SECTION 1: IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY/UNDERTAKING.

1.1 Product identifier.

Product Name: Methanesulfonyl Chloride
Product Code: 116280
Chemical Name: Methanesulfonyl Chloride
CAS No: 124-63-0
EC No: 204-706-1
Registration No: N/D

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

For manufacturing, processing, laboratory or repacking use only

Uses advised against:
Uses other than those recommended.

1.3 Details of the supplier of the safety data sheet.

Company: DC FINE CHEMICALS Ltd.
Address: Hill Top, 88
City: NW11 6DY London (United Kingdom)
Telephone: +44 (20) 7586 6800
Fax: +44 (20) 7504 1701
E-mail: info@dcfinechemicals.com
Web: www.dcfinechemicals.com

1.4 Emergency telephone number: (Only available during office hours)

SECTION 2: HAZARDS IDENTIFICATION.

2.1 Classification of the substance.

In accordance with Regulation (EU) No 1272/2008:
Acute Tox. 2 : Fatal if inhaled.
Acute Tox. 4 : Harmful in contact with skin.
Acute Tox. 4 : Harmful if swallowed or in contact with skin.
Aquatic Chronic 3 : Harmful to aquatic life with long lasting effects.
Skin Corr. 1B : Causes severe skin burns and eye damage.
STOT SE 3 : May cause respiratory irritation.

2.2 Label elements.

Labelling in accordance with Regulation (EU) No 1272/2008:

Pictograms:

Signal Word: Danger

H statements:
H302+H312 Harmful if swallowed or in contact with skin.
H314 Causes severe skin burns and eye damage.
H330 Fatal if inhaled.
H335 May cause respiratory irritation.
H412 Harmful to aquatic life with long lasting effects.

P statements:
P273 Avoid release to the environment.

-Continued on next page.-
SAFETY DATA SHEET
(in accordance with Regulation (EU) 2015/830)

116280-Methanesulfonyl Chloride

Version: 2
Revision date: 20/04/2016
Print date: 20/04/2016

Contains:
Methanesulfonyl Chloride

2.3 Other hazards.
In normal use conditions and in its original form, the product itself does not involve any other risk for health and the environment. PBT Substance (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative).

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS.

3.1 Substances.
Chemical Name: [2] [3] Methanesulfonyl Chloride
CAS No: 124-63-0
CE No: 204-706-1
Registration No: N/D
[2] PBT Substance (Persistent, Bioaccumulative and Toxic.).
[3] vPvB Substance (very Persistent and very Bioaccumulative).

3.2 Mixtures.
Not Applicable.

SECTION 4: FIRST AID MEASURES.

4.1 Description of first aid measures.
In case of doubt or when symptoms of feeling unwell persist, get medical attention. Never administer anything orally to persons who are unconscious.

Inhalation.
If breathing is irregular or stops, perform artificial respiration. Do not administer anything orally. If unconscious, place them in a suitable position and seek medical assistance.

Eye contact.
If wearing contact lenses, remove them. Wash eyes with plenty of clean and cool water for at least 10 minutes while pulling eyelids up, and seek medical assistance.

Skin contact.
Remove contaminated clothing. Wash skin vigorously with water and soap or a suitable skin cleaner. NEVER use solvents or thinners.

Ingestion.
If accidentally ingested, seek immediate medical attention. Keep calm. NEVER induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed.
Very Toxic Product, accidental contact may result in serious respiratory difficulties, alteration of the central nervous system and in extreme cases, unconsciousness. Immediate medical assistance is required.

4.3 Indication of any immediate medical attention and special treatment needed.
In case of doubt or when symptoms of feeling unwell persist, get medical attention. Never administer anything orally to persons who are unconscious.

SECTION 5: FIREFIGHTING MEASURES.

The product is NOT classified as flammable, in case of fire the following measures should be taken:

5.1 Extinguishing media.
Recommended extinguishing methods.
Extinguisher powder or CO₂. In case of more serious fires, also alcohol-resistant foam and water spray. Do not use a direct stream of water to extinguish.

5.2 Special hazards arising from the substance.
Special risks.
Fire can cause thick, black smoke. As a result of thermal decomposition, dangerous products can form: carbon monoxide, carbon dioxide. Exposure to combustion or decomposition products can be harmful to your health.

5.3 Advice for firefighters.
Use water to cool tanks, cisterns, or containers close to the heat source or fire. Take wind direction into account. Prevent the products used to fight the fire from going into drains, sewers, or waterways.
Fire protection equipment.
According to the size of the fire, it may be necessary to use protective suits against the heat, individual breathing equipment, gloves, protective goggles or facemasks, and gloves.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

6.1 Personal precautions, protective equipment and emergency procedures.
For exposure control and individual protection measures, see section 8.

6.2 Environmental precautions.
Prevent the contamination of drains, surface or subterranean waters, and the ground.

6.3 Methods and material for containment and cleaning up.
Pick up the spill with non-combustible absorbent materials (soil, sand, vermiculite, diatomite, etc.). Pour the product and the absorbent in an appropriate container. The contaminated area should be immediately cleaned with an appropriate decontaminator. Pour the decontaminator on the remains in an opened container and let it act various days until no further reaction is produced.

6.4 Reference to other sections.
For exposure control and individual protection measures, see section 8.
For later elimination of waste, follow the recommendations under section 13.

SECTION 7: HANDLING AND STORAGE.

7.1 Precautions for safe handling.
For personal protection, see section 8. Never use pressure to empty the containers. They are not pressure-resistant containers. In the application area, smoking, eating, and drinking must be prohibited. Follow legislation on occupational health and safety.
Keep the product in containers made of a material identical to the original.

7.2 Conditions for safe storage, including any incompatibilities.
Store according to local legislation. Observe indications on the label. Keep far away from ignition points. Keep away from oxidising agents and from highly acidic or alkaline materials. Do not smoke. Prevent the entry of non-authorised persons. Once the containers are open, they must be carefully closed and placed vertically to prevent spills.
Classification and threshold amount of storage in accordance with Annex I to Directive 2012/18/EU (SEVESO III):

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Lower-tier requirements</th>
<th>Upper-tier requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2</td>
<td>ACUTE TOXIC</td>
<td>50</td>
<td>200</td>
</tr>
</tbody>
</table>

7.3 Specific end use(s).

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION.
8.1 Control parameters.

The product does NOT contain substances with Professional Exposure Environmental Limit Values. The product does NOT contain substances with Biological Limit Values.

8.2 Exposure controls.

**Measures of a technical nature:**

Provide adequate ventilation, which can be achieved by using good local exhaust-ventilation and a good general exhaust system.

<table>
<thead>
<tr>
<th>Concentration:</th>
<th>100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses:</td>
<td>For manufacturing, processing, laboratory or repacking use only</td>
</tr>
<tr>
<td>Breathing protection:</td>
<td>If the recommended technical measures are observed, no individual protection equipment is necessary.</td>
</tr>
<tr>
<td>Hand protection:</td>
<td>Non-disposable protective gloves against chemicals.</td>
</tr>
<tr>
<td>Characteristics:</td>
<td>«CE» marking, category III. Check the list of chemicals for which the glove has been tested.</td>
</tr>
<tr>
<td>CEN standards:</td>
<td>EN 374-1, En 374-2, EN 374-3, EN 420</td>
</tr>
<tr>
<td>Maintenance:</td>
<td>A schedule for the periodical replacement of gloves should be established in order to guarantee their replacement before pollutants permeate them. The use of contaminated gloves could be more dangerous than not using gloves, since the pollutant can gradually accumulate in the glove's material.</td>
</tr>
<tr>
<td>Observations:</td>
<td>They are to be replaced whenever tears, cracks or deformations are observed or when exterior dirt could reduce their strength.</td>
</tr>
<tr>
<td>Material:</td>
<td>PVC (polyvinyl chloride)</td>
</tr>
<tr>
<td>Breakthrough time (min.):</td>
<td>&gt; 480</td>
</tr>
<tr>
<td>Material thickness (mm):</td>
<td>0,35</td>
</tr>
</tbody>
</table>

**Eye protection:**

If the product is handled correctly, no individual protection equipment is necessary.

**Skin protection:**

| PPE: | Chemical protective clothing |
| Characteristics: | «CE» marking, category III. Clothing should fit properly. The level of protection must be set according to a test parameter called BT (Breakthrough Time), which indicates how long it takes for the chemical to pass through the material. |
| CEN standards:  | EN 464, EN 340, EN 943-1, EN 943-2, EN ISO 6529, EN ISO 6530, EN 13034 |
| Maintenance:   | In order to guarantee uniform protection, follow the washing and maintenance instructions provided by the manufacturer. |
| Observations:  | The protective clothing's design should facilitate correct positioning, staying in place without moving for the period of use expected, bearing in mind environmental factors as well as any movement or position the user might adopt while carrying out the activity. |
| PPE: | Anti-static safety footwear against chemicals. |
| Characteristics: | «CE» marking, category III. Check the list of chemicals against which the footwear is resistant. |
| CEN standards:  | EN ISO 13287, EN 13832-1, EN 13832-2, EN 13832-3, EN ISO 20344, EN ISO 20345 |
| Maintenance:   | For correct maintenance of this kind of safety footwear, it is necessary to observe the instructions specified by the manufacturer. The footwear should be replaced as soon as any sign of damage is observed. |
| Observations:  | The footwear should be cleaned regularly and dried when damp, although it should not be placed too close to a source of heat in order to avoid any sharp changes in temperature. |

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.**

9.1 Information on basic physical and chemical properties.

- Appearance: Liquid
- Colour: N.A./N.A.
- Odour: N.A./N.A.
- Odour threshold: N.A./N.A.
- pH: N.A./N.A.
- Melting point: -32 ºC
- Boiling Point: 161 ºC
- Flash point: > 110 ºC
- Evaporation rate: N.A./N.A.
- Inflammability (solid, gas): N.A./N.A.
- Lower Explosive Limit: N.A./N.A.
Upper Explosive Limit: N.A./N.A.
Vapour pressure: N.A./N.A.
Vapour density: N.A./N.A.
Relative density: 1.4778 g/cm³
Solubility: N.A./N.A.
Liposolubility: N.A./N.A.
Hydrosolubility: N.A./N.A.
Partition coefficient (n-octanol/water): N.A./N.A.
Auto-ignition temperature: N.A./N.A.
Decomposition temperature: N.A./N.A.
Viscosity: N.A./N.A.
Explosive properties: N.A./N.A.
Oxidizing properties: N.A./N.A.
N.A./N.A. = Not Available/Not Applicable due to the nature of the product

9.2. Other information.

SECTION 10: STABILITY AND REACTIVITY.

10.1 Reactivity.
The product does not present hazards by their reactivity.

10.2 Chemical stability.
Stable under the recommended handling and storage conditions (see section 7).

10.3 Possibility of hazardous reactions.
The product does not present possibility of hazardous reactions.

10.4 Conditions to avoid.
Avoid any improper handling.

10.5 Incompatible materials.
Keep away from oxidising agents and from highly alkaline or acidic materials in order to prevent exothermic reactions.

10.6 Hazardous decomposition products.
No decomposition if used for the intended uses.

SECTION 11: TOXICOLOGICAL INFORMATION.

IRRITANT PREPARATION. The inhalation of spray mist or suspended particulates can irritate the respiratory tract. It can also cause serious respiratory difficulties, central nervous system disorders, and in extreme cases, unconsciousness.

11.1 Information on toxicological effects.
Repeated or prolonged contact with the product can cause the elimination of oil from the skin, giving rise to non-allergic contact dermatitis and absorption of the product through the skin.

Toxicological information.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Test</th>
<th>Kind</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanesulfonyl Chloride</td>
<td>Oral</td>
<td>DL50</td>
<td>Rat</td>
<td>205 mg/kg</td>
</tr>
<tr>
<td>CAS No: 124-63-0 EC No: 204-706-1</td>
<td>Dermal</td>
<td>DL50</td>
<td>Rat</td>
<td>200 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>LC50</td>
<td>Rat</td>
<td>0.117 mg/l (4 h)</td>
</tr>
</tbody>
</table>

a) acute toxicity;
Product classified:
Acute toxicity (Inhalation), Category 2: Fatal if inhaled.
Acute toxicity (Dermal), Category 4: Harmful in contact with skin.
Acute toxicity (Oral), Category 4: Harmful if swallowed.

-Continued on next page.-
b) skin corrosion/irritation;
Product classified:
Skin Corrosive, Category 1B: Causes severe skin burns and eye damage.

c) serious eye damage/irritation;
Not conclusive data for classification.

d) respiratory or skin sensitisation;
Not conclusive data for classification.

e) germ cell mutagenicity;
Not conclusive data for classification.

f) carcinogenicity;
Not conclusive data for classification.

g) reproductive toxicity;
Not conclusive data for classification.

h) STOT-single exposure;
Product classified:
Specific target organ toxicity following a single exposure, Category 3:

i) STOT-repeated exposure;
Not conclusive data for classification.

j) aspiration hazard;
Not conclusive data for classification.

SECTION 12: ECOLOGICAL INFORMATION.

12.1 Toxicity.

<table>
<thead>
<tr>
<th>Name</th>
<th>Ecotoxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
</tr>
<tr>
<td>Methanesulfonyl Chloride</td>
<td>Fish</td>
</tr>
<tr>
<td>CAS No: 124-63-0 EC No: 204-706-1</td>
<td>Aquatic invertebrates</td>
</tr>
<tr>
<td></td>
<td>Aquatic plants</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability.
PBT Substance (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative).

12.3 Bioaccumulative potential.
No information is available regarding the bioaccumulation.

12.4 Mobility in soil.
No information is available about the mobility in soil.
The product must not be allowed to go into sewers or waterways.
Prevent penetration into the ground.

12.5 Results of PBT and vPvB assessment.
PBT Substance (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative), according to assessment made in the Chemical Safety Report, substance meets criteria to be considered PBT and vPvB.

12.6 Other adverse effects.
No information is available about other adverse effects for the environment.
SECTION 13 DISPOSAL CONSIDERATIONS.

13.1 Waste treatment methods.
Do not dump into sewers or waterways. Waste and empty containers must be handled and eliminated according to current, local/national legislation.

SECTION 14: TRANSPORT INFORMATION.

Transport following ADR rules for road transport, RID rules for railway, ADN for inner waterways, IMDG for sea, and ICAO/IATA for air transport.

Land: Transport by road: ADR, Transport by rail: RID.
Transport documentation: Consignment note and written instructions

Sea: Transport by ship: IMDG.
Transport documentation: Bill of lading

Air: Transport by plane: ICAO/IATA.
Transport document: Airway bill.

14.1 UN number.
UN No: UN3246

14.2 UN proper shipping name.
Description: UN 3246, METHANESULPHONYL CHLORIDE, 6.1 (8), PG I, (C/D)

14.3 Transport hazard class(es).
Class(es): 6.1

14.4 Packing group.
Packing group: I

14.5 Environmental hazards.
Marine pollutant: No

14.6 Special precautions for user.
Labels: 6.1, 8

Hazard number: 668
ADR LQ: 0

Provisions concerning carriage in bulk ADR: Not authorized carriage in bulk in accordance with ADR.
Transport by ship, FEm – Emergency sheets (F – Fire, S - Spills): F-A,S-B
Proceed in accordance with point 6.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code.
The product is not transported in bulk.

SECTION 15: REGULATORY INFORMATION.

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

-Continued on next page.-

Product classification according to Annex I of Directive 2012/18/EU (SEVESO III): H2

The product is not affected by Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products.

The product is not affected by the procedure established Regulation (EU) No 649/2012, concerning the export and import of dangerous chemicals.

15.2 Chemical safety assessment.

There has been no evaluation a chemical safety assessment of the product.

SECTION 16: OTHER INFORMATION.

Classification codes:

- Acute Tox. 2 [Inhalation] : Acute toxicity (Inhalation), Category 2
- Acute Tox. 4 [Dermal] : Acute toxicity (Dermal), Category 4
- Acute Tox. 4 [Oral] : Acute toxicity (Oral), Category 4
- Aquatic Chronic 3 : Chronic effect to the aquatic environment, Category 3
- Skin Corr. 1B : Skin Corrosive, Category 1B
- STOT SE 3 : Specific target organ toxicity following a single exposure, Category 3

Sections changed compared with the previous version:

1,2,3,4,8,9,10,11,12,14,16

It is advisable to carry out basic training with regard to health and safety at work in order to handle this product correctly.

Labelling in accordance with Directive 67/548/EEC:

Symbols:

\[ T^+ \]

Very toxic

R Phrases:

- R26 Very toxic by inhalation.
- R34 Causes burns.
- R37 Irritating to respiratory system.
- R21/22 Harmful in contact with skin and if swallowed.
- R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S Phrases:

- S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S28 After contact with skin, wash immediately with plenty of ... (to be specified by the manufacturer).
- S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S61 Avoid release to the environment. Refer to special instructions/safety data sheets.
- S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

Contains:

- Methanesulfonyl Chloride

Abbreviations and acronyms used:

- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
- CEN: European Committee for Standardization.
- EC50: Half maximal effective concentration.
- PPE: Personal protection equipment.
- IATA: International Air Transport Association.

-Continued on next page.-
LC50: Lethal concentration, 50%.
LD50: Lethal dose, 50%.
RID: Regulations Concerning the International Transport of Dangerous Goods by Rail.

Key literature references and sources for data:
http://eur-lex.europa.eu/homepage.html
http://echa.europa.eu/


The information in this Safety Data Sheet on the Preparation is based on current knowledge and on current EC and national laws, as far as the working conditions of the users is beyond our knowledge and control. The product must not be used for purposes other than those that are specified without first having written instructions on how to handle. It is always the responsibility of the user to take the appropriate measures in order to comply with the requirements established by current legislation. The information contained in this Safety Sheet only states a description of the safety requirements for the preparation, and it must not be considered as a guarantee of its properties.