



SAFETY DATA SHEET

Revised edition no : 1
Date : 2015

NAF S 227

PG

SECTION 1. IDENTIFICATION OF THE PRODUCT AND COMPANY UNDERTAKING

Identification of substance or preparation

Product Name NAF S 227
Chemical name 1,1,1,2,3,3,3-Heptafluoropropane
Synonym R227, HFC-227 ea.
Formula C₃HF₇
Molecular Weight 170
EC number (EINECS) 207-079-2

Use of Substance/preparation

Recommended uses Fire Extinguisher

Company:

PUREGAS (PTY) LTD.
4 Liebenberg Street
Alrode, Gauteng, 1451
General Information: 011 903 9760
Emergency #: 082 410 4661

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

- Preparation not classified as dangerous according to Directive 67/548/EC & Directive 1999/45/EC.
- Gas (Liquefied). Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
- High vapor concentration can cause headaches, dizziness, drowsiness and nausea.
- Heartbeat irregularity (arrhythmia)
- Preparation smells lightly lemon.
- In case of thermal decomposition, it releases hydrogen fluoride.
- ODP (Ozone Depletion Potential) = 0.
- GWP (Global Warming Potential) = 2900(Kyoto Protocol) – 3600 (IPCC Third Assessment Report).
- ALT (Atmospheric Lifetime) = 33 years (Kyoto Protocol) – 36.5 years (IPCC Third Assessment Report)
- POCP (Photochemical Ozone Creation Potential): preparation decomposes slowly in the troposphere.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

1,1,1,2,3,3,3-Heptafluoropropane

REACH Registration Number

IUPAC Name 1,1,1,2,3,3,3-Heptafluoropropane

CAS Number 431-89-0

EC Number [EINECS] 207-079-2

Concentration >=99.80% by mass

R phrases

D-Limonene

REACH Registration Number

IUPAC Name (R)-(+)-para-Mentha-1.8-diene


CAS Number 5989-27-5

EC Number [EINECS] 227-813-5

	SAFETY DATA SHEET	Revised edition no : 1 Date : 2015
	NAF S 227	PG

Concentration	0.10%-0.20% by mass
R phrases	R10, R38, R43, R50/53
See Section 16 for the full text of the R Phrases declared above. Occupational Exposure Limit(s), if available, are listed in Section 8.	

SECTION 4. FIRST AID MEASURES

	FIRST AID In case of doubt or if symptom persists, get medical attention.
Inhalation <ul style="list-style-type: none"> Remove the subject from the contaminated area Oxygen or cardiopulmonary resuscitation if necessary Consult with a physician in case of respiratory and nervous symptoms. 	
Eye Contact <ul style="list-style-type: none"> Keep eyelids open to allow evaporation of product Flush eyes with running water for several minutes, while keeping the eyelids wide open Consult with an ophthalmologists in case of persistent pain 	
Skin Contact <ul style="list-style-type: none"> Allow product to evaporate Rinse with lukewarm running water Consult with a physician in case of persistent pain or redness 	
Ingestion <ul style="list-style-type: none"> Risk not possible (gas). 	

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing Media.	<ul style="list-style-type: none"> In case of fire in close proximity, all means of extinguishing are acceptable.
Unsuitable exposure hazards	<ul style="list-style-type: none"> No restrictions
Special exposure hazards	<ul style="list-style-type: none"> Not – Flammable (see section 9). Formation of dangerous gas/vapours in case of decomposition (see section 10).
Special protective equipment for fire-fighters	<ul style="list-style-type: none"> Evacuate all non-essential personnel Wear self-contained breathing apparatus when in close proximity or in confined spaces. Protect fire-fighters using spray water. After intervention, proceed to clean the equipment (remove clothing carefully, take a shower, clean and check).
5.5 Other precautions	<ul style="list-style-type: none"> Approach from upwind Stay at safe distance in a protected location sheltered from possible projections Never approach containers which have been exposed to fire, without cooling them sufficiently.

	SAFETY DATA SHEET	Revised edition no : 1 Date : 2015
	NAF S 227	PG

	<ul style="list-style-type: none"> • After the fire, proceed rapidly to clean the surfaces exposed to the fumes in order to limit the damage to the equipment. • If safe to do so, remove the exposed containers, or cool with large quantities of water. • As for any fire, ventilate and clean the rooms before re-entry.
See section 10 for more detailed information on stability and reactivity.	

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	<ul style="list-style-type: none"> • Follow the protective measures given in section 8. • If safe to do so, without over exposing anyone, try to stop the leak. • Keep away materials and products which are incompatible with the product (see section 10). • In case of leaking container, try to reposition it to get the leak in gaseous phase. • Gas/vapours heavier than air may accumulate in confined spaces, causing possible oxygen depletion.
Environmental precaution	<ul style="list-style-type: none"> • Prevent discharges into the environment (atmosphere, ...)
Methods for cleaning up	<ul style="list-style-type: none"> • Let the product evaporate. • Prevent the product from entering sewers or confined places.
See Section 8 for more detailed information on personal protective equipment and section 13 for waste disposal	

SECTION 7. HANDLING AND STORAGE

Handling	<ul style="list-style-type: none"> • Carry out all operations in closed piping circuits and equipment. • Prevent product vapours decomposition from contacting hot spots. • Prevent product vapours decomposition, owed to the action of electric arc. • Use only equipment and materials which are compatible with the product. • Keep away from heat sources • Keep away from reactive products (see section 10).
Storage Procedures	<ul style="list-style-type: none"> • In a ventilated, cool area. • Keep away from heat sources • Keep away from reactive products (see section 10).
Specific use(s)	<ul style="list-style-type: none"> • For any particularly use, please contact the supplier.
Packaging	<ul style="list-style-type: none"> • Ordinary steel • Aluminium
Other precautions	<ul style="list-style-type: none"> • Inform people about the hazards of the product. • Follow the protective measures given in section 8

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limit values 1,1,1,2,2,3,3-Heptafluoropropane



SAFETY DATA SHEET

Revised edition no : 1
Date : 2015

NAF S 227

PG

-SAEL (Solvay) 2002
-TWA = 1,000 ppm

D-Limonene

-TWA=165,6 mg/m³ (AHIA, 1993)

Exposure controls

Occupational exposure control

Environmental exposure controls

- Provide local ventilation suitable for the product decomposition risk (see section 10).
- Follow the protective measures given in section 7

Respiratory protection

- Minimum need if the local exhaust ventilation is adequate.
- Self-contained breathing apparatus in medium confinement, insufficient oxygen, in case of large uncontrolled emissions in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/national standards.

Hand protection

- Protective gloves-chemical resistant
- Recommended materials: Polyvynlylcohol
- Permeation time/life: n.a.

Eye protection

- Wear protective goggles for all industrial operations
- If risk of splashing, chemical proof goggles/face shield.

Skin protection

- Apron/boots of neoprene if risk of splashing.

Other precautions

- Shower and eye wash stations.
- Gloves, overalls and boots have to be double layered (protection against cold temperature).
- Consult safety manager in order to choose proper personal protective equipments.

Respect local/federal and national regulations for aqueous emissions (see section 15).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Appearance	Pressurized liquefied gas
Colour	Colourless
Odour	Lemon

Important health, safety and environment information

pH	Neutral
Boling point	Not applicable, the mixture is pressurized with nitrogen
Flash point	Not applicable
Flammability	No flammability limit in air
	Remark: non-flammable gas



SAFETY DATA SHEET

Revised edition no : 1
Date : 2015

NAF S 227

PG

Explosive properties	Remark: see also section 10
Oxidising properties	Non Oxidizer
Vapor pressure at 21 °C	24 bar or 42 bar
Relative Density (@ 20°C), liquid	= 1,415
Solubility in water (@20°C)	=0,3 – 0,6 g/l
Partition coefficient	log Po/w 2,5
P (n-octanol/water)	Method: calculated value
Vapour Density (air=1)	= 4.2
Evaporation rate	n.a

Other information

Freezing point -131°C

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid

- Heat/sources of heat

Material to avoid

- Alkaline metals and their alloys

Hazardous decomposition products

- Hydrofluoric acid (HF)
- Carbon Monoxide (CO)

Other information

- Contact with alkaline and alkaline-earth metals may provoke violent reactions or explosions.
- The vapor is heavier than air, disperses at ground level.

SECTION 11. TOXICOLOGICAL INFORMATION

Toxicological data

Toxicokinetics, Metabolism and Distribution

n.a.

Acute toxicity

- Inhalation, LC 50, 4h, rat, >11%

Irritation

- Rabbit, no irritation signs (eyes)
- No significant irritation signs noted during toxicity testing

Corrosiveness

- N.a.

Chronic toxicity

- Inhalation, after a single exposure, dog, >=10%, cardiac sensitization following adrenergic stimulation
- Inhalation, after repeated exposure, rat, 105 %, no observed effect.
- No mutagenic, teratogenic effects



SAFETY DATA SHEET

Revised edition no : 1
Date : 2015

NAF S 227

PG

CMR Effects (Carcinogenicity, Genetic Toxicity, Toxicity to reproduction)

- N.a.

Comments

- No appreciable toxic effect

Health Effects

Inhalation

- At high concentration, risk of narcosis
- At high concentration, risk of cardiac arrhythmia
- At high concentration, risk of asphyxia by lack oxygen

Eye contact

[Gas]

-No effect

[Liquefied gas]

-Severe eye irritation, watering, redness and swelling of the eyelids

-Risk of burns (frostbite)

Skin contact

[Gas]

-No effect

[Liquefied gas]

-Cold sensation followed by redness of the skin

-Risk of frostbite

-In case of repeated contact: dry and chapped skin, risk of chronic dermatitis

Ingestion

- Risk not possible (gas)

SECTION 12. ECOLOGICAL INFORMATION

Eco toxicity

Acute Eco toxicity

- Fish, Brachydanio rerio, LC O, 96 h, $\geq 30\text{mg/l}$
- Bacteria, EC O, activity inhibition, $\geq 173\text{mg/l}$

Mobility

-Air, Henry Constant ca. $264\text{ GPa}\cdot\text{m}^3/\text{mol}$

- Result: considerable volatility
- Conditions: 20°C, calculated value

-Soil/sediments, adsorption, log KOC ca 2,2

- Conditions calculated value



SAFETY DATA SHEET

Revised edition no : 1
Date : 2015

NAF S 227

PG

See section 9 for additional information on chemicals and physical properties

Persistence and degradability

Abiotic degradation

-Air, indirect photo-oxidation, $t_{1/2}$ ca. 28.2 year(s)

- Conditions: sensitizer: OH radical

-Air, fphotolysis, ODP = 0

- Result: no effect on stratospheric ozone
- Reference value for CFC 11:ODP = 1

-Air, greenhouse effect, GWP = 0.84

- Conditions: 20 years.
- Reference value for CFC 11:GWP=11

Biotic degradation

-Aerobic test, ready biodegradability/closed bottle, degradation = 20%, 28 days

Result: non-readily biodegradable

Bio accumulative potential

-Bio concentration: $\log P_{o/w}$ =ca 2,5

Result: non-bioaccumulable

Conditions: calculated value

Other adverse effects

-Study in progress

Comments

Product is persistent in air (atmospheric lifetime: 36.5 years)

Product is not significantly hazardous for the environment as considerable volatility and no bioaccumulation effect

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Treatment

- Dispose in compliance with local/federal and national regulations.
- It is recommended to contact the producer for recycling/recovery.

Packaging (Directive 94/62/EC)

- To avoid treatments, as far as possible, use dedicated containers

SECTION 14. TRANSPORT INFORMATION

	UN no.	1058
ADR	Class	2
	Hazard label:	2.2
	HI/UN No	20/1058
	Proper Shipping Name	LIQUEFIED GAS

	SAFETY DATA SHEET	Revised edition no : 1 Date : 2015
	NAF S 227	PG

IMDG	Class	2.2
	Hazard label:	PRESSURISED NON FLAMMABLE GAS
	HI/UN No	1058
	EMS No.	F-C, S-V
	Marine adverse effect	n.a.
	Proper Shipping Name	LIQUEFIED GAS
IATA-DGR	Class	2.2
	Hazard label:	NON FLAMMABLE GAS
	Proper Shipping Name	LIQUEFIED GAS
RID	Class	2
	Hazard label:	2.2+13
	HI/UN No	20/1058
	Proper Shipping Name	LIQUEFIED GAS

SECTION 15. REGULATORY INFORMATION

EC Labeling



Not classified as dangerous according to Directive 67/548/EEC & Directive 1999/45/EEC.

D.lgs 65/2003 (Directive 1999/45/EC and 2001/60/EC)
Decreto ministeriale 7 settembre 2002 (Directiva 2001/58/EC)
D.lgs 52/97 (Directive 92/32/EC)
Directive 89/686/EC

SECTION 16. OTHER INFORMATION

Reason for update

- General revision according to Directive 2006/1907/EC
- Distribute new edition to clients

R phrases referring to Section 3

R10 Flammable
R38 Irritating to skin
R43 May cause sensitisation by skin contact
R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

This MSDS is intended for only the selected countries to which it is applicable. The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product which conforms to the specification, unless otherwise stated. In this case combination and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.