

SAFETY DATA SHEET

PRIME R448A

Infosafe No.: LQ8QS
ISSUED Date : 22/03/2018
ISSUED by: Prime

1. Identification

GHS Product Identifier

PRIME R448A

Product Code

2800114, 2805035, 2805036, 2805037

Company name

Prime (ABN 93 142 654 564)

Address

1-3 Annick Crescent Laverton North
Vic 3026 AUSTRALIA

Telephone/Fax Number

Tel: +613 8348 9200

Fax: +613 8353 2083

Emergency phone number

1800 638 556 (24hrs)

Emergency Contact Name

www.actrol.com.au

Recommended use of the chemical and restrictions on use

Refrigerant gas

2. Hazard Identification

GHS classification of the substance/mixture

Classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) including Work, Health and Safety Regulations, Australia.

Classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Gases under Pressure: Liquefied Gas

Signal Word (s)

WARNING

Hazard Statement (s)

H280 Contains gas under pressure; may explode if heated.

Pictogram (s)

Gas cylinder



Precautionary statement – Storage

P410+P403 Protect from sunlight. Store in a well-ventilated place.

Other Information

Causes asphyxiation in high concentrations. May cause frostbite. Excessive exposure may also cause cardiac arrhythmia.

3. Composition/information on ingredients

Ingredients

Name	CAS	Proportion
Difluoromethane	75- 10- 5	26 %
Pentafluoroethane	354- 33- 6	26 %
1, 1, 1, 2- Tetrafluoroethane	811- 97- 2	21 %
2, 3, 3, 3- tetrafluoroprop- 1- ene	754- 12- 1	20 %
1- Propene, 1, 3, 3, 3- tetrafluoro- , (1E) -	29118- 24- 9	7 %

4. First-aid measures

Inhalation

If inhaled, remove affected person from contaminated area. Keep at rest until recovered. If symptoms develop and/or persist seek medical attention. If breathing is irregular or stopped, administer artificial respiration. Causes asphyxiation in high concentrations.

Ingestion

Not considered a potential route of exposure.

Skin

Remove all contaminated clothing immediately. Clothing frozen to the skin should be thawed before being removed. Wash affected area thoroughly with soap and water. For Frostbite: Flush affected areas with lukewarm water. Do not use hot water. Treat as thermal burns. Seek IMMEDIATE medical attention.

Eye contact

If eye tissue is frozen, seek IMMEDIATE medical attention. If tissue is not frozen, immediately irrigate with copious amounts of water for at least 15 minutes. Remove contact lenses. Eyelids to be held open. Seek medical attention.

First Aid Facilities

Eyewash and normal washroom facilities.

Advice to Doctor

Treat symptomatically. Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support.

Other Information

For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

5. Fire-fighting measures

Suitable Extinguishing Media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Hazards from Combustion Products

Under fire conditions this product may emit toxic and/or irritating fumes, smoke and gases including carbon monoxide, carbon dioxide, hydrogen fluoride, hydrogen halides and carbonyl halides.

Specific Hazards Arising From The Chemical

Contents under pressure. This product is not flammable at ambient temperatures and atmospheric pressure. However, this material can ignite when mixed with air under pressure and exposed to strong ignition sources. Container may rupture on heating. Can form a combustible mixture with air at pressures above atmospheric pressure.

Hazchem Code

2TE

Decomposition Temperature

> 250 °C

Precautions in connection with Fire

Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) operated in positive pressure mode. Fight fire from safe location. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

6. Accidental release measures

Emergency Procedures

Remove all sources of ignition. Increase ventilation. Evacuate all unprotected personnel. Use self-contained breathing apparatus

(S.C.B.A) and full protective clothing to minimise exposure. Allow gas to vent safely to atmosphere, preferably in well ventilated, remote location. Monitor oxygen concentration in confined spaces. Check for leaks using pressure drop test or soapy water on joints and outlets. Shut cylinder valve to stop leak if possible and safe to do so. Check gas concentration to ensure area is safe before removing protective equipment. Damaged gas cylinders should be returned to the supplier.

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid accumulation of vapours in low areas. Unprotected personnel should not return until air has been tested and determined safe. Ensure that the oxygen content is $\geq 19.5\%$.

7. Handling and storage

Precautions for Safe Handling

Use in a well ventilated area. Wear appropriate personal protective equipment and clothing to prevent exposure. Use smallest possible amounts in designated areas with adequate ventilation. Maintain high standards of personal hygiene ie. washing hands prior to eating, drinking, smoking or using toilet facilities. DO NOT enter confined spaces where gas may have collected. Suck back of water into the container must be prevented. Do not allow back feed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Refer to supplier's container handling instructions.

Conditions for safe storage, including any incompatibilities

Protect containers against physical damage. Store in a cool, dry, well-ventilated place, low fire risk area. Protect from extremes of temperature and weather. Do not allow any part of a cylinder to be exposed above 50°C. Storage areas should be kept clean and free from flammable materials. Ensure that containers are properly vented to prevent build up of pressure. Ensure that storage conditions comply with applicable local and national regulations.

For information on the design of the storeroom, reference should be made to Australian Standard AS 4332 (2004) - The storage and handling of gases in cylinders.

Storage Temperatures

Not exceeding 50 °C

8. Exposure controls/personal protection

Occupational exposure limit values

No exposure standards have been established for this material. However, the available exposure limits for ingredients are listed below:

1,1,1,2-Tetrafluoroethane:

TWA: 1000 ppm, 4240 mg/m³

TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.

Source: Safe Work Australia

Biological Limit Values

No biological limits allocated.

Appropriate engineering controls

This substance is hazardous and should be used with a local exhaust ventilation system, drawing vapours away from workers' breathing zone. If the engineering controls are not sufficient to maintain concentrations of vapours/mists below the exposure standards, suitable respiratory protection must be worn.

Respiratory Protection

If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements.

Reference should be made to Australian Standards AS/NZS 1715 (2009), Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716 (2012), Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

Eye Protection

Safety glasses with side shields, chemical goggles or full-face shield as appropriate should be used. Final choice of appropriate eye/face protection will vary according to individual circumstances. Eye protection devices should conform to relevant regulations. Eye protection should conform with Australian/New Zealand Standard AS/NZS 1337 2 & 6 (2012) - Eye Protectors for Industrial Applications.

Hand Protection

Wear gloves of impervious material (Splash contact: Leather gloves, Protective gloves: Neoprene, Polyvinyl alcohol or nitrile- butyl-rubber). Final choice of appropriate gloves will vary according to individual circumstances. i.e. methods of handling or according to

risk assessments undertaken. Occupational protective gloves should conform to relevant regulations. Reference should be made to AS/NZS 2161.1 (2016): Occupational protective gloves - Selection, use and maintenance.

Body Protection

Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

Other Information

Product causes asphyxiation in high concentrations. Asphyxiant gases which when present in an atmosphere in high concentration, lead to reduction of oxygen concentration by displacement or dilution. It is not appropriate to recommend an exposure standard for each simple asphyxiant, rather it should be required that a sufficient oxygen concentration be maintained.

9. Physical and chemical properties

Properties	Description	Properties	Description
Form	Gas	Appearance	Clear, colourless liquefied gas.
Colour	Colourless	Odour	Slight ether-like
Decomposition Temperature	> 250 °C	Melting Point	Not available
Boiling Point	Not available	Solubility in Water	Not available
Specific Gravity	Not available	pH	Neutral
Vapour Pressure	1,120 kPa (21.1 °C) 2,588 kPa (54.4 °C)	Vapour Density (Air=1)	Not available
Evaporation Rate	Not available	Odour Threshold	Not available
Viscosity	Not available	Partition Coefficient: n-octanol/water	Not available
Flash Point	Not available	Flammability	Non flammable
Auto-Ignition Temperature	Not available	Flammable Limits - Lower	Not available
Flammable Limits - Upper	Not available		

10. Stability and reactivity

Chemical Stability

Stable under normal conditions of storage and handling.

Reactivity and Stability

Reacts with incompatible materials.

Conditions to Avoid

Extremes of temperature and direct sunlight

Incompatible materials

Potassium, calcium, zinc, powdered metals, finely divided aluminium and magnesium.

Hazardous Decomposition Products

Thermal decomposition may result in the release of toxic and/or irritating fumes, smoke and gases including: hydrogen fluoride, hydrogen halides, carbonyl halides, carbon monoxide and carbon dioxide.

Possibility of hazardous reactions

Can form a combustible mixture with air at pressures above atmospheric pressure. Do not mix with oxygen or air above atmospheric pressure.

Hazardous Polymerization

Does not occur.

11. Toxicological Information

Toxicology Information

No toxicity data available for this material. Data available for ingredients is given below.

Acute Toxicity - Inhalation

Difluoromethane

LC50 (rat): > 520,000 ppm/4h

Pentafluoroethane

Rat: > 769,000 ppm/4h

1,1,1,2-Tetrafluoroethane

LC50 (rat): > 500,000 ppm/4h

2,3,3,3-Tetrafluoroprop-1-ene
LC50 (rat): > 400,000 ppm/4h

Ingestion

Ingestion unlikely due to form of product.

Inhalation

Inhalation of product vapours may cause irritation of the nose, throat and respiratory system.

Asphyxiant gases when present in an atmosphere in high concentration, leads to reduction of oxygen concentration by displacement or dilution. Symptoms include decreased visual acuity, decreased coordination and judgment, headache, dizziness, confusion, drowsiness, fatigue, shortness of breath, muscular weakness, convulsions, unconsciousness, coma and eventually death.

Skin

May be irritating to skin. The symptoms may include redness, itching and swelling.

May cause frostbite injuries to skin due to uncontrolled release of compressed gas resulting in redness, tissue destruction.

Skin irritation

1-Propene, 1,3,3,3-tetrafluoro-, (1E)-

Species: Rabbit

Result: No skin irritation

Method: OECD Test Guideline 404

Eye

May be irritating to eyes. The symptoms may include redness, itching and tearing.

May cause frostbite injuries to eyes due to uncontrolled release of compressed gas resulting in stinging, tearing, blurred vision and possibly permanent damage to eyes.

Respiratory sensitisation

Not expected to be a respiratory sensitiser.

Skin Sensitisation

Not expected to be a skin sensitiser.

Germ cell mutagenicity

Not considered to be a mutagenic hazard.

Difluoromethane

Test Method: Ames test

Result: negative

Species: Mouse

Cell type: Bone marrow

Method: Mutagenicity (micronucleus test)

Result: negative

Pentafluoroethane

Test Method: Ames test

Result: negative

1,1,1,2-Tetrafluoroethane

Note: In vitro tests did not show mutagenic effects

2,3,3,3-Tetrafluoroprop-1-ene

Test Method: Chromosome aberration test in vitro

Cell type: Human lymphocytes

Result: negative

Note: Dose 760,000 ppm

1-Propene, 1,3,3,3-tetrafluoro-, (1E)-:

Test Method: Chromosome aberration test in vitro (Cell type: Human)

Result: negative

Test Method: Mutagenicity (in vitro mammalian cytogenetic test) (Cell type: Human lymphocytes)

Result: negative

Test Method: Chromosome aberration test in vitro (Cell type: Chinese Hamster Ovary Cells)

Result: negative

Test Method: Chromosome aberration test in vitro (Cell type: Chinese Hamster Lung Cells)

Result: negative

Test Method: Ames test

Result: negative

Test Method: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)

Species: Mouse

Cell type: Micronucleus

Application Route: Inhalation

Result: negative

Carcinogenicity

Not considered to be a carcinogenic hazard.

Reproductive Toxicity

Not considered to be toxic to reproduction.

Teratogenicity

2,3,3,3-Tetrafluoroprop-1-ene:

Species: Rat

Application Route: Inhalation exposure

Exposure time: Two-generation reproductive toxicity

NOAEL,parent: 50,000 ppm

NOAEL,F1: 50,000 ppm

NOAEL,F2: 50,000 ppm

Difluoromethane

Species: Rat

Dose: NOEL - 50,000 ppm

Note: Did not show teratogenic effects in animal experiments.

Species: Rabbit

Dose: NOEL - 50,000 ppm

Note: Did not show teratogenic effects in animal experiments.

Pentafluoroethane

Species: Rabbit

Application Route: Inhalation exposure

NOAEL,Teratog: 50,000 ppm

NOAEL,Maternal: 50,000 ppm

Note: Did not show teratogenic effects in animal experiments.

Species: Rat

Application Route: Inhalation exposure

NOAEL,Teratog: 50,000 ppm

NOAEL,Maternal: 50,000 ppm

Note: Did not show teratogenic effects in animal experiments.

STOT-single exposure

Not expected to cause toxicity to a specific target organ.

STOT-repeated exposure

Not expected to cause toxicity to a specific target organ.

Repeated dose toxicity

Difluoromethane

NOEL (Rat, Inhalation): 50,000 ppm/90 d (Subchronic toxicity)

Pentafluoroethane

NOEL (Rat, Inhalation): 50,000 ppm/ 4 weeks (Subchronic toxicity)

1,1,1,2-Tetrafluoroethane

NOEL (Rat): 40,000 ppm

2,3,3,3-Tetrafluoroprop-1-ene

NOEL (Rabbit, male, Inhalation): 50,000 ppm/28 d

NOEL (Rabbit, female, Inhalation): 500 ppm/28 d

NOEL (Mini-pig, Inhalation): 1,000 ppm/28d

NOAEL (No observed adverse effect level): 10,000 ppm (highest exposure tested)

1-Propene, 1,3,3,3-tetrafluoro-, (1E)-:

NOEL (Rat, Inhalation): 5,000 ppm/13 Weeks

Causes mild effects on the heart.

Aspiration Hazard

Not expected to be an aspiration hazard.

Other Information

Difluoromethane

Cardiac sensitization (dogs)

No-observed-effect level: >350,000 ppm

Pentafluoroethane

Cardiac sensitization (dogs)

No-observed-effect level: 75,000 ppm

Lowest observed effect level: 100, 000 ppm

1,1,1,2-Tetrafluoroethane

Cardiac sensitization (dogs)
No-observed-effect level: 50,000 ppm
Lowest observed effect level: 75,000 ppm
2,3,3,3-Tetrafluoroprop-1-ene
Cardiac sensitization (dogs)
No effects observed for exposures up to 12% (120,189 ppm).
1-Propene, 1,3,3,3-tetrafluoro-, (1E)-:
Cardiac sensitization (dogs): Did not cause sensitisation on laboratory animals.
Further information: Note: May cause cardiac arrhythmia.

12. Ecological information

Ecotoxicity

No ecological data available for this material. Data available for ingredients is given below.

Persistence and degradability

1-Propene, 1,3,3,3-tetrafluoro-, (1E)-:

Not readily biodegradable (aerobic)

Difluoromethane

Minimal

Pentafluoroethane

Not readily biodegradable.

Value: 5 % (Method: OECD 301 D)

2,3,3,3-Tetrafluoroprop-1-ene

Not readily biodegradable.

Mobility

Not available

Bioaccumulative Potential

1,1,1,2-Tetrafluoroethane

Accumulation in aquatic organisms is unlikely.

Other Adverse Effects

This product contains greenhouse gases which may contribute to global warming. Do NOT vent to the atmosphere.

Environmental Protection

Prevent this material entering waterways, drains and sewers.

Acute Toxicity - Fish

2,3,3,3-Tetrafluoroprop-1-ene

LC50 (Cyprinus carpio (Carp)): > 197 mg/l/96h

Acute Toxicity - Daphnia

1-Propene, 1,3,3,3-tetrafluoro-, (1E)-:

EC50(Daphnia magna (Water flea)): > 160 mg/l/48 h

2,3,3,3-Tetrafluoroprop-1-ene

EC50 Daphnia magna (Water flea): > 83 mg/l/48h

(OECD Test Guideline 202)

Acute Toxicity - Algae

1-Propene, 1,3,3,3-tetrafluoro-, (1E)-:

NOEC: > 170 mg/l/72 h (Growth inhibition)

2,3,3,3-Tetrafluoroprop-1-ene

EC50 (Scenedesmus capricornutum (fresh water algae)): > 100 mg/l

13. Disposal considerations

Disposal considerations

The disposal of the spilled or waste material must be done in accordance with applicable local and national regulations.

14. Transport information

Transport Information

This material is classified as Dangerous Goods Division 2.2 Non-flammable Non-toxic Gases.

Dangerous Goods are incompatible in a placard load with any of the following:

- Class 1: Explosives
- Division 2.1 Flammable Gas when the Division 2.2 gas has a subsidiary risk 5.1 except when all are packed in cylinders or pressure drums not exceeding 500L capacity.
- Division 2.3 Toxic Gas when the Division 2.2 gas has a subsidiary risk 5.1 except when all are packed in cylinders or pressure drums not exceeding 500L capacity.
- Division 4.2: Spontaneously combustible substances
- Division 5.2: Organic peroxides

Marine Transport (IMO/IMDG):

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

Class/Division: 2.2

UN No: 3163

Proper Shipping Name: LIQUEFIED GAS, N.O.S.(Difluoromethane & Pentafluoroethane)

Packing Group: -

EMS : F-C, S-V

Special Provisions: 274

Air Transport (ICAO/IATA):

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

Class/Division: 2.2

UN No: 3163

Proper Shipping Name: Liquefied gas, n.o.s.(Difluoromethane & Pentafluoroethane)

Packing Group: -

Packaging Instructions (passenger & cargo): 200

Packaging Instructions (cargo only): 200

Hazard Label: Non-flammable Gas

Special Provisions: -

U.N. Number

3163

UN proper shipping name

LIQUEFIED GAS, N.O.S.(Difluoromethane & Pentafluoroethane)

Transport hazard class(es)

2.2

Hazchem Code

2TE

IERG Number

06

IMDG Marine pollutant

No

Transport in Bulk

Not available

Special Precautions for User

Not available

15. Regulatory information

Regulatory information

Classified as Hazardous according to the Globally Harmonised System of classification and labelling of chemicals (GHS) including Work, Health and Safety regulations, Australia

Not classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)

Poisons Schedule

Not Scheduled

Australia (AICS)

All components of this product are listed on the Inventory or exempted.

Secondary Notification Conditions apply for 1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (CAS 29118-24-9) and Difluoromethane (CAS 75-10-5).

16. Other Information

Date of preparation or last revision of SDS

SDS created: March 2018

References

Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice.

Standard for the Uniform Scheduling of Medicines and Poisons.

Australian Code for the Transport of Dangerous Goods by Road & Rail.

Model Work Health and Safety Regulations, Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.

Workplace exposure standards for airborne contaminants.

Adopted biological exposure determinants, American Conference of Industrial Hygienists (ACGIH).

Globally Harmonised System of classification and labelling of chemicals.

END OF SDS

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