

SAFETY DATA SHEET

HCS-2012 APPENDIX D TO §1910.1200

Version 1.0.0
Product Name R 404 A

Issue Date 06-May-2016
Revision date 06-May-2016

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

Product identifier

Product Name R 404 A

Other means of identification

No information available.

Recommended use of the chemical and restrictions on use

Recommended Use Refrigerant for professional use in ultra-low temperature freezers.
Uses advised against No Information available

Details of the supplier of the safety data sheet

Supplier Eppendorf AG
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D-22339 Hamburg
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Information provided by Eppendorf Application-Hotline
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Importer Eppendorf North America, Inc.
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Emergency telephone number

For medical advice (in German and English):
+49 (0)551 192 40 (Giftinformationszentrum Nord)

2. HAZARDS IDENTIFICATION

GHS Classification

Gases under pressure Liquefied gas

Label elements

Symbols/Pictograms



Signal word Warning
Hazard Statements Contains gas under pressure; may explode if heated

Precautionary Statements
Prevention None.
Response None.

Storage
Disposal

Protect from sunlight. Store in a well-ventilated place
None.

Hazards not otherwise classified (HNOC)

No information available.

Unknown acute toxicity

No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature

Mixture

Chemical Name	CAS No	Weight-%
Ethane, 1,1,1-trifluoro-	420-46-2	60,4
Pentafluoroethane	354-33-6	35,8
1,1,1,2-Tetrafluoroethane	811-97-2	3,8

4. FIRST AID MEASURES

Description of first aid measures

General advice In case of accident or unwellness, seek medical advice immediately. Remove contaminated clothing and shoes.

Inhalation IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention immediately if symptoms occur.

Skin Contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation persists, call a physician.

Eye contact IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion Not an expected route of exposure.

Most important symptoms and effects, both acute and delayed

In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media No information available.

Specific hazards arising from the chemical

Thermal decomposition can lead to release of irritating and toxic gases and vapors: carbonyl fluoride, hydrogen fluoride, carbon monoxide.

Containers may explode when heated.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. Remove all sources of ignition. Use personal protection recommended in Section 8.

Methods and material for containment and cleaning up

Stop leak if you can do it without risk. Do not flush into surface water or sanitary sewer system.

7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Do not breathe dust/fume/gas/mist/vapors/spray. When using do not eat, drink or smoke. Remove all sources of ignition. Wash thoroughly after handling. Suck back of water into the container must be prevented. Do not allow backfeed into the container.

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place.
Keep container below 50°C in a well ventilated place. Secure cylinders to prevent them from falling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical Name	Latvia	France	Finland	Germany	Italy
Ethane, 1,1,1-trifluoro- (CAS #: 420-46-2)	TWA: 3000 mg/m ³ TWA: 2 ppm TWA: 20 mg/m ³	-	-	-	-
Pentafluoroethane (CAS #: 354-33-6)	TWA: 2 ppm TWA: 20 mg/m ³	-	-	-	-
1,1,1,2-Tetrafluoroethane (CAS #: 811-97-2)		-	-	STEL 8000 ppm STEL 33600 mg/m ³ TWA: 1000 ppm TWA: 4200 mg/m ³	-

Chemical Name	Poland	Portugal	Spain	Switzerland	Netherlands
1,1,1,2-Tetrafluoroethane (CAS #: 811-97-2)	-	-	-	TWA: 1000 ppm TWA: 4200 mg/m ³	-

Chemical Name	Norway	United Kingdom	Australia	Austria	Belgium
1,1,1,2-Tetrafluoroethane (CAS #: 811-97-2)	-	TWA: 1000 ppm TWA: 4200 mg/m ³	1000 ppm 4240 mg/m ³	STEL 4000 ppm STEL 16800 mg/m ³ TWA: 1000 ppm TWA: 4200 mg/m ³	-

Appropriate engineering controls

Use with local exhaust ventilation.

Individual protection measures, such as personal protective equipment

Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
Hand Protection	Wear protective gloves.
Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin and body protection	Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Liquified Gas
Color	Colourless

Odor	Ethereal
Odor Threshold	Not determined
pH	Not applicable
Melting point/freezing point	-111 °C (C2H3F3). -103 °C (C2HF5). -101 °C(C2H2F4). -47,8 °C
Boiling point / boiling range	-47,8 °C
Flash point	Not applicable
Evaporation rate	Not applicable
Flammability (solid, gas)	Non-flammable gas
Flammability Limit in Air	Not determined
Vapor Pressure	21,1°C 1,261 kPa
Vapor density (air= 1)	3.43(calculated)15°C
Density	Not determined
Relative density, gas	Not determined
Relative density, liquid (Water=1)	1.07 (water=1)
Partition coefficient (LogPow)	Not determined
Autoignition temperature	Not applicable
Decomposition temperature	Not known
Kinematic viscosity	Not determined
Dynamic viscosity	Not determined
Explosive properties	Not applicable
Oxidizing properties	Not applicable

Other information

Molecular weight	97.6
Critical temperature	72 °C

10. STABILITY AND REACTIVITY**Reactivity**

May react with aluminium.

Chemical stability

Stable under normal conditions.

Possibility of Hazardous Reactions

No information available.

Conditions to avoid

Keep away from sources of ignition — No smoking.

Incompatible materials

None known.

Hazardous Decomposition Products

Thermal decomposition yields toxic products which can be corrosive in the presence of moisture.

11. TOXICOLOGICAL INFORMATION**Information on likely routes of exposure**

Inhalation	No known effect based on information supplied.
Eye contact	No known effect based on information supplied.
Skin Contact	No known effect based on information supplied.
Ingestion	No known effect based on information supplied.

Information on toxicological effects

Acute toxicity

May react with aluminium.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Ethane, 1,1,1-trifluoro- (CAS #: 420-46-2)	-	-	practically nontoxic
Pentafluoroethane (CAS #: 354-33-6)	-	-	2910 g/m ³ 4h (Rat) > 800000 ppm 4h (Rat)
1,1,1,2-Tetrafluoroethane (CAS #: 811-97-2)	-	-	1500000 mg/m ³ /4h (Rat)

Skin corrosion/irritation

No information available.

Serious eye damage/eye irritation

No information available.

Sensitization

No information available.

Germ cell mutagenicity

No information available.

Carcinogenicity

No information available.

Reproductive toxicity

No information available.

STOT - single exposure

No information available.

STOT - repeated exposure

No information available.

Aspiration hazard

No information available.

12. ECOLOGICAL INFORMATION**Ecotoxicity**

Chemical Name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50
Ethane, 1,1,1-trifluoro- (CAS #: 420-46-2)	-	109 mg/l	115 mg/l
Pentafluoroethane (CAS #: 354-33-6)	142 mg/L 96h other: green algae	109 mg/L 96h Oncorhynchus mykiss	> 100 mg/L 48h Daphnia magna
1,1,1,2-Tetrafluoroethane (CAS #: 811-97-2)	-	450 mg/L/96h (Oncorhynchus mykiss)	980 mg/L/48h (Daphnia magna)

Persistence and degradability

No information available.

Bioaccumulative potential

No information available.

Mobility in soil

No information available.

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.
 Contaminated packaging Dispose of in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT

UN/ID No. 3337
 UN Proper shipping name REFRIGERANT GAS R 404A
 Hazard Class 2.3
 Packing Group None
 Special precautions No information available
 Marine pollutant Not marine pollutant

15. REGULATORY INFORMATION

International Inventories

Component	AICS	DSL/NDSL	EINECS/ELI NCS	ENCS	IECSC	KECL	PICCS	TSCA
Ethane, 1,1,1-trifluoro- 420-46-2	X	X	X	X	X	X	X	X
Pentafluoroethane 354-33-6	X	X	X	X	X	X	X	X
1,1,1,2-Tetrafluoroet hane 811-97-2	X	X	X	X	X	X	X	X

"-" Not Listed

"X" Listed

US Federal Regulations

SARA 313

Not applicable

SARA 311/312 Hazard Categories

Not applicable

CWA (Clean Water Act)

Not applicable

CERCLA

Not applicable

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated under applicable state right-to-know regulations

16. OTHER INFORMATION

Revision Note

Issue Date	06-May-2016
Revision date	06-May-2016
Revision Note	Not applicable

Key or legend to abbreviations and acronyms used in the safety data sheet

TWA - TWA (time-weighted average)

STEL - STEL (Short Term Exposure Limit)

Ceiling - Maximum limit value

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

Disclaimer

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