SAFETY DATA SHEET

R-134a

Issued: January 2023 Version 2.2 Date: 2 January 2023

SECTION 1. Identification of the substance or mixture and of the company or undertaking

1.1. Product identifier

Trade name: **R-134a**

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

Use of the substance/mixture: Refrigerant

Restrictions on use: For professional use only.

1.3. Details of the supplier of the safety data sheet

Supplier name: GAS SERVEI S.A.

Address: C/ Motors, 151-155 nave nº 9 08038 Barcelona SPAIN

Telephone: +34 (93) 2231377

Fax: +34 (93) 2231479

www.gas-servei.com

Email address of the person responsible for the SDS: gas-servei@gas-servei.com

1.4. Emergency telephone number

Gas-servei: +34 619373605

National Institute of Toxicology and Forensic Sciences: +34 (91) 5620420

SECTION 2. Hazard identification

2.1. Classification of the substance or mixture

Criteria EC Regulation 1272/2008 (Classification, Labelling and Packaging):

Pressurised gases, liquefied gas H280: Contains pressurised gas; danger of explosion if heated.

2.2. Label elements

Hazard pictograms: Symbols: GHS04

Signal word: Warning

Hazard statements: H280: Contains gas under pressure; may explode if heated. Precautionary statements: Storage:

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

Additional labelling: Contains fluorinated greenhouse gases (HFC-134a)

2.3. Other hazards

This substance is not considered to be persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB).

Ecological information: The substance is not considered to have endocrine-disrupting properties in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

Toxicological information: The substance is not considered to have endocrine-disrupting properties according to Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

Vapours are heavier than air and may cause asphyxiation by reducing the oxygen in the air breathed.
Incorrect use or intentional inhalation abuse can cause death without warning symptoms due to cardiac effects.
Rapid evaporation of the product may cause frostbite. It may displace
oxygen and cause rapid asphyxiation.

SECTION 3. Composition/information on components

3.1. Substances

Substance name: 1,1,1,2-Tetrafluoroethane

Chemical name	Concentration (% by weight)	CAS No.	EC No.	REACH registration number	Classification
					EC Regulation No. 1272/2008
1,1,1,2-Tetrafluoroethane (HFC 134a)	≥99.9 - ≤100	000811-97-2	212-377-0		2.5 Press. Gas H280

SECTION 4. First aid

4.1. Description of first aid

General recommendations: In the event of an accident or feeling unwell, seek medical attention immediately.
If symptoms persist or in case of doubt, seek medical advice.

Protection for first aiders: No special precautions are required for first aiders.

In case of inhalation: If inhaled, move to fresh air.
If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Consult a doctor immediately.

In case of Skin contact: Thaw frozen parts with warm water. Do not rub the affected area.
Consult a doctor immediately.

In case of contact with eyes: Seek medical attention immediately.

If swallowed: Ingestion is not considered a potential route of exposure.

4.2. Main symptoms and effects, acute and delayed

May cause cardiac arrhythmia.
Other symptoms possibly related to misuse or abuse of inhalation are:

Cardiac sensitisation	Anaesthetic effects
Mild dizziness	Vertigo
Confusion	Lack of coordination
Drowsiness	Unconsciousness

The gas reduces the oxygen available for breathing.
Contact with the liquid or refrigerated gas may cause cold burns and frostbite.

4.3. Indication of any medical attention and special treatment that should be given immediately

Treatment: Symptomatic treatment and supportive therapy as indicated.
Due to possible cardiac arrhythmias, catecholamines, such as epinephrine, which may be used in emergency life-support situations, should be used with particular caution.

SECTION 5. Firefighting measures

5.1. Extinguishing media

Appropriate extinguishing media

Appropriate: Not applicable
Will not burn

Extinguishing agents

Not suitable: Not applicable
Will not burn

5.2. Specific hazards arising from the substance or mixture

Specific hazards during firefighting: Exposure to combustion products may be a health hazard.
Do not inhale the gases produced.
Due to high vapour pressure, there is a risk of containers bursting if the temperature rises.

Combustion products hazards: Hydrogen fluoride
Carbonyl fluoride
Carbon oxides
Fluorinated compounds

5.3. Recommendations for firefighting personnel

Special protective equipment for firefighting personnel

firefighting personnel: If necessary, use self-contained breathing apparatus for firefighting.
Use personal protective equipment.

Specific methods

Extinguishing methods: Use extinguishing measures appropriate to the local circumstances and surroundings.
Fight the fire from a distance due to the risk of explosion. Use water spray to cool closed containers.
Remove intact containers from the fire area if it is safe to do so. Evacuate the area.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas.
Use self-contained breathing apparatus and appropriate personal protective equipment when removing spills. Avoid skin contact with dripping liquid (freezing hazard).
Ventilate the area.
Follow the safety handling advice (see section 7) and personal protective equipment recommendations (see section 8).

6.2. Environmental precautions

Do not disperse into the environment.
Prevent the product from entering the soil/subsoil.
Prevent it from entering surface water or drains. Safely contain any new leaks or spills.
Contain and dispose of contaminated water.
In the event of gas leakage or penetration into watercourses, soil or the sewer system, inform the responsible authorities.

6.3. Containment and cleaning methods and materials

Cleaning methods: Ventilate the area.
Wash with plenty of water.

Containment and cleaning materials:
containment and cleaning: Suitable collection material: absorbent material, organic material, sand.

Local or national regulations may apply to the release and disposal of this material and to the materials and elements used in cleaning up spills. You must determine which regulations apply. Sections 13 and 15 of this safety data sheet provide information on certain local or national requirements.

6.4. Reference to other sections

See also sections 7, 8, 11, 12 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Technical measures: Use equipment rated for cylinder pressure. Use a backflow prevention device on the pipe. Close the valve after each use and after emptying.

Local/total ventilation: Use only with good ventilation.

Tips for safe handling:

Avoid contact with skin and eyes.
Avoid inhaling vapours and mists from the fluid.
Do not use empty containers that have not been previously cleaned. Handle in accordance with good industrial safety and hygiene practices, based on the results of the workplace exposure assessment. Wear insulated gloves and protective equipment for the face/eyes. The valve protection caps and threaded plugs on the valve outlet must remain in place unless the container is secured with the valve outlet connected to the point of use.
Use a non-return valve or trap (drain, siphon trap interceptor) in the discharge line to prevent dangerous backflow into the cylinder.
Before performing transfer operations, ensure that there are no incompatible materials and/or residues in the containers.
Prevent gas from flowing back into the gas container.
Use a pressure regulator when connecting the cylinder to lower pressure systems or pipes.
Close the valve after each use and after emptying. DO NOT change or force connections.
Prevent water from seeping into the gas container. Never attempt to lift the cylinder by its cap.
Do not drag, slide or roll cylinders.
Use a suitable hand truck to move the cylinder. Keep away from heat and sources of ignition.

	The transfer of liquid refrigerant from refrigerant containers to systems and from systems may cause static electricity to build up. Ensure that there is adequate earthing. Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Avoid the build-up of electrostatic charges. Take care to mitigate the risk of high pressures developing in systems, caused by temperature increases when liquid is trapped between closed valves or when containers have been overfilled. Avoid spillage and disposal. Minimise release into the environment.
Hygiene measures:	If exposure to chemicals is likely during normal use, provide eye wash stations and safety showers near the work area. Do not eat, drink or smoke during use. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Technical requirements for Storage and containers:	Keep cylinders in a well-ventilated place away from fire hazards. Cylinders must be stored upright and securely fastened to prevent them from falling or being knocked over. Separate full containers from empty containers. Do not store near combustible materials. Avoid areas where salt and other corrosive materials are present. Store in correctly labelled containers. Keep in a cool, well-ventilated place. Keep away from direct sunlight. Store in accordance with specific national regulations.
Instructions for Joint storage:	Do not store with the following types of products: Self-reactive substances and mixtures Organic peroxides Oxidisers Flammable liquids Flammable solids Pyrophoric liquids Pyrophoric solids Substances and mixtures that undergo spontaneous heating. Substances and mixtures which, in contact with water, emit flammable gases. Explosives Highly toxic mixtures and substances. Very toxic mixtures and substances. Mixtures and substances with chronic toxicity
Recommended storage temperature storage temperature:	< 50 °C
Storage time:	> 10 years
Further information on stability during storage:	The product has an indefinite shelf life when stored properly.

7.3. Specific end uses

Subject to Member State regulations, the uses to which it may be applied are as follows: Refrigerant, foaming agent.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Does not contain substances with occupational exposure limit values.

Derived no-effect level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	CAS No.	End use	Route of exposure	Potential health effects on health	Value (mg/m^3)
1,1,1,2-Tetrafluoroethane	811-97-2	Workers	Inhalation	Long term - systemic effects	13,936
		Consumers	Inhalation		2,476

Predicted no-effect concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	CAS No.	Environmental Compartment	Value
1,1,1,2-Tetrafluoroethane	811-97-2	Freshwater	0.1 mg/l
		Seawater	0.01 mg/l
		Release/discontinuation of use	1 mg/l
		Freshwater sediment (dry weight)	0.75 mg/kg
		Wastewater treatment plant	73 mg/l

8.2. Exposure controls

Occupational exposure controls

Personal protective equipment must comply with current EN standards: Respiratory protection EN 136, 140, 149; Protective goggles/Eye protection EN 166; Protective clothing EN 340, 463, 469, 943-1, 943-2; Protective footwear EN-ISO 20345. Do not breathe vapours.

EN-ISO 20345. Do not
breathe vapours.

Engineering measures

Ensure adequate ventilation, especially in confined areas. Minimise exposure concentrations in the workplace.

Personal protection

Respiratory protection: If adequate exhaust ventilation is not available or exposure assessment shows exposure outside recommended limits, use self-contained breathing apparatus or a positive pressure air line and mask.
The equipment must comply with UNE EN 14387.

Filter type: Low boiling point organic gas and vapour (AX).

Protection of the skin and body: Wash skin after all contact with the product.
Protection of hands:

Hand protection:

Material: Gloves resistant to low temperatures

Remarks: Select chemical protective gloves based on the quantity and concentration of hazardous substances to be handled in the workplace. It is recommended to check with the manufacturer of the above-mentioned protective gloves to ensure that they have the necessary resistance for applications with special chemicals. Wash hands before breaks and after finishing work. The break-through time has not been determined for this product.
Change gloves frequently.

Eye protection: Wear the following personal protective equipment:
Chemical-resistant goggles must be worn. Face shield.
The equipment must comply with UNE EN 166.

SECTION 9. Physical and chemical properties

Appearance:	Liquefied gas
Colour:	Colourless
Odour:	Slight, similar to ether
Odour threshold:	No data available
pH:	No data available
Melting/freezing point:	-108 ºC
Initial boiling point and boiling range:	
:	-26.1 °C (1,013 hPa)
Flash point:	Not applicable
Evaporation rate:	> 1 (CCL4=1.0)
Flammability (solid, gas):	Will not burn
Upper explosion limit /Flammability limit Upper:	Upper flammability limit Method: ASTM E681 None.
Lower explosive limit /Lower flammability limit :	Lower flammability limit Method: ASTM E681 None.
Vapour pressure:	5,700 hPa (20 °C)
Relative density:	4.24 (20 °C) 1.21 (25 °C) (as liquid)
Density:	1.206 g/cm³ (25 °C) (as liquid)
Solubility	
Water solubility:	1 g/l (25 °C)
Partition coefficient (n-octanol/water):	log Pow: 1.06 (25 °C)
Auto-ignition temperature:	> 743 °C
Decomposition temperature decomposition:	No data available
Viscosity:	Not applicable
Explosive properties:	Non-explosive
Oxidising properties:	The substance or mixture is not classified as an oxidiser.
Particle size:	Not applicable
Other data	
Critical temperature:	101.1 °C
Critical pressure:	40.6 bar

SECTION 10. Stability and reactivity

10.1. Reactivity

Not classified as a reactivity hazard.

10.2. Chemical stability

Stable if used according to instructions. Follow precautionary advice and avoid incompatible materials and conditions.

10.3. Possibility of hazardous reactions

The product is not flammable in air under normal ambient temperature and pressure conditions. When pressurised with air or oxygen, the mixture may become flammable. Therefore, certain mixtures of HFC and chlorine may be flammable or reactive under certain conditions.
It may react with strong oxidising agents.

10.4. Conditions to avoid

This substance is not flammable in air at temperatures up to 100 °C (212 °F) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature may become combustible in the presence of an ignition source.
This substance can also become combustible in an oxygen-enriched environment (oxygen concentrations higher than those found in air). Therefore, if a mixture containing air and this substance, or if this substance is in an oxygen-enriched environment, it can become combustible. This will depend on the relationship between 1) temperature, 2) pressure, and 3) the proportion of oxygen in the mixture. In general, this substance should not be mixed with air at pressures above atmospheric pressure or at high temperatures, or in an oxygen-enriched environment. For example, this substance should NOT be mixed with air under pressure for leak detection testing or other purposes.
Avoid heat, flames and sparks.

10.5. Incompatible materials

Strong oxidising agents, alkali metals and alkaline earth metals, and other metals and transition metals, aluminium powder, zinc, etc.

10.6. Hazardous decomposition products

Carbon oxides, carbonyl fluoride, halogenated compounds, hydrogen fluoride by thermal decomposition and hydrolysis.

SECTION 11. Toxicological information

11.1. Information on the hazard classes defined in Regulation (EC) 1272/2008

Information on
possible routes of exposure: Inhalation
Skin contact Eye contact

a. Acute toxicity

Not classified according to available information.

Components:

1,1,1,2-Tetrafluoroethane:

Acute oral toxicity: Assessment: The substance does not present acute oral toxicity.

Acute inhalation toxicity: LC50 (Rat): > 567,000 ppm
Exposure time: 4 h
Atmosphere test: gas
Method: OECD Test Guideline 403

No observed adverse effect concentration (dog): 40,000 ppm Atmosphere test: gas
Observations: Cardiac sensitisation
Concentration with few adverse effects observed (dog): 80,000 ppm Atmosphere test: gas
Observations: May cause cardiac arrhythmia.

Cardiac sensitisation threshold limit (dog): 334,000 mg/m³ Atmospheric test: gas
Remarks: May cause cardiac arrhythmia.

Acute dermal toxicity: Assessment: The substance does not present any acute toxicity via the dermal route.

b. Skin corrosion or irritation

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Result:	Does not irritate the skin.

c. Serious eye damage or irritation

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Result:	Does not irritate the eyes.

d. Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Exposure routes: Skin contact Result:
Negative

Exposure routes: Inhalation Species:
Rat
Result: Negative

e. Germ cell mutagenicity

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

In vitro genotoxicity:	Test type: Reverse mutation assay in bacteria (Ames test). Method: OECD Test Guideline 471 Result: Negative Test type: In vitro chromosomal aberration test Method: OECD Test Guideline 473 Result: Negative
In vivo genotoxicity:	Test Type: Micronucleus test in mammalian erythrocytes (in vivo cytogenetic assay). Species: Mouse Route of administration: inhalation (gas) Method: OECD Test Guideline 474 Result: Negative Type of test: Unscheduled DNA synthesis (UDS) test with live mammalian hepatocytes. Species: Rat Route of administration: inhalation (gas) Method: OECD Test Guideline 486 Result: Negative
Mutagenicity in germ cells:	Assessment: The weight of evidence does not support classification as a germ cell mutagen.

f. Carcinogenicity

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Species: Rat
Route of application: inhalation (gas)
Exposure time: 2 years
Method: OECD Test Guideline 453. Result: Negative

Carcinogenicity: carcinogen.

Assessment: The weight of evidence does not support classification as a

g. Reproductive toxicity

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Effects on fertility:

Species: Mouse
Route of administration: Inhalation
Result: Negative

Effects on foetal development:

Type of test: Repeated dose toxicity study combined with reproductive/developmental toxicity screening test.
Species: Rabbit
Route of administration: Inhalation (gas)
Method: OECD Test Guideline 414
Result: Negative

Reproductive toxicity: Assessment: The weight of evidence does not support classification for reproductive toxicity.

h. Specific target organ toxicity (STOT) - single exposure

Not classified according to available information.

Components:

1,1,1,2-Tetrafluoroethane:

Exposure routes: inhalation (gas)
Assessment: No significant health effects were observed in animals at concentrations of 20,000 ppmV/4h or less.

i. Specific target organ toxicity (STOT) - repeated exposure

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Exposure routes: inhalation (gas)
Assessment: No significant health effects were observed in animals at concentrations of 250 ppmV/6h/d or less.

j. Aspiration hazard

No aspiration toxicity classification.

11.2. Information on other hazards

a. Endocrine-disrupting properties

Assessment:

The substance does not have endocrine-disrupting properties according to Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 12. Ecological information

12.1. Toxicity

Components:

1,1,1,2-Tetrafluoroethane:

Toxicity to fish:	LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l Exposure time: 96 h Method: Regulation (EC) No 440/2008, Annex, C.1
Toxicity to Daphnia and other aquatic invertebrates:	EC50 (Daphnia magna (large water flea)): 980 mg/l Exposure time: 48 hours Method: Regulation (EC) No. 440/2008, Annex, C.2
Toxicity to algae/aquatic plants:	ErC50 (green algae): > 100 mg/l Exposure time: 96 h Remarks: Based on data from similar materials.

12.2. Persistence and degradability

Components:

1,1,1,2-Tetrafluoroethane:

Biodegradability:	Result: Not readily biodegradable. Method: OECD 301D test guidelines

12.3. Bioaccumulation potential

Components:

1,1,1,2-Tetrafluoroethane:

Bioaccumulation:	Observations: Bioaccumulation is unlikely. Partition coefficient (n-octanol/water): log Pow: 1.06

12.4. Mobility in soil

Product:

1,1,1,2-Tetrafluoroethane:

Distribution between environmental compartments:
Koc: 37.26, log Koc: 1.571

12.5. Results of the PBT and mPmB assessment

Assessment: This substance does not contain components that are considered to be persistent bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6. Endocrine-disrupting properties

Assessment: The substance does not contain components that have endocrine-disrupting properties in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7. Other adverse effects

Global warming potential

Regulation (EU) No 517/2014 on fluorinated greenhouse gases

Product:

1,1,1,2-Tetrafluoroethane:

Global warming potential in 100 years: 1,430

SECTION 13. Disposal considerations

13.1. Methods for waste treatment

Product: Dispose of in accordance with local regulations. However, this product should be recycled or regenerated whenever possible.

Contaminated containers: Empty pressure vessels must be returned to the supplier. Operate in accordance with current local and national regulations.

SECTION 14. Transport information

14.1. UN number

ADN:	3159
ADR:	3159
RID:	3159
IATA:	3159
IMDG:	3159

14.2. United Nations official transport designation

ADR/ADN/RID:	1,1,1,2-tetrafluoroethane
IMDG:	1,1,1,2-TETRAFLUOROETHANE
IATA:	1,1,1,2-tetrafluoroethane

14.3. Transport hazard class(es)

	Class	Subsidiary risks	classification code	Hazard identification number	Tunnel restriction code
ADR:	2	2.2	2A	20	(C/E)
DNA:	2	2.2	2A	20	
RID:	2	2.2, (13)	2A	20	
IMDG:	2.2				
IATA:	2.2				

14.4. Packing group

Not assigned by regulation.

Labels

ADR/ADN/RID/IMDG: 2.2

IMDG / IATA: Non-flammable. Non-toxic Gas

Packaging instructions

IATA (Cargo):	200
IATA (Passenger):	200

EmS Code

IMDG: F-C, S-V

14.5. Environmental hazards

No: (ADR/ADN/RID/IMDG)

14.6. Special precautions for users

The transport classification(s) listed are for informational purposes only and are based solely on the properties of the unpackaged material described in this Safety Data Sheet. Transport classifications may vary depending on the mode of transport, the size of the container/packaging, and variations in regional or country regulations.

14.7. Maritime bulk transport in accordance with IMO instruments

Not applicable.

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations and legislation specific to the substance or mixture

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII):
Not applicable

REACH - List of candidate substances of very high concern for authorisation (Article 59): Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer:
Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast): Not applicable

Regulation (EC) No 649/2012 of the European Parliament and of the Council concerning the export and import of dangerous chemicals:
Not applicable

REACH-List of substances subject to authorisation (Annex XIV):
Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances:
Not applicable

Regulation (EC) No 517/2014 of the European Parliament and of the Council on certain fluorinated greenhouse gases:
The fluorinated greenhouse gas R-134a must be supplied in returnable containers (drums/cylinders). The container contains fluorinated greenhouse gases regulated by the Kyoto Protocol. Fluorinated greenhouse gases in containers or cylinders must not be vented into the atmosphere.

15.2. Chemical safety assessment

Chemical safety assessments have been carried out for this substance.

SECTION 16. Other information

This sheet cancels and replaces all previous editions.

Date of issue: 2 January 2023
Version: 2.2

This Safety Data Sheet has been prepared in accordance with:
Regulation (EC) No. 1907/2006 and its subsequent amendments: Regulation (EU) No. 2015/830 and Regulation (EU) No. 2020/878

Text of the phrases used in section 3:

H280: Contains pressurised gas; danger of explosion if heated.

The information provided here is based on our knowledge as of the date indicated above. It refers exclusively to the product indicated and does not constitute a guarantee of specific qualities.

The user must ensure the suitability and accuracy of this information in relation to the specific use to be made of the product.

The information is considered correct but is not exhaustive and should be used only as a guide, based on current knowledge of the chemical substance or mixture and applicable to the appropriate safety precautions for the product.
The list of risks, legal, regulatory and administrative texts is not exhaustive. The recipient or user of the product is solely responsible for referring to the official regulations on the storage, handling and use of these products.

Glossary of abbreviations

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways. ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
CMR: Carcinogenic, mutagenic or toxic to reproduction. DIN: Standard of the German Institute for Standardisation.
CEx: Concentration associated with x% response. EmS: Emergency procedure.
GHS: Globally Harmonised System of Classification and Labelling of Chemicals. IATA: International Air Transport Association.
IBC: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.
IMDG: International Maritime Dangerous Goods Code. LC50: Lethal concentration for 50% of a test population. NOAEL: No observed adverse effect level.
NOEL: Non-observable effect level.
NOELR: No observable effect loading rate. IMO: International Maritime Organisation.
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail (COTIF). UN: United Nations.
VLA: Environmental Limit Values.
UNRTDG: United Nations Recommendations on the Transport of Dangerous Goods.