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Version number 1

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier****Trade name:** HCFC-22**Article number:** DF22**EC number:**

200-871-9

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

No further relevant information available.

1.3 Details of the supplier of the safety data sheet**Manufacturer/Supplier:**

DAIKIN INDUSTRIES, LTD. CHEMICALS DIVISION:

OSAKA UMEDA TWIN TOWERS SOUTH, 1-13-1 Umeda, Kita-ku, Osaka-shi, Osaka, 530-0001, Japan

Phone: +81-6-6147-9702 Fax: +81-6-6147-9807

Further information obtainable from: <http://www.daikin.com/>**1.4 Emergency telephone number:**

Japan: +81-6-6349-7521

China: +86-532-8388-9090, +86-21-34151689

South Korea: +82-2-568-1722

Americas: CHEMTREC +1-800-424-9300 (Outside US/Canada: +1-703-527-3887)

Europe: +49-211-179 225-0

*** SECTION 2: Hazard identification****2.1 Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008



Press. Gas (Liq.) H280 Contains gas under pressure; may explode if heated.



Ozone 1 H420 Harms public health and the environment by destroying ozone in the upper atmosphere

2.2 Label elements**Labelling according to Regulation (EC) No 1272/2008:**

The substance is classified and labelled according to the CLP regulation.

Signal word: Warning**Precautionary statements:**

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

P502 Refer to manufacturer or supplier for information on recovery or recycling.

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

CAS: 75-45-6 Chlorodifluoromethane

100%

Press. Gas (Liq.), H280

Ozone 1, H420

Identification number(s)**EC number:** 200-871-9**SECTION 4: First aid measures****4.1 Description of first aid measures****General information:** Seek immediate medical advice.**After inhalation:**

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult a doctor if symptoms persist.

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In case of unconsciousness place patient stably in side position for transportation.

In case of emergency to rescue the victims; be sure to wear supplied-air respirator (SAR) or self-contained breathing apparatus (SCBA).

At high levels, cardiac arrhythmia may occur.

After skin contact:

In cases of frost bites, rinse with plenty of water. Do not remove clothing.

Immediately rinse with warm water and soap.

Consult a doctor in case of complaints.

After eye contact:

Rinse opened eye for several minutes under running water.

Consult an ophthalmologist in case of complaints.

After swallowing: *Not applicable.*

Information for doctor:

Catecholamines such as adrenaline, and other compounds having similar effects, should be reserved for emergencies and then used only with special caution.

The examining physician should advise workers taking medications containing catecholamines that they may be at increased risk and should avoid excessive exposure.

4.2 Most important symptoms and effects, both acute and chronic:

Frost bites

High concentrations cause asphyxiation. May cause an abnormal heart rhythm and prove suddenly fatal.

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

No further relevant information available.

SECTION 5: Firefighting measures**5.1 Extinguishing media**

Suitable extinguishing agents: *Use fire extinguishing methods suitable for surrounding conditions.*

5.2 Special hazards arising from the substance or mixture:

During heating or in case of fire poisonous gases may be produced.

Formation of toxic gases is possible during heating or in case of fire.

Receptacle may explode when heated.

5.3 Advice for firefighters:

Move receptacle to a safe place immediately if possible. If not, spray water on the receptacles and surrounding equipment to cool.

If receptacle catches fire: cool them with plenty of water.

If possible, close valves of receptacles to shut off the gas supply.

Protective equipment:

Wear self-contained breathing apparatus and protective suit.

Do not inhale explosion gases or combustion gases.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures:**

Wear appropriate protective devices (See Section 8 Exposure Controls/Personal Protection).

Avoid contact with eyes and skin.

Do not inhale the product.

Ensure adequate ventilation before entering the area.

Stay on the windward side.

Keep out unauthorized persons.

6.2 Environmental precautions: *Must not be emitted into the environment.*

6.3 Methods and material for containment and cleaning up: *Ensure adequate ventilation.*

6.4 Reference to other sections:

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

*** SECTION 7: Handling and storage****7.1 Precautions for safe handling:**

Waste air is to be released into the atmosphere only via suitable separators.

Ensure good ventilation/exhaustion at the workplace.

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Handle with care. Avoid jolting, friction and impact.

For heating receptacle, use hot compresses or lukewarm water below 40 °C.

Do not use heaters.

Stay on the windward side when working outdoors.

Be careful of leakage when attaching/detaching receptacles.

Inhaling large quantities may cause cardiac arrhythmia or asphyxiation or both.

Keep away from naked flame or metal heated over 300 - 400 °C to prevent thermal decomposition that may form toxic gases.

Do not handle until all safety precautions have been read and understood.

Information about fire - and explosion protection:

Keep ignition sources away - Do not smoke.

Keep respiratory protective device available.

7.2 Conditions for safe storage, including any incompatibilities:**Storage****Requirements to be met by storerooms and receptacles:**

Store in a cool and dry location.

Keep containers tightly sealed.

Information about storage in one common storage facility:

No further information available.

See section 10 for information on incompatible materials.

Further information about storage conditions:

Store in cool, dry conditions in well sealed receptacle.

Protect from heat and direct sunlight.

Store containers in a well ventilated area.

Store locked up.

7.3 Specific end use(s): No further relevant information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters No further information available.

Ingredients with limit values that require monitoring at the workplace:

CAS: 75-45-6 Chlorodifluoromethane

IOELV (EU) Long-term value: 3600 mg/m³, 1000 ppm

Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls

Appropriate engineering controls No further data; see item 7.

Individual protection measures, such as personal protective equipment**General protective and hygienic measures:**

Wash hands before breaks and at the end of work.

Do not eat or drink while working.

Keep away from tobacco products.

Respiratory protection: Use respiratory protective device with organic gas cartridge.

Hand protection

Protective gloves

To avoid skin problems reduce the wearing of gloves to the required minimum.

Material of gloves:

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Leather

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Eye/face protection

Safety glasses

Body protection: Protective work clothing*** SECTION 9: Physical and chemical properties****9.1 Information on basic physical and chemical properties****General Information**

Physical state	Liquefied gas
Colour:	Colourless
Odour:	Odourless
Melting point/freezing point:	-160 °C
Boiling point or initial boiling point and boiling range	-40.8 °C
Flammability	Product is not flammable.
Lower and upper explosion limit	
Lower explosive limit:	No further information available.
Upper explosive limit:	Not determined.
Flash point:	Not applicable.
Decomposition temperature:	No further information available.
pH	Not determined.
Viscosity:	
Kinematic viscosity	No further information available.
Solubility	
water at 25 °C:	0.30 g/100g
Partition coefficient n-octanol/water (log value)	1.13 log POW
Vapour pressure at 25 °C:	1.04 MPa
Density and/or relative density	
Density at 25 °C:	1.19 g/cm ³
Vapour density	3.0 g/cm ³ (air=1)
Particle characteristics	No further information available.

9.2 Other information:

Form:	Liquefied gas
Auto-ignition temperature:	Product is not self-igniting.

Information with regard to physical hazard classes

Explosives	Not applicable
Flammable gases	Not applicable
Aerosols	Not applicable
Oxidising gases	Not applicable
Gases under pressure	
Contains gas under pressure; may explode if heated.	
Flammable liquids	Not applicable
Flammable solids	Not applicable
Self-reactive substances and mixtures	Not applicable
Pyrophoric liquids	Not applicable
Pyrophoric solids	Not applicable
Self-heating substances and mixtures	Not applicable
Substances and mixtures, which emit flammable gases	
in contact with water	Not applicable
Oxidising liquids	Not applicable
Oxidising solids	Not applicable
Organic peroxides	Not applicable
Corrosive to metals	Not applicable
Desensitised explosives	Not applicable

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SECTION 10: Stability and reactivity

10.1 Reactivity No further relevant information available.

10.2 Chemical stability

Thermal decomposition / conditions to be avoided: To avoid thermal decomposition do not overheat.

10.3 Possibility of hazardous reactions: No dangerous reactions known under normal conditions of use.

10.4 Conditions to avoid: Keep away from heat, sparks, flame, high temperature.

10.5 Incompatible materials: Alkali or alkaline earth metals - powdered Al, Zn, Mg, etc.

10.6 Hazardous decomposition products: Hydrofluoric acid, carbonyl fluoride

*** SECTION 11: Toxicological information****11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

Acute toxicity no data

LD/LC50 values relevant for classification:

CAS: 75-45-6 Chlorodifluoromethane

Inhalative LC50/4 h 220000 ppm (Rat)

Skin corrosion/irritation:

CAS: 75-45-6 Chlorodifluoromethane

Inhalative Cardiac sensitive 25000 ppm (Dog)

Cardiac sensitization occurred in dogs at 50000 ppm or greater from the action of exogenous epinephrine.

Development 20000 ppm (Rat)

A slight, but significant increase in developmental toxicity was observed.

50000 ppm (Rabbit)

Serious eye damage/irritation: No further information available.

after inhalation: No further information available.

Respiratory or skin sensitisation: Based on available data, the classification criteria are not met.

Germ cell mutagenicity: Chromosomal Aberration Study in vivo - Negative

Carcinogenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity:

Fertility was not affected by chlorodifluoromethane in male rats and mice.

Developmental toxicity was not demonstrated in rabbits.

The chlorodifluoromethane caused significantly eye harm exposed to high concentration.

Based on available data, the classification criteria are not met.

STOT-single exposure: Based on available data, the classification criteria are not met.

STOT-repeated exposure: Based on available data, the classification criteria are not met.

Aspiration hazard: Based on available data, the classification criteria are not met.

Other information (about experimental toxicology):

Ames Assay – Positive

Chromosomal Aberration Study in vitro- Negative

Mouse Micronucleus Assay in Vivo - Negative

Subacute to chronic toxicity: No further information available.

11.2 Information on other hazards:

Endocrine disrupting properties:

Substance is not listed.

*** SECTION 12: Ecological information****12.1 Toxicity**

Aquatic toxicity:

CAS: 75-45-6 Chlorodifluoromethane

EC50/48 h 433 mg/l (Daphnia)

LC50/96 h 777 mg/l (Fish)

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12.2 Persistence and degradability: No further relevant information available.

12.3 Bioaccumulative potential:

Due to the distribution coefficient n-octanol/water an accumulation in organisms is not expected.

12.4 Mobility in soil: No further relevant information available.

12.5 Results of PBT and vPvB assessment

PBT: No further relevant information available.

vPvB: No further information available.

12.6 Endocrine disrupting properties The product does not contain substances with endocrine disrupting properties.

12.7 Other adverse effects:

Additional ecological information:

General notes:

Ozone depletion potential(ODP) : 0,055 (CFC-11 1.0)

Global warming potential(GWP) : 1700

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Recommendation:

Disposal must be made according to official regulations.

Incineration in an adequate incinerator is recommended.

Uncleaned packaging

Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

14.1 UN number or ID number

ADR, IMDG, IATA

UN1018

14.2 UN proper shipping name:

ADR:

1018 CHLORODIFLUOROMETHANE (REFRIGERANT GAS R22)

IMDG, IATA

CHLORODIFLUOROMETHANE (REFRIGERANT GAS R22)

14.3 Transport hazard class(es):

ADR



Class:

2 2A Gases.

Label:

2.2

IMDG



Class:

2.2 Gases.

Label:

2.2

IATA



Class:

2 Gases.

Label:

2.2

14.4 Packing group:

ADR, IMDG, IATA

Not applicable

14.5 Environmental hazards:

Marine pollutant:

No

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14.6 Special precautions for user:**Hazard identification number (Kemler code):****EMS Number:****14.7 Maritime transport in bulk according to IMO instruments****Transport/Additional information:**

Warning: Gases.

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F-C,S-V

Not applicable.

Avoid direct sunlight. Make sure of no damage, corrosion, leaks on the receptacles.

Take necessary measures for preventing cargo shift.

ADR**Limited quantities (LQ):****Excepted quantities (EQ)**

120 ml

Code: E1

Maximum net quantity per inner packaging: 30 ml

Maximum net quantity per outer packaging: 1000 ml

Transport category:**Tunnel restriction code:****IMDG****Limited quantities (LQ)****Excepted quantities (EQ)**

3

C/E

120 ml

Code: E1

Maximum net quantity per inner packaging: 30 ml

Maximum net quantity per outer packaging: 1000 ml

UN "Model Regulation":

UN1018, CHLORODIFLUOROMETHANE (REFRIGERANT GAS R22), 2.2

*** SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****Labelling according to Regulation (EC) No 1272/2008**

The substance is classified and labelled according to the CLP regulation.

Hazard pictograms

GHS04 GHS07

Signal word Warning**Hazard statements**

H280 Contains gas under pressure; may explode if heated.

H420 Harms public health and the environment by destroying ozone in the upper atmosphere

Precautionary statements

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

P502 Refer to manufacturer or supplier for information on recovery or recycling.

National regulations No further information available.**15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.**SECTION 16: Other information**

The product is for the industrial use only. We do not guarantee the safety in case the product is used for the other purposes. When using the product for health-care application or food/feed application, consult us in advance.

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS: EHS Department**Contact:** <http://www.daikin.com/>**Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

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LATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Press. Gas (Liq.): Gases under pressure – Liquefied gas

Ozone 1: Hazardous to the ozone layer – Category 1

*** Data compared to the previous version altered.**