

Safety data sheet Nitrogen trifluoride

Creation date : 28.01.2005
Revision date : 27.02.2012

Version : 1.2

GB / E

SDS No. : 091
page 1 / 5

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

1.1. Product identifier

Product name
Nitrogen trifluoride

EC No (from EINECS): 232-007-1
CAS No: 7783-54-2
Index-Nr.

Chemical formula NF₃
REACH Registration number:
Not available.

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

Relevant identified uses
Industrial and professional. Perform risk assessment prior to use.
Uses advised against
Consumer use.

1.3. Details of the supplier of the safety data sheet

Company identification
BOC, Priestley Road, Worsley, Manchester M28 2UT
E-Mail Address ReachSDS@boc.com

1.4. Emergency telephone number

Emergency phone numbers (24h): 0800 111 333

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)

Press. Gas (Liquefied gas) - Contains gas under pressure; may explode if heated.
Ox. Gas 1 - May cause or intensify fire; oxidiser.
Acute Tox. 4 - Harmful if inhaled.

Classification acc. to Directive 67/548/EEC & 1999/45/EC

O; R8 | Xn; R20
Contact with combustible material may cause fire.
Harmful by inhalation.

Risk advice to man and the environment
Compressed gas.

2.2. Label elements

- Labelling Pictograms



- Signal word

Danger

- Hazard Statements

H280 Contains gas under pressure; may explode if heated.
H270 May cause or intensify fire; oxidiser.
H332 Harmful if inhaled.

- Precautionary Statements

Precautionary Statement Prevention

P220 Keep away from combustible materials.

P244 Keep valves and fittings free from oil and grease.
P260 Do not breathe gas, vapours.

Precautionary Statement Response

P304+P340+P315 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice/attention.
P370 + P376 In case of fire: Stop leak if safe to do so.

Precautionary Statement Storage

P403 Store in a well-ventilated place.

Precautionary Statement Disposal

None.

2.3. Other hazards

Contact with liquid may cause cold burns/frost bite.

SECTION 3: Composition/information on ingredients

Substance / Mixture: Substance.

3.1. Substances

Nitrogen trifluoride
CAS No: 7783-54-2
Index-Nr.:
EC No (from EINECS): 232-007-1
REACH Registration number:

Not available.
Contains no other components or impurities which will influence the classification of the product.

3.2. Mixtures

Not applicable.

SECTION 4: First aid measures

4.1. Description of first aid measures

First Aid General Information:

Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First Aid Inhalation:

Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First Aid Skin / Eye:

For liquid spillage - flush with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance. Immediately flush eyes thoroughly with water for at least 15 minutes.

First Aid Ingestion:

Ingestion is not considered a potential route of exposure.

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

Delayed adverse effects possible. Damage to red blood cells (haemolytic poison).

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

Obtain medical assistance. None.

SECTION 5: Fire fighting measures

Safety data sheet Nitrogen trifluoride

Creation date : 28.01.2005
Revision date : 27.02.2012

Version : 1.2

GB / E

SDS No. : 091
page 2 / 5

5.1. Extinguishing media

Suitable extinguishing media

Carbon dioxide. Dry powder. Water fog. Foam. Use water spray or fog to control fire fumes.

Unsuitable extinguishing media

Do not use a solid water stream.

5.2. Special hazards arising from the substance or mixture

Specific hazards

Exposure to fire may cause containers to rupture/explode. Supports combustion.

Hazardous combustion products

If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition:

Nitrogen dioxide, Hydrogen fluoride, Nitric oxide.

5.3. Advice for fire-fighters

Specific methods

If possible, stop flow of product. Move container away or cool with water from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.

Special protective equipment for fire-fighters

Normal firefighters' equipment consists of an appropriate SCBA (open-circuit positive pressure compressed air type) in combination with fire kit. Equipment and clothing to the following standards will provide a suitable level of protection for firefighters.

Guideline:

EN 469:2005: Protective clothing for firefighters. Performance requirements for protective clothing for firefighting., EN 137 Respiratory protective devices — Self-contained open-circuit compressed air breathing apparatus with full face mask — Requirements, testing, marking., EN 15090 Footwear for firefighters., EN 443 Helmets for fire fighting in buildings and other structures., EN 659 Protective gloves for firefighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Eliminate ignition sources. Use self-contained breathing apparatus and chemically protective clothing. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Monitor concentration of released product. Prevent water used in emergency cases from entering sewers and drainage systems.

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

Ventilate area.

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Use no oil or grease. Open valve slowly to avoid pressure shock. Suck back of water into the container must be prevented. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Keep away from ignition sources (including static discharges). Refer to supplier's handling instructions. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced

and when system is placed out of service. Use only with equipment cleaned for oxygen service and rated for cylinder pressure. Do not smoke while handling product. Only experienced and properly instructed persons should handle gases under pressure. Protect containers from physical damage; do not drag, roll, slide or drop. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Ensure the complete gas system has been (or is regularly) checked for leaks before use. If user experiences any difficulty operating container valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminants particularly oil and water. Never attempt to transfer gases from one container to another. Use only oxygen approved lubricants and oxygen approved sealings. Keep equipment free from oil and grease. Do not allow backfeed into the container. The substance must be handled in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for safe storage, including any incompatibilities

Secure cylinders to prevent them from falling. Segregate from flammable gases and other flammable materials in store. Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Cylinders should be stored in the vertical position and properly secured to prevent falling over. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limit value

Value type	value	Note
TLV (ACGIH)	10 ppm	2011

8.2. Exposure controls

Appropriate engineering controls

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep concentrations well below occupational exposure limits. Gas detectors should be used when quantities of oxidising gases may be released. Consider work permit system e.g. for maintenance activities. Systems under pressure should be regularly checked for leakages. Provide adequate general or local ventilation.

Personal protective equipment

Eye and face protection

Protect eyes, face and skin from liquid splashes. Wear a face-shield when transfilling and breaking transfer connections. Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure

Safety data sheet

Nitrogen trifluoride

Creation date : 28.01.2005
Revision date : 27.02.2012

Version : 1.2

GB / E

SDS No. : 091
page 3 / 5

to liquid splashes. Wear eye protection to EN 166 when using gases.

Skin protection

Hand protection

Advice: Wear working gloves and safety shoes while handling containers.

Guideline: EN 388 Protective gloves

Body protection

Protect eyes, face and skin from contact with product. Personal protective equipment for the body should be selected based on the task being performed and the risks involved.

Guideline:

EN 943: Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles.

Other protection

Wear working gloves and safety shoes while handling containers. EN ISO 20345 Personal protective equipment - Safety footwear.

Respiratory protection

Keep self contained breathing apparatus readily available for emergency use., Use SCBA in the event of high concentrations, The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD.

Guideline:

EN 136 Respiratory protective devices. Full face masks. Requirements, testing, marking

When allowed by a risk assessment a supplied air respirator may be used.

Guideline:

EN 133: Respirators, Breathing apparatus, Filters, Air filters, Classification systems, Masks (protective clothing), Supplied air breathing apparatus

Thermal hazards

If there is a risk of contact with the liquid, all protective equipment should be suitable for extremely low temperatures.

Environmental Exposure Controls

Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General information

Appearance/Colour: Colourless gas.

Odour: Mouldy

Melting point: -207 °C

Boiling point: -129 °C

Flash point: Not applicable for gases and gas mixtures.

Evaporation rate:

Not applicable for gases and gas mixtures.

Flammability range: Non flammable.

Vapour Pressure 20 °C: Not applicable.

Relative density, gas (Air=1): 2,4

Solubility in water: 61 mg/l

Partition coefficient: n-octanol/water:

Not applicable.

Autoignition temperature: Not applicable.

Molecular weight: 71 g/mol

Critical temperature: -39 °C

Relative density, liquid (Water=1): 1,5

9.2. Other information

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Violently oxidises organic material.

10.4. Conditions to avoid

None.

10.5. Incompatible materials

May react violently with combustible materials. May react violently with reducing agents. For material compatibility see latest version of ISO-11114.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute inhalation toxicity

Value: LC50

Species: Rat

Exposure time: 4 h

Value in non-standard unit: 3350 ppm

Skin irritation

No known effects from this product.

Eye irritation

No known effects from this product.

Sensitization

No known effects from this product.

Assessment mutagenicity

No known effects from this product.

Assessment carcinogenicity

No known effects from this product.

Assessment toxicity to reproduction

No known effects from this product.

Specific Target Organ Toxicity (STOT) - Single Exposure

Damage to red blood cells (haemolytic poison).

Specific Target Organ Toxicity (STOT) - Repeated Exposure

No known effects from this product.

Aspiration hazard

Not applicable to gases and gas mixtures

SECTION 12: Ecological information

12.1. Toxicity

No data available.

12.2. Persistence and degradability

Not readily biodegradable.

12.3. Bioaccumulative potential

No data available.

Safety data sheet

Nitrogen trifluoride

Creation date : 28.01.2005
Revision date : 27.02.2012

Version : 1.2

GB / E

SDS No. : 091
page 4 / 5

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

No data available.

12.6. Other adverse effects

Global Warming Potential GWP

17.200

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Do not discharge into any place where its accumulation could be dangerous. Avoid discharge to atmosphere. Contact supplier if guidance is required. Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods.

Gases in pressure containers (including halons) containing dangerous substances

EWC Nr. 16 05 04*

SECTION 14: Transport information

ADR/RID

14.1. UN number

2451

14.2. UN proper shipping name

NITROGEN TRIFLUORIDE

14.3. Transport hazard class(es)

Class: 2

Classification Code: 20

Labels: 2.2, 5.1

Hazard number: 25

Emergency Action Code: 2S

14.4. Packing group (Packing Instruction)

P200

14.5. Environmental hazards

None.

14.6. Special precautions for user

None.

IMDG

14.1. UN number

2451

14.2. UN proper shipping name

NITROGEN TRIFLUORIDE

14.3. Transport hazard class(es)

Class: 2.2

Labels: 2.2, 5.1

EmS: F-D, S-W

14.4. Packing group (Packing Instruction)

P200

14.5. Environmental hazards

None.

14.6. Special precautions for user

None.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

IATA

14.1. UN number

2451

14.2. UN proper shipping name

NITROGEN TRIFLUORIDE

14.3. Transport hazard class(es)

Class: 2.2

Labels: 2.2, 5.1

14.4. Packing group (Packing Instruction)

P200

14.5. Environmental hazards

None.

14.6. Special precautions for user

None.

Other transport information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

SECTION 15: Regulatory information

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

Seveso Directive 96/82/EC: Covered

Other regulations

Management of Health and Safety at Work Regulations (1999 No. 3242)

The Regulatory Reform (Fire Safety) Order 2005 (2005 No. 1541)

Control of Substances Hazardous to Health Regulations (COSHH, 2002 No. 2677)

Provision and Use of Work Equipment Regulations (PUWER, 1998 No. 2306)

Personal Protective Equipment Regulations (1992 No. 2966)

Control of Major Accident Hazards Regulations (COMAH, 1999 No. 743)

Chemical Hazards Information and Packaging for Supply (CHIP, 1994 No. 3247)

Pressure Systems Safety Regulations (PER, 2000 No. 128)

15.2. Chemical safety assessment

CSA has not been carried out.

SECTION 16: Other information

Safety data sheet

Nitrogen trifluoride

Creation date : 28.01.2005
Revision date : 27.02.2012

Version : 1.2

GB / E

SDS No. : 091
page 5 / 5

Ensure all national/local regulations are observed. Users of breathing apparatus must be trained. Contact with liquid may cause cold burns/frost bite. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Advice

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

Further information

Note:

When using this document care should be taken, as the decimal sign and its position complies with rules for the structure and drafting of international standards, and is a comma on the line.

As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

References

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:

Agency for Toxic Substances and Diseases Registry (ATSDR) (<http://www.atsdr.cdc.gov/>)

European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.

European Chemical Agency: Information on Registered Substances <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>

European Industrial Gases Association (EIGA) Doc. 169/11 Classification and Labelling guide.

ISO 10156:2010 Gases and gas mixtures -- Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.

International Programme on Chemical Safety (<http://www.inchem.org/>)

Matheson Gas Data Book, 7th Edition.

National Institute for Standards and Technology (NIST) Standard Reference Database Number 69

The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (<http://ecb.jrc.ec.europa.eu/esis/>).

The European Chemical Industry Council (CEFIC) ERICards.

Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH).

United States of America's National Library of Medicine's toxicology data network TOXNET (<http://toxnet.nlm.nih.gov/index.html>)

Substance specific information from suppliers.

End of document