

**SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**

1.1. Product Identifier

Mixture identification:

Name: R407C

UFI code: V1QK-JTNQ-M00F-KGQV

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

Recommended use:

Industrial and professional

Refrigerant gas

1.3. Details of the supplier of the safety data sheet

Company:

TAZZETTI S.P.A

CORSO EUROPA 600/A

10088 VOLPIANO (TO) - ITALY-

Tel. +39 011 97021

Fax +39 011 9702460

rsg.inquiry@tazzetti.com**SECTION 2. HAZARDS IDENTIFICATION**

2.1. Classification of the substance or mixture

EC regulation criteria 1272/2008 (CLP):

Warning, Liquef. Gas, Contains gas under pressure

2.2. Label elements

Symbols:



Signal word: Warning

Hazard statements:

H280 Contains gas under pressure; may explode if heated.

Precautionary statements:

P403 Store in a well ventilated place

P410 Protect from sunlight

P273 Avoid release to the environment.

P314 Get medical advice/attention if you feel unwell

Special Provisions:

Contains fluorinated greenhouse gases covered by the Kyoto protocol.

2.3. Other hazards

Effetti negativi sulla salute:



Inhalation: Like the other volatile aliphatic halogenated compounds, through the accumulation of vapors and/or the inhalation of large quantities, the substance can cause: Loss of consciousness and heart troubles aggravated by stress and lack of oxygen; mortal risk

Contact with liquid may cause cold burns/frostbite.

Vapour heavier than air, may accumulate below ground level and cause choking.

Results of PBT and vPvB assessment : According to Annex III of the REACH regulation, this mixture does not contain any substance meeting the PBT and vPvB criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not available

3.2. Mixtures

Dangerous components	No. Reg. REACH	CAS No.	EC No.	% (w/w)	Classific. CLP
Difluoromethane	01-2119471312-47-0022	75-10-5	200-839-4	23.0	H221 Flam. Gas 1B H280 Press. Gas
Pentafluoroethane	01-2119485636-25-0011	354-33-6	206-557-8	25.0	H280 Press. Gas
1,1,1,2-tetrafluoroethane	01-2119459374-33-0010	811-97-2	212-377-0	52.0	H280 Press. Gas

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

Skin contact:

In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

Eye contact:

In case of contact with eyes, rinse immediately (for at least 15 minutes) with plenty of water and seek medical advice.

Ingestion:

Do not induce vomiting. Obtain medical assistance.

Inhalation:

Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

4.2. Most important symptoms and effects, both acute and delayed

Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects., Other symptoms potentially related to misuse or inhalation abuse are:, Anaesthetic effects, Light-headedness, dizziness, confusion, incoordination, drowsiness, or unconsciousness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

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

Treatment: Do not administer catecholamines (due to cardiac effects caused by the product).

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

All known extinguishants can be used.

Extinguishing media which must not be used for safety reasons:



None in particular.

5.2. Special hazards arising from the substance or mixture

The product is not flammable in air, in a normal temperature and pressure conditions. Certain mixtures of the product with air, in certain conditions of pressure may be flammable. Avoid mixtures of the product with air, under pressure.

Certain mixtures of the product and chlorine may be flammable or reactive under certain conditions. Thermal decomposition causes the emission of fumes very toxic and corrosive gases (hydrogen fluoride).

Containers may explode if heated

Do not inhale explosion and combustion gases.

5.3. Advice for fire-fighters

Specific methods: Cool containers / tanks with water spray. Provide a rapid container evacuation system. In case of fire nearby, remove containers exposed to fire.

Special activities for the protection of firefighters: Wear self-contained breathing apparatus and protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.

Evacuate area.

Ensure adequate air ventilation.

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

See protective measures under point 7 and 8.

6.2. Environmental precautions

Avoid discharge to atmosphere.

6.3. Methods and material for containment and cleaning up

Ventilate area.

6.4. Reference to other sections

See also section 8 and 13.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Do not allow backfeed into the container.

Use only equipment suitable for the product and the operating pressure.

Avoid contact with skin and eyes, inhalation of vapours and mists.

Only experienced and properly instructed persons should handle compressed gases.

The substance must be handled in accordance with good industrial hygiene and safety procedures.

Close container valve after each use and when empty, even if still connected to equipment.

Never attempt to repair or modify container valves or safety relief devices.

Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.

Never use direct flame to raise the pressure of a container.

Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

Do not cut, drill, grind, weld or do similar operations on containers.

7.2. Conditions for safe storage, including any incompatibilities

Observe all regulations and local requirements regarding storage of containers.



Keep container in a well ventilated place.
Protect cylinders from physical damage; do not drag, roll, slide or drop.
Keep away from open flames, sparks and heat sources.
Keep container below 50 °C.
Containers should not be stored in conditions likely to encourage corrosion.
Incompatible materials:
See paragraph 10 below.
Instructions as regards storage permises:
Adequately ventilated.

7.3. Specific end use(s)

If annexed, please make reference to the scenario

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Pentafluoroethane: WEEL Data 2010 LEEL - 8h TWA 1.000 (ppm) 4.900 (mg/m³)

Difluoromethane: ARKEMA LEEL - 8h TWA 1.000 (ppm) 2.130(mg/m³)

DNEL:

Difluoromethane: Workers: 7035 mg/m³, Exposure routes: Inhalation; Health effect: Chronic effects, Systemic toxicity.

Consumers: 750 mg/m³, Exposure routes: Inhalation; Health effect: Chronic effects, Systemic toxicity.

Pentafluoroethane: Workers: 16444 mg/m³ – Exposure routes: Inhalation; Health effect: Chronic effects, Systemic toxicity

Consumers: 1753 mg/m³ - Exposure routes: Inhalation; Health effect: Chronic effects, Systemic toxicity

1,1,1,2-tetrafluoroethane: Workers: Inhalation; Health effect: Chronic effects, Systemic toxicity 13936 mg/m³

Consumers: Inhalation; Health effect: Chronic effects, Systemic toxicity 2476 mg/m³

PNEC:

Difluoromethane:

fresh water: 0,313 mg/l

water (Intermittent use/release) 3,13 mg/l

fresh water sediment 1,8069 mg/kg dw

Pentafluoroethane:

Compartimento: Valore:

fresh water 0,1 mg/l

water (Intermittent use/release) 1 mg/l

fresh water sediment 0,6 mg/kg dw

1,1,1,2-tetrafluoroethane: fresh water: 0.1 mg/l; marine water: 0.01 mg/l; water (Intermittent use/release): 1 mg/l; fresh water sediment: 0.75 mg/kg dry weight; water (sewage treatment plants): 73 mg/l.

8.2. Exposure controls

The product should be handled in a closed circuit.

Provide adequate general and local ventilation.

Make sure the exposure is well below the occupational exposure limits.

If the risk assessment indicates this is necessary, use the following protection

Eye protection:

If foreseeable a risk of spurts or squirts, please wear safety glasses with lateral protection in compliance with rule of law EN 166.

Protection for skin:

Protective clothing

Protection for hands:

If foreseeable a direct contact with liquid or with cold machineries/equipments for which exist a risk of cold burn, please use cold protection gloves in compliance with rule of law EN511 – 020.

Respiratory protection:

Wear self-contained breathing apparatus in compliance with EN 137 when entering area unless atmosphere is proved to be safe.

Thermal Hazards:

Contact with liquid may cause cold burns/frostbite.

Environmental exposure controls:

Refer to environment legislation. Please observe section 13 (Waste treatment methods).

Contact with liquid may cause cold burns/frostbite.

In high concentrations may cause asphyxiation.

Vapour heavier than air, may accumulate below ground level and cause choking.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance and colour:	Gas, Incolour
Odour:	Ethereal
Odour threshold:	Information not available
pH:	Not applicable to substance
Melting point / freezing point:	Information not available
Initial boiling point and boiling range:	from -44.3 to -37.1 °C
Solid/gas flammability:	Not applicable to substance
Upper/lower flammability or explosive limits:	Not applicable to substance
Vapour density:	3.0 (air=1)
Flash point:	Not applicable to substance
Evaporation rate:	Information not available
Vapour pressure:	10.4 bar (at 20°C)
Density:	1.16 g/cm ³ (at 20°C)
Solubility in water:	Not soluble
Solubility (in other substances):	Alcohols, chlorinated solvents, esthers
Partition coefficient n-octanol/water (POW):	Not tested
Auto-ignition temperature:	Not applicable to substance
Decomposition temperature:	Information not available
Viscosity:	Information not available

9.2. Other information

Explosive properties:	Not applicable to substance
Oxidizing properties:	Not applicable to substance

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

The product is not flammable in air, in a normal temperature and pressure conditions. Certain mixtures of the product with air, under certain pressure conditions which may be flammable. Avoiding product mixtures with air under pressure.

Certain product mixtures and chlorine may be flammable or reactive under certain conditions. Thermal decomposition gas emissions very toxic and corrosive fumes (hydrogen fluoride)

10.2. Chemical stability

Stable in normal conditions

10.3. Possibility of hazardous reactions

Can react violently if in contact with alkali metals, alkaline earth metals.



10.4. Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Don't smoke.

10.5. Incompatible materials

Finely divided metals, magnesium and alloys containing more than 2% magnesium, powdered metal salts.

10.6. Hazardous decomposition products

Hydrogen fluoride by thermal decomposition and hydrolysis, carbon oxides, carbonyl fluoride, fluorocarbons.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Toxicological information of the mixture:

Acute inhalation toxicity:

Difluoromethane: Like the other volatile aliphatic halogenated compounds, through the accumulation of vapors and/or the inhalation of large quantities, the substance can cause: Loss of consciousness and heart troubles aggravated by stress and lack of oxygen; mortal risk

On animal : No mortality/4 h/Rat: 520000 ppm (Method: OECD Test Guideline 403)

Pentafluoroethane: Inhaling high concentrations of vapors causes effects that can include: headache, dizziness, drowsiness. Like the other volatile aliphatic halogenated compounds, through the accumulation of vapors and/or the inhalation of large quantities, the substance can cause: Loss of consciousness and heart troubles aggravated by stress and lack of oxygen; mortal risk.

On animal : No mortality/4 h/Rat: 800000 ppm (Method: OECD Test Guideline 403)

1,1,1,2-tetrafluoroethane inhalation: CL50/4h (Rat): > 567000 ppm (Method: OECD Test Guideline 403)

Local effects (Corrosion / Irritation / Serious eye damage):

Skin contact: Freezing possible from liquefied gas splashes

Eye contact: Freezing possible from liquefied gas splashes

Inhalation sensitisation:

Pentafluoroethane : On animal : no effects 7 % (cardiac sensitisation, Dog)

Difluoromethane: On animal : no effects 35 % (cardiac sensitisation, Dog)

1,1,1,2-tetrafluoroethane: Concentration with no observed adverse effect, Dog: 40000 ppm

Test atmosphere: gas Remarks: Cardiac sensitization

Observed Adverse Effect Concentration (Dog): 80000 ppm Test atmosphere: gas

Symptoms: May cause cardiac arrhythmia

Cardiac sensitization threshold limit values (Dog): 334,000 mg/m³ Test atmosphere: gas

Symptoms: May cause cardiac arrhythmia

CMR Effects:

Carcinogenicity:

Species: Rat. Method of application : inhalation (gas) Exposure time : 2 Years

Method: OECD Test Guideline 453 Result : negative

Assessment: The evidence does not support a classification as a carcinogen.

Mutagenicity: Due to its composition, it can be considered as Non-genotoxic

In vitro

Difluoromethane: Ames test in vitro: Inactive (Method: OECD Guideline 471)

In Vitro Human Lymphocyte Test for Chromosomal Aberrations: Inactive (Method: OECD Guideline 473)

It can be considered comparable to a similar product whose experimental results are:

In vitro gene mutation test on mammalian cells: Inactive (Method: OECD guideline 476)

Pentafluoroethane: Ames test: Inactive (Method: OECD Guideline 471)

In vitro chromosome aberration test on CHO cells: Inactive (Method: OECD Guideline 473)

In Vitro Human Lymphocyte Test for Chromosome Aberrations: Inactive (Method: OECD Guideline 476)



In vivo

Difluoromethane: In vivo mouse micronucleus test: Inactive (Method: OECD Guideline 474)

Pentafluoroethane: In vivo mouse micronucleus test: Inactive (Method: OECD Guideline 474)

1,1,1,2-tetrafluoroethane: Germ cell mutagenicity: In vitro genotoxicity :

Test Type: Bacterial Reverse Mutation Test (AMES)

Method: OECD Test Guideline 471 Result: negative

Test Type: Chromosome aberration in vitro

Method: OECD Test Guideline 473 Result: negative

In vivo genotoxicity :

Test Type: Mammalian erythrocyte micronucleus assay (in vivo cytogenetic assay)

Species: Mouse Application Route: Inhalation (gas) Method: OECD Test Guideline 474. Result: negative

Test Type: Unscheduled DNA synthesis (UDS) assay with mammalian liver cells in vivo

Species: Rat Application Route: Inhalation (gas) Method: OECD Test Guideline 486 Result: negative Germ cell mutagenicity

Assessment: Evidence does not support classification as a germ cell mutagen.

Reproductive toxicity:

Fertility: Due to its composition, this product is not expected to be harmful under normal conditions of use

Difluoromethane: On animals : It can be considered comparable to a similar product whose experimental

results are: NOAEL (Parental toxicity): > 50.000ppm NOAEL (Fertility):> 50.000 ppm NOAEL

(Developmental toxicity):> 50000 ppm (rat, mouse, Inhalation)

Fetal development: Based on the available data, it cannot be assumed that the substance has developmental potential.

Difluoromethane: On animals: Absence of toxic effects on the development of the fetus.

NOAEL (Developmental toxicity): 50.000 ppm

NOAEL (maternal toxicity): 50.000 ppm (Method: OECD Guideline 414, rat, rabbit, Inhalation)

Pentafluoroethane: On animals: Absence of toxic effects on the development of the fetus.

NOAEL (Developmental toxicity): 245 mg/l

NOAEL (maternal toxicity): 245 mg/l (Method: OECD Guideline 414, rat, rabbit, Inhalation)

1,1,1,2-tetrafluoroethane:

Effects on Fertility : Species: Mouse Application Route: Inhalation Result: negative.

Effects on fetal development:

Test Type: Repeated dose toxicity study combined with reproductive/developmental toxicity screening

Species: rabbit Application Route: Inhalation (gas) Method: OECD Guideline 414 Result: negative

Reproductive toxicity - Assessment :the evidence does not support a classification for reproductive toxicity

STOT — single exposure:

Route of exposure : inhalation (gas)

Assessment : No significant health effects observed in animals at concentrations of 20000 ppmV/4h or less

STOT — repeated exposure: mixture is not classified as specific target organ toxicant, repeated exposure.

Difluoromethane: In animals : Inhalation: No specific toxic effects observed NOAEL= 50000ppm (Method: OECD Guideline 413, Rat, 3 Months).

Pentafluoroethane: In animals : Prolonged inhalation studies in animals did not reveal any subchronic toxic effects. Inhalation: NOAEL= 50000ppm (Method: OECD Guideline 413, Rat, 3 Months)

1,1,1,2-tetrafluoroethane: Application Route: Inhalation (gas) Assessment: No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or lower

Species: Rat, male and female NOAEL: 50000 ppm LOAEL: >50000 ppm

Application Route: Inhalation (gas) exposure time: 2 years Method: OECD Guideline 453

Aspiration hazard: Not applicable

1,1,1,2-tetrafluoroethane: LC50/4h - rat = 567000 ppm

Difluoromethane: CL50/4h - rat = >520000 ppm



11.2 Information on other hazards

Endocrine Disrupting Properties:

Assessment: mixture does not contain components with endocrine disrupting properties in accordance with article 57(f) of REACH or in accordance with EU Regulations 2017/2100 and 2018/605 (<0,1% concentration).

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Fish: Due to its composition, it must be considered as: Little harmful to fish

Pentafluoroethane: It can be considered similar to a similar product whose experimental results are:

1,1,1,3,3-PENTAFLUOROPANE: LC50/96h/zebra fish (Danio rerio) > 200 mg/l (Method: OECD Guideline 203)

Difluoromethane: LC50/96h/Freshwater fish: 1.731 mg/l (Method: calculated)

1,1,1,2-tetrafluoroethane: LC50/96h/Rainbow trout (Oncorhynchus mykiss): 450 mg/l Method: Regulation (EC) n. 440/2008, annex, C.1.

Aquatic invertebrates: Due to its composition, it must be considered as: Little harmful to daphnia

Pentafluoroethane: It can be considered similar to a similar product whose experimental results are:

1,1,1,3,3-PENTAFLUROBUTANE : CE50/48h/Daphnia magna: > 200 mg/l (Method: OECD TG 202)

Difluoromethane: CE50/48h/Daphnia: 833 mg/l (Method: calculated)

1,1,1,2-tetrafluoroethane: Toxicity to daphnia and other aquatic invertebrates: CE50/48/Daphnia magna: 980 mg/l Method: Regulation (EC) n. 440/2008, annex, C.2

Aquatic plants: Due to its composition, it must be considered as: Little harmful to algae

Pentafluoroethane: It can be considered similar to a similar product whose experimental results are:

1,1,1,3,3-PENTAFLUROPROPANE : CE50r/72h/Pseudokirchneriella subcapitata > 118 mg/l (Method: OECD TG 201)

Difluoromethane: CE50r/96 h/algae: 313 mg/l (Method: calculated)

1,1,1,2-tetrafluoroethane: CE50r/96h/green algae > 100 mg/l Remarks: Based on data from similar materials

12.2. Persistence and degradability

Biodegradation (in water): all products and/or main components mentioned in section 3 and/or analogous substances/metabolites are not readily biodegradable.

Pentafluoroethane: Not readily biodegradable: 5 % after 28 d (Method: OCDE Guideline 301 D)

Difluoromethane: Not readily biodegradable: 5 % after 28 d (Method: OCDE Guideline 301 D)

Photodegradation (In air)

Difluoromethane: Degradation by OH radicals: direct photolysis (half-life time): 3,39 y

1,1,1,2-tetrafluoroethane: Not readily biodegradable

12.3. Bioaccumulative potential

Bioaccumulation:

No product and/or main component mentioned in section 3 and/or analogue substance/metabolite is expected to bioaccumulate.

Pentafluoroethane: Partition coefficient n-octanol/water: log Kow : 1,48 , at 25 °C (Method: OCDE Guideline 107)

Difluoromethane: Partition coefficient n-octanol/water: log Kow : 0,21 , at 25 °C (Method: OCDE Guideline 107)

1,1,1,2-tetrafluoroethane: Remarks: Bioaccumulation is unlikely. Partition coefficient n-octanol/water: log Pow: 1,06

12.4. Mobility in soil

Component:



Difluoromethane: water: 0,01 % Air: 99,99 % Soil: 0 % sediment: 0 % (Method: Calculated as Mackay, level I)

Vapour Pressure: 1,49 hPa, 21,1 °C
3,11 MPa, 50 °C
1,68 MPa, 25 °C
4,31 MPa, 65 °C

Adsorption / Desorption:

Difluoromethane: log Koc: 0,17 - 1,34 (Method: calculated)

Pentafluoroethane: log Koc: 1,3 - 1,7 (Method: calculated)

1,1,1,2-tetrafluoroethane: Koc: 37,26, log Koc: 1,571

12.5. Results of PBT and vPvB assessment

Evaluation results PBT e vPvB : in accordance with Annex III of REACH, this substance does not contain any substance in compliance with PBT and vPvB criteria (<0.1% concentration).

12.6 Endocrine-disrupting properties

Assessment: the substance does not contain components with endocrine disrupting properties in accordance with article 57(f) of REACH or in compliance with EU Regulations 2017/2100 and 2018/605 (<0,1% concentration).

12.7 Other adverse effects

Contains fluorinated greenhouse gases covered by the Kyoto protocol.

Pentafluoroethane: 3.500 GWP (calculation horizon: 100 years)

Difluoromethane: 675 GWP (calculation horizon: 100 years)

1,1,1,2-tetrafluoroethane: 1430 GWP (calculation horizon: 100 years)

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover if possible. In so doing, comply with the local and national regulations currently in force.

Destruction should be on licensed premises equipped to absorb and neutralize acid gases and other toxic processing products. Avoid release to the environment

Avoid discharge to atmosphere.

Recovering according to the supplier's instructions.

SECTION 14. TRANSPORT INFORMATION

14.1. UN number

ADR/RID/IMDG/IATA - UN number: 3340

In case a substance is inside a refrigerating machine is applied the following n° ONU: 2857

14.2. UN proper shipping name:

ADR/RID/IMDG - Shipping name: REFRIGERANT GAS R407C

IATA-Technical name: REFRIGERANT GAS R407C

In case a substance is inside a refrigerating machine the shipping name will be: REFRIGERATING MACHINES containing non-flammable, no-toxic, gases or ammonia solutions (N° ONU 2672).

14.3. Transport hazard class(es)

ADR/RID-Class: 2

ADR-Label: 2.2

RID-Label: 2.2 (+13)

ADR/RID - Hazard identification number: 20

Classification code: 2A

IATA/IMDG - Class: 2.2



14.4. Packing Group

ADR- Packing Group: -

14.5. Environmental hazards: No

14.6. Special Precautions for User

ADR-Tunnel restriction code: C/E

IMDG stowage and segregation: Cat. A

IMDG Emergency Schedules: F-C, S-V

Ensure there is adequate ventilation

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.

Compliance with applicable regulations.

Before transporting product containers :

- Ensure that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.

Avoid transport on vehicles where the load space is not separated from the driver's compartment.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

Not applicable

SECTION 15. REGULATORY INFORMATION

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

Reg. (CE) n. 1907/2006 (REACH), Reg. (CE) n. 1272/2008 (CLP), Reg. (UE) n. 2015/830, Reg. (UE) n. 2020/878.

15.2. Chemical Safety Assessment: yes

SECTION 16. OTHER INFORMATION

Revised safety data sheet in accordance with commission regulation 878/2020.

Points that have changed since the previous version are highlighted with a vertical line in the body of this document.

Ensure operators understand the flammability hazard.

Users of breathing apparatus must be trained.

Ensure operators understand the toxicity hazard.

This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

ECHA: European chemical agency

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold

CCNL - Appendix 1. EIGA

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD. The MSDS cancels and replaces any preceding release.



ADR:	European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS:	Chemical Abstracts Service (division of the American Chemical Society).
CLP:	Classification, Labeling, Packaging..
DNEL:	Derived No Effect Level.
EINECS:	European Inventory of Existing Commercial Chemical Substances.
GHS:	Globally Harmonized System of Classification and Labeling of Chemicals.
IATA:	International Air Transport Association.
IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
ICAO:	International Civil Aviation Organization.
ICAO-TI:	Technical Instructions by the "International Civil Aviation Organization" (ICAO).
IMDG:	International Maritime Code for Dangerous Goods.
LC50:	Lethal concentration, for 50 percent of test population.
LD50:	Lethal dose, for 50 percent of test population.
LTE:	Long-term exposure.
PNEC:	Predicted No Effect Concentration.
RID:	Regulation Concerning the International Transport of Dangerous Goods by Rail.
STE:	Short-term exposure.
STEL:	Short Term Exposure limit.
STOT:	Specific Target Organ Toxicity.
TLV:	Threshold Limiting Value.
TWATLV:	Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).