Safety Data Sheet
DriFlow 20

SECTION 1: Identification

1.1 Product identifier

Product name	DriFlow 20
Product number	DF20

1.3 Recommended use of the chemical and restrictions on use

Friction reducing.

1.4 Supplier's details

Name	Downhole Chemical Solutions
Address	1 Cowboys Way #572 Frisco, Texas 75034
Telephone	469-466-1100

1.5 Emergency phone number(s)

1-888-255-3924 US (ChemTel)
1-813-248-0585 International (ChemTel)

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with: (US) OSHA (29 CFR 1910.1200)

Combustible Dust 1

2.2 GHS label elements, including precautionary statements

Pictogram

Signal word : WARNING

Hazard statement(s)
May form combustible dust concentrations in air.

Precautionary statement(s)
Advice; Forms slippery/greasy layers with water.
Potential environmental effects; 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.

2.3 Other hazards which do not result in classification
Slip hazard from spills

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components	
Adipic Acid (CAS# 124-04-9)	**≦ 2.5%**
Sulfamic Acid (CAS# 5329-14-6)	**≦ 2.5%**

Trade secret statement (OSHA 1910.1200(i))
*The specific chemical identities and/or actual concentrations or actual concentration ranges for one or more listed components are being withheld as trade secrets under the US regulation 29 CFR 1910.1200(i).

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

General advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
If inhaled	No hazards which require special first aid measures. Remove to fresh air.
In case of skin contact	Wash with plenty of water for at least 15 minutes. Call a poison center or doctor if irritation develops or persists. Take off contaminated clothing and wash it before reuse.
In case of eye contact	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center or doctor if you feel unwell.
If swallowed	Call a poison center or doctor if you feel unwell. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms/effects, acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11

4.3 Indication of immediate medical attention and special treatment needed, if necessary
No data available.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Specific hazards arising from the chemical
Dust may form explosive mixtures in air

5.3 Special protective actions for fire-fighters
Wear self contained breathing apparatus for firefighting if necessary.
Use NIOSH/MSHA approved respiratory protection.

Further information
Use water spray to cool unopened containers. Spills produce extremely slippery surfaces.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Warning: Do not touch or walk through spilled material. Spills can create very slippery surfaces. Wear respiratory protection if necessary. Ensure adequate ventilation. Evacuate personnel to safe areas. For personal protection see section 8.

6.2 Environmental precautions
Do not contaminate water

6.3 Methods and materials for containment and cleaning up
Stop leak if you can do it without risk. Sweep up and shovel into suitable containers for disposal.

Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Surfaces are very slippery from this product. Do not swallow. Do not breathe dust. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. See Section 8 for information on Personal Protective Equipment.

7.2 Conditions for safe storage, including any incompatibilities
Storage Temperature 40F - 90F

Unsuitable Materials : To avoid product degradation and equipment corrosion, do not use iron, copper, or aluminum containers or equipment. Avoid strong oxidizing agents.

Specific end use(s)
Apart from the uses mentioned in section 1 no other specific uses are stipulated. Stable under recommended storage conditions.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Adipic Acid : 5 mg/m3 (8 Hours)

8.2 Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands and face before breaks and immediately after handling the product. Avoid contact with skin and eyes. Do not breathe dust. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Handle in accordance with good industrial hygiene and safety practice.

Eye/face protection

Safety glasses with side shields or goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear protective gloves, such as PVC or other plastic material. Consult manufacturer specifications for further information.

Body protection

Wear protective clothing. Clothing with full length sleeves and pants should be worn. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

In case of inadequate ventilation wear respiratory protection. (filter P2)

Thermal hazards

No data available.

Environmental exposure controls

Do not let product enter drains.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form (physical state, color, etc.)	White Solid
Odor	Odorless
Odor threshold	
pH	2.5 - 4.5 (5 g/L)
Melting point/freezing point	> 100°C
Initial boiling point and boiling range	Not applicable
Flash point	
Evaporation rate	Not applicable
Flammability (solid, gas)	No data available.
Upper/lower flammability limits	No data available.
Upper/lower explosive limits	No data available.
Vapor pressure	Not applicable
Vapor density	No data available.
Density	
Relative density	0.6 - 0.9
Solubility(ies)	Water: dispersible
Partition coefficient: n-octanol/water	< 0
Auto-ignition temperature	No data available.
Decomposition temperature	> 200C
Viscosity	No data available.
Explosive properties	Not expected to be explosive based on the chemical structure. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration.
Charge	Cationic
Oxidizing properties	The substance or mixture is not classified as oxidizing

Other safety information

No data available.

SECTION 10: Stability and reactivity

10.1 Reactivity
No dangerous reaction known under conditions of normal use.

10.2 Chemical stability
Stable under normal storage conditions.

10.3 Possibility of hazardous reactions
No data available.

10.4 Conditions to avoid
Avoid alkaline conditions which will degrade the polymer

10.5 Incompatible materials
Strong oxidizing agent

10.6 Hazardous decomposition products
Thermal decomposition may produce: carbon oxides, ammonia, nitrogen oxides

SECTION 11: Toxicological information

Information on toxicological effects

Acute oral toxicity
Conclusion: The acute toxicological results displayed may not be the results of actual testing of this material but based on a similar tested material.
Acute toxicity estimate LD50/oral/rat /> 5,000 mg/kg

Skin corrosion/irritation
Acute toxicity estimate/> 5,000 mg/kg

Serious eye damage/irritation
Information on the product as supplied:
May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Respiratory or skin sensitization
Information on the product as supplied:
Not sensitizing

Germ cell mutagenicity
Conclusion: Based on available data, the classification criteria are not met.

Carcinogenicity
Based on available data, the classification criteria are not met.

Relavent information for the hazardous components

Adipic Acid

Acute oral toxicity	LD50/oral/rat = 5560 mg/kg (OECD 401)
Acute dermal toxicity	LD0/dermal/rabbit >= 3176 mg/kg
Acute Inhalation toxicity	LC0/inhalation/4hours/rat > 7.7 mg/L (OECD 403)
Skin Corrosion/Irritation	Slightly Irritating
Serious Eye Damage/eye irritation	Not irritating (OECD 405)(SNF)

Respiratory/Skin Sensitization	Not Sensitizing
Mutagenicity	negative in the Ames Test (OECD 471). Negative in the In Vitro Mammalian Cell Gene Mutation Test (OECD 476)
Carcinogenicity	Carcinogenicity study in rat : NOAEL > 750 mg/kg/day
Reproductive Toxicity	NOAEL/maternal toxicity/rat >=288 mg/kg/day NOAEL/Developmental toxicity/rat >=288 mg/kg/day
STOT - Single exposure	No known effects
STOT - Repeated exposure	No known effects
Aspiration Hazard	No know effects

Sulfamic Acid

Acute oral toxicity	LD50/oral/rat = 2065 - 2140 mg/kg (OECD 401)
Acute dermal toxicity	LD0/dermal/rabbit >= 2000 mg/kg
Acute Inhalation toxicity	Not expected to be toxic by inhalation
Skin Corrosion/Irritation	Not Irritating
Serious Eye Damage/eye irritation	Moderately irritating to the eyes (EPA OPPTS 870.2400))
Respiratory/Skin Sensitization	Not expected to be sensitizing
Mutagenicity	negative in the Ames Test (OECD 471). Negative in the In Vitro Mammalian Cell Gene Mutation Test (OECD 476)
Carcinogenicity	Based on the absence of mutagenicity, it is unlikely that the substance is carcinogenic
Reproductive Toxicity	NOAEL/maternal toxicity/rat >=200 mg/kg/day NOAEL/Developmental toxicity/rat >=200 mg/kg/day
STOT - Single exposure	No known effects
STOT - Repeated exposure	No known effects
Aspiration Hazard	No know effects

SECTION 12: Ecological information

Toxicity

Information on the product as supplied

Acute Toxicity to Fish	LC50/Danio rerio/96 hours = 10 /mg/L (OECD 203)
Acute Toxicity to Invertebrates	EC50/Daphnia magna/48 hours = 50 mg/L (OECD 202)
Acute Toxicity to Algae	Algal inhibition tests are not appropriate. The flocculation characteristics of the product integers directly in the test medium preventing homogenous distribution which invalidates test.
Chronic Toxicity to Fish	No data available.
Chronic Toxicity to Invertebrates	No data available.
Toxicity to Microorganisms	No data available.
Effects on Terrestrial Organisms	No data available.
Sediment Toxicity	No data available.

Relevant information on the hazardous components

Adipic Acid

Acute Toxicity to Fish	LC50/Danio rerio/96 hours = 1000 /mg/L (OECD 203)
Acute Toxicity to Invertebrates	EC50/Daphnia magna/48 hours = 46 mg/L (OECD 202)
Acute Toxicity to Algae	IC50/Selenastrum capricornutum/72 hours = 59 mg/L (OECD 201)
Chronic Toxicity to Fish	No data available.
Chronic Toxicity to Invertebrates	NOEC/Daphnia magna/21 days = 6.3 mg/L (OECD 211)
Toxicity to Microorganisms	EC50/activated sludge/3 hours = 4747 mg/L (OECD 209)
Effects on Terrestrial Organisms	No data available.
Sediment Toxicity	No data available.

Sulfamic Acid

Acute Toxicity to Fish	LC50/Pimephales promelas/96 hours = 70.3 /mg/L (OECD 203)
Acute Toxicity to Invertebrates	EC50/Daphnia magna/48 hours = 71.6 mg/L (OECD 202)
Acute Toxicity to Algae	IC50/Selenastrum capricornutum/72 hours = 48 mg/L (OECD 201)
Chronic Toxicity to Fish	NOEC/Danio rerio/34 days >= 60 mg/L (OECD 211)
Chronic Toxicity to Invertebrates	NOEC/Daphnia magna/21 days = 19 mg/L (OECD 211)
Toxicity to Microorganisms	EC50/activated sludge/3 hours = 200 mg/L (OECD 209)
Effects on Terrestrial Organisms	No data available.
Sediment Toxicity	No data available.

Persistence and degradability

Information on the Product as Supplied

Degradation:	Readily biodegradable
Hydrolysis	At natural pHs (>6) the polymer degrades due to hydrolysis to more than 70% in 28 days. The hydrolysis products are mot harmful to aquatic organisms.
Photolysis	No data Available.

Relevant information on the hazardous components

Adipic Acid

Degradation:	Readily biodegradable. 70% 28 Days (OECD 301 D)
Hydrolysis	Does not hydrolyze
Photolysis	Half-life (indirect photolysis): = 2.9 days

Sulfamic Acid

Degradation:	Not relavent. (Inorganic)
Hydrolysis	Does not hydrolyze

Photolysis	No data available

Bioaccumulative potential
Information on the product as supplied

The product is not expected to bioaccumulate

Partition co-efficient (LOG POW)	< 0
Bioconcentration factor (BCF)	No data available

Relevant information on the hazardous components

Adipic Acid

Partition co-efficient (LOG POW)	0.093 @ 25C, pH 3.3
Bioconcentration factor (BCF)	No data available

Sulfamic Acid

Partition co-efficient (LOG POW)	< 4.34 @ 20C
Bioconcentration factor (BCF)	No data available

Mobility in soil
Information on the product as supplied
No data available on product or hazardous components

Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

SECTION 13: Disposal considerations

Disposal of the product
Disposal should be in accordance with applicable Federal, State and local laws and regulations. Local regulations may be more stringent than State or Federal requirements.

Disposal of contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
Not classified

IMDG
Not classified

IATA
Not classified

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Contains one or more of the listed substances

California Prop. 65 Components
WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. (< 0.05%)
Chemical name: Acrylamide
CAS number: 79-06-1

WARNING! This product contains a chemical known to the State of California to cause cancer.
Chemical name: Acrylamide
CAS number: 79-06-1

Relevant information on the hazardous components

Adipic Acid

Clean Water Act
Section 311 Hazardous Substances (40 CFR 117.3) - Reportable Quantity: 5000 lbs

CERCLA
Hazardous Substances List (40 CFR 302.4) - Reportable Quantity: 5000 lbs

HMIS Rating

HMIS RATINGS (Hazardous Materials Identification System)	
HEALTH	**0**
FLAMMABILITY	**1**
REACTIVITY	**1**
PERSONAL PROTECTION	**B**

SECTION 16: Other information

16.1 Further information/disclaimer
DISCLAIMER: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigation to determine the suitability of information for their particular purposes. In no event shall Downhole Chemical Solutions be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, whatsoever arising, even if Downhole Chemical Solutions has been advised of the possibility of such damages.