# SAFETY DATA SHEET
**Morpholinosulfur trifluoride**

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

### 1.1. Product identifier
- **Product name**: Morpholinosulfur trifluoride
- **Product number**: FM60385
- **Synonyms; trade names**: Morph-DAST
- **CAS number**: 51010-74-3

### 1.2. Relevant identified uses of the substance or mixture and uses advised against
- **Identified uses**: Laboratory reagent. Manufacture of substances. Research and development.

### 1.3. Details of the supplier of the safety data sheet
- **Supplier**: Carbosynth Ltd
  - 8&9 Old Station Business Park
  - Compton
  - Berkshire
  - RG20 6NE
  - UK
  - +44 1635 578444
  - +44 1635 579444
  - info@carbosynth.com

### 1.4. Emergency telephone number
- **Emergency telephone**: +44 7887 998634

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**Classification (EC 1272/2008)**
- **Physical hazards**: Met. Corr. 1 - H290
- **Health hazards**: Skin Corr. 1B - H314 Eye Dam. 1 - H318
- **Environmental hazards**: Not Classified

### 2.2. Label elements
- **Pictogram**
- **Signal word**: Danger
- **Hazard statements**: H290 May be corrosive to metals.
  H314 Causes severe skin burns and eye damage.
**Precautionary statements**

- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
- P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P501 Dispose of contents/ container in accordance with national regulations.

**Supplemental label information**

- EUH014 Reacts violently with water.

**SECTION 3: Composition/information on ingredients**

**3.1. Substances**

- **Product name**: Morpholinosulfur trifluoride
- **CAS number**: 51010-74-3
- **Chemical formula**: C₄H₈F₃NOS

**SECTION 4: First aid measures**

**4.1. Description of first aid measures**

**General information**

Get medical advice/attention if you feel unwell.

**Inhalation**

Remove person to fresh air and keep comfortable for breathing. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. If breathing stops, provide artificial respiration. Get medical attention if symptoms are severe or persist.

**Ingestion**

Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth thoroughly with water. Give plenty of water to drink. Get medical attention if symptoms are severe or persist.

**Skin contact**

Remove contaminated clothing. Rinse with water. Continue to rinse for at least 15 minutes. Wash contaminated clothing before reuse. Get medical attention if symptoms are severe or persist.

**Eye contact**

Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes. Get medical attention if symptoms are severe or persist.

**4.2. Most important symptoms and effects, both acute and delayed**

**General information**

See Section 11 for additional information on health hazards.

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

**Notes for the doctor**

Treat symptomatically.

**SECTION 5: Firefighting measures**

**5.1. Extinguishing media**

**Suitable extinguishing media**

Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

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

**Specific hazards**

None known.
Morpholinosulfur trifluoride

Hazardous combustion products
Thermal decomposition or combustion products may include the following substances: Harmful gases or vapours. Oxides of carbon. Oxides of nitrogen. Oxides of sulphur. Hydrogen fluoride (HF).

5.3. Advice for firefighters

Special protective equipment for firefighters
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Firefighter's clothing conforming to European standard EN469 (including helmets, protective boots and gloves) will provide a basic level of protection for chemical incidents. Use protective equipment appropriate for surrounding materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions
Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk. Do not touch or walk into spilled material. Avoid inhalation of vapours. Provide adequate ventilation. Keep unnecessary and unprotected personnel away from the spillage.

6.2. Environmental precautions

Environmental precautions
Avoid discharge into drains or watercourses or onto the ground.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up
Wear protective clothing as described in Section 8 of this safety data sheet. Absorb spillage with sand or other inert absorbent. Clear up spills immediately and dispose of waste safely. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. Provide adequate ventilation. For waste disposal, see Section 13.

6.4. Reference to other sections

Reference to other sections
For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions
Wear protective clothing as described in Section 8 of this safety data sheet. Wash hands thoroughly after handling. Provide adequate ventilation. Avoid contact with skin and eyes. Avoid inhalation of vapours. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions
Keep container tightly closed. Store in a cool and well-ventilated place. Store contents under inert gas. Store away from incompatible materials (see Section 10). Protect from moisture. Keep away from heat. Store at temperatures not exceeding -20°C.

7.3. Specific end use(s)

Specific end use(s)
The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits
No exposure limits known for ingredient(s).

8.2. Exposure controls
Morpholinosulfur trifluoride

**Appropriate engineering controls**
Provide adequate ventilation.

**Eye/face protection**
Unless the assessment indicates a higher degree of protection is required, the following protection should be worn: Tight-fitting safety glasses. Personal protective equipment for eye and face protection should comply with European Standard EN166.

**Hand protection**
Wear protective gloves. To protect hands from chemicals, gloves should comply with European Standard EN374.

**Other skin and body protection**
Wear appropriate clothing to prevent repeated or prolonged skin contact.

**Respiratory protection**
Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Ensure all respiratory protective equipment is suitable for its intended use and is ‘CE’-marked. Gas and combination filter cartridges should comply with European Standard EN14387. Full face mask respirators with replaceable filter cartridges should comply with European Standard EN136. Half mask and quarter mask respirators with replaceable filter cartridges should comply with European Standard EN140.

**Environmental exposure controls**
Keep container tightly sealed when not in use.

### SECTION 9: Physical and Chemical Properties

#### 9.1. Information on basic physical and chemical properties

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<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid.</td>
</tr>
<tr>
<td>Colour</td>
<td>Yellow. to Orange. to Brown.</td>
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<tr>
<td>Odour</td>
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<tr>
<td>Odour threshold</td>
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<tr>
<td>pH</td>
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<tr>
<td>Melting point</td>
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<tr>
<td>Initial boiling point and range</td>
<td>41 to 42°C @ 0.5 mm Hg</td>
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<td>Flash point</td>
<td>76°C</td>
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<tr>
<td>Evaporation rate</td>
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<tr>
<td>Flammability (solid, gas)</td>
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<td>Upper/lower flammability or explosive limits</td>
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<tr>
<td>Vapour pressure</td>
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<tr>
<td>Vapour density</td>
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<tr>
<td>Relative density</td>
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<td>Solubility(ies)</td>
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<tr>
<td>Partition coefficient</td>
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<td>Decomposition Temperature</td>
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</tr>
<tr>
<td>Viscosity</td>
<td>No data available.</td>
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</tbody>
</table>
Morpholinosulfur trifluoride

Explosive properties  No data available.
Oxidising properties  No data available.

9.2. Other information
Molecular weight  175.17

SECTION 10: Stability and reactivity

10.1. Reactivity
Reactivity  No data available.

10.2. Chemical stability
Stability  Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions
Possibility of hazardous reactions  No data available.

10.4. Conditions to avoid
Conditions to avoid  Heat, sparks, flames. Water, moisture.

10.5. Incompatible materials

10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity - oral
Notes (oral LD₅₀)  Based on available data the classification criteria are not met.

Acute toxicity - dermal
Notes (dermal LD₅₀)  Based on available data the classification criteria are not met.

Acute toxicity - inhalation
Notes (inhalation LC₅₀)  Based on available data the classification criteria are not met.

Skin corrosion/irritation
Animal data  Skin Corr. 1B - H314 Causes severe burns.

Serious eye damage/irritation
Serious eye damage/irritation  Eye Dam. 1 - H318 Corrosive to skin. Corrosivity to eyes is assumed.

Respiratory sensitisation
Respiratory sensitisation  Based on available data the classification criteria are not met.

Skin sensitisation
Skin sensitisation  Based on available data the classification criteria are not met.

Germ cell mutagenicity
Genotoxicity - in vitro  Based on available data the classification criteria are not met.

Carcinogenicity
Morpholinosulfur trifluoride

<table>
<thead>
<tr>
<th>Carcinogenicity</th>
<th>Based on available data the classification criteria are not met.</th>
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<tbody>
<tr>
<td>IARC carcinogenicity</td>
<td>None of the ingredients are listed or exempt.</td>
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<tr>
<td>Reproductive toxicity</td>
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<td>Reproductive toxicity - fertility</td>
<td>Based on available data the classification criteria are not met.</td>
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<tr>
<td>Reproductive toxicity - development</td>
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<td>Specific target organ toxicity - single exposure</td>
<td>STOT - single exposure Not classified as a specific target organ toxicant after a single exposure.</td>
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<tr>
<td>Specific target organ toxicity - repeated exposure</td>
<td>STOT - repeated exposure Not classified as a specific target organ toxicant after repeated exposure.</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>Based on available data the classification criteria are not met.</td>
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</tbody>
</table>

General information
The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation
Corrosive to the respiratory tract. Symptoms following overexposure may include the following: Severe irritation of nose and throat.

Ingestion
May cause chemical burns in mouth, oesophagus and stomach. Symptoms following overexposure may include the following: Severe stomach pain. Nausea, vomiting.

Skin contact
Causes severe burns. Symptoms following overexposure may include the following: Pain or irritation. Redness. Blistering may occur.

Eye contact
Causes serious eye damage. Symptoms following overexposure may include the following: Pain. Profuse watering of the eyes. Redness.

Route of exposure
Ingestion Inhalation Skin and/or eye contact

Target organs
No specific target organs known.
Morpholinosulfur trifluoride

SECTION 12: Ecological Information

Ecotoxicity
Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.

12.1. Toxicity
Toxicity
Based on available data the classification criteria are not met.

12.2. Persistence and degradability
Persistence and degradability
The degradability of the product is not known.

12.3. Bioaccumulative potential
Bioaccumulative potential
No data available on bioaccumulation.

Partition coefficient
No data available.

12.4. Mobility in soil
Mobility
No data available.

12.5. Results of PBT and vPvB assessment
Results of PBT and vPvB assessment
No data available.

12.6. Other adverse effects
Other adverse effects
None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
General information
Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. This material and its container must be disposed of in a safe way. When handling waste, the safety precautions applying to handling of the product should be considered.

SECTION 14: Transport information

14.1. UN number
UN No. (ADR/RID) 3265
UN No. (IMDG) 3265
UN No. (ICAO) 3265
UN No. (ADN) 3265

14.2. UN proper shipping name
Proper shipping name (ADR/RID) CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Morpholinosulfur trifluoride)
Proper shipping name (IMDG) CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Morpholinosulfur trifluoride)
Proper shipping name (ICAO) CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Morpholinosulfur trifluoride)
Proper shipping name (ADN) CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Morpholinosulfur trifluoride)

14.3. Transport hazard class(es)
ADR/RID class 8
ADR/RID classification code C3
Morpholinosulfur trifluoride

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<td>IMDG class</td>
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<tr>
<td>ICAO class/division</td>
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<tr>
<td>ADN class</td>
<td>8</td>
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</tbody>
</table>

**Transport labels**

1. **14.4. Packing group**
   - ADR/RID packing group: II
   - IMDG packing group: II
   - ADN packing group: II
   - ICAO packing group: II

2. **14.5. Environmental hazards**
   - Environmentally hazardous substance/marine pollutant
   - No.

3. **14.6. Special precautions for user**
   - IMDG Code segregation group: 1. Acids
   - EmS: F-A, S-B
   - ADR transport category: 2
   - Emergency Action Code: 2X
   - Hazard Identification Number (ADR/RID): 80
   - Tunnel restriction code: (E)

4. **14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code**

**SECTION 15: Regulatory information**

1. **15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

   - **National regulations**
     - Health and Safety at Work etc. Act 1974 (as amended).
     - The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348) (as amended) ["CDG 2009"].
     - EH40/2005 Workplace exposure limits.

   - **EU legislation**

2. **15.2. Chemical safety assessment**

   - No chemical safety assessment has been carried out.
### Morpholinosulfur trifluoride

#### SECTION 16: Other information

**Abbreviations and acronyms used in the safety data sheet**

- **ADR**: European Agreement concerning the International Carriage of Dangerous Goods by Road.
- **ADN**: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
- **RID**: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
- **IATA**: International Air Transport Association.
- **ICAO**: Technical Instructions for the Safe Transport of Dangerous Goods by Air.
- **IMDG**: International Maritime Dangerous Goods.
- **CAS**: Chemical Abstracts Service.
- **ATE**: Acute Toxicity Estimate.
- **LC₅₀**: Lethal Concentration to 50 % of a test population.
- **LD₅₀**: Lethal Dose to 50% of a test population (Median Lethal Dose).
- **EC₅₀**: 50% of maximal Effective Concentration.
- **PBT**: Persistent, Bioaccumulative and Toxic substance.
- **vPvB**: Very Persistent and Very Bioaccumulative.

**Training advice**

Only trained personnel should use this material.

**Revision date**

11/07/2018

**Revision**

1

**SDS number**

144929

**Hazard statements in full**

- H290 May be corrosive to metals.
- H314 Causes severe skin burns and eye damage.
- H318 Causes serious eye damage.

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This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.