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

- **Product identifier**
- **Trade name:** R-407E
- **Article number:** R407E
- **Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
- **Application of the substance / the preparation** Chemical intermediate
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
DAIKIN INDUSTRIES, LTD. CHEMICAL DIVISION:
Umeda Center Bldg., 4-12, Nakazaki-Nishi2-chome, Kita-Ku, Osaka, JAPAN
Phone: (+81) 6-6373-4345 Fax: (+81) 6-6373-4281
- **Further information obtainable from:** <http://www.daikin.com/>
- **Emergency telephone number:** +81-6-6349-7521, +1-256-306-5000, +86-512-5232-0973, +49-211-179 225-0

2 Hazard identification

- **Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**



GHS04 gas cylinder

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



GHS07

STOT SE 3 H336 May cause drowsiness or dizziness.

- **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.
- **Signal word** Warning
- **Precautionary statements**
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P405 Store locked up.
P410 Protect from sunlight.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

3 Composition/information on ingredients

- **Chemical characterization: Substances**

811-97-2 1,1,1,2-Tetrafluoroethane	60,0%
Press. Gas, H280	
75-10-5 Difluoromethane	25,0%
F+ R12	
Flam. Gas 1, H220; Press. Gas, H280	
354-33-6 Pentafluoroethane	15,0%
Press. Gas, H280	

- **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

- **Description of first aid measures**
- **General information:** Seek immediate medical advice.
- **After inhalation:** At high levels, cardiac arrhythmia may occur.
- **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
In cases of frost bites, rinse with plenty of water. Do not remove clothing.

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- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If symptoms persist consult doctor.
- **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.
- **Most important symptoms and effects, both acute and delayed**
Frost bites
Causes asphyxiation in high concentrations. May cause an abnormal heart rhythm and prove suddenly fatal.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Firefighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture**
In case of fire, the following can be released:
Hydrogen fluoride (HF)
Formation of toxic gases is possible during heating or in case of fire.
- **Advice for firefighters**
- **Protective equipment:** Wear fully protective suit.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Keep people at a distance and stay on the windward side.
Ensure adequate ventilation
- **Environmental precautions:**
Suppress gases/fumes/haze with water spray.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:** Ensure adequate ventilation.
- **Reference to other sections** See Section 8 for information on personal protection equipment.

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** Waste air is to be released into the atmosphere only via suitable separators.
- **Information about fire - and explosion protection:** The product is not flammable.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store only in unopened original receptacles.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
Store in a cool place.
Protect from heat and direct sunlight.
- **Maximum storage temperature:** 40 °C
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Control parameters**
- **Ingredients with limit values that require monitoring at the workplace:**

811-97-2 1,1,1,2-Tetrafluoroethane

WEEL (USA) 1000 ppm

354-33-6 Pentafluoroethane

WEEL (USA) 1000 ppm

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75-10-5 Difluoromethane

WEEL (USA) 1000 ppm

AIHA

- **Additional information:** The lists valid during the making were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
 - Wash hands before breaks and at the end of work.
 - Keep away from tobacco products.
- **Respiratory protection:**
 - Wear respirator for organic gases, where leakage may occur.
 - Use suitable respiratory protective device in case of insufficient ventilation.
- **Protection of hands:**
 - To avoid skin problems reduce the wearing of gloves to the required minimum.



Protective gloves

- **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.
- **Eye protection:** Safety glasses
- **Body protection:** Protective work clothing

9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
 - Form:** Liquefied gas
 - Colour:** Colourless
 - Odour:** Odourless
- **Change in condition**
 - Melting point/Melting range:** Undetermined.
 - Boiling point/Boiling range:** -43,6 °C
- **Flash point:** Not applicable.
- **Self-igniting:** Product is not selfigniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Vapour pressure at 25 °C:** 1,19 MPa
- **Density:** Not determined.
- **Solubility in / Miscibility with water:** Not miscible or difficult to mix.
- **Other information** No further relevant information available.

10 Stability and reactivity

- **Reactivity**
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** alkali or alkaline earth metals--powdered Al, Zn, Mg, etc.
- **Hazardous decomposition products:** Fluorophosgene on contact with naked flame or red hot objects.

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11 Toxicological information

· **Information on toxicological effects**

· **Acute toxicity:** Low acute toxicity.

· **Other information (about experimental toxicology):**

75-10-5 Difluoromethane

Inhalative Cardiac sensitive NOEL : 350,000 ppm (dog)

Whatever the tested concentration up to 35% in air, HFC32 does not induce cardiac sensitisation to adrenaline in dogs.

Development NOEL : 50,000 ppm (rats and rabbits)

the both NOAEC for foritility and developmental endpoints

354-33-6 Pentafluoroethane

Inhalative Cardiac sensitive 100,000 ppm (dog)

The cardiac sensitization response is observed.

Development NOEL: 50,000 ppm (rats and rabbits)

811-97-2 1,1,1,2-Tetrafluoroethane

Inhalative Cardiac sensitive 75,000 ppm (dog)

The cardiac sensitization response is observed.

Development NOEL : 50,000 ppm (rats and rabbits)

· **Subacute to chronic toxicity:**

75-10-5 Difluoromethane

Inhalative Subchronic study NOEL : 50,000 ppm (rat)

90 day

354-33-6 Pentafluoroethane

Inhalative Subchronic study NOEL: ≥ 50000 ppm (rat)

811-97-2 1,1,1,2-Tetrafluoroethane

Inhalative chronic study NOEL : 10,000 ppm (rat)

· **Additional toxicological information:**

When used and handled according to specifications, the product does not have any harmful effects to our experience and the information provided to us.

· **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)** no genotoxic

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:** No further relevant information available.

· **Persistence and degradability** No further relevant information available.

· **Behaviour in environmental systems:**

· **Bioaccumulative potential**

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

· **Mobility in soil** No further relevant information available.

· **Ecotoxical effects:** no data

· **Additional ecological information:**

· **General notes:**

Ozone depletion potential(ODP) : 0

Global warming potential(GWP) : 1,300-2,800

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects** No further relevant information available.

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13 Disposal considerations

- **Waste treatment methods**
- **Recommendation**
Must be specially treated adhering to official regulations.
Incineration in an adequate incinerator is recommended.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- **UN-Number**
- **ADR, IMDG, IATA** UN3163
- **UN proper shipping name**
- **ADR** 3163 LIQUEFIED GAS, N.O.S. (1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A), DIFLUOROMETHANE (REFRIGERANT GAS R 32))
- **IMDG, IATA** LIQUEFIED GAS, N.O.S. (1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A), DIFLUOROMETHANE (REFRIGERANT GAS R 32))
- **Transport hazard class(es)**
- **ADR, IMDG, IATA**
- **Class** 2.2
- **Packing group**
- **ADR, IMDG, IATA** Not applicable
- **Environmental hazards:**
- **Marine pollutant:** No
- **Special precautions for user** Not applicable.
- **EMS Number:** F-C,S-V
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.
- **Transport/Additional information:**
- **ADR**
- **Limited quantities (LQ)** 120 ml
- **UN "Model Regulation":** UN3163, LIQUEFIED GAS, N.O.S. (1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A), DIFLUOROMETHANE (REFRIGERANT GAS R 32)), 2.2

15 Regulatory information

- **National regulations:**
CHINA INVENTORY: All components of this product are in compliance with the inventory listing requirements of the Inventory of Existing Chemical Substances (IECSC)
KOREA INVENTORY: All components of this product are in compliance with the inventory listing requirements of the Korea. Existing Chemicals Inventory (KECI)
JAPAN INVENTORY: All components of this product are in compliance with the inventory listing requirements of the Japan. Inventory of Existing & New Chemical Substances (ENCS).

16 Other information

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 Organization
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals