (Pimephales promelas)	NOEC 2000 mg/L (Activated sludge, industrial)	EC50 (48h) 1285 mg/L (Daphnia magna) EC16 (21d) 320 mg/L (Daphnia magna) ErC50 (21d) 610 mg/L (Daphnia magna) LC50 (48h) 1285 mg/L (Daphnia magna) LC50 (48h) 2400 mg/L (Daphnia magna)
Sodium thiosulfate	7772-98-7	EC50 (72h) > 100 mg/L (Pseudokirchnerella subcapitata) (similar substance)	LC50 (96h) 770 mg/L (Oncorhynchus mykiss) (similar substance)	No information available	LC50 (72h) 77 mg/L (Americamysis bahia) (similar substance) EC50 (48h) 230 mg/L (Daphnia magna) (similar substance) NOEC (21d) > 10 mg/L (Daphnia magna) (similar substance)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Sodium persulfate	7775-27-1	The methods for determining biodegradability are not applicable to inorganic substances.
Calcium chloride, dihydrate	10035-04-8	The methods for determining biodegradability are not applicable to inorganic substances.
Sodium thiosulfate	7772-98-7	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Substances	CAS Number	Log Pow
Sodium persulfate	7775-27-1	No information available
Calcium chloride, dihydrate	10035-04-8	No information available
Sodium thiosulfate	7772-98-7	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Sodium persulfate	7775-27-1	No information available
Calcium chloride, dihydrate	10035-04-8	No information available
Sodium thiosulfate	7772-98-7	No information available

12.5. Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

Substances	PBT and vPvB assessment
Sodium persulfate	Not applicable
Calcium chloride, dihydrate	Not applicable
Sodium thiosulfate	Not applicable

12.6. Other adverse effects

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Disposal Method

Contaminated Packaging

Disposal should be made in accordance with federal, state, and local regulations.
Follow all applicable national or local regulations.

SECTION 14: Transport Information

IMDG/IMO

UN Number:	Not restricted
UN Proper Shipping Name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

RID

UN Number:	Not restricted
UN Proper Shipping Name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

ADR

UN Number:	Not restricted
UN Proper Shipping Name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

IATA/ICAO

UN Number:	Not restricted
UN Proper Shipping Name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

14.1. UN Number: Not restricted

14.2. UN Proper Shipping Name: Not restricted

14.3. Transport Hazard Class(es): Not applicable

14.4. Packing Group: Not applicable

14.5. Environmental Hazards: Not applicable

14.6. Special Precautions for User: None

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory Information

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

International Inventories

EINECS Inventory

US TSCA Inventory

Canadian DSL Inventory

This product does not comply with EINECS
All components listed on inventory or are exempt.
Product contains one or more components not listed on the inventory.

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

Germany, Water Endangering Classes (WGK)

Not determined.

15.2. Chemical Safety Assessment

No information available

SECTION 16: Other Information**Full text of H-Statements referred to under sections 2 and 3**

H272 - May intensify fire; oxidizer

H302 - Harmful if swallowed

H315 - Causes skin irritation

H317 - May cause an allergic skin reaction

H319 - Causes serious eye irritation

H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled

H335 - May cause respiratory irritation

Key or legend to abbreviations and acronyms

bw – body weight

CAS – Chemical Abstracts Service

CLP – REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Classification, Labelling and Packaging of substances and mixtures

EC – European Commission

EC10 – Effective Concentration 10%

EC50 – Effective Concentration 50%

EEC – European Economic Community

ErC50 – Effective Concentration growth rate 50%

IBC Code – International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk

LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%

LL0 – Lethal Loading 0%

LL50 – Lethal Loading 50%

MARPOL – International Convention for the Prevention of Pollution from Ships

mg/kg – milligram/kilogram

mg/L – milligram/liter

NIOSH – National Institute for Occupational Safety and Health

NOEC – No Observed Effect Concentration

NTP – National Toxicology Program

OEL – Occupational Exposure Limit

PBT – Persistent Bioaccumulative and Toxic

PC – Chemical Product category

PEL – Permissible Exposure Limit

ppm – parts per million

PROC – Process category

REACH – REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals

STEL – Short Term Exposure Limit

SU – Sector of Use category

Key literature references and sources for datawww.ChemADVISOR.com/**Revision Date:** 23-Sep-2015**Revision Note**

SDS sections updated: 1

This safety data sheet complies with the requirements of Regulation (EC) No. 453/2010**Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet