

SAFETY DATA SHEET



Krytox™ GPL 227

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|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Krytox™ GPL 227

SDS-Identcode : 130000024328

Manufacturer or supplier's details

Company : The Chemours Company Singapore PTE. LTD.

Address : 1 HarbourFront Place, #16-01 HarbourFront Tower One
Singapore 098633

Telephone : 65-6715-8688

Emergency telephone number : 1800 315 8134

Telefax : 65-6715-8697

Recommended use of the chemical and restrictions on use

Recommended use : Lubricant

Restrictions on use : For industrial use only.
Do not use or resell Chemours™ materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless agreed to by Seller in a written agreement covering such use. For further information, please contact your Chemours representative.

2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS label elements

No hazard pictogram, no signal word, no hazard statement(s), no precautionary statement(s) required

Other hazards which do not result in classification

The thermal decomposition vapours of fluorinated plastics may cause polymer fume fever with flu-like symptoms in humans, especially when smoking contaminated tobacco.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|-----------------|------------------------------|------------------------------|---|
| Version 1.10 | Revision Date: 02.11.2023 | SDS Number: 1790081-00011 | Date of last issue: 23.03.2023 Date of first issue: 26.06.2017 |
|-----------------|------------------------------|------------------------------|---|

Components

| Chemical name | CAS-No. | Concentration (% w/w) |
|----------------|-----------|-----------------------|
| Sodium nitrite | 7632-00-0 | >= 1 -< 2.5 |

4. FIRST AID MEASURES

- If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : Wash with water and soap as a precaution.
Get medical attention if symptoms occur.
- In case of eye contact : Flush eyes with water as a precaution.
Get medical attention if irritation develops and persists.
- If swallowed : If swallowed, DO NOT induce vomiting.
Get medical attention if symptoms occur.
Rinse mouth thoroughly with water.
- Most important symptoms and effects, both acute and delayed : Inhalation may provoke the following symptoms:
Irritation
Lung oedema
Eye contact may provoke the following symptoms
Blurred vision
Discomfort
Lachrymation
Skin contact may provoke the following symptoms:
Irritation
Redness
Inhalation may provoke the following symptoms:
Irritation
Shortness of breath
- Protection of first-aiders : No special precautions are necessary for first aid responders.
- Notes to physician : Treat symptomatically and supportively.

5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Not applicable
Will not burn
- Unsuitable extinguishing media : Not applicable
Will not burn
- Specific hazards during fire-fighting : Exposure to combustion products may be a hazard to health.
- Hazardous combustion products : Hydrogen fluoride
carbonyl fluoride

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

potentially toxic fluorinated compounds
aerosolized particulates
Carbon oxides
Nitrogen oxides (NOx)
Metal oxides

- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.
Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
- Environmental precautions : Avoid release to the environment.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material.
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container.
Clean up remaining materials from spill with suitable absorbent.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure as-

SAFETY DATA SHEET



Krytox™ GPL 227

Version 1.10 Revision Date: 02.11.2023 SDS Number: 1790081-00011 Date of last issue: 23.03.2023
Date of first issue: 26.06.2017

assessment

Take care to prevent spills, waste and minimize release to the environment.

Do not breathe decomposition products.

Conditions for safe storage : Keep in properly labelled containers.
Store in accordance with the particular national regulations.

Materials to avoid : No special restrictions on storage with other products.

Further information on storage stability : No decomposition if stored and applied as directed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Occupational exposure limits of decomposition products

| Components | CAS-No. | Value type (Form of exposure) | Control parameters / Permissible concentration | Basis |
|---------------------|-----------|----------------------------------|--|--------|
| hydrofluoric acid | 7664-39-3 | PEL (short term) | 3 ppm 2.6 mg/m ³ | SG OEL |
| | | TWA | 0.5 ppm (Fluorine) | ACGIH |
| | | C | 2 ppm (Fluorine) | ACGIH |
| Carbonyl difluoride | 353-50-4 | PEL (short term) | 5 ppm 13 mg/m ³ | SG OEL |
| | | PEL (long term) | 2 ppm 5.4 mg/m ³ | SG OEL |
| | | TWA | 2 ppm | ACGIH |
| | | STEL | 5 ppm | ACGIH |
| Carbon dioxide | 124-38-9 | PEL (short term) | 30,000 ppm 54,000 mg/m ³ | SG OEL |
| | | PEL (long term) | 5,000 ppm 9,000 mg/m ³ | SG OEL |
| | | TWA | 5,000 ppm | ACGIH |
| | | STEL | 30,000 ppm | ACGIH |
| Carbon monoxide | 630-08-0 | PEL (long term) | 25 ppm 29 mg/m ³ | SG OEL |
| | | TWA | 25 ppm | ACGIH |

Engineering measures : Processing may form hazardous compounds (see section 10).
Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|-----------------|------------------------------|------------------------------|---|
| Version 1.10 | Revision Date: 02.11.2023 | SDS Number: 1790081-00011 | Date of last issue: 23.03.2023 Date of first issue: 26.06.2017 |
|-----------------|------------------------------|------------------------------|---|

Personal protective equipment

| | | |
|--------------------------|---|--|
| Respiratory protection | : | If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection. |
| Filter type | : | Combined particulates, acidic gas/vapour and organic vapour type |
| Hand protection | : | |
| Remarks | : | Wash hands before breaks and at the end of workday. |
| Eye protection | : | Wear the following personal protective equipment: Safety glasses |
| Skin and body protection | : | Skin should be washed after contact. |
| Hygiene measures | : | If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use. |

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|-------------------|
| Appearance | : | Grease |
| Colour | : | white |
| Odour | : | odourless |
| Odour Threshold | : | No data available |
| pH | : | 7 |
| Melting point/freezing point | : | 320 °C |
| Initial boiling point and boiling range | : | No data available |
| Flash point | : | Not applicable |
| Evaporation rate | : | Not applicable |
| Flammability (solid, gas) | : | Will not burn |

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|-----------------|------------------------------|------------------------------|---|
| Version 1.10 | Revision Date: 02.11.2023 | SDS Number: 1790081-00011 | Date of last issue: 23.03.2023 Date of first issue: 26.06.2017 |
|-----------------|------------------------------|------------------------------|---|

| | | |
|--|---|--|
| Upper explosion limit / Upper flammability limit | : | No data available |
| Lower explosion limit / Lower flammability limit | : | No data available |
| Vapour pressure | : | Not applicable |
| Relative vapour density | : | Not applicable |
| Relative density | : | 1.89 - 1.93 |
| Solubility(ies) Water solubility | : | insoluble |
| Partition coefficient: n-octanol/water | : | Not applicable |
| Auto-ignition temperature | : | No data available |
| Decomposition temperature | : | 320 °C |
| Viscosity Viscosity, kinematic | : | Not applicable |
| Explosive properties | : | Not explosive |
| Oxidizing properties | : | The substance or mixture is not classified as oxidizing. |
| Particle size | : | No data available |

10. STABILITY AND REACTIVITY

| | | |
|------------------------------------|---|---|
| Reactivity | : | Not classified as a reactivity hazard. |
| Chemical stability | : | Stable under normal conditions. |
| Possibility of hazardous reactions | : | Hazardous decomposition products will be formed at elevated temperatures. |
| Conditions to avoid | : | None known. |
| Incompatible materials | : | None. |

Hazardous decomposition products

| | | |
|-----------------------|---|---|
| Thermal decomposition | : | hydrofluoric acid Carbonyl difluoride Carbon dioxide Carbon monoxide |
|-----------------------|---|---|

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Skin contact
Ingestion
Eye contact

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity : Assessment: The substance or mixture has no acute oral toxicity

Components:

Sodium nitrite:

Acute oral toxicity : LD50 (Rat): 180 mg/kg
Acute inhalation toxicity : LC50 (Rat): 5.5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Skin corrosion/irritation

Not classified based on available information.

Components:

Sodium nitrite:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Components:

Sodium nitrite:

Species : Rabbit
Result : Irritation to eyes, reversing within 21 days
Method : OECD Test Guideline 405

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

Respiratory sensitisation

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Components:

Sodium nitrite:

| | | |
|-----------------------|---|--|
| Genotoxicity in vitro | : | Test Type: Bacterial reverse mutation assay (AMES) Result: positive |
| | | Test Type: In vitro mammalian cell gene mutation test Result: positive |
| Genotoxicity in vivo | : | Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Intraperitoneal injection Result: negative |
| | | Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Rat Application Route: Intraperitoneal injection Result: negative |

Carcinogenicity

Not classified based on available information.

Components:

Sodium nitrite:

| | | |
|-------------------|---|-----------|
| Species | : | Rat |
| Application Route | : | Ingestion |
| Exposure time | : | 2 Years |
| Result | : | negative |

Reproductive toxicity

Not classified based on available information.

Components:

Sodium nitrite:

| | | |
|-------------------------------|---|---|
| Effects on fertility | : | Test Type: Two-generation reproduction toxicity study Species: Mouse Application Route: Ingestion Result: negative |
| Effects on foetal development | : | Test Type: Embryo-foetal development Species: Rat Application Route: Ingestion |

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

Result: negative

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Repeated dose toxicity

Components:

Sodium nitrite:

| | | |
|-------------------|---|-----------|
| Species | : | Rat |
| NOAEL | : | 10 mg/kg |
| Application Route | : | Ingestion |
| Exposure time | : | 2 yr |

Aspiration toxicity

Not classified based on available information.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Sodium nitrite:

| | | |
|------------------|---|--|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 0.54 mg/l Exposure time: 96 h |
|------------------|---|--|

| | | |
|---|---|--|
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 15.4 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 |
|---|---|--|

| | | |
|----------------------------------|---|--|
| Toxicity to algae/aquatic plants | : | EC50 (Scenedesmus capricornutum (fresh water algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 |
|----------------------------------|---|--|

NOEC (Scenedesmus capricornutum (fresh water algae)): 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

| | | |
|-----------------------------------|---|---|
| M-Factor (Acute aquatic toxicity) | : | 1 |
|-----------------------------------|---|---|

| | | |
|-------------------------------------|---|--|
| Toxicity to fish (Chronic toxicity) | : | NOEC (Cyprinus carpio (Carp)): 21 mg/l Exposure time: 30 d Method: OECD Test Guideline 210 |
|-------------------------------------|---|--|

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Penaeid Shrimp): 9.86 mg/l
Exposure time: 80 d

Toxicity to microorganisms : EC50: 281 mg/l
Exposure time: 48 h

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Do not dispose of waste into sewer.

Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number : Not applicable
Proper shipping name : Not applicable
Class : Not applicable
Subsidiary risk : Not applicable
Packing group : Not applicable
Labels : Not applicable

IATA-DGR

UN/ID No. : Not applicable
Proper shipping name : Not applicable
Class : Not applicable
Subsidiary risk : Not applicable
Packing group : Not applicable
Labels : Not applicable
Packing instruction (cargo aircraft) : Not applicable

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

Packing instruction (passenger aircraft) : Not applicable

IMDG-Code

UN number : Not applicable
Proper shipping name : Not applicable
Class : Not applicable
Subsidiary risk : Not applicable
Packing group : Not applicable
Labels : Not applicable
EmS Code : Not applicable
Marine pollutant : Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Special precautions for user

Not applicable

15. REGULATORY INFORMATION

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

Workplace Safety and Health Act and Workplace Safety and Health (General Provisions) Regulations: This product is subjected to the SDS, labelling, PEL and other requirements in the Act/Regulations.

Environmental Protection and Management Act and : Not applicable
Environmental Protection and Management (Hazardous Substances) Regulations

Fire Safety (Petroleum and Flammable Materials) : Not applicable
Regulations

16. OTHER INFORMATION

Revision Date : 02.11.2023

Other information : Krytox™ and any associated logos are trademarks or copyrights of The Chemours Company FC, LLC.
Chemours™ and the Chemours Logo are trademarks of The Chemours Company.
Before use read Chemours safety information.
For further information contact the local Chemours office or nominated distributors.

Further information

Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

Date format : dd.mm.yyyy

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
SG OEL : Singapore. Workplace Safety and Health (General Provisions) Regulations - First Schedule Permissible Exposure Limits of Toxic Substances.

ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
ACGIH / C : Ceiling limit
SG OEL / PEL (long term) : Permissible Exposure Level (PEL) Long Term
SG OEL / PEL (short term) : Permissible Exposure Level (PEL) Short Term

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text.

SAFETY DATA SHEET



Krytox™ GPL 227

| | | | |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number: | Date of last issue: 23.03.2023 |
| 1.10 | 02.11.2023 | 1790081-00011 | Date of first issue: 26.06.2017 |

Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

SG / EN